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COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

SCHOOL OF BUSINESS

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SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICES AND
SUSTAINABILITY PERFORMANCE: THE ROLE OF SUPPLY CHAIN RESILIENCE
AND DYNAMIC CAPABILITIES

By

Victor Junior Kofi Quarshie

(BSc Chemistry)

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DECLARATION

I hereby declare that this submission is my own work toward the MSc. Logistics and Supply Chain Management degree, and that to the best of my knowledge, it contains no material previously published by another person, nor material that has been accepted for the award of any other degree of the University, except where due acknowledgement is made in the text.

VICTOR JUNIOR KOFI QUARSHIE
PG9276021
Signature Date

Certified by:
Dr. LISTOWEL OWUSU APPIAH
(Supervisor) Signature Date

Certified by:
PROF DAVID ASAMOAH
(Head, SCIS Department) Signature Date

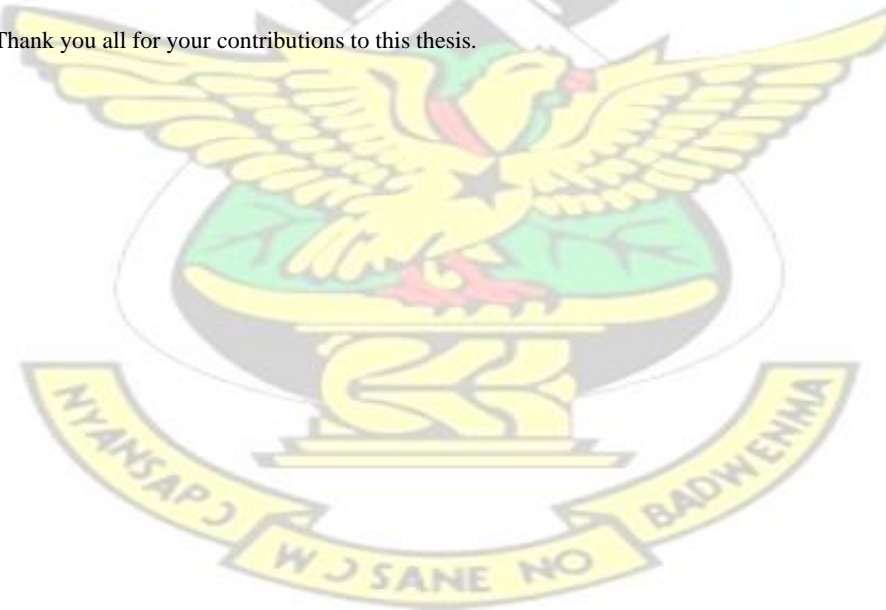
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Thank you all for your contributions to this thesis.



DEDICATION

This thesis is dedicated to my loving parents, Mr. Robert Kofi Quarshie and Mrs. Theresa Quarshie, who have always been my source of inspiration and motivation. Their unwavering support, guidance, and encouragement have been instrumental in my academic journey.



ABSTRACT

This study explores the role of supply chain resilience and dynamic capabilities in the relationship between sustainable supply chain management practices, sustainability, and firm performance. A survey research design is used to collect primary data from 200 manufacturing organizations operating in the Greater Accra region. The study uses a quantitative research approach to develop and test hypotheses. The results suggest that dynamic capabilities mediate the relationship between sustainable supply chain management practices and sustainability performance. The study also revealed no moderating effect of supply chain resilience. Therefore, businesses should prioritize the development of dynamic capabilities to enhance their ability to pursue sustainable practices and respond to challenges. Although no significant moderating effect of supply chain resilience is found, businesses should still prioritize assessing and monitoring their supply chain resilience to ensure sustainability performance. The study highlights the importance of sustainable supply chain management practices in creating a sustainable supply chain that leads to positive sustainability performance. Overall, the study's findings provide valuable recommendations for managers to prioritize sustainability practices and enhance their sustainability performance.

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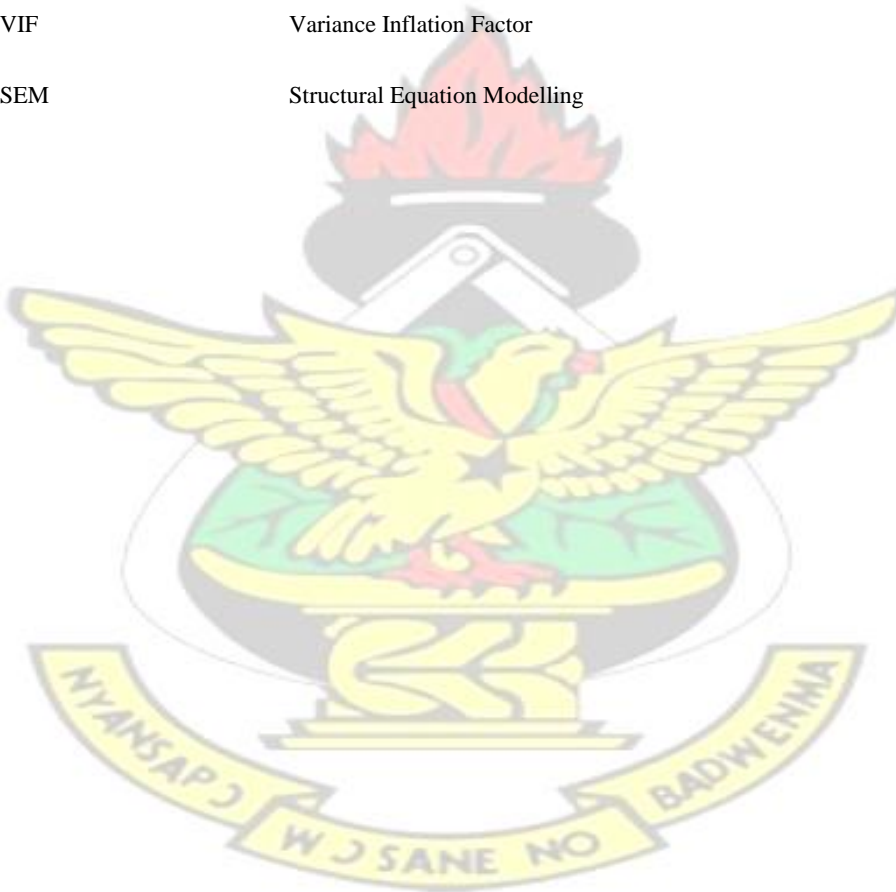
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LIST OF ABBREVIATIONS

SSCM	Sustainable Supply Chain Management
SCRES	Supply Chain Resilience
RBV	Resource-based View
SC	Supply Chain
VIF	Variance Inflation Factor
SEM	Structural Equation Modelling



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Sustainable Supply Chain Management (SSCM) is a strategic approach to manage and optimize supply chain operations while minimizing negative environmental and social impacts (Wang and Dai, 2018). The importance of SSCM has been recognized by businesses and policymakers worldwide, as the growing environmental and social challenges have increased the pressure on organizations to improve their sustainability performance (Ivanov, 2018). In order to implement SSCM standards, supply chain operations such as manufacturing, distribution, transportation, and procurement must all include sustainable principles. Sustainable supply chain management may provide businesses a competitive edge, boost their reputation, and support the sustainability of the global economy as a whole (Gunasekaran et al., 2015)

The capacity of a company to balance its effects on the economy, environment, and society is referred to as sustainability performance (Min, 2019). As they provide a framework for incorporating sustainability concepts into supply chain management, SSCM techniques are essential in advancing sustainability performance. Organizations may improve their economic performance, foster social responsibility, and lessen their environmental effect by embracing SSCM principles (Abeysekara et al., 2019). SSCM practices can help firms achieve sustainability goals by improving resource efficiency, reducing waste and emissions, enhancing stakeholder engagement, and promoting sustainable innovation (Sertyesilisik, 2017).

Supply chain resilience refers to an organization's ability to recover quickly from disruptions caused by environmental, social, or economic events (Lee and Rha, 2016). Supply chain resilience can moderate the relationship between SSCM practices and sustainability performance by enhancing the ability of firms to respond to sustainability challenges. Firms with resilient supply chains can quickly adapt to changing circumstances and recover from disruptions, reducing the negative impact on sustainability performance (Jain et al., 2017). Therefore, understanding the moderating role of supply chain resilience in the relationship between SSCM practices and sustainability performance can provide valuable insights into developing sustainable and resilient supply chains (Jain et al., 2017).

The capacity of an organization to adjust and react to changes in the business environment is referred to as dynamic capability (Juan et al., 2022). By enabling firms to react swiftly to sustainability opportunities and challenges, dynamic capabilities may mediate the link between SSCM practices and sustainability performance. By developing dynamic capabilities, firms can enhance their innovation and learning capabilities, promote sustainability-oriented decision-making, and improve their sustainability performance (Hohenstein *et al.*, 2015). Therefore, understanding the mediating role of dynamic capabilities in the relationship between SSCM practices and sustainability performance can provide valuable insights into developing effective sustainability strategies (Saber *et al.*, 2019).

The importance of sustainable supply chain management, supply chain resilience, and dynamic capabilities in achieving sustainability goals has been widely recognized (Genovese *et al.*, 2017; Jia *et al.*, 2018; Lim *et al.*, 2017; Paulraj *et al.*, 2017). However, the understanding of the relationship between these concepts remains limited. Understanding these relationships allows companies to improve their practices, perform better, and ultimately, create value in a

way that is economically, socially, and environmentally sustainable. By doing so, they not only safeguard their own future, but also contribute positively to society and the environment.

Therefore, this study aims to investigate the relationship between SSCM practices, supply chain resilience, dynamic capabilities, and sustainability performance. The findings of this study can provide valuable insights into how firms can enhance their sustainability performance through effective SSCM practices, supply chain resilience, and dynamic capabilities. The study can also contribute to the academic literature on sustainability and supply chain management, providing a theoretical basis for future research and practical implications for managers.

1.2. Statement of the Problem

A large body of empirical work exists on the relationship between sustainable supply chain practices and different performance outcomes. However, these studies have revealed inconsistent results. While some studies find that sustainable supply chain management practices positively affect performance (e.g., Narimissa et al., 2020a, 2020b; Sajjad et al., 2015) other studies report that it positively impacts performance indirectly (e.g., Koberg and Longoni, 2019; Saeed and Kersten, 2019). Still, other studies find that the relationship between these concepts is either negative (e.g., Busse et al., 2017; Matthews et al., 2016) and non-significant relationship (e.g., Mathivathanan et al., 2018; Touboulic and Walker, 2015)

In part, these conflicting findings can be attributed to researchers linking sustainable supply chain management to different performance dimensions such as sustainability performance, supply chain performance, supply chain efficiency, competitive advantage, firm performance, market performance, and financial performance (see, e.g., (Kot, 2018a; Matthews *et al.*, 2016; Narimissa *et al.*, 2020a, 2020b; Touboulic and Walker, 2015). To date, however, little attention

has been given to understanding how the relationship between sustainable supply chain management and sustainability performance is influenced by variables such as supply chain resilience and dynamic capabilities. This study seeks to address the gaps in the literature. In addition, supply chain scholars contend that sustainable supply chain management is essential but not sufficient for driving superior performance outcomes (Esfahbodi *et al.*, 2016; Khan *et al.*, 2021; Paulraj *et al.*, 2017a) and that the link requires relevant intervening forces (Genovese *et al.*, 2017a; Lim *et al.*, 2017a; Paulraj *et al.*, 2017a). This study, therefore, seeks to advance the literature by developing a research model that examines the relationship between sustainable supply chain management practices, supply chain resilience, dynamic capabilities and sustainability performance.

