A DECISION FRAMEWORK FOR SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES AMONGST MANUFACTURING COMPANIES IN BOTSWANA

By

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A Decision Framework for Sustainable Supplier Relationship Performance Objectives Amongst Manufacturing Companies in Botswana

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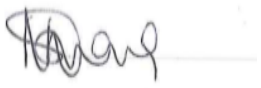

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ABSTRACT

The supply chains of manufacturing companies in Botswana get frequently affected by disruptions emanating from pandemics and calamities, more recently the Covid-19 pandemic and the Russia-Ukraine war that disrupted the supply of raw materials and other products. Sustainable supplier relationship management (SSRM) can be used for enhancing sustainability in manufacturing companies. However, manufacturing companies in Botswana have not integrated it in their supply chains due to the lack of a decision framework for prioritising the sustainable supplier relationship performance objectives (SSRPO). This study carried out a survey by collecting data from manufacturing companies in Botswana using a questionnaire, with a sample size of 50. The respondents were requested to make comparisons between different SSRPO, then data were analysed using the Best Worst Method (BWM), a multi-criteria decision-making method. Nine SSRPO were identified as the first-order factors and their sub-objectives as the second-order factors, and the results suggest that value creation was the best first-order SSRPO. The objective of the study was to develop a decision framework to guide Botswana's manufacturing companies in prioritising SSRPO. This decision framework fills up the gap in the literature regarding a decision framework in SSRM. The absence of a prioritisation framework forces managers to make ad-hoc decisions regarding supplier relationships, leading to misallocated resources, inability to build strategic resilience and the failure to holistically integrate sustainability into the supply chain. The study concludes that adopting SSRPO and prioritising them can help manufacturing companies in Botswana to enhance sustainability and contribute to the economic sustainability of the country. The research contributes to the body of knowledge by providing a decision framework that prioritises the objectives in SSRM which can then be used by manufacturing companies to make decisions. It is strongly recommended that Value Creation be consistently maintained as the highest priority in the SSRPO decision framework as it serves as the strategic anchor for manufacturing companies in Botswana, guiding them towards supplier relationships that generate tangible business benefits and long-term competitive advantage. They should also

treat SCRM as a core strategic requirement for long-term business sustainability given the critical nature of potential risks. Future research may extend the application of the SSRPO framework to other economic sectors like agriculture, construction, retail and services and may also be conducted in other countries. Other objectives may also be determined and added to the SSRPO decision framework.

Keywords: sustainability, SSRM, SSRPO, economic sustainability, social sustainability, environmental sustainability, supply chain risk management, BWM

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LIST OF ABBREVIATIONS

AHP	Analytic Hierarchy Process
ANP	Analytic Network Process
BCCN	Botswana Climate Change Network
BITC	Botswana Investment and Trade Centre
BO	Best to Others
BOBS	Botswana Bureau of Standards
BWM	Best Worst Method
CEDA	Citizens Entrepreneurial Development Agency
CE	Circular Economy
CIPS	Chartered Institute of Procurement and Supply
Covid-19	Corona Virus Disease 2019
CSF	Critical Success Factors
CSR	Corporate Social Responsibility
DEMATEL	Decision-Making Trial and Evaluation Laboratory
ESI	Early Supplier Involvement
GDP	Gross Domestic Product
GHG	Green House Gas
GSCM	Green Supply Chain Management
HACCP	Hazard Analyses Control and Critical Point System
ILO	International Labour Organisation
ISO	International Standards Organisation
ITC	International Trade Centre
JIT	Just in Time
KPI	Key Performance Indicators
MCDM	Multi-criteria Decision-Making
OW	Others to Worst
RCT	Rational Choice Theory
RBV	Resource-Based View
SCM	Supply Chain Management
SCR	Supply Chain Risk
SCRM	Supply Chain Risk Management
SDG	Sustainable Development Goals

SPC	Sustainable Packaging Coalition
SRM	Supplier Relationship Management
SSRM	Sustainable Supplier Relationship Management
SSRPO	Sustainable Supplier Relationship Performance Objectives
TBL	Triple Bottom Line
TCO	Total Cost of Ownership
TQM	Total Quality Management
TW	Textile and Wearing Apparels
UN	United Nations
UNISA	University of South Africa
VMI	Vendor Managed Inventory
WCED	World Commission on Economic Development
WTO	World Trade Organisation

LIST OF APPENDICES

Appendix A: Survey questionnaire

Appendix B: Turnitin Report

Appendix C: Editing Certificate

Appendix D: Research permission from the Government of Botswana

Appendix E: Respondent informed consent letter

Appendix F: Ethics Approval Letter

CHAPTER 1

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 INTRODUCTION

The manufacturing sector is of vital importance to the prosperity of any country and is critical for the generation of change, job creation and sustainable economic growth (Chaurey, Kalpande, Gupta and Toke, 2023). The Botswana government has a key agenda of developing the manufacturing sector, which is the potential growth area of the economy in addition to the utilisation of its mineral wealth (BITC, 2022). The manufacturing industry has been recognised as a crucial sector that can contribute to economic diversification and the generation of employment opportunities (CEDA, 2020). The manufacturing sector of Botswana covers various industries ranging from food and beverages to furniture and related product manufacturing. Although Botswana's manufacturing sector is still in its nascent stage, it is growing and creating employment. The sector employs about 9.2 percent of the total formal employment (Statistics Botswana, 2021). Its average contribution to Botswana's Gross Domestic Product (GDP) from 1994 to 2020 was 7.3 percent and the sector grew by 3.5 percent a year (Statistics Botswana, 2021).

The reliance on the manufacturing sector to assist the mining sector with boosting Botswana's economy may be uncertain because it was deeply affected by the corona virus disease 2019 (Covid-19) pandemic along with the supply chain facing serious challenges, which has seen the country experiencing high rates of unemployment (BITC, 2022). This has led to many companies in the manufacturing sector to explore other ways of improving performance (Bag, Dhamija, Luthra and Huisingh, 2021). The authors further emphasise that manufacturing companies depend on suppliers in to gain competitive advantage. The importance of supply chain management (SCM) in the manufacturing sector was revealed by the Covid-19 pandemic which led companies in the industry to encounter shortages of materials and other supplies due to restrictions on movements of people (Craighead, Ketchen and Darby, 2020). This explains the resource dependence theory because manufacturing companies depend on

suppliers for their resources in terms of raw materials (Kim, Lee and Hwang, 2020). Suppliers are a major contributor towards the operation of a company by providing materials and services required for the smooth running of the business. Lysons and Farrington (2020) point out that manufacturing companies are very dependent on suppliers as they provide materials needed for production. Supplier relationship management plays a key role in ensuring that the suppliers perform according to the agreement.

Supplier relationship management (SRM) is the discipline of proactively planning and managing a relationship between a purchasing organisation and its supplier in which the two parties share a significant level of business processes with the aim of maximising the value of their relationship (Dza, Acquah and Atsu, 2024; Teller, Kotzab, Grant and Holweg, 2016). It provides a structure of how the relationship with the supplier is to be managed (Lambert and Schwieterman, 2012). SRM is referred to by Lysons and Farrington (2020) as a mirror image of customer relationship management (CRM). The management of supplier relationship can lead to sustainable supply chains (Carrim, Agigi, Niemann and Mocke, 2020). The literature stresses the effectiveness of SRM to improve supplier's performance which in turn improves the buying company's performance (Loury-Okoumba and Mafini, 2018). However, not all materials purchased by manufacturing companies requires long term relationships with suppliers, but only those which are critical to the business. The Kraljic matrix is often used to determine suppliers with whom closer relationships should be developed as it helps to identify purchases which are critical and have a high financial impact to a company and may also have high risks of sourcing them.

The objectives of SRM includes enhancing sustainability (Adesanya, Yang, Bin Iqdara and Yang, 2020), improving quality (Acar Alagoz, Testik and Dinler, 2022), reducing supply chain costs (Yoo, Rhim and Park, 2019), improving delivery performance (Oghazi, Rad, Zaefarian, Beheshti and Mortazavi, 2016), improving innovation (Lintukangas, Kähkönen and Hallikas, 2019), creating value for the business (Verma, Jha, Bose and Ngai, 2023) and minimising supply chain risks (Pellegrino, Costantino and Tauro, 2020; Scholten and Schilder, 2015).

1.2 THESIS STATEMENT

The manufacturing sector of Botswana is faced with supply chain issues that hinder performance despite the government's plan to enhance the sector and support the nation's economic growth. The purpose of this study is to develop a decision framework for sustainable supplier relationship performance objectives (SSRPO) for manufacturing companies in Botswana which will help them in decisionmaking, thus enhance performance.

1.3 BACKGROUND AND RATIONALE FOR THE STUDY

The manufacturing sector is one of the sectors of the economy of Botswana which the government plans to develop to boost the economy, thus create jobs and improve the livelihoods of people (BITC, 2022). However, the manufacturing sector of Botswana has not been growing in business expansion and performance (Botswana Chamber of Mines, 2023). The production output from the manufacturing sector declined between the year 2022 and 2023 (Macrotrends, 2026), and it is reported that the country's manufacturing sector recorded a decline in output by approximately 6.5% in 2024, leading to GDP decline by 2% (Dichosa, 2025). Some companies in the manufacturing sector experienced a production decline of 40% due to the supply chain disruptions caused by the Covid-19 pandemic (Kenalemang & Stephens 2025). This calls for resilience in the supply chains of the manufacturing sector, hence, supply chain management is critical.

Supply chain management is the coordination of activities involved in material, financial and information flow, connecting several companies involved in manufacturing and distribution of goods from source to the point of final consumption (Das and Hassan, 2022; Ramos, Dien, Gonzales, Chavez and Hazen, 2021). From this definition, collaboration between partners in the supply chains of manufacturing companies is critical as it enhances the efficient distribution of goods and services; therefore, SRM becomes an important strategy for enhancing performance. For this study, sustainable supplier relationship management (SSRM) is advocated as a way of achieving resilience in the supply chain, making it necessary for manufacturing companies to determine the SSRPO.

The SSRPO can be defined as the goals set by companies that are aimed at achieving long-term relationships with their suppliers focusing on sustainable practices that enable them to achieve economic outcomes while taking into account the environmental and social impact (Blome, Paulraj, Preuss and Roehrich, 2023; Oduro, Nyarku and Gbadeyan, 2020; Dubey, Gunasekaran, Childe, Papadopoulos and Helo, 2019). Considering the importance of SRM to sustainability, several researchers have undertaken studies on SRM and identified the objectives. For example; Yang, Li, Cui and Qiao (2023) analysed the role of SRM in enhancing buyer's innovation, while Adesanya et al. (2020) examined how sustainability performance can be improved through SRM. According to Alagoz, Testik and Dinler (2022), a reliable business environment created with suppliers can lead to high quality products. Yoo et al. (2019) suggest that benefit sharing in an SRM motivates the supplier to reduce supply chain costs, thus increasing the profit of a business. Furthermore, research undertaken by Oghazi, Rad, Zaefarian, Beheshti and Mortazavi (2016) revealed that SRM can improve delivery performance. On the other hand, Verma et al. (2023) determined the value that can be created from a buyer-supplier relationship through supplier awards and Pellegrino et al. (2020) stated that SRM can minimise supply chain risks.

The manufacturing sector enforces pressure on the environmental and health risks due to the waste generated from the manufacturing process, such as defective products, scrap material, packaging and excess raw materials. It is amongst the highest greenhouse gas emissions in Botswana (Ritchie, Rosado & Roser, 2023). Greenhouse gas emissions is regarded as the second highest contributor to carbon emissions, and only second to the energy consumption (Panagiotopoulou, Stavropoulos and Chryssolouris, 2022). The Covid-19 pandemic also raised issues of sustainability by manufacturing companies because they encountered shortages of raw materials and other supplies (Ardolino, Bacchetti and Ivanov, 2022; Modgil, Gupta, Stekelorum and Laguir, 2022). Manufacturing companies were heavily affected by the Covid-19 pandemic whose impact was so powerful on the economy as a whole, thus manufacturing companies anticipate systems of management that can respond quickly and flexibly to any changes (Nguyen, Tucek and Pham, 2023).

In order to achieve SSRPO, manufacturing companies should collaborate with suppliers so that the impact of their operations on the environment can be reduced (Trujillo-Gallego, Sarache and Sellitto, 2021). It is imperative that companies collaborate in designing products so that they can design products that have less impact on the environment by using less energy, lower emissions and more environmental friendly materials (Melander, 2018). SSRPO is instrumental in the development of sustainable businesses in terms of attaining and delivering enhanced market performance (Ukko, Saunila, Nasiri and Rantala, 2022). Many companies recognise the need for involving their suppliers in the environmental, economic and social sustainability programmes which enable them to reduce waste and financial risk at the same time increasing efficiency while minimising dependence on limited environmental resources, thus improving profitability and securing long-term existence (Kashyap and Lakhanpal, 2019).

Though the SSRM and the SSRPO have been widely studied, literature does not give evidence of any study undertaken on the manufacturing sector of Botswana. Thus, there is need for research on the SSRPO in the manufacturing sector of Botswana.

1.4 RESEARCH PROBLEM

Manufacturing companies operate in the highly competitive industry where the adoption of sustainable practice strategies helps to gain supply chain resilience and improve the flow of materials for the enhancement of the production process. SSRM is widely accepted by practitioners and academia as an effective strategy for enhancing supply chain resilience, as collaboration between manufacturing companies and their suppliers ensures the smooth flow of material until the final products reach the right ultimate customers (Butt, Alghababsheh, Arshi and Shah, 2022). However, though sustainable measures have been embraced by many companies in the manufacturing sector, evidence remains scarce that manufacturing companies in Botswana have extended sustainable practices to their suppliers (Kuruneri 2025). Furthermore, the extant literature does not reveal the existence of a framework for integrating suppliers sustainability practices in Botswana. This makes it difficult for managers of the manufacturing companies in

Botswana to determine the factors of SSRM which needs to be prioritised for resources allocation.

Several studies have been undertaken on SRM (Acquah, Asamoah, Kumi, Akyeh & Agyemang 2025; Dza, Acquah & Atsu 2024; Kisinga, Mchopa & Mwagike 2024; Akinleye & Adeyoyin 2022; Bai, Kusi-Sarpong, Khan & Vazquez-Brust 2021), however, none offer a frameworks that prioritise SSRPO for implementation by manufacturing companies in Botswana. Equally, studies that assimilate theories to analyse and prioritise the SSRPO for use by manufacturing companies in decision-making are not available in the current literature (Denhere, Chikazhe and Kanyepe, 2023; Mukonyo, Munuhwa, Mujakachi, Samuel and Kudakwenyu, 2022; Yadav et al., 2020; das Nair, Chisoro and Ziba, 2018). The current lack of a prioritisation framework often forces managers to make ad-hoc decisions regarding supplier relationships leading to misallocated resources, inability to build strategic resilience and the failure to holistically integrate sustainability into the supply chain. Therefore, the objective of this study is to determine the most SSRPO and develop a framework to enable future decision-making. It is expected that the framework will address the research gap by enabling supply chain management professionals to determine and prioritise SSRPO.

1.5 RESEARCH QUESTIONS

The main research question was:

How can manufacturing companies in Botswana strategically prioritise sustainable supplier relationship objectives to enhance post-pandemic resilience and competitive advantage?

To answer this question, the following sub-questions were answered:

i. What are the first-order and second-order SSRPO for decision-making among manufacturing companies in Botswana?
ii. What is the best first-order SSRPO for decision-making among Botswana manufacturing companies?
iii. What is the worst first-order SSRPO for decision-making among Botswana manufacturing companies?

iv. What is the best second-order SSRPO for decision-making among Botswana manufacturing companies?
v. What is the worst second-order SSRPO for decision-making among Botswana manufacturing companies?
vi. Overall, what is the optimal SSRPO decision point for manufacturing companies in Botswana?

1.6 RESEARCH METHODOLOGY

Research methodology is a system embraced in research to gather and analyse data. It refers to the theory of how research will be undertaken. Patel and Patel (2019) define research methodology as 'the systematic theoretical analysis of the methods applied to a field of study'. Saunders, Lewis and Thornhill (2019) use a research onion to describe a range of steps followed by researchers when undertaking studies and these are; namely, determining the research philosophy, research approach, research strategy, choices, time horizon and techniques and procedures. This section provides an outline of the process that was followed in undertaking the current study and developing the SSRPO framework as outlined by Saunders et al. (2019).

1.6.1 Research Philosophy

Research philosophy encompasses fundamental beliefs that shape the design and implementation of a research investigation and various research philosophies provide diverse perspectives on comprehending research (Hackfort and Schinke, 2020). The outer layer of the research onion shows the research philosophy comprising four philosophies: namely, positivism, realism, interpretivism and pragmatism. For this research the positivist research philosophy was adopted. Positivism requires a researcher to work in the stance of the natural scientist (Saunders et al., 2019). The chosen philosophy entails significant assumptions regarding the perspective, through which the world is perceived and these assumptions form the foundation for the research strategy and the methods employed in the study (Saunders et al., 2019).

1.6.2 Research Approach

A researcher should determine the approaches to take when undertaking a study, which can either be deductive or inductive. For this study, a deductive approach was used to determine the relationship and supplier decision-making between the variables of the SSRPO in the manufacturing companies in Botswana.

1.6.3 Research Strategy

A research strategy provides an outline of how the researcher answers the research questions. It outlines the direction to a researcher for organising, performing and keeping track of the study (Johannesson and Perjons, 2014). Saunders et al. (2019) recommend a research strategy to be aligned with the deductive or inductive approach and link a philosophy with the chosen method of collecting data. This research used a survey strategy associated with the deductive research approach, which presented a general overview of the SSRPO among manufacturing companies in Botswana. The strategy was suitable for this study because it helps to gather large quantities of data at a lower cost and in a short period of time (Johannesson and Perjons, 2014). Thus, it was easy to gather data from various manufacturing companies in Botswana.

1.6.4 Methodological Choices

Quantitative or qualitative methods may be used to collect data. The method used to collect data depends on the nature of the research to be undertaken. It is a common practice to use both qualitative and quantitative research for management and business research. For this research, a quantitative approach was followed by collecting quantitative data from manufacturing companies in Botswana to determine the SSRPO.

1.6.5 Time Horizon

A timeframe within which research is to be undertaken should be decided. This can either be a cross-sectional study or longitudinal study. In a cross-sectional study, a study of a phenomenon is conducted at a single point in time (Saunders et al., 2019). This means that data from a population is not studied over time, but

at the same time (Wang and Cheng, 2020). It is different from the longitudinal study where a study is carried out over a long period of time. The same population is observed overtime to detect changes or developments (Wang and Cheng, 2020). This study utilised the cross-sectional study as a survey is most suited for this type of study. Since a cross-sectional study provides an opportunity to compare different population groups, data collected from different manufacturing companies in Botswana was compared in terms of their preparedness in meeting the SSRPO.

1.6.6 Techniques and Procedures

1.6.5.1 Method of Data Collection

Data collection about a phenomenon under investigation is a key activity in an empirical study (Johannesson and Perjons, 2014). There are many methods of collecting primary data and the major ones are questionnaires, interviews, observation and focus groups. For this study, quantitative data was collected using self-administered questionnaires. Data about the SSRPO was collected from manufacturing companies in Botswana. The questionnaire consisted of nine sections covering the nine main objectives and their sub-objectives.

1.6.5.2 Sample Size

Conducting research for the whole population may be impractical or impossible in most cases (Kang, 2021). Thus the use of sampling where it is difficult to study the entire population is recommended (Saunders et al., 2019) and a suitable sample size should be selected. Lakens (2022) suggests factors that justify the sample size that a researcher should select as population size, the desired level of accuracy and resource constraints, of which time and money have been identified as the common resource limitations. For this study, the researcher ensured that a sufficient sample was taken to make a true representation of the entire population by using the Best Worst Method (BWM), a multi-criteria decision-making (MCDM) method. There are many MCDM methods that can be used to study the SSRPO for manufacturing companies, such as Analytic Hierarchy Process (AHP), Decision-Making Trial and Evaluation Laboratory (DEMATEL) and Analytic Network Process (ANP) (Quezada, López-Ospina, Palominos and Oddershede,

2018). However, they all have a common disadvantage because they require a pairwise comparison among all variables. To maintain consistency between judgements, Rezaei (2015) developed the BWM method. When using the BWM the results can be consistent and reliable even with little comparative data (Rezaei, 2015).

The sample size for this study was 50 manufacturing companies. To choose the sample from the manufacturing companies, the stratified sampling method was used because it suits the study population which by nature is divided into different types according to the type of products produced. By using this method, the researcher selected manufacturing companies operating in Gaborone and its surrounding villages.

1.6.5.3 Sampling Framework

A sampling framework is an entire list of the elements in a population from which a sample is taken (Saunders et al., 2019; Leavy, 2017). It is important to obtain a complete and accurate sampling framework so that the sample selected can be a representation of the whole population (Saunders et al., 2019). For this research the sampling framework was a list of all manufacturing companies in Botswana located in Gaborone.

1.6.5.4 Sampling Method

Sampling is the process of selecting a subset from the population to study and draw inferences from (Mauldin et al., 2020). There are two approaches that can be chosen when conducting research and these are probability and non-probability sampling. For this study the probability approach was chosen using the stratified random sampling method. In stratified random sampling a population is divided into groups, referred to as strata, then simple random sampling is used to select a sample in such a way that every member of the population has an equal chance of being selected. In this way all manufacturing companies in Gaborone and surrounding villages of Botswana had an equal chance of being selected.

1.6.5.5 Data Collection and Analysis

The data gathered during the data collection stage is analysed and interpreted to help the researcher determine the most sustainable performance objective and develop a framework, thus contribute to the published empirical knowledge regarding SSRPO. Data about the SSRPO was collected from manufacturing companies in Botswana and categorised into nine (9) sections representing the SSRPO. It was then analysed using the BWM to determine the weights of the different SSRPO and formulate a framework which will enable future decision-making regarding supplier relationship performance objectives by manufacturing companies in Botswana.

1.7 RESEARCH OBJECTIVES

The main research objective was to develop a decision framework for SSRPO in post Covid-19 leading to sustainable business growth amongst Manufacturing companies in Botswana.

The following were the sub-objectives:

i. To evaluate the first-order and second-order SSRPO for decision-making among manufacturing companies in Botswana.
ii. To evaluate the best first-order SSRPO for decision-making among Botswana manufacturing companies.
iii. To evaluate the worst first-order SSRPO for decision-making among Botswana manufacturing companies.
iv. To investigate the best second-order SSRPO for decision-making among Botswana manufacturing companies.
v. To determine the worst second-order SSRPO for decision-making among Botswana manufacturing companies.
vi. To develop the overall optimal SSRPO decision point for manufacturing companies in Botswana.

1.8 ETHICAL CONSIDERATIONS

Ethical issues arise during designing, planning and execution of the research. Saunders et al. (2019) define ethics as 'the standard of behaviour that guide the researcher's conduct in relation to the rights of those who become the subject of the research or are affected by it'. The researcher used peer reviewed norms to obtain data from survey questionnaires that were distributed among manufacturing companies in Gaborone and surrounding villages. The researcher did not envisage negative impact/s (harm) on any persons and/or companies suffice it to point out that the researcher obtained written consent from manufacturing companies prior to commencement of the said surveys. Moreover, to ensure compliance with the research ethics and integrity standards, ethical clearance was obtained from the University of South Africa (UNISA) Graduate School of Business Leadership before commencement of data collection.

1.9 THEORETICAL FRAMEWORK

This study used BWM to prioritise the sustainable supplier relationship objectives and a framework was developed. There are various theories and principles which companies use to improve relationships with their suppliers, thus, enhance performance and gain competitive advantage. The current research used different theories to help with understanding the nine SSRPO. This section outlines an introduction of the theories used for this study, which are further explained in Chapter 4.

1.9.1 The Triple Bottom Line

The Triple Bottom Line (TBL) is a theory that companies use to analyse their performance from three perspectives: namely, economic, social and environmental sustainability. The TBL theory was used for this research to determine the sustainability dimension; economic, environmental and social sustainability that manufacturing companies in Botswana give the most importance to.

1.9.2 The Rational Choice Theory

The Rational Choice Theory (RCT) is used to explain how people make choices of the available options by considering the benefits that they provide and the costs involved. The aim of their choices is to ensure that costs are minimised while maximising the benefits. It implies that people act rationally by weighing the benefits of available alternatives and their costs. This theory serves as a standard that can be used to compare the actual outcomes (Kaiser and Leeson, 2023). Thus, the RCT theory was used for the current study to analyse the choices made among the main SSRPO and their sub-objectives by the participants from the manufacturing industry of Botswana.

1.9.3 Total Quality Management

Total Quality Management (TQM) is a widely used theory in the manufacturing sector to improve the quality of products and services. It enables a company to produce the best products that satisfy customers and contribute to the long-standing success of an organisation (Richards and Jackson, 2023). It is applied at all levels and functions of a company and requires commitment and support by senior management. Companies extend this theory to suppliers to improve the quality of the items bought by building good relationships with them. Maintaining a close relationship with a supplier is paramount to making sustainable quality improvements (Hoque and Maalouf, 2022). The TQM theory was selected for this study because it facilitated the formulation of a framework by determining the most important quality features of a product hence important for the SSRPO.

1.9.4 Total Cost of Ownership Theory

The Total Cost of Ownership (TCO) theory is a useful tool for making sourcing decisions. A company can use it to determine the overall costs it will incur on acquiring a product, including procurement, transportation, operating, maintenance and disposal costs. It guides a company to decide on the sourcing strategy to use by determining all the costs involved in procurement relationships. Manufacturing companies should be cautious when evaluating suppliers' prices because lower prices may be an indication of lower quality products or services and may lead to higher supply chain costs in the long-run (Shabani, Visani,

Barbieri, Dullaert and Vigo, 2019). Thus, TCO should be determined as it includes direct and indirect supply chain costs. TCO is centred on the iceberg theory which states that a company cannot see all the costs involved in a product as some are hidden in the iceberg. TCO was used for this research because it helped to prioritise the costs involved in an SSRM by considering all activities undertaken by a company in a SRM (Visani, Barbieri, Di Lascio, Raffoni and Vigo, 2016).

1.9.5 Circular Economy Theory

The Circular Economy (CE) theory promotes the reduction of waste by encouraging reusing, refurbishing and recycling of current materials and products. This prolongs the life cycle of a product, while products whose life cycles are unable to be prolonged are kept in the company to be used for other production. Thus, a product will remain in the economy for a long time. Hazen, Russo, Confente and Pellathy (2021) stated that circular economy is used to reengineer a product's production process by designing a long-lasting product which takes into account its maintenance, reuse, recycle, repair, refurbishment and remanufacture. The circular economy theory was used for the current research to assess the extent to which manufacturing companies can collaborate with their suppliers to foster innovation in the supply chain by proposing measures such as recycling, repurposing and reusing resource consumption.

1.9.6 Resource-Based View (RBV) Theory

This theory is used to determine a company's resources which are critical for achieving competitive advantage. Suppliers are important resources that a company depends on for its materials. Kim, Lee and Hwang (2020) state that manufacturing companies depend on suppliers for their resources in terms of raw materials. Suppliers are a major contributor towards the operation of a company by providing materials and services required for the smooth running of the business. To maximise the value of these suppliers, manufacturing companies should source from suppliers whose resources in terms of technology, expertise and capacity align with a company's strategic needs. The theory enabled the researcher to prioritise the value that can be created to manufacturing companies in Botswana in collaboration with their suppliers. Moreover, the strategic resources

that a manufacturing company can make use of to gain sustainable competitive advantage were determined. The theory was also used to help with discovering the factors that lead to the timely delivery of materials and assess the importance that manufacturing companies give to delivery performance. Thus, the theory was useful in formulating a SSRPO framework.

1.9.7 Stakeholder Theory

'Stakeholders are groups and individuals who have an interest in the activities and outcomes of a company and upon whom a company relies in order to achieve its own objectives' (Freeman and Mcvea, 2001). With the stakeholder theory (ST), companies should consider the interests of all stakeholders when making decisions, not just the interests of shareholders as stated by the traditional shareholder theory whose emphasis is to increase shareholders' wealth. To maintain long-term well-being, a company should collaborate with its stakeholders including customers, employees and suppliers. When applied to SRM, the ST suggests that the development of long-term relationships with suppliers can help a company improve its stakeholder value. The ST is applicable to SSRM where a company needs to work closely with its suppliers to mitigate supply chain risks. The rationale behind using the ST for the current study was to help the researcher to determine the key supply chain risks that can be mitigated through effective SRM and use them to develop a framework.

1.10 LITERATURE REVIEW

This section discusses the available literature relating to SSRPO among manufacturing companies in Botswana. The section discusses the impact of Covid-19 on manufacturing companies, SRM and the SSRPO, sustainability, quality improvement, supply chain costs, supply and delivery performance, supply chain innovation, value creation and supply chain risks.

1.10.1 The Impact of Covid-19 on Manufacturing Companies in Botswana

Manufacturing is the process of obtaining inputs and transforming them into products which are demanded by customers (Eyaa, 2019). The manufacturing sector plays a strategic and important role in any economy as it is critical to

boosting the economy of a country and consequently the livelihoods of people. The manufacturing sector of Botswana covers various industries ranging from food and beverages to furniture and related product manufacturing. Although Botswana's manufacturing sector is still in its nascent stage, it is growing and creating employment. The sector employs about 9.2 percent of the total formal employment (Statistics Botswana, 2021). Its average contribution to Botswana's Gross Domestic Product (GDP) from 1994 to 2020 was 7.3 percent and the sector grew by 3.5 percent a year (Statistics Botswana, 2021).

The Covid-19 caused worldwide disruptions and revealed the significance of SCM (Craighead et al., 2020). Its impact on the operation of manufacturing companies was high as it disrupted the supply chains, making it difficult for manufacturing companies to operate effectively (Bastas and Garza-Reyes, 2022). Manufacturing companies are working towards recovering from the shortage of products caused by Covid-19 which disrupted production due to shortages of raw materials and the isolation of employees from internal and external stakeholders (Ardolino et al., 2022). Modgil, Gupta, Stekelorum and Laguir (2022) urge companies to build resilience in their supply chains to survive during disruptions such as the Covid-19 pandemic. Manufacturing companies in Botswana lack resilience in the supply chain as they encountered the shortages of raw materials and other supplies during the Covid-19 pandemic. According to Ardolino et al. (2022), Covid-19 has helped manufacturing companies to realise the need for economic and environmental sustainability.

1.10.2 Sustainable Supplier Relationship Performance Objectives

The SRM is the management of a relationship between a purchasing company and its suppliers in which the two parties share a significant level of business processes (Teller et al., 2016). CIPS (2023) defines it as 'the management and maintenance of the relationship between a buyer and a supplier'. It enhances the relationship between a purchasing company and its supplier in which the two parties share a significant level of business processes (Teller et al., 2016). The importance of SRM is emphasised as it helps companies to reduce waste activities in the supply chain. It provides a structure of how the relationship with the supplier is to be managed (Lambert and Schwieterman, 2012). SRM is

referred to by Lysons and Farrington (2020) as a ‘mirror image of customer relationship management’. The management of supplier relationships can lead to sustainable supply chains (Carrim et al., 2020). The literature stresses on the effectiveness of SRM to improve supplier’s performance which in turn improves the buying company’s performance (Loury-Okoumba and Mafini, 2018).

Companies enter into long-term relationships with their suppliers to enable them to improve performance. Their aim is to have relationships which are sustainable and able to achieve corporate objectives. They, therefore, determine the SSRPO and review of literature identifies the following; namely, enhancing sustainability (Adesanya, Yang, Bin Iqdara and Yang, 2020), improving quality (Alagoz, Testik & Dinler, 2022), reducing supply chain costs (Yoo et al., 2019), improving delivery performance (Oghazi, Rad, Zaefarian, Beheshti and Mortazavi, 2016), improving innovation (Lintukangas et al., 2019), creating value to the business (Verma et al., 2023) and minimising supply chain risks (Pellegrino et al., 2020; Scholten and Schilder, 2015).

1.9.2.1 Sustainability

Sustainability has received great attention in recent years due to the importance it has been given by stakeholders including the United Nations (UN) and governments to conserve the environment (Das, Shaw and Irfan, 2020). According to Giannakis, Dubey, Vlachos and Ju (2020), many manufacturing companies have incorporated sustainability in their supply chains due to the increasing pressure emanating from governments, customers, pressure groups and other stakeholders. The world commission on environment and development defined sustainability as ‘meeting the needs of the present generation without compromising the ability of the future generations to meet their needs’ (Thomsen, 2018). SSRM requires the consideration of economic, social and environmental factors in the process of procuring raw materials and transforming them into finished products (Bai et al., 2022).

Companies should not only evaluate their sustainable performance, but that of their suppliers as well because their performance is dependent on suppliers (Giannakis et al., 2020). Sustainability issues emanating from suppliers should be

dealt with before they are displayed to the public and give a negative impact on an company (Adesanya et al., 2020). Whether a company's products are of good quality and customers are willing to purchase them, if the company is practising unethical behaviour towards the environment customers may be discouraged (Duan, Aloysius and Mollenkopf, 2022). Buyer-supplier relationship collaboration is important for the sustainability of a company (Lintukangas et al., 2019). Manufacturing companies should extend green environment to the whole supply chain and this requires commitment by suppliers (Qiao, Li and Capaldo, 2022a).

Sustainability performance including social, economic and environmental, referred to as the triple bottom-line can best be achieved through SSRM (Koc, Ekmekcioğlu and Işık, 2023). It is imperative to select and collaborate with a supplier who has ecological knowledge, thus can contribute to sustainability by introducing sustainable products (Melander, 2018). A company that has invested in sustainability is very much concerned with working with suppliers who have sustainability policies (Melander, 2018). Companies are urged to include economic, social and environmental sustainability factors in their supplier selection policies, which many companies have done by incorporating them in their corporate strategies (Giannakis et al., 2020).

With the increasing concern for sustainability, companies should not only consider quality and price when selecting suppliers, but social, economic and environmental factors as well (Garzon, Enjolras, Camargo and Morel, 2019). It is important to monitor the sustainability performance of a company's suppliers as many of them fail to meet the standard, especially the social aspect of sustainability. Resource management, culture and costs are some of the challenges encountered by suppliers in implementing social sustainability (Akbar and Ahsan, 2021). Nevertheless, manufacturing companies should measure the performance of suppliers in terms of meeting the triple-bottom requirements.

The sustainability of manufacturing companies depends on the introduction of sustainability initiatives. Luthra, Mangla, Shankar, Prakash Garg and Jakhar (2018) state 15 critical success factors (CSF) for the introduction and implementation of sustainability initiatives. Similarly, Zhu and Mazaheri (2021) discuss the influence of business networking on sustainability initiatives. It has

been observed that there is poor adoption of sustainability by companies in developing countries (Yadav et al., 2020a). Much research has been done on sustainability initiatives in the manufacturing sector and supply chain as a whole, but there is very little to no evidence that research has been done on sustainability initiatives that can be implemented through SRM.

The TBL theory describes the three pillars of sustainability as economic, environmental and social sustainability. Rashidi, Noorizadeh, Kannan and Cullinane (2020a) recommend using the TBL for sustainable supplier selection. Utami, Susanto, Septina and Sumaji (2019) explored the effects of supply chain management on the economic sustainability of Indonesian small and medium enterprises (SMEs). People and Global Business Association and Duong (2022) analysed the relationship of social sustainability, operational performance and economic performance in SSCM. Bhatti, Aljoghaiman, Kaliani Sundram and Ghouri (2023) studied the environmental sustainability of a textile company and the role of green supply chain management. Ojijo, Destaings Nyongesa and Mule (2023) examined the role of SCM strategies on the environmental sustainability of sugar firms in western Kenya.

1.9.2.2 Quality Improvement

Quality of goods is a growing concern in Africa's manufacturing industry due to poor standards, high costs of research and development, high costs of raw materials and the pressure exerted by high competition (Shuaib and He, 2023). While quality has been widely defined, there is no universal definition. The ISO 9000 (Lysons et al., 2020:214) define it as 'the composite of all the characteristics, including performance, of an item, product or service, that bears on its ability to satisfy safety or implied needs. It is sometimes referred to as fitness for use, customer satisfaction or conformance to requirements'. It is important to determine the characteristics of quality critical to a company so that suppliers' performance can be measured on those aspects. Gouda, Awasthy, T.S. and R. (2019) outline eight characteristics of quality as performance, features, reliability, conformance to specifications, durability, aesthetics, serviceability and perceived quality.

Companies should develop quality systems which cover all activities it undertakes that relate to the quality of its products (Lysons and Farrington, 2016). According to Sofiana et al. (2019), improving quality is a key factor for a company to gain competitive advantage. Thus, manufacturing companies should occasionally perform quality improvements to their products at minimum costs. Integrating quality management in the supply chain warrants the measurement and improvement of all companies in the supply chain (Chau, Tang, Liu, Ip and Taohmvhm, 2021). In order to enhance the improvement of quality of raw materials, manufacturers should trace and track the sources of quality problems throughout the supply chains (Zhang, Huand Zhao, 2020).

According to the literature, factors and strategies in SSRM that can lead to improved quality include supplier selection (Chen, Chung and Chang, 2021), regular performance reviews and monitoring (Karamouz, Ahmadi Kahnali and Ghafournia, 2021; RezaHoseini, Noori and Ghannadpour, 2021), supplier collaboration (Jung, Kim and Yoo, 2023) and quality risk management (Amoako-Gyampah, Boakye, Adaku and Famiyeh, 2019). Though an effective supplier relationship management helps to determine a supplier that is capable of meeting the right quality, it is not a guarantee that supplier's quality will be good up to the end of the contract, thus regular reviews of supplier performance should be carried out. Collaborating and communicating effectively with suppliers is one of the ways that can help a company to improve its product quality (Jung et al., 2023).

Quality competencies can be developed by involving suppliers at the design stage of a product (Zhang et al., 2020). Chau et al. (2021) emphasise the importance of having reliable suppliers as 'without sufficient reliable suppliers, a company may risk quality problems and delivery'. The review of the literature demonstrate that a lot of research has been conducted on quality improvement in manufacturing companies, but there is limited research on the quality improvement approaches through SRM in the manufacturing sector of Botswana.

1.9.2.3 Supply Chain Costs

Supply chain costs refer to all costs that are incurred in the supply chain including materials, labour, equipment and transportation costs (Shang, 2022). According to

Aditi, Govindan and Jha (2024), suppliers, as essential members of the supply chain, make up 50-80 percent of the overall costs of the product, thus strong relationships need to be entered into with them in order for the company to be successful. Similarly, Lysons et al. (2016) recommend the reduction of costs by maintaining long-term relationships with suppliers. According to Lysons and Farrington (2020), the expenditure on procurement is 60 percent of all the expenditure of a company. Similarly, Dutta, Jaikumar and Arora (2022) state that the percentage of purchases to sales average 55 percent for the manufacturing sector. Dutta et al. (2022) underscore the importance of controlling purchasing costs as they are critical to the firm's success regardless of the industry.

Similarly, Rezaei, Ortt and Trott (2018) state that cost reduction is a driver for a company to enter into partnership with a supplier and profits will be maximised once the supply chain costs are reduced (Shang, 2022). Therefore, suppliers are rated in terms of their ability to reduce costs (Richards and Jackson, 2023). Though a lot of research has been done on the reduction of costs in the supply chain, there is no evidence of the study being carried out on how SRM can contribute to cost reduction among manufacturing companies in Botswana. Various cost reduction collaborative activities can be undertaken in supply chain through collaboration with suppliers in which the company proposes costs reduction activities to the supplier (Yoo et al., 2019). Research has been undertaken on cost reduction approaches in manufacturing companies, but there is limited research on the SRM cost reduction approaches in the manufacturing sector of Botswana.

1.9.2.4 Delivery Performance

Delivery performance is when a company fulfils its customer's requirements by making goods available at the agreed upon time (Jarvis-Grove and Jackson, 2023). Goods of the right quality and in the right quantity must be delivered at the right time and to the right place (Dearing and Foster, 2024) because on time delivery can enhance customer loyalty, as well as improve the reputation of the supplier (Liu and Yang, 2022). Supply and delivery performance is one of the key performance indicators (KPIs) which supply chain partners intend to achieve (Oghazi et al., 2016). In addition to supplying a quality product at the right price,

suppliers should deliver products and services at the right time (Richards and Jackson, 2023).

The measures to be used by a company to evaluate a suppliers' delivery performance are agreed upon and are part of the contract and these may include on-time delivery, lead time reduction and order fulfilment accuracy. Delivery delays in both ways; receiving raw materials from suppliers and delivering products to customers should be avoided as they pose a risk to the business (Kusrini, Sugito, Rahman, Setiawan and Hasibuan, 2020a). For the manufacturing companies who are dealing with perishable products, Chen, Fan and Pan (2021) advise to optimise delivery performance as it reduces deterioration, thus reducing environmental pollution, in addition to customer satisfaction by delivering on time. Liu and Yang (2022) also emphasise on delivering on time as a means of enhancing customer loyalty as well as improving the business reputation. Unfortunately, delivery performance in Botswana is a big issue as there are often delays in the delivery of raw materials by suppliers. There is a need for manufacturing companies to work with suppliers to improve delivery performance.

1.9.2.5 Supply Chain Innovation

Innovation is the development of a new product or making improvements to the current product or processes (Elliot and Toon, 2019). It may be added through the management of strategic relationships with suppliers (Elliot and Toon, 2019). Innovation capabilities play a key role in enabling a company to achieve sustainability (Lintukangas et al., 2019). Manufacturing companies need to be innovative in order to be competitive in the industry and one way of achieving this is by introducing new products and improving on the current ones, which depends on the performance of the supplier (Wehbe, Azoury and Merlo, 2020). There are different categories of innovation which manufacturing companies can select from; namely, product, process and administrative innovation (Shuaib and He, 2023).

(Lintukangas et al. 2019) emphasise that SCM is a key player in the innovativeness of a company and suppliers make a significant contribution to creating innovation. The contribution made by supplier management to the innovativeness of a company is important and needs to be recognised by

managers as SRM nurtures the supply base and helps to mitigate supply chain risks (Lintukangas et al., 2019). Innovation in SCM is significant for a company's sustainability performance. Lately, customers' needs and advancement in technology are putting pressure on the manufacturing companies to improve their products and this requires collaborating with suppliers who have technological skills and resources (Jung et al., 2023).

Though innovation is important for a manufacturing company to gain competitive advantage and various methods of innovation have been studied, little research has been conducted on the achievement of innovation by manufacturing companies through SRM. In addition to reducing costs and delivery performance, supplier- purchaser relationships can improve innovation abilities through mutual problem-solving and sharing information between the parties (Kim et al., 2020). Companies that highly depend on each other and collaborate highly benefit from innovation improvement (Zhu et al., 2018). Innovation activities in manufacturing companies have been studied widely; however, ways that SRM can foster innovation in the manufacturing sector of Botswana have limited research.

1.9.2.6 Value Creation

Value creation is the value added to a product due to factors such as brand image, innovation, customer care or the range of products (Elliot and Toon, 2019). It has been reported as a means of adding sustainable competitive advantage to the business. Value creation is one of the key objectives of SRM, which would arise from cost saving, thus increasing financial benefits to the businesses of both companies; the purchaser and supplier (Enz, Schwieterman and Lambert, 2019). Rezaei et al. (2018) state that enhancing value is one of the outcomes of joint problem solving between supplier and purchaser. The creation of value is an important strategy that manufacturing companies need to pursue in order to remain competitive (Johne and Wallenburg, 2021).

1.9.2.7 Supply Chain Risk Management

Supply chain risk (SCR) is the likely events that may disrupt a company's source of supply. Jajja, Chatha and Farooq (2018) define it as 'the likelihood and impact associated with the disruption of a firm's supply, internal manufacturing, and

delivery operations'. The profitability and sustainability of companies in the supply chains is affected by events that are not foreseeable (Baryannis, Validi, Dani and Antoniou, 2019). The causes of risks are usually investigated to determine how they can be mitigated. According to Baryannis et al. (2019), risks range from natural disasters to man-made disasters. The outbreak of Covid-19 in the year 2019 is an example of risks emanating from natural disasters. Its impact on the operations of manufacturing companies was high as it disrupted the supply chains making it difficult for manufacturing companies to operate (Bastas and Garza-Reyes, 2022). The importance of supply chain risk management (SCRM) can be seen in the risk of unexpected loss of a key supplier as it may result into shortages of raw materials or components. Frost and Thompson (2024) advise a company to have a good risk management system as it contributes to its competitive advantage. While SCRM has been widely researched, the responsibility of each party (buyer and supplier) in sustainability supply chain risks and their accountability has not been explored (Juettner, Windler, Podleisek, Gander and Meldau, 2020). Over a long time the profitability and continuity of supply chains is affected by unpredictable and unforeseeable events (Baryannis, Validi, Dani and Antoniou 2019b).

According to Kshetri (2018), risk reduction is a major objective of SCM and relational risk is one of them. A manufacturing company may encounter supply chain risks if the relationship with its suppliers is not managed efficiently as the failure of a supplier impacts a company. Resilience should be built in the supply chain so that the effects of unexpected events can be dealt with. Supply chain resilience can be defined as a company's capacity to endure disruptions in the supply chain and quickly return to the initial or new ideal state (Silva, Marques and de Sousa, 2023). One of the biggest disruptions in human history has been regarded as the Covid-19 pandemic (Faggioni, Valerio Rossi and Sestino, 2023).

Though a lot of research has been conducted on SCRM, there is less evidence that research has been done on how SCRM can lead to the mitigation of risks in the supply chain hence the enhancement of the performance of the manufacturing sector of Botswana. The hierarchy of the supplier decision-making among the performance objectives criteria according to BMW enabled the researcher to

determine the ‘BEST’ and ‘WORST’ supplier relationship performance objectives and develop a framework that can be used by manufacturing companies in Botswana to help them with decision-making.

1.11 EXPECTED IMPACT OF THE SSRPO FRAMEWORK

The SSRPO framework, when implemented effectively by manufacturing companies in Botswana, is expected to produce the following benefits.

- Managers will be able to make accurate SSRM decisions thus prioritise the objectives and allocate resources more effectively.
- The framework will help to reduce supply chain costs as attention will be given to this aspect.
- Minimisation of supply chain risk is expected, thus improve resilience in the supply chain.
- Manufacturing companies in Botswana will be able to enhance economic, social and environmental sustainability

1.12 LIMITATIONS OF THE STUDY

The researcher could foresee encountering challenges with accurately identifying supply chain management professionals of the manufacturing companies in Botswana and their participation owing to their busy schedules, as well as to the time and financial constraints of undertaking the study. Thus, the researcher used a cross-sectional study and stratified random sampling method to collect data.

1.13 SIGNIFICANCE OF THE RESEARCH

The study anticipates the framework to play a pivotal role in the manufacturing sector of Botswana by enabling supply chain managers to determine the sustainable supplier relationship objectives and prioritise them. The knowledge of the key SSRM objectives is vital to enhancing decision-making in the manufacturing sector.

1.14 LAYOUT OF THE THESIS

Figure 1.1 below presents the research flow diagram which gives an outline of the thesis process. It starts with literature review undertaken on the study, followed by the identification of the SSRPO, thereafter a survey would be undertaken. This was followed by analysis of data using the BWM then finally formulate the SSRPO framework.

Figure 1.1: Research flow diagram



Source: Author's own design, 2024

This section further outlines the chapters contained in the study as follows:

CHAPTER 1: INTRODUCTION AND BACKGROUND OF THE STUDY

This chapter provided an overview of the research and covered the introduction and background of the study, thesis statement, problem statement, research questions, research objectives, research methodology, ethical considerations, the literature review, theoretical framework and limitations of the study, significance of the study, layout of the thesis, timescale and the chapter summary.

CHAPTER 2: THE MANUFACTURING SECTOR OF BOTSWANA

The chapter reviewed the literature relating to the manufacturing sector of Botswana. It includes an overview of the global manufacturing sector, then analyses the various types of industries in the manufacturing sector of Botswana. It further presents the manufacturing sector's supply chain and provides an analysis of the supply chain phases involved in the sector.

CHAPTER 3: SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES

Chapter three presented the literature relating to supplier relationship management performance objectives including sustainability, quality improvement, supply chain costs, delivery performance, supply chain innovation, value creation and SCRM.

CHAPTER 4: THEORETICAL FRAMEWORK

This chapter covered the theories underpinning the study which was used to analyse the performance objectives of SSRM that led to the formulation of a framework for manufacturing companies in Botswana.

CHAPTER 5: RESEARCH METHODOLOGY

This chapter discussed the research methodology covering research philosophy, approach, strategy, choice, time horizon, techniques and procedures and ethical considerations.

CHAPTER 6: DISCUSSION AND ANALYSIS

Chapter six discussed and analysed the data collected from manufacturing companies in Botswana.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

Finally, chapter seven contained the conclusion of the study and made appropriate recommendations.

1.15 CHAPTER SUMMARY

This chapter presented an introduction to the Botswana's manufacturing sector, emphasising the important role it plays to the economic growth of the country. The thesis and problem statements were also presented. The thesis statement highlighted the need to develop a framework to help manufacturing companies in Botswana with decision-making. The problem statement highlighted the downturn of the manufacturing sector due to the impact from the Covid-19 pandemic and the

global emphasis on economic, social and environmental sustainability. Moreover, the research questions, objectives, methodology and ethical considerations were also covered including the theories that underpinned the study. The chapter further presented a preliminary literature review discussing the impact of Covid-19 on manufacturing companies in Botswana, SSRPO including sustainability, quality improvement, supply chain costs, delivery performance, supply chain innovation, value creation and supply chain risks. The next chapter presents a comprehensive literature review on the manufacturing sector of Botswana.

CHAPTER 2

THE MANUFACTURING SECTOR OF BOTSWANA

2.1 INTRODUCTION

The previous chapter provided the introduction and background of the study, in which the research problem was identified, research questions outlined and research objectives presented. The chapter further outlined the preliminary literature review and the limitations of the study. This chapter presents the literature review on the manufacturing sector of Botswana. The study of the manufacturing sector is vital because the manufacturing sector is the foundation of the world's economy, representing creativity and innovation and driving the progress of society. From simple production, such as basket weaving, to very complicated production such as electronics and automotive, the manufacturing industry boosts the economy and improves the livelihoods of people by providing essential commodities.

This chapter presents the manufacturing sector with the aim of identifying the major gaps in the literature. The literature review is crucial for understanding concepts, identifying unnoticed problems, promoting new knowledge creation, framework development and theory development and offering suggestions for future research (Loviscek, 2021). The chapter starts with providing an overview of the global manufacturing sector in Section 2.2, focusing on its contribution to the world's gross domestic product (GDP), economic growth and job creation. Section 2.3 discusses the impact of the manufacturing sector on the environment and the major global manufacturing industries in Section 2.4. It further discusses the Botswana's manufacturing sector in Section 2.5, focusing on the contribution the sector makes to the country's GDP, economic growth and job creation. The major manufacturing industries of Botswana are outlined in Section 2.6 and furthermore Section 2.7 discusses the sustainability of Botswana' manufacturing sector. Lastly, Section 2.8 presents the summary and conclusion of the chapter.

2.2 THE GLOBAL MANUFACTURING SECTOR

Manufacturing is the process of converting raw materials, components and parts into finished products that can satisfy the expectations of customers (Calignano and Mercurio, 2023; Panagiotopoulou et al., 2022). Manufacturing companies can be defined as companies that transform raw materials, components and parts into finished products which they sell to other companies or people. The manufacturing sector is a major wealth-producing sector of any country's economy as it produces products which are used as inputs in other sectors and also provide goods to people. Seclen-Luna, Moya-Fernández and Pereira (2021) point out that the global manufacturing sector is essential to the economies of all countries. Similarly, Ikenna and Enyinna (2023) emphasise that one of the most stable and resilient industries for advancing a country's economy towards industrialisation, expansion and advancement is the manufacturing sector. The global manufacturing sector contributes approximately 16.5 percent to the global GDP (World Bank, 2022) and increased by 1.8 percent during the year 2023, which was because of the increase in Asian output by 3.3 percent (United Nation's Industrial Development Organisation [UNIDO], 2023).

According to UNIDO (2022), the manufacturing sector plays a vital role in strengthening socio-economic resilience in three ways; (1) by providing goods that are critical for the livelihoods of people, including food and medicines, (2) by providing products that combat emergencies, for example; protective clothing to fight Covid-19 and (3) by contributing to the recovery and growth of an economy as it contributes to productivity, jobs and trade. The manufacturing industry is among the highest human activities worldwide (Panagiotopoulou et al., 2022) and the highest job-creator by providing about 13 percent of the total global workforce (Gitnux Market Report, 2023). This supports the views of Handoyo, Suharman, Ghani and Soedarsono (2023), who stated that if the manufacturing sector performs satisfactorily, it can lead to the creation of jobs, the growth of gross national product and increased income, thus contributing significantly to economic performance. The manufacturing sector has a significant role in building the economies of countries, especially those of developing countries. Most of the

world's emerging economies have generated financial gains successfully through their manufacturing sectors (Yadav et al., 2020).

It has become evident that the supply chain of the manufacturing sector is still experiencing the effects of the Covid-19 pandemic, exacerbated by the Russia-Ukraine war, which has disrupted the supply chain of raw materials, especially for the food and beverages manufacturing industry. Jagtap et al. (2022) asserts that there may be long-term effects from the supply chain disruption caused by the Russia-Ukraine war. Statista (2023) further states that the manufacturing industry is impacted by geopolitical factors such as trade tensions and policy changes, with the Russian-Ukraine war having the most significant effect, thus manufacturing companies are looking for ways of improving the sector and developing resilience to survive the pressure. Despite the disruption caused by the Covid-19 pandemic in 2020, the global manufacturing sector has continued to grow steadily, with the global manufacturing value added per capita reaching an all-time high in 2022 at 1879 USD in constant 2015 prices, which represents a 14.5 percent increase from 2015 (UNIDO, 2023). However, though the global manufacturing output has increased, the industry is facing a major challenge of continued supply chain disruptions, increasing frequency of natural disasters, high global inflation and global slow-moving demand in addition to having difficulties with attracting and retaining manpower (UNIDO, 2023).

As posited by the resource theory, a manufacturing company's performance is dependent upon resources, of which SSRM is a critical resource because production is dependent on materials from suppliers. In the manufacturing sector, SSRM is an important activity due to the complexity of production and the need to acquire raw materials of the right quality, in the right quantity, at the right time and bought at competitive prices. Regardless of the manufacturing method used, the sector continues to make a vital contribution to the world's economy and the livelihoods of people. For manufacturing companies to survive and continue contributing to the economic development of countries and improve the livelihoods of people there is a need to adopt sustainable strategies. SSRM can help manufacturing companies to improve their performance (Cui, Wu and Dai, 2023).

2.3 THE ENVIRONMENTAL IMPACT OF THE MANUFACTURING SECTOR

It is important to note that though the manufacturing sector contributes greatly to the economic growth of countries, it can make a noteworthy impact on the environment which can result in negative externalities. The impact of the manufacturing sector on the environment starts from the design of a product to its final consumption and disposal (Trujillo-Gallego et al., 2021). Environmental policy makers, academics and industrial practitioners now recognise manufacturing as a significant cause of environmental degradation, despite previously believing that manufacturing had minimal impact (Kraus, Rehman and García, 2020). This puts pressure on manufacturing companies to reduce the environmental impact of their operations by working with other supply chain players (Trujillo-Gallego et al., 2021), of which suppliers are the key players in manufacturing company's supply chains. This resonates with the view of Melander (2018) who also emphasised the importance of supply chain collaboration and states that it is imperative for companies to collaborate in designing products so that they can design products that have less impact on the environment by using less energy, lower emissions and more environmental friendly materials.

The effect of the manufacturing sector on the environment arises in various ways, including energy consumption, greenhouse gas emissions, waste generation and resource consumption. The sector has a high energy consumption which, according to Sekhar and Pradeep (2021) is continually rising. Hegab, Khanna, Monib & Salem (2023) point out that the manufacturing sector currently contributes 15 percent of global energy consumption and 35-40 percent of material consumption. This is a concern because energy consumption is the highest contributor to climate change as it contributes about 60 percent of the total greenhouse gas emissions (United Nations, 2023) hence the reduction of energy and resource consumption can contribute to global sustainability.

Sekhar and Pradeep (2021) provide various types of energy from manufacturing that pollute the environment, including gas, oil and coal. The sector consumes energy through operating machinery and equipment using electricity and natural gas for heating and lighting of the premises. The energy consumption rate varies between industry types and the type of machinery being used. Since energy is the

highest contributor to carbon emissions, Panagiotopoulou et al. (2022) urge manufacturing companies to plan production processes to reduce energy consumption by using energy efficient equipment and alternative sources of power. Similarly, Sekhar and Pradeep (2021) recommend the use of solar energy to reduce the environmental impact as it is the most reliable source of energy in most parts of the world. The manufacturing sector affects the environment by contributing to the greenhouse gas emissions. Greenhouse gas emissions is regarded as the second highest contributor to carbon emissions, second to the energy consumption (Panagiotopoulou et al., 2022). Its impact on the environment is made during production by releasing carbon dioxide and other pollutants, the input of production such as materials and equipment, transportation of materials and products within the supply chain, the usage of products and their disposal in which methane can be released. Another impact which the manufacturing sector makes on the environment is the generation of waste. Waste generated from the manufacturing process, such as defective products, scrap material, packaging and excess raw materials can cause harm to the environment (Mukherjee et al., 2023; Sagar et al., 2023; Sovacool, Bazilian, Griffiths, Kim, Foley and Rooney, 2021). Resource consumption is another way in which the manufacturing sector contributes negatively to the environment. Water, air and energy have been noted as being highly consumed by the manufacturing sector.

There is need, therefore, for manufacturing companies to collaborate with other players in the supply chain, mainly suppliers to reduce the negative impact that they make on the environment. Manufacturing companies and suppliers can set common goals on sustainability, contribute to the reduction of carbon emissions by using materials which are environmentally friendly and setting policies on waste management. However, sustainable relationships with suppliers require the prioritisation of the SSRPO.

2.4 GLOBAL MAJOR MANUFACTURING INDUSTRIES

The global manufacturing sector consists of different types of industries ranging from the production of food and beverages to furniture and related products. This research has grouped the major industries that improve the socio-economic growth of countries and the livelihoods of people into five categories as: (1) food

and beverages, (2) pharmaceuticals and medicine, (3) automotive, (4) textile and wearing apparels and (5) computer and electronic products. These industries are discussed below focusing on their contribution towards GDP, economic growth and job creation, as well as their supply chains.

2.4.1 Food and Beverages Industry

The food and beverages industry comprises companies that manufacture and process various types of food and drinks which are consumed by the entire world. It is the largest industry in the manufacturing sector with its top distribution channels being the supermarkets, convenience stores and online trading. The food and beverages industry is the highest sector of the manufacturing industry with a turnover of 15.2 percent of the total manufacturing sector's turnover (Chen and Voigt, 2020). The food supply chain was highly affected by the Covid-19 pandemic due to production shutdowns as one third of the world's population was on lockdown (Din et al., 2022). Sovacool et al. (2021) also emphasise that the impact of the Covid-19 on the food and beverages industry was high leading to the loss of production because there was a desire to avoid human contact that would lead to the spread of disease. Thus, there is a need for sustainability in the food supply chain (Kumar, Yetkin Ekren, Wang, Shah and Frederico, 2023).

Due to people's changing diets and increased population, the demand for food has grown tremendously (Sovacool et al., 2021). The authors further report that in the year 2022, China was the highest producer of foods and beverages and accounted for 19.5 percent of the global total production. The food and beverage industry has become diverse with production ranging from traditional less organised production such as the processing of agricultural produce into finished products done at domestic level to more complex highly mechanised and capital-intensive production (TWI, 2023) done by multi-national companies. This industry depends on the primary sector for its input, mainly, the fishing, agriculture and animal farming industries.

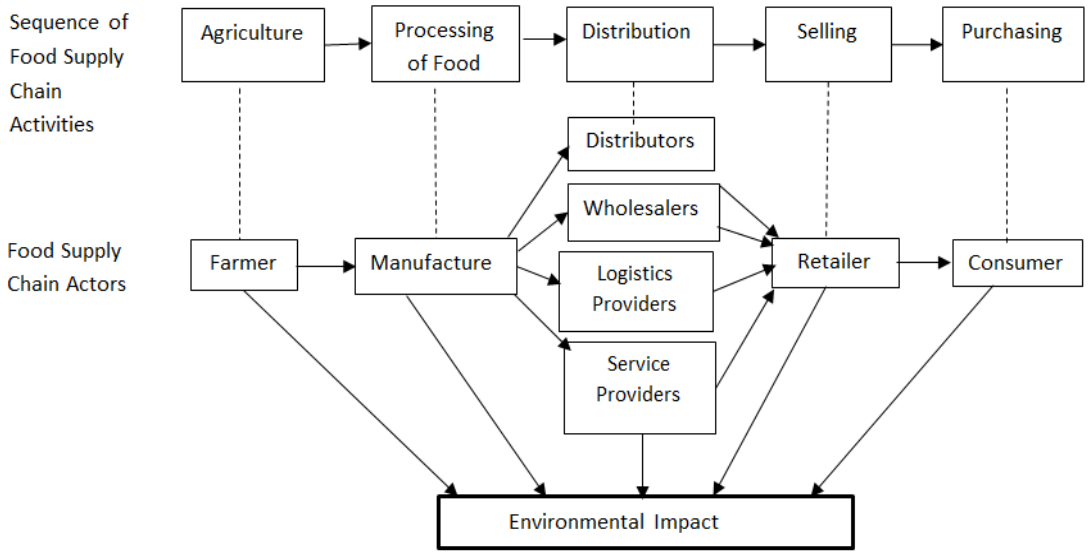
The lifecycle of the food and beverages industry is referred to by Sovacool et al. (2021) as 'farm to fork', describing its supply chain which starts from agriculture, processing of food and transportation and distribution to the ultimate customer. It

is worthy to discuss the food and beverages supply chain in great detail as it is the most important supply chain in the manufacturing industry. Sovacool et al. (2021) point out that there is no other important industry like the food and beverages as it provides good health to humanity by providing food and drinks which they need for sustaining life. Figure 2.1 below is used to explain the food and beverages supply chain. As stated above, the starting point of the food and beverages supply chain is agriculture. Farmers grow different types of food crops which are then harvested and sold to manufacturing companies as the manufacturing companies' major input. The second stage in the food and beverages supply chain is the processing of food by manufacturing companies using the raw materials obtained from the farming industry. After the processing of food, the manufacturing industry pass on their finished products to the third stage and that is distribution. There are various actors in the distribution of food including the following:

i. Wholesalers who buy in bulk from manufacturers and divide them into smaller quantities as they pass them to the retailers.
ii. Distributors who offer services such as transportation, packaging, inventory management and warehousing.
iii. Service providers such as Information & Communications Technology (ICT) companies who offer ICT services such as inventory management software and other communication systems.
iv. Logistics providers covering companies that provide third party services such as transportation, freight forwarding and warehousing.

Despite being the most important supply chain in the manufacturing sector, Sovacool et al. (2021) believe that the food and beverages industry has a high negative impact on the environment that arises from activities at all levels of the supply chain. For example, agriculture results in land degradation, while manufacturing contributes to carbon emissions as energy consumption from manufacturing is estimated at 30 percent globally, as well as water consumption. The distribution of food and beverages affects the environment through waste from food and packaging and air pollution through transportation and finally, the consumption stage also affects the environment through food waste and packaging.

Figure 2. 1: The Food and Beverages Supply Chain



Source: Author's own design, 2024

According to Sovacool et al. (2021), the food and beverages manufacturing industry may significantly worsen the use of water, energy and other environmental subsystems, as well as contribute to climate change. Other than the risks arising from environmental damage, the food and beverages industry is exposed to risks as the supply chain of food face vulnerabilities like perishability, temperature during transportation and storage affecting product quality and freshness (Oliveira, da Silva, Pereira and Chaudhuri (2023).

The food and beverages industry comprises different types of companies including confectioneries, health foods, snack production, frozen foods, beverages such as juice production, soft drinks and alcoholic beverages, dairy products, sauces, meat processing, bakeries, canned and preserved foods. The notable characteristics of the food and beverages industry include the prioritisation of the quality of the products, which is influenced by the environment's hygiene and sanitation, the conditions of storage, mode of transport, the hygiene of people involved in the manufacturing process and the raw materials which have dynamic features that change frequently (Chen and Voigt, 2020).

The industry should also follow stringent hygiene standards because it provides final products consumed by human beings. The regulations on quality and safety

are rigorous and must be complied with within the product supply chain (Chen and Voigt, 2020). The need for regulations in the food and beverages industry is supported by Faour-Klingbeil, Kuri and Todd (2020) who state that food safety encounter problems due to malpractices by food handlers, which can be preventable. Companies in the food industry should establish food safety standards so that they can improve the safety of food and these should be adhered to at all levels of a company (Ibid). To ensure that standards are maintained, some manufacturing companies are certified for quality with quality standards bodies nationally such as the Botswana Bureau of Standards (BOBS) or internationally, such as the International Standards Organisation (ISO) 9001.

However, it should be noted that there is some anxiety on the standard to follow by the food manufacturing companies since the ISO22000 was introduced which relate more to food manufacturing in addition to the ISO9001 and the Hazard Analyses Control and Critical Point System (HACCP) standards (Rr and Sn, 2009). Thus, manufacturing companies are subjected to compliance to the three standards, which makes them often question why they are required to comply with three different standards. Countries have regulatory framework, such as the United States Food and Drug Administration that provides guidance to food and beverages manufacturers and other business operators to ensure that they meet the food safety and quality standards and are certified (Varghese, Singla, Parisi & Begum, 2022).

Manufacturing of all types of foods and beverages is regulated, but tighter control in terms of policies and regulations is given to certain types. For example, as part of its Global Action Plan to prevent and control non-communicable diseases, the World Health Organisation (WHO) implemented regulations limiting the marketing of food and non-alcoholic beverages high in saturated fats, free sugars and/or sodium to children and adolescents in response to the rising prevalence of health issues and obesity (Kelly et al., 2019). Equally, the policies and regulations for the manufacturers of probiotics foods and beverages, foods that contain microorganisms which give health benefits and prevent infections should be updated and tightened frequently to protect consumers and give them assurance about their safety (Koirala and Anal, 2021).

Furthermore, in the food and beverages industry, adding artificial colouring to food is a common practice aimed at stimulating appetite and attracting customers. To control their usage, regulatory bodies regulate the use of artificial food colouring and excessive natural food colouring because they pose a health risk to consumers. They do this by establishing the colours and amounts that can be added to food without negatively impacting the product (Dey and Nagababu, 2022). The industry should put their efforts in meeting the demands of consumer who have different preferences. The implementation of sustainability in the food and beverages manufacturing industry is becoming increasingly important because of the increased promotion necessitated by resource depletion, as well as other environmental and social footprints that the industry has made globally.

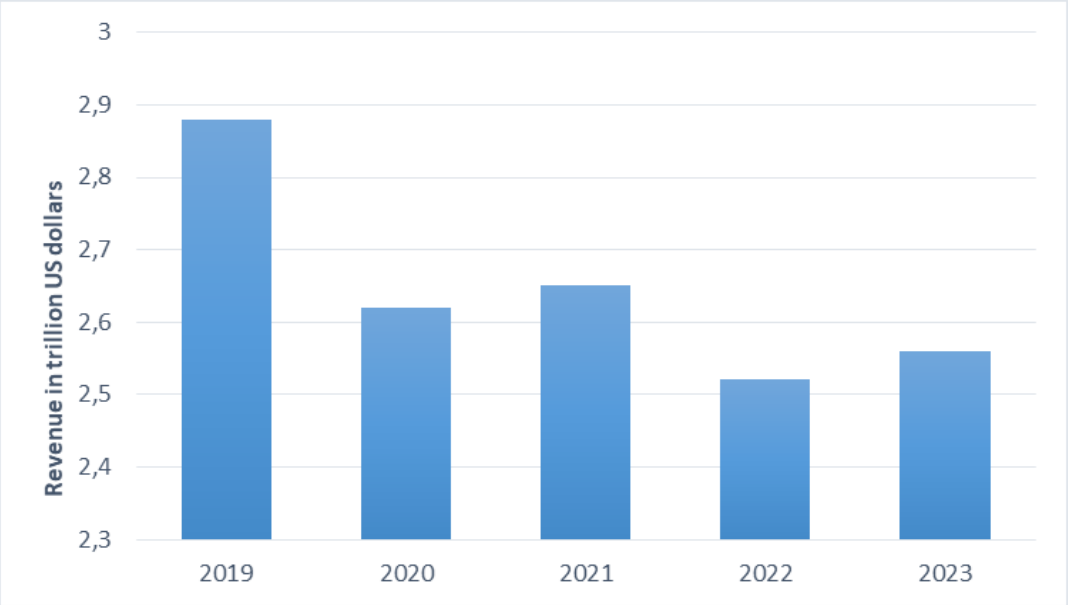
According to the United Nation's (2023) report, the food and beverages industry has 30 percent global energy consumption and 22 percent greenhouse gas emissions. Adams, Donovan and Topple (2021) also report that 80 percent of the deforestation globally emanates from the food and beverages production and greenhouse emissions of 29 percent and the usage of fresh water of 70 percent. Due to this impact on the environment, there is pressure on the food manufacturing companies from stakeholders such as legislators, customers and non-governmental organisations (NGO) to implement sustainable practices and it has been one of the focus areas for the shift to sustainable consumption and production under the United Nations' 12th Sustainable Development Goal (United Nation's, 2023). Having stringent regulations to follow and standards to meet, the food and beverages manufacturers should monitor quality performance of their suppliers to ensure that the raw materials meet the required standards. This then requires entering into long-term relationships with suppliers.

2.4.2 Automotive Industry

The automotive industry is part of the manufacturing sector that is involved in the designing, developing and manufacturing of motor vehicles (Saha, Pamucar, Gorcun and Raj Mishra, 2023; Williams and Blyth, 2023). It is one of the key technology sectors and the world's largest contributor to the economy as it contributes about 3.65 percent to global GDP and accounts for 10 percent of the world trade (Saha et al., 2023). Despite being the world's largest trade industry,

global sales of motor vehicles fell by 20 percent in 2020 because it was affected by the Covid-19 pandemic (ILO, 2021). However, Keith, Naumov, Rakoff, Sanches and Singh (2024) contend that auto sales have been rising and are expected to return to pre-pandemic levels despite a slowdown in global sales in 2022. Figure 2.21 below shows the global revenue of the automotive sector between 2019 and 2023. According to Williams and Blyth (2023), the automotive industry has been vital in boosting global mobility, raising GDP globally and creating jobs in both upstream and downstream sectors of the economy.

Figure 2. 2: Global Automotive Industry Revenue



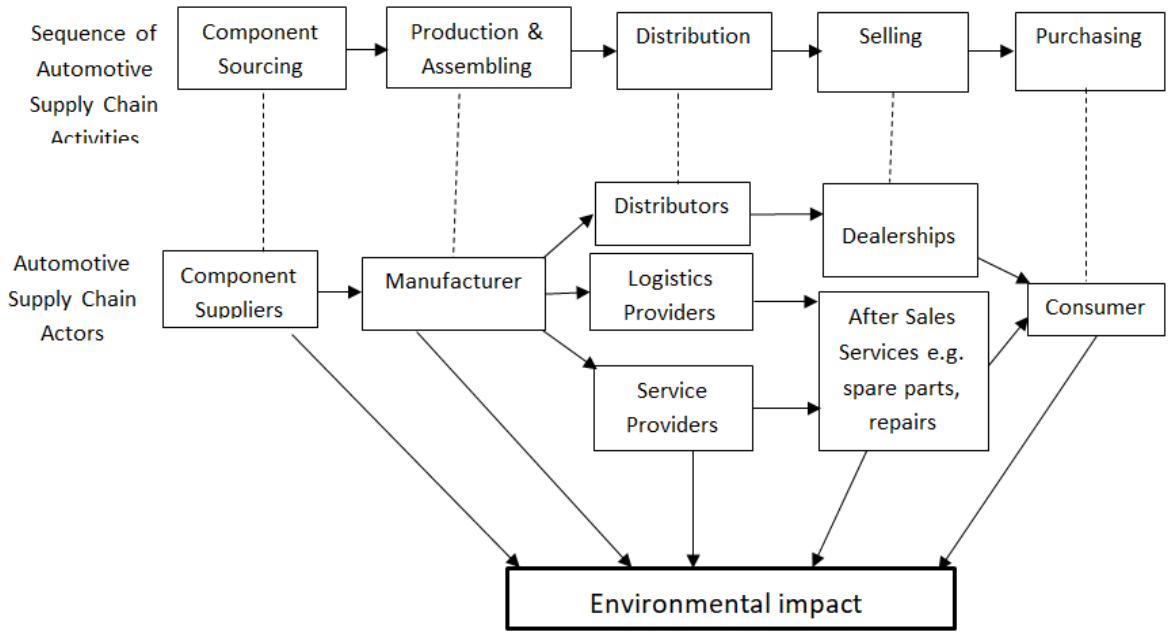
Adapted from: Statista, 2023

Despite making a major contribution to the world's economy, the automotive industry significantly impacts global environmental issues and road transport makes the highest contribution estimated to be 73 percent of the total automotive industry pollution (Priarone, Catalano and Settineri, 2023). Due to the detrimental effects that motor vehicles have on the environment and public health, including an increase in traffic accidents and a decrease in the quality of the air, water and soil, the automotive sector is the primary source of pollution from the manufacturing sector (Williams and Blyth, 2023).

Since the automotive industry has a high impact on the environment, it is imperative that the industry deals with this problem. According to Nguyen (2023), the problems of environmental issues being faced by the world can only be solved by the culprits, of which the manufacturing industry is the major culprit. While most of the authors give an emphasis on environmental issues as the key problems faced by the automotive industry and thus radical changes are to be made to improve in this area, Velkoska and Tomov (2023) recommend that businesses in the automotive industry should focus on quality cost management, which includes raising profit margins and cutting expenses while simultaneously improving product quality. On the other hand, Saha et al. (2023) recognise the problem faced by the automotive industry to be the lack of resilience in the supply chain as seen by the most recent example of the Covid-19 pandemic which disrupted the flow of raw materials and as a result manufacturing companies were not able to operate smoothly due to lack of inventory. As illustrated in Figure 2.3, the supply chain of the automotive industry comprises various actors starting with the component suppliers, who are the source of materials for manufacturing companies.