1.3 Research Objectives

The study's main objective is to examine the role of supply chain resilience and dynamic capabilities in the relationship between sustainable supply chain management practices, sustainability, and firm performance. Specifically, the study seeks to:

1. Examine the relationship between sustainable supply chain management practices and sustainability performance
2. Examine the moderating role of supply chain resilience in the relationship between sustainable supply chain management practices and sustainability performance
3. Examine the mediating role of dynamic capabilities in the relationship between sustainable supply chain management practices and sustainability performance

1.4 Research Questions

1. What impact do sustainable supply chain management practices have on the performance of sustainability?
2. How does the link between sustainable supply chain management techniques and sustainability performance depend on supply chain resilience?
3. What part does dynamic capability play in mediating the link between effective sustainability practices and sustainable supply chain management?

1.5 Significance of the Study

This topic has significant implications for academia and theory. It offers valuable insights into the complex interplay between sustainable supply chain management, sustainability performance, supply chain resilience, and dynamic capabilities. The outcomes of studies in this area can fill gaps in current knowledge, refine existing theories, and provide a robust empirical basis for new conceptual models. Such research can also guide practice by helping Ghana and other developing countries formulate effective policies and strategies to promote sustainable and resilient supply chains.

The implementation of sustainable supply chain management practices can significantly influence the manufacturing industry in Ghana. It can lead to cost savings through improved resource efficiency, enhanced risk management due to the adoption of sustainable procurement, and increased competitive advantage, particularly in global markets where sustainability is increasingly a key differentiator. Furthermore, building supply chain resilience and dynamic capabilities can help businesses cope better with disruptions, adapt to change, and innovate, leading to sustained industry growth.

Sustainable supply chain management practices and improved sustainability performance can positively impact the broader Ghanaian economy. They can contribute to economic growth by creating new green jobs, stimulating innovation, and attracting investment from international companies and investors committed to sustainability. Moreover, resilient supply chains can reduce the risk of economic disruptions caused by events such as climate change or global pandemics, while dynamic capabilities can fuel economic diversification and resilience.

1.6 Overview of Methodology

The study uses a survey research design where data is gathered from manufacturing organisations operating in the Greater Accra region. In terms of the research approach, this study is quantitative, including developing and testing hypotheses. The sample size for the study is two hundred (200) and is drawn from the target population using convenient sampling. The study relies on primary data. Primarily, the study uses a structured questionnaire to obtain data from the sample. All data are conducted using IBM SPSS, version 26 and SmartPLS, version 4. The study ensures that reliability and validity principles are met by testing the data using Alpha Cronbach and Exploratory factor analysis. Finally, to ensure all ethical principles are considered, the study does not request the names of all respondents during the data collection.

1.7 Scope of the Study

The scope of this study is categorised into three: Geographical, contextual and conceptual. The geographical area selected for the study is the Greater Accra region of Ghana. To enable the researcher to test the proposed theoretical framework empirically, data is obtained from manufacturing firms operating within the Greater Accra region of Ghana (Contextual scope). Conceptually, the study adopts fifteen items from Paulraj et al. (2017) to operationalise the predictor variable, sustainable supply chain management. Supply chain resilience, the moderator variable, is operationalised using eight items adopted from Ji et al. (2020). Dynamic capability, the mediating variable, is operationalised using fourteen items adopted from Li and Liu (2014). The outcome variable, Sustainability performance, is operationalised using fifteen items adopted from Wang and Dai (2018).

1.8 Limitations of the Study

Depending on various context-specific factors, such as the type of industry, the size of the company, and the regulatory and cultural environment, the impact of sustainable supply chain management practices on sustainability performance, as well as the role of supply chain resilience and dynamic capabilities in this relationship, may vary.

The cross-sectional methodology of the present research restricts our knowledge of how the associations between these factors change over time. The dynamics of change in sustainable supply chain practices and their effects on sustainability performance are not well captured.

1.9 Organisation of the Study

There are five chapters in the thesis. The introduction is found in Chapter 1. It establishes the study's background and identifies the research issue. Additionally, it emphasizes the importance and contribution of the research and gives the goals and questions of the study. The chapter outlines the research methodology's strengths and weaknesses. An overview of the research appears towards the end. Chapter Two comes after the opening chapter. It provides a review of the relevant existing literature. The components of chapter two include conceptual review, theoretical review, empirical review, and conceptual framework. The methodology for the research is covered in Chapter 3. It offers a thorough explanation of the study environment and choices made to meet the research goals. It examines the research's design, methodology, demographic, sampling strategy, creation of the study instrument, data collecting and processing, data analysis, and ethical concerns. Results and discussion are presented in Chapter 4. The study results are presented and discussed in relation to the body of previous literature. The summary, conclusion, and suggestion of the research are presented in the fifth and final chapter. Additionally, it offers ideas on how the study may be enhanced by additional research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Sustainability performance, supply chain resilience, supply chain dynamic capacity, and supply chain performance are all topics examined in this chapter. This chapter's focus is on a thorough examination of the concepts, hypotheses, evidence, and concepts themselves.

2.2 Conceptual Review

In light of earlier research, this section examines the concepts of sustainable supply chain management, supply chain dynamic capability, supply chain resilience, and sustainability performance.

2.2.1 Sustainable Supply Chain Management (SSCM)

Wang and Dai (2018) describe supply chain management (SCM) as the process through which a firm develops, executes, and regulates its supply, transformation, and delivery networks in order to preserve a competitive edge. Unlike conventional techniques, a sustainable supply chain addresses the environmental effect of each manufacturing step (Sweis and Alsayyed, 2019). A sustainable supply chain includes methods such as green design, resource conservation, hazardous material reduction, and product recycling in order to achieve this objective. (Ivanov, 2018)

Sustainable supply chain management is defined by Hosseini et al. (2019) as the actions performed to reduce the environmental effect of a product from its conception through its final disposal. Mubarik et al. (2022) describe SSCM as the management of operations, resources, information, and supply chain finances to boost supply chain productivity in order to maximize

social welfare and supply chain behavior with employees, consumers, and the general public. SSCM is sometimes defined as "the voluntary integration of key inter-organizational business systems with social, economic, and environmental considerations to create a coordinated supply chain" (Gunasekaran et al., 2015).

Sustainable supply chain management requires a manufacturer's strategic involvement with its suppliers in the management of inter- and intra-organizational processes, product and service flow, and information and capital decisions in order to achieve economic, social, and environmental sustainability (Min, 2019). According to Pettit et al. (2019), a sustainable supply chain aims to generate long-term value while limiting the rising risks connected with the global supply network. According to Scholten and Schilder (2015), sustainable supply chain management takes into account the social, economic, and environmental components of sustainability.

2.2.2 Dynamic Capability

The dynamic capabilities perspective emerged as a response to the limitations of the resource-based view and the action-based view in the context of the knowledge- and innovation-based economy (Schoemaker et al., 2018). Researchers have poured all their attention into the idea of dynamic capacities, yet there is still no agreed-upon definition of the term. Many different points of view and mindsets have been used to the analysis of this idea. Researchers have different areas of interest, with some studying the foundations of dynamic capacities while others examine their consequences. According to Teece (2018), a company with dynamic capacities may quickly adapt to new circumstances by combining and reorganizing existing resources and skills. According to Singh and del Giudice (2019), an organization's normal management and organizational process is its dynamic capabilities, which strive to acquire, disseminate, integrate, and reconfigure resources that are resilient to change.

Bitencourt et al. (2020) contend that dynamic capabilities seek to add meaning to their environment by bringing about innovation and forming an alliance with their customers and other important participants in their environment. This is in contrast to static capabilities, which merely adapt to an organization's Resources by looking at customer demands and also by monitoring market trends, which includes an increase in demand for a particular product or service.

The phrase "complex bundle of skills and acquired knowledge that allow enterprises (or strategic business units—SBUs) to coordinate actions and exploit their assets" is another description for "dynamic capabilities" (Li and Liu, 2014). According to Etemadi et al. (2021), a company's dynamic capabilities may be summed up as its capacity to adapt to a constantly changing external environment while maximizing its available resources.

A company's dynamic capabilities are its processes that use its resources to meet and even drive market change, as stated by Eisenhardt and Martin (2020). In their definition of dynamic capability as a collaborative effort resulting in learnt and stable patterns, Peterson et al. (2021) placed a focus on organizational learning as a source of active capacity. The company methodically creates and optimizes its procedures to boost productivity (Peterson et al. 2021). Denrell et al. (2016) argue that a company's capacity to adapt to a changing market gives a significant competitive advantage.

2.2.3 Supply Chain Resilience (SCRES)

When a firm's supply chain is resilient, it can survive and return to its original form, or even advance toward a more ideal state, after a disruption (Gunasekaran et al., 2015b). The "four Rs" of resilience, as defined by Pettit et al. (2019): robustness, resourcefulness, recovery, and review. Various methods have been proposed in the literature to enhance SCRES (Davis-Sramek and Richey, 2021; Mandal et al., 2016a; Tukamuhabwa et al., 2015). The literature acknowledges that the most effective organizational capabilities for enhancing a firm's responsiveness to supply chain disruptions are flexibility, agility, collaboration, and redundancy strategies, but also notes that resilience enhancers can include a variety of organizational practices. According to many studies (Gunasekaran et al., 2015b; Ivanov, 2018b; Jain et al., 2017b; Singh and Singh, 2019)

As part of a culture of risk management, Shekarian and Mellat Parast (2021) suggest including elements such as resource redundancy, agility, supplier flexibility, and collaborative planning into the development of SCRES. According to Ivanov (2018), there are twenty-four distinct ways to reach SCRES. They discovered that the best ways to enhance SCRES are via boosting adaptability, enhancing supply chain agility, establishing cooperative supply chain partnerships, and introducing redundancy. Strategic and production flexibility were shown to improve supply chain agility by Scholten et al. (2014), while volume and supplier flexibility were shown to improve supply chain agility by Hosseini et al. (2019).