Secondly, it is the manufacturers who use the materials supplied by the component suppliers and transform them into finished products to sell to their valued customers. These are not usually sold directly to consumers, but pass through distributors, supported by logistics providers and other service providers, who then deliver them to retailers (dealerships) for selling to the final customers. The supply chain of the automotive industry has a unique characteristic as it is strongly supported by the aftersales service providers including the seller of spare parts and repair and servicing companies. Figure 2.3 further illustrates the environmental impact of the automotive industry which arises from all supply chain actors.

Figure 2. 3: The Automotive Supply Chain



Source: Author's own design, 2024

Because the automotive manufacturing uses a batch production system that relies on continuous supply of components feeding into the production line, it is critical for manufacturing companies in this industry to develop and maintain long-term relationships with suppliers to ensure a continuous flow of components and to avoid interruptions in component supply, which can lead to high costs. The automotive industry requires a well-structured logistics system to meet the industry's supply chain operations because it is international and has a large supply chain (Saha et al., 2023). SSRM is therefore important in this industry. Since the majority of the suppliers in the automotive supply chain are large corporations with high entry barriers, it is relatively easy to monitor suppliers and put in place measures which are sustainable (Xu et al., 2019). The current study develops a framework for manufacturing industries to help make decisions regarding SSRPO.

2.4.3 Pharmaceuticals and Medicine Industry

The pharmaceutical and medicine industry is another large industry in the manufacturing sector and is one of the most important industries in any country as it is essential to societal well-being (Khan, Gupta, Gunasekaran, Mubarik and Lawal, 2023). The pharmaceutical industry is a critical component of socio-economic development process (Arnold, 2022) as it makes a high contribution to the GDP of many country's globally. The industry reported a growth of 16.7 percent in the year 2023 and it was sustainable throughout the period of the Covid-19 pandemic (UNIDO, 2023). However, Jervelund (2023) argue that value creation by the industry does not arise from its efforts alone, but from various factors including reliable supply chains.

As regards the creation of jobs, the pharmaceutical industry has made a valuable contribution due to its varied supply chain encompassing research and design, marketing, distribution and manufacturing (Jervelund, 2023). A detailed supply chain of the pharmaceutical industry is illustrated in Figure 2.4, which shows the sequence of the medicine supply chain activities and the supply chain actors. It is imperative to note that though the industry has an impact on the economic and environmental sustainability; it has a high bearing on the livelihoods of people as it improves their health and safety, thus high social sustainability. As illustrated by Figure 2.4, all the supply chain actors contribute to social sustainability which has a high bearing on the consumers, which are the patients.

It is necessary to create a dependable and sustainable supply chain for healthcare goods and services in developing countries, including Botswana to raise the standards of living through better medical care and labour conditions. According to Debnath et al. (2023), the aim of a sustainable pharmaceutical supply chain is to deliver an efficient material flow and information to achieve a reactive, agile, accurate and data-driven supply chain. To-date studies undertaken lack the research on how the pharmaceutical and medicine industry can improve its supply chain by collaborating with suppliers.

It is imperative for the industry to enhance its supply chain by improving the flow of medicines to enhance people's health and livelihoods. By doing so, they are

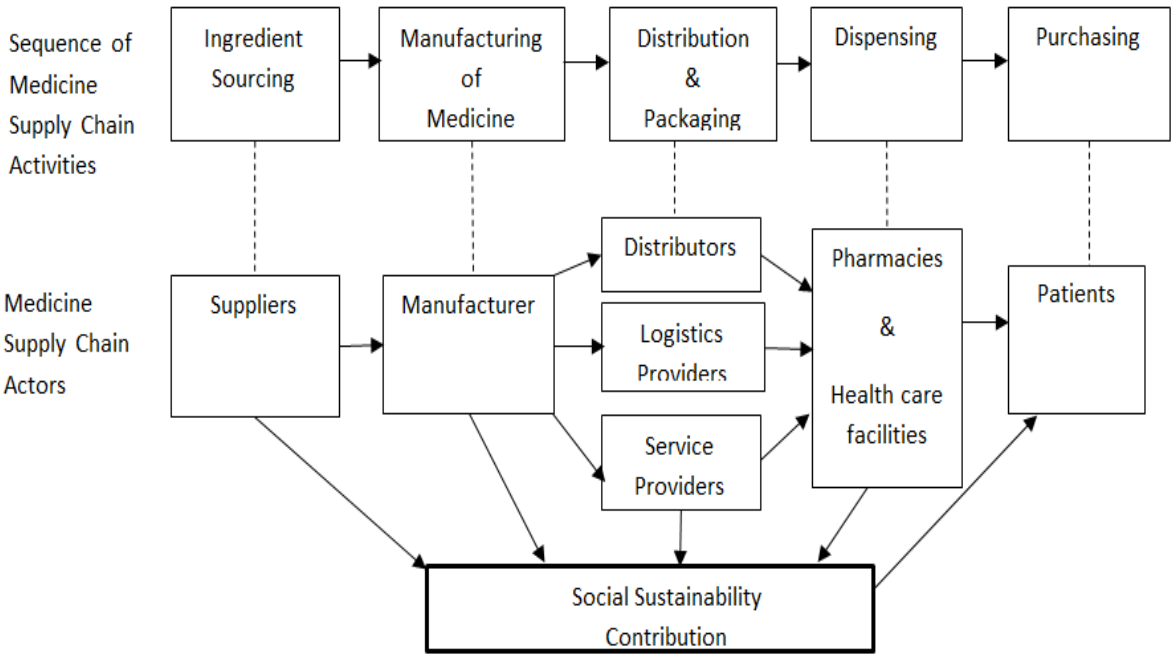
moving towards meeting Goal 3 of the United Nations' 17 Sustainable Development Goals (SDGs) aimed at achieving universal health coverage: good health and well-being (United Nations, 2023). The pharmaceutical supply chain distribute medications to a variety of stakeholders, including biotechnology firms, hospitals, pharmacies, health regulatory companies and patients (Ghadge, Bourlakis, Kamble and Seuring, 2023). Silva, Marques et al. (2023) assert that there is high dependence on the supply chain resilience by the industry which is usually affected by issues such as geographical problems, pandemics and natural disasters. Since medicines have a direct impact on people's lives, the social aspect of sustainability assumes a greater significance.

According to Silva, Marques et al. (2023), it is imperative to guarantee the accessibility and affordability of medicines over the long-term and resilience measures are essential to averting drug shortages in the event of supply chain disruptions. Increasing safety stock is one of the most effective ways of improving resilience in the supply chain as it prevents stock-outs. However, it is important for companies in the industry to understand that increasing safety stock increases waste because pharmaceutical products are perishable, thus increasing inventory costs for a company and impacting the environment due to waste. To reduce this problem, a well-integrated, effective and efficient pharmaceutical supply chain must be created so that pharmaceutical costs are lowered without sacrificing quality and agility (Khan, Gupta et al., 2023).

The pharmaceutical industry must prioritise environmental sustainability and resilience in its supply chains to ensure access to essential medications amidst climate change and social issues (Silva, Marques et al., 2023). The pharmaceutical industry is highly regulated due to the nature of the products, which highly affect the livelihoods of people and can cause harm and danger to people if not well controlled. Ghadge et al. (2023) reported that there is a rise in the production of medication with hazardous, toxic ingredients which increases risks to public health. The supply chain plays a pivotal role in minimising the risk of these harmful medicines and the likelihood that patients will take counterfeit medication by integrating manufacturers with their suppliers.

According to Kumar (2023), stakeholder involvement and integrated supply chains improve supply chain performance, while also assisting the pharmaceutical industry in providing better patient care. To improve the industry's supply chain, companies must coordinate with parties in the supply chain because the inefficiencies in the pharmaceutical supply chain is alluded to the lack of coordination between supply chain parties and other stakeholders (Ghadge et al., 2023). Thus, the current study investigates how pharmaceutical and medicine companies can interact with suppliers to achieve their goals.

Figure 2. 4: The Pharmaceutical Supply Chain



Source: Author's own design, 2024

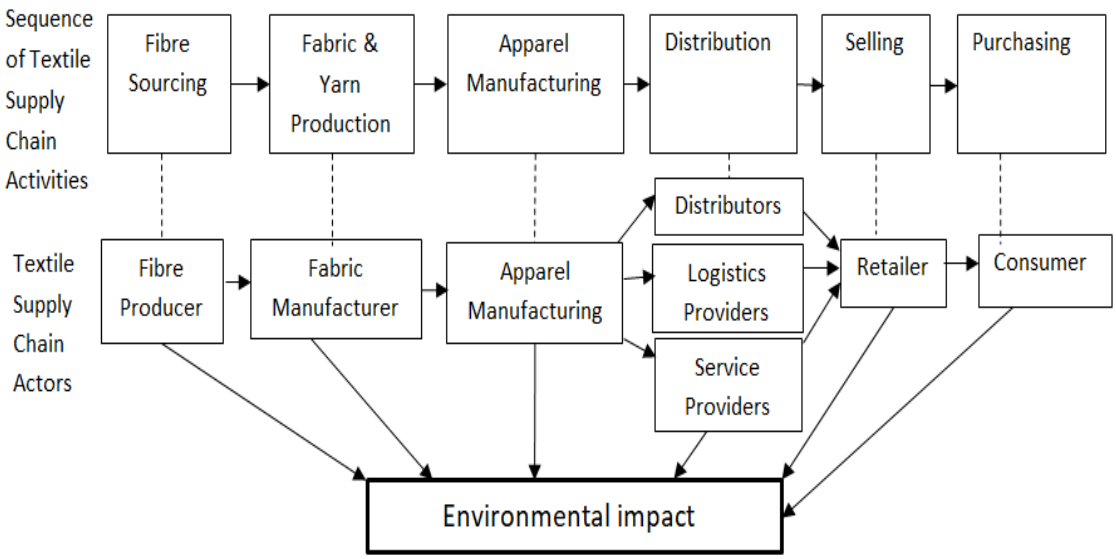
2.4.4 Textile and Wearing Apparels Industry

The textile and wearing apparels (TWA) industry includes businesses that engage in fabric production activities such as spinning and weaving, which result in the creation of clothing (Abbate, Centobelli, Cerchione, Nadeem and Riccio, 2023; Badhwar, Islam and Tan, 2023; Gönlügür, 2019). It is the largest global manufacturing sector and has a significant economic, environmental and social impact (UNIDO, 2023). The global TWA industry was valued at 1.5 trillion USD in

2021 and is expected to rise to 2 trillion USD by 2026 (Badhwar et al., 2023). The industry employs about 75 million people globally (UNIDO, 2023).

Over the last few decades, there has been a consistent increase in both the production and consumption of clothing, which according to Abbate et al. (2023) is due to factors such as rapid population growth, rising global incomes and rising standards, while Grand View Research (2023) allude to the increasing importance of the TWA industry to consumer lifestyles as driven by constant advertisements, impulsive buying and social media, which have boosted demand for fashionable wear. Though, Covid-19 slowed down the market growth of the global textile industry due to trade restrictions and decreased consumption, a strong recovery is anticipated with government support and increased public awareness (Grand view research, 2023). Studies show that the TWA industry is one of the most profitable sectors globally and is growing at a substantial annual rate (Koren and Shnaiderman, 2023).

Figure 2. 5: The Textile Supply Chain



Source: Author's own design, 2024

The TWA industry has a complex supply chain involving raw material procurement, garment construction, shipping, retail, usage and disposal. The TWA

is complex due to the complex production processes and the high number of supply chain parties. Figure 2.5 illustrates the supply chain of the TWA which begins with the fibre producer which could be a company that grows natural fibre such as cotton or an industry that makes chemical fibre such as nylon. This is followed by yarn and fabric manufacturers who produce material (fabric) ready for apparel production. The fabrics are then passed on to apparel manufacturing companies which produce finished fashion clothing ready for final consumption. In all these activities, TWA supply chain actors made some impact on environmental sustainability in addition to economic and social sustainability.

Though the illustration in Figure 2.5 represents a TWA supply chain, in reality it can be a complex manufacturing process which can involve many companies at one particular stage of the supply chain (Agrawal, Kumar, Pal, Wang and Chen, 2021). For example, the second supply chain stage, represented by 'fabric and yarn production' in Figure 2.5 can involve other producers such as buttons, threads and zipper manufacturers, with other service providers such as chemical treatment and embroideries. The TWA supply chain does not end with apparel production but is supported by distributors who obtain finished products from apparel producers and deliver them to retailers. The retailers then make the products available to the consumers. This shows how complex the TWA industry can be and encourages manufacturing companies in this industry to be resilient so that supply chain disruptions, which are eminent, are avoided.

The complexity of the TWA is not only caused by the wide distribution network, but also because it relies on global supply chains for some aspects of manufacturing and distribution, starting from locating raw materials to delivering completed goods to customers (Badhwar et al., 2023). Due to the complexity of the TWA supply chain arising from long supply chains and wide geographic dispersion; it is difficult for the focal firms to track the sustainability risk of the supply chain (Agrawal et al., 2021). Due to its complexity and the nature of work involved, the textile industry is susceptible to unethical practices such as cheap labour, mostly in developing countries. These unethical practices are often not noticed by manufacturing companies and other stakeholders. Badhwar et al. (2023) report that the complexity of the textile supply chain frequently masks the origin and genuineness

of the products and unethical activities such as forced child labour and modern slavery may go unreported, endangering the health and confidence of consumers.

Child labour can lead to severe physical and psychological trauma or even death, which restricts children's fundamental rights by keeping them out of school and out of the medical system in most of the cases (UNICEF, 2023). This then makes companies fail to achieve the social dimension of the triple bottom line which requires companies to meet the sustainable development goals aimed at equality, poverty reduction, job creation, education, empowerment, diversity preservation, human rights protection, equity, health and safety. In order to improve transparency and traceability in the TWA industry's supply chain operations, Badhwar et al. (2023) recommend the use of blockchain technology.

The TWA industry contributes significantly to global environmental pollution, with clothing manufacturing and transportation generating significant waste and high levels of greenhouse gas emissions, prompting stakeholders to address climate and human rights concerns (Abbate et al., 2023). Gönlügür (2019) states that the environmental damage caused by the textile industry is due to high water consumption and wastewater that contains a variety of pollutants. Similarly, Abbate et al. (2023) reports that the TWA industry is among the most polluting industries, generating significant clothing waste due to their rapid trend turnover and early disposal business systems. It is reported that the industry contributes 10 percent of greenhouse gas emissions (Hinkka, Aminoff, Palmgren, Heikkilä and Harlin, 2023). Due to its high levels of pollution, the TWA industry is recommended to take a broad approach to sustainability, encompassing environmental, social and economic aspects (Daukantienė, 2023). Using the Triple Bottom-Line (TBL) theory, the current research studied how manufacturing companies can work with their suppliers to meet sustainability requirements in terms of economic growth without detriment to the environment and the society.

2.4.5 Computer and Electronic Products Industry

Computer and electronic products industry includes businesses that produce goods and devices that use technology and electronic components to carry out different tasks. The digital revolution has significantly increased access to

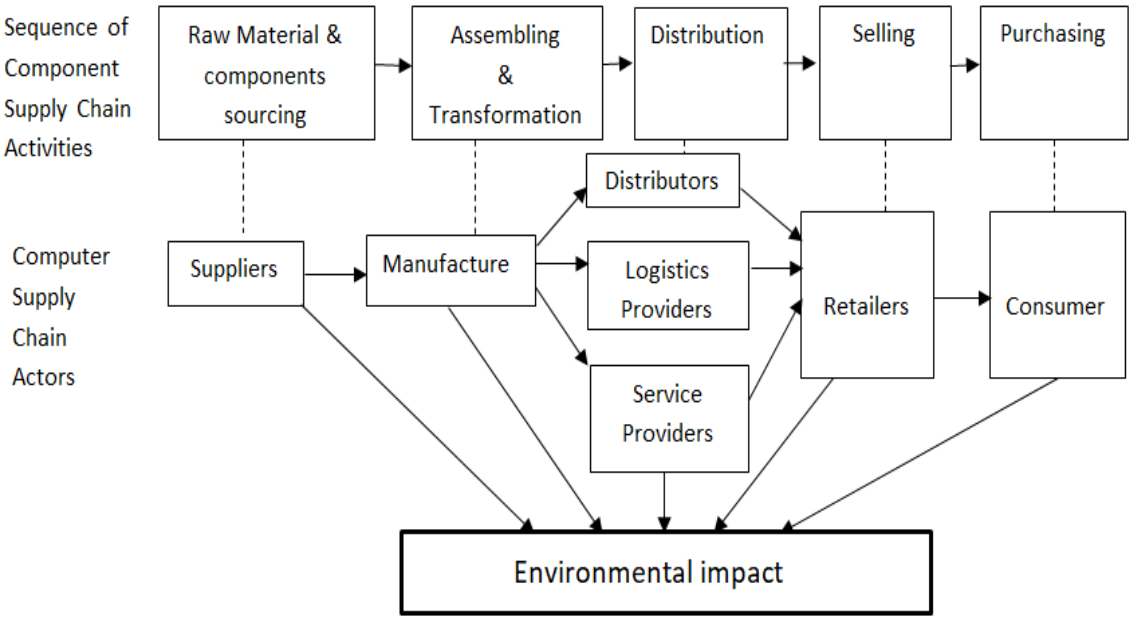
electronic equipment across all geographical areas through extensive innovation and cost reduction (Joshi, Sharma and Barve, 2023) and its global market value is approximately 0.83 trillion USD (Statista, 2023). The global demand for electronic and electric devices produced between 2020-2021 was between 42 and 55 billion, a reflection of both rising demand and falling costs (Joshi et al., 2023). The production has grown and is forecasted to grow further by 2.61 percent between the years 2024 and 2028 (Statista, 2023).

By implementing waste and electrical equipment recycling, circularity is improved and obsolescence is slowed down, which delays the insatiable need to introduce new commercial products (Joshi et al., 2023). The industry makes a vital contribution to global economic growth as it creates jobs and the number of employees in 2024 is estimated to be 17.35 million. A computer and electronic products industry that is thriving can accelerate the development of other industries, increase economic growth and create jobs for skilled workers (Statista, 2023). Even though the manufacturing sector has been severely harmed by the Covid-19 pandemic followed by the Russian-Ukraine war, those who have made investments in process automation and digitalisation are best positioned for long-term success (Statista, 2023). It is imperative to mention that the computer and electronic products manufacturing industry is a major contributor to global economic growth, however, it also has a severe impact on the environment. According to Gupta et al. (2020), the production of electronic devices is a major contributor to carbon emissions. To address the global issue of e-waste, some electronic industry companies are creating recycling programmes and forming alliances with recycling groups (Fisher, 2023).

The computer and electronic manufacturing industry has a complex supply chain system with activities starting from the sourcing of raw materials and components up to the final stage where the customer purchases the finished products such as smartphones, televisions, laptops and complex industrial products such as robots. This is illustrated in Figure 2.6 below. Due to the nature of the products and the complexity of its supply chain, the computer and electronic industry highly affects the environment. According to Wiklund et al. (2021), the production of electronics has a significant negative impact on the environment. Similarly, Joshi et al. (2023)

asserts that as the level of demand for electronic products increases, the level of obsolescence also increases which then leads to high environmental impact. Thus, all the supply chain actors shown in Figure 2.6 contribute to the industry's environmental impact including the ultimate customers who use the products which, in addition to waste management issues due to their obsolescence levels, the products require the usage of energy such as electricity.

Figure 2. 6: The Computer and Electronics Supply Chain



Source: Author's own design, 2024

2.5 THE CONTRIBUTION OF THE MANUFACTURING SECTOR TO BOTSWANA'S ECONOMY

This section discusses the manufacturing sector of Botswana. It concentrates on the contribution that the sector makes to the economy in terms of economic development, including job creation and economic growth. The section discusses the different types of companies in the manufacturing sector and the importance of supply chain management to the sector. Botswana's manufacturing sector is one of the top priorities in the national development agenda for self-sufficiency, job creation and economic diversification and since it is still in its nascent stages,

accounting for 5.5 percent of GDP, it has room for growth (World Bank, 2023). The development of the manufacturing sector is a top priority for the Botswana government as it presents a potential avenue for economic growth beyond the country's mineral wealth (BITC, 2022). This supports the view of Chaurey et al. (2023) who state that any country must prioritise the manufacturing sector because it is a key engine of economic expansion and is essential to bring about change, creating jobs and achieving sustainable economic growth.

The Botswana government has recognised the manufacturing industry as a crucial sector that can contribute to economic diversification and the generation of employment opportunities (CEDA, 2020). The manufacturing industry is one of the highest job creating sectors in Botswana and as a result job seekers who wish to spearhead national development transformation agenda may find a wealth of opportunities in the sector (Human Resource Development Council [HRDC] 2023). Botswana's manufacturing sector is expanding and generating jobs even though it is still in its nascent stages. The sector employs about 9.2 percent of the total formal employment (Statistics Botswana, 2021). Kruse, Mensah, Sen and de Vries (2023) reports that manufacturing employment in sub-Saharan Africa increased from 6 million to more than 20 million between 2000 and 2018, thus increasing the manufacturing sector's contribution to the rate of employment.

The government of Botswana has boosted the manufacturing sector by imposing restrictions on the importation of some products, including baked products, salt and sugar packaging, school uniforms, bottled water, corn extruded snacks and wheat flour (World Trade Organisation, 2022). However, it should be noted that though the government has imposed restrictions on certain products, the importation of some products including beverages and cereals increased in October 2023 (Statistics Botswana, 2023). This raises a concern to the government whose objective is to boost the country's manufacturing industry. Therefore, the enhancement of the manufacturing industry can help Botswana to reduce its imports hence improve the balance of trade.

Botswana's GDP contracted by 8.5 percent in the year 2020 due to the Covid-19 pandemic (International Finance Corporation, 2022). However, the industry remains a major contributor to the country's GDP and according to the World Bank

(2023) report; its contribution in the year 2022 was 5.5 percent of GDP. The manufacturing sector is susceptible to fierce global competition with companies competing for limited market share. The challenges facing manufacturing companies in Botswana are scarcity of resources as they have been depleted, tight government rules and regulations, pressure from customers to improve quality without affecting the costs, the changing market needs (Machingura, Adetunji and Maware, 2023; Eslami, Dassisti, Lezoche and Panetto, 2019) and the high cost of machinery (Calignano and Mercurio, 2023). This has put pressure on manufacturing companies to improve performance and contribute to Botswana's economic development. Therefore, a decision-making framework for the implementation of sustainable supplier relationship performance is important.

2.6 BOTSWANA'S MAJOR MANUFACTURING INDUSTRIES

The manufacturing sector of Botswana has various sub-sectors or industries, which contribute to the national development transformation and improve the socio-economic growth of the country and the livelihoods of people. The industry has been divided into 18 segments as presented in Table 5.2: sampling framework. This section discusses the three major manufacturing industries in Botswana, and these are food and beverages, textile and wearing apparels and paper and paper products. These industries were selected to be discussed in detail due to their concentration in the industry and their ability to make a high contribution towards job creation and the economic growth of the country. The industries are discussed in terms of how they contribute to the economic, social and environmental sustainability of Botswana.

2.6.1 Food and Beverages Industry

In Botswana, one significant economic industry in the manufacturing sector is the food and beverages industry. It comprises companies that manufacture and process various types of foods and drinks which are consumed by the entire country and export some to the rest of the world. The activities involved in this industry are processing, preserving, packaging and distribution. The food and beverages manufacturing industry of Botswana is bolstered by the country's constantly rising need for food and the major foods produced in the country

include meat (principally beef), sorghum products, maize products, dairy products, confectioneries, sour milk (known as madila), snacks, fish product, frozen foods, beverages such as fruit juice, soft drinks and alcoholic beverages.

The industry has approximately 120 companies (Dun and Bradstreet, 2023), with the industry leaders being Bolux Group Pty Limited, Cadbury Botswana Pty Limited, Clover Botswana, Kgalagadi Breweries limited, Senn Foods, Bokomo (Pty) Limited and FSG Enterprises Pty Limited. The local production of food is encouraged because it helps a country to increase the availability of food and help to reduce the costs by cutting import formalities such as custom duties and documentation, as well as the reduction of transportation costs. Unfortunately, Botswana depends more on the importation of foods of which the major supplier is the neighbouring country, South Africa. Since the industry makes the highest contribution to the turnover of the manufacturing sector (Chen and Voigt, 2020), it has been given much attention and support by the government. To increase the production of food and beverages, the government promotes investment in this sector so that the production can increase to meet demand for the increasing population (Statistics Botswana, 2023). In addition to increased demand, the production of food has changed as people desire quality living hence quality food. For example, people are particular with the type of beverages to take as some beverages have high sugar content which is not good for their health. Due to this, the Botswana government is enhancing food quality and safety standards by setting up rules and regulations covering packaging, storage and distribution of food (Food Control Act, 2018).

The food and beverages industry should, therefore, produce products that meet the quality standards and enhance good health of people. In this way they will be contributing to social sustainability as they make profits which contribute to economic sustainability. However, care should be taken to ensure that the industry does not make a negative impact on the environment which has been reported to be making a contribution of 22 percent to greenhouse gas emissions, 30 percent global energy consumption and 70 percent clean water usage (Adams et al., 2021; United Nations, 2023). Silva, Cassel, Wachs and Saurin (2023) emphasise that the food supply chain’s sustainability depends on the companies’ ability to

perform successfully in the social, economic and environmental spheres at the same time. The Covid-19 pandemic has exacerbated food security challenges, causing disruptions in the food supply chain and increased undernourishment among vulnerable populations (Bø, Hovi and Pinchasik, 2023). This is worsened by the on-going Russian-Ukraine war as the two countries are the major suppliers of oil and other food materials including wheat. Sustainable food supply chain management is maintaining the economic, social and environmental performance of the food supply chain. It is a matter of controlling economic, social and environmental performance of the supply chain.

2.6.2 Textile and Wearing Apparel Industry

The textile and Wearing apparel (TWA) industry of Botswana comprises companies that manufacture garments including school uniforms, office uniforms, cotton face cloths, kitchen towels, knitted jerseys, denim jeans and beddings. The industry, which had a downturn during and after the global recession, is now on the rise and promises to create a great deal of employment (Business Weekly and Review, 2022). The TWA industry of Botswana has the highest market share of exports with a contribution of 86 percent of its production to the export market share (Textile Infomedia, 2023). It contributes to the social sustainability of the country by creating jobs through maintaining low-technology manufacturing and the recruitment of unskilled to semi-skilled labour to perform some production activities (World Trade Organisation, 2022). The abundance of low-cost labour helps the TWA industry of Botswana to produce at low cost thus gaining competitive advantage.

The supply chain network of the TWA industry is complex as it involves many parties and relies on global supply chains with materials being sourced from different suppliers who are in different countries or continents thus making the supply chain complex (Badhwar et al., 2023). The supply chain of the TWA industry becomes more complicated when an organisation wants to practice supply chain sustainability (Kumar, Sharma and Pandey, 2023).

2.6.3 Paper and Paper Products Industry

The paper and paper products industry in covers production processing of paper products including household paper, printing paper, lined writing paper, tissue and hygiene paper. The largest segment in the paper industry is the toilet paper production. The paper industry performed well in the year 2021, recording a rise of 10.3 percent in value (Statistics Botswana, 2022). The industry has a revenue of 89.31million USD in 2024 and is projected to make an annual growth rate of 7.19 percent between the years 2024 and 2028 (Statista, 2024).

2.7 SUSTAINABILITY IN THE MANUFACTURING SECTOR OF BOTSWANA

Sustainability requires creating and preserving environments that allow people and the natural world to coexist peacefully and ensuring that the future of both current and future generations are preserved (Kayani, Warsi and Liaqait, 2023). While there are many definitions of sustainability, the definitions by the World Commission on Economic Development (WCED) (WCED, 1987) and the United States Department of Commerce (USDoC) for sustainable manufacturing are widely accepted by manufacturing companies. The WCED define sustainability as ‘meeting the needs of the present generation without compromising the ability of the future generations to meet their needs’ (Thomsen, 2018). On the other hand, the USDoC define it as ‘the creation of manufactured products that use processes that minimise negative environmental impacts, conserve energy and natural resources, are safe for employees, communities and consumers and are economically sound’ (Eslami et al., 2019).

Sustainability is renowned for balancing economic, social and environmental health of society called the ‘triple bottom-line’. Permatasari, Dhewanto and Dellyana (2023) posits that the sustainability of companies in general as an organisation’s management process that encompasses the economic, social and environmental factors of performance, while Kayani et al. (2023) concentrate on sustainability in manufacturing companies and refer it to as ‘the development of manufactured products through processes that are economically sound, have minimal environmental impact and are firmly based on the principles of energy and natural conservation’. If producing a sustainable product is the goal of a

manufacturing company, then obtaining sustainable raw materials from suppliers is cardinal (Yadav et al., 2020).

Sustainability is of vital importance in the manufacturing sector because the sector has a high impact on the environment as it accounts for about half of the world's overall energy consumption which has doubled over the last 60 years (Shokri and Li, 2020). Sustainability has successfully been implemented by manufacturing companies in developed countries, but its adoption in developing countries is remarkably poor (Yadav et al., 2020). There is a need for manufacturing companies in Botswana to work with their suppliers and be successful in sustainability. This is because the concept of sustainability and the reduction of manufacturing processes impact on the environment is no longer optional, but a business requirement for attaining competitive advantage (Shokri and Li, 2020).

A study by Eslami, Dassisti, Lezoche and Panetto (2019) identifies a hierarchy of sustainability dimensions, with environmental dimension being the most prominent, followed by economic and social dimensions, with social sustainability being the least discussed. Researchers place a strong emphasis on sustainability in supply chain management, calling on managers to take social impact, environmental preservation and economic performance into account when formulating plans and procedures (Wu, Jia and Barnes, 2023). In their planning, manufacturing companies of Botswana should go beyond their internal needs and consider supply chain partners, primarily suppliers.

The manufacturing sector of Botswana is susceptible to fierce global competition, thus if a company is to gain competitive advantage and retain its market share, it can use sustainable strategies in collaboration with its suppliers. The literature recommend manufacturing companies to work with suppliers and achieve performance objectives, including improving quality, reducing supply chain costs, improving delivery performance, increasing supply chain innovation, adding value and reduction of supply chain risks (Verma et al., 2023; Alagoz et al., 2022; Adesanya et al., 2020; Lintukangas et al., 2019; Yoo et al., 2019; Oghazi et al., 2016). SSRPO are the goals set by companies that are aimed at achieving long-term relationships with their suppliers focusing on sustainable practices that enable them achieve economic outcomes while taking into account the

environmental and social impact (Blome et al., 2023; Oduro et al., 2020; Dubey et al., 2019).

Many manufacturing companies have realised that sustainable supply chain management (SSCM) can enhance the productivity and operational effectiveness of their supply chains so they have begun integrating SSCM into their supply chain systems (Cui et al., 2023). Razzak (2023) further stress that incorporating sustainable practices into supply chain management is beneficial for more than just projecting a positive image but for improved performance as well. In addition to this, embracing green design and disposal practices can significantly advance sustainability (Yadav et al., 2020).

Despite the fact that studies have shown the importance of sustainability in the manufacturing sector, many companies are reluctant in implementing it because they believe that environmental and social sustainability practices are practiced at the expense of economic sustainability (Razzak, 2023). Opposing this view, Ojijo et al. (2023) state that the manufacturing sector has a high influence on the economy, society and the environment, giving opportunities to people to support sustainability initiatives. Many companies in the manufacturing sector fail to achieve economic, social and environmental sustainability due to failure to extend it to their suppliers. Thus, using the TBL theory, this study presents a decision-making framework to enable manufacturing companies, and their suppliers achieve sustainable relationship and performance goals.

The complexity of supply chain varies from one industry sector to another. For example, the supply chain of a company in the automotive industry may comprise many suppliers because automotive products are made from many different components that are bought from different suppliers, while the supply chain of a company in the food and beverages industry may be lesser complex. If the supply chain is complex, it may be difficult to develop relationships with all suppliers. Therefore, manufacturing companies should identify suppliers with whom closer and long-term relationships should be formed.

Some manufacturing companies use the Kraljic matrix to identify critical suppliers who can be selected for closer relationships and thus form sustainable

relationships. To explain suppliers with whom a manufacturing company may consider maintaining long-term partnership relationship, Jung et al. (2023) presents an example of a car battery being the most critical component for an electric vehicle manufacturer, thus their suppliers need closer relationships. To be competitive in the global market and take proactive measures in response to market disruption, businesses need to create a world-class supply chain and cultivate enduring relationships with them (Shiralkar, Bongale and Kumar, 2022).

2.8 CHAPTER SUMMARY

This chapter covered the literature review of the world manufacturing sector, with much emphasise on the Botswana manufacturing industry. According to the literature review, the manufacturing sector makes the highest contribution to the world's GDP and has the highest human activity, thus it is the highest job creator. It was revealed that the food and beverages industry was the largest manufacturing industry and the highest contributor to the world's economic growth. The literature review further identified other global manufacturing industries that make a vital contribution to the world economy as the automotive industry, pharmaceutical and medicine industry, textile and wearing apparels industry and computer and electronics industry. It was discovered that the Covid-19 made the highest impact on the operation of the manufacturing sector, which was worsened by the Russian-Ukraine war by affecting the supply of raw materials.

The literature further revealed that the manufacturing sector was a significant cause of environmental degradation which was done through energy consumption, greenhouse gas emissions and waste generation hence the environmental impact of the manufacturing industry was determined which started from the design of a product through to manufacturing and consumption up to the disposal of waste. In all the stages of the supply chain, the manufacturing sector contributes to environmental damage. Furthermore, the importance of manufacturing companies' maintenance of relationships with suppliers in order to improve performance and contribute to the country's economic growth was discussed. Sustainability in the manufacturing sector was also discussed as it balances economic, social and environmental health of society, known as the

triple bottom-line. The next chapter discusses the SSRPO, the factors that guide the formulation of the framework for this study.

CHAPTER 3

SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES

3.1 INTRODUCTION

SSRPO are supplier relationship objectives that lead to the achievement of economic results while considering the effects on the environment and society. Suppliers, if reliable, can be a source of gaining competitive advantage by manufacturing companies because production of any product depends upon material. Thus, to produce a good quality product in the desired quantities and at the right time depends upon suppliers delivering the right quality material, in the quantities that can meet the planned production and delivered on time. For this to be achieved, manufacturing companies need to develop sustainable relationships with their suppliers. Businesses incorporate sustainability in their SRM due to the need to maintain supply chain resilience as well as meeting the United Nations' Sustainable Development Goals (SDGs).

This chapter examines the objectives of sustainable supplier relationships in manufacturing companies in Botswana. It seeks to show the relationships among the different SSRPO. Section 3.2 outlines the different SSRPO that manufacturing companies can set, showing the relationship among them. The three dimensions of sustainability; economic, social and environmental are discussed in Sections 3.3, 3.4 and 3.5 respectively by outlining the factors that can lead to their achievement by manufacturing companies, followed by Section 3.6 which presents the relationship between the three sustainability dimensions. Section 3.7 presents the literature review on the quality improvements that manufacturing companies can make in collaboration with their suppliers, while Section 3.8 identifies from the literature costs involvement in the supply chain of manufacturing companies and suggestions on how they can work with suppliers to minimise them.

Furthermore, the importance of delivery performance by manufacturing companies, which is impacted by suppliers' delivery performance, is discussed in Section 3.9, together with the measures of delivery performance. Other SSRPO identified are supply chain innovation, discussed in Section 3.10 and providing the

identified factors that can enable manufacturing companies through working with their suppliers to make innovation in the supply chain and Section 3.11 discusses how value can be created by manufacturing companies in collation with their suppliers in the supply chain. The last SSRPO identified through the literature review is SCRM as discussed in 3.12, outlining the different strategies that can be used to reduce supply chain risks. Finally, a summary of the chapter is presented in Section 3.13.

3.2 SUSTAINABLE SUPPLIER RELATIONSHIPS PERFORMANCE OBJECTIVES

The SSRPO can be defined as the goals set by companies aimed at achieving long-term relationships with their suppliers focusing on sustainable practices that enable them achieve economic outcomes while taking into account the environmental and social impact (Blome et al., 2023; Oduro et al., 2020a; Dubey et al., 2019). The SSRPO outline what a company seeks to achieve out of the relationship with its suppliers, and these goals should not have a detrimental effect on the environment and society. SSRM is the collaboration of the purchaser and supplier to achieve their planned objectives without experiencing any obstacles that could endanger their relationship (Amoako, Zakuan, Okyere-Kwakye and Tetteh, 2023).

Manufacturing companies are forced to enter into SSRM by external stakeholders to achieve sustainability in terms of the contribution that a company makes to the economic development of a country, as well as the social well-being of society and the impact it has on the environment. However, manufacturing companies in Botswana are lacking in achieving improvements in their businesses through supplier relationship management because a framework that can guide them in determining the most important objectives that can be achieved through SSRM is not available (Denhere et al., 2023; Mukonyo et al., 2022; das Nair et al., 2018).

The literature suggests that SSRM can improve the performance of an organisation from all the three sustainability dimensions which are economic, social and environmental (Cui et al., 2023). Suppliers are a vital part of the supply chain as their performance affects an organisation’s performance (Khan, Bashar,

Minhaj, Wasi and Hossain, 2023) because manufacturing companies depend upon material for their production. Dania, Tafarel, Septifani, Amer and Doan (2023) state that a supplier is one of the key players in the supply chain that is crucial in maintaining the flow of raw materials. Botswana's manufacturing companies depend on suppliers for material input which should be available at the right time, in the right quantity and bought at the right price.

However, not all manufacturing companies manage to control raw material costs. Several of them source their input internationally, making the input costs expensive. If the cost of material inputs is high the production costs will also be high, which will raise the price of the manufactured product. According to Khulud, Masudin, Zulfikarijah, Restuputri and Haris (2023), suppliers play a critical role in the supply chain by enabling businesses obtain the needed materials at reasonable costs. Thus, SSRM can help manufacturing companies in Botswana to manage the quality and cost of manufactured products by obtaining the right materials from their suppliers.

The manufacturer-supplier relationship is one of the most important cooperative relationships in a supply chain because it promotes sustainable practices, competitive advantage and enhanced supply chain performance (Aditi, Govindan and Jha, 2024). This is consistent with the views of Gurtu and Johny (2021) who state that supply chains shape the foundation of the world economy and strengthen trade, consumption and economic expansion. Under-performing suppliers have a negative impact on company performance because manufacturing companies rely on suppliers for their primary inputs; raw materials, which if the supply is compromised in terms of quality, quantity ad delivery performance can lead to failure by manufacturing companies. In short, the failure by a supplier affects the manufacturing company. Bag et al. (2021) emphasise that manufacturing companies depend on suppliers to survive and gain a competitive advantage.

The impact of the Covid-19 pandemic, which disrupted the supply chain and the on-going Russia-Ukraine crisis, which is also affecting the supply chain have highlighted the significance of SSRM in the manufacturing sector as no manufacturing business can survive without raw material input. Manufacturing

companies in Botswana were deeply affected by the shortages of raw materials and other supplies during the Covid-19 pandemic as suppliers failed to deliver due to lockdowns and companies' shut down. This demonstrated the importance of suppliers to the achievement of manufacturing companies' supply chain objectives. This resonates with the opinion of Khan, Bashar et al. (2023) who comment that the performance of an organisation is closely linked to the performance of its suppliers as a result the performance assessment of a supplier needs to be connected to the performance assessment of the entire supply chain. To achieve this, it requires manufacturing companies to have SSRM in place with the set objectives they intend to achieve from the relationship.

Researchers have identified various SSRPO which manufacturing companies should achieve for them to remain competitive in the industry. A study by Adesanya et al. (2020) revealed that supplier relationships are fostered to enhance sustainability performance beyond merely adhering to legal requirements, while that of Alagoz et al. (2022) discovered that sustainable supplier relationships lead to improvements in product quality, delivery performance and reduced costs.

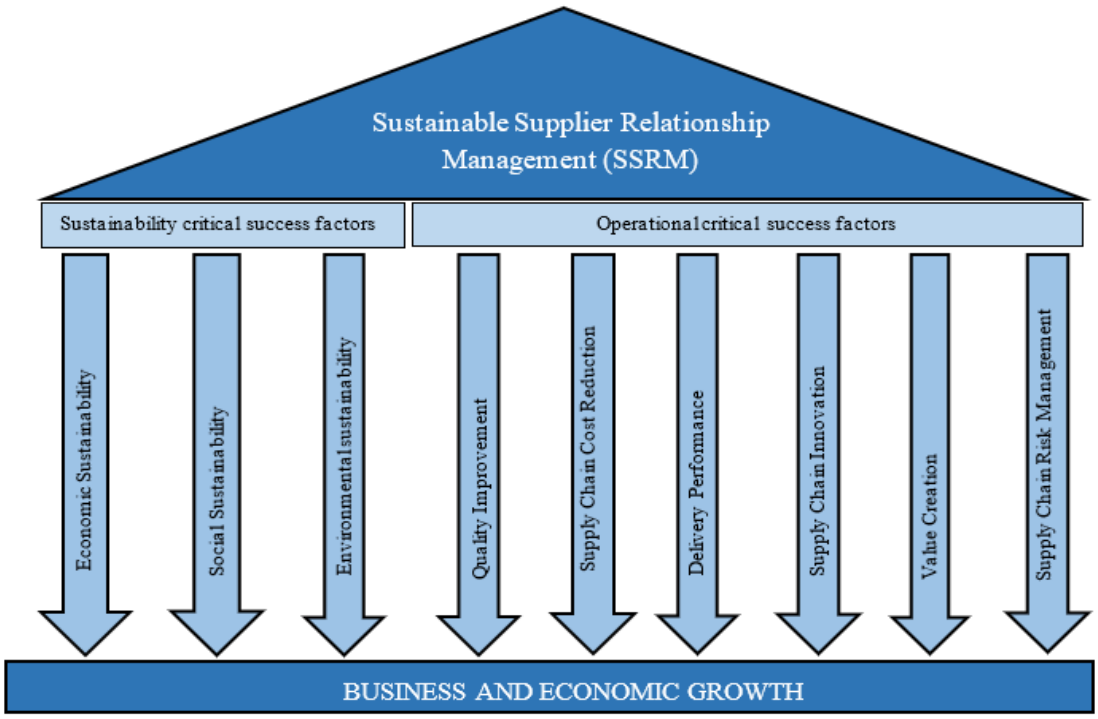
Similarly, research by Yoo et al. (2019) reveal that buyer-supplier relationships help manufacturing companies to reduce supply chain costs while that of Oghazi et al. (2016) reveal that supplier relationship management helps to improve delivery performance. In addition to enhancing sustainability, improving quality, delivery performance and reducing supply chain costs, SSRM can help manufacturing companies to improve innovation (Yang, Li, Cui and Qiao, 2023b), add value to the business (Verma et al., 2023) and minimise supply chain risks (Pellegrino et al., 2020; Scholten and Schilder, 2015).

From these studies, the objectives of SSRM, referred to in this study as SSRPO, can be deduced as (1) economic sustainability, (2) social sustainability and (3) environmental sustainability, (4) quality improvement, (5) supply chain cost reduction, (6) improving delivery performance, (7) enhancing supply chain innovation, (8) value creation and (9) SCRM. These are discussed in more detail in the sections below and they are the major discussion of this chapter. Manufacturing companies should ensure that their relationships with suppliers are

sustainable and able to achieve the SSRPO. However, SSRPO are not always achieved by manufacturing companies in Botswana due to the lack of guidance on prioritising the objectives as there is no framework that can prioritise them.

Figure 3.1 below shows the SSRPO that manufacturing companies in Botswana can achieve to improve their performance in terms of economic benefits and contribute to the economic growth of the country, thus improving the livelihoods of people. The figure shows SSRM as a roof that covers the objectives which manufacturing companies should aim at achieving and, which, if managed efficiently can enable manufacturing companies contribute to the economic growth of Botswana. Figure 3.1 presents the nine SSRPO as organised into two categories: sustainability CSF and operational CSF. The sustainability CSF category comprises the three sustainability dimensions as economic, social and environmental sustainability. While the operational CSF category covers the six CSF as; quality improvement, supply chain cost management, delivery performance, supply chain innovation, value creations and supply chain risk management.

Figure 3. 1: Sustainable Suppliers Relationship Performance Objectives (SSRPO) Conceptual Framework



Source: Author's own design, 2024

It can be believed that the nine performance objectives of sustainable relationships with their suppliers as shown in the figure can allow economic benefits to flow to the business which in turn leads to the achievement of the economic growth of the country.

3.3 ECONOMIC SUSTAINABILITY

Economic, social and environmental sustainability have been a global concern in recent years due to the need to meet the present needs effectively while at the same time catering for the future generation to meet their own needs as well. This section discusses the economic sustainability among manufacturing companies in Botswana. The contributions made by the manufacturing sector of Botswana to the economic growth are discussed and the CSF of economic sustainability are identified as supplier collaboration, technology investment, supporting suppliers and inventory management.

3.3.1 Economic Sustainability in the Manufacturing Sector of Botswana

Many studies undertaken on sustainability show that developing long-term relationships with suppliers increase the future economic value of companies as both companies will be more sustainable (Ukko et al., 2022; Nkwabi and Fallon, 2020; Oduro, Nyarku and Gbadeyan, 2020; Kashyap and Lakhanpal, 2019). Economic sustainability refers to practices that enhance economic growth over a long period while minimising the negative impact on society and the environment (Ikenna and Enyinna, 2023). Unlike the conventional practice that gives emphasis to economic performance at the expense of the environment and society, economic sustainability forces manufacturing companies to give emphasis on achieving economic growth without having a negative effect on the environment and society.

In relation to SSCM, economic sustainability refers to actions made by management to guarantee that all systems and processes throughout the supply chain are operating at maximum efficiency (Razzak, 2023). Ikenna and Enyinna (2023) suggest that the foundation of economic sustainability lies in the idea that companies ought to shun wasteful short-term activities and promote global long-

term well-being. This helps to boost a country's economy through various ways including raising the rate of employment, income generation and profit generation.

According to the Global Commission on Economy and Climate, by 2030 vigorous climate action could result in economic benefits of at least 26 trillion USD (Elsawy and Youssef, 2023). Despite the manufacturing sector's high contribution to the economy of the country, it has a high negative impact on the environment as it depletes natural resources, generates waste and emits harmful emissions (Jayawardane, Davies, Gamage, John and Biswas, 2023). Thus, economic sustainability in the manufacturing sector of Botswana is concerned with the impact that a business will make on the stakeholders and the environment both locally and globally.

Economic sustainability necessitates taking GDP, the quality of life and resource distribution into account (Elsawy and Youssef, 2023). Manufacturing companies that achieve economic sustainability are seen to have an economic impact on their stakeholders in terms of making good flow of funds among stakeholders, such as paying income tax to the government, increasing wealth for the shareholders, job creation and security and reasonable pay to employees. In achieving this, manufacturing companies ensure that no negative impact is made on the environment.

The manufacturing sector of Botswana contributes significantly to the economic growth of the country and is one of the highest jobs creating sectors and spearheads national development transformation (HRDC, 2023; CEDA, 2020). This resonates with the views of Hariyani, Mishra, Hariyani and Sharma (2023), who state that economic growth raises people's standards of living in a number of ways, including increased employment opportunities, access to education, a decrease in poverty, high income and better income distribution.

The idea behind economic sustainability is to utilise resources to meet present needs while protecting and, if possible, improving the natural resource base for future generations (Elsawy and Youssef, 2023). A company should investigate how it can sustain its production in the long term without causing harm to the environment and people. Therefore, the business should have the capacity to

operate sustainably in terms of capital investment, financial planning, strategic planning, innovation and a committed labour force.

In support of this view, Zhuang, Denizel and Montabon (2023) emphasise that improving sustainability performance requires an investment in terms of capital and human resources. Due to the high capital requirement, manufacturing companies are prone to compromise the quality of their products in the process of managing the high costs of resources such as labour, material and machinery (Ikenna and Enyinna, 2023). Manufacturing companies that achieve economic sustainability do not engage in wasteful activities but ensure that all the activities undertaken are driving to the long-term health of the country and the world at large.

Botswana needs an immediate attention to address its challenge of deteriorating economic growth and rising unemployment rates (HRDC, 2023). This puts pressure on manufacturing companies to contribute to resolving this challenge because industry leaders have a task to ‘retool, reinvest, and rethink their businesses for economic growth’ (UNDP, 2023). Manufacturing companies should ensure that their businesses are economically sustainable, which means that they should contribute to economic development and growth of the country. Different scholars have different views on how economic sustainability can be enhanced. While Ikenna and Enyinna (2023) suggest that developing employees can be a source of economic sustainability, Huma, Ahmed and Zaman (2023) have the view that quality-oriented products is the top priority for manufacturing companies to achieving economic sustainability.

According to D’Angelo, Cappa and Peruffo (2023), environmentally and socially conscious manufacturing methods improve economic sustainability because customers respond favourably to environmentally and socially conscious manufacturing methods as they are happier purchasing such products and this in turn boost a company’s economic performance. Furthermore, collaboration between manufacturing companies and supply chain partners is reported to be leading to economic cost savings and increased productivity (Razzak, 2023), which helps to increase the economic benefits of the manufacturing organisation, as well as that of the supplier. When businesses can sustain or improve their

operations' value or efficiency without jeopardizing the economic stability of societies in which they operate, they have achieved economic sustainability (Elsawy and Youssef, 2023).

While some research indicate that implementing social and environmental sustainability practices can improve a company's performance over the long run, others doubt that it is feasible to ignore the immediate financial gains since shareholders evaluate company performance primarily on the basis of immediate outcomes (Razzak, 2023), not the long-term economic benefits which arise from social and economic sustainability. This research examines how manufacturing companies can collaborate with their suppliers to enhance economic sustainability. There are various steps that manufacturing companies can take which act as CSF of economic sustainability as outlined below.

3.3.2 Supplier Collaboration

The economic sustainability of manufacturing companies is dependent on reliable suppliers as manufacturing companies are dependent on suppliers for their materials which is one of the major resources of production. Aditi et al. (2024) urge manufacturing companies to develop collaborative relationships with their suppliers as this helps to gain competitive advantage and implement sustainable practices. It is apparent that because suppliers play a significant role and provide input that ultimately improve supply chain efficiency and responsiveness, a well-integrated supply chain through high-quality relationships and a high level of integration with suppliers can enhance and improve the overall supply chain performance (Afraz, Bhatti, Ferraris and Couturier, 2021). This view is supported by Khan, Bashar et al. (2023) who further state that suppliers are a vital link in the supply chain due to the substantial and indirect effects that their performance has on customer satisfaction. It can then be said that maintaining sustainable relationships with suppliers can help a manufacturing company improve its performance as suppliers will be able to supply materials of the right quality, in the right quantities and at the right time within justifiable costs.

3.3.3 Supply Chain Technology Investment

Supply chain technology plays a vital role in enhancing economic sustainability of manufacturing companies as it helps them to survive competition and gain competitive advantage hence economic growth of the country. Investing in green technology and being able to produce green products leads to higher long term profits and sustainable development and is regarded as a critical business strategy (Wang, Zou and Geng, 2021). There are various ways in which technology advancement can contribute to the economic growth of a manufacturing company including efficiency in production to improve production outputs, improving communication in the supply chain, enhancing communication between manufacturing companies and their suppliers, improvements in transportation, thus making it easy for goods to reach the customers on time.

According to Adama, Popoola, Okeke and Akinoso (2024), technology investment such as big data analytics, block chain and artificial intelligence (AI) transforms the supply chain, lower costs, reduce risks and increase efficiency. These give rise to increased profits hence contributing to economic sustainability. The awareness of sustainability has led to people's high inclination to purchasing products which are environmentally friendly and this has put pressure on manufacturing companies to design and produce green products. Thus, manufacturing companies who invest in technology that can enhance green production are able to increase their profits hence economic sustainability.

A research carried out by Ma, He, Gu and Li (2021) revealed that manufacturing companies that make investment in technological advancement relating to green emission reduction enhance the profits made by supply chain members because demand for the product increases as customers are interested in purchasing environmentally friendly products. However, Wang, Zou et al. (2021) argue that making a high level supply chain sustainability investment in green technology does not always result in environmental sustainability, but there is much dependence on the sensitivity of the environmental impact to green technology. That means it is not always expected that technology investment can lead to increased sales and economic benefits.

3.3.4 Supporting Suppliers

The need for improving economic sustainability forces manufacturing companies to extend it to their suppliers by supporting them to improve their operating processes and the products they deliver to the business. Suppliers can be supported in various ways. Dearing and Foster (2024) recommend supplier development as effective support to suppliers that can help them improve their performance. Manufacturing companies can use various means of developing suppliers. Scholars recommend the use of supplier development including supplier initiatives, performance evaluation and feedback, supplier staff training, development, site visits to supplier's factory, supplier and buyer staff collaboration and investment in supplier companies (Hoque, 2022).

3.3.5 Inventory Management

Inventory management is the system that companies use to handle inventory by setting inventory policies and procedures to guarantee that sufficient quantities of inventory will be held at all times (Alam, Thakur and Islam, 2024). It is a vital part of the manufacturing and supply chain of an organisation as it helps manufacturing companies to reduce inventory costs and aids manufacturing processes that depend on raw materials to make finished products and enable the business to balance demand and supply (Alam et al., 2024; Munyaka and Yadavalli, 2022). Improved inventory management practices can save revenue as it greatly reduces production costs as a result of reducing set up costs and time, reduce wastage, improve service levels and inventory holding costs (Panigrahi, Shrivastava and Nudurupati, 2024).

3.4 SOCIAL SUSTAINABILITY

Social sustainability in the manufacturing industry has increased due to the pressure emanating from stakeholders, suppliers, consumers, employees and the community, who are concerned with the practices of manufacturing companies regarding how they get affected and the impact these companies make on the environment. Governments and regulators also put pressure on manufacturing companies to adopt sustainability practices due to the growing resource scarcity and a move towards more sustainable economies. Since the manufacturing sector

of Botswana is critical to the economic growth of the country (BITC, 2022), enhancing sustainability is critical hence the researcher of this study developed interest in studying SSCM practices that enable the enhancement of social sustainability. Thus, this section presents the literature review on social sustainability and the collaboration of manufacturing companies with their suppliers to foster social sustainability in the supply chain.

Social sustainability is about identifying and managing business impacts on people, both positive and negative (Razzak, 2023). Ipinnaiye and Olaniyan (2023) define social sustainability as 'a sustainable development principle aimed at achieving equality and reducing poverty through job creation and education, empowerment and freedom, preservation of diversity, protection and promotion of human rights, equity and health and safety'. The importance of social sustainability to manufacturing companies cannot be over-emphasised because research shows that companies that are socially responsible perform better than others as supply chain social sustainability improves company image, competitive advantage and lowers costs, labour disputes and supply chain risks (Guo and Wu, 2023).

Although social sustainability can enable manufacturing companies perform better by satisfying their stakeholders, more focus by researchers and practitioners has been given to economic and environmental sustainability, neglecting social sustainability (Mies and Gold, 2021). Moreover, research on sustainability conducted in developing countries has little focus on social sustainability issues across the whole manufacturing supply chain (Nguyen, Mani, Kha M. and Papadopoulos, 2023). With these gaps on social sustainability, this research concentrated on studying social sustainability in the supply chain and to ascertain the collaboration of manufacturing companies in Botswana with their suppliers in ensuring social sustainability. Researchers have high interest to study the supplier-buyer relationship that ensures the enhancement of social sustainability (Amoako et al., 2023).

The manufacturing industry makes a significant impact on social sustainability through fair working conditions, ethical sourcing and community engagement. Social sustainability in supply chain is the response to social issues in the supply chain (Amoako et al., 2023). Padilla-Lozano and Collazzo (2022) state that when

a company practices social responsibility, it has a constant desire to meet stakeholder demands while satisfying the needs of its stakeholders. It is a responsibility of manufacturing companies in Botswana to act socially responsibly so that they can satisfy stakeholders by meeting their social needs. Therefore, manufacturing companies should improve their relationship with suppliers of key resources (raw materials) to ensure that they are committed to social sustainability and by so doing, they form sustainable supplier relationships with the key suppliers of raw materials. SSRM is evolving into a suitable strategy in the supply chain which businesses use to achieve improved performance and social sustainability (Amoako et al., 2023).

In addition to economic and environmental sustainability, it is important for manufacturing companies to achieve social sustainability and meet stakeholder expectations. In fact, a study conducted by Razzak (2023) revealed that social sustainability practices in SSCM make a high impact on the competitive advantage of manufacturing companies compared to economic and environmental SSCM practices. However, several sustainability scholars argue that social sustainability has not received much attention in supply chain (Grybauskas, Stefanini and Ghobakhloo, 2022; D'Eusanio, Zamagni and Petti, 2019; Martins and Pato, 2019). According to Amoako et al. (2023), supply chain's sustainability focus has been given to economic and environmental dimensions, with less consideration for social sustainability.

Similarly, Loviscek (2021) argue that not all aspects of the three dimensions of sustainability (economic, environmental and social) are followed by companies because social sustainability is less considered as important. Furthermore, Yadav, Choi, Kumar, Luthra and Naz (2023) emphasise that many companies overlook the social sustainability dimension and Eslami et al. (2019) states that social sustainability is the most challenging and least explored dimension of sustainability. On the other hand, though most of the researchers of sustainability paid little attention to social sustainability, a research study carried out by Zhuang et al. (2023) did not give priority to any one of the three pillars of sustainability, but considered all of them equally.

Since a company's activities affect stakeholders, including employees, suppliers and customers, they need to be executed in ways that show responsibility. Many companies use the triple bottom line framework to measure their sustainability performance. This framework measures a company's performance in relation to economic, environmental and social sustainability, thus helping to reduce the tendency of giving more importance to economic and environmental sustainability and leaving out social sustainability. As a result, companies that use the triple bottom line manage to gain competitive advantage while meeting the requirements of all the three sustainability dimensions.

According to Padilla-Lozano and Collazzo (2022), when a company behaves responsibly, it always seeks to improve the social and economic value it provides while satisfying the needs of its stakeholders. Supply chain management professionals have a vital role to play in ensuring that strategies that minimise social exploitation are in place and implemented effectively. Jarvis-Grove and Jackson (2023) advise companies to extend the socially responsible practices to their suppliers, as well as all parties in the supply chain.

Similarly, Loviscek (2021) state that the formation of long-term business partnerships is critical to sustainable development and the partners should embrace win-win strategies that integrate the financial and non-financial performance of the industry as a way of dealing with economic, social and environmental problems. The author further emphasises that a company cannot be successful in sustainable development without establishing long-term partnerships and win-win strategies. Therefore, conducting business sustainably can help to boost the competitiveness of manufacturing companies and this includes forming collaborative long-term relationships with their suppliers.

It is envisaged that a company will gain competitive advantage through managing the social and environmental impact of the value chain (Padilla-Lozano and Collazzo, 2022). Acting with social responsibility shows that a company has great interest in increasing the value it delivers, thus meeting stakeholder demand. If a company improves its environmental and social performance, financial, reputational and legal benefits will flow to the business (Saini, Malik and Sharma,

2023). The ISO 26000 framework provides guidance to companies that are committed to operating in a socially responsible way (ISO Standards, 2021).

Companies should act in ways that show that they are responsible to their stakeholders, including employees, customers, suppliers, shareholders and the community at large. Many studies have been undertaken on how companies should act to show social responsibility to their stakeholders. A research conducted by People and Global Business Association and Duong (2022) identified six most important factors affecting social sustainability; namely, education, health and safety, ethical improvement, philanthropy, gender equity and well-being. While a study carried out earlier by Mani, Gunasekaran, Papadopoulos, Hazen and Dubey (2016) identified equity, health and safety, ethics, labour rights, child and bonded labour, wages, education, society and regulatory responsibility as measures that can show social responsibility.

Furthermore, CIPS (2023) recommend companies to look into various aspects in order to show social responsibility and these are employee relations and diversity, health and safety, working conditions, community impact, modern slavery, training and education, employee engagement, data protection and privacy and transparent stakeholder communication. The manufacturing companies in Botswana are not an exception to practicing these social responsibility factors. These are the key social sustainability activities that bear a high impact on the supply chains of Botswana's manufacturing company. For this research, these social sustainability responsibility factors are summarised into three categories, which are working conditions, ethical sourcing and community engagement. This is shown in Figure 3.2 and explained below in Sections 3.4.1 to 3.4.3. Manufacturing companies are now incorporating social sustainability in their supply chains. For example, the supply chains of Ford and Apple have incorporated social sustainability practices (Guo and Wu, 2023).

3.4.1 Working Conditions

As one of the key stakeholders of a company, employees should be treated fairly by ensuring that the working conditions are fair. In the manufacturing sector, fair working conditions encompass aspects such as training and education of

employees, health and safety, reasonable working hours and reasonable wages, gender equity, labour rights, employee relations and diversity and employee engagement (Kumari and Singh, 2023; People and Global Business Association and Duong, 2022; Mani et al., 2016). Additionally, Tafa and Batisani (2023) state the following as major challenges that the Botswana workplace is facing in the modern days, and these are; contract ambiguity, health and safety, the lack of legal certainty, data privacy and security, expense reimbursements, working hours and overtime and performance evaluation. The working conditions are grouped together and shown in Figure 3.2. Despite social sustainability being part of the wider sustainability concept, many manufacturing companies do not treat their employees fairly.

For example, in India, General Motors faced a labour union lawsuit in July 2021, alleging job security and retrenchment of service, even though 90 percent of the employees protested to keep their jobs when the company fired a large number of them, resulting in financial strain and an uncertain future (Kumari and Singh, 2023). Contrary to the General Motors' case, Fariphones promotes social sustainability by enhancing the working conditions of its manufacturing workers (Agrawal, Mohanty, Agarwal, Dixit and Agrawal, 2023). Kumari and Singh (2023) urge businesses to consider social sustainability in the same manner as environmental sustainability because as much as pollution impacts the environment and cause losses to the business and the community, poor working conditions affect employee performance as they compromise psychological and the welfare of employees. A socially responsible manufacturing company extends social sustainability practices to suppliers by ensuring that suppliers also adopt social sustainability practices. Many manufacturing companies are starting to monitor the labour practices of their suppliers and are developing long-term relationships to achieve this.

Training and education is an essential element of social sustainability that manufacturing companies implement to improve employees' skills, increase productivity, improve the quality of production and preparing them for future leadership. Ikenna and Enyinna (2023) urge companies to act socially responsibly by developing their employees as it increases a company's capacity to achieve its

objectives while benefiting the employees as it boosts their market worth and earning potential.

The implementation of social sustainability measures is imperative for the success of companies as the attention that the management of these businesses pays to social parameters has a direct impact on employee motivation, relationships with supply chain partners, the company's reputation and the perceptions of local communities (Razzak, 2023). Despite employee training being essential for supporting social sustainability, Amoako et al. (2023) argue that it has been under researched. The authors further argue that employee training enhances sustainability because employees are taught how to do their work more effectively.

It is essential to point out that social sustainability should not only be addressed at company level, but inter-organisational level, as well as between different parties of the supply chain (Guo and Wu, 2023). Thus, manufacturing companies should not only be concerned with the training and education of their employees but support the suppliers as well so that they can meet social sustainability factors. It is emphasised that training should involve everyone in the supply chain including suppliers of key raw materials to minimise waste and remove risk from the supplier-buyer relationship and ultimately promote social sustainability (Amoako et al., 2023).

Another vital measure that manufacturing companies in Botswana can take to provide fair working conditions to employees is by creating a health and safety environment. Health and safety are important in workplaces as enhancing employees' well-being helps them to be productive, thus increasing a company's output and this leads to economic sustainability. The path towards sustainability is paved with the implementation of sustainable human resource management and the internal applications of health and safety systems (Yadav et al., 2020). The relationship between social sustainability and environmental sustainability in relation to health and safety cannot be overlooked. Increases in environmental performance translate into less environmental harm being done to workplaces and communities, which likely improves worker and community safety and health (Machingura et al., 2023). The modern Botswana workplace faces challenges as regards the health and safety of employees due to some ambiguity in the law that

governs health and safety at work. One recent issue that has been mentioned in the literature is the Covid-19 pandemic which forced employers to let their employees work from home, without clarifying how their health and safety would be adhered to by employers and the legislation did not cover the aspect of working from home.

As stated by Tafa and Batisani (2023), most of the workers in Botswana were recruited on contracts that did not make mention of working from home and in the case of any injury whilst working from home, it would be difficult to decide on whether an employee would be compensated. The compensation of workers at work in Botswana is covered by the 'Workers Compensation Act', but it does not make mention of compensation while working from home. Many companies struggle with achieving sustainability because they neglect the social factors relating to employee welfare. However, having a health and safety system and sustainable human resource management can help an organisation to improve its performance (Yadav et al., 2020). Akbar and Ahsan (2021) mentioned unfair working conditions and abusive labour practices as the major social sustainability issues that manufacturing companies should address.

Most countries have laws and regulations relating to the health and safety of employees which employers are required to follow to create a safe working environment and ensure that employees follow all safety requirements. To emphasise the importance of health and safety regulations, Jarvis-Grove and Jackson (2023) stated that factories and workplaces in countries where the law is not upheld have poor standards for health and safety. Botswana regulates the health and safety of employees through various pieces of legislations including Factories Act, the Mines, Quarries Works and Machinery Act, the Workers Compensation Act and the Agrochemicals Act (ILO, 2020). According to Botswana laws, health and safety is not only important to employees, but to the community and the environment as well. The health and safety laws of Botswana, in addition to covering employees' health and safety have covered the control of manufacturing, distribution and the usage of a product for the purpose of preventing pollution which may cause harm to human life and the environment (ILO, 2020). It is recommended that companies collaborate with their suppliers to

implement health and safety policies and procedures that can be observed in actions in the workplace (CIPS, 2023). This study confirms how manufacturing companies in Botswana operate to ensure that the health and safety of employees at work are observed.

3.4.2 Ethical Sourcing

Ethical sourcing guarantees that products are obtained responsibly and sustainably in ways that prove recognition for the people who make them and for the environment (Dearing and Foster, 2024). Manufacturing companies that have ethical sourcing policies perform better in terms of social sustainability. The various objectives of ethical sourcing are set by companies aimed at enhancing social sustainability and these include ethical behaviour, transparency, confidentiality and fairness, data protection, avoidance of child labour, society and regulatory responsibilities (Kumari and Singh, 2023; People and Global Business Association and Duong, 2022; Mani et al., 2016).

Razzak (2023) point out that in some manufacturing industries, ethical practices command transparency when interacting with suppliers, customers and the community. Transparency, confidentiality and fairness is a common practice that requires companies to treat suppliers fairly and being open with the necessary information that may affect suppliers' performance such as supplier selection criteria, supplier evaluation and other procedures. Transparency, confidentiality and fairness to suppliers can also be achieved by developing trust in the relationship between supplier and buyer. When the supplier-buyer relationship has a high degree of trust, parties have confidence that no one will take an action to endanger the relationship and its sustainability (Amoako et al., 2023).

Secondly, unfair usage of power should be avoided as it may affect the relationship between the company and its suppliers. Another important aspect to consider in ethical sourcing is avoiding corruption. According to Jarvis-Grove and Jackson (2023), corruption should not be tolerated and if the company is aware of any corrupt practices by the supplier, corrective measures should be taken immediately. Furthermore, manufacturing companies should encourage their suppliers to act with social responsibility such as avoidance of child labour,

excessive working hours and discrimination. For example, an American apparel company, Patagonia, sources from factories that have demonstrated a strong commitment to human rights and the environment (Agrawal et al., 2023).

3.4.3 Community Engagement

A company cannot operate if it chooses to isolate itself from society because a company's competitiveness and general operations are heavily dependent on society (Padilla-Lozano and Collazzo, 2022). Thus, they need to work with stakeholders, including suppliers and customers, to be competitive. Social sustainability also addresses poverty in local supply chains through transparency, sustainable working standards and investing in social and environmental-compliant raw materials (Rathore, 2023). Manufacturing companies can foster positive impact on society by undertaking socially responsible practices that protect the employees and the community.

The lack of understanding of societal factors causes many companies to struggle to achieve sustainability. Manufacturing companies may take actions relating to philanthropy, fair pricing, stakeholder communication such as sharing product information with customers and sharing information with suppliers such as product demand, business partnerships and environmental sustainability support (Kumari and Singh, 2023; Razzak, 2023; People and Global Business Association and Duong, 2022; Mani et al., 2016).

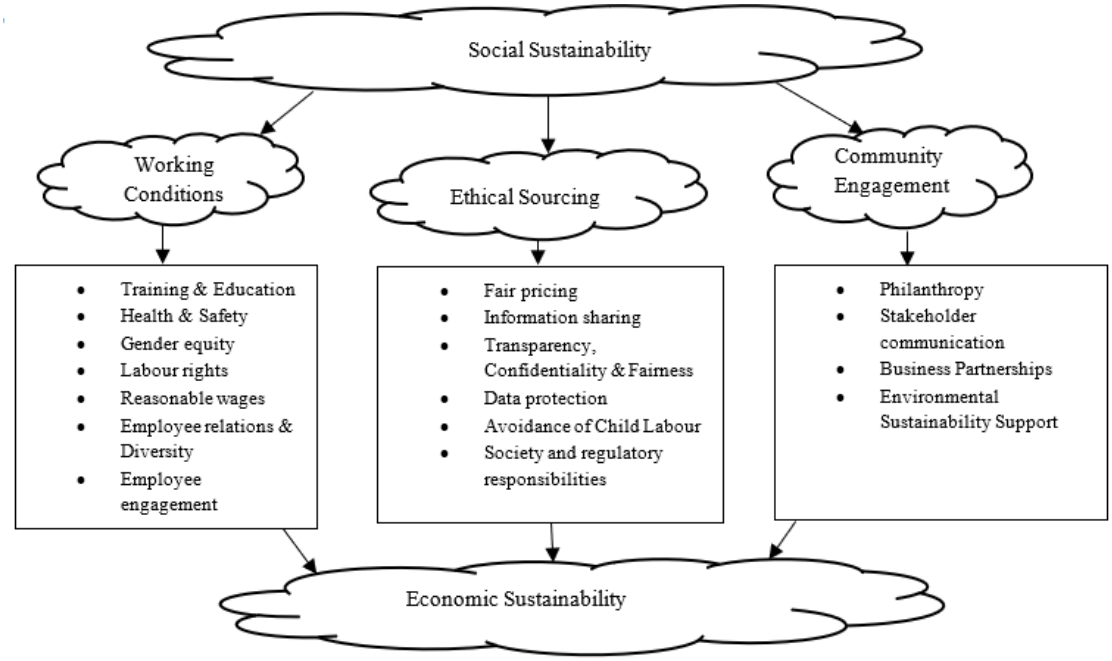
The health and safety measures should not only be taken on employees, but the community as well because they are affected by manufacturing companies' activities and they are the consumers of the final products which may affect them negatively if health and safety measures are not followed. Health and safety measures are more emphasised in industries that produce products which can be a health hazard if much care is not taken, such as the food and beverages industry which can be a health hazard if they are not produced well. As per Sovacool et al's. (2021) report, the food and agriculture sector significantly impacts public health, natural systems, land and water resources, employment and economic activity, making it crucial for future health support.

For example, the global food industry continues to produce processed foods and sugary beverages, leading to obesity and diabetes, posing significant public health risks (Sovacool et al., 2021). Another way that manufacturing companies affect society is the way products are distributed. The United Nations (2023) reports that the distribution of goods especially food is not fairly done because despite people in some places going without food, there is a high wastage of food in some places. For example, in European countries, there is wastage of food as there is greater than one third of food grown, procured and processed that is wasted (Sovacool et al., 2021).

A manufacturing company that is socially responsible focusses its attention on creating and maintaining sustainable and mutually beneficial relationships with its stakeholders in society (Razzak, 2023). As much as social sustainability measures are important, a company needs to be cautious over this and determine whether its social sustainability measures will be recognized by customers as corporate social responsibility acts or else the actions will not make an economic impact on the business. Figure 3.2 below provides a summary of social sustainability practices and shows that if the practices are implemented effectively, it will lead to economic sustainability because economic benefits will flow to the business.

Once stakeholders get to know how a company carries out its production processes and that it produces safe and environmentally friendly products, utilises resources and takes sustainable actions for the advancement of society, they will be able to recognise the company's sustainable social performance (Rahman, Bag, Gupta and Sivarajah, 2023). This leads to economic benefits flowing to a company through customer retention and customer goodwill, thus increasing sales and profits as demonstrated in Figure 3.2 below.

Figure 3. 2: Relationship between Social Sustainability and Economic sustainability



Source: Author's own design, 2024

3.5 ENVIRONMENTAL SUSTAINABILITY

Resource depletion, economic deterioration, the desire for quality life by humans and tight regulations have put pressure on manufacturing companies to adopt sustainable practices by adopting manufacturing systems and products that reduce the negative impact on the environment while taking into account social and economic sustainability (Eslami et al., 2019). Supply chain management is becoming a popular tool used by companies, particularly in high-polluting industries, to address environmental pollution issues brought on by industrial development (Ojijo et al., 2023). This section discusses the sustainability environmental issues relating to manufacturing companies in Botswana and the measures that can be taken in collaboration with suppliers to reduce the negative impact of the manufacturing sector on the environment.

3.5.1 Environmental Issues in the Manufacturing Sector of Botswana

Botswana is a world leader in protecting the environment and has made significant progress to address the climate change issues, including leading in biodiversity

conservation and has protected more than 40 percent of its land (Boyd, 2023). However, it faces numerous environmental difficulties including shortages of water. Businesses in Botswana are concerned with environmental risks and how the scarcity of water, among other risks, impacts their operation which manufacturing companies complain is a hindrance to the effective production of goods (International Trade Centre [ITC] (ITC, 2019).