2.2.4 Sustainability Performance

Performance is an economic indicator demonstrating a firm's ability to employ people and material resources to achieve its objectives (Juan *et al.*, 2022). Sustainability performance is a novel idea in talks about business and corporate social responsibility. Its purpose is to explore corporate management's social, environmental, and economic (performance) elements, especially corporate sustainability management (Modgil *et al.*, 2022). According to Hohenstein *et al.* (2015), sustainability performance is the process of measuring and managing the relationship between business, society, and the environment. Sustainability performance is the performance of a corporation across all dimensions and sustainability criteria. Sustainability performance management needs a strong management framework that connects environmental and social management to business and competitive strategy and management, as well as the integration of environmental and social data with economic and commercial data (Saber *et al.*, 2019)

Sustainability is conceptualised using the triple bottom line: economic, social and environmental sustainability (Narimissa *et al.*, 2020)

2.2.4.1 Economic Dimension of Sustainability

The economic dimension of sustainability is the foundation of every organisation's activities. It provides economic interests with future thought by using available resources to remain better competitive (Jia *et al.*, 2018). Economic sustainability, according to (Lim *et al.*, 2017b), encompasses all the activities that attract customers, generate opportunities, minimise organisational costs, promote gains and anticipate and manage risk while at the same time encouraging competition in the long term (Paulraj *et al.*, 2017b). (Genovese *et al.*, 2017b) advocates that economic sustainability entails the effective and efficient use of resources,

production structures and technologies to an organisation's advantage to yield benefits.. To Brandenburg and Rebs (2015), Economic sustainability considers the total profit attained by supply chain members together with the nation the organisation operates. It helps provide employment and income for people in society and also contributes to growth through honouring tax obligations (Kot, 2018b)

2.2.4.2 Environmental Dimension of Sustainability

The activities of organisations due to recent growth in industries have brought hazards to natural resources and the environment (Hong *et al.*, 2018). The environmental dimension of sustainability has to do with schemes that look at the environmental impact of the operations of organisations and implement principles to safeguard the environment (Hong *et al.*, 2018). It is geared toward preserving natural resources and the environment by adopting measures such as restrictions on hazardous products, energy conservation and management, waste treatment, and disposal regulations to ensure zero or minimal environmental effects (Ivanov, 2018).

Jabbarzadeh *et al.* (2018) define environmental sustainability as “all measures taken by a firm to enhance environmental practices continuously.. Environmental sustainable practices such as green procurement, solar panels, biogas, and bio-digesters have been introduced to improve sustainability. These sustainable environmental activities are essential since they offer resources for economic growth for an economy (Thaiprayoon *et al.*, 2019)

2.2.4.3 Social Dimension of Sustainability

While the environmental dimension of sustainability highlights managing natural resources, the social dimension of sustainability rather is concerned with the management of social resources, that is, what an organisation does to enhance societal interest to provide equal opportunities and basic human needs through sustainable practices and policies (Kaur and Mehta, 2017a). Schilke et al. (2018) define the social dimension of sustainability as “a process for improving and maintaining well-off places that promote welfare understanding the needs of employees and their expectations. It ensures fair opportunity for all in social services such as education, health, political participation, and gender equality (Ou *et al.*, 2015). Dillard et al. (2019) explained that social sustainability deals with all administrative actions and how organisations add up to the growth and development of human potential. It looks at how organisations add value with the idea of improving resources for individuals and society in various communities (Correia *et al.*, 2020)

2.3 Theoretical Review

In examining the roles of supply chain dynamic capability and resilience in the relationship between sustainable supply chain management and sustainability performance, the study draws on the Resource-based view (RBV) theory.

When it comes to supply chain management, the resource-based perspective demonstrates how businesses may gain an advantage over rivals. According to this school of thought, successful businesses have distinctive advantages that are hard for rivals to replicate (Hossain et al., 2022). Therefore, businesses may get an edge in the market by identifying and cultivating traits that set them apart from the competition and leave no room for doubt (Barney and Mackey, 2016). This theory also proposes that the diverse capabilities and assets of an organization are its key

drivers of success. Therefore, firms may maintain a competitive advantage if they can determine which aspects of their resources or talents are difficult for rivals to replicate (Collins, 2021)

The resource-based view (RBV), a strategy for gaining a competitive advantage, first evolved in the 1980s, when the emphasis of study shifted from the external market structure of the business to its internal structure (Barney, 2020). The RBV emphasizes both the external and internal resources of a corporation as potential sources of competitive advantage in the marketplace (Molloy and Barney, 2015). The RBV states that successful businesses will have developed distinctive core competences that set them apart from the competition and help them achieve sustainable competitive advantage (Amis et al., 2020)

The RBV theory suggests that businesses look inside rather than to the external environment for competitive advantages. Furthermore, the idea suggests that the diversity and immobility of recognized resources and abilities provide competitive advantage (Barney, 2020). Differentiated resources and capabilities allow for the possibility of competitive outcomes from alternative methods. However, brand equity and corporate image are examples of immovable resources and competencies that would be very difficult, if not impossible, to transfer to a new company. (Barney, 2021)

In light of this, the study makes the claim that crucial aspects of sustainable supply chain management, such as sustainable product design, sustainable process design, supply-side sustainability collaboration, and demand-side sustainability collaboration, can be viewed as special internal organizational resources and competencies that can be used to promote social, economic, and environmental sustainability. Furthermore, supply chain resilience and dynamic capabilities as core competencies are also required to act as catalysts for enhancing sustainable supply chain management, as per this study

2.4 Empirical Review

Table 2.1 provides a comprehensive review of literature on Sustainable Supply Chain Management (SSCM). The authors, their objectives, theoretical frameworks used, methods adopted, key findings, and the identification of any gaps in each study are all highlighted.

Hong et al. (2017) examined the influence of SSCM practices on enterprise performance, focusing on supply chain dynamic capabilities. The study indicated a significant positive impact of SSCM activities on supply chain capabilities and all output dimensions. However, its geographical focus on China's Yangtze River Delta area limits the generalizability of its findings. Wang and Dai (2018) explored the relationship between SSCM and performance, revealing internal SSCM activities beneficially impact a firm's environmental and social efficiency. However, the omission of moderator and control variables limits the study. Lin and Tseng (2016) used a hierarchical structure and linguistic preferences to ascertain strategic goals of electronic focal manufacturing firms in Taiwan concerning SSCM. Their results indicated competitive pressure drives organizations to incorporate sustainability into their supply chains. Still, the study was limited by its reliance on existing literature to develop SSCM aspects and criteria. Das (2018) focused on the effect of SSCM on organizational performance, finding that the environmental and social practices of an organization significantly influence its social and environmental performance. However, the study's scope was limited by its sole focus on social and environmental performance as the dependent variable. Suryanto et al. (2018) established a significant relationship between organizational learning mechanisms, support, and green supply chain management practices. However, the study lacked a moderator or mediator component in its research model. Schultz and Flanigan (2016) found a competitive advantage resulting from the adoption of the triple bottom line strategy, but their research did not consider

the use of a moderator variable in examining the relationship between sustainability and competitive advantage.

Chavez et al. (2016) reported that customer pressure benefits the adoption of customer-centric green supply chain management, leading to improved operating efficiency. However, the study was limited to only considering customer pressures. Laari et al. (2016) showed a strong correlation between competitive strategies and environmentally friendly supply chain management practices. Nevertheless, the research had limited generalizability due to a small sample size and regional restriction to Finland. Finally, Sajjad et al. (2015) identified top management sustainability values, a desire to reduce risk, and stakeholder management as key motivators for SSCM adoption in New Zealand. The generalizability of these findings, however, is limited by the small sample size.



Table 2.1 Literature review on Sustainable Supply Chian Management

Author(S)	Objectives of the Study	Theoretical Framework	Method	Key Findings	Gaps Identification
Hong et al. (2017)	This study empirically examines the relationship between supply chain (SC) dynamic capabilities and enterprise performance (including economic, environmental, and social performance), with a particular emphasis on the mediating influence of SC dynamic capabilities on the relationship between SSCM practices and enterprise performance.	The resource-based view and institutional theory	Quantitative	The findings indicate that SSCM activities have a major positive impact on the complex capabilities of SC and all three output dimensions.	Since the analysis centred on China's Yangtze River Delta area, the findings are less generalisable.
Lin and Tseng (2016)	This study employs a hierarchical structure and linguistic preferences to ascertain the strategic goals of electronic focal manufacturing firms in Taiwan that are subject to SSCM.	Institutional theory	Quantitative	According to the report, competitive pressure compels organisations to incorporate sustainability into their supply chains.	This study utilised existing and sustainable supply chain management literature to develop the SSCM's aspects and criteria.
Das (2018)	The study investigates the effect of sustainable supply chain management on the performance of the organisation	stakeholder theory	Quantitative	The environmental and social practices of an organisation have an impact on the social and environmental performance of the firm	The study adopted social-an environmental performance as the dependent variable, limiting the study's scope

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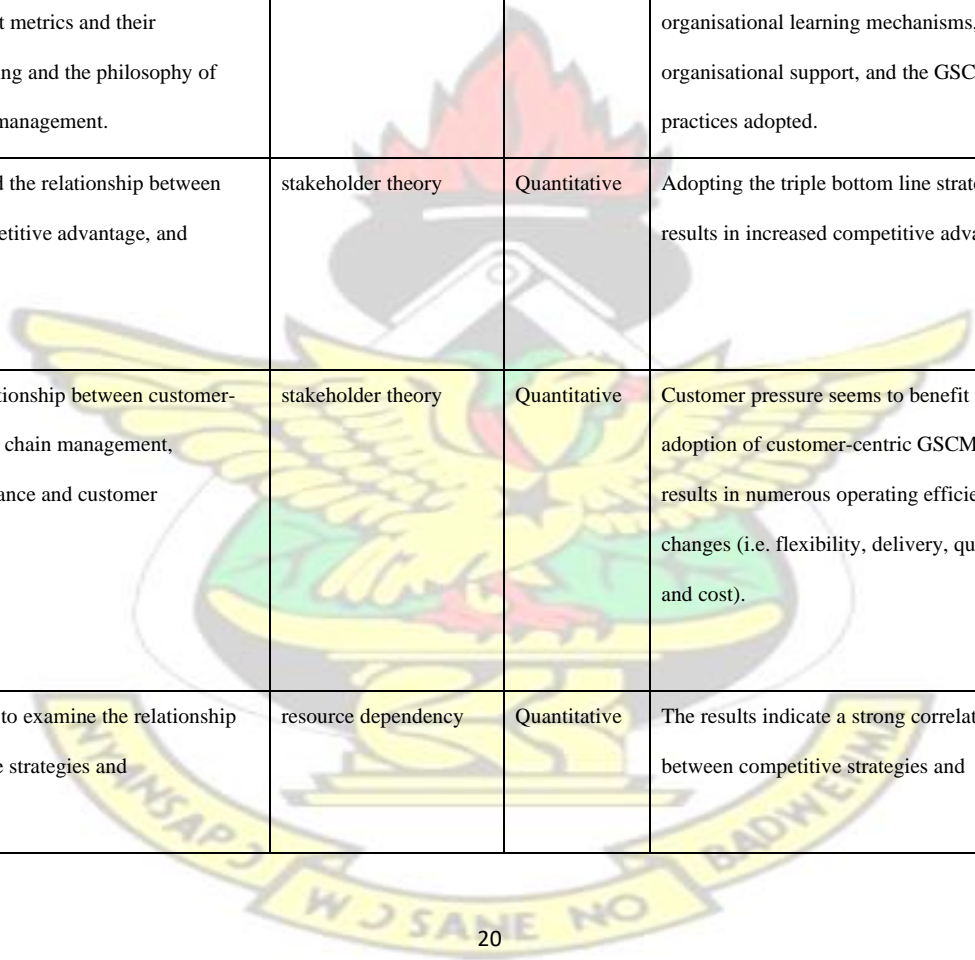
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Suryanto et al. (2018)	The primary objective of this paper is to determine the degree of association between two management support metrics and their organisational learning and the philosophy of green supply chain management.	theory of investment recovery	Quantitative	This study established a strong, statistically significant relationship between organisational learning mechanisms, organisational support, and the GSCM practices adopted.	The study's research model a moderator or mediator component.
Schultz and Flanigan (2016)	This study examined the relationship between sustainability, competitive advantage, and innovation.	stakeholder theory	Quantitative	Adopting the triple bottom line strategy results in increased competitive advantage.	The research did not examine relationship between sustainability and competitive advantage using a moderator variable.
Chavez et al. (2016)	To examine the relationship between customer-centric green supply chain management, operational performance and customer satisfaction	stakeholder theory	Quantitative	Customer pressure seems to benefit the adoption of customer-centric GSCM, which results in numerous operating efficiency changes (i.e. flexibility, delivery, quality and cost).	The research is solely concerned with consumer pressures.
Laari et al. (2016)	This analysis aimed to examine the relationship between competitive strategies and	resource dependency	Quantitative	The results indicate a strong correlation between competitive strategies and	The findings of this analysis focused on a survey with small sample size and regional