While ITC (2019) states water shortage as a major environmental issue in Botswana, the Botswana Climate Change Network (BCCN, 2023) state that pollution is the major challenge of the country's environmental sustainability and the manufacturing industry has been cited as the major source of pollution through poor waste management and air pollution. Similarly, Wiston (2017) mentions air pollution as a major environmental concern and manufacturing activities as one of the major sources. It has come to be believed by manufacturing companies in Botswana that environmental issues are a risk to their businesses but there are few of them that have made investments in measures that can reduce these risks (ITC, 2019).

Environmental sustainability is important to manufacturing companies because the economic growth of Botswana has increased manufacturing activities resulting in increased resource consumption. It is emphasised that environmental sustainability is critical to the country because it affects economic and social sustainability as their success depends on a healthy and clean environment (Boyd, 2023). Among the three dimensions of sustainability, environmental dimension has received more attention and companies practice it more than social sustainability (Razzak, 2023) due to the world's current experience of environmental degradation and the manufacturing sector being the major source of environmental problems.

However, a study undertaken by Muin and Jumena (2024) found that environmental sustainability has been given little attention by manufacturing companies by budgeting little amounts for it. As stated by Kraus et al. (2020), manufacturing companies make a significant impact on the environment, making it the major contributor to environmental issues. Since the manufacturing sector significantly contributes to environmental issues like global warming,

environmental disruption, water pollution and carbon emissions, manufacturing companies face significant environmental concerns globally (Shehzad, Zhang, Dost, Ahmad and Alam, 2023). The manufacturing sector, though vital to national economic development has a high negative impact on the environment because it uses large quantities of natural resources including water and makes a high level of pollution (Seclen-Luna et al., 2021). The impact made on the environment by the manufacturing industry arises in various ways:

i. *Greenhouse gas emissions*: The manufacturing industry has large amounts of emissions which are made during the processes of production, transportation and usage. It is reported that the global manufacturing sector is responsible for a fifth of carbon emissions (Ritchie and Roser, 2023). Similarly, Panagiotopoulou et al. (2022) report that greenhouse gas emissions is the second highest contributor to carbon emissions, that is, only second to the energy consumption. Having realised that manufacturing companies contribute highly to the amount of emissions globally, some manufacturing companies have taken steps to reduce this. For example, Schneider Electric implemented 'The Zero Carbon Project' which it extended to its suppliers and its suppliers managed to reduce 10 percent carbon emissions by the end of 2022 (Gartner, 2023).
ii. *Air and water pollution:* The manufacturing process releases pollutants such as chemicals into the air and water (Shehzad et al., 2023) and this affects the health of people and the environment.
iii. *Waste generation*: The intended output of the production process is a product. However, waste material is also produced in the process. For example, wastewater is produced from a production process, residues from chemicals during the production process and scrap materials of metal or wood that are left or cut off during production.
iv. *Energy consumption*: The manufacturing industry is an energy-intensive industry with its usage of energy rapidly increasing due to increased production, leading to high carbon emissions (Wang and You, 2023). The increase in the production of goods and services is due to the increase in global population and rising standards of living, thus increasing the

production of waste, resource depletion causing noteworthy threat to the environment and societal health (Mukherjee et al., 2023).

Botswana's manufacturing companies can prevent degradation and long-term environmental quality by minimizing the usage of natural resources. This can be achieved by taking into account the impact of economic and human activities on the source of resources, concentrating on the consumption of water, generation of waste, green gas emissions, pollution and energy consumption (Maulida, 2023). Manufacturing companies are urged to determine the activities that generate greenhouse gas emissions so that they can be minimised in economic ways (Jarvis-Grove and Jackson, 2023).

The measurement of the carbon footprint should not only look at one stage of the supply chain, but throughout the lifecycle of a product, which includes the acquisition of materials, production, transportation and usage. Various sustainable practices can be adopted in the production of goods, and many companies have adopted energy efficient measures to reduce the impact on the environment. For example, some companies have resorted to the installation of renewable energy systems such as solar panels to reduce the usage of fossil fuel and the purchase of energy efficient machinery to reduce energy consumption (D'Angelo et al., 2023).

Manufacturing companies that are committed to their stakeholders and the environment at large operate in a sustainable manner. They pursue sustainable business practices and take responsibility over their activities. In the quest for sustainability, there are various sustainable infrastructures that manufacturing companies can invest in, including the introduction of water saving measures and waste management systems. When it comes to the management of waste, many countries apply the reduce, reuse, recycle and recover tools to deal with the adverse implications of manufacturing and retailing on the environment by treating waste and improving quality (Yu, Zhang, Li, Montenegro-Marin and Kumar, 2021). That means companies should reduce the quantities of materials purchased, reuse items that can be reused, and put some items into other uses, while some items can be converted into resource materials. The objective of sustainable manufacturing is to create an environment in which all goods are recyclable;

production has no detrimental effects on the environment and products are routinely disassembled when their useful lives come to an end (Eslami, Lezoche, Panetto and Dassisti, 2021).

A manufacturing company should show corporate sustainability, that is, conducting business in a way that benefits people and the environment as it seeks economic growth. Therefore, a company should develop long-term growth plans than short-term ones that are centred on profitability. To achieve this, companies should align their strategic plans with the TBL principles which enable them to look at their operation of the three dimensions of economic, social and environment. Despite sustainability being given high importance and becoming very popular, Zhuang et al. (2023) contend that many companies are hesitating to implement it because it requires resources which are costly.

Similarly, Yadav et al. (2023) claim that sustainability activities incur additional costs, thus reducing companies' financial performance. While it may be correct that environmental sustainability increases costs for manufacturing companies, it can be a source of competitive advantage, and it can perform better than traditional companies in the long-term. According to Saini et al. (2023), companies that adopt environmental strategies develop positive relationships with their customers who in turn expect companies to meet their social and environmental expectations. The TBL theory is used for this study as a foundation to illustrate the sustainability objectives incorporated in the SSRPO to develop a framework. The triple bottom-line principle requires companies to contribute towards the three aspects of sustainability: economic, social and environmental factors.

Manufacturing companies can use new ways of production that can enable them to meet the present needs without hindering future generations to meet their own needs (Mukherjee et al., 2023). In order to achieve this, companies can use modern systems such as circular economy. Mukherjee et al. (2023: 2) defines the circular economy as 'the use of finite resources with maximum efficiency, renewable resources with greater usage, material recovery at the end of their cycle, and regenerative natural systems'. Owing to the integration of supply chains, environmental issues in the supply chain's upstream pose a threat to the buying company's regular operations, as well as having the potential to unleash a

massive “butterfly effect” that could affect the entire industry and supply chains, even on a global scale (Qiao et al., 2022).

Environmental sustainability is one of the main concerns of the global agenda and as a result of the increased attention, private businesses are also stepping up their efforts in environmental stewardship (D’Angelo et al., 2023). Manufacturing companies are encouraged to get committed to sustainability by collaborating with their suppliers to implement sustainable solutions such as reducing packaging materials to reduce waste. The review of the literature shows that there is no collaboration between manufacturing companies and their suppliers on the improvements that can be made to environmental sustainability. Sections 3.5.2, 3.5.3 and 3.5.4 discuss the common practices by manufacturing companies to achieve environmental sustainability.

3.5.2 Green Supply Chain Management

Green Supply Chain Management (GSCM) is becoming a popular strategy among manufacturing companies for enhancing environmental sustainability. It is the process of integrating environmental sustainability into all components of supply chain management (Ojijo et al., 2023). GSCM is a robust strategy as it enables manufacturing companies to pay attention to improving economic benefits and social outcomes, while reducing any negative impact on the environment (Le, 2020). Due to the worldwide awareness of the impact of manufacturing companies on the environment, manufacturing companies are under pressure to adopt sustainable practices and eco-friendly products (Ojijo et al., 2023). This has made companies seek ways of protecting the environment and GSCM is one of the strategies that can help in this regard. There is no one method of GSCM that is superior, but different manufacturing companies adopt various practices, including green procurement, green production, green logistics and green materials management.

The term ‘green procurement’ refers to the procurement procedures that have less damaging impact on the environment (Bhatti et al., 2023). The goal of green procurement is to protect the environment by implementing fundamental systems in the procurement process as needed to attain environmental sustainability

(Amoako, Dzogbenuku and Abubakari, 2020). According to Bhatti et al. (2023), green procurement is improved when the final product is manufactured by comparing the product and the procurement process. The implementation of GSCM depends on the successful implementation of green procurement because green procurement is one of the major components of GSCM. According to Bhatti et al. (2023), green procurement enhances the procurement process and the products procured in an effort to preserve the environment and promote sustainability. Manufacturing companies that practice green procurement are found to be competitive as the final product becomes marketable because buyers want to buy from companies that are environmentally friendly.

Mukandwal, Cantor and Laczniak (2024) state that consumers react to environmental SCM practices when making procurement decisions, thus irresponsible sourcing practices aimed at maximising profits have a negative impact on consumers' perceptions. The purpose of green procurement is to encourage suppliers to implement sustainability measures in their production process; thus, sustainable practices are extended to a company's suppliers. According to Sheng et al. (2023), manufacturers should purchase green raw materials from suppliers so that they can achieve green production. For example, in the process of preserving the environment, Eco Zera produces pencils using waste newspapers with the aim of meeting the UN's 17 SDGs with an emphasis on Goal 4; Quality Education, Goal 9 industry, innovation and infrastructure and Goal 11 sustainable cities and communities (The Monitor, 2024).

Green procurement requires collaboration with suppliers to achieve environmental objectives through collaborative activities such as joint research, information sharing and training (Le, 2020). Green procurement focuses on procurement at competitive prices of products that cause minimal negative environmental impact (Dearing and Foster, 2024). The author refutes the common perception that environmentally friendly products are costly, sub-standard, or non-durable, but most of them working perfectly well. From the literature review it can be deduced that manufacturing companies in Botswana do not practice green procurement.

Another aspect of GSCM is green production, which is implemented in the production process to accomplish manufacturing companies' objectives relating to

environmental sustainability. Green production can be defined as a production system that uses inputs that are highly efficient and have fewer negative effects on the environment (Le, 2020). It has a positive effect on the economic growth of a company because consumers value environmentally friendly production and they will favour goods from businesses that engage in more green activities (D'Angelo et al., 2023).

Green production should not be a one-off activity, but a long-term strategy that is embedded in a company's corporate strategy. For example, Patagonia, an American clothing company has a commitment to guaranteeing that their products are manufactured in a manner that is safe, equitable, lawful and care for human beings and this is a vital component of their long-term supply chain management strategy (Agrawal et al., 2023). The implementation of green supply chain management can help manufacturing companies to avoid environmental damage and economic and social disasters (Bhatti et al., 2023).

Furthermore, manufacturing companies can practice green materials management. The term 'green materials' refers to the materials connected to energy and resource efficiency in the process of manufacturing; which has less pollution to the environment and not detrimental to the health of humans (Chong, Liu, Hernandes and Albescu, 2023). Material usage is optimised aiming at improving resource efficiency by making the most use of resources while minimising waste, therefore, alleviating the consequences on the environment related to production and consumption (Sagar et al., 2023). While green materials management involves the use of eco-friendly materials, green logistics is the process of reducing environmental damage caused by the logistics activities of an organisation including transportation, warehouse management and product distribution (CIPS, 2023). It is anticipated that the adoption of GSCM initiatives will increase suppliers' capacity for environmental management and help them embrace the environmental concept of purchasing companies (Qiao et al., 2022). SSRM plays a key role in achieving green procurement and GSCM.

3.5.3 Waste Management

Waste management is the use of environmentally friendly techniques to handle waste generated by manufacturing companies. The manufacturing sector produces waste materials in addition to the production of the final product. This material may be in the form of metal or wooden scrap, packaging material and chemical waste. The waste products generated during the manufacturing process are seriously polluting the environment worldwide (Bhatti et al., 2023). Manufacturing companies that are environmentally friendly use cleaner technologies including reduce, reuse or recycling, while waste that cannot be reused or recycled is treated and disposed through environmental control equipment (Le, 2020).

A manufacturing company should minimise the creation of waste material which cannot be recycled because according to Nandy, Fortunato and Martins (2022), the waste materials that cannot be recycled raises a concern. Due to population growth, the production of goods has increased, thus waste has increased and this raises a concern. The World Bank reports that waste generation is growing from one year to another and is expected to grow by 70 percent by the year 2050 as the population growth is expected to double (Nandy et al., 2022).

The management of waste by manufacturing companies is an important exercise that should not be overlooked because manufacturing companies are a major contributor to the creation of waste in the country. However, though the Botswana government has set up policies that deal with waste management, there is lack of implementation among manufacturing companies as can be seen from several solid wastes noticed in the environment. The BCCN (2023) report provides examples of solid waste noticed on the roadsides of Botswana, public places like playgrounds and parks, including plastics bottles, used baby diapers and crushed cans of beer. This shows the failure by manufacturing companies to introduce or implement measures that can reduce waste or recycle what cannot be reduced. Collaborating with suppliers to manage waste can enhance waste reduction in the supply chain.

However, Qiao, Li and Capaldo (2022) point out that the extension of environmental management across the supply chain is the major strategic challenge faced by procuring companies. The authors further examined the impact of environmental assessment and collaboration on supplier commitment in green supply chain management, and the results show that environmental collaboration positively influences commitment. Manufacturing companies in Botswana can manage waste management in the supply chain by encouraging their suppliers to use materials that can be recycled, taking measures to reduce wastewater in production and use packaging materials which are nontoxic and are recyclable. The implementation of waste management measures can enhance the competitiveness of manufacturing companies in Botswana. Padilla-Lozano and Collazzo (2022) assert that it is anticipated that a key factor influencing a company's competitiveness will be how it handles the social and environmental effects of their value chain.

3.5.4 Sustainable Packaging

The use of packaging materials has increased due to the long distance that goods have to travel due to global supply chains in which products are produced, assembled and finally sold in different countries (Meherishi, Narayana and Ranjani, 2019). The importance of packaging materials in the supply chain cannot be over-emphasised as they facilitate the preservation of products in the process of transportation, handling and storage, as well as extending the products' shelf life (Ibrahim et al., 2022). Sustainable packaging is the creation and use of packaging systems which are environmentally friendly and contribute to sustainable development. This may involve using environmentally friendly packaging materials, less materials, biodegradable materials and recycling of packaging materials. Sustainable packaging can be defined as packaging which is produced by making use of clean production technologies, sourced and distributed using renewable energy, ensures healthy and safety in use while optimising materials and energy and meeting performance, as well as cost requirements (Meherishi et al., 2019).

From this definition, four important criteria of sustainable packaging can be construed: namely, production, procurement, transportation and usage. Thus,

manufacturers of packaging materials should consider the use of the right materials in production; consider the procurement process, the need for packaging for transportation and how the materials will be handled in the process of usage of a product. Packaging material is considered to be sustainable when natural material usage is reduced and post-consumption material can be recycled or reused from materials that can easily be accessed (Ibrahim et al., 2022). While sustainable packaging leads to environmental sustainability, Kuwornu, Khaipetch, Gunawan, Bannor and Ho (2023) argue that it can have a negative effect on the financial performance of a company, thus impacting economic sustainability. This supports the view of Ibrahim et al. (2022) who stated that sustainable packaging adds to the product cost due to the cost of the materials used and the processes undertaken in producing them. Thus, many companies choose to use lower cost packaging materials such as plastics to reduce the impact of sustainable packing on their financial performance. Companies should critically evaluate the materials to use for packaging and use suitable ones, but the material chosen may depend on the places where they are to be used, their benefits and limitations (Ibrahim et al., 2022).

Packaging material plays a vital role in the supply chain of manufacturing companies in Botswana by enhancing the maintenance of product quality, the easy handling of the product as it makes movements in the supply chain and dissemination of information to customers. Although packaging material plays this vital role, it should be noted that it can be hazardous to the environment depending upon the type of materials used and how it is handled. For example, there is an increase in the usage of plastic packaging materials because they are of lower cost than other packaging materials such as metal and glass.

However, this negatively impacts the environment due to poor disposal, failure to recycle and their being biodegradable. Instead of using plastic materials which cause harm to the environment, Ibrahim et al. (2022) contend that paper and paperboard may be much better because they are sustainable and of lower cost compared to metal and glass. Several scholars have provided guidance on how packaging materials can be used to minimise their negative effect on the environment. While, Ibrahim et al. (2022) recommend the use of paper as a way of

mitigating environmental damage, Bradley and Corsini (2023) recommend switching packaging materials from single-use to reusable packaging materials.

However, this requires collaboration among stakeholders in the supply chain. Thus, the achievement of sustainable packaging by manufacturing companies in Botswana requires them to collaborate with their suppliers and ensure that they attain SSRM. Bradley and Corsini (2023) emphasise that by preventing avoidable single use of packaging materials, a company can meet the UN SDG 12 which focuses on enhancing sustainable usage and manufacturing and the 14th and 15th SDG which focus on safeguarding oceans and seas. This study uses the CE theory to assess how manufacturing companies in Botswana can collaborate with their suppliers to take measures that enhance sustainable packaging such as reducing, recycling and reusing packaging material. According to Bradley and Corsini (2023), the CE can help to determine substitute packaging solutions. For example, a company may design packaging material which is reusable. Reusable packaging is the packaging that gives an opportunity to the user to use the same material multiple times during its lifetime by using it to package the same type of product that was originally contained in it.

The Sustainable Packaging Coalition (SPC) defines it as “packaging that allows either the business or the consumer to put the same type of purchased product back into the original packaging and is designed to be returnable and/or refillable, is free of chemicals of concern and accomplishes a minimum number of reuses by being part of a system that enables reuse” (McNamara et al., 2022: 6). Although reusable packaging is assumed to be sustainable and is becoming popular in the manufacturing industry globally, it may not offer the expected sustainability benefits because it may lead to circular rebound effects by reducing waste as intended, but raising energy usage or making an influence on consumption behaviour (Bradley and Corsini, 2023). Countries have introduced policies and regulations to reinforce sustainable packaging. For example, the UN’s New Plastic Economy Global commitment, centred on the elimination of plastic waste and pollution from the source (Meherishi et al., 2019).

3.6 THE RELATIONSHIP BETWEEN ECONOMIC, SOCIAL AND ENVIRONMENTAL SUSTAINABILITY

Manufacturing companies must ensure that the economic, social and environmental factors are taken into account when producing goods (Jum'a, Zimon, Ikram and Madzík, 2022). D'Eusanio et al. (2019) emphasise that the development of an innovative and sustainable product is not enough, but the whole process of a product's supply chain should embrace sustainability. Equally, when making strategic plans, companies are urged to consider the three aspects of sustainability; namely, economic, social and environmental, not accounting for financial returns alone (Loviscek, 2021). The author further underscores the importance of treating all sustainability factors equally by emphasising that in situations where companies tend to give more importance to economic than social and environmental, it is encouraged to use the win-win scenario in place of a trade-off.

Understanding the relationship between the three sustainability dimensions to manufacturing companies is essential as each dimension contributes to the achievement of the other two dimensions. Economic sustainability considers how funds are generated by a company to meet its financial obligations and enhance the economic growth of the business subsequently the country. Economic sustainability ensures that a company is financially sound in the short and long term and hence can support social and environmental activities. Previous studies recommend that environmental and social sustainability practices can only be implemented successfully if an organisation ensures economic sustainability (Razzak, 2023). That means when supply chain managers plan to adopt social and environmental practices, they need to consider whether their companies are financially sound to meet those practices. Social sustainability can be supported by economic sustainability in various ways.

Social sustainability involves a company adopting measures that support stakeholders including customers, employees, suppliers and the community. For example, a manufacturing company can support its stakeholders by undertaking activities such as participating in community projects, making donations, improving working conditions of employees, fair pricing, paying suppliers on time and ethical

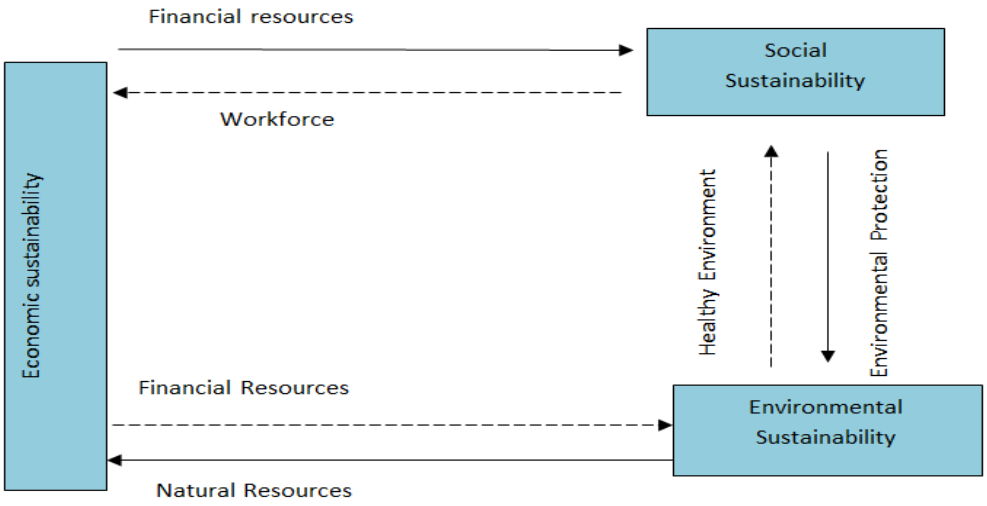
sourcing. Achieving these activities requires money which is generated through economic sustainability. Environmental sustainability, such as sustainable production, waste management and sustainable packaging can also be enhanced through money generated through economic sustainability.

On the other hand, social sustainability practices can support economic and environmental sustainability. Society provides customers who buy the products made by a company, provides suppliers of raw materials which are used in production and provides employees for a manufacturing company. In this way, they support the operation of a company, thus enhancing economic sustainability of a business. Lastly, by taking environmental sustainability measures such as preserving and providing natural resources needed for production, manufacturing companies help the company to meet its production schedules and boost its economic sustainability. Previous studies suggest that embracing environmental sustainability measures can help manufacturing companies to improve their financial performance; for example, Walmart benefited through the use of less packaging thus reducing the quantity of materials used hence the reduction of overall costs (Razzak, 2023). Figure 3.3 illustrates the relationship among the three dimensions of sustainability. Each sustainability dimension contributes to the achievement of the other two dimensions, and it is in turn supported by them.

Even though economic sustainability has become more popular in academic writing and business, there are still many challenges in putting it into practice, such as competing stakeholder interests among suppliers who many have different expectations and interests. Moreover, comprehensive frameworks are lacking to guide manufacturing companies in implementing sustainable practices, often neglecting its interconnectedness to environmental and social aspects. For manufacturing companies to reduce these risks, they can employ tactics like supplier diversification, building strong supplier relationships, performance monitoring and investment in technology to enhance supply chain visibility and resilience and making contingent plans. Despite empirical evidence of the positive impact that SSRPO makes on the manufacturing companies, there is a wide spread belief that investment in social and environmental sustainability initiatives

come at the expense of economic performance, thus they are not implemented by many manufacturing companies (Razzak, 2023).

Figure 3. 3: Economic, social and environmental sustainability relationship



Source: Author's own design, 2024

3.7 QUALITY IMPROVEMENT

Quality defects is one of the production process complexities faced by manufacturing companies and which needs to be managed to enable manufacturing companies to attain their competitive goals (Verna, Genta and Galetto, 2023). The quality of a product is a key strategic factor in a manufacturing company's supply chain, thus the buyers and suppliers should consider it in their relationships (Selepe and Makinde, 2024). According to Karim, Islam and Motamedisedeh (2025), quality improvement is widely recognised as a factor that has a high impact on business performance. A product's quality is reliant on the ability of the supply chain to improve the quality aspects of the product through raising performance levels. The quality of incoming material and long-term relationship with suppliers enhance the quality of manufacturing companies (Karim et al., 2025). Since the 1970s, when businesses started to view quality as essential to their survival and success due to rising competition and customer expectations, quality has attracted a lot of attention in business and as a result, significant investments have been made in quality improvements (Ho, Cavacece,

Moretta Tartaglione and Douglas, 2023). There are many definitions of quality, with no universal definition.

According to Wijewickrama, Chileshe, Rameezdeen and Ochoa (2021:5), ‘quality contains those product features which meet the needs of customers and thereby provide product satisfaction’. Eyaa (2019:117) defines quality as ‘conformance to requirements or specifications, not necessarily elegance or goodness’. Comparing the two definitions, it can be noticed that Wijewickrama et al's. (2021) definition emphasise on the need for a product to have the required features, while that of Eyaa (2019) concentrates on the ability of a product to meet the customer’s specifications. A broader definition is given by the ISO 9000 (Lysons et al., 2020:214) as ‘the composite of all the characteristics, including performance of an item, product or service that bears on its ability to satisfy safety or implied needs’.

It is sometimes referred to as fitness for use, customer satisfaction or conformance to requirements. From these definitions and in the context of SSRM, quality can be defined as the ability of an organisation to obtain components or materials that meet the organisation’s requirements now and in the future. An organisation can improve quality by implementing a whole-system approach by investing in expanding its quality management procedures to include suppliers (Eyaa, 2019). Thus, a supplier is an important party in the supply chain for the enhancement of quality. According to Emon, Khan and Siam (2024), SSRM has a significant positive influence on the quality of a product.

Quality management is crucial for maintaining market position, gaining a competitive advantage and enabling sector competition due to the expansion of quality requirements (Lestyánszka Škůrková, Fidlerová, Niciejewska and Idzikowski, 2023). The literature records quality issues being a major threat to business success whose severity can vary from one organisation to another and in extreme cases poor quality has resulted in bankruptcy, while in less severe cases they have resulted in reduced sales (Berger, Schulze-Schwering, Long and Spinler, 2023). Therefore, the management of quality is vital to a manufacturing company for the enhancement of quality and avoidance of quality issues. This can only be achieved if raw materials sourced from suppliers are of the right quality hence the need to enter into long-term relationships with suppliers so that the

quality of the materials that were bought can be ensured. Manufacturing companies are constantly under pressure to produce goods of high quality at lower costs due to growing industrialisation and competition (Antony et al., 2023).

However, the manufacturing industry in developing countries, including Botswana are facing challenges with attaining high quality products, thus failing to compete in the international market. Shuaib and He (2023) link these quality issues to poor standards and challenges in the manufacturing process, including product development, production techniques and rising costs. According to Eyaa (2019), a downstream supply chain member (supplier) has a significant influence on all aspects of quality in the supply chain. However, despite the increased focus on raw materials and component quality by manufacturing companies in recent years (Chau et al., 2021), suppliers continue to face challenges in implementing more effective quality control procedures (Hoque and Rana, 2020). This gives manufacturing companies, whose objective is to improve product quality, a challenge because the quality of a finished product is dependent on the quality of raw materials.

If suppliers are failing to meet the quality requirements, it means the company will fail to meet the quality standards as well. Thus, suppliers must improve their quality in order for manufacturing companies to improve the quality of their products (Sofiana et al., 2019). Despite Botswana's efforts to improve manufacturing capabilities and promote quality standards, the industry's survival and growth are in jeopardy because of poor quality products produced by certain companies (Munodawafa, Naude and Govender, 2024). Therefore, it is necessary to identify SSRM strategies and tactics that can result in higher quality manufacturing companies in Botswana.

The production of high-quality products can contribute to economic sustainability by ensuring that products are durable, waste is minimised and customers are satisfied. According to CIPS (2023), the procurement of quality materials is one of the criteria that can help an organisation deliver economic sustainability, thereby supporting the future of an organisation, the environment and society. In support of this view, Shuaib and He (2023) urge companies to continuously improve the quality of their products in order to become more efficient and gain competitive

advantage over competitors, thus enhance economic sustainability. To provide the required quality of a product, together with giving a good after-sales service, manufacturing companies closely monitor their product stages based on the lifecycle analysis (Yadav et al., 2020). By analysing the lifecycle of a product, manufacturing companies ensure that attention is given to quality at all stages of a product's life; from its introduction, growth, maturity, through to the end of its life when it is withdrawn from the market.

Manufacturing companies must create quality-focussed procedures and business practices to lower variances and raise product quality (Kang and Um, 2023). Since quality is the most important element in the manufacturing industry, it needs to be a continuous process, and companies perform better where they embed it in their culture. To emphasise the importance of culture to the sustainability of an organisation, Shuaib and He (2023) state that the reason for the success of many large companies globally is their ability to create and preserve a strong organisational culture. Therefore, if manufacturing companies can adopt the quality culture, the implementation of any initiatives aimed at improving culture will be successful.

Manufacturing companies use various initiatives to improve quality hence enhancing organisational performance and meeting the ever-growing needs of customers (Shokri and Li, 2020). Among the initiatives that manufacturing companies can implement, Eyaa (2019) recommend businesses to invest in systems that automate tasks that were previously manual or disconnected processes. Secondly, supplier audits are recommended to be carried out as they help to get assurance for the product quality before they leave the supplier's premises (Eyaa, 2019). Companies that are audited have good performance in terms of the quality of the products and services they offer, and they usually meet the quality standards. According to Eyaa (2019), the supplier audit is a better way for the supplier to respond to quality issues as they arise before the final product reaches the final customer.

Furthermore, some companies in the manufacturing sector improve quality by determining their CSF to quality. Many studies have been conducted on improving supply chain quality. For example, Chau et al. (2021) found customer involvement

and customer communication as the CSF of quality, while the study undertaken by Hoque and Maalouf (2022) reveal that quality can be enhanced by getting buyers involved in the quality control practices of suppliers. On the other hand, a study by Amoako-Gyampah, Boakye, Adaku and Famiyeh (2019) reveal that SSRM is the key factor for improving product quality. In support of SSRM, a number of authors (Benzaquen and Narro, 2023; Burgess, Sunmola and Wertheim-Heck, 2023; Hoque and Maalouf, 2022; Johne and Wallenburg, 2021) recommend SSRM as a way of improving quality in the manufacturing sector. Keeping close relationships with suppliers is a key factor for buyers to enhance product quality at the operational level and sustain quality improvements at the strategic level (Hoque and Maalouf, 2022).

This is consistent with the view of Pellegrino et al. (2020) who recommend SSRM as strategically important to a companies' quality and continuous improvement. Similarly, a study by Kang and Um (2023) suggest that supplier involvement may play a vigorous role in quality performance. Although SSRM has been widely recommended for quality improvement, some manufacturing companies in Botswana have reported instances of poor quality due to supplier failure, thus they are becoming increasingly quality oriented and putting pressure on their suppliers to improve their product quality performance (Hoque and Maalouf, 2022). The non-availability of a framework on SSRPO in Botswana's manufacturing industry makes it difficult for them to determine the factors that lead to quality improvements.

To motivate suppliers to get committed to quality improvement, Sofiana et al. (2019) recommend the use of profit-sharing schemes because if implemented successfully in the supply chain, it has the potential of increasing suppliers' dedication to raising component (material) quality. Martínez-Lorente, Dewhurst and Dale (1998) state that when choosing suppliers, quality should be given priority to price, that the company must build long-term relationships with their suppliers and that the company must work with suppliers to raise the product quality. This study concentrates on determining the suppliers' contribution to the achievement of quality by manufacturing companies through formulating a framework that can be used by manufacturing companies in Botswana to define

the objectives of their SRM that can lead to product quality improvement. Integrating quality management in the supply chain warrants the measurement and improvement of all companies in the supply chain (Chau et al., 2021).

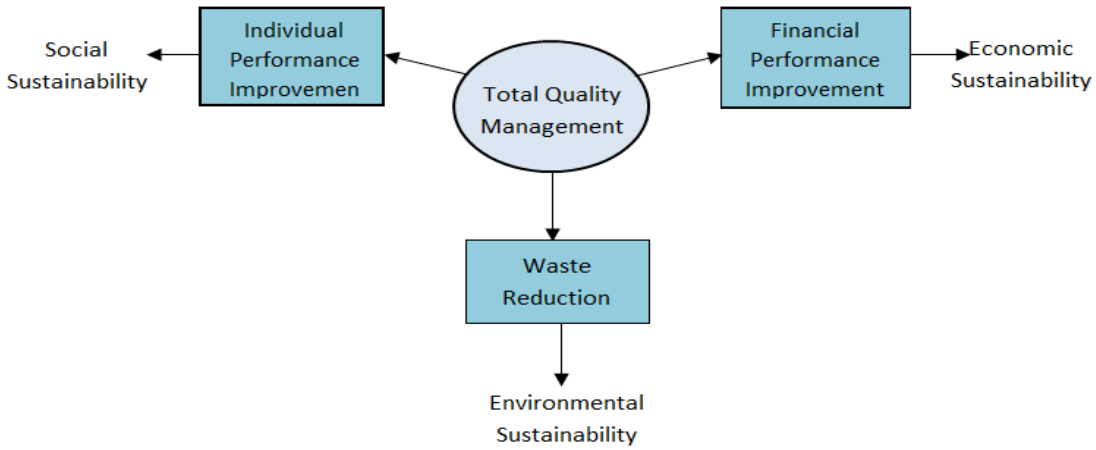
The Total Quality Management (TQM) theory is used to help with determining the contribution that suppliers can make to the manufacturing companies in Botswana to improve quality. TQM is a common strategy among manufacturing companies to achieve high quality products while lowering quality related costs and raising customer satisfaction (Ghunaim and Jaaron, 2022). CIPS (2023) defines TQM as 'a continuous improvement in quality, efficiency and effectiveness'. The TQM philosophy, which managers aim to establish in the workplace, enables businesses to generate high quality products by combining a performance system with continuous improvement (Ghunaim and Jaaron, 2022).

Contrary to the traditional quality management practices that involve defect detection and correction, the TQM concept requires manufacturing companies to put control measures in the system that prevent defects from occurring in the supply chain process and maintain high standards of quality. The TQM theory, if implemented successfully can enable manufacturing companies to achieve all the three dimensions of sustainability; namely, economic, social and environmental. To explain this, the author of this report uses Figure 3.4 below. As illustrated, TQM involves employees in quality improvement, thus boosting their morale to work and motivation, which meets the socially sustainability requirement relating to employee satisfaction. Economic sustainability is met through TQM by boosting financial performance, while environmental sustainability is achieved through TQM programmes such as waste reduction.

This system has the capacity to improve individual performance in addition to the organisation's performance (Abbas, 2020). In this way, it is meeting the social sustainability criteria that requires boosting employees at the same time meeting the economic sustainability goals of an organisation by improving its financial performance and as it is aimed at achieving the long-term success of an organisation

(Ho et al., 2023). Additionally, through the use of TQM, manufacturing companies can be able to meet the environmental sustainability requirements as it is thought to be an environmentally friendly system because it aims to reduce waste by efficiently utilising resources (Abbas, 2020).

Figure 3. 4: Outcomes of Total Quality Management



Source: Author's own design, 2024

The vital role played by SSRM in enhancing product quality cannot be over emphasised as it helps manufacturing companies to enable suppliers to meet the quality standards and enhance continuous improvement processes. This is in agreement with the view of Tarigan, Mochtar, Basana and Siagian (2021) who state that working in collaboration with suppliers ensures that the necessary raw materials are delivered on time and in the required quality. Integrating operational activities with suppliers has become essential to getting the desired outcomes in this competitive market (Saragih, Tarigan, Pratama, Wardati and Silalahi, 2020). According to Pellegrino et al. (2020), SRM has been acknowledged as strategically important to the company's quality and continuous improvement.

Determining the quality attributes that are essential to a company is crucial in evaluating the performance of suppliers based on those factors. Establishing quality systems that encompass all of a company's activities related to product quality is imperative (Lysons and Farrington, 2016). According to Sofiana et al. (2019), improving quality is a key factor for an organisation to gain competitive

advantage. Thus, manufacturing companies ought to occasionally perform quality improvements to their products, but care should be taken to ensure that these improvements are done at minimum costs because if costs are high the product will not attract customers who are price sensitive. In order to enhance raw material quality improvement, manufacturers should trace and track the sources of quality problems throughout the supply chains (Zhang et al., 2020).

The extant literature suggests that supplier selection (Chen, Chung, et al., 2021), supplier collaboration (Jung et al., 2023), regular performance reviews and monitoring (Karamouz et al., 2021; RezaHoseini et al., 2021) and quality risk management (Amoako-Gyampah et al., 2019) are some of the SSRM strategies and factors that can result in improved quality. Chau et al. (2021) emphasise the importance of having reliable suppliers as a means of improving product quality because without sufficient dependable suppliers a business runs the risk of experiencing quality and delivery issues. Though an effective SSRM helps to determine a supplier that can meet the right quality, it is not a guarantee that supplier's quality will be good up to the end of the contract, thus regular reviews of supplier performance should be carried out. This is in support of the view of Jung et al. (2023) who state that effective collaboration and communication with suppliers is one of the ways that can help a company to improve its product quality.

Manufacturing companies may not see the benefits of SRM if they fail to involve suppliers at the early stages of their production. Quality competencies can be developed by involving suppliers at the design stage of a product (Zhang et al., 2020). The review of the literature demonstrates that a lot of research has been done on quality improvement in manufacturing companies, but there is no study on the quality improvement approaches that can be taken through SSRM to improve quality in the manufacturing sector of Botswana. The study of the literature reviews identifies the following as the vital characteristics of quality that manufacturing companies need to take into consideration when producing their products; namely, performance, product features, reliability, conformance to specifications, durability, serviceability and perceived quality (Rajasa, Manap,

Ardana and Yusuf, 2023; Gouda, Awasthy, T.S. and R., 2019; Lysons and Farrington, 2016).

3.7.1 Product Performance

Performance relates to the functional aspects of a product and is the primary characteristic of quality which the customer considers when buying a product (Rajasa et al., 2023; Gouda et al., 2019). A product should have the vital characteristics that enable it to operate, such as speed performance, efficiency and its power. That means a product should have the characteristics that enables it to operate to or beyond the expectations of the customers. For example, performance characteristic of a kitchen knife is to cut food, therefore, it is the feature that a customer tests when purchasing a knife. Dearing and Foster (2024) recommend that in addition to discussing business issues by suppliers and purchasers in their regular meetings, they should also discuss their financial performance as it affects the quality of their performance.

Manufacturing companies should set specific key performance indicators (KPI) to monitor their suppliers' performance in terms of meeting the quality standards as an objective of their company of which performance should be given priority as it is the primary feature of quality. KPIs are set as a way of measuring suppliers' performance in terms of their contribution towards the improvement of the quality of a company's products. KPIs set on quality enhancement may include fitness for purpose, aimed at determining whether the goods delivered are able to meet a company's needs and compliance to specifications, aimed at determining the number of goods delivered which meet the specification requirements. By setting KPIs in their SSRM, manufacturing companies can have a standard of measuring suppliers' performance, thus meeting the quality standard set by the company.

3.7.2 Product Features

Product features are the secondary characteristics of a product which are added to its main characteristics (Rajasa et al., 2023; Lysons and Farrington, 2016). Manufacturing companies that consider product features in the design of their products make their products unique to those of their competitors. For example, Mercedes-Benz is famous for making cars with luxury features such as

comfortable seats, quiet cabins and smooth rides which attract customers. In addition to these features, the 2024 Mercedes-Benz GLA came with a screen that shows the road map of where the car is heading to, as well as the roadway image showing the driver where to go and also location information (Threewitt, 2024). When deciding the features to add to a product, manufacturing companies should consider those that delight customers because if features do not attract customers, they will not add any value to the business. For example, Toyota designed a van in 1984 with a shoebox-size ice maker for keeping beverages cold as the users took their journeys. However, this was withdrawn as it did not add value to the business since ice makers are meant for luxury cars, but the Toyota van was not a luxury car hence did not attract customers (Florea, 2021). The features are useful for increasing the basic functions of a product and influence the product choices (Rajasa et al., 2023).

3.7.3 Reliability

Reliability refers to the likelihood of a product to perform satisfactorily given the normal operating conditions over a specified period of time (Rajasa et al., 2023). It provides an assurance that a product will not fail to operate within a certain period of time. Reliability is one of the major factors to consider when purchasing non-current assets such as plant and machinery and office fixtures and fittings. According to Gouda et al. (2019), this dimension of quality is more important to manufacturing companies that produce products with long life, particularly the heavy and costly equipment. The authors further give an example of products whose reliability characteristic of quality is vital as server equipment for the information and communication technology industry and catalytic improvers in the industry for refinery of oil. Thus, manufacturing companies should encourage their suppliers to supply products which are reliable.

3.7.4 Conformance

Conformance refers to the level of adherence to the set specifications which were determined based on the desires of the customer (Rajasa et al., 2023). That means a product's quality should meet the expected standards. In addition, meeting the standards as specified by the customers in their specifications, quality

products need to conform to the standards set by the standards board such as the industry, national or international standards. Quality standards in Botswana are set by the Botswana Bureau of Standards (BOBS). Manufacturing companies should consider conformance as an important factor which they need to comply with and extend to their suppliers because if the materials received from suppliers fail to meet companies' specifications, they are less likely to meet the production standard. The BOBS encourage customers, consumers and suppliers to always procure products and services which are BOBS quality approved (BOBS, 2023). Gouda et al. (2019) emphasise that conformance is vital for a manufacturing company because products that fail to meet the requirements given in the specifications are frequently get thrown away or reworked upon.

3.7.5 Durability

Durability is the ability of a product to be used over a specified period of time before it can lose value and be scraped off. This is the length of time that a product can endure before wearing out. It helps manufacturers to reflect on the economic age of a product or its service life. Product durability, which initially focussed on the physical attributes of a product has expanded to include the capacity to tolerate changing consumer preferences and technological developments hence it encompasses emotional significance, physical robustness and technological adaptability (Jetti and Dhar, 2024). Product durability has been gaining popularity in recent years due to the need to design products for sustainability as the popularity for sustainability increases (Mesa, Gonzalez-Quiroga, Aguiar and Jugend, 2022). Durable products are more valuable to customers because they minimise the number of replacements and provide more opportunity to users to bond with the product (Jetti and Dhar, 2024). Manufacturing companies in Botswana should analyse their suppliers' products to determine their durability. Various products in industries and businesses have specific durability amount, for examples appliances, steel and cars (Li, Yang, Shi and Cai, 2023). Product durability provides financial benefits to the purchaser because it enables them to save money since the products that have been purchased have a long life and also contributes to the reduction of waste (Sun, Bellezza and Paharia, 2021).

3.7.6 Serviceability

A product should be easy to repair and maintain during its usage. Lysons and Farrington (2016) stated that serviceability is the ease, speed and accessibility of repairing a product. This factor is very important to consider when purchasing non-current assets such as machinery and equipment. Thus, manufacturing companies should ensure that the non-current assets bought from their suppliers are easy to repair. Similarly, manufacturing companies should make improvements to their products so that they can be easy to repair and the warranties which are after-sales services that they give to their customers factor in the rating of a product.

3.7.7 Aesthetics

Aesthetics is the judgement that people make about the quality of a product in terms of how it looks like, smells, feels, tastes and sounds. It is a subjective aspect of quality which relates to individual considerations and their inclinations (Rajasa et al., 2023).

3.7.8 Perceived Quality

Perceived quality is the quality that a customer regards to be right. This characteristic of quality relates to the reputation a product has made. Thus, improving quality will help to increase customer satisfaction. With this characteristic of quality, customers learn about the product indirectly as they do not usually have full information about the features of a product (Rajasa et al., 2023). The customers' perception of quality positively and significantly impacts a company's brand image (Diputra and Yasa, 2021).

3.8 SUPPLY CHAIN COST MANAGEMENT

Supply chain maximises the value provided to customers by supplying products of high quality at the lowest feasible costs through coordination between manufacturers and suppliers (Abdelraheem, 2024). Supply chain costs cover costs related to the complete process of manufacturing and delivering a product up to the ultimate customer, including procurement, manufacturing and distribution

costs; and the costs of resources such as material, labour, transportation, equipment and other supply chain activities (Selepe and Makinde, 2024; Erboz and Yumurtacı Hüseyinoğlu, 2023; Shang, 2022). As much as it is an objective of manufacturing companies to improve product quality, it is important to control the costs because it is a critical factor for increasing business productivity, consequently improving a company's ability to compete (Ghunaim and Jaaron, 2022). Therefore, cost reduction is a primary objective of supply chain improvement (Calignano and Mercurio, 2023). However, many companies neglect the supply chain costs (Ahlsell, Jalal, Khajavi, Jonsson and Holmström, 2022). Supply chain cost management is a technique used by buyers in collaboration with suppliers to jointly determine ways of minimising costs to the lowest possible level (Abdelraheem, 2024).

There is a need for manufacturing companies in Botswana to control supply chain costs because the expenditure in the supply chain activities of the business can be high hence affecting the cost of the final product. Scholars state that the expenditure on procurement, which is one of the elements of supply chain costs is usually higher than any other company expenditure for most of the companies. The literature suggests that supply chain costs are between 50 and 60 percent of the total product's cost. Lysons and Farrington (2020) estimate that a company's procurement costs account for 60 percent of its total spending, while others estimate 55 percent of the total product cost to be the cost of supply chain (Selepe and Makinde, 2024; Dutta et al., 2022). Thus, it is important for supply chain professionals to consider the costs involved in the supply chain and to be able to determine suitable strategies of controlling them. Since the cost of the material that were bought forms the largest component of the supply chain costs, Liu, Song and Liu (2023) urge manufacturing companies to maintain low material costs for them to remain competitive in the modern global market.

Regardless of the industry, Dutta et al. (2022) emphasise that it is crucial to keep supply chain costs under control for the benefit of the company. However, Dearing and Foster (2024) warns companies to exercise caution when pursuing supply chain cost reduction strategies because they may have a negative impact on the wider supply chain, causing costs to rise elsewhere in the organisation or

downstream. For example, a company may buy materials in bulk with the aim of reducing procurement costs; on the other hand, this may raise stockholding costs such as warehouse management and the opportunity cost of tying up large amounts of money in inventory. As a result, the total supply chain cost may remain the same or may even increase. Ultimately, the company's product cost may increase hence passing it to the ultimate customer. Manufacturing companies are now determining product costs by maintaining relationships with suppliers outside the organisational boundaries (Abdelraheem, 2024). This study examines how manufacturing companies in Botswana can work with suppliers to reduce the costs in supply chains. The supply chain costs are determined and guide the researcher on important elements, thus included in the SSRPO framework.

Manufacturing companies ought to have the ability to identify costs from the source of supply of materials through production up to the sale of a product. The materials that were bought contribute greatly to the total supply chain costs, thus the need to be identified and analysed. Erboz and Hüseyinoğlu (2023) advised companies to regard measuring supply chain costs as a prerequisite to decreasing total costs subsequently increasing the company's profit. Similarly, Moritz, Schönfisch and Schulte (2023) emphasise the need for companies to evaluate the entire supply chain costs in order to quantify them. A research carried out by Emon et al. (2024) revealed that SSRM highly and positively influence cost efficiency in the supply chain. The main supply chain costs, which are discussed in this report, are distribution, manufacturing, procurement, reverse logistics and inventory costs.

3.8.1 Distribution Costs

Distribution costs cover costs of moving materials from suppliers to the business and moving goods from the business to the customer, including their administration such as carriage, customs clearance, loading and unloading, fuel, and vehicle maintenance (Erboz and Hüseyinoğlu, 2023). These costs influence the overall operating costs of a manufacturing company as the increase in costs leads to an increase in the total operating costs, while their decrease helps to reduce total operating costs. Botswana's transportation infrastructure has tremendously improved, with structures such as the Kazungula Bridge and

improved road network, however, despite all improvements made to the road network, transportation costs are still high (BMI, 2024). This calls for manufacturing companies to work with their suppliers to determine how costs from moving goods between the two parties can be minimised.

3.8.2 Production Costs

Production costs are costs incurred in the process of manufacturing a product; that is, converting raw materials into finished products. According to Erboz and Hüseyinoğlu (2023), production costs includes the costs of material, labour, equipment, maintenance and rework. The part of supply chain costs which is covered by production costs vary from one type of production to another. For some goods, production costs form the largest part of supply chain costs while it is less for others. For example, a research carried out by Moritz et al. (2023) revealed that productions costs form the largest part of supply chain costs in liquid processing, while for gases the production costs are minimal. Manufacturing companies should watch their suppliers' production costs as they affect the cost of the materials.

3.8.3 Procurement Costs

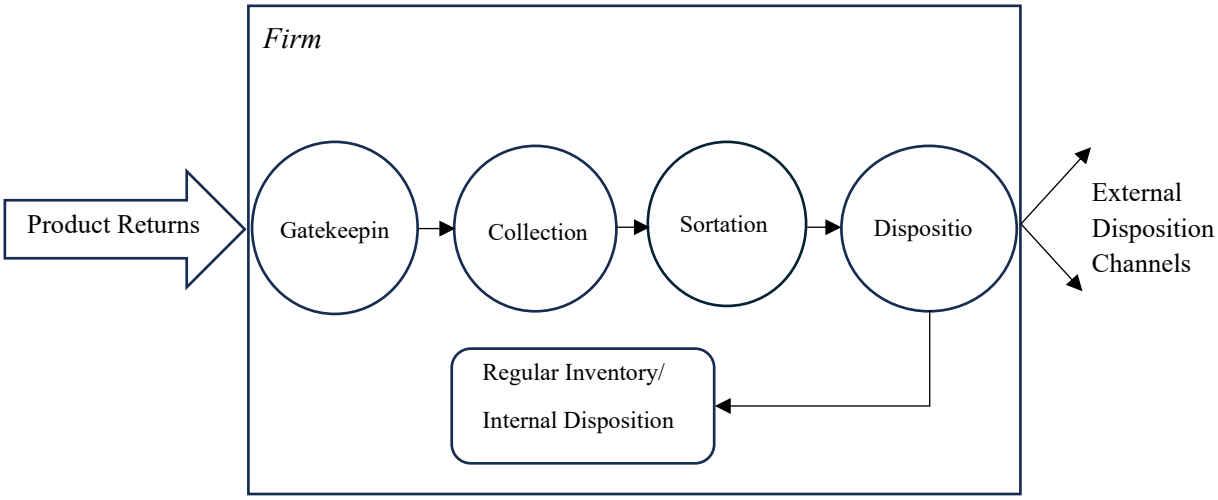
Procurement costs are costs associated with acquiring a product, such as negotiation, supplier appraisal and documentation. Ahlsell et al. (2022) estimated these costs to be 60 to 80 percent of the costs of goods sold. Reducing procurement costs will result in reduced supply chain costs. The target costing technique can be used to manage supply chain costs for procurement activities from suppliers (Abdelraheem, 2024).

3.8.4 Reverse Logistics Costs

The supply chain system requires moving goods from the manufacturing company to a customer through a distribution channel. However, there are some cases where goods need to make a reverse by going back to the manufacturing company because of defects such as product recall, return of rejected materials, returned for repairs, returning used materials to the supplier for disposal or recycling. Reverse logistics is the process of transferring products from their

destination back to the point of origin in order to recover value or to dispose them (Sanni, Jovanoski and Sidhu, 2020). It is important to note that reverse logistics is an umbrella term that covers a number of operational activities including waste disposal, remanufacturing, refurbishing, reusing, recycling and return products (Bikissa-Macongue and Chinomona, 2022). Reverse logistics costs are costs incurred in the process of having goods taken back to the manufacturing company for purposes such as returning packaging materials or returning goods that are not needed by customers or recalling a defective product (Rushton, Croucher and Baker, 2014). The costs involved in reverse logistics may include communication costs, documentation costs, replacement costs and disposition costs. Purchasing companies should liaise with their suppliers on how the costs of reverse logistics would be covered. Therefore, in a SRM the two parties should agree on who bears the costs and how the costs can be managed. Figure 3.5 illustrate the reverse logistics process beginning with the products being returned by the customers. In all the stages, costs are incurred by a company.

Figure 3. 5: Reverse logistics process



Adapted from Sanni et al. 2020

3.8.5 Inventory Costs

Inventory costs are costs incurred in the process of keeping an item in inventory. Inventory costs may cover costs such as capital cost, cost of space, valuation of inventory, inventory management and insurance, inventory forecasting, quality management, stock deterioration, demand forecasting and replenishment (Alam et

al., 2024; Rushton et al., 2014). According to Rushton et al. (2014), inventory costs are one of the key supply chain costs for many manufacturing companies and can account for a substantial portion of the total supply chain cost. To emphasise this point, Munyaka and Yadavalli (2022) point out that the company's inventory may represent as high as half of the operating costs of a company or in some cases it may be half of the whole capital investment. Inventory management is a vital part of the manufacturing and supply chain of a company as it helps manufacturing companies to reduce inventory costs and aids manufacturing processes that depend on raw materials to make finished products and enable the business to balance demand and supply (Alam et al., 2024; Munyaka and Yadavalli, 2022).

There are many strategies recommended in the literature that manufacturing companies can use to reduce supply chain costs, including vendor managed inventory (VMI), consignment stocking and just in time (JIT) production. VMI model is an inventory management system whereby the supplier receives inventory data from the customer and manages the customer's inventory, replenishment and forecasting deliveries of goods, while the customer usually keeps ownership of the stock (Lotfi et al., 2024). This supply chain technique reduces cost of holding inventory. Consignment stocking system, on the other hand, involves having the supplier's inventory being kept on the customer's premises without changing ownership. This benefits both parties by saving money by allowing regular restocking, flexible payment options and lower risks (Adegbola and Abdulrahman, 2023).

JIT production requires companies to manufacture and deliver its goods in accordance with customer demand, at the appropriate time and in the appropriate quality and quantity (Keshipour, Jabbarzadeh Kangarlouei and Bahri Sales, 2024). According to Urohman, Suryana, Pandin and Riyadi (2024), JIT can reduce supply chain costs by lowering inventory costs, improving productivity and lowering production costs, allowing manufacturers to concentrate more on quality while also boosting business profits. Erboz and Hüseyinoğlu (2023) recommend measuring supply chain costs associated with manufacturing, distribution and inventory as a way of reducing organisational total costs.

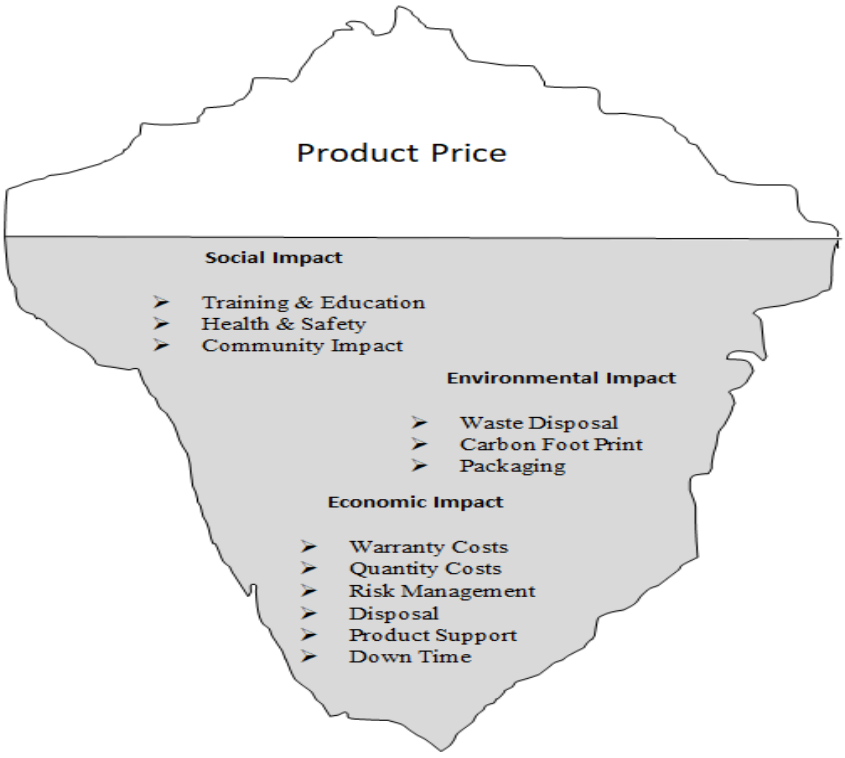
While all these strategies are used to reduce supply chain costs, collaboration with suppliers can be a more effective way that manufacturing companies can use to control supply chain costs. Rezaei et al. (2018) assert that a company's desire to cut costs motivate it to collaborate with suppliers, while according to Shang (2022), cutting supply chain costs maximises a company's profits. Consequently, suppliers can be graded according to how well they cut costs (Jarvis-Grove and Jackson, 2023). Entering into long-term relationships with suppliers can be an effective way of reducing supply chain costs (Lysons and Farrington, 2016).

Extant literature shows that research has been done on cost reduction approaches in manufacturing companies, but there is limited research on the SSRM cost reduction approaches in the manufacturing sector of Botswana. Manufacturing companies use the total cost of ownership (TCO) technique to analyse the costs involved in their supply chains as it helps to examine all costs to be incurred over a product's lifecycle. This study uses the TCO to analyse how manufacturing companies in Botswana can work with their suppliers to reduce supply chain costs. According to Shabani et al. (2019), one management accounting analysis that aims to determine the total cost of managing relationships with suppliers is the evaluation of the supplier's total cost of ownership. Saragih et al. (2020) state that to achieve cost-effectiveness while maintaining product quality, manufacturing companies must coordinate their operational efforts with their suppliers.

Manufacturing companies must set up effective cost control systems that can maximise supply chain profits so that businesses can contribute to economic sustainability (Shang, 2022). Supply chain cost reduction practices chosen should be carefully selected because some measures that are taken to achieve social and environmental sustainability such as circular economy also increase supply chain costs. However, some researchers argue that by implementing circular economy practices, for example, efficient waste treatment and recycling, they can avoid fines from environmental protection agency, thus the cost of waste disposal and future compliance costs can be decreased (Yin, Jia, Chen and Wang, 2023). Gurtu and Johny (2021) recommend reducing supply chain costs by combining the physical movement of goods with well-designed supply chain flows.

Manufacturing companies analyse the costs involved in SSRM critically because it is not all costs that can easily be noticed from the commencement of a contract as some are hidden. The TCO used in conjunction with the iceberg theory which states that a company cannot see all costs involved in a product as some are hidden in the iceberg, can help to determine costs involved in a supplier-buyer relationship. According to the iceberg theory, the costs that are visible are simply a fraction of the total amount to be incurred. The costs that manufacturing companies may incur in supplier relationship management may affect the three dimensions of sustainability; economic, social and environmental sustainability. Figure 3 below is a representation of an iceberg showing the TCO in a manufacturing company's relationship with its supplier. As shown in Figure 3, the costs arising from the economic impact, which are hidden in the iceberg, may include warrant costs, risk management, disposal costs, cost of downtime and product support and the social impact costs may include staff training, health and safety and labour costs. As for the costs arising from environmental issues, an organisation may incur costs such as waste disposal, carbon footprint and packaging.

Figure 3. 6: **Supply chain cost iceberg**



Source: Researcher's own compilation, 2024

Various cost reduction collaborative activities can be undertaken in supply chain through collaboration with suppliers in which the company proposes cost reduction activities to the supplier (Yoo et al., 2019). As important participants in the supply chain, suppliers bear 50-80 percent of the total product costs (Aditi et al., 2024). Effective and efficient product and service delivery is a critical component of any business hoping to compete in the global market places of today, facilitated by properly designed and coordinated supply chains (Maulida, 2023). This study examines how manufacturing companies can collaborate with their suppliers to reduce supply chain costs. Thus, the study determines how SSRM can help to reduce costs among manufacturing companies in Botswana and contribute to economic, social and environmental sustainability.

3.9 DELIVERY PERFORMANCE

Delivery performance is one of the key factors for companies to gain competitive advantage because customers are happy with suppliers that deliver goods on time. Manufacturing companies typically rely on outside suppliers for materials and components required for their production and it is their aim to receive these materials at the right time. According to Sadrabadi, Fatemeh Sabouhi, Bozorgi-Amiri and Sheikhalishahi (2023), a company's main operations depend on obtaining the necessary products and services in the quickest amount of time and at the right quality. Sometimes suppliers fail to deliver on time due to uncertainties and this impacts on manufacturing companies who end up failing to meet their customer requirements by adhering to production and delivery schedules due to these supply uncertainties (Sakhare, Chakraborty, Sarmah and Singh, 2024). To achieve the desired delivery performance, manufacturing companies aim at dealing with suppliers who are able to adhere to the agreed delivery times.

The term delivery time is used to describe the period of time customers have to wait for their orders to be fulfilled (Kusrini, Sugito, Rahman, Setiawan and Hasibuan, 2020). Thus, the concept of delivery time is related to how customers perceive delivery performance. Delivery performance can, therefore, be described as the ability of a company to fulfil its customers' requirements by making goods available at the agreed upon time (Richards and Jackson, 2023). Manufacturing companies rely on the delivery performance of their suppliers to maintain their

production schedules. Frequently, manufacturing companies experience supply uncertainties, which makes it difficult for them to meet customer requirements and negatively impacts company reputation, making it hard for the companies to survive in the highly competitive environment (Sakhare et al., 2024). For manufacturing companies to improve performance, they need to investigate how delivery performance can be improved, which can satisfy their customers and sustain their businesses. To meet the expected delivery performance, goods of the right quality and in the right quantity must be delivered at the right time and to the right place (Dearing and Foster, 2024) because on time delivery can enhance customer loyalty, as well as improving the reputation of the business (Liu and Yang, 2022). Regrettably, Botswana's delivery performance is severely lacking since suppliers frequently experience delays in delivering raw materials. Sakhare et al. (2024) observed that the inconsistency in delivery performance of the suppliers affects the manufacturing company's profits, which then negatively affects its market reputation. Supply and delivery performance is one of the KPIs which supply chain partners intend to achieve (Oghazi et al., 2016). It is imperative that manufacturing companies ensure that in addition to supplying a quality product at the right price, suppliers should deliver products and services at the right time (Jarvis-Grove and Jackson, 2023) so that production is not interrupted.

Researchers recommend several actions that can be taken by manufacturing companies to help their suppliers improve their performance regarding delivery of goods. While Baah et al. (2022) suggest that information sharing between supply chain partners can lead to improved supplier performance, Sakhare et al. (2024) state that imposing penalties on suppliers can enhance delivery performance. The authors proposed a reward-penalty mechanism that can be used to enhance supplier delivery consistency, thereby enabling manufacturing companies to maintain a consistent production schedule and maintain a high market share. Imposing penalties on suppliers is a commonly practiced strategy. For example, in 2010, Wal-Mart and other retailers started charging suppliers who did not deliver goods within Wal-Mart's four-day delivery window, a penalty of 3 percent of the total cost of goods (Bhattacharyya, Guiffrida, Soto-Ferrari and Schikora, 2023).

Similarly, Kroger charges 500 USD to its suppliers for any order that is delivered later than two days (Bhattacharyya et al., 2023). Although penalising the supplier is commonly used as a standard way of dealing with supplier delivery performance, Bhattacharyya et al. (2023) argue that penalties for late deliveries undermine trust between supplier and buyer. The authors then design a supplier evaluation model that analytically equates supplier delivery performance to cost realisation, replicating a crucial component of successful supply chain alignment that fosters long-term supplier relationships. Similarly, Sadrabadi et al. (2023) suggest that supplier evaluation can be used as a means of helping suppliers to improve their delivery performance. It is on this basis that the current study centres on how SSRM can enhance delivery performance.

A strategy that leads to SSRM is more beneficial to manufacturing companies as it enables them to secure a continuous flow of material, thus avoiding stock-outs of their major raw materials or components, thus enhancing production. Instead of imposing penalties to force suppliers to improve delivery performance as practiced in contemporary supply chain, manufacturing companies who are practicing SSRM can measure supplier's delivery performance internally, then use the results for negotiation and not penalising the supplier (Bhattacharyya et al., 2023).

This research examines how SSRM can enhance delivery performance of the supplier, thus enabling manufacturing companies to maintain a continuous flow of production and meet its customer requirements. Employing techniques that lead to SSRM is more effective in measuring supplier delivery performance as it can allow both parties to enter into a long-term relationship than adversarial measures of supplier delivery performance which are a win-lose and short term based.

Whatever measure a manufacturing company chooses to use for evaluating its suppliers' delivery performance, it should be agreed upon and form part of the contract. Many companies evaluate their supplier's performance using on-time delivery, lead time reduction and order fulfilment accuracy as measures. This is supported by Salam (2021) who recommend the use of four elements, similar to the above, when measuring suppliers' delivery performance as on-time delivery, reliable delivery, order fulfilment, time flexibility and reduced lead time.

3.9.1 On Time Delivery

For the business and production processes of a manufacturing company to remain functional, on time delivery is a vital element. Dearing and Foster (2024) recommend KPIs on delivery performance, such as on time delivery to be included in contracts with suppliers which can then be used to measure supplier's delivery performance. It is used to measure a supplier's ability to deliver goods on time. According to Amoako-Gyampah et al. (2019), an increase in information sharing facilitates faster product introductions, shorter lead times and better delivery outcomes for buyer firms.

3.9.2 Reliable Delivery

Reliable delivery can be defined as providing the appropriate product, of the right quality, in the right quantity, from the right source, delivered to the right location, at the right time and at the right price (Salam, 2021).

3.9.3 Order Fulfilment

Order fulfilment is the whole process of a sale from receiving an order from a customer up to delivery of a product. This includes activities such as placing and processing an order, picking stock from the stock location and packing it, shipping and delivery. The order fulfilment helps to determine the time a supplier takes to deliver a product. According to Dearing and Foster (2024), this process overlaps business functions, thus requires coordination with a company's primary suppliers. Manufacturing companies can use this to track the number of orders that are delivered to customers without any problems. This enables the tracking of supply chain operations and provides the capacity to recognise concerns that may be compromising the efficiency of supply chain operations (Dearing and Foster, 2024).

3.9.4 Time Flexibility

Time flexibility implies the ability of a supplier to respond to the customers' delivery schedules (Forslund and Mattsson, 2023). It means that suppliers should be prepared to adjust the delivery of goods to accommodate the customers' changing

schedules. It may happen that a manufacturing company changes its production schedule to accommodate the changes in demand, which means suppliers should respond to the buyers' needs.

3.9.5 Lead Time

Lead time is the duration between receiving an order from a customer and when the product is delivered (Forslund and Mattsson, 2023). In other words, it is the time taken from ordering goods up to when delivery is made. Reducing the lead time will help with delivering a product on time. Delivery delays in both ways; receiving raw materials from suppliers and delivering products to customers should be avoided as they pose a risk to the business (Kusrini et al., 2020). The largest last-mile challenge cited by many businesses is delivery inefficiency, which highlights the need for supplier relationship management investments (Bhattacharyya et al., 2023). For the manufacturing companies who produce perishable products, Chen, Fan and Pan (2021) advise them to optimise delivery performance as it reduces deterioration, thus reducing environmental pollution, in addition to customer satisfaction by delivering on time. Liu and Yang (2022) also emphasise delivering on time as a means of enhancing customer loyalty, as well as improving the business reputation. Thus, manufacturing companies should measure the performance of their suppliers to ensure that delivery performance is improved. It is preferable to use a supplier evaluation model that measures both early deliveries and late deliveries because both are a cost to manufacturing companies.

Bhattacharyya et al. (2023) state that although emphasis has been given, theoretically and practically to measuring suppliers' late deliveries and preventing them, it is recommended that early deliveries be measured as well because both lead to costs. The best method for measuring both of them is to use a multinomial modelling technique based on delivery deviations (Bhattacharyya et al., 2023). In this way the amount of deviation from the agreed upon delivery time will be determined and corrective measures taken by liaising with the supplier. Based on the Resource-Based View (RBV) theory, delivery performance is important because time is an important resource in an organisation. The RBV theory was

used for this study to analyse the importance of time as an intangible resource of a company.

3.10 SUPPLY CHAIN INNOVATION

Innovation is the application of new concepts, methods and techniques to the advantage of people, community and society as a whole (Solaimani and van der Veen, 2022). It can be applied in all functions of a company and involve all people internal to the company and external; namely, suppliers. Ikenna and Enyinna (2023) stated that innovation is the result of efforts made to broaden a person's knowledge or comprehension and to apply the knowledge to develop practical tools, products and procedures. Supply chain innovation can be defined as planning, execution, controlling of core activities, such as logistics, procurement and manufacturing that create and provide value to the ultimate customer and coordinate business partners into value networks (Hahn, 2019).

Manufacturing companies are expected to make innovations to their products and processes so that they can achieve economic benefits and the realisation of a circular economy. Innovation can be defined as the creation and utilisation of improved or new products, processes, techniques and solutions that can be used in business operations (Koc et al., 2023). Innovation achievement for manufacturing companies is dependent on suppliers being innovative as well and giving good support to the buying companies. In the context of SSRPO, supplier innovation can be defined as a supplier's ability to create and apply new concepts, procedures and operations, as well as their readiness to make investments in innovative goods and technology (Yang et al., 2023).

Thus, suppliers should support manufacturing companies by sharing their knowledge and improving the materials that they supply. Suppliers' commitment to their knowledge development capabilities determine how different companies' innovative outcomes turn out (Afraz et al., 2021). Lately, customers' needs and advancement in technology are putting pressure on the manufacturing companies to improve their products and this requires collaborating with suppliers who have technological skills and resources (Jung et al., 2023). This study explores how

manufacturing companies in Botswana can be supported by suppliers to enhance innovation.

There are different categories of innovation which manufacturing companies can select from; namely, product, process and administrative innovation (Shuaib and He, 2023). The goal of supply chain innovation is to discover new approaches to managing supply chain operations by utilising process and technological advancements (Afraz et al., 2021). Thus, supply chain innovation can contribute significantly to the success of a company in terms of producing innovative products that exceed customer expectations and gain competitive advantage. Supply chain innovation plays the role of an enabler, supporting a number of tasks like better planning, procurement, forecasting and supply chain practice monitoring, as well as increasing an organisation's operational and risk management capabilities (Afraz et al., 2021).

Manufacturing companies in Botswana fail to make innovations to their products and processes due to poor investment in technology and concentration on cost reduction than innovation as innovative measures are costly. The importance of innovation for manufacturing companies cannot be overemphasised as they give several positive impacts on the companies. One positive impact of innovation is found in the study carried out by Afraz et al. (2021), which revealed that innovation practices can help an organisation to improve competitive advantage by developing key competencies, thus provide better services to customers than competitors. Secondly, Maulida (2023) posits that innovation is the primary force behind global manufacturing, driven by factors such as globalisation, economic, social and political uncertainties, as well as the need to maintain competitiveness.

Furthermore, innovation can help companies compete in the market as stated by Mazikana (2023) that due to pressure emanating from competition, manufacturing companies must offer innovative products and services. In addition to gaining competitive advantage, managing globalisation and competing in the industry, manufacturing companies that are innovative can contribute to environmental sustainability. This is supported empirically by Seclen-Luna et al. (2021) who found that the development of innovative strategies has a positive effect on the environmental impact of manufacturing companies. For example, innovation

improves production processes, which leads to the reduction in waste. As manufacturing companies contribute significantly to the growth of their countries' economies hence people's livelihoods, adopting innovative strategies to increase productivity will be a move towards sustainability.

Innovation is significant in the current dynamic world because customer preferences and tastes change quickly, leading to products and services getting outdated quickly (Rahman et al., 2023). To keep customers satisfied, operating procedures must be changed and new products and services must be introduced (Dubey et al., 2020). Scholars have different views on how innovation can be achieved by manufacturing companies. Seclen-Luna et al. (2021) recommend manufacturing companies to consider servitisation strategy, which incorporates services into their core offerings, enhancing economic performance and environmental performance as it can contribute to the transition towards circular economy. Another way of improving innovation is recommended by Du, Liu, Um and Kang (2023) as acquiring knowledge beyond national boundaries. This is supported by Afraz et al. (2021) who state that for an organisation to incorporate innovation into business, collaboration and information sharing among companies is necessary. With the expansion of globalisation, manufacturing companies in Botswana can easily interact with other companies and supply chain parties outside the country for new ways of managing the supply chain. Thirdly, Bhatti et al. (2023) emphasise the importance of using recyclable resources because the environment is severely harmed by the use of non-recycling resources in the manufacturing system, as well as by unsustainable and disposal methods. In support of this view, Malhotra (2023) claims that collaborative joint activities and work processes are critical for manufacturing companies to effectively manage valuable resources that could be reused rather than allowing them to be disposed of in landfills. Similarly, Lintukangas et al. (2019) state that innovation capabilities play a key role in enabling an organisation to achieve sustainability.

Furthermore, a number of authors emphasise the importance of supplier relationship management for enhancing innovation in the manufacturing sector because suppliers can make better contribution to the manufacturing companies' innovation (Razzak, 2023; Yang et al., 2023; Afraz et al., 2021). Lintukangas et

al. (2019) underscore that SCM is a key player to the innovativeness of an organisation and suppliers make a significant contribution to creating innovation. A study by Li, Zhang, Liu, Zhang and Jasimuddin (2023) proved that supply chain collaboration enhances supply chain innovation, thus improves manufacturing companies' performance. Similarly, a study undertaken by Delgado-Verde and Díez-Vial (2023) illustrate that supplier participation in the development of new products may improve innovation performance.

This research concentrates on this view because collaborating with suppliers in an SSRM can be a means of achieving innovation in the manufacturing sector. Thus, using the CE theory, the manufacturing sector of Botswana is studied to determine how their suppliers can contribute to fostering innovation. This is consistent with the study undertaken by Yang et al. (2023) which revealed the role played by suppliers in product innovation. The factors that can enhance supply chain innovation which manufacturing companies in Botswana can use include research and design, production processes, technology and new product development (Shuaib and He, 2023).

3.10.1 Research and Design

Suppliers offer fresh, specialised knowledge that can be combined with the company's existing knowledge to improve innovation performance and support the company with research and design, provide equipment and training (Delgado-Verde and Díez-Vial, 2023). Yang et al. (2023) emphasise that suppliers' contributions to buyers' innovation enable manufacturing companies to reshape and create new capabilities, which improve innovation performance of manufacturing companies. However, to recognise the contribution that suppliers can make to the innovation of manufacturing companies, a high calibre partnership between the two parties is necessary.