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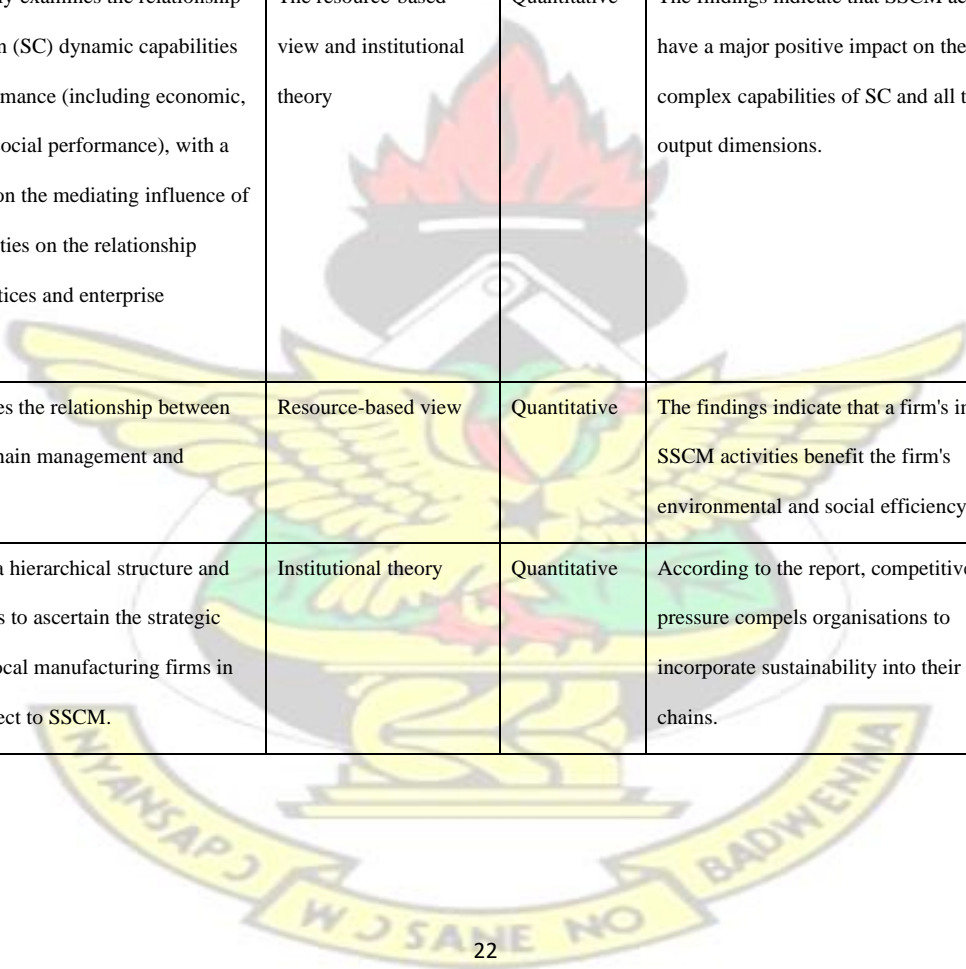
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	environmentally friendly supply chain management.			environmentally friendly supply chain management practices.	distribution restricted to Finland, suggesting limited generalizability.
Sajjad et al. (2015)	this study examines the motivators for and barriers to SSCM adoption in the New Zealand business context and aims to contribute to an improved understanding of the motivators of and barriers to SSCM implementation	Stakeholder theory	Quantitative	The results reveal that the sustainability values of top management, a desire to reduce risk and stakeholder management are salient motivators for SSCM adoption.	The small sample limits the generalizability of the research findings.
Kot (2018)	The purpose of this article is to present the current state of the research in sustainable development in relation to managing the supply chain of SMEs, as well as the empirical findings in this area.	Stakeholder theory	Quantitative	The results found that all of the sustainability areas were very important in the supply chain management practices of the studied SMEs, despite the imbalance described in the literature.	This study indicates only SMEs' engagement in environmental and social responsibility. These results most likely differ from those that could be obtained within European developed economies, as well as in developing economies in Asia or Africa

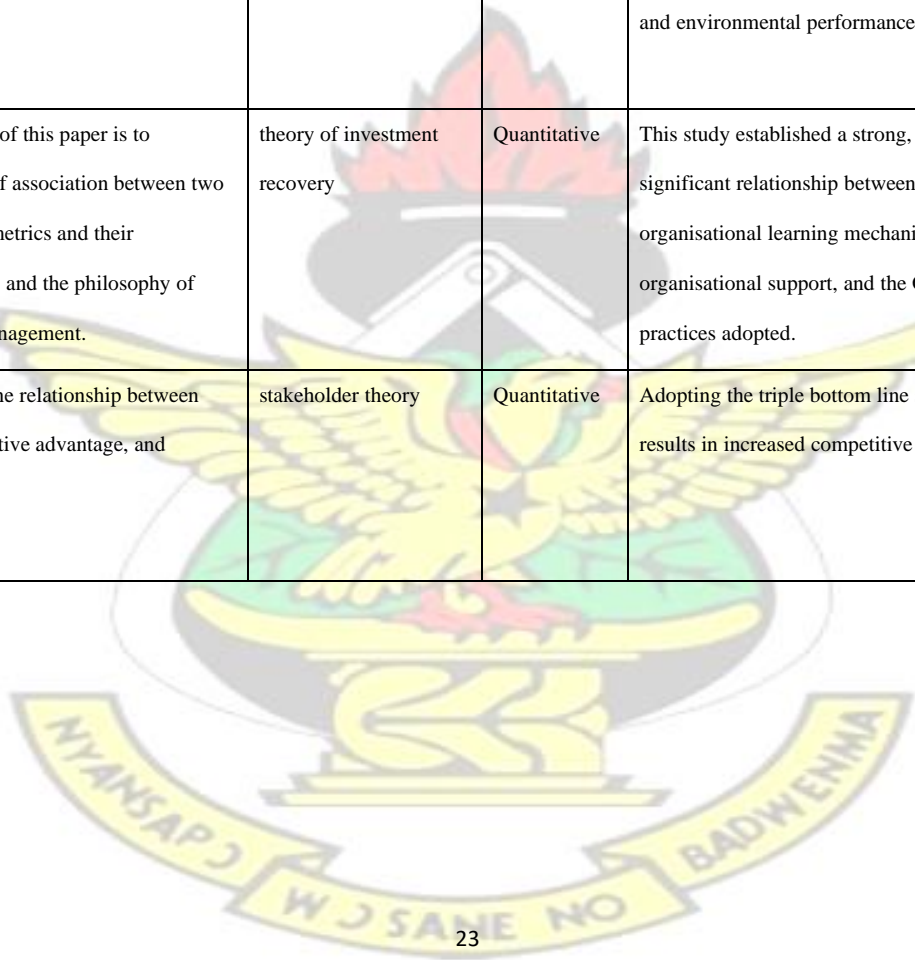
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Author(S)	Objectives of the Study	Theoretical Framework	Method	Key Findings	Gaps Identification
Hong et al. (2017)	This study empirically examines the relationship between supply chain (SC) dynamic capabilities and enterprise performance (including economic, environmental, and social performance), with a particular emphasis on the mediating influence of SC dynamic capabilities on the relationship between SSCM practices and enterprise performance.	The resource-based view and institutional theory	Quantitative	The findings indicate that SSCM activities have a major positive impact on the complex capabilities of SC and all three output dimensions.	Since the analysis centred on China's Yangtze River Delta area, the findings are less generalisable.
Wang and Dai (2018)	The study investigates the relationship between sustainable supply chain management and performance	Resource-based view	Quantitative	The findings indicate that a firm's internal SSCM activities benefit the firm's environmental and social efficiency.	The study model omitted moderator and control variables.
Lin and Tseng (2016)	This study employs a hierarchical structure and linguistic preferences to ascertain the strategic goals of electronic focal manufacturing firms in Taiwan that are subject to SSCM.	Institutional theory	Quantitative	According to the report, competitive pressure compels organisations to incorporate sustainability into their supply chains.	This study utilised existing and sustainable supply chain management literature to develop the SSCM's aspects and criteria.



Das (2018)	The study investigates the effect of sustainable supply chain management on the performance of the organisation	stakeholder theory	Quantitative	The environmental and social practices of an organisation have an impact on the social and environmental performance of the firm	The study adopted social and environmental performance as the dependent variable, limiting the study's scope
Suryanto et al. (2018)	The primary objective of this paper is to determine the degree of association between two management support metrics and their organisational learning and the philosophy of green supply chain management.	theory of investment recovery	Quantitative	This study established a strong, statistically significant relationship between organisational learning mechanisms, organisational support, and the GSCM practices adopted.	The study's research model a moderator or mediator component.
Schultz and Flanigan (2016)	This study examined the relationship between sustainability, competitive advantage, and innovation.	stakeholder theory	Quantitative	Adopting the triple bottom line strategy results in increased competitive advantage.	The research did not examine relationship between sustainability and competitive advantage using a moderator variable.

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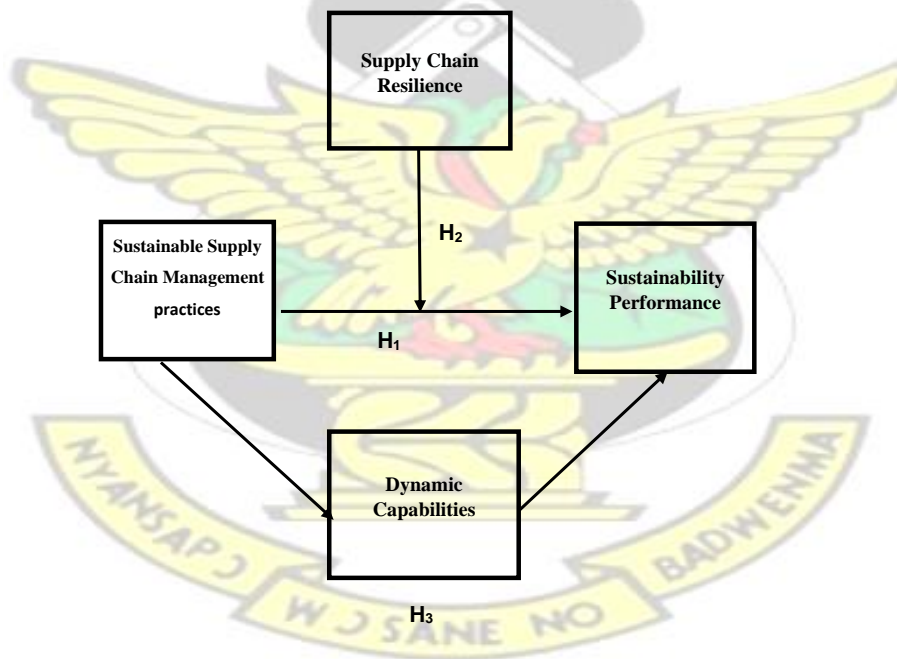
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2.5 Conceptual Framework

Based on RBV theory, the research's model suggests that sustainable supply chain management has a positive and significant impact on sustainability performance. The model also suggests that supply chain resilience has a favorable and substantial moderating influence on the association between sustainable supply chain management and sustainability performance. According to the research, supply chain dynamic capacity mediates the association between sustainable supply chain management and sustainability performance. Figure 2.1 depicts the factors' direct, indirect, and moderated relationships between the constructs.

Figure 2.1 Research Model



Source: Researcher's construct (2022)

2.5.1 Sustainable supply chain management and supply chain performance

According to the RBV theory, enterprises may use their resources to generate distinctive organisational skills that their rivals cannot replicate (Barney, 2020). According to the RBV literature, skills may be developed via intricate interactions between the firm's resources (Barney and Mackey, 2016). Such resources may serve as the foundation for improved supply chain performance. Sustainable supply chain management may be harnessed and applied in novel ways to improve supply chain performance. In this research, the RBV is presented to define how the many elements of sustainable supply chain management as a core and distinctive organisational capability improve their sustainability performance. As a result, this research contends that there is a favourable association between sustainable procurement and supply chain performance. The reason is that there is compelling evidence that sustainable supply chain management improves performance. While some studies find that sustainable supply chain management practices positively affect performance (e.g., Narimissa et al., 2020a, 2020b; Sajjad et al., 2015) other studies report that it positively impacts performance indirectly (e.g., Koberg and Longoni, 2019; Saeed and Kersten, 2019). Still, other studies find that the relationship between these concepts is either negative (e.g., Busse et al., 2017; Matthews et al., 2016) or non-significant relationship (e.g., Mathivathanan et al., 2018; Touboulic and Walker, 2015). Based on the continuing conversation, this research concludes:

H₁: Sustainable supply chain management positively and significantly affects sustainability performance.

2.5.2 Moderation effect of Supply chain resilience

It has been argued that supply chain resilience is crucial in encouraging businesses to participate in environmental management programs and attaining sustainable development because it helps businesses bounce back from the effects of supply chain environmental accidents and difficulties (Gunasekaran et al., 2015). Therefore, businesses may strengthen their supply chain's resilience while also improving their environmental performance via the use of environmental management techniques and green technology (Mandal et al., 2016; Pettit et al., 2019). According to RBV, in order for businesses to achieve sustainable growth, they must gradually amass resources and competencies over time. Building supply chain resilience is seen as a good way to develop skills that stand out and are focused on the future (Ji et al., 2020). A highly resilient supply chain might mean that a company works hard to change its manufacturing and operational procedures in order to lessen the environmental effect of its goods and services (Juan et al., 2022). Therefore, strengthening supply chain resilience is expected to lead to better environmental performance. By reducing waste and enhancing the effectiveness with which resources are used, businesses may increase the environmental advantages of their supply chains (Abeysekara et al., 2019). High-resilience businesses have a lower environmental impact because they reduce pollution, boost output, and maximize resource efficiency (Thaiprayoon et al., 2019). Sustainability performance may be influenced less by sustainable supply chain management strategies if the supply chain is resilient. The following possibilities are presented by the researcher in light of the aforesaid considerations.

H₂: Supply chain resilience positively moderates the relationship between Sustainable supply chain management practices and sustainability performance

2.5.3 Mediating effect of Dynamic Capabilities

According to the resource-based approach, certain organizational resources may be either physical or immaterial (dynamic capability). Such corporate assets, however, must be distinctive in order for businesses to effectively use them to accomplish growth and development. Additionally, variations in their resources and capacities are blamed for variations in their sustainability performances (dynamic capability). Dynamic capacity is suggested as a significant intangible resource that might improve a firm's supply chain management procedures in this research. There is compelling evidence that the techniques of supply chain management and dynamic capabilities are closely related. Short-term competitive advantage from SSCM techniques would encourage the continued development of dynamic capabilities (Kaur and Mehta, 2017). It is uncommon to find research that combines SSCM with dynamic capabilities, particularly in empirical research. According to Giniuniene and Jurksiene (2015), customer orientation and involvement in SSCM activities provide enterprises access to a variety of information (knowledge) and, to a certain degree, help develop the dynamic capacity, which enhances company performance. According to Schilke et al. (2018), collaboration within a supply chain may increase the capacity for rapid reaction, environmental adaption, and rebuilding. As a result, this research makes the following claims:

H4: Dynamic capability mediates the relationship between Sustainable supply chain management practice and sustainability performance

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

In the link between sustainable supply chain management practices and sustainability performance, this research evaluates the functions of dynamic supply chain capacity and resilience. It outlines the demographic, sampling strategy, data collecting procedures, data analysis, validity and reliability checks, and ethical issues for the study.

3.2 Research Design

A study design serves as the foundation for data gathering and analysis. The explanatory research method was applied for this investigation. When a phenomenon hasn't been studied or adequately explained, researchers will use a method called "explanatory research" to learn more about it. Sustainability performance, adaptability, and resilience in dynamic supply networks are all investigated in relation to sustainable supply chain management strategies.

A research strategy is a step-by-step plan of action that organizes your ideas and time, allowing you to carry out research efficiently and on schedule to create high-quality findings and

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thorough reporting. In terms of the research methodology, the study selected a survey that was directed at workers at businesses located in the Greater Accra Region.

The research strategy is the set of programs and practices that ranges from general hypotheses to specific ways to data collecting, analysis, and interpretation. According to Ackroyd and O'Toole (2010), the research might be qualitative, quantitative, or a mix of the two. The hallmark of quantitative research is the use of logical tools throughout the study process to support or refute preexisting ideas. In this study, variables are measured and the interactions between them are analyzed in order to find patterns, correlations, or causal connections. The inductive information creation methods used in qualitative research are often characterized by their emphasis on creating meaning (Leavy, 2013). The quantitative method was used in this research, which included creating and testing hypotheses.

3.3 Population of the Study

Johnson and Onwuegbuzie (2004) define a population as the set of entities or variables of interest to a researcher. Managers at the highest levels of businesses in the Greater Accra Region make up the study's population.

3.4 Sample Size and Sampling Technique

Sampling is a method used to estimate features of a statistical population by picking a subset of the population at random. The two forms of sampling are probability and non-probability. Probability sampling is equally likely to choose members of the whole study population. The target population was sampled for this investigation using 200 convenient samples. Due to time and money constraints, the researcher settled on 200.

3.5 Data Collection Method

Accurate insights for study are gathered, calculated, and analyzed via this procedure, which is known as data collecting. This section focuses on the methods used to acquire the data and the sources used to do so.

The research uses first-hand information. Information gathered for a particular purpose from primary sources is known as primary data (Bell and Roberts, 1984). The research used questionnaire-based primary data.

An online questionnaire designed using google forms was sent to the respondents' emails and other preferred online channels. Before discussing with each respondent, the researcher asked for their permission and consent to participate in the study. Having received the respondents' responses, the researcher sent messages to each respondent to show appreciation for the time taken to respond to the questionnaire.

The questionnaire consisted of five sections. Section A detailed the demographics of the respondents. Section B provided the measures of Sustainable supply chain management practices, the independent variable. Section C provides the measures for the moderating variable, supply chain resilience. Section D provided the measures of dynamic supply chain capability, the moderating variable. Section E provided the measures of the outcome variable, sustainability performance. The elements used to measure each construct in the questionnaire are listed in table 3.1 below.

SUSTAINABILITY PERFORMANCE

- Economic Dimension 5 Wang and Dai (2018)
- Social Dimension 5 Wang and Dai (2018)
- Environmental Dimension 5 Wang and Dai (2018)

Source: Author's Construct (2022)

3.6 Data Analysis

Data analysis is the process of examining, cleaning, manipulating, and modeling data to extract insights, make inferences, and aid in decision-making. The analysis used by the researcher was both descriptive and inferential. Sustainable supply chain management methods, dynamic supply chain capabilities, resilience, and sustainability performance were described using descriptive statistics. The study's model was also subjected to PLS-SEM testing by the researcher.

3.7 Reliability and Validity Test

Validity and reliability are two crucial factors to take into account while doing research. Reliability is concerned with the repeatability of research findings and the consistency of the metrics used to evaluate each component. The degree to which an indicator used to assess a notion correctly measures that idea, on the other hand, is referred to as validity (Koro-Ljungberg, 2008). In order to confirm that the study complies with reliability and validity

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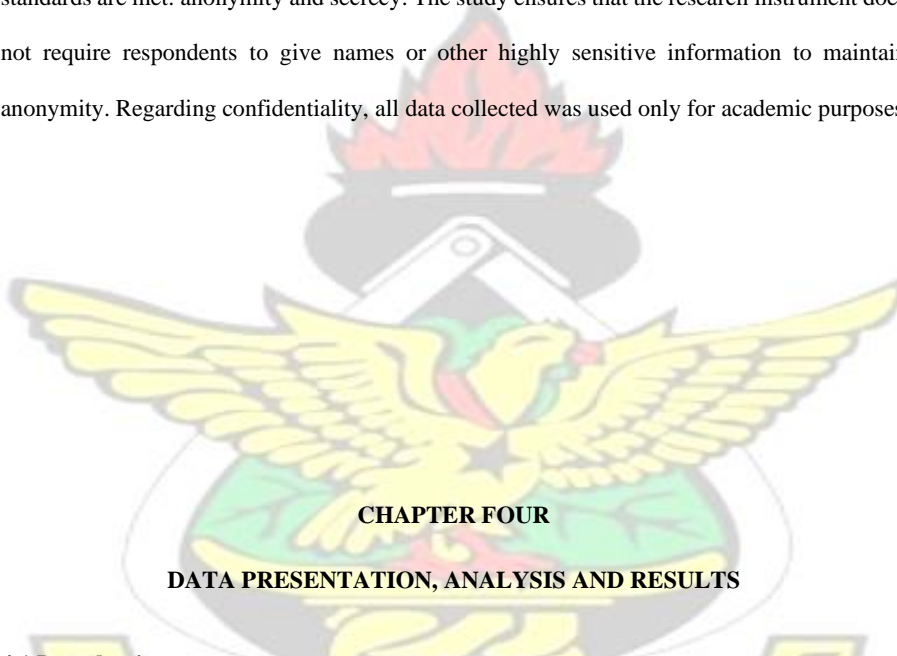
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criteria, the obtained data was assessed using the Alpha Cronbach (reliability) and exploratory factor analysis (validity).