3.10.2 Production Processes Innovation

Production processes innovation is the introduction of improved or new ways of producing goods covering aspects such as changing equipment, software or production methods. It encompasses all the functional and operational aspects of the business and generates a substantial decrease in the cost of production

processes and complexity (Migdadi, 2022). Production processes innovation introduces more efficient methods of production and this increases productivity and efficiency, thus giving an organisation a competitive advantage (Migdadi, 2022). Manufacturing companies in Botswana can enhance innovation performance by allowing their suppliers to participate in innovation processes and having common goals regarding innovation. Li, Zhang et al. (2023) emphasise that process innovation is the new approach for creating and integrating supply chain processes.

3.10.3 Technology Innovation

Technology innovation plays a vital role in the manufacturing sector strengthened by the growth of new generation technologies like the internet of things (IoT), blockchain, digital twins and big data, increasing process visibility and providing real-time information (Li, Zhang et al., 2023). Technology can be used in innovation to produce new products and processes, thus the company will be able to produce new procedures more efficiently and produce quality in response to market needs (Basana, Malelak, Suprapto, Siagian and Tarigan, 2024). The authors further stated that technology-drive innovations and will expose businesses to more supply chain transparency.

3.10.4 New Product Development

In order to increase their chances of accomplishing their strategic objectives, businesses should include their suppliers in the new product development process (Afraz et al., 2021) and this is referred to as early supplier involvement (ESI). With ESI, procurement professionals work closely with their suppliers who have the expertise for the product under development. Dearing and Foster (2024) emphasise the importance of ESI to manufacturing companies as they can benefit from suppliers' expertise, thus promote innovation. The engagement of suppliers in new product development has been deemed a particularly valuable external source of knowledge, augmenting companies' innovativeness, thus, suppliers can provide companies with competitive advantage in terms of the technologies employed and time and cost advantages (Delgado-Verde and Díez-Vial, 2023). However, the study by Delgado-Verde and Díez-Vial (2023) revealed that there is

conflicting evidence regarding suppliers' contributions to innovative performance; while some studies report a direct, positive impact, others find none at all or negative ones.

Companies that manage to constantly develop new products which meet customer expectations are capable of increasing their market share, retain customers and grow the size of their market (Migdadi, 2022). The body of research has demonstrated how seriously the environment is harmed through the use of non-recycling sources in the manufacturing system, as well as by undisposed and unsustainable practices (Bhatti et al., 2023). Therefore, many manufacturing companies are making new product developments that take sustainability into account. For example, Patagonia, an American clothing company, uses certified organic cotton that is grown using regenerative farming methods and about 70 percent of its products are currently made from recycled materials (Agrawal et al., 2023).

While many studies have been undertaken on the contributions made by innovation towards the competitiveness of manufacturing companies, there is no evidence of the research that has been carried out on how manufacturing companies can achieve innovation through SSRM and the ways that SSRM can foster innovation in the manufacturing sector of Botswana have not been explored. Using the CE theory this research assesses the extent to which manufacturing companies can collaborate with their suppliers to foster innovation in the supply chain. It is critical for an innovation-focused company to identify and cultivate the right suppliers to share innovation goals which are compatible because supply chain innovation may not be achieved if they are not aligned (Li, Zhang et al., 2023).

3.11 VALUE CREATION

Value creation is the process that involves combining resources from various supply chain partners to enhance a product's worthiness (Zainuddin, Randle, Gordon and Dolnicar, 2024; Hammervoll, 2009). It is known as a means of adding sustainable competitive advantage to the business. The creation of value is an important strategy that manufacturing companies can pursue to remain

competitive (Johne and Wallenburg, 2021). Without any doubt, manufacturing companies must adapt and enhance value creation processes in order to stay competitive in today's competitive market. This is because businesses must contend with not only stiff competition, but also a dynamic environment that presents unexpected hindrances (Johne and Wallenburg, 2021).

Suppliers give a vital support to manufacturing companies' value creation by providing materials of the right quality at the right time and in the right quantity to enable the smooth production while supplied at the right price. Rezaei et al. (2018) gave enhancing value as one of the outcomes of joint problem solving between supplier and purchaser. This section discusses how suppliers can add value to manufacturing companies through SSRM. SSRM can be used as a strategic approach to maximising business value by manufacturing companies (Asa, Naruses, Nautwima and Tsoy, 2023). Some manufacturing companies involve suppliers throughout their production process from product design to the finished product, while others involve suppliers at the acquisition stage of their material. In reference to the RBV theory, a resource can be defined as something that a company has or has access to (Afraz et al., 2021) and suppliers are a key resource that a company depends on. The current research uses the RBV theory to investigate the effects of various resources, including suppliers or capabilities on adding value to strategic and operational processes of a company (Afraz et al., 2021). Value can be created in the supply chain through factors such as brand image, cost saving, customer care and product diversity (Elliot and Toon, 2019).

3.11.1 Brand Image

Brand image is the perception which customers and other stakeholders have of an organisation's brand, which leads them to making a decision to purchase the product of the same brand (Elliot and Toon, 2019). The term 'brand image' refers to the collection of emotional connections that consumers have with the brand in their memories, which demonstrate how the brand is noticeable in their thoughts and minds and highlighting its distinctiveness and difference from competitors (Huang, 2023). It includes how the target market views the features, benefits, applications, uses and characteristics of the manufacturer and has a significant influence on determining consumers' buying intentions, thus has the ability to grow

the number of consumers (Adwiyah, Syaukat, Indrawan and Mulyati, 2023). A research undertaken by Adwiyah et al. (2020) found that supply chain management and brand image have a substantial and favourable impact on the competitive advantage of a business.

3.11.2 Cost Saving

Value creation is one of the key objectives of SSRM, which would arise from cost saving, thus increasing financial benefits to the businesses of both companies; the purchaser and supplier (Enz et al., 2019). Reducing expenses can give a company financial benefit such as increased profit, improved cash flow, improved share value, reducing debts and enhancing competitive advantage.

3.11.3 Customer Care

Customer care is the totality of the experiences that a customer has with the business pre- and post-purchase (Elliot and Toon, 2019). It enhances the value of an organisation through various ways including reduced customer complaints, increased customer satisfaction, high rates of customer retention thus sustained customer relationship. It is vital for a manufacturing company to consider the service received from its suppliers as it has an effect on the overall supply chain performance. A manufacturing company should set service standards to which the supplier must adhere. By encouraging suppliers to provide excellent customer service, firms can obtain essential and scarce resources (Wang, Zhao and Gu, 2021). According to Dania, Tafarel, Septifani, Amer and Doan (2023), the service needs to be excellent and comprehensive.

3.11.4 Product Diversity

Product diversity is a collection of products and features that suppliers provide to buyers such as product type, size, quality, brand and availability which makes it easy for customers to choose and buy these items based on their needs (Nasikhak and Firmansyah, 2021). The production of a range of products can enhance the value of a company through various ways including diversifying risks, increased sales, increased market share and improving the brand image. According to Elliot and Toon (2019), product diversity is a popular strategy

because it enables customers to easily find products in a wide range of brands and products. However, Krause and Gebhardt (2023) argue that product diversity has a negative impact on a company such as reduced transparency and reduced economies of scale.

3.12 SUPPLY CHAIN RISK MANAGEMENT

SCRM has become more critical today due to increased occurrence of events that disrupt the supply chains. The literature cites a number of global events and phenomena that have occurred in the years which have impacted highly on the supply chain, and among the noteworthy occurrences are pandemics, like SARS and Covid-19, natural disasters, cyberattacks, political challenges like Brexit in the UK and geographical disputes like the most recent Russia-Ukraine war (Choudhary, Singh, Schoenherr and Ramkumar, 2023; Emrouznejad, Abbasi and Sıcakyüz, 2023; Gupta, Modgil, Choi, Kumar and Antony, 2023). The discussions among scholars and practitioners regarding global supply chain management have been sparked by concerns about business uncertainty, threats to network flow and economic implications (Gupta et al., 2023). While much literature cite catastrophes and pandemics to be the cause of supply chain disruptions, Berger et al. (2023) contend that globalisation and outsourcing are the major cause of supply chain risks. SCR is the potential events that could interfere with a company's supply chain. However, it is difficult to find a common definition of supply chain risk and many authors have provided different definitions. To broaden the understanding of SCR for the purpose of this research, Table 3.1 provides different authors' definitions. The literature has shown that to reduce supply chain it is important to identity and manage risks through close cooperation among supply chain stakeholders (Duong and Ha, 2021).

Table 3. 1: Definitions of Supply Chain Risk (SCR) and Supply Chain Risk Management (SCRM)

Authors	Definitions
(Gurtu and Johny, 2021)	SCR is the "implementation of strategies and plans to manage supply chain networks through constant risk assessment and reduce vulnerabilities to ensure resilience in supply chains". SCRM is "a systematic and phased approach for recognising, evaluating, ranking, mitigating and monitoring potential disruptions in supply chains".
(Pham, Pham, Truong Quang and Dang, 2023)	SCRM is to "develop strategies for identifying, assessing, mitigating and monitoring risks".
(Emrouznejad et al., 2023)	SCRM is "the process of detecting, analysing, and managing the risks associated with global and dispersed information and communications technology structure".
(Berger et al., 2023)	SCRM "deals with the design of a robust network structure and management of flow of information and goods throughout the network, which enables the company to cope, predict, and recover from potential disruptions".
(Heckmann, Comes and Nickel, 2015)	SCR is "the potential loss for a supply chain in terms of its target values of efficiency and effectiveness evoked by uncertain developments of supply chain characteristics whose changes were caused by the occurrence of triggering events".
(Shah, Gardas, Narwane and Mehta, 2023)	SCRM is "the identification, assessment and mitigation of SCR by taking the necessary strategic steps".

Source: Researcher's own compilation, 2024

For this research, supply chain risk is defined as the possibility and effects of a disruption to a company's internal manufacturing, delivery and supply operations (Jajja et al., 2018). Botswana's manufacturing supply chain has become more uncertain and complex due to increased supply chain risks and disruptions caused by natural disasters and other catastrophes. The sector lacks resilience as evidenced by the way manufacturing companies encountered shortages of raw materials and other supplies during the Covid-19 pandemic. This is consistent with the views of Ardolino et al. (2022) who claimed that Covid-19 has aided manufacturing companies to realise the importance of environmental and economic sustainability. Therefore, manufacturing companies in Botswana need to manage supply chain risks so that they can build resilience in the system. There

are many types of supply chain risks faced by manufacturing companies. Khan, Bashar et al. (2023) cite pandemics and transportation accidents as some of the risks to which a company's supply chain is exposed, while Berger et al. (2023) contend that the major sources of supply chain risk are related to quality issues. Baryannis et al. (2019) are of the view that risks include both natural disasters and man-made disasters. The 2019 Covid-19 outbreak serves as an example of the risks associated with natural disasters, which has affected the supply chain. It had a significant impact on how manufacturing companies operated because it disrupted supply chains, which made it harder for companies to function (Bastas and Garza-Reyes, 2022).

Having noticed the impact it has made on supply chains, Faggioni et al. (2023) state that one of the biggest disruptions in human history has been regarded as the Covid-19 pandemic. The Russia-Ukraine war is an example of man-made disaster and has significantly affected supply chains of manufacturing companies globally; including Botswana as the two countries are the major sources of energy and input for manufacturing companies and one of which is wheat. One of the first effects of the Russia-Ukraine conflict was the worldwide disruption of food and energy supply, which was accompanied by significant increases in the costs of basic logistics services like international transportation and warehousing (Toygar and Yildirim, 2023). While Emrouznejad et al. (2023) cite the important supply chain risks as risks associated with supply chain management including manufacturing risks, storage and shipment risks, financial risks, legal risks, quality risks, transit delays, theft, natural disasters, weather-related issues and cybercrime, Vanany, Zailani and Pujawan (2009) associate supply chain risk with delays in receiving materials from suppliers, significant forecast errors, system failures, capacity problems, inventory issues and disruptions.

Since the supply chain of manufacturing companies in Botswana is increasingly threatened by pandemics together with natural and mechanical hazards, causing disruptions that impact productivity, revenue, competitive advantage and profitability, SCRM is important. SCRM is a systematic approach to managing supply chain risks, involving coordination and collaboration among partners to ensure profitability and continuity (Gurtu and Johny, 2021; Vanany et al., 2009;

Christopher and Peck, 2004). It can also be defined as the procedure for identifying, evaluating and mitigating risks to the authenticity, dependability and integrity of products and services along the supply chain (Emrouznejad et al., 2023).

SCRM is an essential function of the supply network because it assists in handling unforeseen circumstances that have created uncertainty and challenges for supply chain companies, significantly impacting their financial performance, as well as the national economy (Gurtu and Johny, 2021). Since supply chain disruptions can have a detrimental effect on a company's profitability and ability to survive, the ultimate goal of an efficient SCRM process is to build strong and resilient supply chain capabilities (Afraz et al., 2021).

Most of the researchers concentrated their studies on operational risk, which includes risks from natural disasters, socio-political unrest, economic disruptions and terrorist attacks (Vanany et al., 2009). However, Afraz et al. (2021) encourage companies to take a more strategic approach, which are risks that need to be strategically managed, such as fluctuating demand, supply default or bankruptcy, growing competition, market limitations and technological advancement (Vanany et al., 2009). Strategic risk management can provide companies with a competitive edge by pushing them to view risks more strategically and assisting them in making plans for unanticipated supply chain disruptions (Afraz et al., 2021).

In the current competitive environment, manufacturing companies need to increase their performance by monitoring and controlling suppliers' risk to survive, thus quality supplier relationship can help reduce supply chain risks (Al-Shboul, 2023). The literature highlights numerous factors, including globalisation, operational responsiveness, decision-making capability and monitoring capability as having an impact on the level of supply chain risks (Emrouznejad et al., 2023). Supply chain risk affects the economic sustainability of manufacturing companies due to the effect it has on the operating activities such as shortages of material, increased production costs, shortages of skilled labour and reduced profits. Baryannis et al. (2019) stated that unpredictable events have an impact on the sustainability and profitability of supply chain companies. Research on SCRM has focused on the effects of catastrophes such as Covid-19 and less to no research

has focused on how SRM can help manufacturing companies to mitigate supply chain risks.

Juettner et al. (2020) state that although supply chain risks have been extensively studied, little has been done to examine the accountability and responsibilities of buyers and suppliers in sustainability supply chain risks. The possibility of an unanticipated loss of a major supplier, which could lead to a shortage of components or raw materials, highlights the significance of SSRM. When a company works closely with its suppliers to mitigate supply chain risks, it explains the stakeholder theory (ST), which suggests that the development of long-term relationships with suppliers can help a company to improve its stakeholder value. According to Amoako-Gyampah et al. (2019), SRM offers the chance to minimise risk exposure and decrease supply disruptions, thus meet performance targets.

The ST can help a manufacturing company to determine the roles and responsibilities that its suppliers can play in relation to risk management (Oliveira et al., 2023). Thus, a manufacturing company may encounter supply chain risks if the relationship with its suppliers is not managed efficiently because the failure of a supplier impacts on a company. Therefore, the management of relationships with suppliers need to be given the importance it deserves so that supply chain risks in the manufacturing industry can be reduced. It is noticed that strategic supplier relationship promotes cooperative learning, organisational sustainability and improved risk management (Dubey et al., 2019). Manufacturing companies should apply diligence in their relationships with suppliers because according to a study undertaken by Pellegrino et al. (2020), there are a number of risks that can have an impact on buyer-supplier relationships, including risks associated with traditional supply chain. To emphasise the importance of SRM, Senna, Reis, Santos, Dias and Coelho (2021) state that when companies are not integrated within the supply chain an organisation’s results may be less than expected.

Though much research has been done on supply chain risks, there is less evidence that research has been done on how supplier relationship management can lead to the reduction of supply chain risks in the manufacturing sector of Botswana. Afraz et al. (2021) suggest that companies can lower supply chain risks by working with suppliers to implement creative measures such as communication

system integration, which can help to improve forecasting, planning, monitoring and controlling opportunities. The Aberdeen Group discovered that companies can improve risk management by utilising innovative processes, such as information systems and technological innovation (Afraz et al., 2021). Frost and Thompson (2024) recommend that buyers and suppliers work together to manage risks to ensure the sustainability of their relationships and thereby achieve their objectives.

3.12.1 Supply Chain Risk Management Approaches

Due to the interconnectedness of supply chain risks, manufacturing companies should deal with them diligently by taking approaches that can help to mitigate risks. Many researchers recommend taking SCRM approaches that involve risk identification, risk assessment, risk mitigation and risk resilience (Choudhary et al., 2023; Emrouznejad et al., 2023). Risk identification is recognising events or actions that could have a negative impact on supply chain performance by disrupting the flow of material into and out of an organisation (Emrouznejad et al., 2023). Senna et al. (2021) stated that accurately identifying potential risks is critical for businesses to actively prevent losses. Risks in the supply chain are interconnected because one risk can result in other risks. For example, late delivery or failure to deliver may lead to production shutdown, which may also lead to loss of sales and subsequent loss of profits. Due to this interconnectedness supply chain risk identification and assessment become a challenge in the age of globalisation (Choudhary et al., 2023). Risk identification is important because when supply chain disruptions are not anticipated and their causes are not known, the chain becomes vulnerable and SCM leaders are less productive (Gurtu and Johny, 2021).

The second stage in the SCRM is risk assessment, which is the process of analysing risks in light of stakeholder needs and business objectives (Emrouznejad et al., 2023). When assessing risk in the supply chain, Choudhary et al. (2023) outline eight crucial factors that can aid manufacturing companies in risk management as avoidance, cost, impact intensity, impact time, detectability, likelihood, risk exposure and expected utility. Comprehending the categories of risks and their likelihood of occurrence and the consequences that go along with

them serves as the foundation for businesses to create efficient risk management strategies (Vanany et al., 2009). Though risk assessment is a vital task to be undertaken by manufacturing companies in the SCRM process, it has not been given much attention in the literature as compared to risk identification.

Risk mitigation comes as the third and very important stage in the SCRM process. Because supply chain risks can have a negative impact on the financial performance of a manufacturing company due to the costs involved, affecting the economic growth of the country, companies are looking for ways of mitigating them. Authors recommend various ways that can be taken to mitigate SCR. Emrouznejad et al. (2023) recommend allocating resources in a methodical manner as a way of mitigating SCR, while Kusrini et al. (2020) emphasise on mitigating supply chain risks by having a thorough and recorded explanation of how risk will be strategically handled. In order to reduce the likelihood of performance degradation and disruption propagation, which manifests itself in the form of supply chain quantity downscaling when disrupted, choosing suppliers that have undergone evaluation and allocating order quantities based on criteria that simultaneously incorporate resilience aspects and TBL sustainability dimensions can help (Kayani et al., 2023).

Manufacturing companies that implement resilient supply chain strategies such as SSRM, which can manage to prevent interruptions in the supply of materials. SSRM can help a manufacturing company to mitigate supply chain disruption risks because suppliers have the potential to impact supply chains' overall performance, therefore businesses must be diligent when choosing suppliers in order to lower risks (Khan, Bashar, et al., 2023). Some researchers have an opposing view as they believe that using multiple sources of supply can help companies to reduce risk by distributing risk and the network becomes more resilient when there are more suppliers because fewer suppliers are critical, lessening the impact of a disruption (Berger et al., 2023).

The final stage in the risk management process is risk resilience. In the context of SCRM, resilience is the system's capability to quickly recover from a temporary disturbance and return to its normal position (Emrouznejad et al., 2023). In other words, supply chain resilience is the capacity of a supply chain to bounce back

and resist disturbances (Gupta et al., 2023). The supply chain of manufacturing companies in Botswana lacks resilience because recovery took long after the disruption from the Covid-19 pandemic and the industry is still recovering. As stated by Kayani et al. (2023), a supply chain network should be able to resist disruptions and recover quickly after a disruption has happened. According to Afraz et al. (2021), companies that react effectively to disruptions create numerous opportunities for unique value and can minimise transfer costs by gaining more negotiating leverage and attracting more potential customers.

Some authors suggest that risk monitoring should be undertaken because risks are ever-changing, mitigation strategies must be adjusted and their development must be continuously monitored (Pham et al., 2023; Fan, Stevenson and Li, 2020). Having the SCRM process updated and reviewed continuously using both formal processes and judgemental evaluation is a good move towards SCRM. Numerous studies have proposed methods for risk monitoring in industries, such as identifying trends, constructing early-warning management processes, establishing data management systems, building an integrated abnormality diagnosis model and developing risk monitoring capabilities (Pham et al., 2023).

3.12.2 Supply Chain Risk Management Strategies

In today's complex and globalised business environment, companies must implement effective SCRM strategies in order to stay competitive and achieve long-term success (Emrouznejad et al., 2023). The literature suggest the strategies that can be used to successfully implement SCRM as supplier performance monitoring, supplier diversification and collaborative supply chain relationships (Emrouznejad et al., 2023; Christopher and Peck, 2004). The implementation of robust risk management systems helps companies to gain competitive edge (Frost and Thompson, 2024). While Emrouznejad et al. (2023) recommend the use of technology as a means of reducing supply chain risk, Fan et al. (2020) recommend supplier relationship management of reducing supply chain risk by strengthening an organisation's supply side. To reduce supply chain risks caused by global trade, Gurtu and Johny (2021) suggest that replacing global suppliers by local suppliers is recommended.

Businesses can use techniques like supplier diversification, strong supplier relationships, performance monitoring, technology investment to increase supply chain visibility and resilience and having backup plans to reduce these risks (Emrouznejad et al., 2023). Gurtu and Johny (2021) divide SCRM into two categories of approaches, being setting a strategy for comprehensive risk management and a focused approach to a specific disruption such as lead time, poor specifications and transport breakdown. The authors further emphasise the importance of have a risk management strategy as the lack of risk management strategies can expose businesses to environmental risks. While much research has been done on strategies of SCRM, no research has been done on how SSRM can help manufacturing companies in Botswana to mitigate supply chain risk and no framework has been developed to this issue.

3.12.3 Sustainable Supplier Relationship Management Critical Success Factors

Sustainable Supply Chain Management (SSCM) is becoming more important for business managers and stakeholders as stakeholders see the environmental and social effects of the supply chain as a crucial component of business performance (Xu et al., 2019). SSCM can be defined as the integration of economic, social and environmental practices into the supply chain management (Adwiyah et al., 2023). Razzak (2023) assert that SSCM practices are new strategies that companies can use to gain competitive advantage compared to the conventional Porter's generic strategies; product differentiation and cost leadership. Companies that operate internationally are realising more and more that incorporating sustainable practices into supply chain management is beneficial for more than just projecting a positive image, but research indicates that these companies actually see improved performance results (Razzak, 2023). The success of SSRM depends on various factors which manufacturing companies in Botswana need to pay attention to. This sub-section discusses the CSF of SSRM. The literature identifies various CSF of SSRM including supplier selection, supplier segmentation, supplier development, information sharing and trust and supplier monitoring and evaluation (Kayani et al., 2023; Shiralkar et al., 2022; Adesanya et al., 2020).

3.12.4 Supplier Selection

The achievement of SSRM begins with supplier selection because choosing the best supplier from a pool of suppliers is essential to transforming companies from conventional processes to sustainable operations. Kayani et al. (2023) define supplier selection as 'the process by which firms identify, evaluate, and contract with suppliers. Choosing sustainable suppliers has grown in complexity as a concept for supply chain management (Hailiang, Khokhar, Islam and Sharma, 2023). Ebrahim, Niemann and Kotzé (2022) contend that supplier selection is vital to mitigating supply chain risks. In today's competitive world, choosing sustainable suppliers is not just an operational, but also strategic activity as it enables companies to make decisions that optimise costs while improving customer satisfaction and overall competitiveness (Khulud et al., 2023). Supplier selection is a difficult task in the manufacturing sector because the poor selection of a supplier can lead to poor product quality, high costs and decreased supply chain efficiency (Alavi, Tavana and Mina, 2021).

When an organisation wants to achieve sustainable performance, choosing sustainable suppliers is crucial (Giannakis et al., 2020). According to Koc et al. (2023), recent regulations and competitive environment necessitate corporations to adopt sustainable solutions, making sustainable supplier selection a crucial concern for companies. Selecting sustainable suppliers to work with is essential to the effective implementation of sustainable supply chain management (Adesanya et al., 2020). Companies include sustainability in their supplier selection process by taking measures such as considering ISO certification in the selection process. Kayani et al. (2023) describe supplier selection as a complex process as it requires considering many factors that the supplier should meet such as quality, cost, deliver and service level. On the other hand, Adesanya et al. (2020) describe more sustainable criteria; namely, environmental and social criteria, in addition to economic sustainability to be incorporated into the supplier selection process by gathering and assessing data regarding supplier's sustainability performance. This supports the view of Fan and Kang (2023) who state that the selection of suppliers has historically been based on economic factors like price, quality and delivery schedule, but lately, social and environmental issues are

being considered. The manufacturing companies of Botswana should carefully select suppliers to enter long-term relationships by considering the suppliers' ability to meet the organisational performance objectives.

The supplier selection process can be biased if the criteria used are not clearly explained. This research discusses the SSRPO that manufacturing companies need to achieve and these same objectives can be used as part of the criteria for supplier selection. Dania et al. (2023) assert that it is vital to consider all the factors as they are crucial to supplier performance. Though supplier selection has been widely studied the selection criteria based on SSRPO have not been explored. This research attempts to prioritise the SSRPO and be used by manufacturing companies in Botswana as criteria for supplier selection.

3.12.5 Supplier Segmentation

The sustainability of manufacturing companies in terms of economic, social and environmental aspects depends on SSRM. However, it is not all suppliers that require long-term relationship because not every supplier adds value equally. Companies normally maintain relationships with their suppliers who can make a strategic contribution to the business. In order to guarantee that supply chain specialists make the most of their limited resources to manage supplier relationships and create a robust supply chain, supplier segmentation becomes a crucial business strategy (Shiralkar et al., 2022). Supplier segmentation can be defined as a strategic process that evaluates suppliers, identifies approaches and establishes appropriate criteria for different supplier groups, aiming to adopt suitable strategies for each group (Paybarjay, Fallah Lajimi and Hashemkhani Zolfani, 2023). Supplier segmentation is important because different suppliers may require different types of relationships as the characteristics of purchased materials vary. This is in accordance with the Kraljic matrix that divides an organisation's purchases into various categories according to the importance of the materials to the profitability of an organisation and the supply risks involved (Adesanya et al., 2020). Using the Kraljic matrix, purchases are classified into four categories: namely, strategic, bottlenecks, leverage and non-critical purchases. The strategic and bottleneck items need long-term relationship with suppliers because they are high risk items, while for leverage and non-critical items, long-

term relationships are not necessary. The study conducted by Adesanya et al. (2020) revealed that supplier segmentation is essential to guaranteeing supplier performance.

3.12.6 Supplier Development

Supplier development is commonly practiced by manufacturing companies to manage the relationships with their suppliers and achieve the performance objectives. It can be defined as efforts made by the buying company to enhance sustainable supplier performance, thus meet the economic, social and environmental sustainability (Fan and Kang, 2023; Jia, Stevenson and Hendry, 2023). Companies develop supplier development programmes aimed at improving supplier capabilities so that they can meet or surpass the buying organisation's performance objectives (Benton, Prahinski and Fan, 2020). Adesanya et al. (2020) emphasise the importance of supplier development in SSRM and point out the primary activities in supplier development as supplier training programmes, technical and managerial support, giving them incentives aimed at improved performance, as well as fostering competition among suppliers. Similarly, Benton et al. (2020) state that incentives are a means of developing suppliers and explain incentives as a positive reinforcement technique that manufacturing companies can use to encourage suppliers to enhance their performance in line with the particular objectives. The fundamental goal of the supplier development process is to enhance the supplier's performance in order to meet specific requirements (Adesanya et al., 2020). It is more preferable to develop a supplier who is found to be underperforming rather than terminate a contract and move to a different supplier because engaging a different supplier necessitates going through the supplier selection process which can be time consuming. Alagoz et al. (2022) stated that a buying company may prefer to work with current suppliers that have a solid track record rather than new suppliers that do not have a track record that has been demonstrated.

Supplier development is given importance by manufacturing companies because suppliers can influence the performance of manufacturing companies (Du et al., 2023). Whether the supplier has the potential to currently offer valuable resources, it is critical to develop their capacity and performance to support the purchasing

organisation's long-term sustainable objectives (Fan and Kang, 2023). It has been observed that manufacturing companies can improve supplier's performance hence their own performance through initiatives and actions like sharing information, communication and offering personal assistance (Fan and Kang, 2023). Supplier development is an important factor influencing a manufacturing company's competitive advantage as suppliers' capability will be improved (Paybarjay et al., 2023).

3.12.7 Sharing of Information and Trust

Information sharing and trust between the parties is another important requirement for the achievement of SSRM. Research identify knowledge sharing as a source of competitive advantage (Butt et al., 2023). High quality information and communication in a supplier-buyer relationship is viewed as a tool that improves organisational performance (Agarwal and Narayana, 2020). Transparency is a fundamental component of SSCM, which is the process by which businesses proactively tell their stakeholders about goods and procedures that they might not otherwise have access to (Duan et al., 2022). The exchange of knowledge between purchasing and supplying companies is one of the key factors that determines a company's success (Butt, Shah and Ahmad, 2023). Research on the value of information exchange in supplier-buyer relationships found that knowledge sharing among firms decreases uncertainty and leads to an improvement in decision-making (Butt et al., 2023).

3.12.8 Supplier Monitoring and Performance Evaluation

One aspect that has been emphasised as important in the SSRM is supplier performance evaluation which helps manufacturing companies to rate the performance of their suppliers and give them feedback for future improvement. Sustainable supplier monitoring is a method for continuously evaluating suppliers' performance in terms of sustainability (Adesanya et al., 2020). Its importance is providing suppliers with the feedback for evaluation, giving clarity on what the buyer expects and giving direction to suppliers for further improvement (Adesanya et al., 2020). Disruptions to the upstream supply chain, such as shortages of raw materials and delivery delays have a substantial effect on downstream problems.

This necessitates careful supplier performance evaluation for improved performance such as quality maintenance, cost reduction and customer satisfaction (Dania et al., 2023). Continuous measurement and monitoring of suppliers' performance has become increasingly important in improving the overall performance of the supply chain as a result of companies' growing reliance on their suppliers (Alagoz et al., 2022). Where a manufacturing company wants to stimulate competition among suppliers for the purpose of improving performance, they may add new suppliers to their supply base.

3.13 CHAPTER SUMMARY

The success of the manufacturing industry is highly dependent on the suppliers of their key items; the raw materials, not ignoring the suppliers of major supporting items including machinery and spare parts. Therefore, working with suppliers by setting objectives which are intended to be achieved from the relationship and determining how these objectives can be achieved is of vital importance. This chapter presented the literature review of the SSRPO of the manufacturing sector in Botswana. The nine SSRPO were identified as economic sustainability, social sustainability, environmental sustainability, improving quality, reducing supply chain costs, delivery performance, supply chain innovation, value creation and supply chain risk reduction. The sub-objectives of each of these objectives were also identified. It further discussed how each of the objectives can be achieved by manufacturing companies and the contribution that the sector makes to the economic, social and environmental sustainability of Botswana were discussed.

The economic sustainability of the manufacturing sector of Botswana was discussed together with its sub-objectives or CSF, which are supplier collaboration, supply chain technology investment, supporting suppliers and inventory management. This was followed by a discussion of social sustainability in the supply chain of Botswana's manufacturing sector and its CSF, which are improved working conditions, ethical sourcing and community engagement. The environmental issues in the manufacturing sector of Botswana were identified as greenhouse gas emissions, air and water pollution, waste management and energy consumption, followed by an identification of the sub-objectives of environmental sustainability and these are GSCM, waste management and

sustainable packaging. The chapter further presented the supply chain cost management and identified the elements that make up the supply chain costs as distribution, production, procurement, reverse logistics and inventory costs. This was followed by a discussion of delivery performance together with how the manufacturing companies can measure suppliers' delivery performance such as on-time delivery, reliable delivery, order fulfilment, time flexibility and lead time.

Moreover, the factors enhancing supply chain innovation were identified as research and design, production processes innovation, technology innovation and new product development, followed by discussing how value can be created through brand image, cost saving, customer care and product diversity. The chapter ended with discussing the SCRM approaches and strategies including paying attention to supplier selection and segmentation, sharing information and trust and monitoring and evaluating suppliers' performance. The next chapter examines the theoretical framework used in the study of the SSRPO among manufacturing companies in Botswana.

CHAPTER 4

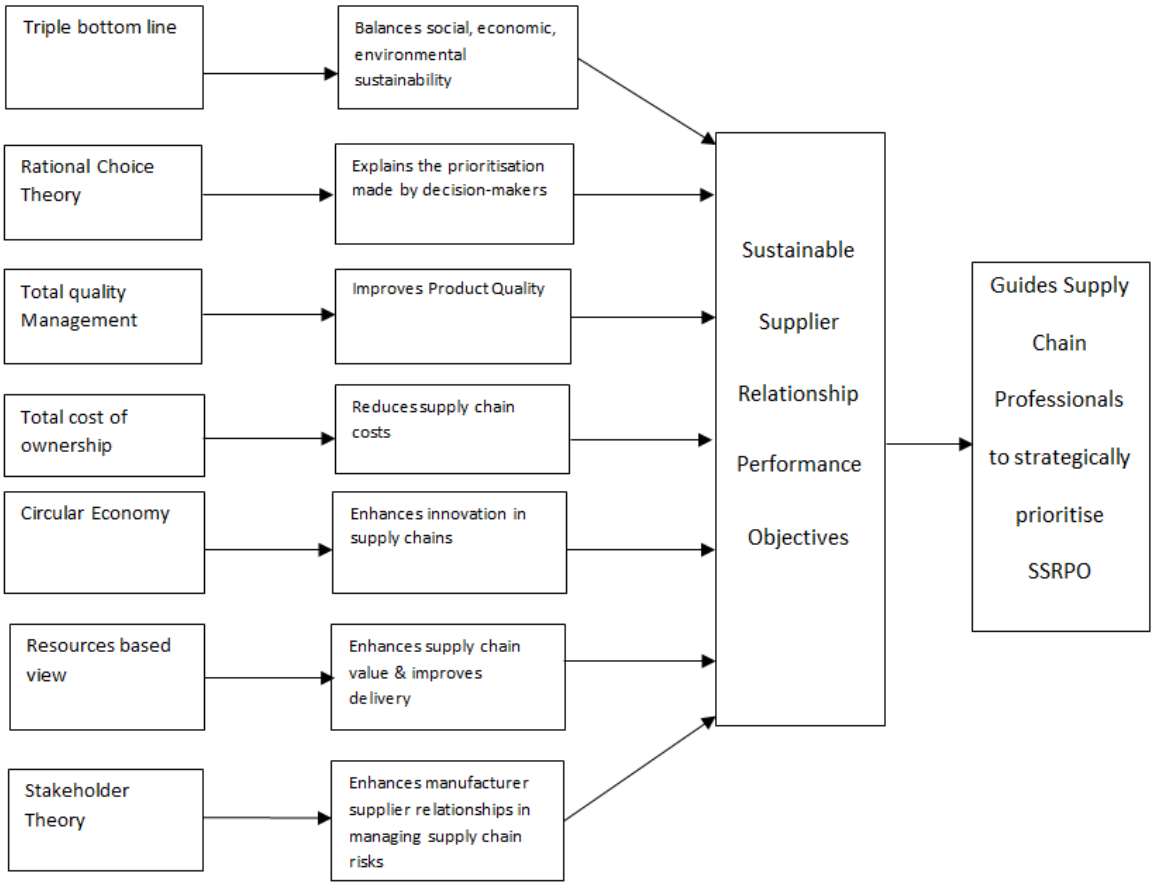
THEORETICAL FRAMEWORK

4.1 INTRODUCTION

A theory is a planned system of recognised knowledge that is used in different ways to explain a certain set of phenomena and forecast the features of an imperceptible phenomena (Bordens and Abbott, 2022). Since theories aid the explanation of phenomena, they are crucial for carrying out research, thus suitable theories should be applied to studies. It is important to note that the researcher's choice of a suitable theory depends upon fully understanding the research problem and questions, its purpose and significance (Grant and Osanloo, 2014). Therefore, for this to happen, the researcher should align the research problems, questions, purpose and significance of the study.

For this research the theories were determined as crucial for directing the investigation in the study. The theories chosen for this study helped to better understand sustainability in the supply chain and analyse the performance objectives of SSRM that led to the formulation of a framework for manufacturing companies in Botswana. This chapter covers the theories that were identified to be relevant for directing the investigation. There are various theories and principles which companies use to improve relationships with their suppliers, thus, enhance performance and gain competitive advantage. Asikhia, Osinowo and Kassim (2021) emphasised that when a combination of theories is used in a study, they do not compete with each other but rather complement each other. The main theory underpinning this study is the Triple Bottom-Line (TBL) theory supported by six sub-theories; namely, Rational Choice Theory (RCT), Total Quality Management (TQM), Total Cost of Ownership (TCO), Circular Economy (CE), Resource-Based View (RBV) and Stakeholder theory (ST). A theoretical framework that represents the TBL theory and the six sub-theories was developed. This is shown in Figure 4.1. It clearly shows all the seven theories and how each theory contributes to the study of the SSRPO, thus guiding their prioritisation.

Figure 4. 1: Theoretical framework for SSRPO



Source: Researcher's own draft, 2025

4.2 THE TRIPLE BOTTOM LINE

The most widely used theory for analysing sustainability in recent years is the Triple Bottom-Line (TBL), which was proposed by John Elkington with the aim of measuring organisational performance not only from a financial perspective, but also its impact on the environment and society (Elkington, 1998). The TBL theory has been acknowledged by the research community as a critical and comprehensive lens for dealing with sustainability issues (Aytac, Bautista-Puig, Orduña-Malea and Tran, 2023). The conventional way of measuring a company's performance is through financial (economic) reporting. In recent years the promotion of sustainability has forced companies to pay attention to non-financial measures in addition to financial measures, thus the TBL theory has become more useful. Therefore, the TBL theory was used for this research to assess how manufacturing companies in Botswana can achieve economic, environmental and

social objectives in collaboration with their suppliers by prioritising the dimensions of sustainability; economic, social and environmental and determining the most important one. Since its introduction, the theory has gained popularity and has reached its peak in sustainability due to the increasing pressure for social and environmental compliance from the stakeholders (Loviscek, 2021).

The TBL framework helps companies to measure their performance from three dimensions; economic, social and environment. It is based on the three pillars of sustainable development; namely, economic, environmental and social sustainability as introduced by the United Nations with the objective of enhancing security of people and the environment (Wiebe et al., 2023; Loviscek, 2021). The three dimensions are sometimes referred to as profit (standing for economic), people (standing for social) and planet (standing for environment). For the purpose of this research the terms; economic, social and environment are used. The words profit, people and planet may be used where they suit the point being addressed.

The TBL theory holds the view that for a company to survive, it must give attention to meeting the community welfare and actively contribute to conserving the environment as it makes profit (Pandiangan, Oktafiani, Panjaitan, Shifa and Jefri, 2022). The supply chain of manufacturing companies makes a high impact on sustainability by promoting practices that are directed towards boosting economic, social and environmental sustainability, such as anti-corruption practices, environmental advancement and fair labour practices. However, this is discouraged by the United Nations who regards the supply chain practices as the greatest obstacle to sustainability performance improvement because of the size and complexity of many supply chains (UN Global Compact, 2018).

Using the TBL, Zhuang et al. (2023) examined the firm's performance in terms of economic, social and environmental sustainability. While Yip, Zhou and To (2023) analysed the TBL of sustainable manufacturing and found that the three sustainability dimensions were not balanced as social sustainability was given more emphasis than economic and environmental dimensions. Furthermore, a study conducted by Adwiyah et al. (2023) on the implementation of SSCM in relation to the TBL revealed that the combination of SSCM and the TBL can lead

to long term sustainability of a company. The TBL framework is important for manufacturing companies as it helps them consider the environmental and social concerns of sustainability in their supply chains in addition to economic sustainability. Some businesses that may be profitable and making high returns on investment may cause harm to the environment in the process of manufacturing their products or the business activities as a whole. The use of the TBL theory is increasing among manufacturing companies as they are expected to meet social and environmental requirements in order to contribute to the United Nation's 17 Sustainable Development Goals (SDGs) (Heim, Vigneau and Kalyuzhnova, 2023). Traditionally, the supply chain management's objective was to reduce costs and improve delivery without concern for environmental impact, but pressure from the external stakeholders has forced supply chain management professionals to take into account environmental dimensions in their supply chains (Saini et al., 2023).

Scholars have different perceptions of the reason sustainability has become popular in companies. According to Zhuang et al. (2023), the cause for increased sustainability among companies is customer awareness, increased regulations and competitive pressure. Similarly, Yadav et al. (2023) allude to the increase in sustainability to market and regulatory pressure. While Saini et al. (2023) state that companies are encouraged to adopt the TBL framework to enhance sustainability by regarding people, profit and the planet as key factors to economic and social achievement, the TBL enables companies to view sustainability from three dimensions, which are the economic benefits, social requirements and its impact on the environment (Aytac et al., 2023). As companies spread globally in pursuit of gaining competitive advantage and having a wide chain of stakeholders, they have more social and environmental responsibilities hence the need to use the TBL in measuring their performance.

The adoption of the TBL theory should be extended to a company's suppliers to accomplish sustainability goals. Thus, factors that can enhance sustainability in all the three dimensions of the supply chain of the manufacturing sector of Botswana have been identified through a literature review. Economic sustainability factors identified include supplier collaboration (Aditi et al., 2024; Afraz et al., 2021), investing in supply chain technology (Adama, Popoola, Okeke & Akinoso 2024;

Wang, Zou and Geng 2021), supporting suppliers (Hoque, 2022) and inventory management (Alam, Thakur and Islam, 2024; Munyaka and Yadavalli, 2022). When it comes to the social sustainability aspect, manufacturing companies can adopt various practices including fair working conditions (Kumari and Singh, 2023; People and Global Business Association and Duong, 2022), ethical sourcing (Kumari and Singh, 2023; Razzak, 2023) and community engagement (Rathore, 2023; Padilla-Lozano and Collazzo, 2022). Lastly, environmental sustainability can be enhanced by manufacturing companies through practices such as green supply chain management (Sheng et al., 2023; Amoako et al., 2020), waste management (Nandy et al., 2022) and sustainable packaging (Bradley and Corsini, 2023; Meherishi et al., 2019).

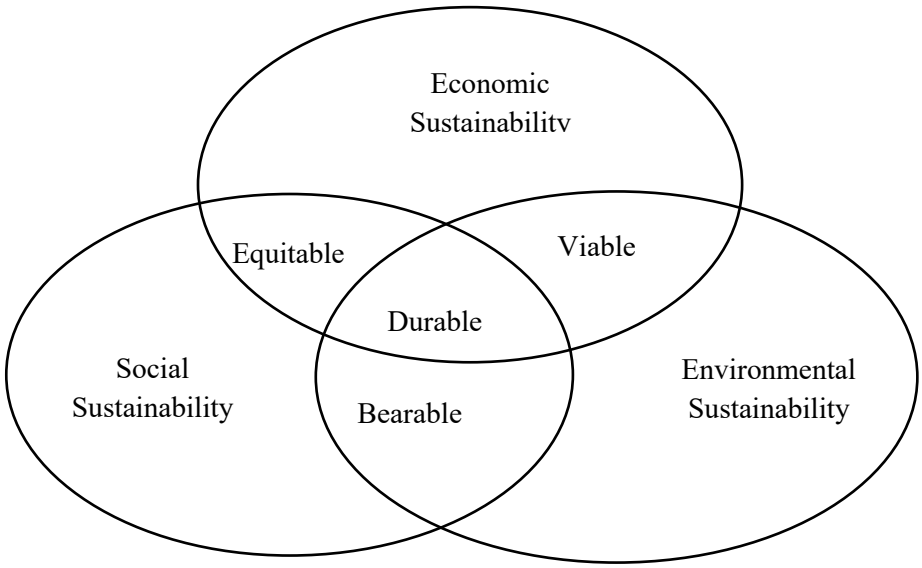
As the TBL framework emphasises the observation of economic, social and environmental sustainability by manufacturing companies, it is important to select the right suppliers who can enable a company to produce environmentally friendly products and thus achieve its performance objectives. Rashidi, Noorizadeh, Kannan and Cullinane (2020) assert that supplier selection is one of the most critical tasks in supply chain as suppliers have a vital influence on the performance of a company. Similarly, Huma et al. (2023) urge companies to develop supply chain partnerships as they help businesses improve the quality of their products and the processes. Many companies require their suppliers to improve their sustainability or else the company will move to suppliers who can meet these requirements. Previous studies on supplier relationship management that used the TBL include Huma et al. (2023) who studied the impact of supply chain quality integration on a firm's sustainable performance, and Adwiyah et al. (2023) who used TBL to examine the sustainable supply chain management performance in the palm oil industry.

To show the relationship between economic sustainability, social sustainability and environmental sustainability, the author of this study adopts the sustainability Venn diagram as shown in Figure 4.1 below. The diagram illustrates that the achievement of economic and environmental sustainability gives viable outcomes, while a combination of economic and social sustainability leads to equitable results. A combination of social and environmental sustainability gives bearable

outcomes. True sustainability can only be achieved by combining all the three dimensions of sustainability and this is shown in the diagram as an inter-section set of all the three dimensions and described as ‘durable’.

Manufacturing companies should use the TBL framework as a tool for measuring company performance towards the three aspects of life; namely, economic, social and environmental sustainability. The TBL theory was used for this study as a foundation to illustrate the sustainability objectives incorporated in the SSRPO and develop a framework. Although there has been a lot of research on economic sustainability, social sustainability and environmental sustainability combining them in a study is more vital (Kraus et al., 2020). Therefore, the TBL theory provides the foundational structure for the three sustainability objectives (economic, social, environmental) and demands that they be evaluated not in isolation but as an integrated whole.

Figure 4. 2: The three pillars of sustainability



Adapted from: CIPS: 2019: Socially Responsible Procurement Study Guide

4.3 THE RATIONAL CHOICE THEORY

The Rational Choice Theory (RCT) has been widely used in microeconomics to explain how humans make decisions when they are faced with many options (Ardyan, Kurniawan, Istiatin and Luhgiatno, 2021). The essential idea of the RCT is that people go through a cognitive process in which they assess the likely

benefits and drawbacks of every available option before making a decision (Małecka, Mitręga and Pfajfar, 2024). The theory was used for the current research to study the different objectives of the SSRM among manufacturing companies in Botswana and to determine how the supply chain professionals make decisions regarding the prioritisation of these objectives. As posited by the RCT, supply chain professionals make decisions based on the logical examination of the benefits that would arise from each available option and its associated costs so that they can attain the outcomes that they trust will maximise their company objectives. Achmad and Asis (2025) emphasised that these decisions made by the supply chain professionals are defined by rationality because the actions they take are linked to the expected outcomes.

Thus, the theory was chosen for this study because it helped the researcher to study the prioritisation of the SSRPO by manufacturing companies' professionals. RCT was relevant to the SSRPO decision framework development because supply chain professionals in the manufacturing sector make logical choices among the various objectives of SSRM. According to Kao (2014), decisions made by people are based on options they expect to increase their profits or gains and reduce the losses and costs. Similarly, Ejigu, Siponen and Muluneh (2021) emphasised that decisions made by people are those that enable them to attain their objectives and increase their benefits as assumed by the RCT. The RCT is based on the idea that individuals are logical and make choices grounded on what they know and think is the best way of accomplishing their goals (Gichuhi, 2022). Since the current study used the BWM, an MCDM method, the RCT served as the theoretical foundation to help with explaining why decision makers in the manufacturing sector of Botswana prioritised the SSRPO the way they did. It helped to determine why decision makers in the supply chains of Botswana's manufacturing sector ranked some SSRPO highly compared to others.

The RCT has been used for various studies in supply chain that involved decision-making where many options were available. For example; Achmad and Asis (2025) used the RCT in their study on the impact of supplier selection and monitoring to explain why and how procurement professionals select vendors when procuring products and services, while Gichuhi (2022) used it in their study

for the determination of the effects of supply chain management training on milk production among smallholder dairy farmers in Kenya. The RCT was also used by Sengupta and Amarjeet (2023) to study the role of human behaviour in supply chain management and also the study by Małecka et al. (2024) employed the RCT to determine the beliefs that might potentially influence customer attitudes in relation to collaboration consumption. The current study analysed the prioritisation of SSRPO by manufacturing companies in Botswana using the RCT as the basis since this theoretical model was suitable for the study. The principle of RCT enables the decision maker to make decisions under certainty; thus, the decision-maker comprehends all available options and the benefits that would arise from each of the options. The decision-maker should understand all the criteria for decision-making (Asikhia, Osinowo and Kassim, 2021). People in the supply chain endeavour to attain their objectives by acting logically based on their familiarity, resources and circumstances.

4.4 TOTAL QUALITY MANAGEMENT

Total Quality Management (TQM) is a widely used theory in the manufacturing sector to improve the quality of products and services. It is a common strategy among manufacturing companies to achieve high-quality products while reducing quality related costs and raising customer satisfaction (Ghunaim and Jaaron, 2022). Its use has increased due to the increase in competition; thus, companies strive to gain a competitive advantage by improving the quality of their products and services and delivery. TQM can be defined as a strategy that involves the overall organisation from top management to operational staff, suppliers and customers, centering on the continuous enhancement of the quality of products considering customer requirements and expectations as a benchmark (Benzaquen and Narro, 2023). CIPS (2023) defines TQM as ‘a continuous improvement in quality, efficiency and effectiveness’. The TQM philosophy, which managers aim to establish in the workplace, enables businesses to generate high quality products by combining a performance system with continuous improvement (Ghunaim and Jaaron, 2022). Abbas (2020) recommend the implementation of TQM in the manufacturing sector as it helps to achieve sustainable performance leading to competitive advantage.

TQM was first introduced in the 1950s and places a strong emphasis on staff involvement in all operations of a company, customer focus and continuous improvement (Martínez-Lorente et al., 1998). It is applied at all levels and functions of a company and requires commitment and support by senior management. Companies extend this theory to suppliers to improve the quality of the items bought by building long term relationships with them. According to Hoque and Maalouf (2022), maintaining a close relationship with a supplier is paramount to making sustainable quality improvements. TQM places a strong focus on supply chain thinking, which is collaborating with suppliers to raise quality throughout the supply chain (CIPS, 2023). It provides companies with the tools and techniques of improving quality of the products and services, enabling them to create competitive goods at low cost and deliver them on schedule and with high quality (Albloushi, Alharmoodi, Jabeen, Mehmood and Farouk, 2023). TQM focuses on customer satisfaction, at the same time focusing on continuous improvement (Ho et al., 2023). A study by Abbas (2020) revealed that the implementation of TQM significantly enhances capability by companies to achieve business sustainability objectives.

The TQM theory was used for this study to facilitate the formulation of a framework by determining and prioritising the features of quality and take it as an objective of SSRM. Riaz et al. (2023) emphasise the key objective of TQM theory as a team approach to meeting quality requirements by explaining the meaning of the three words in the title as: ‘total’ refers to consideration of everyone, ‘quality’ refers to meeting customer demands and ‘management’ refers to commitment from everyone. Thus, it is not an isolated process but a team approach that involves everyone in a company and support by management to meet quality requirements. The TQM philosophy has already incorporated the aspects of supplier management relationships, such as information sharing, mutual dependence, building long-term and trustworthy relationships with suppliers and commitment (Pellegrino et al., 2020).

The goal of TQM is the long-term success of a company through continuous improvement of performance and quality to meet or surpass client expectations (Benzaquen and Narro, 2023). Ho et al. (2023) reports that the study of quality

has evolved, from product quality to total quality management. Similarly, Berger et al. (2023) state that quality issues can be controlled through the use of TQM. The theory is used for the current study to determine how manufacturing companies can involve suppliers to analyse the identified characteristics of quality and these are product performance (Rajasa et al., 2023; Lysons and Farrington, 2016), product features (Rajasa et al., 2023; Lysons and Farrington, 2016), conformance (BOBS, 2024), durability (Lysons and Farrington, 2016), serviceability (Lysons and Farrington, 2016), aesthetics (Rajasa et al., 2023) and perceived quality (Rajasa et al., 2023).

Since TQM encourages customer satisfaction by delivering better products, processes and services through continuous improvement to achieve competitive advantage, it has become a common business strategy in many top manufacturing companies (Shuaib and He, 2023). Contrary to the traditional quality management practices that involve defect detection in the supply chain and taking corrective measures, the TQM concept requires manufacturing companies to put control measures in the system that prevent defects from occurring in the supply chain process and maintain high standards of quality. To achieve this, TQM is used to execute SRM activities such as information exchange, building enduring and trustworthy relationships with suppliers, mutual reliance and commitment (Pellegrino et al., 2020).

TQM plays a critical role in manufacturing companies' sustainability as it enhances their ability to meet sustainability from all the three dimensions; economic, social and environmental. This system has the capacity to improve individual performance in addition to the organisation's performance (Abbas, 2020). In this way, it is meeting the social sustainability criteria that requires boosting employees at the same time meeting the economic sustainability goals of an organisation by improving its financial performance and as it is aimed at achieving long term success of an organisation (Ho et al., 2023). Not only does TQM enhance economic and social sustainability, but also through its use manufacturing companies can be able to meet the environmental sustainability requirements as TQM is thought to be an environmentally friendly system because it aims to reduce waste by efficiently utilising resources (Abbas, 2020).

4.5 TOTAL COST OF OWNERSHIP THEORY

The Total Cost of Ownership (TCO) theory is a method for examining the costs relating to procurement and owning a particular product over the course of its full lifecycle, including acquisition, use, maintenance and disposal (Heimes et al., 2023; Lyu, Pons and Zhang, 2023; Saccani, Perona and Bacchetti, 2017). Companies use it to calculate the total costs of purchasing and owning a product, including procurement, transportation, operating, maintenance and disposal costs, making it a helpful tool for sourcing decisions. CIPS (2023) categorises the TCO into four groups as procurement costs, transportation costs, usage costs and end of life costs. This tool is most appropriate to companies that produce products which continue incurring costs after transferring the product to customers, such as electrical appliances and motor vehicles. The TCO assists a company in selecting its sourcing strategy by calculating all the costs associated with a procurement relationship. Shabani et al. (2019) warns that manufacturing companies should be cautious when evaluating suppliers' prices because lower prices may be an indication of lower quality products or services and may lead to higher supply chain costs in the long-run. Thus, the TCO should be determined as it includes direct and indirect supply chain costs.

The TCO is centred on the iceberg theory which states that a company cannot see all costs involved in a product as some are hidden in the iceberg and the price quoted by a supplier is just a fraction of the total cost to be incurred on a product. Hidden costs may include environmental impact, social impact and economic impact. Farmer, Crocker and Jessop (CIPS, 2023:11) gave examples of hidden costs such as logistics and handling costs, re-work, stock costs, delay, inspection, training and support, consumables and customer service.

As manufacturing companies form contracts with suppliers, the TCO model can be used to determine all costs involved in the relationships. It should be noted that it is not all costs that can be seen from the onset of the contract as other costs are hidden and will reveal themselves once the contract progresses. Therefore, the TCO model is useful as it helps to determine costs and unearth the hidden ones. According to CIPS (2023), TCO aids supply chain professionals in calculating the total cost of producing a product or rendering a service, taking into account all

non-value-adding procedures, as well as the costs associated with disposing of scrap or other wastes.

The TCO was selected for this research to help with determining the overall costs, direct and indirect that are involved in a supplier relationship management by considering all activities undertaken by a company in a supplier relationship management (Visani et al., 2016). Thus, the TCO was used for this study to analyse supply chain costs identified through the literature review as distribution costs (Erboz and Yumurtacı Hüseyinoğlu, 2023), production costs (Erboz and Yumurtacı Hüseyinoğlu, 2023; Moritz et al., 2023), procurement costs (Abdelraheem, 2024), reverse logistics (Rushton et al., 2014) and inventory costs (Alam et al., 2024; Rushton et al., 2014). Furthermore, the TCO was used for this research to help with prioritising the costs involved in supply chain management.

4.6 CIRCULAR ECONOMY THEORY

The Circular Economy (CE) Theory promotes the reduction of waste by encouraging reusing, refurbishing and recycling of current materials and products. This prolongs the life cycle of a product, while keeping products in the company whose life cycles are unable to be prolonged to be used for other production. Thus, a product will remain in the economy for a long time. Hazen, Russo, Confente and Pellathy (2021) state that circular economy is used to re-engineer a product's production process by designing a long-lasting product which takes into account its maintenance, reuse, recycle, repair, refurbishment and re-manufacture.

The circular economy seeks to minimize the amount of natural resources, pollution produced and waste generated in order to recover resources and promote sustainability and continuous economic growth (Kumar, Sezersan, Garza-Reyes, Gonzalez and AL-Shboul, 2019). Notwithstanding the advantages associated with CE strategies as it enhances sustainability by reducing the environmental impact and economic growth, it is not always that the intended outcomes would be achieved as it may have a rebound effect due to the fact that it creates new flows of resources, thus producing more emissions and waste (Castro, Trevisan, Pigosso and Mascarenhas, 2022).

A CE strategy encompasses practical actions, spreading beyond material recirculation to embrace innovation, consumption and human behaviour, putting emphasis on social and cultural aspects (Castro et al., 2022). A product's production process can be redesigned using the circular economy by creating a long-lasting product that considers maintenance, reuse, recycling, repair, refurbishment and remanufacture (Hazen et al., 2021). According to Kumar et al. (2019), there is a low level of public awareness of circular economy accompanied by a lack of suitable partners in supply chains which limit the collaboration between companies. There is need for SSRM between Botswana's manufacturing companies and their suppliers to enhance supply chain innovation. Thus, the CE theory was used for this research to assess the extent to which manufacturing companies can collaborate with their suppliers to foster innovation in the supply chain by proposing measures such as improving research and design, production processes, new product development and using technology in the supply chain. For a circular economy to result in improved environmental, social and economic outcomes, economic activity and environmental well-being must be integrated (Malhotra, 2023).

The United Nations (2023) mandates countries to make the shift to circular economy by designing products that are durable, repairable and recyclable. They also encourage practices like product reuse, refurbishing and recycling to reduce waste and resource depletion. The circular economy is essential to the manufacturing sector because it can help businesses reduce, reuse and recycle their waste, which increases their economic sustainability and adds value to their operations (Fobbe and Hilletofth, 2023; Prabhu and Majhi, 2023; Yin et al., 2023). The SCM can support the implementation of CE by eliminating waste and enhancing the use of materials and goods, regenerating natural systems aimed at decoupling economic activities from using limited resources, for example, carbon-based energy. A study undertaken by Malhotra (2023) revealed that the implementation of circular economy has a positive effect on the manufacturing companies' sustainable supply chain performance. Remanufacturing, a key sustainable practice, contributes to cleaner production, CE and the sustainable development goals by retaining product value and creating local jobs (Tondolo, Paiva, Tondolo and Santos, 2023). Re-manufacturing, a key sustainable practice,

contributes to cleaner production, CE and the SDGs by retaining product value and creating local jobs.

4.7 RESOURCE-BASED VIEW THEORY

The Resource-Based View (RBV) theory is used to determine a company's resources which are critical for achieving competitive advantage. Since raw materials are critical for manufacturing companies, suppliers are important resources because manufacturing companies depend on them for their raw materials. Kim, Lee and Hwang (2020) state that manufacturing companies depend on suppliers for their resources in terms of raw materials, thus they are a major contributor towards the operation of a company by providing materials and services that are required for the smooth running of the business. To maximise the value of these suppliers, manufacturing companies should source from suppliers whose resources in terms of technology, expertise and capacity align with a company's strategic needs. The advancement of sustainability goals has drawn increased attention to the RBV theory in the manufacturing industry (Albloushi et al., 2023).

Companies struggle to achieve a sustainable competitive advantage in modern business environments, but alliances and joint ventures allow companies to access knowledge and resources from partners, which enable companies with little resources to acquire resources from business partners and this is resource dependency (Kim et al., 2020). Manufacturing companies can collaborate with their suppliers to improve their products, thus gain competitive advantage. According to Barney, Ketchen and Wright (2021), a company can have sustained competitive advantage when competitors struggle to reach the level of value that the focal company has created. When resources help a company develop or implement strategies that increase its efficacy and efficiency, they are valuable (Shehzad et al., 2023).

It is argued that the RBV suggests that intangible resources like effective supply chain management may be a more powerful source of competitive advantage than tangible resources (Razzak, 2023). The RBV theory was used for the current study to explain how suppliers can add value to manufacturing companies.

Moreover, it helps to determine the strategic resources a manufacturing company can make use of to gain sustainable competitive advantage. The RBV is the most well-known theory that offers a solid foundation for identifying various resources and examining their roles in organisational performance (Bhatti et al., 2023). Therefore, the RBV guides the analysis of how suppliers, as strategic resources, contribute to value creation and innovation, providing a sustained competitive advantage.

4.8 STAKEHOLDER THEORY

Stakeholders are groups and individuals that are interested in a company's operations and results and who a company depends on to meet its goals (Freeman and Mcvea, 2001). With the stakeholder theory (ST), companies consider the interests of all stakeholders when making decisions, not just the interests of shareholders as stated by the traditional shareholder theory whose emphasis is to increase shareholders' wealth and posits that 'only money matters' to a business (Freeman, Phillips and Sisodia, 2020). To be sustainable, a company should collaborate with its stakeholders, including customers, employees and suppliers. When applied to SRM, the ST suggests that the development of long term relationship with suppliers can help a company to improve its stakeholder value. Oliveira et al. (2023) point out that stakeholders can help by creating policies, assessing, monitoring and identifying opportunities to make improvements to a supply chain. The ST is applicable to SCRM where a company needs to work closely with its suppliers to mitigate supply chain risks. As stated by Ojijo et al. (2023) ST examines how a company functions and how its interactions with its stakeholders impacts its operations.

The rationale behind using the ST for this research was to help the researcher determine the key SCR that can be mitigated through effective SRM and use them to develop a framework. Thus, the researcher was able to identify various stakeholders in the supply chain of manufacturing companies of Botswana hence determine and understand their interests so that supply chain risks can be identified and mitigated. These supply chain risks were then prioritised to determine the most important ones. Having conversations with stakeholders help to determine how various stakeholders identify and manage risks. Using the ST,

various stakeholders of manufacturing companies were identified, of which suppliers were identified as the key stakeholders in the process of managing supply chain risks.

The ST was used by Ojijo et al. (2023) to study how businesses can relate with stakeholders in environmental sustainability and found that businesses should establish mutual respect with their stakeholders to motivate them to take pride in environmental protection. Similarly, Bello-Pintado, Machuca and Danese (2023) propose the use of stakeholder approach in the study of sustainability management given the widespread concern for the environment and since it has been observed that few manufacturing companies have adopted sustainability. There are various studies conducted on SCRM that used the ST. Oliveira et al. (2023) used the ST to study the role of stakeholders in SCRM and found that stakeholders are helpful in risk mitigation. Another study that used the ST was conducted by Cantor, Blackhurst, Pan and Crum (2014) to examine the role of stakeholder pressure on a company and found that stakeholders put pressure on companies to reduce risk.

In this study, the focus is on the role that suppliers can play in manufacturing companies' SCRM. The ST can help manufacturing companies to link SRM to SCRM. If manufacturing companies can integrate their risk management systems with their suppliers, they can be able to identify risks that can be mitigated by suppliers. According to Oliveira et al. (2023), ST is helpful in SCRM because it helps to identify the various needs, responsibilities and duties of stakeholders, making it easier to decide what actions they should take to reduce risk. Therefore, this theory underpins the social sustainability and SCRM objectives, emphasizing that managing relationships with key stakeholders (like suppliers) is essential for long-term viability.

4.9 CHAPTER SUMMARY

Chapter 4 discussed the theories that underpinned the study of the performance objectives of the relationship that manufacturing companies develop with their suppliers. The TBL was used to study the three aspects of sustainability; namely, economic, social and environmental and how suppliers and buyers could

collaborate to enhance sustainability. Secondly, the RCT was adopted to help with giving an explanation on how decision makers in the manufacturing sector of Botswana evaluate and prioritise the SSRPO, while the TQM was identified as a tool that could be used to study how manufacturing companies in Botswana can improve the quality of their products through SSRM. Furthermore, the literature review helped identify TCO as a tool for studying how manufacturing companies could collaborate with their suppliers to reduce supply chain costs. The CE theory was used to study how supply chain innovation by manufacturing companies in collaborations with their suppliers.

Moreover, the RBV theory was adopted to study how manufacturing companies in Botswana can collaborate with their suppliers to enhance supply chain value in the supply chains of manufacturing companies in Botswana and improve delivery performance. Finally, the stakeholder theory was adopted for the study of SCRM. The research was motivated by the research gap existing in the manufacturing industry due to a lack of a framework that can be used by supply chain professionals to determine the most important SSRPO, thus making decisions. Thus, the above theories were used to determine the most sustained SSRPO among manufacturing companies in Botswana. The next chapter provides an overview of the research methodology employed in the current study.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 INTRODUCTION

Research methodology is the process by which researchers explain and describe how their work is carried out in predicting phenomena (Lavanya, Vidhya, Annlet, Premila and Lawrence, 2023). It is important to distinguish research methodology from research methods as the research methods are the techniques used in the process of research (Verma, Verma and Abhishek, 2024), while research methodology is broader. According to Leavy (2022), research methodology is a combination of research theories and methods. Thus, research methodology is a comprehensive term used to discuss the approaches and procedures used in a well-planned study that is aimed at achieving a specific outcome (Khatri, 2020). It involves a range of steps that researchers follow when undertaking studies. Therefore, it can be said that a research methodology is a path that a researcher follows to arrive at a solution to the problem. The researcher needs to choose a suitable research methodology for carrying out a study. According to Alturki (2021), selecting a research methodology is one of the most difficult and confusing activities in the research process that most of the researchers face because each research requires its own way of collecting and analysing data.

The purpose of this chapter is to discuss the research methodology which was employed in the study to determine the most sustained supplier relationship performance objectives among manufacturing companies in Botswana. It gave the researcher an opportunity to posit a detailed explanation of the process that was undertaken in conducting the research. The research exercise involved collecting a sample of data from the research population; manufacturing companies in Botswana, analysing it and interpreting it to provide information for formulating a framework that could be used for decision-making by supply chain professionals in Botswana. The chapter starts by outlining the research philosophy that shaped the design and implementation of the research investigation. Furthermore, the chapter discusses the research approach taken, the research design and the research strategy.

5.2 RESEARCH DESIGN

Research design is the rationale and logical plan that the researcher prepares to guide a research study, outlining the goals of the study, the methodology and approaches to be adopted (Leavy, 2022). There are many research methodologies that are used by researchers and the type chosen depends upon the type of research to be undertaken. To this research the research onion framework was used to guide the researcher with developing a research design. A research onion, introduced by Saunders et al. (2019) is commonly used in research design to describe the range of steps followed by researchers when undertaking research studies. Mardiana (2020) recommend that researchers must make use of the research onion framework to guide them on creating a research design. The framework comprises of different layers, with each layer focusing on different aspects of the study, illustrating the range of paradigms, approaches and decisions that researchers make when conducting their research (Alturki, 2021). The six layers covered by the research onion are determining the research philosophy, research approach, methodical choices, research strategy, time horizon and techniques and procedures used by the researcher.

5.3 RESEARCH PHILOSOPHY

As displayed by the research onion, research philosophy is the beginning of the whole research process. It comprises of various research philosophies that can be adopted by researchers. According to Saunders et al. (2019), a research philosophy is a set of presumptions and beliefs regarding the advancement of knowledge. Leavy (2017) states that there is a variety of beliefs that influence research practice, including views on the nature of the social world, what can be learnt about social life, how research should be conducted, who is qualified to be a knower, what kind of knowledge is valued and how people can learn new things. Research philosophy includes the fundamental ideas that influence the design and implementation of a research investigation and various research philosophies provide diverse viewpoints on understanding research (Hackfort and Schinke, 2020). It is vital to understand research philosophy because it shapes the research approach and guides the researcher on the perception of knowledge. Khatri (2020) states that research philosophy provides guidance to the researcher,

including choosing the research problem, development of research questions, identifying the types and nature of reality, knowledge, methodology and the value of research work. All stages of the research involve making assumptions, whether the researcher is aware of it or not. This is consistent with Khatri (2020)'s view who stated that every research undertaken should be based on certain fundamental philosophical assumptions relating to the nature of legitimate research. While many scholars classify the assumptions made in research into two categories; namely, ontology and epistemology (Ahuja and Baishya, 2024; Saliya, 2023; Easterby-Smith, Jaspersen, Thorpe and Valizade, 2021; Tavares and Dias, 2020), some researchers include a third assumption as axiology (Saunders et al., 2019), while Ahuja and Baishya (2024) included a fourth assumption as metaphysics. This research discusses the three assumptions; ontology, epistemology and axiology, which are commonly used in management science research.

The first category of research assumptions is ontology. It is a theory of reality because it deals with the philosophical assumption of the nature of reality or issues of existence (Ahuja and Baishya, 2024; Khatri, 2020). It is about how authentic the data gathered is and how its existence can be understood. Hayati and Dalimunthe (2022) define ontology as the study that focuses on the parameters of the scope used to investigate and interpret the nature of reality or the existence of something. The ontological assumption occurs when assumptions made relate to the realities a researcher encounters and how existence can be understood by a researcher (Saliya, 2023).

Moreover, it is a framework for classifying information about a particular area of reality (Flak, 2023). As Saliya (2023) states ontology relates to a fundamental question of whether or not social entities must be viewed as subjective or objective. In research, ontology is used to describe how the researcher comes to know something; that is, how they come to know reality or truth (Khatri, 2020). To emphasise the importance of ontology in knowledge creation, Flak (2023) states that a correctly constructed ontology serves as the basis for developing knowledge on a specific subject and illustrates the relationship between phenomena represented by concepts with clearly defined meanings. The ontology assumption

requires researchers to clearly explain their position regarding reality and truth. Similar to how research in social sciences involves assumptions, research in management sciences is also based on assumptions. The current research examines the possibility of implementing SSRPO in real life. Thus, the researcher proves the ontology of manufacturing companies working with suppliers to achieve the SSRPO.

The second assumption is epistemology, which relates to the field of knowledge, including the condition, kinds, nature, source and the desire for knowledge (Ahuja and Baishya, 2024). It is a philosophical belief on how research is carried out and what is considered as knowledge. According to Hayati and Dalimunthe (2022), the term epistemology denotes the branch of philosophy that examines the origins and the validity of science. The epistemology assumptions are those related to human knowledge or what makes knowledge to be valid, whether it is knowable and how a researcher can obtain and transfer it (Saliya, 2023). Similarly, Khatri (2020) contends that epistemology addresses the fundamentals of knowledge, including its nature and types and how it can be acquired and transmitted to other people.

According to Easterby-Smith et al. (2021), epistemology is the study of the nature of knowledge and methods for investigating the physical and social worlds. It deals with the ways in which knowledge can be obtained from various sources (Khatri, 2020). It can then be said that epistemology relates to how knowledge can be acquired and transmitted to other people. Epistemology is vital in research because it explains the researcher's approach in undertaking a study and gain knowledge in the area of study. Thus, the researcher should state how the knowledge was acquired from the population. In this study, the manufacturing companies in Botswana constituted the research population and quantitative data about SSRPO was obtained using questionnaires.

The last category of research assumptions is axiology which addresses ethical concerns that must be taken into account when conducting research (Khatri, 2020). According to Easterby-Smith et al. (2021), axiology is related to the researcher's own values in terms of how they influence the research process. The researcher should consider the stand they will take when dealing with issues of

value in research. The most important thing to note is that the researcher should differentiate between value and facts as values are subjective while facts are objective truths. As stated by Saunders et al. (2019), the researcher should consider how to deal with the values of the research participants and the researcher's own values. The authors further emphasise that the role a researcher's own values play in every level of the research process is vital for the achievement of credible results. Researchers show their axiological skills through the way they use their values to guide their decisions regarding the type of research to conduct and how to conduct it (Saunders et al., 2019). For this research the researcher shows her axiological skills by choosing the quantitative type of research for collecting and analysing data from manufacturing companies in Botswana.

To summarise the research philosophical assumptions, Tavares and Dias (2020) state that the researchers assumptions about the investigated phenomenon reality (ontology) affects how knowledge is achieved about the phenomenon (epistemology) and this affects the choice of the research methods appropriate for the study. Table 5.1 below summarises the three research assumptions; namely, ontology, epistemology and axiology in terms of how they can be used in research. While ontology is based on the nature and reality of existence, epistemology is based on acquisition and transmission of human knowledge and axiology is based on the values and ethics. These assumptions influence the way a researcher understands the research questions, the methods used and the interpretations of the findings (Saunders et al., 2019).

Therefore, understanding of the researcher's philosophy gives more insights into their interpretation of their findings. Saliya (2023) emphasise that it is important to establish the researcher's philosophy to comprehend their argument. The author further emphasises how crucial it is for researchers to state their philosophy from the outset of the research report because awareness and understanding of the theories, viewpoints and worldviews influence and affect many aspects of research. In undertaking the current study, the researcher considers the reality of manufacturing companies working with suppliers to make improvements, how knowledge would be obtained from manufacturing companies and maintained a

distance from her personal values while also exercising ethics in the whole process of research, especially the protection of participants and confidentiality of information obtained from them.