3.8 Ethical Consideration

A collection of rules that regulate how researchers behave themselves is referred to as research ethics (Bryman, 2009). The research emphasises two key concerns to guarantee that all ethical standards are met: anonymity and secrecy. The study ensures that the research instrument does not require respondents to give names or other highly sensitive information to maintain anonymity. Regarding confidentiality, all data collected was used only for academic purposes

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CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND RESULTS

4.1 Introduction

This chapter includes the findings from the data analysis, along with a discussion of the findings and their relevance to the research. First, the replies are examined in light of the respondents' demographic data and response rate. The next section is descriptive statistics, which covers mean, standard deviation, skewness, and kurtosis. The study of the measurement model, which follows, aims to guarantee the correctness and consistency of the results. Cronbach Alpha, Composite reliability, and exploratory factor analysis are all used in

measurement model analysis. The model testing part that follows includes correlation analysis, structural equation modeling, and a table of hypotheses. Discussion of Results, the last part, examines the study's findings in the context of the examined literature. Using IBM SPSS version 23 and SmartPLS4, all analyses were performed.

4.2 Response Rate

Two hundred (200) questionnaires were distributed to employees and management of firms operating within the Greater Accra Region. All two hundred questionnaires were completed, giving a response rate of 100%.

4.3 Demographic Profile of the Respondents

The demographic information of the respondents and their firms are analysed in this section using product type, ownership type, number of employees, educational level, firm age, experience, position and position experience. The results of the respondent's profile are analysed in Table 4.1.

Table 4.1 Demographic Information

Variable	Categories	Frequency	Percent (%)
Product Type	Industrial machinery	12	6
	Chemicals	14	7
	Plastics and rubber	10	5
	Food beverages and drinks	96	48

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	Metals and metal working	12	6
	Pharmaceuticals	10	5
	Paper and packaging materials	3	1.5
	Engineering and construction	19	9.5
	Textiles and clothing	6	3
	Others	18	9
Ownership Type	Local private company	173	86.5
	Local public company	-	-
	Subsidiary of a foreign multination	5	2.5
	International joint venture	22	11
Number of Employees	1 - 50	174	87
	51 - 100	15	7.5
	101 – 150	7	3.5
	151 – 200	-	-
	Above 200	4	2
Educational Level	Up to SHS level	15	7.5
	Up to Diploma level	56	28
	Up to 1 st degree	106	53
	Up to second degree	22	11
	Up to PhD	1	.5
Firm Age	1 – 10 years	30	15
	11 – 20 years	146	73
	Above 20 years	24	12
Experience	1 – 10 years	168	84
	11 – 20 years	28	14
	Above 20 years	3	2

Source: Field study (2023)

Table 4.1 reveals that the "Food beverages and drinks" industry is the primary industry for most respondents, with 48% of the total. "Engineering and construction" (9.5%), "Others" (9%), and "Chemicals" (7%) are the next most popular industries, while "Paper and packaging materials" (1.5%) and "Textiles and clothing" (3%) are the least common. Additionally, a large majority of respondents (86.5%) work for local private companies, with "International joint

venture" (11%) and "Subsidiary of a foreign multination" (2.5%) being the next most common ownership types. Most respondents (87%) work in companies with 1-50 employees, with 51-100 employees (7.5%), 101-150 employees (3.5%), and above 200 employees (2%) being less common. In terms of education, the majority of respondents (53%) have up to a 1st degree level, followed by up to Diploma level (28%), up to second degree (11%), up to SHS level (7.5%), and up to PhD level (0.5%). Additionally, most respondents (73%) work for firms between 11 and 20 years old, with above 20 years old (12%) and 1-10 years old (15%) being the next most common ranges. Finally, the majority of respondents (84%) have 1-10 years of experience, with 11-20 years of experience (14%) and above 20 years of experience (2%) being less common.

4.4 Descriptives Analyses

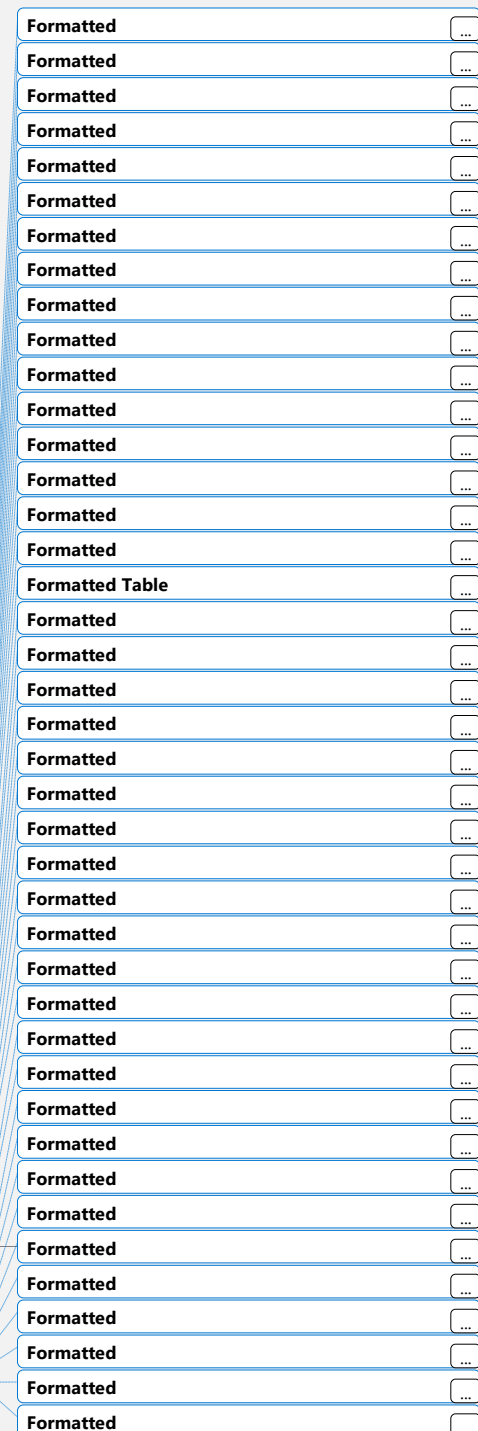
The descriptive analysis results on sustainable supply chain management, supply chain resilience, dynamic capability and sustainability performance are analysed using mean, standard deviation, skewness, and kurtosis.

4.4.1 Sustainable Supply Chain Management

Sustainable Supply Chain Management was operationalised using sixteen items adopted from Paulraj et al. (2017). The descriptive results for Sustainable Supply Chain Management are detailed in Table 4.2.

Table 4.2 Descriptive Results on Sustainable Supply Chain Management

<i>Sustainable Supply Chain Management</i>	Mean	SD	Kurtosis	Skewness
When creating goods, we focus on minimizing material and energy use.	5.28	1.138	-0.413	-0.126
We consider material recovery, recycling, and/or reuse while creating goods.	5.12	1.262	-0.592	0.277



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4.4.2 Supply Chain Resilience

Supply Chain Resilience was operationalised using four items adopted from Ji et al. (2020).

The descriptive results for Supply Chain Resilience are detailed in Table 4.3

Table 4.3 Descriptive Results on Supply Chain Resilience

<i>Code</i>	<i>Supply Chain Resilience</i>	<i>Mean</i>	<i>SD</i>	<i>Kurtosis</i>	<i>Skewness</i>
SCRES_1	The ability to go on with operations.	5.23	1.206	0.539	0.027
SCRES_2	The need from the clientele might still be satisfied.	5.22	0.962	0.215	-0.044
SCRES_3	Our performance would not considerably differ from goals.	5.04	0.915	0.327	-0.281
SCRES_4	The supply chain would be able to continue operating normally.	5.18	1.001	0.117	-0.787
COMPOSITE SCALE		5.166	0.741	0.247	0.348

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Source: Field study (2023)

The descriptive results of Supply chain resilience are provided in Table 4.3. According to the results, Supply chain resilience of firms operating in the Greater Accra Region is very high giving a composite mean score of 5.166 and standard deviation of 0.741.

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4.4.3 Dynamic Capabilities

Dynamic Capabilities was operationalised using ten items adopted from Li and Liu (2014). The descriptive results for Dynamic Capabilities are detailed in Table 4.4

Table 4.4 Descriptive Results on Dynamic Capabilities

Code	Dynamic Capabilities	Mean	SD	Kurtosis	Skewness
DC_1	Before rivals, we may detect environmental change	4.51	1.414	-0.387	-0.463
DC_2	We often gather to talk about market demand.	4.91	1.23	-0.177	-0.554
DC_3	We are able to comprehend the effects of both the internal and exterior surroundings.	5.22	1.046	-0.468	0.401
DC_4	The biggest possible possibilities and hazards are tangible to us.	4.32	1.424	-0.337	-0.477
DC_5	Conflicts may be promptly resolved throughout the strategic decision-making process.	4.85	0.96	-0.348	0.43
DC_6	In many situations, we may make prompt decisions to address strategic issues.	4.83	1.112	-0.389	0.058
DC_7	Unhappy consumers may promptly get a fix from us.	4.93	1.096	-0.531	0.969
DC_8	Our planned modifications can be implemented effectively.	5.32	0.891	-0.128	-0.348

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DC_9	There is effective collaboration between many departments.	5.16	1.003	0.106	-0.493
DC_10	In implementing strategic change, we support one another.	4.17	1.657	-0.026	-0.98
COMPOSITE SCALE		4.821	0.638	-0.045	-0.21

Source: Field study (2023)

The descriptive results of dynamic capability are provided in Table 4.4. According to the results, firms operating within the Greater Accra region of Ghana have high dynamic capabilities, given a composite mean of 4.821 and standard deviation of 0.638.