Table 5. 1: Research Philosophy

Types of assumptions	Assumption	Use in research
Ontology	Nature of reality and existence (Ahuja and Baishya, 2024)	Helps the researcher to seek answers to the research questions (Khatri, 2020)
Epistemology	Theory and philosophy of knowledge, that is how we know what we know (Nguyen and Chia, 2023)	Describes how the researcher gets to know the truth and reality (Khatri, 2020)
Axiology	Theory of value and ethics in a research process (Saunders et al., 2019)	It assists the researcher with identifying, assessing and understanding concepts of appropriate and inappropriate behaviour relating to research (Khatri, 2020)

Source: Researcher's own compilation, 2024

5.3.1 Research Paradigms

A paradigm is a fundamental set of perspectives or worldview that directs a research action or a study (Saliya, 2023). The importance of paradigms is to show the beliefs and provides guidance on what should be investigated, how it should be investigated and how to interpret the outcomes from the study (Saliya, 2023). Thus, it is important for the researcher to indicate their paradigm as it provides guidance on how interpretation was made from the collected data. Researchers classify research paradigm in various ways and the five paradigms commonly used are positivism (Saunders et al., 2019; Ryan, 2018), critical realism (Knudsen, 2023; Zhang, 2023; Elder-Vass, 2022; Lawani, 2021), interpretivism, postmodernism (Easterby-Smith et al., 2021) and pragmatism (Elder-Vass, 2022). The positivism research paradigm posits the view that researchers base the phenomenon's knowledge on what is measurable, observable and recordable. The positivism view holds that reality is steady and unchanging and that it can be observed and described with the aid of an impartial perspective (Alturki, 2021). It

requires the researcher to begin the process of research by determining the theories that help to understand and explain a phenomenon (Saliya, 2023).

According to Tavares and Dias (2020), positivists believe that there is an objective reality that should be considered by the researcher in a neutral, logical and objective manner. This means the researcher can discover the reality by undertaking an observation empirically and through scientific methods. Extreme positivists see companies as real similar to the way physical objects are real (Saunders et al., 2019). The positivism paradigm can make epistemological, ontological and axiological assumptions. Epistemological assumption for a positivist assumes that the data collected out of a research is observable and quantifiable and have causal inferences and forecast as contribution (Saunders et al., 2019). The central principle of positivism is that the social world is an external reality whose properties can be objectively measured as opposed to being subjectively deduced through experience, perception or awareness (Easterby-Smith et al., 2021).

From an ontological perspective, a positivist researcher views the issue under investigation as any other physical object and interactions are viewed as a natural phenomenon (Saliya, 2023). According to the axiological assumption, the positivist researcher upholds objectivity and there is no room for the researcher's value to influence the research; the researcher studies the issues as they occur and maintain neutrality as much as possible (Alturki, 2021). Therefore, positivism requires a researcher to work in the stance of the natural scientist (Saunders et al., 2019), with the aim of investigating, describing, forecasting or testing theories (Saliya, 2023). The positivist researcher emphasises the scientific approach aimed at producing data and facts that are free from bias and human misinterpretations (Saunders et al., 2019). Opposing the stance of positivism is an advanced version of post-positivism which has a perspective that the values of a researcher have an influence on what is observed (Ngulube, 2022).

The second paradigm that researchers can base their study on is the interpretivism paradigm. Interpretivism paradigm is grounded on the worldview that people are actively involved in creating and recreating meanings through daily interactions, thus the philosophy is sometimes known as social construction of

reality (Leavy, 2022). While many researchers view interpretivism as social construction, Ryan (2018) regards it as an anti-positivism because it opposes the positivism paradigm. Unlike the positivism paradigm, researchers who base their studies on the interpretivism philosophy cannot distance their personal values when conducting a study. This philosophy assumes that reality is constructed by each person depending upon their culture and historical background, which may vary between individuals and the researcher will not try to reconcile different people's perceptions (Pache et al., 2023). Interpretivism contends that research in the social sciences must differ from that in the natural sciences because humans and their social environments cannot be investigated in the same manner as physical phenomena (Saunders et al., 2019). With this philosophical belief, researchers respect peoples' personal perceptions and understanding of their experiences and situations (Leavy, 2022).

The aim of interpretivist philosophy is to help with understanding human behaviour. Interpretivists think that reality can be understood by interpreting it subjectively and making changes to reality (Alturki, 2021). It is important to note the philosophical differences within the interpretivism paradigm. The interpretivists who take an ontological position believe that reality is an outcome of events and human experiences (Lawani, 2021). While an interpretivist who takes the epistemological philosophical position believes that actions and perceptions of social actors generate knowledge as a result the researcher and what is being investigated are inseparable (Lawani, 2021). According to Saunders et al. (2019), an interpretivists pays attention to stories, narratives, perceptions and interpretations. When it comes to axiological philosophy, an interpretivist undertakes subjective research, and the interpretations are vital to the contribution of what is being researched.

The third research paradigm is critical realism. Realism refers to anything in the universe, including forces and structures that produce phenomena that can be perceived (Alturki, 2021). Critical realism is a philosophy about how social structures and human agency interact and this interaction serves as the foundation for analysing complex phenomena and theorising how structures, culture and agency interact with each other (Lawani, 2021). It is a division of

philosophy that differentiates the real world from the noticeable world and its underlying premise is that reality cannot be separated from human creations, perceptions and theories (Saliya, 2023). While Lawani (2021) is of the view that critical realism opposes the positivism view and is based on the argument that reality is not solely about empirical knowledge and that interpretations cannot be made through experiments, Easterby-Smith et al. (2021) claim that critical realism takes a middle ground position between the positivist and interpretivist approaches.

According to Zhang (2023), the unique feature of critical realism is the ontological realism, which maintains that the presence of a transcendental reality that 'operates independently of our consciousness or understanding of it' and 'does not entirely answer to empirical surveying or hermeneutical examination'. To emphasise the importance of critical realism, Saunders et al. (2019) state that the goal of critical realism is to explain the experiences and observations in terms of the underlying reality structures that outline the observable events. Critical realism suggests that in order to comprehend the world, the researcher must take two steps; experiencing sensations and events and then process the information afterwards by working backwards the underlying reality (Saunders et al., 2019). There are philosophical differences in critical realism. In terms of epistemological assumption, critical realism believes that social facts are social constructions that have been endorsed and accepted by people and that knowledge is a product of its time (Alturki, 2021).

Saliya (2023) contends that the epistemological assumption in critical reality is that the researcher is not independent of what they are investigating and deliberates the findings of the study through their values. The ontology philosophical position is that there is a real world independent of the perception of people and that reality is external, independent and structured, but it is not observable directly (Lawani, 2021; Saunders et al., 2019). With respect to the axiological assumption, the critical realism researcher incorporates both the researcher's and the social unit under the study's values. Some researchers (Zhang, 2023; Yeung, 1997) take the positivism paradigm stand and are in favour of critical realism. According to Yeung (1997), the application of critical realism lacks methodical development. However,

Lawani (2021) argues that critical realism offers researchers fresh chances to examine complex organisational occurrences holistically.

In addition to the above three research paradigms which are commonly taken by researchers, postmodernism and pragmatism can be taken. Postmodernism is a group of philosophies that reject realism and are typically critical of the advancement of science (Easterby-Smith et al., 2021). In an effort to challenge conventional wisdom and give voice to marginalised perspectives that are different from the mainstream, postmodernism emphasises the importance of language and power dynamics (Saunders et al., 2019). According to Easterby-Smith et al. (2021), postmodernism has three key ideas. Firstly, it offers a critical assessment of scientific advancement, arguing that it is not always beneficial. Secondly, postmodernism is linked to an experimental movement in the arts and architecture that aims to correct modernism's excesses. Thirdly, postmodernism has an ontological stance that differentiates it from critical realism. The postmodernist's ontological assumption is that reality is insignificant, meaning that the structure and order of social phenomenon under study is not independent of the researcher, instead it is formed by the researcher and participants (Saunders et al., 2019). The study also presents the major characteristic of postmodernism and epistemological assumption as knowledge constitutes the disliked, stifled, silenced meaning and explanations of other realities. When it comes to the axiological assumption, a postmodernist researcher's values and those of the participants form the basis of the research (Saunders et al., 2019).

Finally, researchers can base their studies on the pragmatism paradigm. Pragmatism is a philosophical position which argues that direct experience is the best source of knowledge (Easterby-Smith et al., 2021). In academia, pragmatism can be defined as a research philosophy that argues that the best and most correct idea is the one that has been successfully demonstrated in a practical way (Alturki, 2021). Elder-Vass (2022) is of the view that pragmatism opposes the critical realism paradigm and the two are in conflict with each other. According to pragmatists, ideas are only important when they facilitate action (Saunders et al., 2019). This approach avoids the debate on which approach is superior as it employs the techniques that are most appropriate for the issue the researcher is

trying to solve (Alturki, 2021). It assumes that a single research method cannot present the true outcomes, thus different methods of research should be used in order to obtain reality (Pache et al., 2023). A pragmatist researcher, with ontological assumptions, holds that there are various realities and that reality is complex, external and emerges from ideas (Saunders et al., 2019). Research is the source of practical knowledge that becomes practice in a particular context and knowledge enables actions, solves a problem and enhance practice and procedures (Saunders et al., 2019). In a research based on the pragmatism paradigm, there is an axiological assumption stating that the researcher's values and participants drive the research (Saunders et al., 2019). According to Easterby-Smith et al. (2021), the pragmatism philosophy rejects the idea that knowledge and truth are shaped by establishing theories or frameworks and rejects the idea that people can create their own realities out of nothing. In summarising the five research paradigms, Table 5.2 outlines a brief presentation of the views and philosophical assumptions of each one of them.

Table 5. 2: Research paradigm summary

Paradigm	Emphasis	Philosophical assumption
Positivism	Understanding reality through experiments (Alturki, 2021)	• Ontology: interaction is natural phenomenon (Saliya, 2023). • Epistemology: data is observable and quantifiable (Saunders et al., 2019). • Axiological: researchers' views do not influence the research (Alturki, 2021).
Interpretivism	Understanding reality through human experience (Pache et al., 2023; Leavy, 2022)	• Ontology: reality is an outcome of events and human experiences (Lawani, 2021). • Epistemology: knowledge is generated by actions and perceptions of social actors (Lawani, 2021). • Axiology: research is subjective.
Critical realism	Takes a middle ground position between the positivism and interpretivism approaches (Easterby-Smith et	• Ontology: a real world exists, but not observable directly (Lawani, 2021; Saunders et al., 2019). • Epistemology: researchers' values influence their findings (Saliya, 2023). • Axiological: incorporates the

Paradigm	Emphasis	Philosophical assumption
	al., 2021).	values of the researcher and the social unit under study.
Postmodernism	Emphasises the importance of language and power dynamics (Saunders et al., 2019)	• Ontology: reality and social phenomenon are formed by the researcher and participants (Saunders et al., 2019). • Epistemology: Knowledge constitutes the disliked, stifled, silenced meaning and explanations of other realities. • Axiological: Researcher's values and those of the participants form the basis of the research (Saunders et al., 2019).
Pragmatism	The source of knowledge is direct experience (Easterby-Smith et al., 2021), using numerous methods (Alturki, 2021)	• Ontology: there are various realities and that reality is complex, external and emerges from ideas (Saunders et al., 2019). • Axiology: researcher's values and participants drive the research (Saunders et al., 2019).

Source: Researcher's own compilation, 2024

The chosen philosophy entails significant assumptions regarding the perspective, through which the world is perceived and these assumptions form the foundation for the research strategy and the methods employed in the study (Saunders et al., 2019). For this research the positivism research philosophy was adopted, and various theories were used to understand the SSPRO. Firstly, the TBL was used to study sustainability in manufacturing companies of Botswana to identify the sustainability objectives incorporated in the SSRPO framework. Secondly, the TQM theory was used to study the characteristics of quality by identifying the activities that can help to improve quality in manufacturing companies through SRM.

Furthermore, the TCO was used to understand the supply chain costs, while the CE theory was used to study how manufacturing companies could collaborate with suppliers to enhance innovation in the supply chain. Furthermore, RBV helped the researcher to explain how suppliers can add value to manufacturing companies through SSRM and how delivery performance can be enhanced in the supply chain of manufacturing companies of Botswana. Lastly, the ST was used to study

SCRM by identifying responsibilities of manufacturing companies and suppliers towards risk mitigation. The research findings in the positivism research are quantitative and observable. Though pragmatism is a useful viewpoint in management research as it concentrates on processes that are relevant to studies of knowledge, it could not suit the current study because the study was based on different theories to determine the most sustained SSRPO among manufacturing companies in Botswana, which is not supported by the pragmatism theory.

5.4 RESEARCH APPROACHES

A theory is a tested and acceptable explanation of a phenomena that occurs in the real world (Bordens and Abbott, 2022; Creswell, 2013). Research approaches are the main structures within which the researcher works and they give rise to the attainment of new knowledge (Leavy, 2022). According to Alturki (2021), research approach is the shifting trend between theories and research. Hall, Savas-Hall and Shaw (2023) emphasise that an explanation of the research approach undertaken is important because it helps to determine the reasoning used during the research. It is for this purpose that some scholars (Kumar, 2024; Hall et al., 2023) use the term ‘research reasoning’ to describe the research approaches because they are ways of reasoning. Moreover, some researchers choose to prefer the reasoning approaches to theorising (Okoli, 2023).

Several approaches are appropriated to developing research theories. While many authors (Naeem, Ozuem, Howell and Ranfagni, 2023; Leavy, 2022; Alturki, 2021) discuss two approaches to research theory development; deductive and inductive approaches, some authors (Okoli, 2023; Saliya, 2023; Saunders et al., 2019) propose three approaches as deductive, abductive and inductive. The current study discusses the three research approaches; deductive, inductive and abductive and explains the reasoning taken for the current research, in the research theory development of the SSRPO.

Deductive approach is the process of drawing a conclusion logically from a set of premises (evidence) and the conclusion is true when each of the premises is true (Saunders et al., 2019). According to Leavy (2022), the deductive approach is a way of predicting what is expected to be found regarding the study being

undertaken. It starts with a strong theory after which the data is used to test the implications of the theory (Alturki, 2021), then the observations are examined to determine whether they support the generalisation (Hall et al., 2023). Similarly, Saunders et al. (2019) emphasise that deductive theory entails developing a theory, which is then subjected to a rigorous test via a series of propositions. The deductive approach is aimed at agreeing, disagreeing or contributing to existing theory (Leavy, 2022).

The current study used the deductive approach to develop an SSRPO framework to be used by manufacturing companies in Botswana to determine the priorities within the objectives. This is consistent with the statement of Kumar (2024) who emphasises that researchers should transit from a broader to a narrower level by starting the process with identifying suitable theories then test their implications with data. Unlike the inductive approach which is likely to draw untrue inferences due to its illogicalness, the deductive approach gives true outcomes as the inferences drawn are logical (Hall et al., 2023). Since the premise and conclusions must make sense together in a deductive approach, Alturki (2021) regards it as a top-down method.

Saunders et al. (2019) outlined similar steps for conducting a research development; however, they added a sixth one. According to Saunders et al. (2019) the deductive research approach is more suitable to a researcher who wants to describe what is happening. Thus, the deductive approach was adopted for the current study to determine the SSRPO among manufacturing companies in Botswana hence theories were utilised for the different SSRPO (TBL, TQM, TCO, CE, RBV and ST) to develop the SSRPO framework, which is recommended for use by manufacturing companies in Botswana.

The second approach to theory development is the inductive approach, which involves a logical argument that is judged to be supported by the observations made; however, there is a gap between the conclusion and the premises observed (Saunders et al., 2019). Hall et al. (2023) define it as a type of reasoning which requires using particular observations to make broad conclusions. This requires the researcher to start the process of theory development by conducting an investigation, then the framework is developed using the findings obtained. The

inductive approach begins with formulating empirical data, then work towards building a theory (Okoli, 2023). It is the opposite of the deductive approach as it begins with the collection of data then the researcher determines the data patterns to use, thereafter develop a theory that explains the patterns (Alturki, 2021).

It is often described as a bottom-up approach since it starts with making observations before moving to an overall set of suggestions (Alturki, 2021). This approach has widely been employed in the management science research. However, it should be noted that the inductive approach has limitations of producing false results because the inferences drawn are not of rational consequences (Hall et al., 2023). Kumar (2024) outlines the three stages of inductive research approach as (i) observation of the phenomenon under study using methods such as interviews, direct observation and surveys, (ii) pattern recognition, that is, examining the data for relationships, trends and themes and (ii) theory development, that is, the creation of concepts using the collected data , which were analysed.

According to Saunders et al. (2019), the inductive research approach is more suitable to a researcher who wants to determine why something is happening. Thus, it could not suit the current study because inductive approach is best suited for the qualitative method of data collection and analysis (Leavy, 2022), while the current research used the quantitative method. However, Kumar (2024) argues that though the deductive and inductive approaches are different these approaches can be used in unison by using both to conduct a research. The third approach which researchers can take to develop theories is the abductive approach. The aim of the abductive approach is to propose a theory; that means they develop a fully completed theory, but do not carry out an empirical verification. The beginning of abductive approach is to identify a ‘surprising fact’; then formulate a reasonable theory explaining how it might have happened (Saunders et al., 2019). Okoli (2023) further explains how the abductive approach operates; it starts with taking a theory-in-progress and developing a theory which is then proposed without testing it. According to Saunders et al. (2019), the abductive approach moves back and forth between theory formulation and data collection. This approach does not predict or test before introducing a new

concept or understanding a new phenomenon, but it merely suggests that something is likely to be the case (Saliya, 2023).

There are some notable differences among deductive, inductive and abductive approaches. Different authors (Okoli, 2023; Saliya, 2023) explain the differences among the three research approaches as follows; deductive approach establishes that something must be the case for logical reasoning, while inductive approach shows that there is actual evidence supporting a claim and abduction only proposes that something must be the case. Saunders et al. (2019) explain further the differences among the three research approaches to be that deductive approach operates by moving from theory to data, while inductive moves from data to theory and abductive approach rotates back and forth, meaning that the approach mixes deductive and inductive approaches. It can be concluded that the main theory development approaches are deductive and inductive, while abductive complements the two. Table 5.3 presents the differences among the three research approaches.

Table 5. 3: Differences among Research Approaches

	Deductive	**Inductive**	**Abductive**
Reasoning	Establishes that something is the case (Okoli 2023; Saliya 2023)	Shows empirical evidence that something is the case (Okoli 2023; Saliya 2023)	Suggests that something is the case (Okoli 2023; Saliya 2023)
Objective	To test an existing theory (Kumar 2024)	To generate new theory (Kumar 2024)	To propose a theory (Kumar 2024)
Research process	Starts with theory identification, then data collection (Kumar 2024; Okoli 2023; Saunders et al. 2019)	Starts with data collection, then theory formulation (Kumar 2024; Okoli 2023; Saunders et al. 2019)	Starts with taking a theory-in-progress, then theory proposing (Kumar 2024; Okoli 2023; Saunders et al. 2019)
Type of approach	Confirmatory (Okoli 2023)	Emergent (Okoli 2023)	Explanatory (Okoli 2023)
Research method	Quantitative (Saunders et al. 2019)	Qualitative (Saunders et al. 2019)	Qualitative (Saunders et al. 2019)

Source: Researcher's own compilation, 2024

When undertaking a study, a researcher should determine the approaches to theory development that should be taken; either deductive or inductive and whether abductive shall be used as a complement. The importance of choosing a suitable approach for theory development cannot be over-emphasised. Firstly, it helps the researcher to make a more thoughtful decision regarding the research design (Saunders et al., 2019), enabling a researcher to make an overall plan of the whole research process that includes determining the type of evidence to be gathered, where it will be obtained from and how it is to be interpreted. Secondly, the choice of research approach is important because it helps the researcher to include the research constraints, such as limited data access in the research design (Easterby-Smith et al., 2021). Thirdly, the choice of research approach helps to determine research strategies and the methodology suitable for the study (Saunders et al., 2019).

The research approach chosen depend upon the research topic, time available for research and the availability of the literature (Saunders et al., 2019). While the inductive approach can be helpful when researching a new topic with little available literature, thus the researcher will start with collecting data that is then used to develop a theoretical framework. On the other hand a topic may have enough information on one aspect and less on the area being studied, in which case the abductive approach may be more appropriate. For this study, a deductive approach was used to determine the most sustained supplier performance objectives and the relationship between the variables of the SSRPO in the manufacturing companies in Botswana. The research variables were established and theories used to study them were identified. These theories helped with determining the contribution made by suppliers to manufacturing companies and a SSRPO framework was formulated.

5.5 RESEARCH METHODS

Research methods are the tactics used by researchers in undertaking their investigations (Verma et al., 2024). Some authors (Creswell, 2013) use the term research approaches to describe research methods. Research methods can be differentiated from research methodology as methodology can be likened to a map, while a method can be a series of steps to take when traveling from one

place to another on the map (Tavares and Dias, 2020). The research methods are useful in research because they help researchers to collect data and analyse it so that solutions to the problems can be found. The methods of research can either be quantitative or qualitative and in some cases a combination of the two is done, which is referred to as mixed methods. The classification of the research methods is determined by a number of criteria including the study's application, the research objectives and the information required (Taherdoost, 2022).

Quantitative research is a method of collecting numerical data from the observations and analysing it using mathematical systems to explain and characterise a phenomenon (Bordens and Abbott, 2022; Taherdoost, 2022). This approach makes use of both empirical statements and methods, which serve as descriptive declarations regarding the actual meanings of the cases rather than their moral implications (Taherdoost, 2022). The quantitative research method is based on the positivist theory development approach (Saunders et al., 2019) and follows firm research design development process before starting the actual research (Adams, Khan, and Raeside, 2014). When it comes to research reasoning, the quantitative method is more associated with deductive approaches which focuses on using data to test a theory (Saunders et al., 2019). According to Taherdoost (2022), the primary aim of quantitative research is to arrive at explanations and estimates which can be applied to other people, situations and locations. However, Tavares and Dias (2020) argue that quantitative research forces scientific meanings on participants to explain a singular phenomenon presumed to be true reality that may not be understood by many non-scientists. The current study used the quantitative research method following the deductive research reasoning.

Qualitative research, on the other hand, refers to methods of collecting and analysing data and producing evidence using non-numerical and non-statistical approaches (Bhangu, Provost and Caduff, 2023). It emphasises on describing in detail and comprehending a phenomenon from a close viewpoint (Verma et al., 2024). According to Bhangu et al. (2023), qualitative research methods provide a means to learn about a phenomena that cannot be quantified; for example, the experiences of people. Therefore, it gives an opportunity to participants to express

themselves by explaining their experiences regarding their daily life realities. It is related to an interpretivist research philosophy, for the reason that researchers need to make sense of the socially constructed and subjective meanings conveyed about the phenomenon under study (Saunders et al., 2019).

When it comes to the approach taken for theory development, the qualitative method uses inductive approach, though some qualitative studies begin with deductive approach to test a current theory by making use of quantitative procedures (Saunders et al., 2019). There are various qualitative research techniques that can be used, of which the commonly used ones are observations, interviews, audio and video records and texts and documents. Triangulation in qualitative research is common. This is where the researcher combines two or more techniques, for example, an observation can be followed by an interview. Tavares and Dias (2020) contend that triangulation of methods is a means of increasing the understanding of the intricacy, depth and rigour of the study objects. When a single data collection technique is employed, for example only interviews are conducted, the method is referred to as mono-method qualitative study, but when more than one data collection technique is employed, the system is referred to as multi-method qualitative study (Saunders et al. 2019). Qualitative research methods make remarkable contribution to research outcomes by providing rigorous, theoretically sound and logical techniques for analysing subjective, unclear and challenging-to-pin-down phenomena (Bhangu et al., 2023).

Though quantitative and qualitative research methods are different methods of data collection and analysis, they have some similarities between them as they are both aimed at giving description topics under the researchers' study. They have however, different ways of analysing data; while quantitative data is analysed mathematically using statistics measures (Taherdoost, 2022), qualitative data is measured through conceptualisation (Saunders et al., 2019). Quantitative methods have strong external validity as they produce results which can be generalised to the entire community, however, qualitative methods have a strong internal validity as they focus on the social groups studied (Tavares and Dias,

2020). To differentiate the two approaches; quantitative and qualitative methods, the differences between the two methods are further explained in Table 5.4 below.

The third research method that researchers can use is the mixed method. This is a system that utilises multiple methods of research by combining qualitative and quantitative techniques of collecting data and analytical procedures (Saunders et al., 2019). According to Tavares and Dias (2020), this approach seeks to integrate the insights gained from quantitative and qualitative research into a practical solution. A variety of ways, ranging from straightforward concurrent forms to more intricate sequential forms are used when combining qualitative and quantitative techniques in a mixed methods research (Saunders et al., 2019). Both qualitative and quantitative methods can be used equally or one may be used more than the other depending upon the nature of the study (Taherdoost, 2022). The critical realism and pragmatism philosophies may influence the mixed method approach (Saunders et al., 2019).

Table 5. 4: Quantitative and Qualitative Research comparison

Attribute	Quantitative research	Qualitative research
Data collection	Numerical data collection	Verbal data collection
Participants	Large number of participants (Verma et al., 2024)	Small number of participants (Verma et al., 2024)
Data analysis	Data were analysed using statistical measures (Taherdoost, 2022)	Data were analysed through conceptualisation (Saunders et al., 2019)
Research approach	The focus is on deduction (Tavares and Dias, 2020)	The focus is on induction (Tavares and Dias, 2020)
Validity	The results are generalisable to the entire community (Tavares and Dias, 2020)	The results are specific to the group studied (Tavares and Dias, 2020)

Source: Researcher's own compilation, 2024

In most cases, researchers choose to use either the qualitative or quantitative research method. However, mixed methods research is also commonly used for various reasons. One of the reasons is that in the process of using one chosen research method, a researcher may discover some new insights whose investigation may require the use of another method (Saunders et al., 2019).

Taherdoost (2022) contends that employing both methods in research can help to get the benefits of qualitative and quantitative methods and help in a case of a situation where applying one method may not produce satisfactory results. In the explanation of mixed method research, Taherdoost (2022) illustrates how qualitative and quantitative research methods are combined by classifying them into sequential design and concurrent design. Sequential design uses explanatory, exploratory and transformative, while concurrent design is divided into triangulation, embedded and transformative. In a concurrent design, data were gathered using quantitative and qualitative methods simultaneously and then data from both methods is examined to determine the differences, convergences and combinations. Its goal is to strengthen one method so that it can improve the other one.

The method used to collect data depends upon the nature of the research to be undertaken. It is a common practice to use both qualitative and quantitative research for management and business research. For this research, a quantitative approach was followed by collecting quantitative data from manufacturing companies in Botswana to determine the SSRPO and the survey strategy was used. Quantitative research method is good for providing explanations and estimates that can be applied to the research population, thus suited the current research that intended to elicit an understanding of the SSRPO and prioritise them.

Secondly, this method helps to produce the results that represent the whole population though it may be large. The Botswana manufacturing sector is large, but the quantitative research method helped to get results that represented the whole population. Furthermore, due to the limited time that was available for conducting the research, the quantitative research method was suitable as it is time efficient. Additionally, the quantitative research method ensures validity and reliability as its usage replicates earlier studies. Its usage on the current study replicated the earlier studies on SRM, making the research reliable.

Quantitative research method has been used for several studies on SRM. For example, Amoako-Gyampah et al. (2019) used it for their study on how SRM provides the benefits to the buying organisation. Denhere et al. (2023) used the

quantitative approach to determine how resource allocation affects SRM and how SRM affects the paint manufacturing industry performance. Oduro et al. (2020) used the quantitative research method to make a comparative examination of the organisational performance and SRM dimensions of Ghana's public and private hospitals. Another research that used quantitative research method was conducted by Romeo Asa, Naruses, Pangeiko Nautwima and Tsoy (2023) who aimed at determining the SRM techniques employed in public procurement and evaluating their influence on the performance of a company. These studies present evidence that quantitative research methods have been applied extensively to study SRM, thus it gave confidence to the researcher for the current study to use the method.

5.6 RESEARCH STRATEGIES

A strategy is a plan or direction that is decided to be taken in order to achieve the desired goal. A research strategy presents an outline of how the researcher will answer the research questions. It can be defined as an overall plan for undertaking a research study that guides a researcher with the direction to take in organising, performing and overseeing the study (Johannesson and Perjons, 2014). A research strategy acts as a linkage between the research philosophy and the method a researcher chooses for data collection and analysis (Saunders et al., 2019). Saunders et al. (2019) recommend that a research strategy should be aligned with the deductive or inductive approach and link a philosophy with the chosen method of collecting data. Saunders et al's. (2019) research onion outlines seven research strategies that can be used to conduct research as follows: experiment, survey, case study, action research, grounded theory, ethnography and archival research.

It is important for a researcher to choose a suitable strategy for the study that can enable them to collect and analyse data, thus achieving the research objectives. Alturki (2021) state that the strategy chosen is influenced by the philosophy, required data and the study's purpose, while Johannesson and Perjons (2014) suggest that suitability, feasibility and ethical considerations are the factors that influence the choice of a research strategy. The current research made use of a survey strategy, associated with the deductive research approach to provide a

general overview of the SSRPO among manufacturing companies in Botswana. Though there are many quantitative research methods, a survey best suited the current research because as stated by Taherdoost (2022), survey research helps to collect data about a population by questioning people from that population.

Moreover, surveys are more related to the quantitative method that is adopted for this study. Questionnaires were issued to supply chain personnel from various manufacturing companies who responded to the structured questions regarding the SSRPO. Saunders et al. (2019) state that surveys are typically related to deductive research approach and are commonly used in management and business research, the category in which the current research falls. Thus, survey strategy was suitable for this study and also because it helps to gather large quantities of data at a lower cost and within a short period of time. This is consistent with the view of Johannesson and Perjons (2014) who state that the chosen strategy should suit the study objectives and enable the researcher to find solutions to the research questions being investigated.

Surveys are appropriate for collecting data about large populations and be able to determine their activities, attitudes and beliefs and work more effectively when gathering data on specific, well-defined subjects (Johannesson and Perjons, 2014). The current research made use of a well-structured questionnaire, previously validated to collect data on the SSRPO from manufacturing companies in Botswana. The questionnaire covered the nine SSRPO as follows; enhancing economic sustainability, social sustainability, environmental sustainability, improving quality, reducing supply chain costs, improving delivery performance, improving innovation, creating value to the business and minimising supply chain risks, together with their sub-objectives. It was designed to enable each of the participants to provide scores regarding the relevance of each of the objectives.

Several previous studies on SRM used surveys to collect data. For example, Amoako-Gyampah et al. (2019) used it to gather data from companies in Ghana to evaluate relationships between operational efficiency, SRM, firm performance and ownership structure. Denhere et al. (2023) used a questionnaire for their study on the establishment of the influence on the paint manufacturing industry of SRM, resource allocation and the contribution made to the performance of a company.

Furthermore, Yang et al's. (2023) study on how SRM affect supplier innovation contribution was conducted using a survey questionnaire. These studies carried out on SRM using the survey strategy proved the validity and reliability of the survey strategy. Therefore, it gave an assurance to the researcher of the current study that the survey strategy would produce reliable results. The strategy made it easy to gather data from various manufacturing companies in Botswana. Survey strategies which are questionnaire-based are widely used because standardised data is easily collected from a large population, enabling easy comparison (Saunders et al., 2019).

Some scholars (Bordens and Abbott, 2022; Johannesson and Perjons, 2014) puts more emphasis on the importance of behaving ethically by researchers when conducting surveys. While Johannesson and Perjons (2014) emphasise that researchers should ensure that no research participant gets harmed as a result of the research, Bordens and Abbott (2022) puts an emphasis on the importance of keeping participants' responses confidential and maintaining anonymity. The current study ensured that anonymity was maintained by using the information for the purpose of the current study and no disclosure of the names of participants to any third party. This assurance was given to participants at the beginning of the study by including it on the questionnaire. Moreover, the questionnaire required no names of the participants.

5.7 TIME HORIZON

The determination of the timeframe within which to undertake research is another important factor the researcher needs to consider. The researcher should decide whether the research should be carried out at a particular time or be carried out over a long period of time. Alturki (2021) defines time horizon as 'a specific period of time that is covered by a study alongside the time that data were collected and related analysis was conducted'. There are basically two time horizons that any research can adopt: either a cross-sectional study or longitudinal study. The cross-sectional study requires a researcher to undertake a study of a phenomenon at a particular time (Saunders et al., 2019). This means that data from a population is not studied over a long period of time, but at the same time (Wang and Cheng, 2020). According to Alturki (2021), a cross-sectional study can enable a

researcher to determine the cause and effect within a short period of time. In contrast, the longitudinal study involves carrying out a study over a long period of time. It requires the researcher to observe the same population over time to detect changes or developments (Wang and Cheng, 2020). The longitudinal study enables researchers to capture changes and test the consistency of the interpretations over time (Alturki, 2021).

The current research was of a cross-sectional time horizon as the study was carried out at one particular time. The cross-sectional time horizon was chosen because it enabled the researcher to collect data from manufacturing companies in Botswana at the same time and make a realistic comparison of the variables as all data were collected at the same time, thus all manufacturing companies where operating in similar economic conditions. Additionally, since the research adopted the survey research strategy using questionnaires as a means of collecting data, the cross-sectional time horizon was appropriate because surveys are most suited for this type of study. As a cross-sectional study provides an opportunity to compare different population groups, data collected from different manufacturing companies in Botswana was compared in terms of how they gave the importance to SSRPO.

A number of researchers on SRM adopted cross-sectional studies. Amoako-Gyampah et al. (2019) used a cross-sectional study to collect data from companies in Ghana for the investigation of the relationship between SRM, flexibility of the operation, proprietorship structure and organisational performance. Agarwal and Narayana (2020) also undertook a cross functional study to examine the impact of communication in a buyer-supplier relationship satisfaction. A similar process was carried out by Denhere et al. (2023) who collected data from 116 employees of paint manufacturing companies to determine the influence of resource allocation and SRM on the companies. Furthermore, a cross-sectional study was conducted in Thailand to determine the role played by SRM in improving the performance of the maintenance, repair and overhaul companies (Madzik and Suwannasap, 2023). Additionally, Nkwabi and Fallon (2020) undertook a cross-sectional research to determine the factors that hinder effective SRM among food manufacturing companies in Tanzania targeting small and

medium enterprises (SMEs). In all these studies, the cross-sectional method has proved to be effective.

5.8 TECHNIQUES AND PROCEDURES

This section presents a discussion of the techniques and procedures used to collect data from the manufacturing companies in Botswana and how the data were analysed.

5.8.1 Methods of Data Collection

Data collection is the process of accumulating data and analysing it to give an understanding of the issue being researched using legitimate methods (Mazhar, Anjum, Anwar, and Kan, 2021). There are two methods of collecting data which researchers can use: primary and secondary data. Data collection for the current study involved both secondary and primary data. Secondary data can be defined as data that is being used for a purpose different from what it was collected for (Näher et al., 2023). Saunders et al. (2019) gave a similar definition by describing data collection as data gathered initially for a different purpose. Secondary data gives numerous opportunities to researchers for gathering data relating to the phenomena under study. As stated by Verma et al. (2024), secondary data is quicker and cheaper to collect than primary data and can be obtained even when primary data is not available. The secondary data collected for the current study was done through the literature review.

The literature review is an outline of an academic study in a particular field which is carried out as part of an empirical study (Lim, Kumar and Ali, 2022). According to Bordens and Abbott (2022), the literature review is the process of finding, obtaining, reading and assessing the research literature in a researcher's field of study. It provides a foundation on which the research is built because it helps the researcher to develop a good understanding of the research that has already been carried out in that field and any changes that have taken place (Saunders et al., 2019). To emphasise the purpose of the literature review, Bordens and Abbott (2022) state that the primary objective of carrying out a literature review is to determine what has already been researched on a topic in order to avoid duplication.

The literature review is crucial for understanding concepts, identifying unnoticed problems, promoting new knowledge creation, framework development and theory development and offering suggestions for future research (Loviscek, 2021). Ngulube (2022) emphasises that the literature review is an important part of any research because it helps to prove if the researcher understood other people's work. The author further emphasises that literature exposes a researcher to a wider scope of studies, thus broadening up the perception of the individual. Moreover, literature review enables the researcher to gain an understanding of earlier studies conducted on the topic and theories that relate to the phenomena, thus helping the researcher to build knowledge in that area.

However, Kraus, Mahto and Walsh (2023) argue that increased literature on a topic may hinder the objective of gaining a greater understanding of the subject area because numerous competing, complex and unreasonable arguments may be presented. Nevertheless, Lim et al. (2022) maintain that the literature review is important in research as it offers valuable insights, enabling clearer and more swift scientific progress, thus empowering scholars with a broad understanding, reducing prejudice and misleading superiority. To maintain the quality of information, Bordens and Abbott (2022) advice researchers to exercise caution when reading literature because some publications are not peer-reviewed, therefore compromising quality.

Similarly, Verma et al. (2024) emphasise the need for researchers to scrutinise secondary data as it may not be suitable or sufficient for the study hence caution should be exercised to ensure that secondary data is reliable, suitable and adequate. The authors further give guidance on how to test reliability, suitability and adequacy of data. Testing reliability may involve assessing the source of data, methods used, time and the level of accuracy desired. When it comes to determining whether the data were suitable for the study, researchers must analyse the definitions of the terms used and measures used during the original data collection exercise. Furthermore, researchers must ensure that the collected data were adequate for their studies.

The literature review undertaken for the current study helped the researcher to gain more understanding of the manufacturing companies in Botswana and the

characteristics of each of the SSRPO. It also enabled the researcher to address the theoretical objectives that dealt with the SSRPO. In addition, the literature review covered the global manufacturing sector and Botswana's manufacturing sector together with the main types of manufacturing companies and this is presented in Chapter 2. Furthermore, the literature review on the SSRPO among Botswana's manufacturing companies was conducted and reported in Chapter 2, while the SSRPO results from the literature review are presented in Chapters 3 and the literature review on the theoretical framework was presented in Chapter 4.

The literature review for the current study was conducted using various credible sources that included books, journals, GoogleScholar, Emerald, Springer, Science Direct, Taylor & Francis, Sage Research Methods, EBSCOhost, ProQuest and other industry sources. These sources played a significant role in gathering secondary data about the study on the SSRPO in Botswana's manufacturing companies and the research methodology. As stated by Johannesson and Perjons (2014), the process of gathering data relating to a phenomenon that is being investigated is a major activity in an empirical study. Due to this importance, the review of the literature was given the importance that it deserves, and much caution was exercised when undertaking the current study.

5.8.2 Empirical Research

Empirical research is a scientific study based on objective and systematic first hand observations, whose findings can be verified by other researchers (Bordens and Abbott, 2022). In an empirical research, data collection is not dependent on theories as in literature review but is obtained directly from the real world. The empirical research for the current study was undertaken in a process that involved determining the research population, sample size and framework, data collection and data analysis.

5.8.3 Target Population

The first step in the data collection process is to define the population for that study. According to Verma et al. (2023), a population is the whole collection of people or objects with similar characteristics on which a study is undertaken. The same authors further advise researchers to define the population clearly for their

study because a well-defined population decreases the likelihood of adding participants in a study who do not meet the characteristics of the research objectives. The population for the current study was identified as the manufacturing companies in Botswana. To ensure that companies outside the manufacturing sector were not included in the study, the manufacturing companies were defined. As per the definition outlined in Chapter 2.2, manufacturing companies are companies that transform raw materials, components and parts into finished products that they sell to other companies or people. There is often confusion between the meaning of population and that of the target population.

A population is an entire set of elements on which an investigation is being carried out (Bordens and Abbott, 2022; Saunders et al., 2019), while a target population is the part of the population that is taken to form a representation of the entire population such that the findings obtained represent the entire population. According to Kumar (2011), a target population represents all the people from whom the required data to get answers to a researcher's study questions is collected. Similarly, Saunders et al. (2019) describe a target population as a subset of the whole population which is easier to handle by the researcher. It is imperative for the researcher to determine the target population from the entire population. For the current research, the population was the entire manufacturing industry of Botswana, and the target population was manufacturing companies in the city of Gaborone and the surrounding villages. As illustrated in Table 5.7, the target population for the current study was 994 manufacturing companies. Thus, the study undertaken on the companies falling within this region represents all manufacturing companies in Botswana.

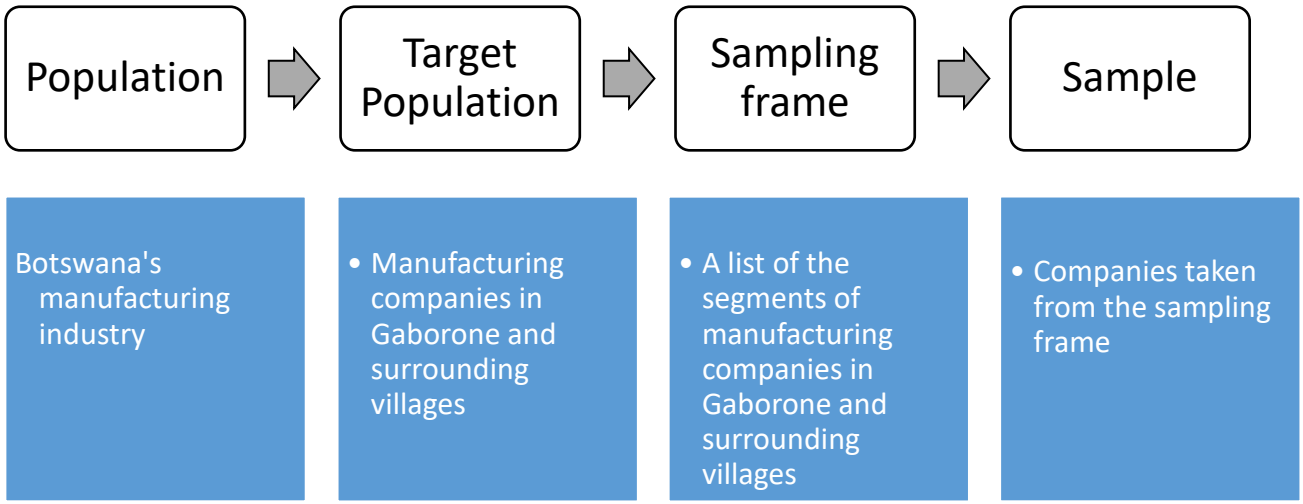
5.8.4 Sampling

In most cases it is almost impossible to collect data from the entire population due to the complexities of data collection and analysis hence sampling is done. A sample can be defined as a small subgroup selected from the overall population (Bordens and Abbott, 2022). According to Johannesson and Perjons (2014), it is almost always required for surveys to use sampling for studying the whole population. Bordens and Abbott (2022) encourage researchers to be satisfied with using a sample for their study because it is often impracticable to study the entire

population. Similarly, Saunders et al. (2019) advise researchers to use a sample when it is not possible to survey the entire population. The authors further state three circumstances that may lead to the use of a sample; when it is impracticable to survey the entire population due to its size, when the survey costs cannot be met by the budget and when time available for data collection is limited. Thus, a sample is taken as a representative of the entire population. Since the current study uses the survey strategy to collect data, sampling was appropriate.

To ensure that a sample provides a good representation of the entire population, researchers are required to determine the sampling framework and then take a sample from it. This is in accordance with Saunders et al's. (2019) advice who state that it is important to obtain a complete and accurate sampling framework so that the sample selected can be a representation of the whole population. A sampling framework is an entire list of the elements in a target population from which a sample is taken (Saunders et al., 2019; Leavy, 2017). To present a clear explanation of the sampling process as part of the collection exercise, the researcher for the current study makes a distinction among the different terms that are widely used, but often confusing; target population, sampling frame and sample. The population is the entire group of people on which a study is carried out, while a target population is the part of the population from which data were collected. The sampling frame is a list of elements or people from whom data were collected, while a sample is a representative taken from the target population as guided by the sampling frame. Therefore, it can be said that a sample is a subset of a sampling frame, while a sampling frame is a subset of a target population and a target population is a subset of a population. For the current study, the population was the entire group of manufacturing companies in Botswana, with a target population being manufacturing companies in Gaborone and its surrounding villages, while a sampling frame (shown in Table 5.6 below) was a list of all types of manufacturing companies in and around Gaborone from which a sample was taken. Figure 5.1 below provides a summary of these elements.

Figure 5. 1: The Sampling Process



Source: Author's own design, 2024

5.8.5 Sample Size

Since sampling cannot be avoided in a survey due to the difficulties associated with studying the entire population, the determination of a sample size becomes vital. Researchers need to note that it is challenging to determine whether the sample size is suitable for producing the results that can be extrapolated to the entire population from which it was drawn (Johannesson and Perjons, 2014). This is in agreement with Kang's (2021) view who states that accurate results cannot be obtained if a study has inappropriate sample sizes, therefore making it difficult to make a judgement or a decision. In a quantitative research, a sample size is usually large as this helps to increase the accuracy, though, consideration needs to be made for the additional costs of increasing the sample size (Leavy, 2022). Though Leavy (2022) recommended a large sample size, several researchers argue that the smaller the sample size the more accurate will the results be than carrying out a study on a large group or the entire population because when participants are few more time is devoted to them and also more time is devoted to data checking and testing for accuracy (Saunders et al., 2019). Opposing the view, Bordens and Abbott (2022) advice that the best sample size is one that is economical, meaning that it involves enough participants to enable the researcher to make a reliable and valid survey.

Though the current study made use of the quantitative research method, the sample size was small because the BWM, which was used for data analysis requires little data or small sample size. When using the BWM, the results can be consistent and reliable even with little comparative data (Rezaei, 2015). Lakens (2022) outlines factors that justify the sample size that a researcher selects; population size, the desired level of accuracy and resource constraints, of which time and money have been identified as the common resource limitations. Bayanati et al. (2022) emphasise that there is no precise formula for deciding the sample size in MCDM. For this study, the BWM method is used, and the sample size is determined by analysing similar studies that used the method. Previous studies conducted in supply chain using the BWM used sample sizes ranging between three and 50.

For instance, Bai et al. (2022) used 20 elements, while Badri Ahmadi et al. (2017) used 38 elements and Rostami, Tavakoli, Tajally and GhanavatiNejad (2023) and Kusi-Sarpong, Gupta and Sarkis (2019) used five elements in their respective studies, while Ecer and Pamucar (2020) used three elements. A full list of identified supply chain studies that used BMW is presented in Table 5.5 below. The table shows that the lowest sample size is three participants and the highest is 48 participants. The sample size for the current research was determined by getting the average of all these identified previous supply chain studies that used BWM. The average obtained is 13 which is rounded up to 50 to make it easier to use the stratified sampling method for calculating the sample to obtain from each stratum. Thus, the sample for the current study was fifty (50) manufacturing companies. To choose the sample from the manufacturing companies, the stratified sampling method was used by classifying the manufacturing companies into strata according to their segments. A manufacturing segment is a group of manufacturing companies that produce similar products (CIPS, 2024). Then samples taken from each stratum were determined by dividing each stratum by the total target population (994) then multiplying by the sample size (fifty) as shown in Table 5.7 below. Thereafter, a simple random sampling method was used to select samples from the strata.

Table 5. 5: Sample Sizes of Previous Studies using BWM

Research field	Authors	Sample size	Decision making on:
Sustainable supply chain transparency	(Bai et al., 2022)	20	Best-Worst Method enablers and sub-enablers
Sustainable supplier selection	(Amiri et al., 2021)	3	Weighting supplier selection criteria
Service quality of airline industry	(Gupta, 2018)	5	Characteristics of airline service quality
Sustainable supply chain management	(Badri Ahmadi et al., 2017)	38	Social sustainability criteria
Sustainability drivers	(El Baz, Tiwari, Akenroye, Cherrafi and Derrouiche, 2022)	4	Prioritising sustainability drivers
Sustainable supplier selection	(Ecer and Pamucar, 2020)	3	Prioritising suppliers
Supplier selection	(Rostami et al., 2023)	5	Supplier selection
Just in time system (JIT)	(Talib, Asjad, Attri, Siddiquee and Khan, 2020)	6	JIT practices
Sustainable supply chain management	(Kusi-Sarpong et al., 2019)	5	Prioritise sustainable innovation management criteria
Supplier selection	(Tavana, Sorooshian and Mina, 2023)	4	Weighing supplier selection criteria
Supply chain sustainability	(Badri Ahmadi et al., 2017)	48	Important sustainable supply chain external forces

Source: Author's own compilation, 2024

To gain more confidence in the effectiveness of the BWM decision-making method and determine the suitable sample size, the researcher of this study conducted additional research on the studies that used the technique. It was discovered that in addition to the studies published in articles and journals that used the BWM decision-making method, the method has also been used for doctoral theses and master's dissertations and sample sizes of less than 50 were used. Table 5.6

below shows the doctoral theses in logistics and supply chain that used the technique and the sample sizes used.

Table 5. 6: Sample Size of Doctoral studies that used Best Worst Method

Research title	Authors	Sample size
Factors influencing physical distribution structure design	Onstein (2021)	22
The future of ports in the physical internet	Fahim (2022)	24
Simulated annealing-based system, statistical evaluation, and application to logistics interoperability	Mohammadi (2020)	12

Source: Author's own compilation, 2024

5.8.6 Sampling Method

Sampling is the process whereby a number of cases or subsets are selected from the population to conduct a study and draw conclusions from that subset (Leavy, 2017). For this to be done the elements of the population have to be determined first so that the sample size suits the population. Researchers use various sampling techniques to enable them to generate samples which are representative of the population. The method chosen should help the researcher ensure that the addition of the participants to the sample is not influenced by them. There are two approaches that can be chosen when selecting a sample: probability and non-probability sampling. Probability sampling is a sampling technique which gives all elements in a sampling frame an equal chance of being selected (Verma et al., 2024). That means the likelihood of each element to be included in a sample is known (Easterby-Smith et al., 2021). On the contrary, non-probability sampling is the type of sampling whereby the likelihood of a participant being selected is not known (Mauldin et al., 2020).

Since it is impossible to state the likelihood of the elements of the population to be sampled when using the non-probability sampling method, it is difficult for the researcher to gain confidence that the inferences drawn from the sample can apply to the entire population (Easterby-Smith et al., 2021). Thus, the researcher opted not to use the non-probability sampling method to conduct the current study, but the probability sampling method was used. As stated by Leavy (2017),

quantitative research uses the probability sampling strategies and they help researchers to generalise the research findings to the entire population. Since the current study used the quantitative research method, probability sampling was appropriate. Secondly, the probability sampling was chosen because it enabled the researcher to select a sample which represented the whole sampling frame, therefore, removing bias by the researcher in the process of sample selection. This made the sample selection in the current study to be a good representation of the target population because the sample was not based on the researcher's favourite participants henceforth generalising the results to the whole population of the manufacturing companies in Botswana.

The probability sampling method has different techniques including simple random sampling, multi-stage sampling, stratified sampling, cluster sampling and systematic sampling (Verma et al., 2024). Simple random sampling involves choosing participants from the population at random (Bordens and Abbott, 2022). Verma et al. (2024) define it as a sampling technique in which each participant in the target population has an equal likelihood of being added to the sample. According to Johannesson and Perjons (2014), the simple random sampling is viewed as the gold standard because it ensures that each participant has an equal opportunity of being chosen. The second method is the multi-stage sampling, which is a technique whereby the sampling process is conducted in many stages (Verma et al., 2024). It is conducted by selecting a sample from the whole population and then a sample is selected from the sample until the researcher obtains a manageable sample. The third probability sampling technique is cluster sampling, which involves dividing the population into categories referred to as clusters; choosing a few categories to represent the whole population, then study all elements within the chosen cluster to make a conclusion (Verma et al., 2024).

The fourth probability sampling is the stratified sampling method. Stratified sampling is a strategy that involves dividing the target population into different groups, referred to as strata and based on common characteristics (Easterby-Smith et al., 2021). Thereafter, samples are taken from each stratum using other random methods; either systematic, simple random or cluster sampling methods. In this way each stratum is represented as there are equal chances of each

member in a stratum to be selected. This method is similar to the cluster sampling, however, it is important to note the difference as in both methods the population is divided into different groups, but with the cluster sampling a group (cluster) is picked and all elements within that cluster are tested, while with the stratified sampling, samples are taken from each group (stratum). The last probability sampling method is systematic sampling. This technique is a random sampling method whereby every element in a target population is selected.

For the current study, the researcher used the stratified random sampling method. The method was chosen because it suited the research population which was divided into different segments of the manufacturing industry hence the target population (manufacturing companies in Gaborone and its surrounding villages) was divided into 10 strata, according to the different segments of industries falling within the manufacturing sector of Botswana. The sample size obtained from each stratum was determined using the stratified sampling method; thereafter the simple random sampling method was used to select participants from each stratum.

Bordens and Abbott (2022) argue that although random sampling lowers the likelihood of bias in sampling by limiting the researchers' choice of their preferred elements from the population, it does not give an assurance that the sample represents the sampling frame because all samples obtained may be of the same features when there are other elements within the sampling frame with different features. For example, the manufacturing sector has segments of companies that produce different types of products ranging from cars to bicycles and textiles to food production, which would have made the study to be conducted on one type of manufacturing industry. That is why to overcome this limitation; the current study used the stratified sampling method which ensured that each segment of the manufacturing industry was represented by dividing the target population into strata according to segments or types of manufacturing companies. The simple random method was only used to pick companies from each stratum.

The sampling framework and sample size using the stratified sampling method are shown in Table 5.7 below. The sampling framework was made by dividing companies according to the types of products they produce. In simple random

sampling a sample is selected in such a way that every member of the population has an equal chance of being selected (Verma et al., 2024). In this way all manufacturing companies in Gaborone and the surrounding villages had an equal chance of being selected, therefore, making a realistic representation of manufacturing companies in Botswana. Since stratified sampling enables the selection of individuals from each stratum, there is an assurance that all strata are represented by the sample (Bordens and Abbott, 2022).

Table 5. 7: **Sampling framework**

Manufacturing segment	**Number of companies**	**Sample size**
Food and beverages	120	6
Textile and wearing apparel	28	2
Paper, printing and reproduction	179	9
Chemical manufacturing	142	7
Pharmaceuticals and medicine	28	2
Metal and non-metallic mineral products	207	10
Computer and electronic products	74	4
Machinery and equipment	80	4
Furniture and related products	85	4
Other	54	2
Total	**994**	**50**

Source: Dun and Bradstreet (2023)

Figure 5.2 below provides a summary of the research methodology adopted for this study. As presented by the figure, the ontology philosophy was adopted, accompanied by the positivism paradigm as data were measurable, observable and recordable. The deductive approach was chosen to prioritise the SSRPO, while the quantitative method was used to gather data and using a survey strategy which relates well with the quantitative method. The figure further shows that the cross-sectional time horizon was adopted due to limited time, and the sampling method used was the stratified random sampling.

Figure 5. 2: Research Methodology



Source: Author's own design, 2024

5.8.7 Data Collection Instrument

Data collection is the most important phase of the research process. It must be collected in a well-arranged manner because if wrong data were gathered, the research results would not meet the research objectives and therefore will fail to produce the research knowledge expected from a study. Data collection can be defined as the process of gathering information from appropriate sources with the goal of learning more about the research topic (Gandhi and Narmawala, 2023). Researchers can use different methods and instruments to collect data. The instrument chosen depends upon the objective of the research and the research method employed, whether qualitative or quantitative method, as well as the technique used to gather data. As stated by Taherdoost (2022), the commonly employed research techniques for quantitative research approach are

experimental, survey, descriptive, casual-comparative and correlation. The current study used the survey research technique as it helped to gather a large amount of data within a short period of time.

The instrument used for collecting primary data for the current research was a self-administered survey questionnaire. A questionnaire is a predetermined list of questions distributed to various participants who are then given an opportunity to record responses on their own without the researcher's intervention. According to Easterby-Smith et al. (2021), the rate of responses under this method is very slow because of lack of physical contacts with the participants. Secondly, the researcher may not be sure of who answered the questions as some participants such as Chief Executive Officers (CEOs) have the tendency of delegating the task to their subordinates. Though a questionnaire has these weaknesses, Mazhar et al. (2021) recommend that it is the most appropriate method for collecting data from a large number of people and from people who are difficult to reach. In order to reduce the risk of having questionnaires completed by wrong people, the current research ensured that responses were checked thoroughly for accuracy and completeness.

The research involved collecting quantitative data from manufacturing companies in Botswana using self-administered questionnaires. The questionnaires consisted of nine main objectives and their sub-objectives which were identified through literature review. It was then validated by conducting a pilot study on six manufacturing companies and industry experts who were not part of the study. Before the questionnaire was distributed for pilot study, it was sent to three academics in the field of supply chain management to test the reliability and validity. After receiving their feedback, the questionnaire was adjusted to cater for their recommendations and was now ready for distribution to the participants of the pilot study. Letters seeking permission to conduct a pilot study were also issued, and the six respondents agreed to participate in the pilot study. The purpose of the pilot study was to validate the identified main objectives (SSRPO) and their relevant sub-objectives. Upon return of the pilot questionnaires by the respondents, the questionnaires were analysed and the identified SSRPO were found to be valid. This helped the researcher to improve the final survey

questionnaire by including the relevant SSRPO and improving the instructions to the respondents. The questionnaire was developed covering information that would help the researcher to prioritise the SSRPO and identify the most important one for manufacturing companies in Botswana. It was divided into two sections; Section A, comprising the main factors and sub-factors for participants to giving the weighting, and section B, giving definitions for the factors and sub-factors to help participants understand the factors and sub-factors.

5.8.7.1 Section A

Section A of the questionnaire consisted of the SSRPO (main criteria) and their sub-objectives (sub-criteria), with space for participants to indicate the weightings. The purpose of this section was to assist the researcher to get answers to the six research questions and thereby achieve the research objectives by determining the following.

i. The first-order and and second-order SSRPO for decision-making among manufacturing companies in Botswana.
ii. The best first-order SSRPO for decision-making among Botswana manufacturing companies.
iii. The worst first-order SSRPO for decision-making among Botswana manufacturing companies.
iv. The best second-order SSRPO for decision-making among Botswana manufacturing companies.
v. The worst second-order SSRPO for decision-making among Botswana manufacturing companies.
vi. The overall optimal SSRPO decision point for manufacturing companies in Botswana.

The questionnaire had a scale of 1 to 9 for weighting the sub-factors hence the main factors. The participants were then requested to indicate on a scale of 1 to 9 the weightings they would give to each of the factors, thus determine the most important SSRPO and the least important, as well by indicating the relevant number against each factor. Table 5.8 below was adapted from Section A of the

questionnaire, with the main factors (SSRPO) and sub-factors (sub-SSRPO) of the research.

Table 5. 8: Sustainable Supplier Relationship Performance Objectives and Sub-objectives

Main factors	Supporting theories	Sub-factors
Economic sustainability	Triple Bottom Line	Supplier collaboration
		Technology investment
		Supplier support programmes
		Inventory management
Social sustainability	Triple Bottom Line	Fair working conditions
		Ethical sourcing
		Community engagement
Environmental sustainability	Triple Bottom Line	Green supply chain management
		Waste management
		Sustainable packaging
Quality	Total Quality Management	Product performance
		Product features
		Reliability
		Conformance
		Durability
		Serviceability
		Aesthetics
		Perceived quality
Supply chain costs	Total Cost of Ownership	Distribution costs
		Production costs
		Procurement costs
		Packaging costs
		Reverse logistics costs
		Inventory costs
Delivery performance	Resource-Based View	On-time delivery
		Reliable delivery
		Order fulfilment
		Time flexibility
		Lead time
Innovation	Circular Economy	Research and design
		Production processes
		Technology
		New product development
Value creation		Brand image
		Cost saving

Main factors	Supporting theories	Sub-factors
	Resource-Based View	Customer care
		Product diversity
Supply chain risk management	Stakeholder Theory	Supplier selection
		Supplier segmentation
		Supplier development
		Information sharing and trust
		Supplier monitoring and performance evaluation

Source: Researcher's own compilation, 2024

5.8.7.2 Section B: Definitions of Sustainable Supplier Relationship Management Performance Objectives

Section B of the questionnaire comprised of the definitions of the main factors and the sub-factors. The aim of the section was to help participants to understand the meaning of each of the main factors and sub-factors so that they could give realistic weightings to all the factors. The definitions from the questionnaires are extracted and shown in Tables 5.9 to 5.18 below.

Table 5. 9: Sustainable Supplier Relationship Management Performance Objectives definitions

Economic sustainability	Economic sustainability occurs when a company is financially stable and continuing to be competitive. It requires pursuing business growth by satisfying the needs of the present people in a way that preserves natural resources for future generations. For example; economic value added, net income and revenue (Ikenna and Enyinna, 2023; Razzak, 2023).
Social sustainability	An organisation should have fair and beneficial business practices that enable all people, including employees, customers and suppliers attain their basic necessities. For example; employee wellness, human rights and diversity (Ipinnaiye and Olaniyan, 2023; Razzak, 2023).
Environmental sustainability	Protecting the natural environment by reducing activities that can damage the environment such as waste generation, greenhouse gas emissions and energy consumption (Ojijo et al., 2023; Eslami et al., 2019).
Quality	Quality is the composite of all the characteristics,

	including performance of an item, product or service that bears on its ability to satisfy safety or implied needs. Its characteristics include performance, features, reliability, conformance to specifications, durability, aesthetics: serviceability and perceived quality (Lysons and Farrington, 2016).
Supply chain costs	Supply chain costs are all costs that are incurred in the supply chain such as materials, labour, equipment and transportation costs (Shang, 2022).
Delivery	Delivery performance is when an organisation fulfils its customers' requirements by making goods available at the agreed upon time. Goods of the right quality and in the right quantity must be delivered at the right time and to the right place. On time delivery can enhance customer loyalty, as well as improving an organisation's reputation (Dehghani Sadrabadi et al., 2023; Kusrini et al., 2020).
Innovation	Innovation is the development of a new product or making improvements to the current product or processes. Innovation may be added through management of strategic relationships with suppliers (Koc et al., 2023; Shuaib and He, 2023).
Value creation	Value creation is the value added to a product due to factors such as brand image, innovation, customer care or the range of products. It is a means of adding sustained competitive advantage to the business (Johne and Wallenburg, 2021; Enz et al., 2019).
Supply chain risk	Supply chain risk is the likely events that may disrupt an organisation's source of supply. That is to say, the likelihood and impact associated with the disruption of a firm's supply, internal manufacturing and delivery operations (Jajja et al., 2018).

Source: Researcher's own compilation, 2024

Table 5. 10: Economic sustainability sub-factors definitions

Supplier collaboration	The approach of working closely with suppliers to achieve results which give economic benefits to both suppliers and the organisation.
Technology investment	Acquisition of assets that can be used by manufacturing companies to advance in technology, thus enhance efficiency and productivity which ultimately contribute to the economic growth of a company.
Supplier support programmes	Programmes that are aimed at giving support to suppliers with the view of developing them so that they can meet an organisation's delivery requirements.
Inventory management	Inventory management is the system companies use to handle inventory by setting inventory policies and procedures to guarantee that sufficient quantities of inventory will be held at all times.

Source: Researcher's own compilation, 2024

Table 5. 11: Social sustainability sub-factors definitions

Fair working conditions	In the manufacturing sector, fair working conditions encompass aspects such as training and education of employees, health and safety, reasonable working hours and reasonable wages.
Ethical sourcing	Ethical sourcing guarantees that products are obtained responsibly and sustainably in ways that prove recognition for the people who make them and for the environment.
Community engagement	Community engagement in supply chain means working with and assisting local communities which are affected by supply chain operations of an organisation. The supply chain can engage the local community in activities such as community development, local sourcing, stakeholder communication and social responsibility.

Source: Researcher's own compilation, 2024

Table 5. 12: Environmental sustainability sub-factors definitions

Green supply chain management	Green supply chain management (GSCM) is the process of incorporating environmental sustainability into all facets of supply chain management.
Waste management	Waste management is the use of environmentally friendly techniques to handle waste generated by manufacturing companies, including reduce, reuse or recycling, while waste that cannot be reused or recycled is treated and disposed by environmental control equipment.
Sustainability packaging	The creation and use of packaging systems which are environmentally friendly and make a contribution to sustainable development. This may involve using environmentally friendly packaging materials, less materials, biodegradable materials and recycling of packaging materials.

Source: Researcher's own compilation, 2024

Table 5. 13: Quality Sub-factors definitions

Product performance	Performance is the ability of a product to execute its intended functions. It relates to the functional aspects of a product and is the primary characteristic of quality which the customer considers when buying a product (Rajasa et al., 2023; Gouda et al., 2019). A product should be able to fulfil its intended functions correctly and efficiently.
Product features	Product features are the secondary characteristics of a product which are supplement (Rajasa et al., 2023; Lysons and Farrington, 2016). The features differentiate a company's product from those of its competitors.

Reliability	Reliability refers to the likelihood of a product to perform satisfactorily given the normal operating conditions over a specified period of time (Rajasa et al., 2023). It gives an assurance that a product will not fail to operate within a certain period of time.
Conformance	Conformance refers to the level of adherence to the set specifications which were determined based on the desires of the customer (Rajasa et al., 2023). A product should meet the standards as specified by the customers in their specifications.
Durability	The period of use available from the time a product is manufactured until it losses value. A manufacturer can improve a product by making it more durable.
Serviceability	Serviceability is the ease, speed and accessibility of repairing a product (Lysons and Farrington, 2016). A product should be easy to repair and maintain during its usage.
Aesthetics	Aesthetics is the judgement that people make about the quality of a product in terms of how it looks, smells, feels, tastes and sounds. It is a subjective aspect of quality which relates to individual considerations and their inclinations (Rajasa et al., 2023).
Perceived quality	The quality a customer considers being right. Customers learn about the product indirectly as they do not usually have full information about the features of a product (Rajasa et al., 2023).

Source: Researcher's own compilation, 2024

Table 5. 14: Supply chain costs sub-factors definitions

Distribution costs	Costs of moving a product from a supplier to the business, including carriage, customs clearance, loading and unloading, fuel, vehicle maintenance (Rushton, Croucher and Baker, 2014).
Production costs	Costs incurred in the process of manufacturing a product, such as materials, labour and overhead costs (Rushton, Croucher and Baker, 2014).
Procurement costs	Costs associated with acquiring a product, such as negotiation, supplier appraisal and documentation. Reducing procurement costs will result in reduced supply chain costs (Rushton, Croucher and Baker, 2014).
Reverse logistics costs	Costs incurred in the process of moving a product from the customer to the supplier for purposes such as returns, repairs, recalls, reuse and recycling (Rushton, Croucher and Baker, 2014).
Inventory costs	Costs involved in holding inventory, including opportunity cost, damages, deterioration and security (Rushton, Croucher and Baker, 2014).

Source: Researcher's own compilation, 2024

Table 5. 15: Delivery performance Sub-factors Definitions

On-time delivery	Delivering goods before or on the stated date of delivery. It is used to measure a supplier's ability to deliver goods on time.
Reliable delivery	Reliable delivery can be defined as providing the appropriate product, of the right quality, in the right quantity, from the right source, delivered to the right location, at the right time and at the right price (Salam, 2021).
Order fulfilment	The whole process of sale from receiving an order from a customer up to delivery of a product. This includes activities such as placing and processing an order, picking stock from the stock location and packing it, shipping and delivery.
Time flexibility	Time flexibility implies the ability of a supplier to respond to the customers' delivery schedules (Forslund and Mattsson, 2023).
Lead time	Lead-time is the time taken from ordering goods up to when delivery is made. Reducing the lead time will help with delivering a product on time.

Source: Researcher's own compilation, 2024

Table 5. 16: Innovation Sub-factors Definitions

Research and design	Research and design is the process of discovering new knowledge and use it to design a new product
Production processes	The procedure undertaken in converting raw materials, components or resources into finished goods. The procedures are essential to a manufacturing company and play a vital role in meeting customer requirements.
Technology	The application of scientific knowledge, tools and techniques to solve practical problems and improve human life. It encompasses a wide range of needs from electronic and information technology to biotechnology, energy, transportation and communication.
New product development	The activity undertaken by manufacturing companies to create new products and take them to the markets where they are needed. In order to achieve this, companies need to be innovative and should respond to customers' needs.

Source: Researcher's own compilation, 2024

Table 5. 17: Value Creation Sub-factors Definitions

Brand image	Brand image is the perception which customers and other stakeholders have of an organisation's brand. This enables an organisation to charge a higher price as customers are prepared to spend more.
Cost saving	Reducing expenses can give an organisation financial benefit such as increased profits, improved cash flow, improved share value, reducing debts and enhancing competitive advantage.
Customer care	Customer care enhances the value of an organisation through various ways including reduced customer complaints, increased customer satisfaction, high rates of customer retention, and thus sustained customer relationship.
Product diversity	Production of a range of products can enhance the value of an organisation through various ways including diversifying risks, increased sales, increased market share and improving the brand image.

Source: Researcher's own compilation, 2024

Table 5. 18: **Supply Chain Risk Management Sub-factors Definitions**

Supplier selection	Supplier selection is the process of determining, assessing and contracting the best suppliers to provide goods and services (Hailiang et al., 2023; Kayani et al., 2023).
Supplier segmentation	Supplier segmentation is a strategic process that evaluates suppliers, identifies approaches and establishes appropriate criteria for different supplier groups, aiming to adopt suitable strategies for each group (Paybarjay et al., 2023).
Supplier development	Supplier development are efforts made by the buying company to enhance sustainable supplier performance, thus meet the economic, social and environmental sustainability (Fan and Kang, 2023; Jia et al., 2023).
Information sharing and trust	The exchange of information between an organisation and its suppliers (Butt, Shah and Ahmad, 2023).
Supplier monitoring and performance evaluation	Assessing the supplier's performance to determine how they have achieved the set criteria directed towards an organisation's objectives (Coşkun, Kumru and Kan, 2022).

Source: Researcher's own compilation, 2024

5.8.8 Data Collection Procedure

Data collection is a vital phase in the research process which needs to be given much attention so that the inferences drawn can be realistic. The current study involved collecting primary data from supply chain professionals in manufacturing companies in Botswana using a self-administered survey questionnaire. The supply chain professionals included procurement professionals, stores and warehousing professionals, production professionals and quality control professionals. These were people who had been with the respective companies for some time; they had been present in the companies during the period of the Covid-19 pandemic. The questionnaires containing the SSRPO were distributed to manufacturing companies in Gaborone and its surrounding villages through mainly print copies which were delivered physically. The manufacturing companies were selected only if they had been operating before the onset of Covid-19, so that respondents could assess SSRPO after the Covid-19 disruption based on prior experience. As shown in Table 5.7, data were gathered from all categories of manufacturing companies in Botswana using stratified sampling, which ensured diversity and gave all respondents an equal chance of being selected

However, some professionals preferred online survey, while others preferred receiving the questionnaires by email. Regardless of the means used to distribute the questionnaires, the information content was the same. The researcher made physical deliveries of the questionnaires to the professionals that preferred print copies, while emails were sent to those who chose to receive questionnaires by email. The online survey was done using Google Forms. The researcher created a platform on Google Forms and then created a survey by adding the information from the questionnaire. A link was then sent to all participants who desired this method for completing the questionnaires.

The participants were given a period of two weeks within which to complete the questionnaires and return them to the researcher. The print copies were then collected by the researcher, while the ones sent by email were returned through the same means. As for those professionals who used the online survey, the response was received immediately after the questionnaire was completed. The participants who were delaying completing the questionnaires were followed up

through a telephone call or email to encourage them to complete the exercise. In this way the researcher ensured that a reasonable number of questionnaires were returned.

5.8.9 Data Analysis

This section covers the data analysis process and the BWM which was used to analyse data. The data gathered during the data collection stage were analysed and interpreted to help the researcher show patterns and relationships, thus contribute to the published empirical knowledge regarding SSRPO. Patel and Patel (2019) emphasise that the collected data should be refined using various means of analysis including coding, tabulation, editing and statistical analysis. Data about the SSRPO were collected from manufacturing companies in Botswana and were categorised into nine sections representing the SSRPO. It was then analysed using the BWM to determine the weights of the different SSRPO and formulate a framework which would enable future decision-making on performance objectives that manufacturing companies in Botswana expect from sustainable supplier relationships. The BWM method is explained here to provide more understanding of the method and the steps taken in analysing data.

The BWM was developed by Rezaei (2015) and is used to solve MCDM problems, which are complex and difficult to make. The BWM was selected for this study because in its nature the SSRPO is an MCDM problem as SSRM requires balancing the nine identified competing objectives; economic sustainability, social sustainability, environmental sustainability, quality improvement, delivery performance, supply chain cost management, supply chain innovation, value creation and supply chain risk management. For this context, BWM offers advantages including; it requires fewer pairwise comparisons, minimises pressure on the decision makers, and produces a consistency ratio to verify reliability. Thus, the BWM was chosen as a suitable MCDM method for developing an SSRPO decision framework for manufacturing companies in Botswana.

Decision-making on SSRPO is complex and difficult because it requires managers to take into account a number of factors to prioritise the SSRPO. The BWM method requires involving the decision makers or experts to determine the best

and worst criteria among all available criteria in a decision-making process. The decision-maker is given an opportunity to make a pairwise comparison by comparing all criteria and identifying the best and worst among them.

According to Rezaei (2015), experts are engaged to make pairwise comparisons and the results are then used to show the comparisons. The BWM has been added to the MCDM criteria which experts and decision makers use to solve problems with several alternative criteria. From the literature, MCDM method can be defined as mathematical models that can be used to address complex problems, which have varying perceptions, objectives and criteria by helping decision makers to prioritise and synthesize them (Rourkela, Odisha, India, Sahoo, Goswami and Biju Patnaik University of Technology (BPUT), Rourkela, Odisha, India, 2023; Baudry, Macharis and Vallée, 2018; Ceballos, Lamata and Pelta, 2016). There are many MCDM methods that experts use to solve multi-criteria problems including Analytic Hierarchy Process (AHP), Simple Multi-attribute Rating Technique (SMART), Decision-Making Trial and Evaluation Laboratory (DEMATEL) and Analytic Network Process (ANP) (Quezada et al., 2018). A comparative analysis of these methods is provided in Table 5.19. Often a time decision makers are faced with complex problems that have competing objectives such that it may be difficult to determine the best of all objectives or criteria. Thus, the MCDM methods can help to determine the best objective.

AHP is a mathematical technique developed (Saaty and Vargas, 2013) and used to evaluate tangible and intangible criteria using absolute scales based on the opinion of knowledgeable and experienced people (Nguyen, Tucek, et al., 2023). It involves giving weights to the factors by making pairwise comparisons through utilising decision makers and experts. The experts, through questionnaires are made to compare the different criteria and attach the importance to the item pairs. This helps to determine the criteria's relative importance through making a comparison between criteria and sub-criteria, if available. This makes it possible to determine the best alternative. Simple Multi-attribute Rating Technique (SMART) is an MCDM method that requires allocating weights to different criteria to show the importance of criteria against the others (Rahim, 2017).

It is based on the idea that each alternative comprises several criteria of value and each criterion has a weight that indicates its importance compared to other criteria (Agustiawan, Rosalina and Purnamasari, 2023). This method is used by decision-makers to make decisions for simple problems. The third method is the Decision-Making Trial and Evaluation Laboratory (DEMATEL), which is a similar method to AHP and SMART as it is used by decision makers to solve multi-criteria problems. It is commonly used to identify the cause and effect relationship among variables and determine the factors that have the greatest impact on the ultimate goal (Khan, Gupta, et al., 2023). Lastly, the Analytic Network Process (ANP) is an MCDM method developed by Saaty in 1996 as an extension of AHP to overcome the weakness of AHP which fails to consider the interrelationships between and among different variables (Khan, Gupta, et al., 2023).

The current study would have used any of these MCDM methods; however, they all have a common disadvantage because they require a pairwise comparison among all variables. In other words, n factors need to be compared $n * n$ times, which may cause difficulties to evaluate factors when they are many and therefore affecting the accuracy of the final decision. In order to maintain consistency between judgements, Rezaei (2015) developed the BWM method and was used for the current study. While Baudry et al. (2018) argue that there is no best MCDM method, a number of researchers (Bai et al., 2022; Talib et al., 2020; Rezaei, 2015) contend that BWM offers more benefits to decision makers compared to other MCDM methods. This method gives two major benefits. Firstly, it requires lesser data than other MCDM methods such as AHP when making a pairwise comparison. Secondly, its calculation of the ratio of the pairwise comparison is consistent in confirming that the criteria are both reliable and optimal (Talib et al., 2020). It is because of these benefits that the method was selected to be used for the current research so that the researcher could obtain reliable and optimal results.

Table 5.19: Multi-criteria Decision-Making Techniques comparative analysis

MCDM	Description	Output type		References
Analytic Hierarchy Process (AHP)	AHP is a mathematical technique used to make pairwise comparisons through utilising decision makers and experts.	Weights and ranking	Structured decision problems	(Nguyen, Tucek, et al., 2023)
Simple Multi-attribute Rating Technique (SMART)	A direct scoring method that requires rating alternatives against criteria then aggregate them using weights.	Scores and ranking	Simple evaluation	(Rahim, 2017)
Decision-Making Trial and Evaluation Laboratory (DEMATEL)	Used to identify the cause-and-effect relationship among variables and determine the factors that have the greatest impact on the goal	Casual maps and influence weights	Identifying casual relationships	(Khan, Gupta, et al., 2023)
Analytic Network Process (ANP)	An extension of AHP to overcome the weakness of AHP which fails to consider the interrelationships between and among different variables.	Global priorities	Complex interrelated systems	(Khan, Gupta, et al., 2023)
Best Worst Method (BWM)	A newer method for making optimised weights through pairwise comparison.	Optimised weights	Efficient weight derivation	Rezaei (2015)

Source: Researcher's own compilation, 2024

Formulating a framework for SSRPO among manufacturing companies in Botswana required the use of an MCDM method to facilitate this complex and

critical process. Therefore, the BWM was adopted for the current study as it was suitable because this study had a lot of factors since the method requires less data than other methods and also has the ability to solve inconsistent and complex evaluations. The need for fewer comparisons is an important advantage because managers and other decision makers do not have much time to spend on evaluating the criteria, then this method which requires little time is best for them.

The BWM method has been used by many researchers in various studies and has performed well by 'maintaining consistency between judgements' (Mi et al., 2019). For instance, Bai et al. (2022) used it to evaluate the blockchain enablers for improving sustainable supply chain transparency in Africa's cocoa industry, while Talib et al. (2020) used it to determine the best and worst JIT practices. Another research that used the BWM method was conducted by Salimi and Rezaei (2018) who evaluated the research and design performance. Furthermore, Gupta (2018) used it to evaluate service quality, while Badri Ahmadi et al. (2017) used it to assess social sustainability of supply chains. Lastly, Rostami et al. (2023) also used it to deal with viable supplier selection problems. More information on the studies that used BWM is provided in Table 5.5 above. From this, the researcher believed that BWM was a reliable tool and could work effectively on the development of a framework for SSRPO.

The BWM process is structured by Rezaei (2015) as outlined below with the descriptions of the notations (symbols) used given in Table 5.20.

1. Decision makers determine a set of criteria, represented by the matrix; $c = \{c_1, c_2, ...c_n\}$. The current study had nine main decision criteria (SSRPO) and were represented as economic sustainability (c_1), social sustainability (c_2), environmental sustainability (c_3), improving quality (c_4), reducing supply chain costs (c_5), improving delivery performance (c_6), improving innovation (c_7), creating value to the business (c_8) and minimising supply chain risks (c_9). The main criteria had sub-criteria that were important for achieving the main criteria SSRPO.
2. Decision makers identify the best criterion and the worst criterion. In this study the best criterion was the most important SSRPO and the

worst criterion was the least important SSRPO. Supply chain professionals from manufacturing companies in Botswana determined the most and least important SSRPO.

3. This is the stage at which a pairwise comparison among the best criterion against other criteria is done. Thus, decision makers compare the best criterion to others on a 1-9-point scale. A score of 1 represents an equal preference between the best criterion and another criterion. Also, a score of 9 shows an extreme preference for the best criterion over another criterion. The outcome gives the Best-to-Others (BO) vector as: $BO = \{aB_1, aB_2, ..., aB_j\}$ where aB_j depicts the preference of the best criterion *B* over criterion *j*.
4. A pairwise comparison between the worst criterion and the other criteria is conducted. Decision makers compare all other criteria to the worst criterion on a 1-9 -point scale. This result portrays the Others-to-Worst (OW) vector as: $OW = \{a_1W_1, a_1W_2, ..., a_jW\}^T$ where a_jW is the preference of the criterion *j* over the worst criterion *W.*
5. BO and OW vectors are substituted into a linear programming problem of the form:

b. $min\ \xi L\ subject\ to$

$wB - aBj \times wj \leq \xi L$

$wj - ajW \times wW \leq \xi L \sum wj = 1$

c. $wj \geq 0, for\ all\ j$

The linear programming problem is solved to get the optimal weights (w_1^*, w^*_2, ⋯ , w_n^*), and ξL^*. The ξL^* depicts consistency. There is a higher consistency when the value of ξL^* is closer to zero. This means the comparison is more reliable.

Following Rezaei (2015) and subsequent BWM validation studies, the following thresholds are applied:

- ξL < 0.10:* High consistency (excellent reliability)
- 0.10 ≤ ξL < 0.20:* Acceptable consistency

- ξL ≥ 0.20:* Low consistency (comparisons should be reviewed or respondent excluded).

The current study had all the 48 respondents producing ξL^* values as shown in Tables 6.8-6.17, which represent as samples, thus confirming the reliability of the pairwise comparison.

Table 5.20: The Best Worst Method Notation table

Notation	Description
$c = \{c_1, c_2, ...c_n\}$	Set of decision criteria
n	Total number of criteria
B	Best (most important) criterion selected by the decision maker
W	Worst (least important) criterion selected by the decision maker
a_{Bj}	Preference value of the best criterion B over criterion j
a_{jW}	Preference value of criterion j over the worst criterion W
w_j	Weight of criterion j
w_B	Weight of the best criterion
w_W	Weight of the worst criterion
$(w_1^*, w_2^*, \dots, w_n^*)$	Optimal weights of all criteria obtained after solving the BWM model
ξ_L	Maximum absolute deviation in the linear BWM model
ξ_L^*	Optimal value of the deviation obtained after solving the model
$\min \xi_L$	Objective function aimed at minimising inconsistency in pairwise comparisons
$\sum w_j = 1$	Normalisation constraint ensuring that all criterion weights sum to one
$w_j \geq 0$	Non-negativity constraint ensuring all weights are positive

Source: Researcher's own compilation, 2024

5.9 ETHICAL CONSIDERATIONS

Ethics are the principles of behaviour that directs a researcher's conduct with regard to the rights of people who become the subjects of the research or affected by its outcomes (Saunders et al., 2019). Although ethical issues arise throughout the process of research; during designing, planning and execution of the research, Leavy (2022) states that ethics largely come into play during data collection due to the amount of time that a researcher spends with the participants, as well as the information that the two parties exchange. This section discusses the ethical issues that could have arisen during the current research. The three main ethical principles in research as stated by Bordens and Abbott (2022) are discussed in this section and these are research consent, anonymity and confidentiality.

5.9.1 Research Consent

Research consent is a research requirement that researchers should obtain informed consent from participants before they can be made to participate in the research. The consenting process involves letting the participants know about the research and obtaining written consent for them to participate (Bordens and Abbott, 2022). The researcher for the current study provided sufficient information to participants that could enable them to make a decision on their participation in the research whether to accept or reject. The researcher used peer reviewed norms to obtain data from survey questionnaires that were distributed among manufacturing companies in Gaborone and its surrounding villages. The participants consented to participation in the research by completing the questionnaires without any undue influence.

Moreover, prior to data collection, consent letters were obtained from some manufacturing companies to give permission for their participation in the research. This is in agreement with the view of Leavy (2022) who stated that written consent should be acquired from the participants. By obtaining the written consent, it gave an assurance that the participation of the manufacturing companies in the research was voluntary and that they were given the right to withdraw at any time of the data collection process. Furthermore, the letters sent to the manufacturing companies requesting permission to participate in the research gave them all

critical information regarding the data collection and analysis process, including the aim of the research, the method of data collection to be used, the benefits of the research and the policy of the University of South Africa (UNISA), which requires all participation to be voluntary and the right to withdraw at any time without recourse. This fulfilled the requirement of research as stated by Leavy (2022) who emphasised that participants should be made aware of what is involved in the research process in terms of the information required from them and the possible risks involved in their participation and the benefits thereof. Moreover, obtaining a written consent is an important measure of protection to both the participants and researcher (Leavy, 2022).

5.9.2 Maintaining Anonymity and Confidentiality

Participation anonymity is an important element in research ethics which researchers should consider and comply with. Anonymity is an element of research ethics which is vital in data collection and analysis, which means that participants' identity is kept anonymous. According to Bordens and Abbott (2022), anonymity entails that the researcher should ensure that participants are assured that their identities as study participants cannot be revealed. The current research assured the participants that anonymity would be maintained by stating clearly in the request for permission letter sent to manufacturing companies as per UNISA policy and also the data collection questionnaires did not require participants to disclose their names or any other evidence that could lead to their identities being revealed. That means all supply chain professionals from the manufacturing companies of Botswana who participated in the research were protected by maintaining their anonymity. Bordens and Abbott (2022) emphasised that the maintenance of participants' response anonymity should be the researcher's concern regardless of the chosen research environment.

Confidentiality, on the other hand, is the act of guaranteeing the participants to maintain security of their responses (Bordens and Abbott, 2022). The participants completed the questionnaires at their convenience and returned them to the researcher, thus maintaining anonymity. Furthermore, the questionnaires sent electronically contained a password thus restricting the accessibility of the completed questionnaires to the researcher and participants. In this way,

information could not be accessed by any other person who might use the computer. The questionnaires were distributed manually and this also restricted accessibility by ensuring that they were collected in person by the researcher and kept securely. All the raw data obtained by the researcher were not made accessible to any other person except the supervisor and statisticians. This is in agreement with many authors' recommendations (Bordens and Abbott, 2022; Leavy, 2022) who advise researchers to protect the research participants and maintain confidential responses obtained from them.

Moreover, to ensure compliance with the research ethics and integrity standards, ethical clearance was obtained from UNISA Graduate School of Business Leadership before the commencement of data collection. Additionally, a research permit was granted to the researcher by the Government of Botswana through the Ministry of Communication and Innovation, which permitted the research to be carried out on the manufacturing sector of Botswana.

5.10 CHAPTER SUMMARY

This chapter covered the research methodology for the study. It started by outlining the research onion framework as the design to guide the study. Secondly, the research philosophies as the sets of assumptions and beliefs regarding the advancement of knowledge were outlined and these are ontology, epistemology and axiology. The chapter went on to present the research paradigms as sets of perspectives that direct research action and study, presenting positivism, which is the understanding of reality through experiments. The theory development approaches were also outlined as deductive, inductive and abductive. The chapter further covered the research methods such as quantitative and qualitative and research strategies including experiments, surveys, case study, action research, grounded theory, ethnography and archival.

It further presented a summary of the methodology adopted for the current study. The philosophy of the study was ontology, with positivism as the research paradigm. The research approach was deductive, while the quantitative method was used for data collection using survey strategy. The chapter further discussed the time horizon adopted for the study as cross-sectional and discussed the

various sampling methods available emphasising the stratified random sampling method which was used for the current study. The data collection instrument was also outlined and the data analysis method used for the current study was discussed as the BWM. The chapter ended with explaining the ethical considerations as research consent and maintaining anonymity and confidentiality. The next chapter will discuss and analyse the collected data from the manufacturing companies in Botswana.

CHAPTER 6

DATA ANALYSIS AND DISCUSSION

6.1 INTRODUCTION

Chapter 5 presented the research methodology which was employed in the study of determining the SSRPO amongst manufacturing companies in Botswana and determining the optimal decision point. Chapter 6 presents the discussion and analysis of the data collected from manufacturing companies in Botswana. The chapter starts with Section 6.2 which presents the demographic information of the respondents including the manufacturing segments of the respondents, age and gender, respondents' levels of education, their positions in their respective companies and work experience. This is followed by the respondents' pairwise comparison in Section 6.3. The ranking of the main SSRPO is presented in Section 6.4, while the ranking of the sub-objectives of the SSRPO is presented in Section 6.5. This is followed by Section 6.6 that presents the linkage between the theoretical ST. Finally, a decision framework for SSRPO for manufacturing companies in Botswana is presented in Section 6.6 together with guidance on how to use it.

6.2 RESPONDENTS' DEMOGRAPHIC INFORMATION

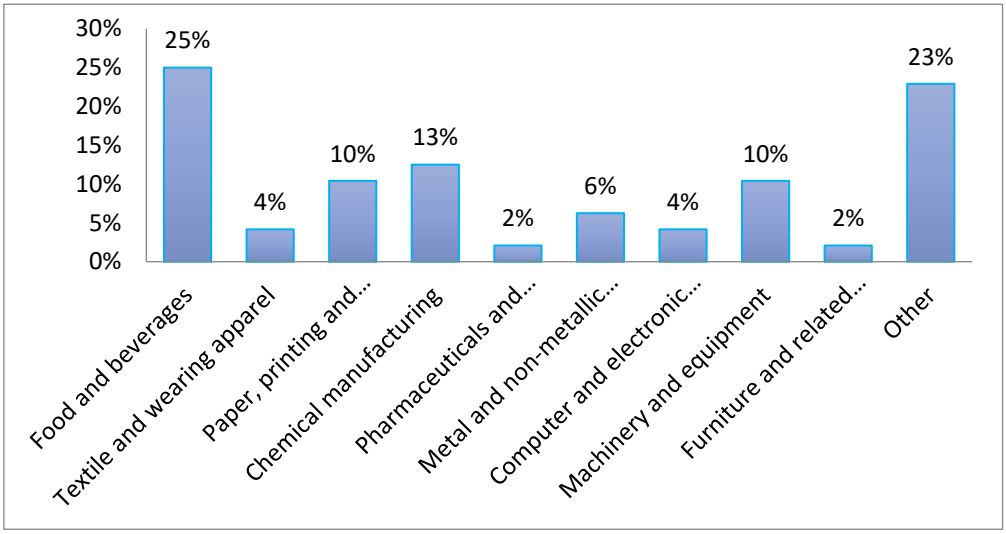
This section provides the demographic information of the respondents who took part in the current study. The information is broken down into the segments of the manufacturing industry, age and gender, level of education, position in the company and the number of years of experience in the manufacturing industry.

6.2.1 Data Collection Per Manufacturing Segment

An evaluation was conducted to determine how well spread the respondents were across the segments of the manufacturing industry. The study included small, medium, and large companies. Using stratified sampling method, the manufacturing industry was divided into various segments according to the types of production. As presented in Table 6.1 and illustrated in a bar chart in Figure 6.1, the collected data were well spread among manufacturing companies. The largest

amount of sample data was collected from the food and beverages companies which is the largest segment of the manufacturing industry and had a rate of 25 percent of the total data sample. The pharmaceutical and medicine and furniture sectors proved to be the smallest sectors with 2 percent of data sample collected from each segment. Another large sample of data came from the manufacturing companies that did not fall in any of the main categories and were categorised as 'other'. These manufacturing companies included companies such as clay works, basket weaving and the manufacturing of animal feed. The amount of data collected from this category was 23 percent of the total data collected.

Figure 6.1: Classification by manufacturing industry segment



Source: Author's own design, 2024

Table 6. 1: Data collection by manufacturing industry segment

Manufacturing industry segment	Number of respondents	Percentage
Food and beverages	12	25 percent
Textile and wearing apparel	2	4 percent
Paper, printing and reproduction	5	10 percent
Chemical manufacturing	6	13 percent
Pharmaceuticals and medicine	1	2 percent
Metal and non-metallic mineral products	3	6 percent
Computer and electronic products	2	4 percent
Machinery and equipment	5	10 percent
Furniture and related products	1	2 percent
Other	11	23 percent
Total	**48**	**100 percent**

Source: Researcher's own compilation, 2024

6.2.2 Age and Gender of Respondents

Data were obtained from supply chain experts of various ages and genders to guarantee that data collection was cross-sectional and that the opinions of diverse age groups and genders were considered. As demonstrated in Table 6.2, the male respondents were the majority of the respondents as they were 63 percent of the total respondents, while the female respondents were 38 percent. Regarding the ages of the respondents, the majority were those above 41 years as they made up a representation of 25 percent of the total respondents. The table also shows that the youngest respondents, between the ages of 20 and 30 years were only 9 representing 19 percent of the total respondents.

Table 6. 2: Age and gender of respondents

Variable	Category	Number	Percentage
Gender	Male	30	63 percent
	Female	18	38 percent
Age (Years)	20 – 30	9	19 percent
	31 – 40	14	29 percent
	41 and above	25	52 percent
Total		**48**	

Source: Researcher's own compilation, 2025

6.2.3 Levels of education of respondents

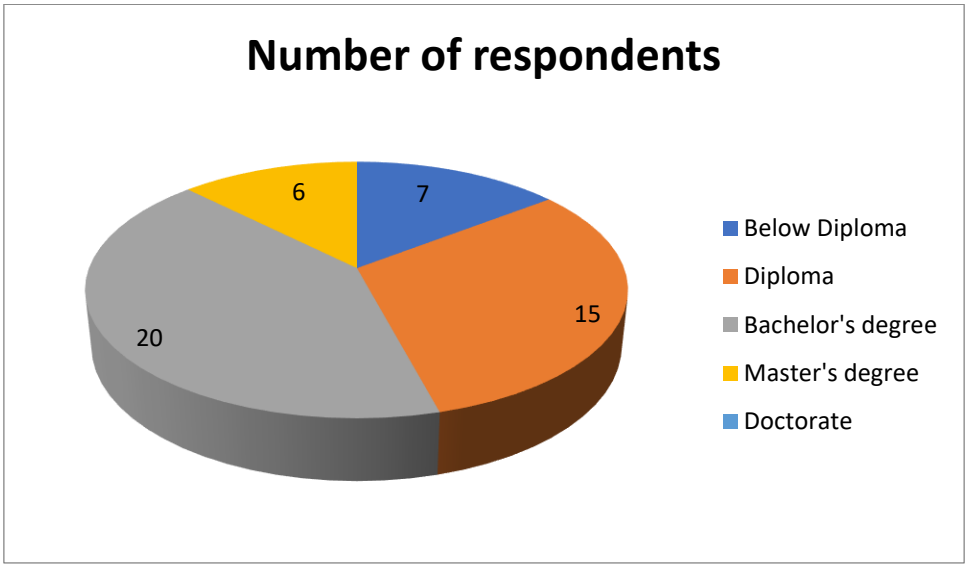
Respondents of diverse levels of education were involved because engaging people of varied educational level can help with collecting data from people who have different degrees of knowledge since educational level is often linked to specialised knowledge and view topics differently. The educational background of the respondents is displayed in Table 6.3. The majority of the respondents held bachelor's degree as they were 42 percent of the total respondents, followed by those who held diploma qualifications being 31 percent. Those who held master's degrees were 13 percent, while holders of qualifications below diploma level were 15 percent. None of the respondents held qualifications at doctorate level. Figure 6.2 makes a further analysis of the qualifications held by the respondents. It clearly shows that master's degrees were held by 6 respondents and 20 of the total respondents held bachelor's degrees, while 15 held diplomas. Those who held qualifications below the diploma level were 7.

Table 6. 3: Levels of education

Education Level	Number of respondents	Percentage
Below Diploma	7	15 percent
Diploma	15	31 percent
Bachelor's degree	20	42 percent
Master's degree	6	13 percent
Doctorate	0	0 percent
Total	**48**	**100 percent**

Source: Researcher's own compilation, 2025

Figure 6.2: Qualifications of respondents



Source: Author's own design, 2025

6.2.4 The Respondents' Positions in the Company

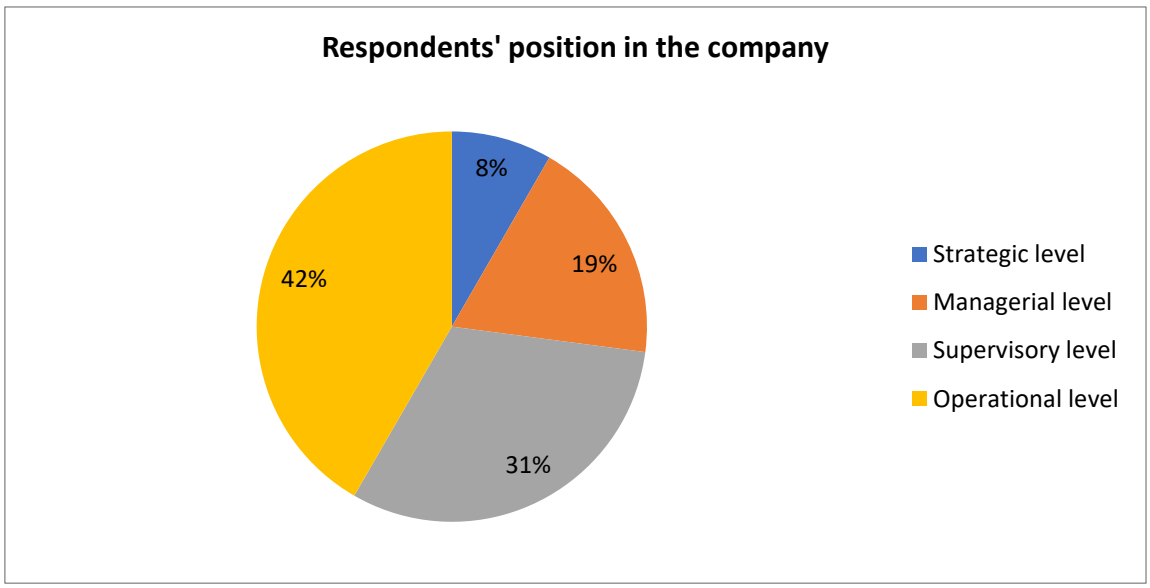
The data were collected from supply chain professionals in manufacturing companies including procurement professionals, stores and warehousing professionals, production professionals and quality control professionals. These were at different levels of management as illustrated in Table 6.4. The respondents comprised staff at different levels of management with those at operational levels being the highest as they represented 42 percent of the total respondents, followed by 31 percent at supervisory level and managerial level being 19 percent. The minority group was respondents at the strategic level with only 8 percent of the total respondents. A pie chart is also provided in Figure 6.3 to present a different presentation of the positions held by the respondents in their various companies. As can be seen from the pie chart, the distribution suggests that the largest sample was obtained from respondents at the operational level. These were staff with hands-on in the supply chain management discipline, thus have direct contact with their suppliers hence the responses given were more reliable.

Table 6. 4: Respondents' position in the company

Management Level	Number of respondents	Percentage
Strategic level	4	8 percent
Managerial level	9	19 percent
Supervisory level	15	31 percent
Operational level	20	42 percent
	48	**100 percent**

Source: Researcher's own compilation, 2025

Figure 6.3: Respondents' position in the company



Source: Author's own design, 2025

6.2.5 Respondents' Work Experience

When it came to the respondents' work experience in the manufacturing sector, it was found that the highest category was the staff with 6 to 10 years' experience representing 35 percent of the total respondents as illustrated in Table 6.5. The table further shows that the respondents with over 15 years' experience were the second category with 25 percent respondents, followed by 21 percent of the respondents who had 11 to 15 years of experience in the manufacturing sector.

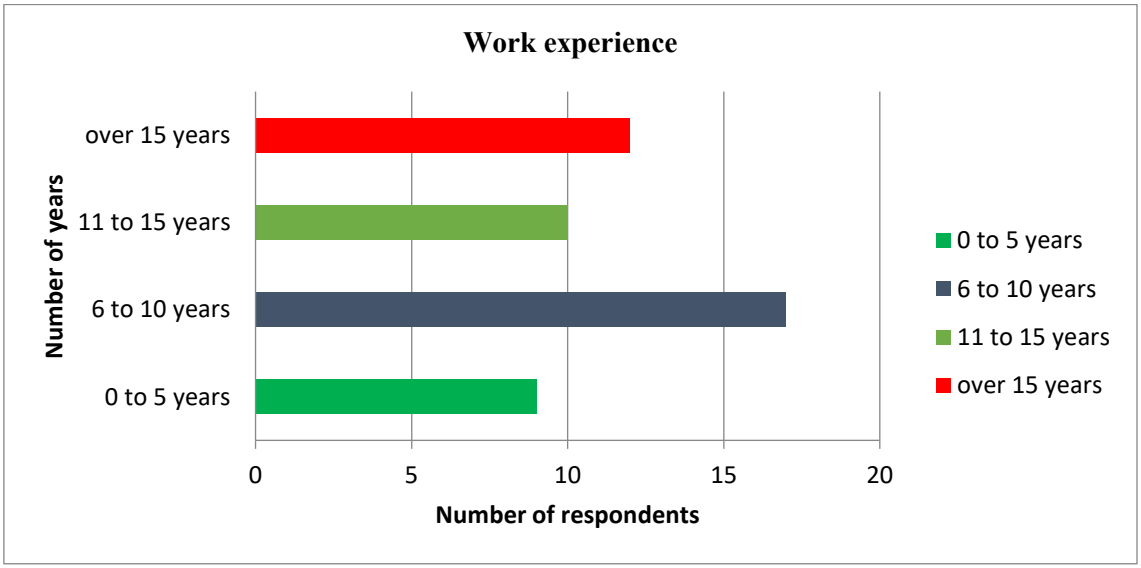
The category of 0 to 5 years had 19 percent respondents. A view from the bar chart presented as Figure 6.4 shows the concentration of respondents in the category of 6 to 10 years' experience.

Table 6. 5: Respondents' work experience

Work experience	Number of respondents	Percentage
0 to 5	9	19 percent
6 to 10	17	35 percent
11 to 15	10	21 percent
over 15 years	12	25 percent
Total	**48**	**100 percent**

Source: Researcher's own compilation, 2025

Figure 6.4: Classification by work experience



Source: Author's own design, 2025

6.3 RESPONDENTS' PAIRWISE COMPARISON OF THE QUESTIONNAIRES FOR DATA COLLECTION

The methodology employed the BWM to gather preferences among the nine main objectives and their sub-objectives, using a scale of 1 (equally important) to 9 (extremely more important). The questionnaires were distributed to manufacturing

companies in Gaborone and surrounding villages with some being sent by email, while most of them were delivered physically. The physical distribution of questionnaires was ideal as it gave the researcher an opportunity to answer any questions which were raised by the respondents and be able to give more explanations on the information contained on the questionnaires. Though the sample size was 50 manufacturing companies, the questionnaires were distributed to 70 manufacturing companies, as shown in Table 6.6 below, to give provision for failure to return the questionnaires so that collected questionnaires could be close to the desired number of 50 manufacturing companies. For each manufacturing company, one expert was required to complete the questionnaire so that the researcher could obtain from them their preferences among the main objectives and their sub-objectives. This is followed by Table 6.7 which gives the abbreviations of the main SSRPO and the sub-objectives of the SSRPO and these are used in the tables and figures that follow. Out of the 70 distributed questionnaires, 48 were completed and returned by the respondents and therefore these were used to make an analysis. The analysis of the SSRPO was done to help manufacturing companies to identify the most important objectives in the SSRM with their suppliers.

Table 6. 6: Linguistic scale for pairwise comparison for best worst methodology (BWM)

Equally important	Equal to moderately more important	Moderately more important	Moderately to strongly more important	Strongly more important	Strongly to very strongly more important	Very strongly more important	Very strongly to extremely more important	Extremely more important
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Table 6. 7: Abbreviations of the Sustainable Supplier Relationship Performance Objectives

Objective/sub-objective	Abbreviation	Objective/sub-objective	Abbreviation
Economic sustainability	ECO	Aesthetics	QUI7
Social sustainability	SOC	Perceived quality	QUI8
Environmental sustainability	ENT	Distribution costs	SCC1

Objective/sub-objective	Abbreviation	Objective/sub-objective	Abbreviation
Quality improvement	QUI	Production costs	SCC2
Supply chain cost management	SCC	Procurement costs	SCC3
Delivery performance	DLP	Reverse logistics costs	SCC4
Supply chain innovation	SCI	Inventory costs	SCC5
Value creation	VLC	On-time delivery	DLP1
Supply chain risk management	SCR	Reliable delivery	DLP2
Supplier collaboration	ECO1	Order fulfilment	DLP3
Supply chain technology investment	ECO2	Time flexibility	DLP4
Supplier support	ECO3	Lead time	DLP5
Inventory management	ECO4	Research and design	SCI1
Working conditions	SOC1	Production processes	SCI2
Ethical sourcing	SOC2	Technology	SCI3
Community engagement	SOC3	New product development	SCI4
Green supply chain management	ENT1	Brand image	VLC1
Waste management	ENT2	Cost saving	VLC2
Sustainable packaging	ENT3	Customer care	VLC3
Product performance	QUI1	Product diversity	VLC4
Product features	QUI2	Supplier selection	SCR1
Reliability	QUI3	Supplier segmentation	SCR2
Conformance	QUI4	Supplier development	SCR3
Durability	QUI5	Information sharing	SCR4
Serviceability	QUI6	Supplier monitoring & performance evaluation	SCR5

To make a pairwise comparison so that the best criteria could be rated against the other categories of the nine main objectives, the respondents were asked to indicate the best criterion (objective) under each category. They were also requested to determine the worst objective and rate the rest of the objectives against the worst objective. A similar exercise was undertaken for the sub-criteria (sub-objectives) of each of the nine main objectives. The respondents were requested to rate the best sub-objectives against other sub-objectives and then rate the worst sub-objective against other sub-objectives. Upon completion of this

exercise by the respondents, 48 questionnaires were returned and the next step was to determine the weights of the main objectives and sub-objectives. This was done by using the Best Worst Solver which helped the researcher to calculate the weights of each of the main objectives and sub-objectives for each of the ratings made by the respondents. Thereafter, the rankings of the main and sub-objectives were done by averaging the weights derived from each respondent.

All the responses from the 48 respondents were completed in the same way using the Best Worst Solver to calculate the weights. To give the readers of this report a sample of the weightings of the responses, Tables 6.8 to 6.17 were presented to show the weightings made from the responses from respondent 1, together with the graphs, presented in Figures 6.5 to 6.14, created from these weightings. The weights are close to zero as indicated by KSI*, which demonstrates the high consistency of the decision makers in their pairwise comparison. This indicates that the BWM in this study were reliable. Presented in Table 6.8 are the weightings of the main criteria; the main SSRPO as scored by Respondent 01, who determined the scores for the preference of the most important objectives as the best over all the other eight objectives and determined the least important as the worst criterion to other objectives. As shown in Table 6.8, Respondent 01 selected environmental sustainability as the best objective and value creation as the worst objective. The weighting for environmental sustainability was given as 0.3146 and the value creation objective was 0.0274 as shown in Figure 6.5.

Table 6. 8: BWM weights computation of the main objectives of the SSRPO among manufacturing companies in Botswana for Respondent 01

Criteria Number = 9	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8	9
Names of Criteria	ECO	SOC	ENT	QUI	SCC	DLP	SCI	VLC	SCR

Select the Best	ENT

Select the Worst	VLC

Best to Others	ECO	SOC	ENT	QUI	SCC	DLP	SCI	VLC	SCR
ENT	2	3	1	5	4	7	8	9	6

Others to the Worst	VLC
ECO	8
SOC	7
ENT	9
QUI	5

Criteria Number = 9	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8	9
SCC	6								
DLP	3								
SCI	2								
VLC	1								
SCR	4								

Weights	ECO	SOC	ENT	QUI	SCC	DLP	SCI	VLC	SCR
	0,1915	0,1277	0,3146	0,0766	0,0958	0,0547	0,0479	0,0274	0,0638

Ksi*	0,0684

Graph showing SSRPO (main objectives) among manufacturing companies in Botswana for Respondent 01

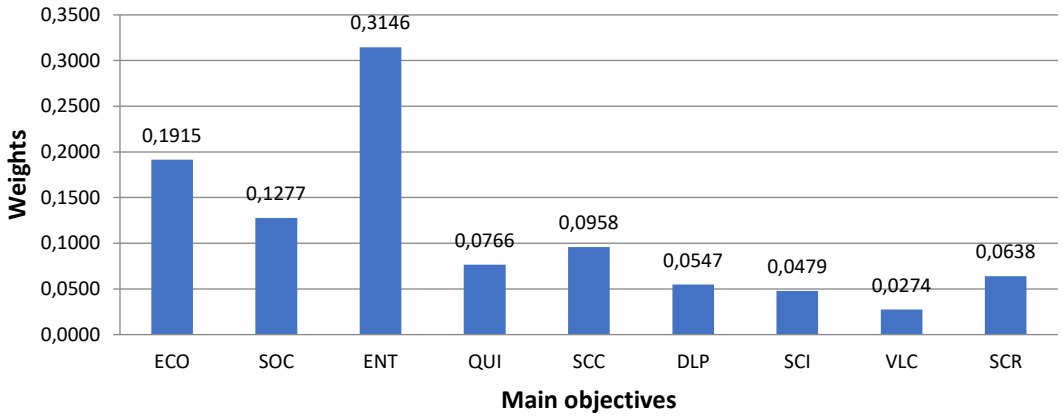


Figure 6.5: Sample graph of pairwise comparison for SSRPO among manufacturing companies in Botswana for Respondent 01

After scoring the main objectives, the sub-objectives were scored using the same scale of 1 to 9 and the weightings for these scores were calculated using the same tool for the BWM; the Best Worst Solver. Table 6.9 and Figure 6.6 show the weightings of the sub-objectives by Respondent 01, who gave the most importance to supplier collaboration (ECO1) and the least importance to inventory management (ECO4).

Table 6. 9: BWM weights computation of the Economic sub-objectives for Respondent 01

Criteria Number = 4	Criterion 1	Criterion 2	Criterion 3	Criterion 4
Names of Criteria	ECO1	ECO2	ECO3	ECO4

Select the Best	ECO1

Select the Worst	ECO4

Best to Others	ECO1	ECO2	ECO3	ECO4
ECO1	1	4	2	9

Others to the Worst	ECO4
ECO1	9
ECO2	6
ECO3	8

Criteria Number = 4	Criterion 1	Criterion 2	Criterion 3	Criterion 4
ECO4	1			

Weights	ECO1	ECO2	ECO3	ECO4
	0,5000	0,1522	0,3043	0,0435

Ksi*	0,1087

Graph showing economic sustainability sub-objectives

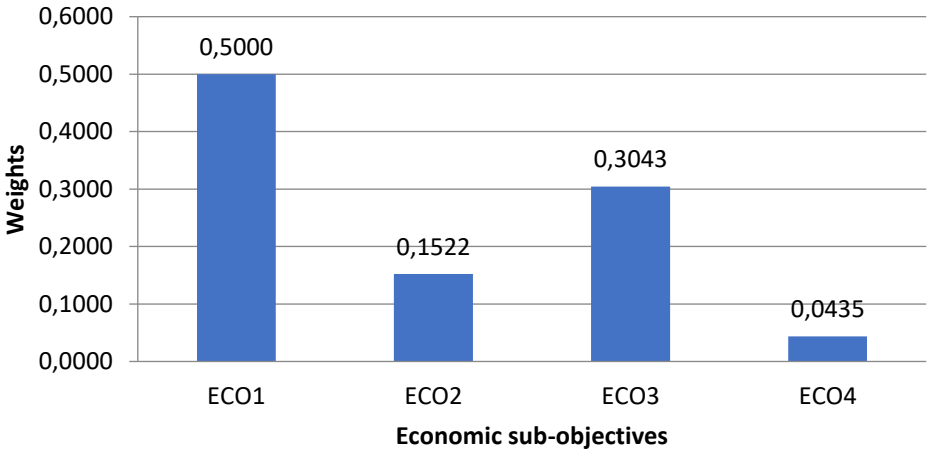


Figure 6.6: Sample graph of pairwise comparison for economic sustainability sub-objectives

When it came to the sub-objectives of social sustainability, Respondent 01 gave the highest score to the working conditions (SOC1) as demonstrated by Table 6.10 and represented by the tallest bar in the bar chart of Figure 6.7, while community engagement (SOC3) was regarded as the least important.

Table 6. 10: BWM weights computation of social sustainability sub-objectives for Respondent 01

Criteria Number = 3	Criterion 1	Criterion 2	Criterion 3
Names of Criteria	SOC1	SOC2	SOC3

Select the Best	SOC1

Select the Worst	SOC3

Best to Others	SOC1	SOC2	SOC3

Criteria Number = 3	Criterion 1	Criterion 2	Criterion 3
SOC1	1	4	5

Others to the Worst	SOC3
SOC1	9
SOC2	6
SOC3	5

Weights	SOC1	SOC2	SOC3
	0,5263	0,2632	0,2105

Ksi*	0,5263

Graph showing social sustainability sub-objectives

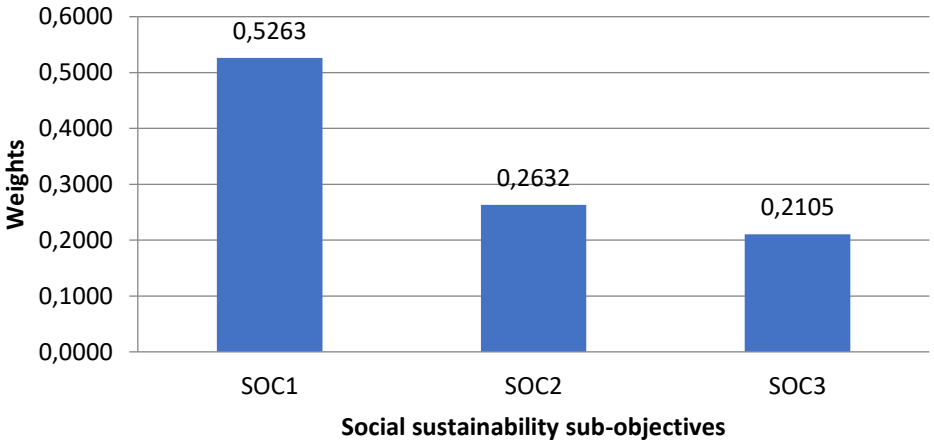


Figure 6.7: Sample graph of pairwise comparison for social sustainability sub-objectives

There were three sub-objectives of the environmental sustainability objective and using the Best Worst solver tool to calculate the responses given by Respondent 01, GSCM (ENT1) was the best and waste management (ENT2) was the worst. This is illustrated in Table 6.11 and Figure 6.8.

Table 6. 11: BWM weights computation of environmental sustainability sub-objectives of Respondent 01

Criteria Number = 3	Criterion 1	Criterion 2	Criterion 3
Names of Criteria	ENT1	ENT2	ENT3

Select the Best	ENT1

Select the Worst	ENT2

Best to Others	ENT1	ENT2	ENT3
ENT1	1	5	2

Others to the Worst	ENT2
ENT1	9
ENT2	5
ENT3	8

Weights	ENT1	ENT2	ENT3
	0,4167	0,1667	0,4167

Ksi*	0,4167

Graph showing environmental sustainability sub-objectives

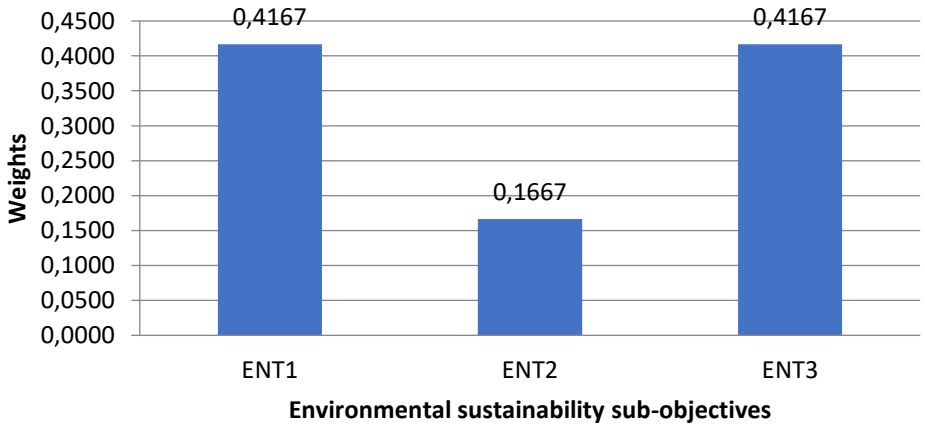


Figure 6.8: Sample graph of pairwise comparison for environment sustainability sub-objectives for Respondent 01

The weightings calculated from the responses given by Respondent 01 for the sub-objectives of quality improvement are demonstrated by Table 6.12 and a graphical presentation shown in Figure 6.9. Both the table and graphical presentation show that serviceability (QUI6) was given the greatest importance, while reliability (QUI3) was of the least importance.

Table 6. 12: BWM weights computation of quality sub objectives of Respondent 01

Criteria Number = 8	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	Criterion 7	Criterion 8
Names of Criteria	QUI1	QUI2	QUI3	QUI4	QUI5	QUI6	QUI7	QUI8

Select the Best	QUI6

Select the Worst	QUI3

Best to Others	QUI1	QUI2	QUI3	QUI4	QUI5	QUI6	QUI7	QUI8
QUI6	2	6	8	5	3	1	4	7

Others to the Worst	QUI3
QUI1	8
QUI2	4
QUI3	2
QUI4	5
QUI5	7
QUI6	9
QUI7	6
QUI8	3

	QUI1	QUI2	QUI3	QUI4	QUI5	QUI6	QUI7	QUI8
Weights	0,2254	0,0751	0,0564	0,0902	0,1503	0,2254	0,1127	0,0644

Ksi*	0,2254

Graph showing quality sub-objectives

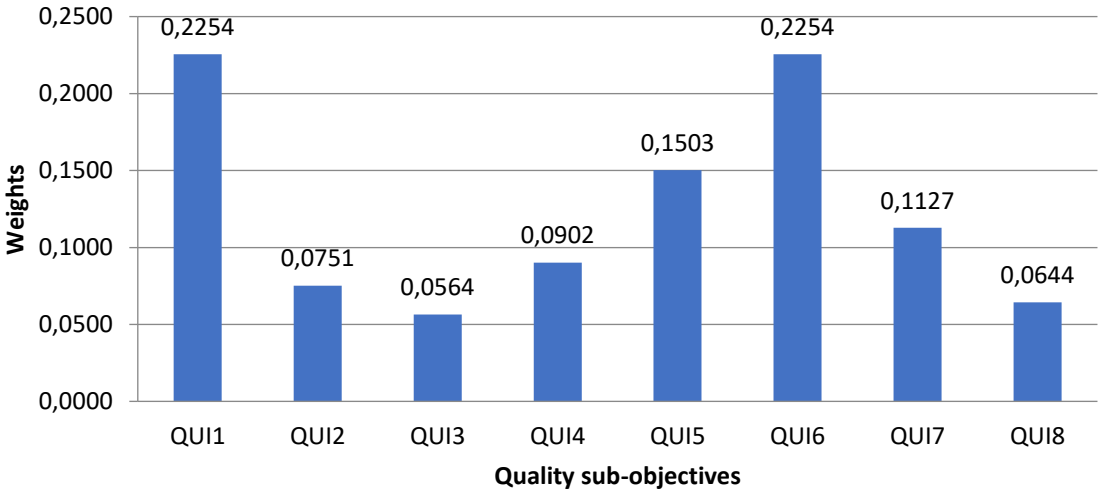


Figure 6.9: Sample graph of pairwise comparison for quality sub-objectives for Respondent 01

The supply chain cost management sub-objectives were also weighed as shown in the sample of Respondent 01 in Table 6.13 and a graphical presentation in Figure 6.10. Out of the five sub-objectives, procurement costs (SCC3) were rated as the best while production costs (SCC2) were rated as the worst.

Table 6. 13: BWM weights computation of supply chain cost management sub-objectives of Respondent 01

Criteria Number = 5	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
Names of Criteria	SCC1	SCC2	SCC3	SCC4	SCC5

Select the Best	SCC3

Select the Worst	SCC2

Best to Others	SCC1	SCC2	SCC3	SCC4	SCC5
	6	8	1	4	7

Others to the Worst	SCC3
SCC1	4
SCC2	2
SCC3	9

Criteria Number = 5	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
SCC4	6				
SCC5	3				

Weights	SCC1	SCC2	SCC3	SCC4	SCC5
	0,1407	0,1055	0,4221	0,2111	0,1206

Ksi*	0,4221

Graph showing supply chain cost management sub-objectives

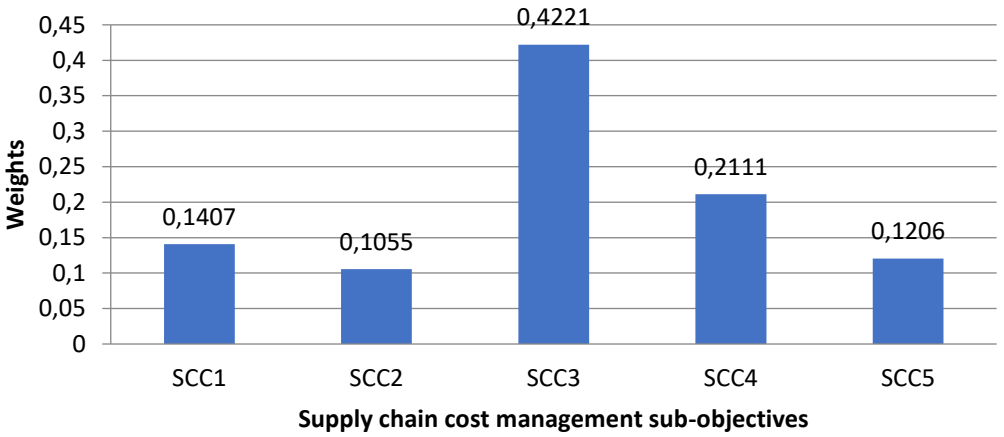


Figure 6.10: Sample graph of pairwise comparison for supply chain cost management sub-objectives for Respondent 01

From the rating of the delivery performance sub-objectives by Respondent 01, the weighting was done which showed that this respondent gave the most importance to time flexibility (DLP4) and reliable delivery (DLP2) being the least important. This is illustrated in Table 6.14 and presented graphically in Figure 6.11.

Table 6. 14: BWM weights computation of delivery performance sub-objectives of Respondent 01

Criteria Number = 5	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
Names of Criteria	DLP1	DLP2	DLP3	DLP4	DLP5

Select the Best	DLP4

Select the	DLP2

Criteria Number = 5	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
Worst					

Best to Others	DLP1	DLP2	DLP3	DLP4	DLP5
	5	7	6	1	2

Others to the Worst	DLP2
DLP1	5
DLP2	3
DLP3	4
DLP4	9
DLP5	8

Weights	DLP1	DLP2	DLP3	DLP4	DLP5
	0,1325	0,0946	0,1104	0,3312	0,3312

Ksi*	0,3312

Graph showing delivery performance sub-objectives

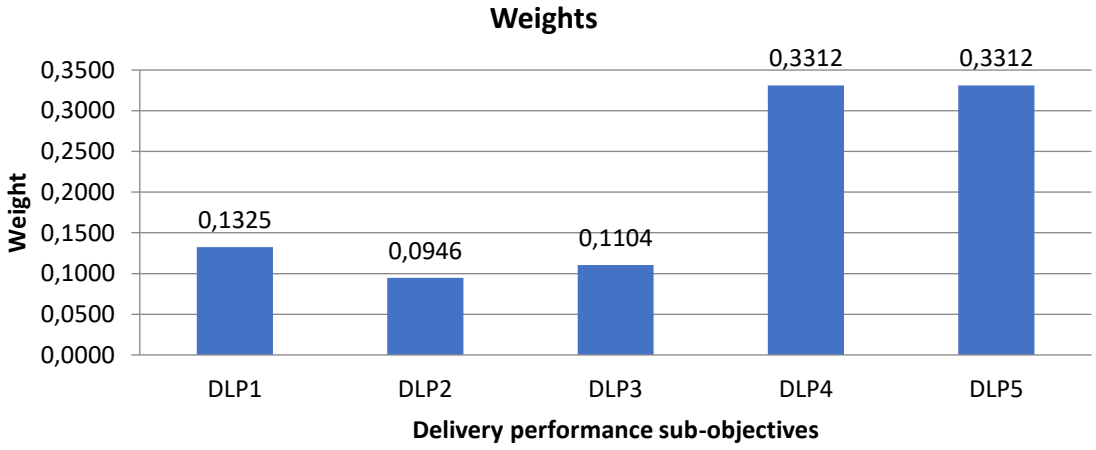


Figure 6.11: Sample graph of pairwise comparison for delivery performance sub-objectives for Respondent 01

Table 6.15 demonstrates the weightings done from the responses given by Respondent 01 regarding the supply chain innovation sub-objectives, where technology (SCI3) was the best sub-objective and production processes (SCI2) was the worst sub-objective.

Table 6. 15: BWM weights computation of supply chain innovation sub-objectives of Respondent 01

Criteria Number = 4	Criterion 1	Criterion 2	Criterion 3	Criterion 4
Names of Criteria	SCI1	SCI2	SCI3	SCI4

Select the Best	SCI3

Select the Worst	SCI2

Best to Others	SCI1	SCI2	SCI3	SCI4
SCI2	5	6	1	2

Others to the Worst	SCI2
SCI1	5
SCI2	4
SCI3	9
SCI4	8

Weights	SCI1	SCI2	SCI3	SCI4
	0,1463	0,1220	0,3659	0,3659

Ksi*	0,3659

Graph showing supply chain innovation sub-objectives

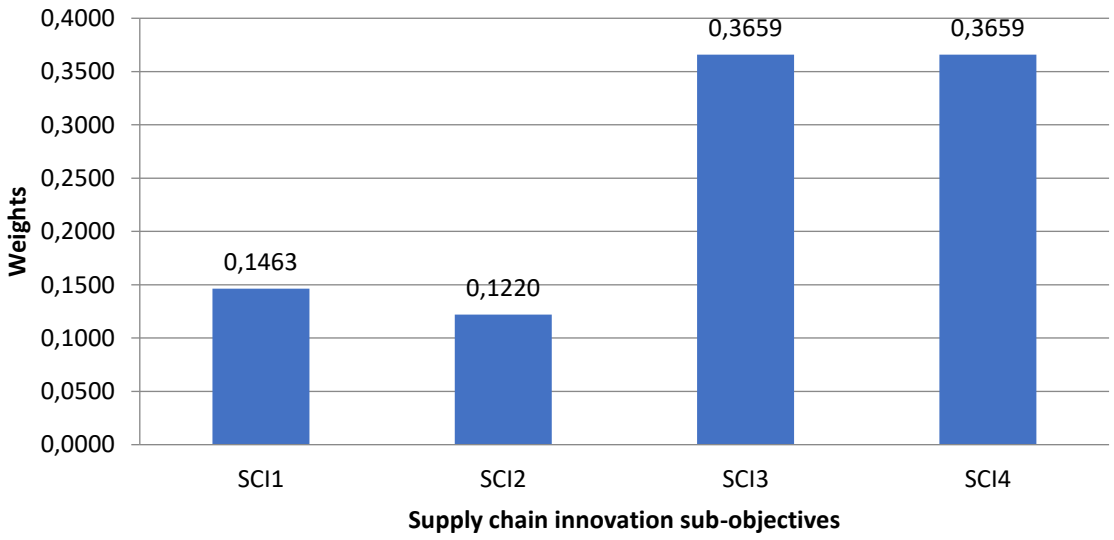


Figure 6.12: Sample graph of pairwise comparison for supply chain innovation sub-objective for Respondent 01

Table 6.16 illustrates Respondent 01's weightings where the brand image came out as the best sub-objective and customer care being the worst sub-objective. This is clearly shown using a graphical presentation in Figure 6.13; the brand image is represented by the tallest bar.

Table 6. 16: Sample graph of pairwise comparison for value creation sub-objective of Respondent 01

Criteria Number = 4	Criterion 1	Criterion 2	Criterion 3	Criterion 4
Names of Criteria	VLC1	VLC2	VLC3	VLC4

Select the Best	VLC1

Select the Worst	VLC3

Best to Others	VLC1	VLC2	VLC3	VLC4
VLC1	3	5	9	7

Others to the Worst	VLC3
VLC1	7
VLC2	5
VLC3	1
VLC4	3

Weights	VLC1	VLC2	VLC3	VLC4
	0,4234	0,2540	0,1411	0,1815

Ksi*	1,2702

Graph showing value creation sub-objectives

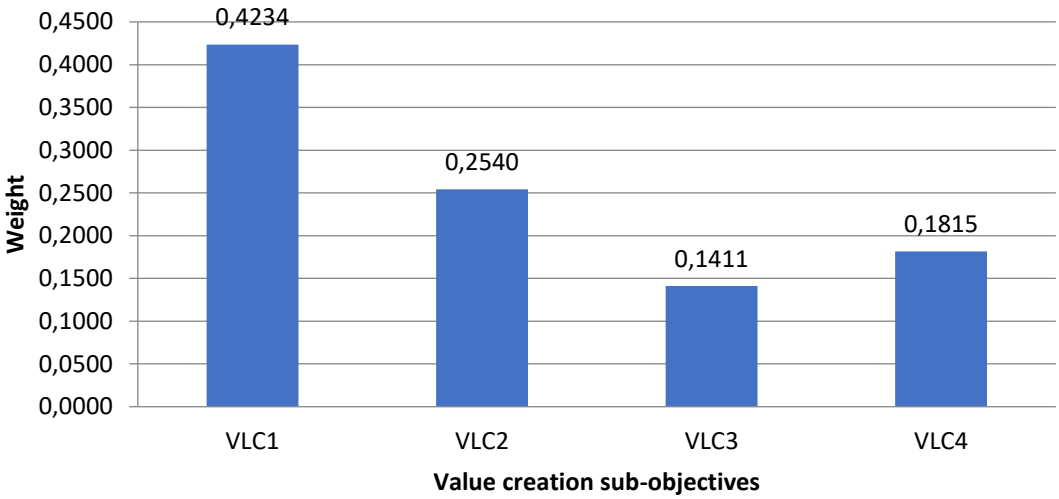


Figure 6.13: Sample graph of pairwise comparison for value creation critical success factors for Respondent 01

The last CSF were related to the SCRM objective as illustrated in Table 6.17. As shown in a graphical presentation of Figure 6.14, there was a wide margin between the best and the worst CSF, where information sharing (SCR4) was ranked as the best and supplier development (SCR3) being the worst.

Table 6. 17: Sample graph of pairwise comparison for supply chain risk management sub-objective of Respondent 01

Criteria Number = 5	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
Names of Criteria	SCR1	SCR2	SCR3	SCR4	SCR5

Select the Best	SCR4

Select the Worst	SCR3

Best to Others	SCR1	SCR2	SCR3	SCR4	SCR5
SCR4	8	5	9	1	6

Others to the Worst	SCR3

Criteria Number = 5	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
SCR1	2				
SCR2	5				
SCR3	1				
SCR4	9				
SCR5	4				

Weights	SCR1	SCR2	SCR3	SCR4	SCR5
	0,0895	0,1432	0,0527	0,5953	0,1193

Ksi*	0,1206

Graph showing supply chain risk management critical success factors

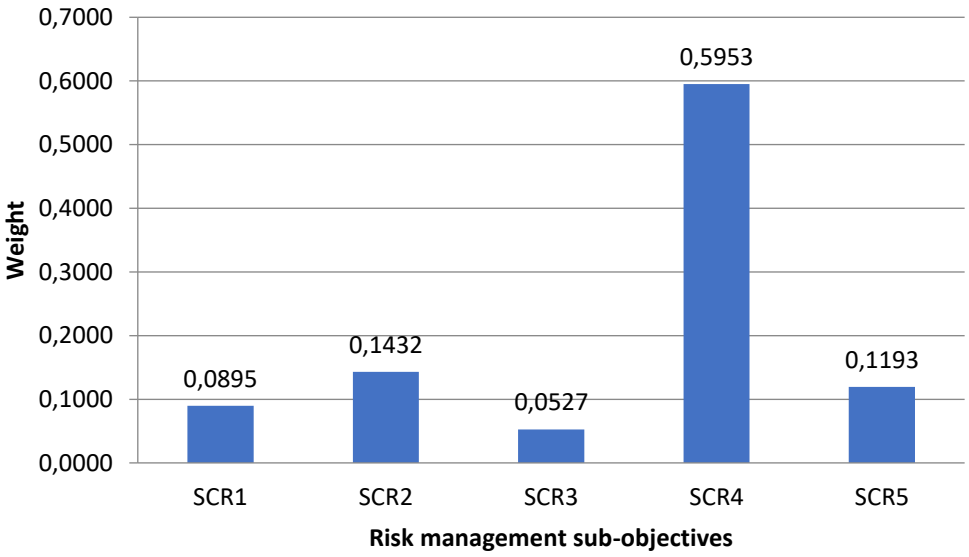


Figure 6.14: Sample graph of pairwise comparison for supply chain risk management critical success factors for Respondent 01

6.4 RANKING THE MAIN SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES

The main nine SSRPOs that manufacturing companies in Botswana should consider in their relationships with suppliers were ranked based on importance as determined by the survey respondents. The empirical analysis yielded a definitive hierarchy of the nine main SSRPOs, providing the foundation for strategic decision-making in the manufacturing sector. Table 6.18 provides an outline of the rankings of the main SSRPOs together with their CSF. Among all the nine main

SSRPO, value creation was the most prominent objective with a weight value of 0.7780 as shown in column 2 of Table 6.18 and ranked as number 1 shown in column 3 of the same table. This shows the significance of value creation in the supply chain of the manufacturing industry of Botswana. The reason for giving the most importance to value creation maybe because enhancing value helps an organisation save costs and increase financial benefits to both supplier and buyer hence enhancing economic sustainability (Verma et al., 2023; Johne and Wallenburg, 2021). The research by Johne and Wallenburg (2021) revealed the importance of suppliers' knowledge on value creating processes as a crucial factor for facilitating improvements in the buyer-supplier relationships. Value can be created by applying SSRM in managing the relationships with suppliers (Romeo Asa et al., 2023). The importance of value to a manufacturing company can be seen in the research conducted by Abdelraheem (2024) in which it was found that value analysis helps companies to reduce product costs in the supply chain by utilising the connection between supplier and supply chain activities. Asha, Dulal and Habib (2023) found customer satisfaction as an essential factor in an organisation's value creation, thus enhancing economic sustainability.

Therefore, it can be deduced that value creation has a positive effect on economic sustainability. This is important in Botswana which has recognised the manufacturing industry as a crucial sector that can contribute to economic diversification and the generation of employment opportunities (CEDA, 2020). The research by Tapaninaho and Heikkinen (2022) found that joint value creation was important to enhance the circular economy and business sustainability. The findings from the study by Liu, Kim and Park (2022) highlight the criticality of SRM to enhancing effective value creation in the manufacturing industry. Using the Resource-Based View (RBV), it can be explained that value creation is considered by Botswana's manufacturing companies as a competence that gives competitive advantage above and beyond cost reduction.

The second important objective in a SSRM was found to be economic sustainability with the aggregate weight value of 0.2068. By being the second out of the nine objectives of SSRM, economic sustainability is highly important. This shows the importance given by manufacturing companies in Botswana to

economic sustainability as their aim is to make significant contribution to the country's economic growth (HRDC, 2023). The findings of this study supports the national plan whose goal is to let the manufacturing sector boost the economy of Botswana as the sector employs about 9.2 percent of the total formal employment (Statistics Botswana, 2021) and its average contribution to the national Gross Domestic Product (GDP) is high, with a high growth rate (Statistics Botswana, 2021).

CEDA (2020) reported that the manufacturing industry is a critical sector that can contribute to economic diversification and the generation of employment opportunities. Numerous studies have demonstrated the crucial role played by the manufacturing sector in boosting the economy as it has the capacity to hire a large number of workers (Muin and Jumena, 2024). The importance of economic sustainability can be explained using the TBL theory to interpret these findings. The manufacturing companies of Botswana highly ranked economic sustainability, predominantly through supplier relationship management, highlighting the dominance of the profit pillar of the TBL in an economy that frequently experiences supply chain interruptions.

Quality improvement was ranked as the third objective of SSRM with an aggregate weight value of 0.1488. Considering the large number of SSRPO, being the third place out of the nine objectives is regarded as a high rank, thus very important objective. The findings of this study are consistent with previous studies that attributed importance to quality improvement in the supply chains. For example, the study by Kang and Um (2023) found that encouraging supplier participation in quality improvement enhances a company' overall performance. While the study by Karim et al. (2025) on Australian manufacturing companies found that product quality improvement and implementing advanced quality methods were essential to companies' sustainability since they promote long-term growth, environmental sustainability and customer loyalty. Maintaining a close relationship with a supplier is paramount to making sustainable quality improvements (Hoque and Maalouf, 2022).

The TQM can be used to explain why quality improvement through SSRM was highly ranked by manufacturing companies in Botswana. TQM emphasises that

suppliers have a role to play in quality improvement as it is a responsibility shared across the supply chain. Manufacturers play a role as partners in quality improvement than contractors. Thus, manufacturing companies in Botswana work together with suppliers to improve product and service quality. The TQM philosophy, which managers aim to establish in the workplace, enables businesses to generate high quality products by combining a performance system with continuous improvement (Ghunaim and Jaaron, 2022).

A study by Abbas (2020) revealed that the implementation of TQM significantly enhances capability by companies to achieve business sustainability objectives hence recommended the implementation of TQM in the manufacturing sector as it helps to achieve sustainable performance, leading to a company's competitive advantage. TQM is applied at all levels and functions of an organisation and requires commitment and support by senior management. Companies extend this theory to suppliers to improve the quality of the items that were bought by building long-term relationships with them. Thus, maintaining a close relationship with a supplier is paramount to making sustainable quality improvements (Hoque and Maalouf, 2022).

Delivery performance was ranked as the fourth objective out of the nine objectives, with an aggregate weight value of 0.1242. This shows the average importance that this objective of SSRM has been given by manufacturing companies in Botswana due to their experience with their suppliers who often deliver late. This is consistent with the views of Sakhare et al. (2024) who stated that often suppliers fail to deliver on time due to uncertainties and this impacts on manufacturing companies who end up failing to meet their customer requirements by adhering to production and delivery schedules due to these supply uncertainties. Liu and Yang (2022) emphasise the importance of delivery performance as it can enhance customer loyalty, as well as improve the reputation of the business. The ranking of delivery performance moderately may be an indicator that the Botswana manufacturing industry has taken the objective lightly due to the culture that has been developed because suppliers usually deliver late as stated above hence the commitment to delivery performance is not high. More importance has been attributed to value creation, economic sustainability and

quality improvement which they perceive to give more direct benefits than delivery performance. The average ranking of delivery performance can be explained using the RBV theory. According to the RBV theory, a collaborative relationship with a supplier is a special resource that enables the manufacturing company to improve performance and gain competitive advantage by enhancing delivery performance. The medium ranking of delivery performance using RBV can be explained that manufacturing companies in Botswana do not regard it as a core strategic resource.

The fifth rank was given to the environmental sustainability objective with an aggregate weight value of 0.1154. The fifth rank out of the nine objectives is a medium ranking. This demonstrates that although manufacturing companies in Botswana are aware of environmental sustainability, they do not prioritise it compared to other supply chain objectives. The manufacturing industry of Botswana is dominated by small and medium companies; therefore, they give priority to economic sustainability because their objective is to increase profits and be able to survive. The findings contradict the view of Razzak (2023), who stated that among the three dimensions of sustainability, environmental dimension has received more attention and companies practice it more due to the world's current experience of environmental degradation and the manufacturing sector being the major source of environmental problems. Since less importance has been given to environmental sustainability, it shows that manufacturing companies in Botswana do not put an emphasis to their suppliers to implement environmental sustainability. According to Qiao et al. (2022), manufacturing companies should extend green environmental practices to the whole supply chain and this requires commitment by suppliers.

The findings of the current research are in consistent with the research undertaken by Muin and Jumena (2024) who found that manufacturing companies gave little budget allocation to environmental activities. Studies alluded to the reluctance of manufacturing companies to implement environmental sustainability due to the high costs involved which reduce organisational financial performance (Yadav et al., 2023; Zhuang et al., 2023) which is the primary objective of manufacturing companies in Botswana. The TBL can be used to explain environmental

sustainability. The TBL gives importance and balances the three dimensions of sustainability. However, the manufacturing industry of Botswana is more concerned with short term financial performance than the long-term benefits arising from environmental sustainability because being small to medium sized companies, capital is limited therefore economic sustainability is given more importance.

Social sustainability followed environmental sustainability by being ranked the sixth one with an aggregate weight value of 0.1012. These findings revealed that while manufacturing companies in Botswana recognise social sustainability, it is given less attention compared to economic and environmental sustainability and even the other objectives of SSRM including value creation, quality improvement and delivery performance. The findings of this study are consistent with the research undertaken by Quayson et al. (2023) who ranked social sustainability after environmental sustainability, however, they believed that social issues needed to be considered by companies as they cause disquiet among employees and the community, disrupting the supply chain for natural resources, particularly regarding health and safety issues.

Despite SSRM being recommended as a suitable strategy that businesses can use in the supply chain to achieve social sustainability (Amoako et al. 2023), the findings of this study revealed that social sustainability has been given average recognition by manufacturing companies in Botswana in their SSRM. Many studies have reported on the low attention social sustainability has received in business. According to Loviscek (2021), social sustainability is less considered and followed by companies. Similarly, Yadav et al. (2023) reported that many companies overlook social sustainability, while in the same manner Eslami et al. (2019) reported that social sustainability is the most challenging and least explored dimension of sustainability. Since most of the companies in the manufacturing industry of Botswana are SMEs, they are more focused on profitability hence economic sustainability than social sustainability.

Another reason social sustainability might have been given low recognition by manufacturing companies in Botswana might be because there is little pressure from external stakeholders such as labour unions and the community. The

medium recognition of social sustainability by the manufacturing industry of Botswana can be explained using the TBL theory. Though the theory aims to balance the three dimensions of sustainability; namely, economic, social and environmental, in most cases these dimensions are given varying importance, just like in the findings of this study where less importance has been given to social sustainability compared to economic and environmental sustainability. This implies that social sustainability practices including working conditions, ethical sourcing and community engagement are treated with less importance by the manufacturing companies in Botswana hence are not encouraged to their suppliers.

The seventh objective was supply chain cost management with an aggregate weight value of 0.0947. Being the seventh out of the nine objectives shows a low ranking. The low ranking of supply chain costs by manufacturing companies in Botswana reflects a unique practice as in most cases cost is the major factor in the manufacturing industry. That means the manufacturing companies of Botswana have little concern for the reduction of costs despite the need to control costs and enhance profitability of their companies. The findings of the current study support the views of Ahlsell et al. (2022) who stated that many businesses neglect the supply chain costs.

While the TCO theory emphasises that supply chain costs extend beyond purchasing prices to include procurement, transportation, operating, maintenance and disposal costs, manufacturing companies in Botswana are not concerned with determining the overall costs, direct and indirect, involved in a supplier relationship management by considering all activities undertaken by an organisation. It may be believed that little attention is given to cost reduction because the companies in the manufacturing industry have attached more importance to value creation which can be viewed as more long term than cost reduction which is short term.

Supply chain innovation was ranked as the eighth objective and had an aggregate weight value of 0.0784. Though customers' needs and advancement in technology are putting pressure on the manufacturing companies to improve their products (Jung et al., 2023), the manufacturing companies in Botswana have given little importance to supply chain innovation which could have been achieved by

collaborating with suppliers who have technological skills and resources (Jung et al., 2023). The little importance attached to supply chain innovation by manufacturing companies in Botswana contradicts the views of Wehbe et al. (2020) who emphasised that manufacturing companies need to be innovative in order to be competitive in the industry and one way of achieving this is by introducing new products and improving on the current ones, which depends on the performance of the supplier.

From the CE view point, manufacturing companies can re-engineer a product's production process by designing a long-lasting product which takes into account its maintenance, reuse, recycle, repair, refurbishment and remanufacture (Hazen, Russo, Confente and Pellathy, 2021). However, this is not given much importance by manufacturing companies in Botswana. The low rating of supply chain innovation by manufacturing companies in Botswana might be due to lack of resources as most of the manufacturing companies found in the country are small or medium sized and lack capital, thus may not budget for supply chain innovation. Secondly, the companies might lack technical expertise to implement supply chain innovative measures.

SCRM was the ninth and last objective with the aggregate weight of 0.0530. Despite the lessons learnt from the Covid-19 which deeply affected the supply chain by facing serious challenges and has seen the country of Botswana with high unemployment rates (BITC, 2022), supply chain risks are still not given much importance by manufacturing companies. This implies that manufacturing companies do not foster risk management on their suppliers though it has been reported that SSRM can help a manufacturing company to mitigate supply chain disruption risks as suppliers have the potential to impact supply chains' overall performance (Khan, Bashar, et al., 2023). The reason for not attaching high importance to SCRM by manufacturing companies in Botswana might be due to the lack of promotion of its importance and since many manufacturing companies in Botswana are small and do not have much capital, they may not prioritise training on SCRM. Secondly, there is not enough or no literature at all that has been done on the effects of SCRM on the manufacturing industry in Botswana. The stakeholder theory (ST) requires an organisation to collaborate with its

suppliers to mitigate supply chain risks; however, manufacturing companies are not actively pushing the implementation of SCRM on their suppliers.

Table 6.18 presents a summary of the rankings given to the main SSRPOs. As discussed above, value creation was given the highest ranking, followed by economic sustainability. The third ranking went to quality improvement, promoting long-term growth of manufacturing companies. Delivery performance received the fourth ranking, while environmental sustainability and social sustainability were given the fifth and sixth rankings respectively, revealing the low importance attached to them compared to economic sustainability. The seventh ranking was given to supply chain costs indicating the little concern that manufacturing companies attach to cost reduction. Supply chain innovation was ranked the eighth indicating that there was no urgency in improving the products and introducing new ones. The lowest ranking went to SCRM showing that manufacturing companies do not foster risk management on their suppliers.

6.4.1 Sensitivity analysis

To test the robustness of the BWM results, a sensitivity analysis was conducted by systematically varying the weight of the highest-ranked SSRPO; value creation with a weight of 0.7780 by ±10%, ±20%, and ±30%, and recalculating the normalised weights of the remaining eight SSRPO. Table 6.19 presents the results. As can be noticed in Table 6.19 sensitivity analysis shows how the variation by ±10%, ±20%, and ±30% of the weight of the best SSRPO, value creation, affects the weights of the nine main SSRPO. The results confirm that value creation is continuously ranked first and SCRM is consistently ranked last across all sensitivity scenarios. This stability confirms the robustness of the findings.

Table 6. 18: Weights and rankings of the main and sub-objectives respondents' preferences

Main Criteria	Agg Weight	Rank	Sub criteria	Local Weight	Global Weight	VLC Sub Rank	ECO Sub Rank	QUI Sub Rank	DLP Sub Rank	ENT Sub Rank	SOC Sub Rank	SCC Sub Rank	SCI Sub Rank	SCR Sub Rank	Overall Rank
VLC	0,7780	1	VLC1	0,2197	0,1709	3									3
			VLC2	0,2922	0,2273	1									1
			VLC3	0,1923	0,1496	4									4
			VLC4	0,2659	0,2069	2									2
ECO	0,2068	2	ECO1	0,3119	0,0645		1								5
			ECO2	0,2369	0,0490		2								6
			ECO3	0,2347	0,0485		3								8
			ECO4	0,2166	0,0448		4								9
QUI	0,1488	3	QUI1	0,1774	0,0264			2							17
			QUI2	0,0954	0,0142			7							32
			QUI3	0,1178	0,0175			4							27
			QUI4	0,1836	0,0273			1							16
			QUI5	0,1073	0,0160			5							29
			QUI6	0,1185	0,0176			3							26
			QUI7	0,0727	0,0108			8							34
			QUI8	0,1064	0,0158			6							30
DLP	0,1242	4	DPL1	0,2548	0,0316				1						12
			DPL2	0,1889	0,0235				3						19
			DPL3	0,2323	0,0289				2						14
			DPL4	0,1669	0,0207				4						20
			DPL5	0,1604	0,0199				5						22
ENT	0,1154	5	ENT1	0,4213	0,0486					1					7
			ENT2	0,2619	0,0302					3					13
			ENT3	0,3169	0,0366					2					11

Main Criteria	Agg Weight	Rank	Sub criteria	Local Weight	Global Weight	VLC Sub Rank	ECO Sub Rank	QUI Sub Rank	DLP Sub Rank	ENT Sub Rank	SOC Sub Rank	SCC Sub Rank	SCI Sub Rank	SCR Sub Rank	Overall Rank
SOC	0,1012	6	SOC1	0,3612	0,0366						2				11
			SOC2	0,3636	0,0368						1				10
			SOC3	0,2752	0,0279						3				15
SCC	0,0947	7	SCC1	0,1920	0,0182							2			24
			SCC2	0,2108	0,0200							1			21
			SCC3	0,1859	0,0176							4			26
			SCC4	0,1907	0,0181							3			25
			SCC5	0,1789	0,0169							5			28
SCI	0,0784	8	SCI1	0,2545	0,0200								2		21
			SCI2	0,3214	0,0252								1		18
			SCI3	0,2376	0,0186								3		23
			SCI4	0,1864	0,0146								4		31
SCR	0,0530	9	SCR1	0,1789	0,0095									4	36
			SCR2	0,144	0,0076									5	37
			SCR3	0,2192	0,0116									2	33
			SCR4	0,2676	0,0142									1	32
			SCR5	0,1868	0,0099									3	35

Table 6.19: Sensitivity Analysis Results

Scenario	VLC Weight	ECO Weight	QUI Weight	DLP Weight	ENT Weight	SOC Weight	SCC Weight	SCI Weight	SCR Weight	Rank Change?
Original	0.7780	0.2068	0.1488	0.1242	0.1154	0.1012	0.0947	0.0784	0.0530	-
VLC -30%	0.5446	0.2895	0.2083	0.1739	0.1616	0.1417	0.1326	0.1098	0.0742	None
VLC -20%	0.6224	0.2482	0.1786	0.1490	0.1385	0.1214	0.1136	0.0941	0.0636	None
VLC -10%	0.7002	0.2206	0.1588	0.1325	0.1231	0.1080	0.1010	0.0837	0.0566	None
VLC +10%	0.8558	0.1805	0.1299	0.1084	0.1008	0.0884	0.0827	0.0685	0.0463	None
VLC +20%	0.9336	0.1484	0.1068	0.0892	0.0829	0.0727	0.0680	0.0563	0.0381	None
VLC +30%	1.0114	0.1161	0.0836	0,0698	0.0649	0.0569	0.0532	0.0441	0.0298	None

6.5 RANKING THE SUB-OBJECTIVES OF THE SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES

The analysis of the second-order SSRPOs provides granular detail on the operational priorities underpinning the main objectives. It starts with discussing the rankings of these sub-objectives within the main objectives, followed by the overall ranking of these sub-objectives as shown in column 16 of Table 6.18. They were arranged in the order of the importance of the main objectives starting with the most important.