4.4.4 Sustainability Performance

Sustainability Performance was operationalised using fourteen items adopted from Wang and Dai (2018). The descriptive results for Sustainability Performance are detailed in Table 4.5

Table 4.5 Descriptive Results on Sustainability Performance

<i>Sustainability Performance</i>	Mean	SD	Kurtosis	Skewness
an increase in market share	2.86	1.25	0.559	0.25
an increase in profit	2.65	1.358	0.975	0.985
minimizing the impact of the disaster on the environment	2.5	1.248	1.085	1.219
An increase in return on assets	2.86	1.382	0.658	0.314
An increase in return on sales	4.11	1.47	-0.37	-0.463
reduction of hazards and effects on the broader public	3.68	1.416	0.101	-0.799
Employees' workplace safety and health improving	4.21	1.094	-0.42	-0.218
Enhancement of the company's social reputation	4.49	1.136	-0.32	0.238
Enhancement of the company's reputation among consumers	4.51	1.588	-0.39	-0.675
Enhancement of the product's image	4.47	1.389	-0.30	-0.225
reduction of waste water, air emissions, and solid waste	4.77	1.12	-0.05	-0.52

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Reduced intake of risky, dangerous, or poisonous substances	4.97	1.128	-0.18	-0.127
usage of energy is reduced	5.04	0.994	-0.25	-0.302
reduction in the number of environmental accidents	5.1	1.07	-0.49	0.365
COMPOSITE SCALE	4.014	0.5630	0.437	0.63

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Source: Field study (2023)

The descriptive results of sustainability performance are provided in Table 4.5. According to the results, there is a strong sustainability performance of firms operating within the Greater Accra region given a composite mean of 4.014 and standard deviation of 0.56

4.5 Measurement Model Analysis

This section seeks to statistically validate the scales/items used in measuring the study's variables: sustainable supply chain management, supply chain resilience, dynamic capability, and sustainability performance. These model test include Variance Inflation Factor (VIF) for Multicollinearity Test, Cronbach Alpha and Composite reliability for reliability test, exploratory factor analysis for validity.

4.5.1 Multicollinearity Test (Variance Inflation Factor)

When the predictor variables in a multiple regression analysis are substantially associated with one another, multicollinearity might become a problem. The variance inflation factor is used to assess the level of multicollinearity among the predictor variables (VIF). The VIF determines how much the variance of an estimated regression coefficient rises when multicollinearity is present. According to a common rule of thumb, the existence of considerable multicollinearity in the model is indicated by a VIF score more than 5. The Multicollinearity Test findings are shown in Table 4.6.

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Table 4.6 Variance Inflation Factor (VIF)

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.284	.409		3.143	.002		
	SSCM	.037	.073	.033	.504	.615	.906	1.104
	SCRES	.241	.049	.317	4.944	.000	.940	1.064
	DC	.272	.057	.309	4.760	.000	.919	1.088

a. Dependent Variable: Sustainability Performance

Source: Field study (2023) **Note:** SSCM (Sustainable Supply Chain Management); SCRES (Supply Chain Resilience); DC (Dynamic Capability)

According to Table 4.6, the VIF value for sustainable supply chain management was 1.104, which indicates that this predictor variable is not strongly correlated with the other predictor variables in the model. Similarly, the VIF values for supply chain resilience and dynamic capability were 1.064 and 1.088, respectively, which also suggest that these predictor variables are not contributing to multicollinearity in the model. Furthermore, the statement reports that all three variables' VIF values were less than 5, which is a commonly used cut off for detecting multicollinearity. This implies that there is no significant issue of multicollinearity in the data

used for the study. Therefore, it can be concluded that the regression model is reliable and can be used for further analysis and interpretation.

4.5.2 Test of Reliability

In research, reliability refers to the consistency and stability of a measure or research instrument over time, across different observers, and across different items or questions in a questionnaire or survey. It is the extent to which a measurement or test yields consistent and accurate results, and the degree to which these results can be replicated. Cronbach's Alpha are used to test the data for reliability. Table 4.7 below provides the reliability results

Table 4.7 Results of Cronbach's Alpha

Construct	Number of items	Cronbach's Alpha
Sustainable product design	4	0.75
Sustainable process design	4	0.72
Supply-side sustainability collaboration	4	0.73
Demand-side sustainability collaboration	4	0.77
Strategic sense-making capacity	3	0.78
Timely decision-making capacity	4	0.79
Change implementation capacity	3	0.80
Proactive Dimension Supply Chain Resilience	2	0.72
Reactive dimension of supply chain resilience	2	0.74
Economic Dimension	5	0.76
Social Dimension	5	0.77
Environmental Dimension	4	0.76

Source: Field study (2023)

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The Cronbach's Alpha for all constructs in the study are above the widely accepted cut-off point of 0.70, indicating that your constructs have a good internal consistency and are generally reliable. With an Alpha ~~of 0.75~~ of 0.75, the five items used to measure this Sustainable product design show good internal consistency. This suggests that the items function together effectively to assess the aspect of sustainable product design. The Cronbach's Alpha of 0.72 indicates a satisfactory level of reliability for this Sustainable process design. Despite being the second lowest Alpha in your data, it still reflects an acceptable level of internal consistency among the items. With a Cronbach's Alpha of 0.73, the internal consistency of these five items for Supply-side sustainability collaboration is acceptable, indicating that they are capturing a similar underlying concept related to supply-side sustainability collaboration. Demand-side sustainability collaboration has a relatively higher Cronbach's Alpha of 0.77, showing a strong internal consistency amongst the items used for its measurement. The Cronbach's Alpha of 0.78 indicates a high level of reliability for Strategic sense-making capacity, demonstrating the items are suitable for evaluating this dimension. Despite having only four items, timely decision-making capacity shows a strong Cronbach's Alpha of 0.79, suggesting the items are reliable for measuring the concept. With the highest Cronbach's Alpha of 0.80, Change implementation capacity construct demonstrates excellent reliability. Proactive Dimension Supply Chain Resilience has an acceptable Alpha of 0.72, indicating a sufficient level of internal consistency. Slightly higher than its proactive counterpart, Reactive dimension of supply chain resilience has an Alpha value of 0.74 demonstrates good internal consistency. With an Alpha of 0.76, Economic Dimension indicates good reliability amongst the items used to evaluate the economic aspect of your study. The Cronbach's Alpha of 0.77 for Social Dimension implies good reliability for the items used in this construct. Similar to the economic dimension, Environmental Dimension also has an Alpha of 0.76, indicating a high level of reliability amongst the items.

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4.5.3 Test of Validity

In research, validity refers to the extent to which a study or research instrument measures what it is intended to measure. It is the degree to which the results of a study accurately represent the phenomenon or construct of interest, and the extent to which the conclusions drawn from the study can be generalized to other populations or contexts. Exploratory factor analysis is used to assess the data for validity.

Table 4.8 Exploratory Factor Analysis (EFA) Results

ITEMS	VARIABLES			
	SSCM	SCRES	DC	SP
SSCM1	0.765			
SSCM2	0.842			
SSCM3	0.732			
SSCM4	0.765			
SSCM5	0.723			
SSCM6	0.745			
SSCM7	0.809			
SSCM8	0.823			
SSCM9	0.734			
SSCM10	0.773			
SSCM11	0.756			
SSCM12	0.789			
SSCM13	0.878			
SSCM14	0.823			
SSCM15	0.759			
SSCM16	0.743			
SCRES1		0.795		

SCRES2		0.761	
SCRES3		0.643	
SCRES4		0.681	
DC1			0.642
DC2			0.654
DC3			0.551
DC4			0.607
DC5			0.529
DC6			0.567
DC7			0.530
DC8			0.553
DC9			0.543
DC10			0.579
SP1			0.653
SP2			0.586
SP3			0.832
SP4			0.654
SP5			0.677
SP6			0.765
SP7			0.743
SP8			0.843
SP9			0.785
SP10			0.678
SP11			0.765
SP12			0.657
SP13			0.634
SP14			0.667

Source: Field study (2023)

Note: SSCM (Sustainable Supply Chain Management); SCRES (Supply Chain Resilience); DC (Dynamic Capability); SP (Sustainability Performance)

According to Table 4.8, all forty-four (44) items tapping into sustainable supply chain management, dynamic capability, supply chain resilience and sustainability performance

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loaded above the 0.50 threshold. This indicates that all forty-items measured the variables they were adopted to measure. The data obtained is therefore valid.

4.6 Structural Equation Modelling

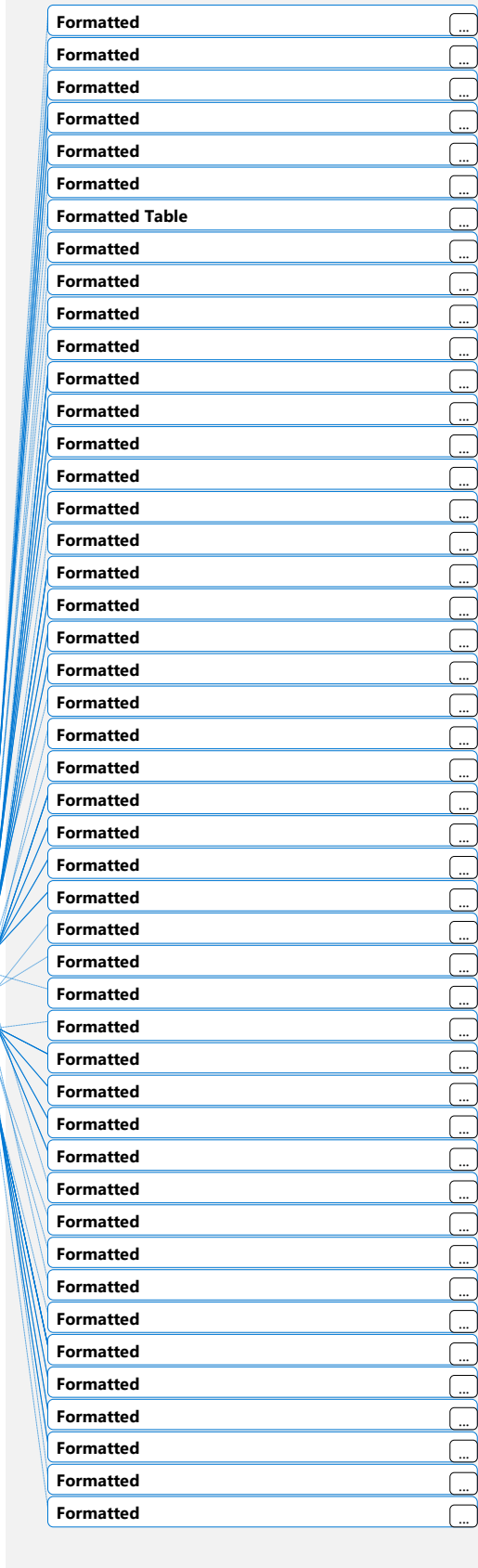
The model for this study is tested using Structural Equation Modelling (SEM), specifically PLS-SEM. SEM is a statistical method used to analyse complex relationships between variables. It is a multivariate analysis technique that involves the measurement of latent constructs or variables (i.e., constructs that cannot be directly observed or measured) by using observed variables or indicators. Table 4.9 presents the results from the SEM analyses.