6.5.1 Ranking of the Sub-Objectives of Value Creation

Within the main objective of value creation were cost savings, product diversity, brand image and customer care as the sub-objectives. The cost saving sub-objective was ranked as the most important sub-objective with a weight value of 0.2922. As illustrated in Table 6.18, cost saving is highly regarded by manufacturing companies in Botswana. Cost saving is one of the sub-objectives of value creation, which would lead to increased financial benefits to the businesses of both companies; the purchaser and supplier (Enz et al., 2019). This shows that manufacturing companies consider cost savings as a strategic driver of

competitive advantage because the production of a range of products can enhance the value of an organisation through various ways including; diversifying risks, increasing sales, increasing market share and improving the brand image.

Product diversity followed cost savings and the weight value given to it was 0.2659. Being the second place out of four sub-objectives shows that though product diversity was not given the highest rating, it was equally important to manufacturing companies in Botswana. However, Krause and Gebhardt (2023) argue that product diversity has a negative impact on an organisation such as reduced transparency and reduced economies of scale. The findings of this study do not agree with this argument as product diversity was ranked highly by manufacturing companies in Botswana.

Within the value creation objective was brand image as the third important objective with a local weight value of 0.2197. By giving it a low rating, it shows that customers and other stakeholders of manufacturing companies in Botswana have low perception with the companies' brands. If the brand image was high, it could enable a manufacturing company to charge a higher price as customers would be prepared to spend more. However, this is not the case in the manufacturing industry of Botswana where brand image has a low ranking. Customer care came as the fourth and last sub-objective of the value creation objective and had a local weight value of 0.1923. Though customer care enhances the value of a company, the manufacturing industry of Botswana gave it the lowest ranking, implying that it was the worst criterion out of the four criteria.

When it came to the overall ranking of all the 41 sub-objectives, all the sub-objectives of value creation were highly ranked with the rankings similar to those of the rankings within the main objective. Cost saving was given an overall ranking of number one with a global weight of 0.2273, while product diversity was ranked as number two with a global weight of 0.2069, brand image being number three with the weight of 0.1709 and customer care as number four with the global weight of 0.1496. The high importance attributed to all the sub-objectives of value creation shows the high importance of value creation in the manufacturing sector of Botswana.

6.5.2 Ranking of Sub-objectives of Economic Sustainability

The sub-objectives of the economic objective were four; namely, supplier collaboration, supply chain technology investment, supplier support, and inventory management. Manufacturing companies of Botswana highly ranked supplier collaboration with a local weight value of 0.3119. The high ranking of supplier collaboration might have been due to the need for reducing risks of stockout and delayed delivery as collaboration leads to high commitment from suppliers. It is apparent that because suppliers play a significant role and provide input that ultimately improve supply chain efficiency and responsiveness, a well-integrated supply chain through high-quality relationships and a high level of integration with suppliers can enhance and improve the overall supply chain performance (Afraz et al., 2021).

The findings of the current study resonate well with the findings from the study carried out by Ebrahim et al. (2022) who found that collaboration with suppliers was critical for enhancing supply chain sustainability performance as it enables them to share value creation through collaborating with suppliers, enabling shared problem-solving for sustainability issues. The economic sustainability of manufacturing companies is dependent on reliable suppliers as manufacturing companies are dependent on suppliers for materials which is one of the major resources of production. Collaboration between manufacturing companies and supply chain partners is reported to be leading to economic cost savings and increased productivity (Razzak 2023). Using the RBV theory to explain the importance of supplier collaboration, manufacturing companies in Botswana have the ability to access resources from their suppliers.

Supply chain technology investment was the second sub-objective in the economic sustainability objective and had a local weight value of 0.2369. The high ranking could have been because investing in green technology and being able to produce green products leads to higher long term profits and sustainable development which is viewed as a critical business strategy (Wang, Zou et al., 2021). The findings of this research agrees with the research carried out by Ma et al. (2021) which revealed that manufacturing companies that make investment in technological advancement relating to green emission reduction enhance the

profits made by supply chain members because demand for the product increases as customers are interested in purchasing environmentally friendly products.

Supplier support was ranked as the third sub-objective of the economic sustainability objective, with a local weight value of 0.2347. The low ranking could have been that manufacturing companies in Botswana do not see it as a need to extend sustainability practices to their suppliers by supporting them to improve their operating processes and the products they deliver to the business. They might be more focussed to cost savings than supplier support as many manufacturing companies in Botswana are small to medium sized with resource constraints, making them to be more focused on short-term objectives than long-term objectives.

The last sub-objective in the economic sustainability group was inventory management, with a local weight value of 0.2166. Though it was given low importance by manufacturing companies in Botswana, many companies regard it as a vital part of the manufacturing and supply chain because it helps manufacturing companies to reduce inventory costs, aids manufacturing processes that depend on raw materials to make finished products and enables the business to balance demand and supply (Alam et al., 2024; Munyaka and Yadavalli, 2022). Panigrahi et al. (2024) emphasised that improved inventory management practices can save revenue as it greatly reduces production costs as a result of reducing set up costs and time, reduce wastage, improve service levels and inventory holding costs. The manufacturing companies of Botswana might have given low importance to inventory management because since the country depends more on imports, mainly from South Africa, inventory is usually bought in bulk, thus high levels of buffer inventory are maintained.

The overall rankings of the SSRPO sub-objectives were made as shown in column 16 of Table 6.18. All the four sub-objectives of economic sustainability were highly ranked following the sub-objectives of value creation. Supplier collaboration was ranked as the fifth sub-objective with a global weight value of 0.0645, followed by supply chain technology investment ranked as the sixth sub-objective in the overall ranking with a global weight value of 0.0490. Supplier support was ranked as the eighth sub-objective in the overall ranking with a global weight value of

0.0485. When it came to the overall ranking of inventory management, it was ranked as the ninth sub-objective with a global weight value of 0.0448. The high ranking of the sub-objectives of economic sustainability means that economic sustainability was given high importance in the manufacturing sector of Botswana.

6.5.3 Ranking of Sub-objectives of Quality Improvement

As the third objective, quality improvement was among the highly ranked main objectives. It had eight sub-objectives with the highest ranking being given to product conformance which had a local weight value of 0.1836. This was given the highest importance because it is imperative that a product's quality meets the expected standards as specified by the customers in their specifications and conforms to the standards set by the standards board such as the industry, national or international standards. Quality standards in Botswana are set by the Botswana Bureau of standards (BOBS). Secondly, product conformance could have been given high importance because manufacturing companies consider conformance as an important factor that they need to comply with and extend to their suppliers because if materials received from suppliers fail to meet companies' specifications, they are less likely to meet the production standards. The BOBS encourages customers, consumers and suppliers to always procure products and services which are BOBS quality approved (BOBS, 2024). Gouda et al. (2019) emphasised that conformance is vital for a manufacturing company because products that fail to meet the requirements given in the specifications frequently get thrown away or reworked upon.

The second sub-objective of the quality improvement objective was product performance and had a local weight value of 0.1774. It was given such high importance possibly because it relates to the functional aspects of a product which are the primary characteristics of quality highly considered by the customer when buying a product (Rajasa et al., 2023; Gouda et al., 2019). CIPS (2024) recommend that in addition to discussing business issues by suppliers and purchasers in their regular meetings, they should also discuss their relationship's financial performance as it affects the quality of their performance.

Serviceability was the third sub-objective of the quality improvement objective and was given the weighting of 0.1185. Being ranked the third out of eight sub-objectives shows that serviceability is given high importance. Serviceability is important to be considered by manufacturing companies because the products produced should be easy to repair and maintain during its usage. Lysons and Farrington (2016) stated that serviceability was the ease, speed and accessibility of repairing a product. Manufacturing companies should make improvements to their products so that they can be easy to repair and the warranties which are after-sales services that they give to their customers are factored in the rating of a product. The fourth sub-objective of quality improvement was reliability which had a local weight value of 0.1178.

Being ranked as the fourth out of eight factors, reliability is important to the manufacturing companies in Botswana as they are interested in purchasing capital items which can be able to operate reliably over a certain period hence, they will have an assurance that a purchased product will not fail to operate within a certain period. Reliability was followed by durability which had a local weight value of 0.1073. Durability is a product's ability to remain in use over a specified period before it can lose value and be scraped off, indicating its service life. This sub-objective was given the importance because of the benefits it offers to the manufacturing companies. It contributes to the financial benefits of an organisation as it minimises the number of replacements (Jetti and Dhar, 2024).

Perceived quality was ranked as the sixth sub-objective with a local weight value of 0.1064. Although this was not given the highest importance, improving perceived quality can help a company to increase customer satisfaction. Perceived quality is the quality a customer regards to be right and relates to the reputation a product has made. Thus, with this characteristic of quality, customers learn about the product indirectly as they do not usually have full information about the characteristics of a product (Rajasa et al., 2023). The customers' perception of quality positively and significantly impacts a company's brand image (Diputra and Yasa, 2021).

The seventh sub-objective was product features which had a local weight value of 0.0954. The manufacturing companies of Botswana gave low importance to

product features, however, features are useful for increasing the basic functions of a product and influence the product choices (Rajasa et al., 2023). Manufacturing companies that consider product features in the design of their products make their products unique to those of their competitors. For example, Mercedes-Benz is famous for making cars with luxury features such as comfortable seats, quiet cabins and smooth rides which attract customers.

In addition to these features, the 2024 Mercedes-Benz GLA came with a screen that shows the road map of where the car is heading to, as well as the roadway image showing the driver where to go and location information (Threewitt, 2024). The last sub-objective of the quality improvement objective was aesthetics and had a local weight value of 0.0727. Aesthetics is the judgement that people make about the quality of a product in terms of how it looks like, smells, feels, tastes and sounds. It is a subjective aspect of quality which relates to individual considerations and their inclinations (Rajasa et al., 2023). In industrial applications, aesthetics is normally given little importance because more importance is given to the functionality of a product than its appearance hence the reason manufacturing companies in Botswana gave it a low ranking.

The sub-objectives of the quality improvement objective were ranked against the sub-objectives of other main objectives totalling 41 sub-objectives. Product conformance was ranked as number 16 with a global weight value of 0.0273, followed by product performance ranked as number 17 with a global weight value of 0.0264. Though serviceability was highly ranked in the quality improvement group, its overall ranking among the rest of the sub-objectives was very low as it was ranked as number 26. This might have been because when compared with all the other sub-objectives, serviceability is not highly considered as there are other sub-objectives that manufacturing companies give more priority to. Similarly, product reliability was given high importance in the quality improvement group but was given low overall importance among other sub-objectives by being ranked as number 27. The rest of the sub-objectives; durability, perceived quality, product features and aesthetics were given low importance both in the quality improvement objective and the overall ranking of all sub-objectives.

6.5.4 Ranking of Sub-objectives of Delivery Performance

The delivery performance objective had five sub-objectives; on-time delivery, order fulfilment, reliable delivery, time flexibility and lead time and were all ranked by manufacturing companies in Botswana. The highest ranking was given to on-time delivery with a local weight value of 0.2548. This was given the highest importance because for the business and production processes of a manufacturing company to remain functional, on-time delivery is a vital element. CIPS (2024) recommends on-time delivery to be included in contracts with suppliers as key performance indicators (KPIs) of delivery performance which can then be used to measure supplier's delivery performance so that their ability to deliver goods on time can be improved. The second highest sub-objective of delivery performance was order fulfilment with a local weight value of 0.2323. Manufacturing companies want suppliers who can demonstrate commitment to the orders and meet the requirements of the company.

Reliable delivery was ranked as the third sub-objective of delivery performance and had a local weight value of 0.1889. Reliable delivery means providing the appropriate product, of the right quality, in the right quantity, from the right source, delivered to the right location, at the right time and at the right price (Salam, 2021). By being ranked the third out of five sub-objectives, reliable delivery is still given high importance though it is not given priority by manufacturing companies of Botswana as they may consider on-time delivery and order fulfilment more critical. However, it is not ranked as the least important; therefore, manufacturers want suppliers who can deliver consistently.

The fourth sub-objective of delivery performance was time flexibility which had a local weight value of 0.1669. Time flexibility implies the ability of a supplier to respond to the customers' delivery schedules (Forslund and Mattsson, 2023). This implies that suppliers of Botswana's manufacturing companies should be prepared to adjust the delivery of goods to accommodate the customers' changing schedules. It may happen that a manufacturing company changes its production schedule to accommodate the changes in demand, which means suppliers should respond to the buyers' needs. However, the manufacturing companies in Botswana did not give high importance to this sub-objective.

Lead time was ranked as the last sub-objective of delivery performance with a local weight value of 0.1604. This shows that, though lead time is an important factor in supply chain, it is not regarded as a priority by manufacturing companies in Botswana compared to the other sub-objectives of delivery performance. It may be that manufacturers in Botswana keep buffer inventory which they rely on as they wait for deliveries from suppliers. However, for the manufacturing companies who produce perishable products, Chen, Fan and Pan (2021) advise them to optimise delivery performance as it reduces deterioration, thus reducing environmental pollution, in addition to customer satisfaction by delivering on time. Liu and Yang (2022) also emphasised the importance of delivering on time as a means of enhancing customer loyalty, as well as improving the business reputation.

The overall ranking of the sub-objectives of delivery performance shows that on-time delivery was ranked as number 12 with a global weight of 0.0316. By being ranked number 12 out of the total 41 sub-objectives shows that on-time delivery was given high importance. Similarly, order fulfilment was given high importance by being ranked as number 19 with a weight value of 0.0289. The rest of delivery performance's sub-objectives were given average importance as their rankings ranged from 19 to 22 as shown in Table 6.18. These results show that generally manufacturing companies in Botswana give importance to delivery performance though it is not given the highest importance.

6.5.5 Ranking of Sub-objectives of Environmental Sustainability

Environmental sustainability had three sub-objectives out of which GSCM was ranked as the first one by manufacturing companies in Botswana. Its local weight value was 0.4213. It is a robust strategy as it enables manufacturing companies to give attention to improving economic benefits and social outcomes, while reducing any negative impact on the environment (Le, 2020). The purpose of green procurement is to encourage suppliers to implement sustainability measures in their production processes; thus sustainable practices are extended to a company's suppliers (Sheng et al., 2023). By applying GSCM practices, manufacturing companies in Botswana demonstrate their commitment to sustainability, thereby improving their company image.

The second sub-objective under the environmental objective was waste management with a local weight of 0.3169. Waste management is considered secondary to GSCM, indicating that priority is given to GSCM, with waste management addressed thereafter. However, this does not imply that waste management is not being considered. The Botswana government has waste management standards which manufacturing businesses in Botswana must comply with. Thus, compliance with waste management regulations assists these businesses in avoiding penalties and reputational damage. It is important for manufacturing companies to consider waste management regulations because these companies generate waste through production, packaging and transportation. According to Bhatti et al. (2023), waste products generated during the manufacturing process are seriously polluting the environment worldwide. The World Bank reports that waste generation is growing from one year to another and is expected to grow by 70 percent by the year 2050 as the population growth is expected to double (Nandy et al., 2022). The management of waste by manufacturing companies is an important exercise that should not be overlooked because manufacturing companies are a major contributor to the creation of waste in the country.

Sustainable packaging was given the last ranking out of the three sub-objectives of environmental sustainability, with a local weight value of 0.2619. Though the use of packaging material has increased due to the long distance that goods have to travel due to global supply chains in which products are produced, assembled and finally sold in different countries (Meherishi et al., 2019), manufacturing companies in Botswana still attach low importance to it. Ibrahim et al. (2022) stated that packaging materials in the supply chain facilitate the preservation of products in the process of transportation, handling and storage, as well as extending the products' shelf life. The manufacturing companies in Botswana may have given low attention to sustainable packaging factors due to the cost implications as most of the companies are small to medium sized with capital challenges.

This is consistent with the argument of Kuwornu et al. (2023) who stated that sustainable packaging can have a negative effect on the financial performance of

a company, thus impacting economic sustainability. Ibrahim et al. (2022) also stated that sustainable packaging adds to the product costs due to the cost of the materials used and the processes undertaken in producing them. Thus, many companies choose to use lower cost packaging materials such as plastics to reduce the impact of sustainable packaging on their financial performance. Considering the overall ranking of the sub-objectives of environmental sustainability compared to the rest of the sub-objectives among all SSRPO, all the sub-objectives of environmental sustainability; GSCM, waste management and sustainable packaging were given high importance as they had the overall ranking of 7, 11 and 13 respectively. This shows how important environmental sustainability is in the manufacturing sector of Botswana.

6.5.6 Ranking of Sub-objectives of Social Sustainability

The social sustainability objective had three sub-objectives as ethical sourcing, working conditions and community engagement. Ethical sourcing was given the highest importance out of all the sub-objectives of social sustainability and had a local weight value of 0.3636. This might have been given the highest importance by the manufacturing companies of Botswana because ethical sourcing guarantees that products are obtained responsibly and sustainably in ways that prove recognition for the people who make them and for the environment (CIPS, 2024). Manufacturing companies that have ethical sourcing policies perform better in terms of social sustainability. Ethical sourcing shows that a company is compliant with the laws and standards, therefore enhances company reputation. The working conditions were ranked as the second sub-objective with a local weight value of 0.3612. Socially responsible manufacturing companies extend social sustainability practices to suppliers by ensuring that suppliers also adopt social sustainability practices. Many manufacturing companies are starting to monitor the labour practices of their suppliers (Guo and Wu, 2023) and are developing long term relationships to achieve this.

Community engagement was the last sub-objective of the social sustainability objective and had a local weight value of 0.2752. That means companies in the manufacturing industry of Botswana have given low importance to community engagement and are less involved in community activities. This is in conflict with

the study by Padilla-Lozano and Collazzo (2022) who found that a company cannot operate if it chooses to isolate itself from society because a company's competitiveness and general operations are heavily dependent on society. Therefore, to remain competitive, manufacturing companies must collaborate with suppliers and customers.

Once stakeholders get to know how a company carries out its production processes and that it produces safe and environmentally friendly products, utilises resources and takes sustainable actions for the advancement of the society, they will be able to recognise the company's sustainable social performance (Rahman et al., 2023). The overall ranking of the sub-objectives placed ethical sourcing at the tenth position with a global weight value of 0.0368, while working conditions ranked as the eleventh with a global weight value of 0.0366 and community engagement being 15th with a global weight of 0.0279. The global ranking shows that the sub-objectives of social sustainability are given average importance by the manufacturing companies of Botswana.

6.5.7 Sub-objectives of Supply Chain Cost Management

The sub-objectives of supply chain cost management were production costs, distribution costs, reverse logistics, procurement costs and inventory costs. These were ranked and production costs were given the highest importance by manufacturing companies of Botswana. It was ranked as the first one and had a local weight value of 0.2108. Production costs might have been given the highest importance because they form the highest cost of the supply chain. It can be believed that cost control is the priority of manufacturing companies in Botswana as production costs have a direct impact on the cost of the final product.

According to Erboz and Hüseyinoğlu (2023), production costs include the costs of material, labour, equipment, maintenance and rework. The part of supply chain costs which is covered by production costs vary from one type of production to another. For some goods, production costs form the largest part of supply chain costs while it is less for others. For example, a research carried out by Moritz et al. (2023) revealed that productions costs form the largest part of supply chain costs in liquid processing, while for gases the production costs are minimal.

Manufacturing companies should watch their suppliers' production costs as they affect the cost of the materials bought from them.

The second ranking went to distribution costs with a weight value of 0.1920. Distribution costs have been given this importance because Botswana is a landlocked country, therefore distribution accounts for a significant portion of supply chain costs. Distribution costs cover costs of moving materials from suppliers to the business and moving goods from the business to the customer, including their administration such as carriage, customs clearance, loading and unloading, fuel, and vehicle maintenance (Erboz and Hüseyinoğlu, 2023). These costs influence the overall operating costs of a manufacturing company as the increase in costs leads to an increase in the total operating costs, while their decrease helps to reduce total operating costs.

Reverse logistics costs were ranked as the third sub-objective of supply chain cost management. Its local weight value was 0.1907. Botswana's manufacturing companies do not place a high importance on reverse logistics since it may be viewed as an expense that adds little value because these businesses are small to medium-sized and face capital constraints. As a result, they are concerned that funding for reverse logistics may put further strain on the limited resources. Following reverse logistics costs was procurement costs which were ranked as the fourth sub-objective with a weight value of 0.1859. Procurement costs are costs associated with acquiring a product, such as negotiation, supplier appraisal and documentation which contribute to total supply chain costs. As a result, if manufacturing companies in Botswana reduced the procurement costs, the entire supply chain costs would fall. However, these businesses did not give it the significance it deserves.

Inventory costs were ranked as the last sub-objective with a local weight value of 0.1789. This implies that Botswana's manufacturing companies give least importance to the inventory costs which in fact can be high for the organisation and can increase supply chain costs. The findings of this study do not agree with Alam et al. (2024) and Munyaka and Yadavalli (2022) who attached high importance to inventory management and regarded it as a vital part of the manufacturing and supply chain of an organisation as it helps manufacturing

companies to reduce inventory costs and aids manufacturing processes that depend on raw materials to make finished products and enables the business to balance demand and supply.

Similarly, Rushton et al. (2014) attached high importance to inventory costs as they emphasised that inventory costs are one of the key supply chain costs for many manufacturing companies and can account for a substantial portion of the total supply chain cost. To emphasise this point Munyaka and Yadavalli (2022) pointed out that the company's inventory may represent as high as half of the operating costs of a company or in some cases it may be half of the whole capital investment.

When the overall ranking of all SSRPO sub-objectives were analysed, it was discovered that all supply chain cost management sub-objectives were given moderate importance, with rankings ranging from 21 to 28 and the global weight value ranging from 0.0169 to 0.0200. It was discovered that while production costs were rated the highest relevance in the supply chain cost management category, they received low overall ranking. This was due to supply chain cost management being ranked low among the main objectives.

6.5.8 Sub-Objectives of Supply Chain Innovation

When the sub-objectives of supply chain innovation were ranked, the highest importance was given to production processes innovation and was given a local weight value of 0.3214. By prioritising this sub-objective, it implies that manufacturing companies in Botswana recognise that improving production processes is a key driver of economic sustainability. Production processes innovation encompasses all the functional and operational aspects of the business and generates a substantial decrease in the cost of production processes and complexity (Migdadi, 2022).

The manufacturing companies in Botswana may be interested in learning more efficient methods of production. This resonates well with the view of Migdadi (2022) who stated that production processes innovation introduces more efficient methods of production and this increases productivity and efficiency, thus giving an organisation a competitive advantage. According to Li, Zhang et al. (2023),

process innovation is the new approach for creating and integrating supply chain processes. Thus, manufacturing companies in Botswana can enhance innovation performance by allowing their suppliers to participate in innovation processes and having common goals regarding innovation.

Research and design was the second sub-objective with a local weight value of 0.2545. Research and design has been given the importance because suppliers can make a contribution to the innovation of manufacturing companies through high calibre partnership between the two parties. According to Delgado-Verde and Díez-Vial (2023), suppliers offer fresh, specialised knowledge that can be combined with the company's existing knowledge to improve innovation performance and support the company with research and design, provide equipment and training. The findings of this study agree with the research by Yang et al. (2023) who found that suppliers' contributions to buyers' innovation enable manufacturing companies to reshape and create new capabilities, which improves innovation performance of manufacturing companies.

Technology innovation was ranked the third sub-objective with a local weight value of 0.2376. Although technology was given a low ranking, it plays a vital role in the manufacturing sector. According to Li, Zhang et al. (2023), technology is strengthened by the growth of new generation technologies like the internet of things (IoT), blockchain, digital twins and big data, increasing process visibility and providing real-time information. The last rank in the supply chain innovation went to new product development with the local weight value of 0.1864. In order to increase the chances of accomplishing their strategic objectives, businesses should include their suppliers in the new product development process (Afraz et al., 2021). The fact that new product development was given a low ranking means that these businesses do not give much consideration to it.

These research findings contradict the findings by Delgado-Verde and Díez-Vial (2023) that the engagement of suppliers in new product development has been deemed a particularly valuable external source of knowledge, augmenting companies' innovativeness, thus, suppliers can provide companies with competitive advantage in terms of the technologies employed and time and cost advantages. Companies that manage to constantly develop new products which

meet customer expectations are capable of increasing the market share, retain customers and grow the size of their market (Migdadi, 2022). The overall ranking of the sub-objectives reveals that new product development was given the least importance in the supply chain innovation category and was equally given low importance in the overall ranking with 0.0146 as a global weight and a rank of 31.

6.5.9 Sub-objectives of Supply Chain Risk Management

Sub-objectives for SCRM included information sharing, supplier development, supplier monitoring and performance evaluation, supplier selection and supplier segmentation. Botswana's manufacturing companies ranked and weighted these sub-objectives as shown in Table 6.18. Information sharing was given the highest importance, with the local weight value of 0.2676. Information sharing between the supplier and purchaser results in the transparent flow of inventory information, which leads to reduced stockouts and reduced inventory costs. The highest importance given to information sharing is consistent with the recent study, which recognised knowledge sharing as a source of competitive advantage (Butt et al., 2022).

Similarly, Agarwal and Narayana (2020) discovered that high quality information and communication in a supplier-buyer relationship are viewed as a tool that improves organisational performance. The exchange of knowledge between purchasing and supplying companies is one of the key factors that determines a company's success (Butt et al., 2023). Furthermore, research on the value of information exchange in supplier-buyer relationships found that knowledge sharing among companies decreases uncertainty and leads to an improvement in decision-making (Butt et al., 2023). According to Amoako-Gyampah et al. (2019), an increase in information sharing facilitates faster product introductions, shorter lead times and better delivery outcomes for buyer companies. Businesses that integrate with their suppliers can operate effectively through sharing information such as quality standards, designs, design changes and product specifications (Basana et al., 2024).

Supplier development was the second highest sub-objective of the SCRM, with a weight value of 0.2192. Among the SCRM, supplier development was given the

highest priority probably because it is more preferable to develop a supplier who is found to be underperforming rather than terminate a contract and move to a different supplier because engaging a different supplier necessitates going through the supplier selection process, which can be rigorous and time consuming. Alagoz et al. (2022) stated that a buying company may prefer to work with current suppliers that have a solid track record rather than new suppliers that do not have a track record that has been demonstrated. Companies make supplier development programmes aimed at improving supplier capabilities so that they can meet or surpass the buying organisation's performance objectives (Benton et al., 2020). Adesanya et al. (2020) emphasised the importance of supplier development in SSRM.

The third ranking was given to supplier monitoring and performance evaluation with a weight of 0.1868. Despite supplier performance evaluation being one aspect that has been emphasised as important in the SSRM since it helps manufacturing companies to rate the performance of their suppliers and give them feedback for future improvement, it was not given the highest importance by manufacturing companies in Botswana. According to Adesanya et al. (2020), the importance of supplier performance evaluation is to provide suppliers with the feedback for evaluation, giving clarity on what the buyer expects and giving direction to suppliers for further improvement. This helps to avoid disruptions in the upstream supply chain, such as raw material shortages and delivery delays, which have a substantial effect on downstream issues. This necessitates careful supplier performance evaluation for improved performance such as quality maintenance, cost reduction and customer satisfaction (Dania et al., 2023). The continuous measurement and monitoring of suppliers' performance has become increasingly important in improving the overall performance of the supply chain as a result of companies' growing reliance on their suppliers (Alagoz et al., 2022).

Supplier selection was rated as the fourth sub-objective of SCRM. It had a local weight value of 0.1789. This sub-objective was given low importance by manufacturing companies of Botswana despite the fact that it is critical to achieving SSRM because it begins with supplier selection and selecting the best supplier from a pool of suppliers is essential to transforming companies from

conventional processes to sustainable operations. The findings of this study contradict with the study by Khulud et al. (2023) who emphasised that in today's competitive world, choosing sustainable suppliers is not just an operational, but also a strategic activity as it enable companies to make decisions that optimise costs while improving customer satisfaction and overall competitiveness.

However, Botswana's manufacturing companies did not regard supplier selection as a strategic activity. Supplier selection should be given importance because it is a difficult task in the manufacturing sector as the poor selection of suppliers can lead to poor product quality, high costs and decreased supply chain efficiency (Alavi et al., 2021). When an organisation wants to achieve sustainable performance, choosing sustainable suppliers is crucial (Giannakis et al., 2020). The last sub-objective of the SCRM was supplier segmentation which had a local weight of 0.1440. The manufacturing companies of Botswana did not give importance to supplier segmentation, making it the least sub-objective.

However, scholars believe supplier segmentation is important because different suppliers may require different types of relationships as the characteristics of purchased materials vary (Adesanya et al., 2020). The Kraljic matrix can be used to explain this as it divides an organisation's purchases into various categories according to the importance of the material to the profitability of an organisation and the supply risks involved (Adesanya et al., 2020). The study conducted by Adesanya et al. (2020) revealed that supplier segmentation is essential to guaranteeing supplier performance. As shown in Table 6.18 column 16, the sub-objectives of the SCRM objective were ranked against sub-objectives of other main objectives. It can be noticed that all the sub-objectives of SCRM were ranked as the worst with the rankings ranging from 32 to 37. Though information sharing and trust were highly ranked in the SCRM category, it had a low ranking in the overall ranking with a global weight of 0.0142. Supplier segmentation was rated as the last one in the SCRM and was the last one in the overall ranking with a global weight value of 0.0076. This shows that SCRM is given little importance and also its sub-objective; supplier segmentation is given little importance.

6.6 LINKING THE THEORETICAL FRAMEWORK TO THE RESULTS OF THE STUDY

This section critically links the empirical findings, especially concerning low-ranked objectives, back to the six theories underpinning the study, asserting points of alignment or strategic misalignment. The theories were discussed in detail in Chapter 4 and these are; the Triple Bottom Line (TBL), Total Quality Management (TQM), Total Cost of Ownership (TCO), Circular Economy (CE), Resource-Based View (RBV) and the Stakeholder Theory (ST). The section explains the importance of each of these frameworks and links them to the specific SSRPO that were analysed using the respective theories. The discussion starts with the TBL theory in Section 6.5.1 which was used to study the economic sustainability, social sustainability and environmental sustainability as SSRPO of manufacturing companies in Botswana. This was followed by the RBV in 6.5.2, the lens for value creation and delivery performance objectives. Section 6.5.3 presented the TQM theory, which was used for the quality improvement objective, followed by Section 6.5.4 which presented the TCO as a theory for analysing the supply chain costs. The CE was discussed as a lens for the supply chain innovation objective in Section 6.5.5 and finally the ST used for the SCRM was discussed in Section 6.5.6.

6.6.1 The Link Between the Triple Bottom Line and the Results of the Study

The TBL is a concept based on three dimensions of sustainability; namely, economic, social and environmental, whose aim is to measure organisational performance not only from the financial perspective, but also its impact on the environment and society (Elkington, 1998). This theory has been acknowledged by the research community as a critical and comprehensive lens for dealing with sustainability issues (Aytac et al., 2023). According to Jayashree, Reza, Malarvizhi and Mohiuddin (2021), the three dimensions of sustainability as explained by the TBL were summarised as economic sustainability concentrates on making a profit, social sustainability seeks to improve humanity and the community and environmental sustainability seeks to protect natural resources. The objective of the TBL is to meet the present and future generations' needs without compromising the environment (Khan, Ahmad and Majava, 2021). The TBL

framework is significant for manufacturing companies because it allows them to incorporate environmental and social sustainability concerns in their supply chains, as well as economic sustainability. Thus, it was employed in the current study to examine the three dimensions of sustainability; economic, social and environmental, which were among the nine main objectives of SSRM as mentioned below.

i. Economic sustainability and the triple bottom line

The economic sustainability are strategies that foster long-term economic growth without negatively impacting the community's social, environmental and cultural aspects (Ikenna and Enyinna, 2023). The economic aspect of sustainability is rooted in the sustainable development principle of economic prosperity regarding the production and distribution of goods and services that will enhance the standard of living globally, by going beyond profit maximisation but taking into account the financial benefits for stakeholders and society as a whole (Cantele, Landi and Vernizzi, 2024). In the current study, economic sustainability was given the highest importance over social and environmental sustainability because according to the TBL, the economic sustainability dimension drives the social and environmental sustainability. Economic sustainability ensures that there is cost efficiency in businesses and profitability which is the top priority for developing countries including Botswana. That means in the relationships with their suppliers, manufacturing companies in Botswana consider the ways of enhancing their relationships so that, through SSRM, they can be able to improve their profitability. Increasing profit is a top priority in Botswana just like any other developing country. Without a strong financial stand, manufacturing companies in Botswana may not manage to implement social and environmental sustainability measures.

ii. Environmental sustainability and the triple bottom line

Another sustainability dimension as explained by the TBL is environmental sustainability. Environmental sustainability refers to promoting actions that do not jeopardise environmental resources for future generations, which requires preserving ecosystems' limited capacity for regeneration (Pasamar, Bornay-Barrachina and Morales-Sánchez, 2023). Traditionally, the supply chain

management's objective was to reduce costs and improve delivery without concern for their environmental impact, but pressure from external stakeholders has forced supply chain management professionals to take into account environmental dimensions in their supply chains (Saini et al., 2023). The manufacturing sector, though vital to national economic development has a high negative impact on the environment because it uses large quantities of natural resources including water and makes a high level of pollution (Seclen-Luna et al., 2021). It is among the highest greenhouse gas emissions in Botswana (Ritchie and Roser, 2023). Therefore, environmental sustainability is important to be implemented by manufacturing companies so that they can reduce the impact of their activities on the environment and preserve it.

Environmental sustainability is important to manufacturing companies because the economic growth of Botswana has increased manufacturing activities, resulting in increased resource consumption. It is emphasised that environmental sustainability is critical to the country because it affects economic and social sustainability as their success depends on a healthy and clean environment (Boyd, 2023). The importance of environmental sustainability in Botswana's manufacturing sector is demonstrated by its high ranking in the present survey, which places it fifth overall in the SSRPO rankings. As indicated above, environmental sustainability remains secondary to economic sustainability which is often given priority in sustainability decision-making. This is because according to Pandiangan et al. (2022), the TBL theory holds the view that for a company to survive, it must give attention to meeting the community welfare and actively contribute to conserving the environment as it makes profits. Being the second among the sustainability dimensions shows that in Botswana's manufacturing sector, environmental sustainability recognition is growing because there is increasing pressure from the community, government and regulatory bodies forcing manufacturing companies to comply with environmental sustainability standards. However, the pressure from these stakeholders is not enough because environmental sustainability would have been given a much higher ranking than the fifth position. According to Ikenna and Enyinna (2023), the only way to achieve environmental sustainability is through widespread action.

It has been noticed that the manufacturing sector is among the highest greenhouse gas emissions in Botswana (Ritchie, Rosado and Roser, 2023) hence the need for environmental sustainability standards. Environmental policymakers, academics and industrial practitioners now recognise manufacturing as a significant cause of environmental degradation, despite previously believing that manufacturing had minimal impact (Kraus et al., 2020). It is imperative that companies collaborate in designing products so that they can design products that have less impact on the environment by using less energy, lower emissions and more environmental friendly materials (Melander, 2018). Whether an organisation's products are of good quality and customers are willing to purchase them, if the organisation embrace unethical behaviour towards the environment, customers may be discouraged (Duan et al., 2022). Botswana's dependence on natural resources, water scarcity and susceptibility to climate change also makes environmental measures such as cleaner manufacturing and waste reduction and in SSRM.

Though environmental sustainability has been given importance worldwide, the manufacturing companies of Botswana did not give it the most importance among the SSRPO as it was ranked fifth out of the nine objectives, unlike the economic sustainability which was ranked second. One of the reasons environmental sustainability was not given a higher ranking might have been due to the fact that environmental practices requires large investment. Cantele et al. (2024) stated that a recurring problem under the environmental dimension has to do with the investment a company has to make to minimise or avoid environmental damage such as investing in energy saving measures. Since Botswana's manufacturing companies are small to medium sized with challenges of capital, such investments may be costly.

iii. Social sustainability and the triple bottom line

The TBL theory is used to explain social sustainability as the dimension of sustainability that focuses on people, ensuring favourable and fair practices in the labour market and the broader society (Pasamar et al., 2023). Social sustainability can be viewed as the comparatively greater concern on issues impacting participants than society and how significant it is to distance the concerns of

participants from social issues (Amoako et al., 2023). Social considerations in the supply chain may include factors such as working conditions, ethical sourcing and community engagement. By fostering transparent relationships and advocating equitable pay or health care coverage, an organisation may concentrate on its interaction with the community while generating value. Out of the three sustainability dimensions, social sustainability was ranked lowest. This demonstrates that manufacturing companies in Botswana place less focus on social sustainability elements like community development, labour rights, equity and workplace safety in their SSRM. Because Botswana's manufacturing sector is relatively small and less labour intensive, social issues do not seem urgent. The results from the current study indicate that while manufacturing companies in Botswana consider the social sustainability dimension of the TBL, they do not prioritise it to economic and social sustainability.

This may be because the benefits are frequently long term and intangible, making them less appealing than the immediate financial gains of economic initiatives. According to the TBL theory, the results of this study indicate that the manufacturing sector of Botswana lacks the social component of sustainability as companies are primarily concerned with financial survival, enhancing economic sustainability and compliance with environmental sustainability. There may also be limited stakeholder pressure from consumers, government and civil society demanding social accountability in supply chains. However, Quayson et al. (2023) contend that social issues cause unease among the community and among employees, disrupting the supply chain for natural resources, particularly pertaining to health and safety. Some social factors may affect specific manufacturing industries, for example; modern slavery and working conditions may affect the textile industry, while the electronic industry may be affected by the use of conflict minerals (CIPS, 2024). In summary, the findings of this study reveal that manufacturing companies in Botswana understand all the dimensions of sustainability, resulting in durable results of the TBL as illustrated in Figure 4.1 in Chapter 4.

6.6.2 The Link between the Results of the Study and the Total Quality Management Theory

The TQM is a common strategy among manufacturing companies to achieve high-quality products while reducing quality related costs and raising customer satisfaction (Ghunaim and Jaaron, 2022). It enables businesses to generate high quality products by combining a performance system with continuous improvement (Ghunaim and Jaaron, 2022). The TQM was used for this study to determine the features of quality that enhance an organisation's performance and analyse how manufacturing companies in Botswana prioritise them in collaboration with their suppliers. The results of the current study are consistent with the TQM as the quality improvement was highly ranked at third position out of nine objectives. This shows that manufacturing companies in Botswana effectively work with their suppliers to improve the quality of bought-out items by building long term relationships with them. The key objective of TQM is to enable an organisation to meet its quality requirements by taking a team's approach in which internal people work together as well as suppliers. Thus, it is a team approach to meeting quality requirements than isolated process (Riaz et al., 2023). TQM places a strong focus on supply chain thinking, which is collaborating with suppliers to raise quality throughout the supply chain (CIPS, 2023). This study examined product quality holistically by analysing its characteristics and therefore meeting the principle of TQM that requires meeting the quality requirements holistically.

6.6.3 The Link between the Results of the Study and the Total Cost of Ownership Theory

The TCO theory was used to analyse the costs involved in SSRM. This theory helps to examine the costs relating to procurement and owning a particular product over the course of its full lifecycle, including acquisition, use, maintenance and disposal (Heimes et al., 2023; Lyu et al., 2023; Saccani et al., 2017). As manufacturing companies form contracts with suppliers, the TCO model can be used to determine all costs involved in the relationships. It should be noted that it is not all costs that can be seen from the onset of the contract as other costs are hidden and will reveal themselves once the contract progresses. For the current

study, supply chain costs were given low recognition by ranking it number seven out of the nine objectives of SSRM. This indicates that manufacturing companies in Botswana do not give much attention to the analysis of supply chain costs. Thus, the findings do not agree with the TCO which requires manufacturing companies to make a detailed analysis of costs including taking into account the hidden costs.

6.6.4 The Link between the Results of the Study and Circular Economy Theory

The CE is a framework which focuses on addressing resource issues such as waste, biodiversity loss, climate change and pollution (Costa Melo, Alves Junior, Queiroz, Yushimito and Pereira, 2023). It is used to re-engineer a product's production process by designing a long-lasting product which takes into account its maintenance, reuse, recycle, repair, refurbishment and re-manufacture (Hazen, Russo, Confente and Pellathy, 2021). The CE was used for this study to determine the extent to which manufacturing companies value innovation in their production processes and if they extend it to their suppliers. Innovation is the result of efforts made to broaden a person's knowledge or comprehension and to apply the knowledge to develop practical tools, products and procedures (Ikenna and Enyinna, 2023). Manufacturing companies in Botswana are expected to make innovations to their products and processes so that they can achieve economic benefits and the realisation of a circular economy.

However, the research findings of the current study did not agree with this as supply chain innovation was given a very low ranking; eight out of nine objectives. That means innovation was not valued as important in the manufacturing sector of Botswana. The cause of failure to give importance to supply chain innovation may be because innovation requires investment in new technology which is not easy for them because most of the manufacturing companies in Botswana are small to medium sized, thus have difficulties with capital. Secondly, the findings show that the manufacturing companies in Botswana were more focused on reliability of supply since they were more reliant on external suppliers, especially South Africa. Manufacturing companies in Botswana might have failed to achieve innovative practices because of the risks involved. According to Ikenna and Enyinna (2023),

companies often assume risks to achieve innovative goals due to uncertainties about technologically achievable or the actual method of accomplishing these goals.

6.6.5 The Link between the Results of the Study and the Resource-based View

The RBV is the most well-known theory that offers a solid foundation for identifying various resources and examining their roles in organisational performance (Bhatti et al., 2023). The RBV was used for this study to analyse two SSRPO; the value creation in the supply chain of manufacturing companies in Botswana and the enhancement of delivery performance. The findings of this study align well with the RBV which emphasises the importance of resources as a source of competitive advantage for an organisation (Shehzad et al., 2023).

i. Value creation and the resource-based view

Value creation is the process that involves combining resources from various supply chain partners to enhance a product's worthiness (Zainuddin, Randle, Gordon and Dolnicar, 2024; Hammervoll, 2009). According to the RBV theory, an organisation's resources that are critical to creating competitive advantage contribute to the value of the business (Barney, Ketchen and Wright, 2021). This makes manufacturing companies to see raw materials as vital resources hence suppliers are vital to their businesses. Kim, Lee and Hwang (2020) stated that manufacturing companies depend on suppliers for their resources in terms of raw materials, thus suppliers are a major contributor towards the operation of an organisation by providing material and services required for the smooth running of the business. Raw materials play a vital raw in value creation.

In this study, Botswana's manufacturing companies prioritised value creation as it was viewed as the most important SSRPO, thus was ranked as number one. Being ranked first, it is reasonable to assume that Botswana's manufacturing companies place a high importance on the value creation and approach their SSRM through the lens of improving their resources. Suppliers give vital support to manufacturing companies' value creation by providing materials of the right quality at the right time and in the right quantity to enable the smooth production

while supplied at the right price. According to Rezaei et al. (2018), enhancing value is one of the outcomes of joint problem solving between supplier and purchaser. Thus, value creation resonates well with the RBV theory.

ii. Delivery performance and the resource-based view

The RBV theory also recognises intangible resources as vital to the businesses. Delivery performance is one of the resources of an organisation that is intangible. Though intangible, delivery performance is vital to manufacturing companies. The RBV suggests that intangible resources may be a more potent source of competitive advantage than tangible resources (Razzak, 2023). Integrating intangible assets improves a company's performance and sustainability as they enable the development of strategies that improve effectiveness and efficiency (Shehzad et al., 2023). Ranking delivery performance fourth out of the nine objectives demonstrated that manufacturing companies in Botswana value delivery performance. Though not as a strategic activity, delivery performance may be placed at an operational level. Thus, the delivery performance objective is consistent with the RBV, which values an organisation's intangible resources.

6.6.6 The Link between the Results of the Study and the Stakeholder Theory

The ST states that businesses should give priority to the expectations of stakeholders who have the power, legitimacy and urgency (Mahajan, Lim, Sareen, Kumar and Panwar, 2023; Bridoux and Stoelhorst, 2022). Companies react to the pressure from stakeholders who have more influence. In the case of Botswana's manufacturing companies, the key stakeholders are the government, suppliers, shareholders, customers and the community. Thus, the extent of SCRM implemented by manufacturing companies depends upon the pressure arising from these stakeholders because according to the ST, an organisation should balance, in its dealings, the interests of the stakeholders (Iyere and Misopoulos, 2022).

It is probable that the manufacturing companies of Botswana gave low importance to SCRM because there was no pressure emanating from the stakeholders due to various reasons. Firstly, they did not prioritise SCRM as they were more

concerned with value creation, which customers give the most importance to as they are more concerned with improved goods and prices and consistency of delivery than risk management. This might be the reason why the manufacturing companies attributed most importance to the value creation objective of SSRPO and gave the least importance to SCRM as seen in Table 6.18. Another reason for giving the lowest importance to SCRM may be that it is less likely that customers put pressure on businesses to implement SCRM, as long as these companies are able to supply the required goods.

In addition to that, it is likely that there is no pressure emanating from the government to implement SCRM as they may be more concerned with compliance with job creation and adhering to local sourcing regulations than the development and implementation of SCRM policies. Another stakeholder that may put pressure on manufacturing companies to implement SCRM is suppliers. It seems suppliers do not put pressure on manufacturers for contingency planning or risk sharing; both parties do not take risk management as a priority. Furthermore, shareholders are more concerned with seeing their wealth grow than seeing that manufacturers implement SCRM which they see as an added cost and therefore will reduce profit. Lastly, the community is happy to see businesses running profitably as their concerns are job creation, thus SCRM is not much of an issue to them.

6.6.7 The Link between the Use of the Best Worst Method and Rational Choice Theory

The rational choice (RCT) theory posits that the goal of people is to maximise the outcomes by making decisions upon weighing the benefits and costs of each available option (Ardyan, Kurniawan, Istiatin and Luhgiatno, 2021). The BWM requires decision makers to prioritise the available factors and determine the best or most important factor and worst or least important factor. Using this method, supply chain professionals in the manufacturing industry of Botswana evaluated and prioritised the SSRPO by the way each contributes to the value of their businesses and minimising costs. Thus, the RCT was used as the decision makers ranked the SSRPO by considering the benefits they offer to their companies. The decision makers in Botswana's manufacturing companies use SSRPO practices that enhance organisational benefits and therefore improve their

companies' performance. By identifying the best SSRPO by the decision makers, it shows how they give importance to the criteria thus mirror its contribution to the maximisation of organisational benefits and by identifying the worst SSRPO it shows the least importance that managers in the manufacturing sector of Botswana give to these objectives.

6.7 DEVELOPMENT OF A DECISION FRAMEWORK FOR THE SUSTAINABLE SUPPLIER PERFORMANCE OBJECTIVES AMONG MANUFACTURING COMPANIES IN BOTSWANA

Section 6.6 discussed the research findings. The prioritisation of the SSRPO was discussed and the most sustainable objectives were revealed together with the rankings of the objectives and sub-objectives. This section presents the recommended framework that shows the most important SSRPO in enhancing better decision-making among Botswana's manufacturing companies. The section indicates the attainment of the research objectives. It further shows the developed framework for SSRPO among manufacturing companies in Botswana. The section also guides manufacturing companies on how to determine the main SSRPO and their sub-objectives. Figure 6.15 depicts how the framework was developed based on the study's findings. It is recommended for use by manufacturing companies in Botswana in their relationships with their suppliers to prioritise the SSRPO hence in their relationships with suppliers, manufacturing companies in Botswana should list the SSRPO and prioritise them. The framework covers all the objectives that enhance SSRM and enable manufacturing companies to improve their sustainability, thus sustainability of the national economy at large.

The SSRPO framework is grounded in empirical evidence derived from the BWM, which ensures mathematically optimised and consistent prioritisation of objectives. By integrating both first-order and second-order SSRPO, the framework provides a robust decision-making tool that reflects the strategic realities of Botswana's manufacturing sector. The SSRPO decision framework recognises the critical objectives of SSRM for manufacturing companies and so can aid managers with decision-making as they will be able to determine and prioritise the objectives, thereby improving the performance of their supply chains. The framework addresses the objectives that are relevant for sustainable relationships with

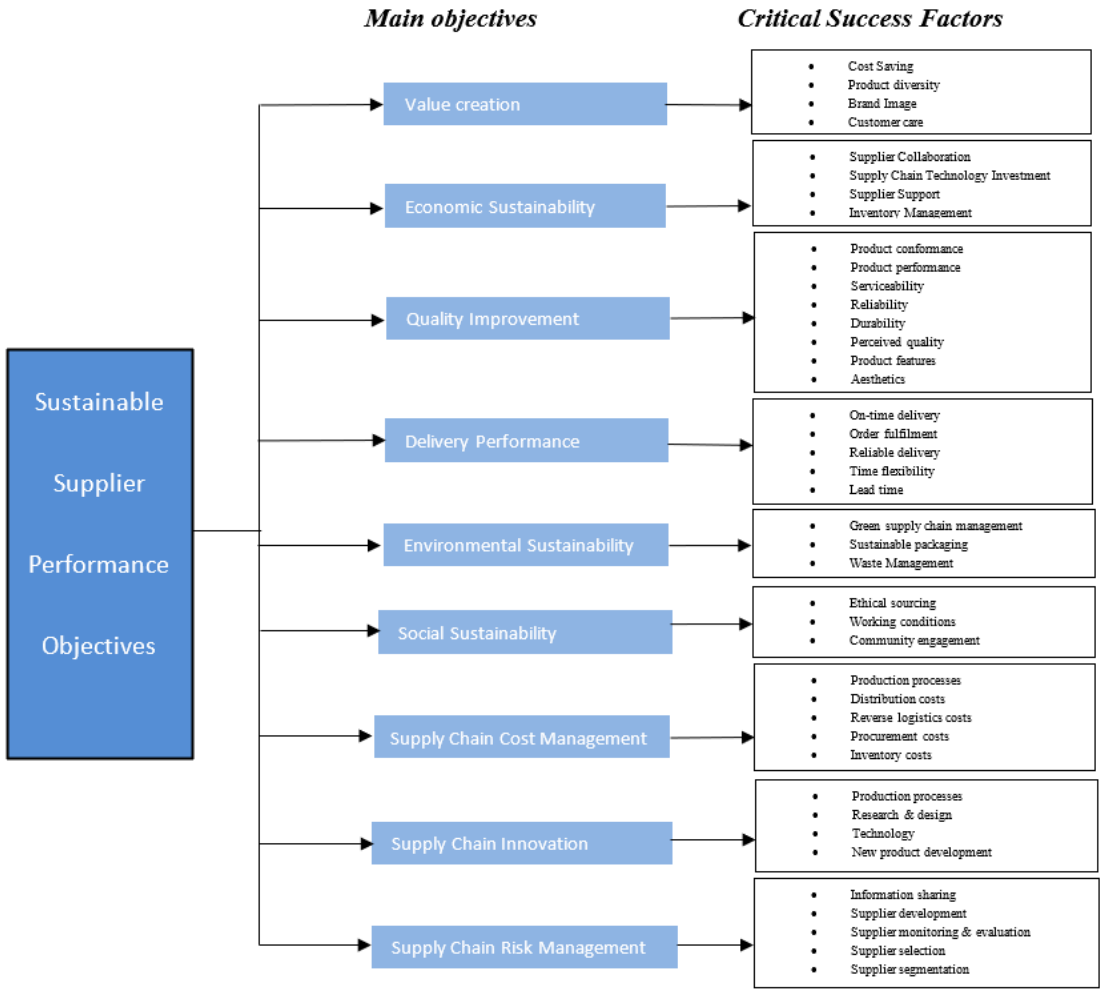
suppliers, allowing manufacturing companies to be sustainable. The consideration of these objectives can help manufacturing companies focus their efforts where results have a greatest impact on their companies. The framework also indicates the sub-objectives, which are the CSF of the main objectives. Therefore, the decision framework can be used by manufacturing companies to determine the objectives that they need to prioritise in the SSRPO.

The section starts with sub-section 6.7.1 that answers sub-question (i); 'what are the first-order and and second-order SSRPO for decision-making among manufacturing companies in Botswana?'. It is followed by sub-section 6.7.2 which answers sub-question (ii); 'what is the best first-order SSRPO for decision-making among Botswana manufacturing companies?'. Sub-question (iii); 'what is the worst first-order SSRPO for decision-making among Botswana manufacturing companies?' is answered in sub-section 6.7.3. Sub-section 6.7.4 answers the fourth research sub-question; 'what is the best second-order SSRPO for decision-making among Botswana manufacturing companies?', while the fifth sub-question; 'what is the worst second-order SSRPO for decision-making among Botswana manufacturing companies?', is answered in sub-section 6.7.5. Finally, sub-question (vi); 'overall, what is the optimal SSRPO decision point for manufacturing companies in Botswana?', is answered in sub-section 6.7.6.

6.7.1 The First-order and Second-order Sustainable Supplier Relationship Performance Objectives for Decision-Making Among Manufacturing Companies in Botswana

The study of the SSRPO among manufacturing companies in Botswana identified the objectives of SSRPO. Both, the first-order SSRPO and second-order SSRPO were identified and are clearly illustrated in the SSRPO decision framework in Figure 6.15. First-order SSRPO refers to the main objectives of sustainable supplier relationship performance, while second-order SSRPO refers to the sub-objectives, which are the CSF factors of the main objectives. The first-order and second-order SSRPO as presented in the SSRPO framework and discussed below.

Figure 6.15: Sustainable Supplier Relationship Performance Objectives (SSRPO) decision framework



Source: Author's own design, 2025

6.7.1.1 The First-order SSRPO for Decision-Making Among Manufacturing Companies in Botswana

Through the research findings, the first-order SSRPO in enhancing better decision-making among Botswana's manufacturing companies were identified. The first-order SSRPO are illustrated in the SSRPO framework in Figure 6.15 as the main objectives and are presented in the order of their importance starting with the most important and ending with the least important as follows; value creation, economic sustainability, quality improvement, delivery performance, environmental sustainability, social sustainability, supply chain cost management, supply chain innovation and SCRM.

i. *Value creation*: As shown by the SSRPO framework in Figure 6.15, value creation is one of the first-order SSRPO. It has been ranked the highest among all the first-order SSRPO, thus, the most important objective. Manufacturing companies should give it the importance it deserves in the management of the relationships with their suppliers. That means they should ensure that their relationships result in creating value for their businesses. In achieving the creation of value, the sub-objectives which work as CSF to the achievement of value creation have been determined as cost saving, product diversity, brand image and customer care. The SSRPO framework has presented these CSF in the order of their importance starting with the most important and ending with the least important as cost saving, product diversity, brand image and customer care. That means, to achieve value creation, manufacturing companies in Botswana should give priority to identifying the means of saving costs in their supply chains, followed by product diversity, then determining ways of enhancing their brand image and lastly determining ways that show to customers that they are being cared for.

ii. *Economic sustainability*: The SSRPO decision framework also shows economic sustainability as one of the first-order SSRPO for decision-making among manufacturing companies in Botswana. This objective was ranked as the second one, meaning that it has been given high importance by manufacturing companies in Botswana. In order to enhance economic sustainability, manufacturing companies should ensure the implementation of sub-objectives which work as the CSF is done. As shown by the SSRPO decision framework in Figure 6.15, these CSF have been identified and arranged in the order of their importance as supplier collaboration, supply chain technology investment, supplier support and inventory management. Thus, manufacturing companies in Botswana should give priority to working together with their suppliers to determine and implement economic sustainability measures.

iii. *Quality improvement*: Quality improvement is another first-order SSRPO as illustrated in the SSRPO decision framework in Figure 6.15. It can be

noticed that quality improvement has been ranked as the third SSRPO, implying that manufacturing companies in Botswana give it high importance. This objective has eight CSF ranked in the order of their importance as conformance, product performance, serviceability, reliability, durability, perceived quality, product features and aesthetics.

iv. *Delivery performance*: The fourth first-order SSRPO is delivery performance, and it has five sub-objectives which are its CSF arranged in the order of their importance as on-time delivery, order fulfilment, reliable delivery, time flexibility and lead time. That means manufacturing companies in Botswana should give priority to managing their suppliers to ensure that deliveries are made on time.

v. *Environmental sustainability*: The framework further shows another main SSRPO as environmental sustainability which can be achieved by implementing the CSF in the order of their importance as GSCM, sustainable packaging and waste management.

vi. *Social sustainability*: According to the SSRPO decision framework, social sustainability is one of the first-order SSRPO. Regarding the importance that this objective has been given, it comes after the environmental sustainability objective. The decision framework also identifies the variables that contribute to social sustainability, and these are ethical sourcing, working conditions and community engagement. To meet the sustainability standards, manufacturing companies in Botswana should give priority to ethical sourcing, followed by improving working conditions, and lastly, determining ways of engaging with the community.

vii. *Supply chain cost management*: Furthermore, the SSRPO decision framework shows the supply chain cost management as the seventh important SSRPO. Figure 6.15 clearly shows the order of importance of the CSF of social sustainability as production costs, distribution costs, reverse logistics and inventory costs.

viii. *Supply chain innovation*: The eighth SSRPO as indicated by the decision framework is the supply chain innovation. It has four sub-objectives

presented in the order of their importance as production processes innovation, research and design, technology innovation and new product development.

ix. *Supply chain risk management*: Finally, the SSRPO framework indicates the last first-order SSRPO as SCRM. As shown by the decision framework, the CSF to SCRM are information sharing, supplier development, supplier monitoring and performance evaluation, supplier selection and supplier segmentation.

6.7.1.2 The Second-order SSRPO for Decision-Making Among Manufacturing Companies in Botswana

The study also identified the second-order SSRPO. For each of the identified main SSRPO, the CSF were identified. These are referred to as sub-objectives in this report, and they are the second-order SSRPO. The sub-objectives or second-order SSRPO are the factors that lead to the successful achievement of the main SSRPO. The SSRPO decision framework (Figure 6.15) shows the second-order or sub-objectives and their linkage to the first-order SSRPO. They are discussed below by linking them to the first-order SSRPO.

i. The sub-objectives of value creation

In achieving the value creation SSRPO, the sub-objectives which work as CSF to the achievement of value creation were determined as cost saving, product diversity, brand image and customer care. The SSRPO framework has presented these CSF in the order of their importance starting with the most important and ending with the least important as cost saving, product diversity, brand image and customer care. Thus, in the quest to achieve value creation to their businesses, manufacturing companies should determine the cost saving measures that can be implemented in the relationships with their suppliers. The cost saving measures that can be implemented include VMI, JIT system, standardisation of raw materials, negotiation for favourable prices and digitalisation of procurement. Secondly, product diversity can help manufacturing companies in Botswana to enhance value creation. This may be done by encouraging their suppliers to make available a variety of materials as this can enable the manufacturing companies to

reduce the supply base. Thirdly, for the manufacturing companies to be able to manufacture products of the brands that are noticeable and appealing to customers and outperform their competitors, they depend on suppliers for reliable materials. Customer care can enhance an organisation's value if implemented successfully. As a result, manufacturing companies should ensure that their suppliers provide good service by setting service standards to which suppliers must conform, thus improve the overall supply chain performance.

ii. **Sub-objectives of economic sustainability**

The SSRPO framework also indicates another SSRPO to be considered by manufacturing companies in their SSRM as economic sustainability. In order to enhance economic sustainability, manufacturing companies should ensure the implementation of sub-objectives which work as CSF. As shown by the SSRPO decision framework in Figure 6.15, these CSF have been identified and arranged in their order of importance as supplier collaboration, supply chain technology investment, supplier support and inventory management. Supplier collaboration has been identified as the most important critical success factor of economic sustainability.

Manufacturing companies can implement supplier collaborative practices such as joint problem solving, reduction of inventory levels, reducing supply chain disruptions and setting KPIs. The second most important sub-objective of economic sustainability is making an investment in supply chain technology. This can help manufacturing companies to improve performance through such benefits as speeding the supply chain processes and improving the quality of information flow. The decision framework further shows that manufacturing companies should support suppliers so that they can improve performance. Inventory management is also a means of enhancing economic sustainability through practices such as demand forecasting, JIT inventory system, inventory classification using techniques such as ABC analysis and Kraljic matrix and VMI.

iii. **Sub-objectives of quality improvement**

As illustrated by the SSRPO decision framework in Figure 6.15, the sub-objectives of quality improvement were identified and ranked in their order of importance as

product conformance, product performance, serviceability, reliability, durability, perceived quality, product features and aesthetics. The framework gives conformance as the most important critical success factor to quality improvement. Thus, manufacturing companies should ensure that suppliers adhere to the set specifications so that the quality of materials received meets the expected standards. The second important critical success factor to quality improvement is product performance.

To achieve this, manufacturing companies in Botswana can set specific KPIs to monitor their suppliers' performance in terms of meeting the quality standards. The third enabler to quality improvement is serviceability, which applies to the procurement of non-current assets such as machinery and equipment. Therefore, manufacturing companies should consider the ease, speed and accessibility of repairing non-current assets bought from suppliers. Reliability, being the fourth critical success factor to quality improvement should be given the attention that it deserves. Manufacturing companies should consider factors such as the history of the supplier in delivering reliable products and quality certifications.

The SSRPO decision framework further shows durability as a sub-objective or critical success factor of quality improvement. The supplier's products should be tested for their ability to perform over an intended period without failure. To confirm that products would be durable before purchasing them, manufacturing companies should get information from suppliers such as warranty period, third-party durability certifications and expected lifespan stated on the specifications. The perceived quality is also shown by the framework as an important factor to consider for enhancing quality improvement in bought-out materials. Thus, manufacturing companies should determine the quality that other customers of the bought-out products regard as right as it helps to determine the reputation a product has made. The seventh important critical success factor of quality improvement is product features. Manufacturing companies can consider product features of bought-out items that add value to their businesses. Finally, the framework shows aesthetics as the last critical success factor to consider for quality improvement. To achieve this, manufacturing companies should determine

whether there are any features to consider for a product to be bought such as how it looks like, smells, feels, tastes and sounds.

iv. Sub-objectives of delivery performance

The delivery performance as a first-order SSRPO has five sub-objectives which are its CSF and are arranged in the order of their importance as on-time delivery, order fulfilment, reliable delivery, time flexibility and lead time. On-time delivery as the most important critical success factor of delivery performance can be determined through measures such as percentage of on-time deliveries in full, percentage of early deliveries, percentage of late deliveries, percentage of deliveries over order quantity, percentage of deliveries under order quantity and percentage of deliveries with the correct paperwork (CIPS, 2024). The SSRPO decision framework indicates that order fulfilment is the second important factor to the enhancement of delivery performance. Manufacturing companies should consider the whole delivery performance of a supplier, starting from placing and processing an order, picking stock from the stock location and packing it, shipping it and until delivery.

Furthermore, reliable delivery is shown by the SSRPO decision framework in Figure 6.15 as a third enabler of delivery performance improvement. To ensure that suppliers make reliable deliveries, manufacturing companies can take measures directed towards supplier appraisal such as financial assessment and technical assessment. Additionally, they can set service level agreements, improve communication and demand forecast sharing. Time flexibility is another critical success factor for enhancing delivery performance as indicated by the SSRPO decision framework. To achieve this, manufacturing companies should ensure that suppliers are able to respond to the organisation’s delivery schedules. Thus, it should be determined whether suppliers are prepared to adjust the delivery of goods to accommodate the organisation’s changing schedules. Lastly, the SSRPO decision framework shows lead time as one of the CSF to delivery performance improvement. To stick to the lead time, a manufacturing company should determine the right time to place an order to ensure that their supplier will be able to deliver on time.

v. Sub-objectives of environmental sustainability

The sub-objectives or CSF of the environmental sustainability were established. As demonstrated in the SSRPO decision framework and arranged in the order of their importance, the sub-objectives of environmental sustainability are GSCM, sustainable packaging and waste management. The SSRPO decision framework clearly indicates the most important enabler of environmental sustainability as GSCM. Therefore, manufacturing companies should ensure that they adopt GSCM practices and extend them to suppliers so that suppliers' capacity for environmental management can be enhanced.

Secondly, sustainable packaging is an important critical success factor to the enhancement of environmental sustainability. Manufacturing companies should adopt sustainable packaging measures which are environmentally friendly and contribute to sustainable development and encourage them to be adopted by their suppliers as well. These measures include using environmentally friendly packaging material, less material, biodegradable material and recycling of packaging material. The last critical success factor for achieving environmental sustainability as indicated by the SSRPO decision framework is waste management. Manufacturing companies must adopt waste management practices including reduce, reuse or recycling. That means companies should reduce the quantities of material purchased, reuse items that can be reused, put some items into other uses, while some items can be converted into resource material (Eslami et al., 2021).

vi. Sub-objectives of social sustainability

The three sub-objectives of the social sustainability SSRPO were determined and clearly shown in the SSRPO decision framework. The framework demonstrates the variables that contribute to social sustainability, arranged in the order of their importance as ethical sourcing, working conditions and community engagement. Manufacturing companies in Botswana may implement ethical sourcing practices including fair pricing, information sharing, transparency, confidentiality and fairness, data protection, avoidance of child labour and society and regulatory responsibilities. The second important enabler of social sustainability is the

improvement of working conditions. This can be achieved through measures such as staff training and education, health and safety, gender equity, labour rights, reasonable wages, employee relations and diversity and employee engagement. Finally, the social sustainability objective can be achieved by manufacturing companies through the engagement of the community. Manufacturing companies may take actions relating to philanthropy, fair pricing, stakeholder communication such as sharing product information with customers and sharing information with suppliers such as product demand, business partnerships and environmental sustainability support (Kumari and Singh, 2023; Razzak 2023; People and Global Business Association and Duong, 2022; Mani et al., 2016).

vii. Sub-objectives of supply chain cost management

Furthermore, the framework shows the supply chain cost management's sub-objectives as production costs, distribution costs, reverse logistics and inventory costs. The production cost management as the most important sub-objective of supply chain cost management should be given careful consideration by manufacturing companies. Thus, they should watch their suppliers' production costs as they affect the cost of the materials bought from them. The decision framework further shows that procurement costs are an important factor to consider reducing the supply chain costs. Measures that can be taken to reduce procurement costs include negotiation, supplier appraisal and documentation.

Furthermore, the framework shows that the reduction of the costs of reverse logistics can contribute to the reduction of supply chain costs. Manufacturing companies should determine the reverse logistics costs involved in their supply chains and identify the means of reducing them. These costs many include communication costs, documentation costs, replacement costs and disposition costs (Rushton et al., 2014). Lastly, to reduce supply chain costs, manufacturing companies should determine the costs involved in managing inventory so that they can determine suitable means of minimising them. The most frequently inventory costs incurred by manufacturing companies are capital cost, cost of space, valuation of inventory, inventory management and insurance, inventory forecasting, quality management, stock deterioration, demand forecasting and replenishment (Alam et al., 2024a; Rushton et al., 2014).

viii. Sub-objectives of supply chain innovation

The study further identified four sub-objectives of supply chain innovation SSRPO. These were presented in the SSRPO decision framework in the order of their importance as production processes innovation, research and design, technology innovation and new product development. As indicated by the SSRPO decision framework in Figure 6.15, production processes innovation is the most important critical success factor for supply chain innovation. In their production processes, manufacturing companies should take innovative measures that cover aspects such as changing equipment, software and production methods.

The second important critical success factor to supply chain innovation is research and design. Suppliers should offer fresh, specialised knowledge that can be combined with the company's existing knowledge to support the company with research and design. Technology innovation is another important aspect of supply chain innovation. To achieve this, manufacturing companies can make use of new generation technologies like the IoT, blockchain, digital twins and big data (Li, Zhang, et al., 2023). Finally, the SSRPO framework shows new product development as one of the important factors of supply chain innovation activities. Manufacturing companies' procurement professionals should work closely with their suppliers to introduce new products who have the expertise for the product under development.

ix. Sub-objectives of supply chain risk management

The last set of sub-objectives of SSRPO was classified under the SCRM. As shown by the SSRPO decision framework, the CSF to SCRM are information sharing, supplier development, supplier monitoring and performance evaluation, supplier selection and supplier segmentation. The most important critical success factor for the SCRM is information sharing. Manufacturing companies and suppliers should be transparent and exchange information. Supplier development is the second enabler of SCRM. Manufacturing companies in Botswana can take various measures to develop their suppliers thus enable them to meet the companies demand and minimise supply chain risks. The measures that can be implemented include supplier training programmes, technical and managerial

support, giving incentives to suppliers aimed at improving performance, as well as fostering competition among suppliers. The third enabler of SCRM is supplier monitoring and performance evaluation.

Manufacturing companies should monitor the performance of their suppliers on the existing contracts, rate their performance and give them feedback for future improvement. The SSRPO also shows that the supplier selection process is an enabler to SCRM. Manufacturing companies should take supplier selection exercise seriously and can consider many factors that the supplier should meet in order to be awarded a contract, such as quality, cost, delivery and service level. Manufacturing companies should devise the supplier development programmes aimed at improving supplier capabilities so that they can meet or surpass the buying organisation's performance objectives. As shown in the SSRPO framework, supplier segmentation is the last enabler of the SCRM. Manufacturing companies should segment their suppliers using suitable techniques such as the Kraljic matrix and ABC analysis. This will help to determine the suppliers who can make strategic contribution to their businesses, thus enter into long-term relationships with them.

6.7.2 The Best First-order Sustainable Supplier Relationship Performance Objectives for Decision-Making Among Botswana Manufacturing Companies

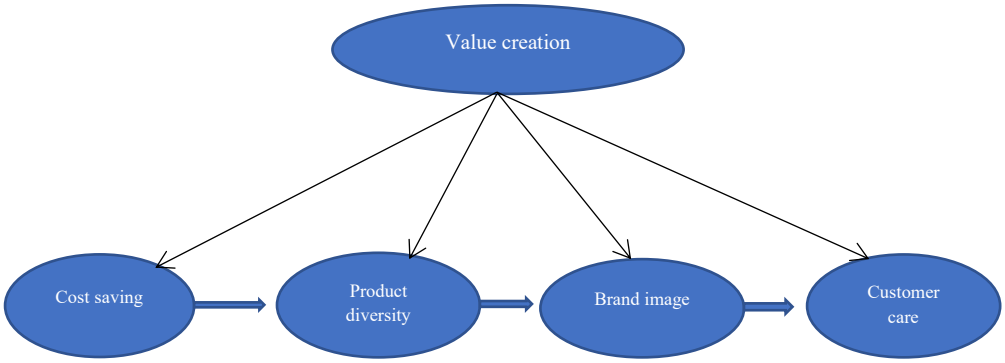
The best first-order SSRPO was value creation. The SSRPO framework in Figure 6.15 clearly portrays the priority of value creation. This is also shown in Table 6.18. That means this is the most important objective that manufacturing companies in Botswana should give attention to in their SSRM. The value creation in SSCM through SSRM, if implemented effectively, can give the best results to the manufacturing companies of Botswana and enable them to contribute to the economy of the country. As shown in Table 6.18, the value creation objective of SSRM gives the greatest results to the companies as it has been given the highest weighting with a wide margin between it and the second best objective; economic sustainability. Manufacturing companies must place the greatest efforts where the results will be greatest. That means the greatest efforts in SSCM through SSRM

should be placed on value creation as it is able to give the greatest outcomes compared to other SSRPO.

The manufacturing sector, being essential to the prosperity of Botswana and with the aim of driving change through job creation and sustainable economic growth can be able to achieve this objective through SSCM by implementing measures that create value in the supply chain. As illustrated by the SSRPO framework, manufacturing companies can enhance value creation through achieving the four sub-objectives; cost saving, product diversity, brand image and customer care as these work as CSF for value creation. The Botswana government, having prioritised the manufacturing sector in addition to the mining sector, has great concern for the development and growth of manufacturing sector hence through value creation in the supply chains, the manufacturing sector will be able to meet the government objectives.

To illustrate the value creation as the best first-order SSRPO, Figure 6.16 is given. This figure clearly demonstrates the main objective being value creation, together with the CSF as its sub-objectives. The sub-objectives of value creation are presented in the order of their priority starting with cost saving on the left, ending with customer care on the right. That means, for a manufacturing company to be successful with value creation in its supply chain, it needs to meet the sub-objectives as they are the keys to the success.

Figure 6.16: Best first-order SSRPO



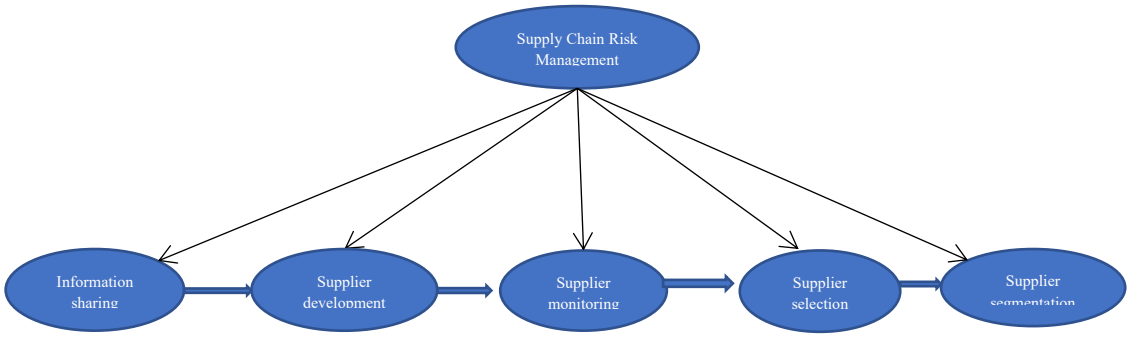
Source: Author's own design, 2025

6.7.3 The Worst First-order Sustainable Supplier Relationship Performance Objectives for Decision-Making Among Botswana Manufacturing Companies

Among the nine SSRPO for decision-making among Botswana manufacturing companies, SCRM was determined as the worst objective. This can also be seen from the SSRPO decision framework, presented in Figure 6.15, which presents SCRM as the worst objective by being positioned at the very bottom of the figure. This implies that its implementation can yield the lowest results. Thus, priority is given to the other eight SSRPO, before considering SCRM. This implies that when allocating resources, the supply chain professionals of manufacturing companies in Botswana give the last priority to SCRM. To further illustrate SCRM, Figure 6.17 below makes the objective's presentation and its sub-objectives, together with how the sub-objectives relate to each other. The figure shows the five sub-objectives as information sharing, supplier development, supplier monitoring and performance evaluation, supplier selection and supplier segmentation, which are the techniques that enable the manufacturing companies in Botswana to achieve the supply chain management objective.

The figure clearly shows the relationship among these sub-objectives, whereby information sharing is presented as the first one, implying that it is considered first in decision-making, followed by supplier development, then supplier monitoring and evaluation. While supplier segmentation is not considered until all the sub-objectives including supplier selection have been considered. Though low importance has been given to SCRM, it does not mean that the criterion should be neglected because supply chain risks are eminent in the supply chains, and if not attended to, may disrupt the supply chains of manufacturing companies in Botswana.

Figure 6.17: Worst first-order SSRPO



Source: Author's own design, 2025

6.7.4 The Best Second-order Sustainable Supplier Relationship Performance Objectives for Decision-Making Among Botswana Manufacturing Companies

The SSRPO decision framework among Botswana manufacturing companies presents the best second-order SSRPO as cost saving. As can be seen from Figure 6.16, cost saving is a sub-objective of the value creation objective. Furthermore, Table 6.18 column 16 presents an illustration of the rankings of the second-order objectives and cost saving has been given the highest ranking. This implies that manufacturing companies in Botswana allocate more efforts and resources to the determination and implementation of cost saving measures. Thus, in their SSRM, manufacturing companies in Botswana should implement systems that reduce costs in their supply chains such as VMI, just in time system, standardisation of raw materials, negotiation for favourable prices and digitalisation of procurement. It has been observed that the successful implementation of the cost saving criterion gives benefits not only to the value creation objective, but to other SSRPO as well because costs have a high effect on the implementation of most of the supply chain techniques especially in the manufacturing sector of Botswana which has capital constraints.

6.7.5 The Worst Second-order Sustainable Supplier Relationship Performance Objectives for Decision-Making Among Botswana Manufacturing Companies

The worst second-order SSRPO for decision-making among Botswana manufacturing companies was supplier segmentation, which is a sub-objective of SCRM. As shown by the SSRPO decision framework in Figure 6.15, supplier segmentation is a sub-objective of the worst objective; SCRM. After considering all the sub-objectives that can enable the manufacturing companies in Botswana to achieve the nine objectives, supplier segmentation should be the last factor to consider. Not only is it the last sub-objective to give attention to in the SCRM process as shown in Figure 6.17 where it is put at the end of the figure, it is also the last one to consider in the whole SSRM process. That means it should be the last one to give attention to after considering the rest of the sub-objectives. Manufacturing companies usually give little attention to supplier segmentation probably due to the fact that they are small and medium sized and may not have much capital to invest in supplier segmentation.

6.7.6 The Optimal SSRPO Decision Point for Manufacturing Companies in Botswana

The proposed SSRPO framework for the manufacturing companies in Botswana gives the optimal decision point as the implementation of value creation. It is regarded as the most important factor to consider in the SSRM. The framework further shows that the SCRM is the lowest objective and should be given the last priority or lowest importance. Having identified the objectives to give priority, it gives managers an opportunity to allocate limited resources optimally by giving priority to critical objectives. Therefore, manufacturing companies in Botswana should give priority to the allocation of limited resources to the SSRPO that can give the greatest results to their companies. Value creation should be the first one to consider among the SSRPO as it has the highest impact on the operation of the manufacturing companies. When it comes to the sub-objectives, cost saving, being the best second-order should be the first one to consider.

The SSRPO decision framework will enable manufacturing companies in Botswana to resolve the problem of competing demands; therefore, they will be able to focus on the objectives that give the greatest impact on their operations and finances. It also indicates the areas that give an organisation the lower impact on the performance of an organisation and this is SCRM among the main objectives and supplier segmentation among the sub-objectives.

It is important to note the managerial interpretation of the weight differences among the SSRPO. Since the weights presented are ratios not percentages, it is significant to explain them in relative comparisons as it can give managers better understanding. For example, to make a comparison between value creation which has a weight of 0.7780 and SCRM with a weight of 0.0530, it can be interpreted that value creation is about 14.7 times more important than SCRM. Thus, with resource allocation, every 1 unit resource allocated to SCRM, approximately 15 units should be allocated to value creation. More examples of managerial interpretation of the differences among the SSRPO are given in Table 6.20 below.

Table 6.20: Interpretation of weight differences for managers

SSRPO & weights	Weight difference	Ratio	Managerial interpretation
VLC (0.7780) vs SCR (0.0530)	0.7250	15:1	Value creation is 15 times important than SCRM
ECO (0.2068) SOC (0.1012)	0.1056	2:1	Economic sustainability is twice as important as social sustainability
QUI (0.1488) vs SCC (0.0947)	0.0541	1.6:1	Quality management is more important by approximately one and half than supply chain cost management
DLP (0.1242) vs SCI (0.0794)	0.0448	1.6:1	Delivery performance is more important by approximately one and half than supply chain innovation
VLC (0.7780) vs ENT (0.1154)	0.6626	7:1	Value creation is approximately 7 times more important than environmental sustainability

Source: Author's own computation, 2026

Practically, supply chain managers may use the SSRPO weight differences to make decisions on business aspects such as:

i. Resource allocation: Managers will allocate more resources to value creation than SCRM.
ii. Decision trade off: In case of a conflict between two SSRPO, priority will be given to the SSRPO with higher weight.
iii. Strategic focus: since value creation has been given high importance, managers should overwhelmingly focus on value creation in their SSRM.

6.8 CHAPTER SUMMARY

This chapter presented the findings of the study and discussed them in detail. The chapter started with presenting the demographic information of the respondents from the manufacturing companies of Botswana including age and gender, level of education, position in the company and work experience. This was done in Section 6.2, while Section 6.3 presented the pairwise comparison of the questionnaires for data collection by respondents. Section 6.4 presented the rankings of the main SSRPO starting with the highest ranked objective; value creation, followed by economic sustainability, quality improvement, delivery performance, environmental sustainability, social sustainability, supply chain cost management and ending with the objective that was given the lowest importance; SCRM. Section 6.5 covered the ranking of the sub-objectives of the SSRPO. This was followed by Section 6.6 that showed the linkage of the theoretical framework to the results of the study.

The theories used in the study were the TBL, RBV, TQM, TCO, CE and ST. The TBL was used to study the economic, social and environmental sustainability, while the RBV was used to study the value creation and delivery performance. Furthermore, the TQM was used to study the quality improvement and the TCO theory was used to study the supply chain cost management. The CE was used to study the innovation in the supply chain innovation, and finally, the ST was the lens for the SCRM. The last section was 6.7, which presented the proposed framework for SSRPO. This section indicated the first-order and second-order SSRPO, followed by the best first-order SSRPO and the worst first-order SSRPO.

The best second-order SSRPO and worst second-order SSRPO were also presented. Finally, the framework presented the optimal decision point for manufacturing companies in Botswana. The next chapter discusses the conclusions and recommendations from the study.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

This chapter presents the conclusion and recommendations derived from the study's findings on how manufacturing companies in Botswana can improve their supply chain performance through SSRM. The conclusion summarises the main findings regarding the prioritisation of the SSRPO, which include economic sustainability, social sustainability, environmental sustainability, quality improvement, delivery performance, supply chain costs, supply chain innovation, value creation and SCRM. Table 7.1 below shows the rankings of the main objectives or first order SSRPO together with the conclusion given on the importance of each of them. The table clearly shows that value creation imaged as the highest ranked (best first-order SSRPO), and SCRM was ranked as the lowest (worst first-order SSRPO). Furthermore, this chapter provides practical and actionable recommendations aimed at guiding manufacturing companies in Botswana on implementing strategies that enhance overall supply chain performance via SSRM, grounded in the theoretical frameworks used in the study; namely, Triple Bottom Line (TBL), Total Quality Management (TQM), Resource-Based View (RBV), Total Cost of Ownership (TCO), Circular Economy (CE) and Stakeholder theories (ST).

Table 7. 1: Conclusion on SSRPO Ranking

Rank	Objective (First-Order SSRPO)	Aggregate Weight Value	Conclusion
1	Value Creation (VLC)	0.2319	Best First-Order SSRPO
2	Economic Sustainability (ECO)	0.2068	High importance, reflecting profit dominance
3	Quality Improvement (QUI)	0.1488	Highly important for sustaining growth
4	Delivery Performance (DLP)	0.1242	Important, though ranked lower than direct financial/quality factors
5	Environmental Sustainability (ENT)	0.1068	Given low attention compared to economic goals, indicating a focus on short-term financial performance

Rank	Objective (First-Order SSRPO)	Aggregate Weight Value	Conclusion
			(TBL link)
6	Social Sustainability (SOC)	0.0934	Least explored dimension of sustainability, lacking urgency due to Botswana's small manufacturing sector size
7	Supply Chain Cost Management (SCC)	0.0886	Given low recognition, suggesting greater emphasis on long-term value creation
8	Supply Chain Innovation (SCI)	0.0784	Low importance given due to capital constraints and reliance on external suppliers
9	Supply Chain Risk Management (SCR)	0.0768	Worst First-Order SSRPO.

Source: Author's own design, 2025

7.2 THE RESEARCH OVERVIEW

Chapter 1 presented an introduction of Botswana's manufacturing sector and outlined the background of the study. The chapter emphasised the important role that the manufacturing sector plays to the economic growth of the country. The chapter also highlighted the thesis statement and the need to develop a framework to help manufacturing companies in Botswana with decision-making. Furthermore, the problem statement was discussed which highlighted the downturn of the manufacturing sector due to the impact of the Covid-19 pandemic and the global emphasis on economic, social and environmental sustainability. The chapter further presented the research questions, objectives, methodology and ethical considerations. The theories that underpinned the study were also discussed. The chapter further presented an argument of the significance of the study.

Chapter 2 reviewed the literature of the manufacturing industry. It started by discussing the global manufacturing sector, followed by an analysis of the impact of the manufacturing sector's activities on the environment. Furthermore, the global major industries were discussed as food and beverages, automotive, pharmaceuticals and medicine, textile and wearing apparels and computer and electronic product industries. The chapter went on to discuss the contribution

made by the manufacturing sector to the economy of Botswana and the types of manufacturing industries found in Botswana, where the food and beverages industry was identified as the largest manufacturing industry and the highest contributor to the country's economic growth. Moreover, the chapter discussed sustainability in the manufacturing sector of Botswana.

Chapter 3 presented the literature review of the SSRPO of Botswana's manufacturing sector. This chapter identified the nine SSRPO as economic, social and environmental sustainability, quality improvement, supply chain cost management, delivery performance, supply chain innovation, value creation and SCRM. The literature review further identified the CSF of these SSRPOs and was referred to as sub-objectives.

Chapter 4 presented the theoretical framework of the study. The theories that underpinned the study were discussed and these are TBL, TQM, RBV, TCO, CE and stakeholder theories. The TBL was used as a lens for economic, social and environmental sustainability. While the TQM theory was used to study quality improvement by manufacturing companies in collaboration with suppliers. The TCO was discussed as a tool for studying how manufacturing companies could collaborate with their suppliers to reduce supply chain costs. The fourth theory identified for use in this study was the CE theory which was identified to be used to study how supply chain innovation can be enhanced. The RBV theory was discussed as a lens for studying value creation, as well as delivery performance. Finally, the ST was adopted for the study of how manufacturing companies can collaborate with suppliers in SCRM.

Chapter 5 discussed the research methodology of the study. The research design was covered followed by the research philosophy and paradigms. Additionally, the theory development approaches were outlined as deductive, inductive and abductive and the research methods together with the research strategies including experiments, surveys, case study, action research, grounded theory, ethnography and archival were outlined. Furthermore, the chapter presented the time horizon of the study, followed by the techniques and procedures of the study including the methods of data collection, empirical research, the target population and sampling methods. Moreover, the data collection instrument was outlined and

the chapter ended with explaining the ethical considerations as research consent and maintaining anonymity and confidentiality.

Chapter 6 presented the analysis and discussion of data collected from the manufacturing companies of Botswana. The chapter started with presenting the respondents' demographic information. The pairwise comparison of the questionnaires for data collection by the respondents was done in this chapter. The chapter also presented the rankings of the SSRPO together with their sub-objectives. Furthermore, the theoretical frameworks were linked to the results of the study. Finally, chapter 6 presented the development of the proposed decision framework for SSRPO.

Chapter 7 presents the conclusions of the study. The chapter further presents recommendations for manufacturing companies on how they can collaborate effectively with their suppliers to enhance the overall supply chain performance and sustainability. The recommendations were derived from the findings from the study and were grounded in the theoretical frameworks that guided the research. The suggested actions aim to address the key performance dimensions identified in the study, economic sustainability, social sustainability, quality performance, delivery performance, supply chain innovation, value creation and SCRM. Implementing these recommendations can enable manufacturing companies and their suppliers to build stronger, more resilient and mutually beneficial partnerships that contribute not only to profitability, but also to long-term sustainable development in the manufacturing sector.

7.3 CONCLUSIONS

This section provides conclusions on the empirical study of the SSRPO following the survey as per objectives presented in Chapter 1. The main objective of the study was to develop the SSRPO and prioritise them in enhancing better decision-making among Botswana's manufacturing companies. The sub-objectives were:

i. To evaluate the first-order and second-order SSRPO for decision-making among manufacturing companies in Botswana.
ii. To evaluate the best first-order SSRPO for decision-making among Botswana manufacturing companies.

iii. To evaluate the worst first-order SSRPO for decision-making among Botswana manufacturing companies.
iv. To investigate the best second-order SSRPO for decision-making among Botswana manufacturing companies.
v. To determine the worst second-order SSRPO for decision-making among Botswana manufacturing companies.
vi. To develop the overall optimal SSRPO decision point for manufacturing companies in Botswana.

7.3.1 Conclusion on the First-order and Second-order SSRPO for Decision-Making Among Manufacturing companies in Botswana

The first objective of the current study was to determine the first-order and second-order SSRPO for decision-making among manufacturing companies in Botswana. Through the literature review the first-order SSRPO were identified as the main objectives and the second-order SSRPO were also identified as the sub-objectives referred to as CSF. The conclusions were drawn and are presented in sub-sections 7.3.1.1 and 7.3.1.2 respectively.

7.3.1.1 First-order SSRPO for Decision-Making Among Manufacturing Companies in Botswana

The study identified nine main SSRPO through the literature review as follows: economic, social and environmental sustainability, quality improvement, supply chain cost management, enhancing delivery performance, supply chain innovation, value creation and SCRM. The research concludes that the nine SSRPO are the main objectives that manufacturing companies in Botswana need to implement their relationships with their suppliers for the enhancement of supply chain performance. The survey showed that all the manufacturing companies in Botswana value these SSRPO though they give them varying importance.

7.3.1.2 Second-order SSRPO for Decision-Making Among Manufacturing Companies in Botswana

Through the literature review, the second-order SSRPO, referred to as sub-objectives, were also identified. Each of the nine main SSRPO had sub-objectives

which are the CSF for the achievement of the SSRPO. The value creation had four sub-objectives, which are brand image, cost saving, customer care and product diversity, while economic sustainability had four sub-objectives, which are supplier collaboration, supply chain technology investment, supplier support and inventory management. Quality improvement had eight sub-objectives, which are product performance, product features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. The identified sub-objectives of delivery performance were five and these are on-time delivery, reliable delivery, order fulfilment, delivery time flexibility and lead time. Furthermore, the sub-objectives that were determined for environmental sustainability were three, and these are Green Supply Chain Management (GSCM), waste management and sustainable packaging. Similarly, social sustainability had three sub-objectives, and these are working conditions, ethical sourcing and community engagement. The sub-objectives of supply chain cost management were distribution costs, production costs, procurement costs, reverse logistics and inventory costs. The study also identified four sub-objectives of supply chain innovation as research and design, production processes, technology and new product development. Finally, the sub-objectives determined for SCRM were supplier selection, supplier segmentation, supplier development, information sharing and supplier monitoring and performance evaluation. It is concluded by the researcher of this study that these sub-objectives can aid manufacturing companies in Botswana to achieve the main objectives (SSRPO).

7.3.2 Conclusion on the Best First-order SSRPO for Decision-Making Among Botswana Manufacturing Companies

Based on the empirical findings, the study concludes that value creation stands out as the most critical first-order SSRPO, having achieved the highest ranking and weight among all evaluated criteria. This dominant position reflects a strong consensus across the manufacturing industry in Botswana, where stakeholders consistently prioritise initiatives that enhance the value derived from supplier relationships. The significant margin by which value creation surpasses the second-ranked objective, economic sustainability, underscores its strategic importance. It suggests that manufacturers are not merely focused on maintaining

operations or achieving incremental improvements; they are actively seeking transformative partnerships that yield measurable benefits in productivity, innovation and competitiveness.

The emphasis on value creation as a strategic imperative signals a shift in mindset in the industry. Rather than viewing suppliers as transactional entities, manufacturers increasingly regard them as integral contributors to long-term success. By fostering collaborative relationships, sharing knowledge and aligning goals, companies can unlock synergies that lead to superior outcomes. This approach not only enhances operational efficiency but also strengthens the resilience and adaptability of supply chains in a rapidly changing global environment.

Furthermore, the effective utilisation of value creation enables manufacturers to become agents of broader economic change. It empowers them to support a country's development goals, stimulate job creation and contribute to GDP growth. In doing so, the manufacturing sector aligns itself with Botswana's overarching government objectives, including industrial diversification, export competitiveness and inclusive economic participation. Ultimately, prioritising value creation in supplier relationships is not just a business strategy; it is a catalyst for sustainable development and organisational progress.

7.3.3 Conclusion on the Worst First-order SSRPO for Decision-Making Among Botswana Manufacturing Companies

The research concludes that SCRM ranks as the least prioritised first-order SSRPO, receiving the lowest ranking (Rank 9) among all evaluated objectives. This outcome suggests that manufacturing companies in Botswana are currently allocating minimal attention, effort and resources towards identifying, evaluating and mitigating risks in their supply chains. Such a low prioritisation is concerning as it reflects a strategic blind spot in an otherwise dynamic and evolving industrial landscape. Neglecting SCRM exposes businesses to a range of vulnerabilities, including disruptions in operations, delays in production and potential supplier failures. These risks are not hypothetical; they are increasingly common in today's interconnected global economy, where supply chains are susceptible to

geopolitical tensions, natural disasters, cyber threats and market volatility. Without a robust risk management framework, manufacturers may find themselves ill-equipped to respond to unexpected challenges, leading to cascading effects that compromise performance and profitability.

Moreover, this oversight directly threatens the achievement of higher-ranked objectives such as value creation. Effective supplier relationships depend not only on collaboration and innovation, but also on stability and reliability. When risks go unmanaged, the foundation of these relationships becomes fragile, undermining efforts to generate added value and drive strategic growth. In this context, the lack of emphasis on SCRM could hinder Botswana's manufacturing sector from realising its full potential and aligning with broader organisational development goals. To address this gap, it is imperative for industry leaders and policymakers to recognise the critical role of SCRM in building resilient supply networks. Elevating its importance in strategic planning can safeguard operations, enhance supplier performance and ultimately support the pursuit of long-term value creation and economic sustainability.

7.3.4 Conclusion on the Best Second-order SSRPO for Decision-Making Among Botswana Manufacturing Companies

The study concludes that cost saving is the most strategically significant second-order SSRPO, having emerged as the universally highest-ranked sub-objective across the entire evaluation framework. This result highlights a clear and consistent emphasis among manufacturing companies in Botswana on achieving financial efficiency and optimising profit margins through well-managed supplier relationships. It reflects a pragmatic approach to supply chain strategy, where cost control is not merely a financial metric but a cornerstone of operational excellence and long-term sustainability. The prioritisation of cost saving indicates that manufacturers are acutely aware of the pressures of global competition, rising input costs and the need to deliver value to stakeholders. By leveraging supplier partnerships to reduce procurement expenses, streamline logistics and eliminate inefficiencies, companies can significantly enhance their bottom line.

This focus on financial discipline also enables companies to reinvest savings into innovation, capacity building and market expansion further reinforcing their competitive positioning. Importantly, cost saving is not an isolated objective; it is deeply intertwined with the top-ranked first-order SSRPO; which is value creation. In fact, the ability to generate value through supplier relationships is often contingent upon achieving meaningful cost efficiencies. When suppliers contribute to lowering costs without compromising quality or reliability, they become strategic allies in driving growth and differentiation. Thus, cost saving serves as both a tactical lever and a strategic enabler in the broader pursuit of value creation. In this context, the elevation of cost saving to the highest rank among second-order objectives underscores its role as a foundational element of competitive advantage. It signals to industry leaders and policymakers that fostering cost-effective supplier collaborations is essential not only for individual company success, but also for enhancing the overall productivity and resilience of Botswana's manufacturing sector.

7.3.5 Conclusions on the Worst Second-order SSRPO for Decision-Making Among Botswana's Manufacturing Companies

The research concludes that supplier segmentation ranks as the least prioritised among all the CSF of SSRPO. This finding aligns with the low ranking of its parent objective, SCRM, suggesting a broader pattern of underinvestment in risk-oriented supplier strategies in Botswana's manufacturing sector. The minimal emphasis on supplier segmentation indicates that many manufacturers may not be fully leveraging this essential practice to inform strategic decision-making, optimise resource allocation or mitigate supply chain vulnerabilities. Supplier segmentation is a foundational tool in modern supply chain management, enabling companies to categorise suppliers based on their strategic importance, risk exposure and potential impact on business continuity. Frameworks such as the Kraljic Matrix are widely used to distinguish between routine, leverage, bottleneck and strategic suppliers each requiring tailored management approaches. By neglecting this practice, manufacturers risk treating all suppliers uniformly, which can lead to inefficient allocation of attention and resources, missed opportunities for collaboration and heightened exposure to supply disruptions.

The low prioritisation of supplier segmentation also suggests a reactive rather than proactive approach to supplier management. Without clear differentiation between high-impact and low-impact suppliers, companies may struggle to identify which relationships warrant strategic investment and which requires contingency planning. This oversight can be particularly detrimental in times of crisis, where the inability to quickly assess supplier criticality can delay response efforts and amplify operational disruptions. In essence, the under-utilisation of supplier segmentation represents a missed opportunity to strengthen supply chain resilience and strategic agility. To address this gap, manufacturers in Botswana should be encouraged to adopt segmentation tools and methodologies that support smarter supplier engagement, risk mitigation and value optimisation. Elevating the role of supplier segmentation within the broader SSRPO framework could significantly enhance the sector's ability to navigate uncertainty and drive sustainable growth.

7.3.6 Conclusions on the Overall Optimal SSRPO Decision Point for Manufacturing Companies in Botswana

The proposed SSRPO decision framework in Figure 6.15 serves as a definitive visual and strategic guide for supply chain practitioners, offering a clear, empirically grounded hierarchy of objectives and their associated CSF. By organising these elements based on their observed importance and impact, the framework enables manufacturing companies to navigate complex supplier relationship dynamics with precision and purpose. At the core of this hierarchy lies value creation, identified as the highest-ranked first-order objective. This finding underscores the strategic imperative for companies to channel their resources, capabilities and decision-making efforts towards initiatives that enhance the value derived from supplier collaborations. Prioritising value creation reflects a forward-looking approach that aligns with the broader goals of innovation, competitiveness and economic contribution.

To fully realise the potential of value creation, the decision framework emphasises the importance of cost saving, the top-ranked second-order objective as a key CSF across all supply chain operations. Cost saving not only supports financial efficiency but also reinforces the broader value proposition by freeing up resources for strategic investments and operational improvements. This dual

prioritisation empowers managers to make informed choices about where to focus limited resources for maximum impact. At the same time, the decision framework helps identify areas of lower strategic weight, such as SCRM, which received comparatively low rankings. While not entirely dismissing its relevance, this insight allows companies to calibrate their attention and investment in proportion to the expected returns, ensuring a balanced and results-driven approach to supplier relationship performance.

7.4 RECOMMENDATIONS

The need to improve supply chain performance in the manufacturing sector of Botswana requires strong support from key suppliers, thus upholding SSRM is important. The findings of this study emphasise the adoption of SSRPO decision framework to enhance supply chain performance. The study found that there were nine SSRPO that manufacturing companies in Botswana need to consider in their relationships with their suppliers to enhance performance. The researcher makes the following recommendations to manufacturing companies in Botswana and scholars based on the findings from the study.

7.4.1 Recommendations on the First-order and Second-order SSRPO for Decision-Making Among Manufacturing Companies in Botswana

Manufacturing companies in Botswana must begin to recognise SSRM as a vital practice that not only enhances individual business performance but also contributes meaningfully to the broader national economy. In an increasingly competitive and interconnected global market, the ability to build and manage supplier relationships strategically is no longer optional; it is essential. SSRM enables companies to improve operational efficiency, foster innovation and strengthen supply chain resilience. When adopted effectively, it becomes a powerful lever for driving productivity, supporting industrial growth and aligning with Botswana's economic development goals.

To operationalise SSRM successfully, it is strongly recommended that manufacturers adopt the nine SSRPOs along with their associated CSF as outlined in the developed decision framework. This structured approach provides a clear roadmap for strategic decision-making, helping managers prioritise efforts

that yield the greatest impact. By using the decision framework as a guide, companies can allocate resources more effectively, enhance collaboration with suppliers and ensure that their supply chain strategies are aligned with both corporate goals and national priorities. Ultimately, embracing this framework positions Botswana's manufacturing sector to compete more effectively, adapt to change and contribute to sustainable economic progress.

7.4.1.1 Recommendations for Enhancing Economic Sustainability

Manufacturing companies in Botswana should ensure that economic sustainability is improved so that they can boost the economy of the country and increase the rate of employment and the livelihoods of people. The study revealed that manufacturing companies can improve economic sustainability through adopting sustainable practices including supplier collaboration, technology investment, supplier support and effective inventory management. According to the TBL theory, economic sustainability should be achieved without compromising social and environmental sustainability. The following measures are recommended to manufacturing companies in Botswana:

i. They should strengthen supplier collaboration (the most important sub-objective of economic sustainability) for joint cost efficiency through shared supply chain activities such as joint problem solving, reduction of inventory levels, reduction of supply chain disruptions and setting key performance indicators (KPIs). This lowers production costs and increases profit margins.
ii. Another action they should take to enhance economic sustainability is to invest in supply chain technologies such as enterprise and resource planning (ERP), barcoding, radio frequency identification (RFID), warehouse management systems and global position systems (GPS). These technologies can lower transaction costs, facilitate better decision-making and increase operational efficiencies throughout the supply chain.
iii. Manufacturing companies should adopt supplier support measures to strengthen operational capabilities. The measures to take include financial support such as advance payment of suppliers, technical support such as supplier staff training and joint planning. These measures can help

suppliers to increase productivity, improve quality and decrease waste, thus contributing to minimise input costs and boost the supply chain's economic performance.

iv. The implementation of inventory management techniques is another important critical success factor for the enhancement of economic sustainability by manufacturing companies. Inventory management techniques that can be implemented include demand forecasting, JIT inventory, inventory classification using techniques such as ABC analysis and Kraljic matrix, VMI and consignment inventory.

Through supplier collaboration, technology development, supplier support and efficient inventory control, manufacturing companies can attain improved cost effectiveness, increased productivity and long-term financial stability.

7.4.1.2 Recommendations for Enhancing Social Sustainability

Since social sustainability (Rank 6) is often overlooked, recommendations are made to demonstrate viability and economic return, thus supporting the viability of the TBL pillars. Manufacturing companies should:

i. Promote safe and equitable working conditions throughout the supply chain, ensuring suppliers adhere to labour laws, health and safety standards, foster gender equity, labour rights and reasonable wages. Monitoring these practices mitigates supply chain risks.
ii. Encourage their suppliers to adopt ethical sourcing practices that can enhance social sustainability. The effective ethical sourcing practices may include fair pricing, information sharing, transparency, confidentiality and fairness, data protection, avoidance of child labour and society and regulatory responsibilities.
iii. Enhance community engagement through philanthropic activities and by promoting business partnerships and environmental sustainability support, recognising that improved social performance boosts the company's reputation and leads to economic benefits.

By improving working conditions, ensuring ethical sourcing and engaging local communities, manufacturing companies can enhance social sustainability.

7.4.1.3 Recommendations for Enhancing Environmental Sustainability

Environmental sustainability promotes the reduction of ecological footprint emanating from supply chain activities. As environmental sustainability's importance is growing in the manufacturing industry of Botswana, companies should work in collaboration with their suppliers to achieve this objective. Guided by the TBL theory, Botswana's manufacturing companies should ensure that in collaboration with their suppliers, they meet the environmental sustainability SSRPO through adopting GSCM practices, waste management practices and sustainable packaging. There are various practices that manufacturing companies can adopt to enhance environmental sustainability including the following:

i. Manufacturing companies should integrate environmental considerations into procurement, production and logistics decisions. Therefore, they should collaborate with their suppliers to meet GSCM standards. This can include adopting GSCM practices such as green procurement, green production, green logistics and green materials management.
ii. Implement effective waste management strategies by focusing on the 4Rs (reducing, reusing, recycling, recovering), collaborating with suppliers to convert waste into resource materials and ensuring compliance with local regulations, such as the Environmental Assessment Regulations (2012) (Botswana Government, 2012) to avoid penalties.
iii. Adopt sustainable packaging practices and encourage suppliers to design packaging that incorporates biodegradable, recyclable or reusable materials. Minimising excessive packaging and optimising package sizes can also reduce transportation emissions and material waste.
iv. Implement green procurement practices by encouraging suppliers to adhere to environmental standards.
v. Manufacturing companies should collaborate with their suppliers in product designing so that environmental standards can be achieved through factors in product design such as the reduction of energy consumption in production and product usage, reduction of emissions in production processes, reduction of material usage on products, as well as packaging and considering the efficient use of water as a natural resource.

vi. Undertaking suppliers' due diligence to ensure that suppliers have environmental sustainability policies that show how they achieve environmental requirements on the critical environmental factors including emissions, water usage and waste management.
vii. Manufacturing companies should assess their suppliers to determine their compliance with the relevant environmental standards and regulations including the Environmental Assessments Regulations, 2012 (Botswana Government, 2012).

By implementing green supply chain management, effective waste management and sustainable packaging, manufacturing companies can significantly reduce their environmental impact.

7.4.1.4 Recommendations for Improvement of Quality Performance

The current study revealed that the quality performance of manufacturing companies can be improved through collaboration with suppliers in enhancing product performance, product features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. Using principles from TQM, manufacturing companies in collaboration with their suppliers can enhance quality and be able to meet customer expectations. To meet these features, manufacturing companies in Botswana can take the following recommended actions:

i. Manufacturing companies should prioritise product performance through designing and developing products jointly with their suppliers. They ought to involve suppliers during product design and development stages to take advantage of their technical expertise and innovative potential. Early supplier involvement helps to ensure that materials, components and processes fulfil performance expectations and functional needs.
ii. Where the product features are important to a company, manufacturing companies should ensure that they are improved, which can be done through innovation and technology sharing. They can work with their suppliers on product innovation to integrate new technologies, materials or

design improvements that increase functionality, safety and customer satisfaction.

iii. Similarly, reliability is an important characteristic that manufacturing companies aim to achieve. Therefore, manufacturing companies should ensure that a product is able to function satisfactorily during its useful life. Thus, when purchasing non-current assets, manufacturing companies should ensure that their reliability is confirmed. To achieve this, before purchasing a product, suppliers should be evaluated for technical capability, financial capability, production capability and commercial capability such as company history.

iv. Suffice to say, conformance to specifications is the most important characteristic of quality. Manufacturing companies in Botswana should ensure that suppliers are assessed to determine whether they have the capability to meet the standards specified by the organisation. This can be confirmed by checking for quality certification such as ISO certification.

v. Manufacturing companies should improve durability through material selection and testing. They can work with suppliers to choose durable high-quality materials and undertake joint product testing in various conditions to guarantee long service life. This minimises product failures and increases customer confidence.

vi. Manufacturing companies should improve serviceability and after sales collaboration. They must collaborate with suppliers to effect after sales support, spare parts availability and repair services. They must also include key performance indicators in contracts such as rework levels, defect rates and customer complaints.

vii. Manufacturing companies should promote aesthetics through design excellence and consistency. They must engage suppliers who have strong design and finishing competencies to enhance the visual appeal, texture and ergonomics of products. Aesthetic improvements raise market competitiveness and perceived product value.

viii. They should also strengthen perceived quality through brand reputation and supplier alignment. Manufacturing companies should match suppliers with their brand quality messaging to customers.

7.4.1.5 Recommendations for Supply Chain Cost Management

Reducing supply chain costs requires manufacturing companies to collaborate with their suppliers and implement cost reduction measures. Drawing on the principle of TCO, manufacturing companies can work with their suppliers to achieve cost savings without compromising quality and sustainability. Various costs that make up the supply chain costs were identified by this study, and these are distribution, production, procurement, reverse logistics and inventory costs. These costs need to be monitored to reduce the overall supply chain costs. Botswana's manufacturing companies should take measures that reduce these elements of supply chain costs. In Botswana where companies face high supply chain costs, collaborating with suppliers on the reduction of costs of distribution, production, procurement, reverse logistics and inventory can help to manage supply chain costs. Thus, the following recommendations are made:

i. Distribution costs, being one of the elements that increase supply chain costs of manufacturing companies in Botswana should be managed in collaboration with their suppliers. Steps that manufacturing companies should take include joint transport planning and scheduling, using technology for planning and scheduling, outsourcing transportation, jointly planning the packaging and handling of goods, inventory and distribution planning.
ii. In the modern competitive manufacturing environment, the production costs of suppliers have a direct influence on the manufacturing company's overall performance. It is to this effect that suppliers' production costs should be monitored closely to reduce the overall supply chain costs. They should jointly reduce production costs of suppliers so that the items that were bought can be of lower prices which can help to reduce a manufacturing company's production costs and ultimately supply chain costs. There are various steps that manufacturing companies can take to help their suppliers to reduce production costs including training suppliers on the methods of cost efficient production, open book costing, collaborating in product design, benchmarking and sharing results with suppliers, technology

sharing and encouraging them to buy their raw materials in bulk so that they can reduce input costs.

iii. Manufacturing companies should also monitor the procurement costs as they have a high impact on the total supply chain costs. There are various techniques that can be adopted to reduce procurement costs including negotiating with suppliers on favourable contract terms, undertaking supplier appraisal to gain assurance in the suppliers' capabilities, joint process and product improvement using systems such as value engineering and value analysis, standardisation of bought-out components, adapting inventory control systems such as JIT inventory system, VMI, consignment inventory, continuous improvement, optimisation of logistics and transportation and collaborative forecasting and planning.

iv. Costs of reverse logistics should be monitored as they may increase the supply chain costs. Manufacturing companies should reduce reverse logistics costs by adopting practices such as improving packaging design to make them easy to transport, reinforcing quality control to reduce returns such as undertaking supplier quality audits, outsourcing reverse logistics, implementing tracking and tracing technologies such as barcoding and RFID and encouraging reuse and recycling.

v. For the reduction of inventory costs, manufacturing companies in Botswana should collaborate with their suppliers to reduce the costs incurred in the process of managing inventory. They should implement various inventory management techniques including JIT inventory system to minimise inventory holding costs, VMI to reduce administrative costs and stockout while improving service level, consignment inventory arrangement to reduce working capital tied up in inventory, use information and technology integration such as enterprise resource planning (ERP) and electronic data interchange (EDI) to help with timely and accurate replenishments, standardisation of bought-out components and materials to enable businesses consolidate their purchases and continuous communication to prevent over and understocking caused by poor communication, demand forecasting and replenishment.

7.4.1.6 Recommendations for Enhancing Delivery Performance

Delivery performance reflects a supplier's ability to deliver materials and components in the right quality, quantity and time. The findings from the current study indicate that manufacturing companies in Botswana can enhance delivery performance by suppliers by focusing on factors such as on-time delivery, reliable delivery, order fulfilment, time flexibility and lead time. As the RBV theory values company resources, of which suppliers are regarded as a major resource because they provide materials, manufacturing companies in Botswana should ensure that delivery performance is improved through collaboration with their suppliers. The following measures are recommended to manufacturing companies in Botswana to improve delivery performance:

i. Promote on-time delivery through the use of collaborative planning, forecasting and replenishment (CPFR) to assist with real-time demand forecasts thus guarantee timely delivery and prevent stockouts or surplus inventory.
ii. Strengthen delivery reliability through supplier performance agreements. Manufacturing companies should establish supplier performance agreements and define clearly the service level agreements (SLAs) that specify delivery times, quantities and penalties for non-compliance. This fosters accountability and encourages suppliers to consistently meet delivery commitments.
iii. Manufacturing companies should improve order fulfilment accuracy by working closely with their suppliers to guarantee that every order is fulfilled completely, precisely and in compliance with specifications. They can adopt electronic order tracking technologies such as EDI, barcoding and RFID to monitor order status and avoid inconsistencies or incomplete deliveries.
iv. They should also promote time flexibility and responsiveness by working with suppliers to create flexible manufacturing and logistics systems that can accommodate unexpected changes in demand or last-minute orders. Giving real-time updates on order changes enables suppliers to adjust delivery schedules effectively.

v. Manufacturing companies can reduce lead-time through process improvement and technology integration. This can be achieved by supporting suppliers to adopt systems such as lean manufacturing, VMI and consignment inventory system that allow suppliers to monitor stock levels at the manufacturing company's facility and replenish materials as needed, minimising lead times and improving delivery reliability.

By implementing these recommendations, manufacturing companies may achieve higher levels of delivery reliability, decrease production downtime and enhance customer satisfaction.

7.4.1.7 Recommendations for Enhancing Supply Chain Innovation

The research findings revealed that supply chain innovation among manufacturing companies can be enhanced through collaborative efforts in research and design, improvement of product processes, adoption of advanced technology and development of new products. Guided by the CE theory, manufacturing companies can collaborate with their suppliers to make innovations to their products and processes so that they can achieve economic benefits. The following actions are recommended to manufacturing companies in Botswana:

i. Manufacturing companies should strengthen collaboration in research and design. They should actively engage suppliers in research and design initiatives to take advantage of their technical expertise and creativity. Joint research and design initiatives can lead to the creation of innovative materials, improved product features and sustainable production methods.
ii. Enhancement of production processes by continuous improvement and process innovation. Manufacturing companies should work in partnership with suppliers to identify and eliminate inefficiencies in production. The adoption of lean manufacturing, six sigma and TQM principles can improve productivity, quality and flexibility.
iii. Manufacturing companies should also promote technology sharing by facilitating workshops where the two parties can share ideas on production methods and sustainability solutions. They can also promote technology by facilitating the training of the supplier's staff.

iv. They should integrate suppliers early in new product development. It is important to involve suppliers during the conceptual and design stages of new products to leverage their insights on materials, manufacturing and sustainability.
v. Recognise and reward innovative suppliers by establishing innovation awards or preferred supplier for those who contribute creative solutions that improve quality, cost or environmental performance.

By enhancing collaboration in research and design, improving production processes, investing in advanced technologies and fostering new product design, manufacturing companies can drive continuous innovation across their supply chains.

7.4.1.8 Recommendations for Enhancing Value Creation

Value creation in supply chains occurs when suppliers and manufacturing companies jointly produce benefits that are greater than what each could accomplish individually. Guided by the RBV theory, effective collaborations enable shared value creation, productivity and sustainability. Thus, the following recommendations are made to manufacturing companies in Botswana:

i. Manufacturing companies should improve their brand image through collaborative marketing and quality consistency. They should work collaboratively with their suppliers to guarantee that all products and raw materials fulfil consistent quality standards. They should also create joint branding initiatives including co-branding, sustainable and ethical sourcing, and supplier appreciation programmes.
ii. Manufacturing companies should work closely with their suppliers to achieve cost savings. Cost saving can be realised through long-term relationships with suppliers focusing on optimising production and logistics processes. Cost saving measures that can be taken include value analysis, shared technology platforms, bulk purchasing, information sharing and lean supply chain techniques.
iii. Manufacturing companies should improve customer care through responsive supply chain practices so that the end-user needs are prioritised

at every stage. Manufacturing companies should work together with their suppliers to maintain order processing flexibility, quick response to market changes and consistent after-sales support.

iv. They should promote product diversity by encouraging their suppliers to take part in joint research and development programmes, create knowledge sharing platforms and workshops, diversifying the supplier base to include small, micro and medium-sized enterprises (SMMEs).

By incorporating these strategies, manufacturing companies can create stronger customer-focused supply chains that not only improve value creation but also support long-term sustainability and market competitiveness.

7.4.1.9 Recommendations for Supply Chain Risk Management

Effective SCRM involves determining effective strategies of managing risks. The current study determined that manufacturing companies can effectively manage SCR through collaborative supplier management strategies including supplier selection, supplier segmentation, supplier development, information sharing and supplier monitoring and evaluation. Based on the stakeholder theory, manufacturing companies should take suppliers as key stakeholders for the management of SCR. The following are recommended to manufacturing companies:

i. Manufacturing companies should adopt rigorous supplier selection processes. This can be achieved by undertaking supplier appraisal determining their financial stand, quality performance, dependability, adherence to sustainable requirements and capability to manage risks. Selecting reliable and capable suppliers lowers the chances of supply disruptions and improve overall supply chain resilience.

ii. They should implement supplier segmentation techniques such as grouping suppliers according to their strategic significance and risk exposure. This enables managers to properly allocate resources and attention, concentrating more on high risk and high impact suppliers.

iii. Manufacturing companies should invest in supplier development programmes by giving the key suppliers support through training, technical

assistance and access to new technologies to improve their capability and risk management procedures. Joint improvement programmes strengthen supplier's capabilities to deliver reliably even under difficult conditions.

iv. They should improve information sharing and communication by setting up digital platforms and organised channels for real-time sharing of information on demand projections, inventory levels, logistics problems and potential disruptions. Clear communication helps both parties react swiftly to emerging risks and maintaining continuity.

v. Manufacturing companies should conduct regular supplier monitoring and performance evaluation by implementing systematic performance reviews using KPIs such as delivery dependability, quality consistency, safety standards compliance and emergency responses. Continuous monitoring ensures the early identification of possible risks and support prompt remedial actions.

vi. They should also make joint contingency and continuity plans by working together with suppliers to formulate emergency response plans, backup logistic routes and inventory buffers for essential supplies.

If these strategies are incorporated in the supply chains, manufacturing companies will be able to strengthen supplier reliability, thus lower the chances of supply chain disruptions.

7.4.2 Recommendations on the Best First-order SSRPO for Decision-Making Among Botswana Manufacturing Companies

It is strongly recommended that value creation be consistently maintained as the highest priority within the SSRPO decision framework. As the most impactful first-order objective, value creation should serve as the central focus of SSRM strategies; guiding how manufacturing companies in Botswana allocate their resources and shape their supplier engagement practices. This prioritisation reflects a commitment to building supplier relationships that go beyond transactional efficiency, aiming instead to generate long-term value through innovation, collaboration and strategic alignment.

To effectively achieve value creation, companies must concentrate on several key performance drivers; namely, enhancing brand image, attaining cost savings, delivering superior customer care and expanding product diversity. These elements collectively strengthen a company's competitive edge, enabling it to differentiate itself in the market and respond more effectively to evolving customer demands. By embedding these priorities into supplier strategies, manufacturers can ensure that their supply chains contribute not only to operational success, but also to sustainable growth and national economic development. In doing so, value creation becomes both a strategic goal and a catalyst for transformation across the entire manufacturing sector.

7.4.3 Recommendations on the Worst First-order SSRPO for Decision-Making Among Botswana Manufacturing Companies

Given the critical nature of potential risks and the notably low internal ranking of SCRM, it is imperative that manufacturing companies in Botswana reframe their perception of SCRM not only as a peripheral concern, but as a core strategic requirement for long-term business sustainability. The current underemphasis on risk management leaves companies vulnerable to a range of disruptions, from supplier failures and logistical bottlenecks to geopolitical shocks and market volatility. In an era where supply chain resilience is increasingly synonymous with competitive advantage, overlooking SCRM can jeopardise not only operational continuity, but also the achievement of broader strategic goals (Sarker, Rahman, Ali, Hossain and Gonzalez 2025; Bastas and Garza-Reyes, 2022).

To mitigate these risks, companies must actively reinforce their risk management initiatives through rigorous monitoring, supplier performance tracking and joint contingency planning. Establishing collaborative protocols with suppliers to anticipate and respond to potential disruptions can significantly enhance preparedness and agility. These proactive measures serve as a protective buffer, ensuring that high-ranking objectives such as value creation remain viable even in the face of uncertainty. By embedding SCRM into the strategic fabric of supplier relationship management, manufacturing companies can safeguard their operations, protect stakeholder interests and contribute to a more resilient and forward-looking industrial ecosystem.

7.4.4 Recommendations on the Best Second-order SSRPO for Decision-Making Among Botswana Manufacturing Companies

Cost saving must be prioritised as the most critical sub-objective within the SSRPO framework. Its universal relevance across all nine SSRPO categories highlights the need for manufacturing companies in Botswana to embed cost-reduction mechanisms, such as lean manufacturing techniques, Vendor Managed Inventory (VMI) and process standardisation into every facet of their supplier relationship strategies. These practices not only streamline operations and eliminate waste, but also foster more efficient collaboration with suppliers, enabling companies to achieve consistent financial gains without compromising quality or service levels.

This elevated focus on cost saving directly reinforces the overarching strategy of value creation, the highest-ranked first-order SSRPO. By systematically reducing costs across supply chain activities, companies can unlock resources for innovation, capacity expansion and strategic investments. Moreover, prioritising cost saving ensures that financial performance remains strong and sustainable, even in volatile market conditions. When integrated effectively, this sub-objective becomes a powerful driver of competitive advantage, allowing manufacturers to deliver greater value to customers, stakeholders and the national economy.

7.4.5 Recommendations on the Worst Second-order SSRPO for Decision-Making Among Botswana's Manufacturing Companies

It is strongly recommended that manufacturing companies in Botswana immediately adopt strategic supplier segmentation practices as a core component of their supply chain management approach. Supplier segmentation allows companies to classify their suppliers based on factors such as strategic importance, risk exposure and potential impact on business continuity. Tools like the Kraljic Matrix provide a structured methodology for this process, helping companies distinguish between routine suppliers and those that are critical to long-term success. By implementing segmentation, companies can move away from a one-size-fits-all approach and instead tailor their engagement strategies to match the unique characteristics and contributions of each supplier.

This targeted approach ensures that limited resources are optimally allocated towards developing and managing high-contribution suppliers, those that offer the greatest value and pose the highest risk if disrupted. In doing so, manufacturing companies not only enhance their SCRM capabilities, but also strengthen their ability to deliver on top-tier objectives such as value creation. Strategic segmentation enables proactive planning, focused collaboration and more resilient supplier relationships. Ultimately, embedding supplier segmentation into the SSRPO framework equips companies with the insights and agility needed to thrive in a competitive and uncertain global environment.

7.4.6 Recommendations on the Overall Optimal SSRPO Decision Point for Manufacturing Companies in Botswana

The study confirms that the overall optimal decision point within the SSRPO framework is the prioritisation of value creation. This top-ranked objective serves as the strategic anchor for manufacturing companies in Botswana, guiding them towards supplier relationships that generate tangible business benefits and long-term competitive advantage. Value creation encompasses more than just operational efficiency; it reflects a commitment to innovation, collaboration and economic contribution. By focusing on this objective, companies can align their supply chain strategies with broader organisational goals and national development priorities, ensuring that supplier partnerships are leveraged to their fullest potential.

To operationalise this strategic focus, it is essential that manufacturing companies adopt the proposed SSRPO decision framework (Figure 6.15) as a primary decision-making tool. This framework provides a structured, empirically validated hierarchy of nine SSRPOs and their associated CSF, enabling companies to systematically prioritise their efforts. Within this structure, cost saving emerges as the fundamental enabler of value creation, making it imperative that cost-reduction mechanisms, such as lean practices, process optimisation and supplier collaboration are embedded across all supply chain activities. By doing so, companies can maximise financial performance, enhance supplier efficiency and reinforce the strategic pursuit of value; ensuring that resources are directed towards initiatives with the highest impact.

7.5 CONTRIBUTIONS OF THE STUDY

This section provides a discussion of the contribution made by this study to the body of knowledge in the field of supplier relationship management. Secondly, the contribution made to the methodology is also discussed. Furthermore, the section discusses the practical contribution made by the study.

7.5.1 Theoretical Contribution of the Study

The SSRPO decision framework offers a theoretical model for the prioritisation of the objectives in SSRM as it identifies value creation as the optimal decision point and underscores cost saving as a vital sub-objective, contributing a structured approach to comprehending performance trade-off in supplier relationships. The framework improves theoretical discourse by offering a hierarchy of SSRPO, filling up a research gap in supplier relationship management literature. The study strengthens the theoretical knowledge of how SSRM contributes to the economic performance of manufacturing companies. Furthermore, the study extended the application of TBL, TQM, RBV, TCO, CE and ST to the context of manufacturing companies in Botswana.

7.5.2 Methodological Contribution of the Study

The application of the BWM to prioritise SSRPO offers a methodological contribution by proving the appropriateness of this method in complex decision-making contexts with competing priorities. The methodological design tailored for manufacturing companies in Botswana demonstrates how global sustainability and quality management concepts can be adapted to the local context. Lastly, by combining the literature review, expert judgement and quantitative ranking methods, the study improved the reliability and robustness of supplier performance evaluation.

7.5.3 Practical Contribution of the Study

The outcomes of this study provide practical guidance on how manufacturing companies can improve collaboration with suppliers to enhance organisational performance. Secondly, the findings of this study provide guidance to

manufacturing companies on the objectives they should give more efforts to that can yield the greatest results. Additionally, by using the framework as a guide, businesses can allocate resources more efficiently, enhance collaboration with suppliers and ensure that their supply chain strategies are aligned with both corporate objectives and national priorities. By implementing the SSRPO decision framework, Botswana's manufacturing industry is positioned to compete more effectively, adjust to change and contribute to sustainable economic development. Furthermore, manufacturing companies can use the SSRPO decision framework for performance evaluation to ensure that there is alignment between the SSRPO and the organisation's goals.

7.6 LIMITATIONS OF THE STUDY

While this study makes significant contributions to theory, methodology, and practice, a number of limitations need to be noted.

7.6.1 Limitations of the Best-Worst Method

The BWM, just like other MCDM methods, relies on human judgement which may be subjective because it depends on the pairwise comparisons. The judgement made by the respondents, 48 supply chain professionals from manufacturing companies, may be influenced by their personal experiences, company culture, and individual biases.

7.6.2 Geographic limitations

The study was undertaken in Botswana, taking samples from manufacturing companies in Gaborone and its surrounding villages. Thus, the development of the SSRPO framework took into consideration the Botswana manufacturing sector. Manufacturing sectors in different countries function under various regulatory frameworks, economic conditions, cultural contexts, and supply chain maturity levels. For instance, a manufacturing company in a developed country might prioritise supply chain innovation or environmental sustainability differently than the Botswana manufacturing companies.

7.6.3 Industry limitations

The scope of this research was limited to the SSRM among manufacturing companies. The data was collected from manufacturing companies. Other companies not falling within the manufacturing sector, such as construction and retail, were not included in the study. There may be different prioritisation of SSRPO in other sectors of the economy. For example, delivery performance might be given priority in the retail sector where companies are in direct contact with consumers than manufacturing companies.

7.6.4 Lack of longitudinal validation

A cross-sectional time horizon was employed in the current study, in which collection of data was done at a single point in time. The priorities of SSRM may change over time due to various factors including shifting market conditions, regulatory changes, and technological advancements. For example, in a period of economic downturn, supply chain cost reduction may be prioritised, while during the acute phase of Covid-19, SCRM might have been given priority than the time of the current study.

7.6.5 Limited sustainable supplier performance objectives

The current study included nine SSRPO; economic sustainability, social sustainability, environment sustainability, quality improvement, delivery performance, supply chain cost management, supply chain innovation, value creation, and SCRM, which then were included in the SSRPO framework. Other objectives of SSRM were not considered

7.6.6 Single method focus

The current study made use of the BWM to prioritise the SSRPO. The use of a single MCDM method means that triangulation with other methods such as AHP, ANP, DEMATEL, was not performed.

7.7 RECOMMENDATIONS FOR FUTURE RESEARCH

This study has provided valuable understandings of the SSRPO decision framework for Botswana's manufacturing companies and how SRM influences organisational performance. However, given the dynamic nature of SRM and sustainability in the manufacturing industry, it is necessary to conduct more research to enrich the current research. The researcher recommends the following future research in the field. Firstly, future research may extend the application of the SSRPO framework to other economic sectors like agriculture, construction, retail and service. This could assist to ascertain whether the prioritisation of objectives such as value creation and cost savings as its sub-objective is consistent across different industries outside of manufacturing.

Secondly, since this research concentrated on manufacturing companies in Botswana, future research on SSRPO may be conducted in other countries. This can help to determine whether there are similarities in the prioritisation of the objectives of SSRM. Additionally, other objectives of SSRM such as digital transformation may be included in the SSRPO decision framework. Moreover, the current research was conducted using the BWM; other methods of the MCDM such as the AHP, DEMATEL and ANP may be employed in future research to test the strength of the SSRPO framework and compare the results.

Furthermore, qualitative case studies could be undertaken to gain an in-depth understanding of the practical challenges and success factors in implementing SSRPO within specific manufacturing contexts. This can help to develop detailed industry specific guidelines and performance measurement tools to assist companies in effectively managing their suppliers. Finally, various studies may be undertaken to develop other frameworks on the SSRPO in the manufacturing sector. Overall, future research should aim to refine and expand the SSRPO decision framework to enhance its theoretical, methodological and practical relevance across diverse sectors and geographical contexts.

7.8 CHAPTER SUMMARY

This chapter presented conclusions and recommendations of the study. The conclusions were provided on the six objectives of the study. The findings on the

first-order and second-order SSRPO for decision-making among manufacturing companies in Botswana were concluded. This was followed by presenting a conclusion on the best first-order SSRPO for decision-making among Botswana manufacturing companies as value creation, then the worst first-order SSRPO for decision-making among Botswana manufacturing companies as SCRM. The chapter continued with making conclusions on the best second-order SSRPO for decision-making among Botswana's manufacturing companies as cost saving which is a sub-objective of value creation. The worst second-order SSRPO for decision-making among Botswana's manufacturing companies was concluded as supplier segmentation. The SSRPO decision framework was also formulated that shows the overall optimal SSRPO decision point for manufacturing companies in Botswana. Although manufacturing companies have effectively prioritised value creation as a top strategic objective and therefore prioritised for resource allocation, more attention should now be placed on improving SCRM as supply chain is vulnerable to risks.

Furthermore, the chapter presented recommendations based on the research findings on how manufacturing companies in Botswana can partner with their suppliers to enhance sustainability, improve quality, enhance delivery performance, improve innovation, enhance value creation and reduce SCR throughout the supply chain. The recommendations were based on the TBL, RCT, TQM, TCO, RBV, CE and ST theories, which together highlighted the value of collaboration, continuous improvement and strategic resource deployment in achieving sustainable supply chain performance. The recommendations section started with economic sustainability, which highlighted that long-term economic sustainability can be achieved through supplier collaboration, technology investment, supplier support and effective inventory management. The recommendations on social sustainability were made, including improving working conditions, promoting ethical sourcing and engagement in community programmes, while that of environmental sustainability emphasised the importance of GSCM, waste management and sustainable packaging. Manufacturing companies are encouraged to integrate environmental factors into procurement, production and logistics processes to reduce carbon emissions and conserve natural resources.

The recommendations on quality improvement were also made to manufacturing companies as enhancement of quality by collaborating with suppliers in product performance, reliability, conformance, durability, serviceability, aesthetics and perceived quality. As for supply chain cost management, it was recommended to focus on cost reduction through efficient procurement processes and waste minimisation. To enhance delivery performance, the recommendation was made to manufacturing companies to collaborate with their suppliers to ensure timely, reliability and flexibility in deliveries. The chapter also recommended working with suppliers on research and designing, improving production processes, adopting advanced technologies and developing new products as a means of achieving supply chain innovation.

The chapter further made recommendations on value creation that manufacturing companies should improve brand image, attain cost savings, provide superior customer care and promote product diversity. The recommendations on improving SCRM were also made. It was recommended that manufacturing companies should regard suppliers as key stakeholders for the management of supply chain risks and that supply chain risks can be managed through effective supplier selection, supplier segmentation, supplier development, information sharing and supplier monitoring and evaluation. Lastly, a recommendation was made on the overall optimal SSRPO decision point to prioritise value creation which serves as the strategic anchor for manufacturing companies in Botswana. Collectively, the proposed recommendations provide a roadmap for manufacturing companies, particularly in developing countries such as Botswana to move away from transactional supplier relationships that promote economic growth, social welfare, environmental stewardships and long-term supply chain excellence.

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APPENDIX A

SURVEY QUESTIONNAIRE



Survey Questionnaire

RESEARCH TITLE: A Framework for Sustainable Supplier Relationship Performance Objectives amongst Manufacturing Organisations in Botswana

DEMOGRAPHICS INFORMATION

Age:

Education:

Gender:

Position in Company:

Number of Years' Experience in Manufacturing Industry:

Annual revenue ($):

Size of Workforce in the Manufacturing Industry (Number of employees):

Dear Respondent,

We are working on a research paper titled "**A Decision Framework for Sustainable Supplier Relationship Performance Objectives among Manufacturing Companies in Botswana**". Our research has the following objectives:

i. To evaluate the first-order and second-order sustainable supplier relationship performance objectives (SSRPO) for decision-making among manufacturing firms in Botswana.
ii. To evaluate the best first-order SSRPO for decision-making among Botswana manufacturing firms.
iii. To evaluate the worst first-order SSRPO for decision-making among Botswana manufacturing firms.
iv. To investigate the best second-order SSRPO for decision-making among Botswana manufacturing firms

v. To determine the worst second-order SSRPO for decision-making among Botswana manufacturing firms
vi. To develop the overall optimal SSRPO decision point for manufacturing firms in Botswana.

We sincerely ask for your participation to help us determine the most sustainable supplier relationship performance objectives (SSRPO) and develop a framework to enable future decision making on supplier relationship performance objectives. The individual respondent results will remain confidential at all stages. Only final results will be made public.

Thank you for your time and expertise.

Sincerely,

Dora Sikana.

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Using the scale as mentioned in Table 2 below, please rate the supplier relationship performance objectives and the subsequent sub-objectives presented in table 1.

Table 1: List of Sustainable Supplier Relationship Performance Objectives

Main objectives	**Sub-objectives**
Economic Sustainability	Supplier collaboration (collaboration)
	Supply chain technology investment (technology)
	Supplier support (support)
	Inventory management (inventory)
Social Sustainability	Working conditions (conditions)
	Ethical sourcing (ethical)
	Community engagement (community)
Environmental Sustainability	Green supply chain management (GSCM)
	Waste management (waste)
	Sustainable packaging (packaging)
Quality Improvement	Product performance (perf)
	Product features (feat)
	Reliability (reli)
	Conformance (conf)
	Durability (dura)
	Serviceability (serv)
	Aesthetics (Aest)
	Perceived quality (perc)
Supply Chain Cost Management	Distribution costs (distribution)
	Production costs (production)
	Procurement costs (procurement)
	Reverse logistics costs (reverse)
	Inventory costs (inventory)
Delivery Performance	On-time delivery (On-time)
	Reliable delivery (reliable)
	Order fulfilment (fulfilment)
	Time flexibility (flexibility)

	Lead time (lead-time)
Supply Chain Innovation	Research and design (R&D)
	Production processes (processes)
	Technology (technology)
	New product development (NPD)
Value Creation	Brand image (brand)
	Cost saving (saving)
	Customer care (customer)
	Product diversity (diversity)
Supply Chain Risk Management	Supplier selection (selection)
	Supplier segmentation (segmentation)
	Supplier development (development)
	Information sharing (sharing)
	Supplier monitoring & performance evaluation (monitoring & evaluation)

Score for Ranking of the Main Objectives

Among the nine main performance objectives namely; **economic sustainability, social sustainability, environmental sustainability, quality improvement, supply chain cost reduction, improving delivery performance, enhancing supply chain innovation, value creation, and supply chain risk management**, identify which is the **best** (most important) and which is the **worst** (least important).

Best (Most important) Main Objective:

Worst (Least important) Main Objective:

Using 9-point scale where 1 is the most important objective and 9 the least important, rate the Best to Other and Other to Worst objective in the format mentioned below:

Main category objective comparison

Best to others (BO)

BO	**Economic**	**Social**	**Environmental**	**Quality**	**Cost**	**Delivery**	**Innovation**	**Value**	**Risk**
Best objective									

Others to Worst (OW)

Others to Worst	**Worst objective**:
Economic	

Social	
Environmental	
Quality	
Cost	
Delivery	
Innovation	
Value	
Risk	

Similarly, for each main objective, identify the best and worst sub-objective among sub-objectives of these main objectives and provide pairwise comparison using the linguistic scale shown in Table 1 above.

Economic Sustainability Sub-objectives Comparison

Best to others (BO)

Best to others	***Collaboration***	***Technology***	***Support***	***Inventory***
Best objective				

Others to Worst (OW)

Others to Worst	**Worst objective:**
Collaboration	
Technology	
Support	
Inventory	

Social Sustainability Sub-objectives Comparison

Best to others (BO)

BO	***Conditions***	***Ethical***	***Community***
Best Sub-objective			

Others to Worst (OW)

OW	**Worst objective:**
Conditions	
Ethical	
Community	

Environmental Sustainability Sub-objectives Comparison

Best to others (BO)

BO	**GSCM**	**Waste**	**Packaging**
Best sub-objectives			

Others to Worst (OW)

OW	Worst Objective
GSCM	
Waste	
Packaging	

Quality Sub-objectives Comparison

Best to others (BO)

BO	Perf	Feat	Reli	Conf	Dura	Serv	Aest	Perc
Best sub-objectives								

Others to Worst (OW)

Others to Worst	Worst objective:
Performance	
Features	
Reliability	
Conformance	
Durability	
Serviceability	
Aesthetics	
Perceived	

Supply Chain Costs Sub-objectives Comparison

Best to others (BO)

BO	Distribution	Production	Procurement	Reverse	Inventory
Best sub-objectives					

Others to Worst (OW)

Others to Worst	Worst objective:
Distribution	
Production	
Procurement	
Reverse	
Inventory	

Delivery Performance Sub-objectives Comparison

Best to others (BO)

BO	On-time	Reliable	Fulfilment	Flexibility	Lead-time
Best sub-objectives					

Others to Worst (OW)

Others to Worst	**Worst objective:**
On-time	
Reliable	
Fulfilment	
Flexibility	
Lead-time	

Innovation Sub-objectives Comparison

Best to others (BO)

BO	**R&D**	**Processes**	**Technology**	**New product**
Best sub-objectives:				

Others to Worst (OW)

OW	**Worst objective:**
R&D	
Processes	
Technology	
New product	

Value Creation Sub-objectives Comparison

Best to others (BO)

BO	**Brand image**	**Cost saving**	**Customer care**	**Product delivery**
Best sub-objectives:				

Others to Worst (OW)

OW	**Worst objective:**
Brand image	
Cost saving	
Customer care	
Product delivery	

Supply Chain Risks Sub-objectives Comparison

Best to others (BO)

BO	**Selection**	**Segmentation**	**Development**	**Information**	**Monitoring & evaluation**
Best sub-objectives:					

Others to Worst (OW)

OW	**Worst objective:**
Selection	
Segmentation	
Development	
Information sharing	
Monitoring & evaluation	

APPENDIX B

TURNITIN REPORT

Similarity Report

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Summary

APPENDIX C

EDITING CERTIFICATE



Centre for Scholarly Publishing Services (PTY) Ltd
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19 December 2025

DORA MALAMA MWAPE SIKANA
University of South Africa
Graduate School of Business Leadership
Cnr Janadel and Alexandra Ave
Midrand
1686

This serves to confirm that a PhD thesis by Dora Malama Mwape Sikana and submitted in accordance with the requirements for the degree of Doctor of Business Leadership in the subject Supply Chain Management at the University of South Africa titled *A decision framework for sustainable supplier relationship performance objectives amongst manufacturing organisations in Botswana* has undergone a thorough copy-editing as well as proof-reading processes.

Sincerely,

Solani Ngobeni
Publishing Director

Centre for Scholarly Publishing Services
Cell: 061 506 6115

www.csps.co.za

APPENDIX D

RESEARCH PERMISSION FROM BOTSWANA GOVERNMENT

Republic of Botswana

Research Permit

Reference: 695

Approval Date: 29-04-2025
Project title: A Framework for Sustainable Supplier Relationship Performance Objectives Amongst Manufacturing Organisations In Botswana

Dear Dora Sikana

Application For Research Permit: A Framework for Sustainable Supplier Relationship Performance Objectives Amongst Manufacturing Organisations In Botswana

Reference is made to your application on the above captioned matter. Your application for Research Permit for the proposed research titled:
A Framework for Sustainable Supplier Relationship Performance Objectives Amongst Manufacturing Organisations In Botswana
has been granted. The permit was approved on 29-04-2025 and shall expire on 28-04-2026 . You are kindly advised to peruse section 4.4 to 5.0 of the Guidelines for Application for Research Permit in Botswana.

Any changes in the proposed research should be communicated, without fail, to the Permanent Secretary(ies),
Ministry of Communications and Innovation
(Phone: +267 361 2000, Email: mtc@gov.bw, Address: West Gate Mall, Western by-Pass, Gaborone)

You are further advised to deposit the final report with the Department of Research and Knowledge Business or Department of National Archives and Records Services.

By copy of this letter, the Director of Research and Knowledge Business is advised to take note of this development and ensure that deliverables to government are timely met.

This research permit is verifiable online at *www.rims.gov.bw* by searching for the reference number.

Yours faithfully

Deputy Permanent Secretary

CC: Director of Research and Knowledge Business

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APPENDIX E

RESPONDENT INFORMED CONSENT LETTER

PARTICIPANT INFORMATION SHEET

24th April 2024

TITLE: A FRAMEWORK FOR SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES AMONGST MANUFACTURING ORGANISATIONS IN BOTSWANA

Dear Prospective participant

My name is Dora Malama Mwape Sikana and I am doing research with Dr Osayuwamen Omoruyi, a Senior Lecturer in the Area of management sciences, towards a Doctorate in Business Leadership at the University of South Africa. We are inviting you to participate in a study entitled 'A framework for sustainable supplier relationship performance objectives among manufacturing organisations in Botswana'.

The aim of the study is to determine the most sustainable supplier relationship performance objectives (SSRPO) and develop a framework to enable future decision-making on supplier relationship performance objectives by supply chain personnels in the manufacturing sector of Botswana.

I am conducting this research to find out the key sustainable performance objectives of the relationships with your suppliers.

Your company has been selected to participate in my study because your business is involved in manufacturing of goods, thus has a wide supply base and knowledge on supplier relationship management.

I got to know about your organisation through your marketing and promotions of your products, and I came to understand that you are involved in the manufacture of goods.

Your role in this study is to complete self-administered survey questionnaires, enquiring on the sustainable supplier relationship performance objectives (SSRPO) for manufacturing organisations in Botswana with the aim of determining the most sustainable objectives. The questionnaire is divided into two sections; section A, comprising the objectives and sub-objectives for you to give the weightings. You need to provide your responses by

writing (1) 'not relevant', (2) 'somewhat relevant', (3) 'quite relevant' OR (4) 'highly relevant' against each of the objectives, and it will take you approximately ten minutes to complete them. Section B, gives definitions for the objectives and sub-objectives in order to help you understand the objectives and sub-objectives.

Being in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason. However, once you submit the questionnaire withdraw will not be possible. It is important to note that there is penalty or loss of benefit for non-participation.

Your participation in this will be beneficial because the data you will provide will help to determine the key objectives that manufacturing organisations in collaboration with their supplier should prioritise to enhance economic, social and environmental sustainability of the overall supply chain, and subsequently sustainability of the nation. Moreover, it will help supply chain professionals to redesign their supply chain strategies to prioiritise the objectives hence improving the efficiency and effectiveness of their operations.

There are no foreseeable risks of harm or side-effects involved in your participation in this study. The only foreseeable risk is the time that you will dedicate to completing the questionnaire which may take about 10 to 15 minutes of your time.

Any information obtained in this study will remain confidential. Your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a fictitious code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings.

Your answers may be reviewed by people responsible for making sure that research is done properly, including a transcriber, external coder, and members of the Research Ethics Committee. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

Your anonymous data collected may also be used for other purposes such as research report, journal articles, conference presentation, etc. your privacy will be protected in any publication of the information. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report.

Hard copies of your answers will be stored by the researcher for a period of 5 years in a locked filing cabinet for future research or academic purposes; electronic information will be stored on a

password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. Indicate how information will be destroyed.

There will be no payment, gifts, rewards or any other incentives to the participants.

This study has received written approval from the Research Ethics Committee of the Graduate School of Business Leadership (SBL), Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

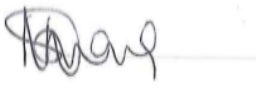
If you would like to be informed of the final research findings, please contact Dora Malama Mwape Sikana on 00267 71850834 or 18032729@mylife.unisa.ac.za. The findings will be accessible end of 2024.

Should you require any further information or want to contact the researcher about any aspect of this study, please Dora Malama Mwape Sikana on 00267 71850834 or 18032729@mylife.unisa.ac.za.

Should you have concerns about the way in which the research has been conducted, you may contact Dr Osayuwamen Omoruyi on 0027 81004 3459 or osayuwamen.omoruyi@spu.ac.za.

Thank you for taking time to read this information sheet and for participating in this study.

Thank you.



Dora Malama Mwape Sikana

APPENDIX F

ETHICS APPROVAL LETTER

Graduate School of Business Leadership_RERC

Ref #: 2025_SBL_DBL_003_FA_4574
Name: Mrs Dora Malama Mwape Sikana
Student #: 18032729

Date: 10/03/2025

Dear: Mrs Dora Malama Mwape Sikana

Decision: Ethics Approval from March 2025 to February 2028

Researcher: Mrs Dora Malama Mwape Sikana

Institute of Development Management

Gaborone

18032729@mylife.unisa.ac.za 00267 71850834

Supervisor: Dr Osayuwamen Omoruyi osayuwamen.omoruyi@spu.ac.za

A FRAMEWORK FOR SUSTAINABLE SUPPLIER RELATIONSHIP PERFORMANCE OBJECTIVES AMONGST MANUFACTURING ORGANISATIONS IN BOTSWANA

Qualification: DBL

Thank you for the application for research ethics clearance by the Graduate School of Business Leadership_RERC for the above-mentioned research study Ethics approval is granted for three years.

The **low risk application** was **reviewed** by Graduate School of Business Leadership_RERC on 04 March 2025 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Graduate School of Business Leadership_RERC .
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires

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Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za

additional ethics clearance.

7. No field work activities may continue after the expiry date (February 2028). Submission of a completed research ethics progress report will constitute an application for renewal, for Ethics Research Committee approval.

Additional Conditions

1. Disclosure of data to third parties is prohibited without explicit consent from Unisa.
2. De-identified data must be safely stored on password protected PCs.
3. Care should be taken by the researcher when publishing the results to protect the confidentiality and privacy of the university.
4. Adherence to the National Statement on Ethical Research and Publication practices, principle 7 referring to Social awareness, must be ensured: "Researchers and institutions must be sensitive to the potential impact of their research on society, marginal groups or individuals, and must consider these when weighing the benefits of the research against any harmful effects, with a view to minimising or avoiding the latter where possible." Unisa will not be liable for any failure to comply with this principle.

Note

The reference number 2025_SBL_DBL_003_FA_4574 should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.

Kind regards,

NBWMiltwa

Prof N Miltwa
Chair of Graduate School of Business Leadership_RERC
E-mail: wiltonb@unisa.ac.za

Prof P Msweli
Executive Dean / By delegation from the Executive Dean of Graduate School of Business Leadership_RERC
E-mail: mswelp@unisa.ac.za