Table 4.9 Structural Equation Model

Path	Path Coefficients	T-statistics	P-values
Direct Effects			
SSCM → SP	0.097	0.971	0.331
SSCM → DC	0.514	12.916	0.00
DC → SP	0.321	3.899	0.00
Moderation Effect			
SSCM × SCRES → SP	0.066	1.185	0.236
Indirect Effect			
SSCM → DC → SP	0.165	3.481	0.01

Source: Field study (2023) **Note:** SSCM (Sustainable Supply Chain Management); SCRES (Supply Chain Resilience); DC (Dynamic Capability); SP (Sustainability Performance)

A structural equation model was used to examine the links between sustainable supply chain management, dynamic capability, supply chain resilience, and sustainability performance. The findings are shown in Table 4.10. The findings demonstrate that while



sustainable supply chain management improves sustainability performance, the impact is not substantial. The path coefficient values, specifically $\beta = 0.097$, $t = 0.971$, and $p > 0.05$, show that there is no evidence for the link since the t-value is below the cutoff of 1.96. Additionally, the p-value is higher than 0.01, indicating that H1, the hypothesis that sustainable supply chain management positively and substantially influences sustainability performance, is not supported.

The chart indicates that a positive and substantial association between dynamic capacity and sustainable supply chain management was discovered using the structural equation model. According to the coefficient values of $\beta = 0.514$, $t = 12.916$, and $p = 0.01$, sustainable supply chain management significantly and favorably affects dynamic capability. More specifically, dynamic capability rises by 0.514 units for every unit increase in sustainable supply chain management. The association between dynamic capacity and sustainable supply chain management is supported by the fact that the relationship's statistical significance (t-value) of 12.916, which is higher than the 1.96 cutoff, is statistically significant.

The table also implies that a positive and substantial association between dynamic capacity and sustainability performance was discovered using the structural equation model. According to the coefficient values of $\beta = 0.321$, $t = 3.899$, and $p = 0.01$, dynamic capacity significantly and favorably affects sustainability performance. Specifically, sustainability performance rises by 0.321 units for every unit increase in dynamic capacity. The association between dynamic capacity and sustainability performance is supported by the fact that the relationship's statistical significance (t-value) of 3.899, which is higher than the 1.96 cutoff, indicates that there is a connection.

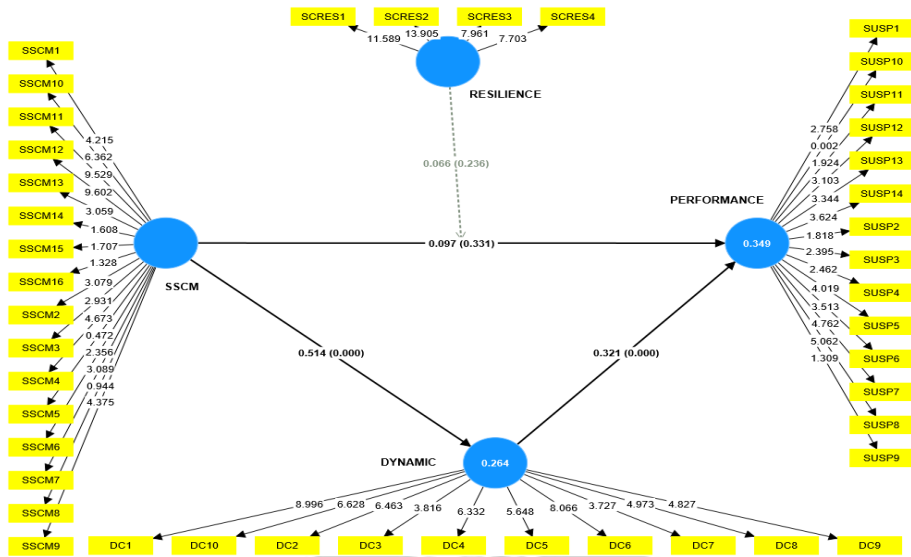
Additionally, the table indicates that the structural equation model did not uncover evidence to support the claim that supply chain resilience substantially and favorably moderates the association between sustainable supply chain management practices and sustainability performance. The interaction between supply chain resilience and sustainable supply chain management has a positive but minor impact on sustainability performance, according to the coefficient findings of $\beta = .066$, $t = 1.185$, and $p > .05$. The hypothesis that supply chain resilience significantly and positively moderates the relationship between sustainable supply chain management practices and sustainability performance is not supported by the fact that the relationship's t-value of 1.185 is less than the threshold value of 1.96, which denotes that the relationship is not statistically significant. Additionally, a p-value larger than 0.05 means that the result is not statistically significant and that the hypothesis is not supported.

According to the table, the structural equation model revealed evidence to support the claim that dynamic capacity mediates the link between sustainable supply chain management practices and sustainability performance in a positive and substantial way. Dynamic capacity has a positive complete mediation impact on the link between sustainable supply chain management and sustainability performance, according to the coefficient findings of $\beta = .165$, $t = 3.481$, and $p < .05$. The hypothesis that dynamic capability positively and significantly mediates the relationship between sustainable supply chain management practices and sustainability performance is strongly supported by the t-value of 3.481, which is far greater than the 1.96 threshold and indicates that the relationship is statistically significant. Additionally, the hypothesis is supported by the statistical significance of the finding and the p-value of less than 0.05.

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Figure 4.1 Structural Equation Model



Source: Field study (2023)

Table 4.10 Hypotheses Table

Hypotheses	Path Analysis	Expected effect	Results	Conclusion
H1	SSCM → SP	Positive and significant	.097 (p > 0.05)	Not Supported
H2	SSCM × SCRES → SP	Positive and significant	.066 (p > 0.05)	Not Supported
H3	SSCM → DC → SP	Positive and significant	.165 (p < .05)	Supported

Source: Field study (2023)

Note: SSCM (Sustainable Supply Chain Management); SCRES (Supply Chain Resilience);

DC (Dynamic Capability); SP (Sustainability Performance)

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Table 4.10 Hypotheses Table

Hypotheses	Path Analysis	Expected-effect	Results	Conclusion
H1	SSCM → SP	Positive and significant	.097 (p > 0.05)	Not Supported
H2	SSCM × SCRES → SP	Positive and significant	.066 (p > 0.05)	Not Supported
H3	SSCM → DC → SP	Positive and significant	.165 (p < .05)	Supported

Source: Field study (2023) Note: SSCM (Sustainable Supply Chain Management); SCRES (Supply Chain Resilience); DC (Dynamic Capability); SP (Sustainability Performance)

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4.7 Discussion of Results

This section discusses the results from the regression analysis in light of the literature reviewed

4.7.1 Sustainable Supply Chain Management and Sustainability Performance

The study revealed a positive and insignificant effect of Sustainable Supply Chain Management on Sustainability Performance, given the path coefficient results: $\beta = .097$, $t = .971$, and $p > .05$. This is inconsistent with the literature reviewed. According to the RBV theory, enterprises may use their resources to generate distinctive organisational skills that their rivals cannot replicate (Barney, 2020). According to the RBV literature, skills may be developed via intricate interactions between the firm's resources (Barney and Mackey, 2016). Such resources may serve as the foundation for improved supply chain performance. Sustainable supply chain management may be harnessed and applied in novel ways to improve supply chain performance. In this research, the RBV is presented to define how the many elements of sustainable supply chain management as a core and distinctive organisational capability improve their sustainability performance. As a result, this research contends that there is a

favourable association between sustainable procurement and supply chain performance. The reason is that there is compelling evidence that sustainable supply chain management improves performance. While some studies find that sustainable supply chain management practices positively affect performance (e.g., Narimissa et al., 2020a, 2020b; Sajjad et al., 2015) other studies report that it positively impacts performance indirectly (e.g., Koberg and Longoni, 2019; Saeed and Kersten, 2019). Still, other studies find that the relationship between these concepts is either negative (e.g., Busse et al., 2017; Matthews et al., 2016) or non-significant relationship (e.g., Mathivathanan et al., 2018; Touboulic and Walker, 2015).

4.7.2 Moderation effect of Supply Chain Resilience

Path coefficient estimates of $\beta = 0.066$, $t = 1.185$, and $p > .05$ indicated a positive but negligible impact of the interaction between sustainable supply chain management and supply chain resilience on sustainability performance. This finding is also at odds with the analyzed literature. It has been argued that supply chain resilience is crucial in encouraging businesses to participate in environmental management programs and attaining sustainable development because it helps businesses bounce back from the effects of supply chain environmental accidents and difficulties (Gunasekaran et al., 2015). Therefore, businesses may strengthen their supply chain's resilience while also improving their environmental performance via the use of environmental management techniques and green technology (Mandal et al., 2016; Pettit et al., 2019). According to RBV, in order for businesses to achieve sustainable growth, they must gradually amass resources and competencies over time. Building supply chain resilience is seen as a good way to develop skills that stand out and are focused on the future (Ji et al., 2020). A highly resilient supply chain might mean that a company works hard to change its manufacturing and operational procedures in order to lessen the environmental effect of its goods and services (Juan et al., 2022). Therefore, strengthening supply chain resilience is

expected to lead to better environmental performance. By reducing waste and enhancing the effectiveness with which resources are used, businesses may increase the environmental advantages of their supply chains (Abeysekara et al., 2019). High-resilience businesses have a lower environmental impact because they reduce pollution, boost output, and maximize resource efficiency (Thaiprayoon et al., 2019). Sustainability performance may be influenced less by sustainable supply chain management strategies if the supply chain is resilient.

4.7.3 Mediation effect of Dynamic Capability

The study also revealed a positive full mediation effect of dynamic capability on the relationship between sustainable supply chain management and sustainability performance, given the path coefficient results of $\beta = .165$, $t = 3.481$, and $p < .05$. This is consistent with the literature reviewed. The Resource-based view explains that some organisational resources could be tangible or intangible (dynamic capability). However, such company resources must be unique so firms can utilise them efficiently to achieve growth and development. Also, differences in sustainability performances are attributed to differences in their resources and capabilities (dynamic capability). This study proposes dynamic capability as an important intangible resource that could enhance a firm's supply chain management practices. There is strong evidence to show a close relationship between supply chain management practices and dynamic capabilities. SSCM practices would bring a short-term competitive advantage, boosting the further development of dynamic capability (Kaur and Mehta, 2017).

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CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The chapter summarizes the research outcomes, draws conclusions, provides suggestions, and identifies potential research avenues for the future.

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5.2 Summary of Findings

The study's key findings are summarised in this section.

The study revealed that the extent of sustainable supply chain management amongst firms operating within the Greater Accra region is high, given a composite mean of 4.665 and standard deviation of 0.501.

The study also revealed that supply chain resilience of firms operating in the Greater Accra Region is very high giving a composite mean score of 5.166 and standard deviation of 0.741.

The study also revealed that firms operating within the Greater Accra region of Ghana have high dynamic capabilities, given a composite mean of 4.821 and standard deviation of 0.638.

The study revealed a strong sustainability performance of firms operating within the Greater Accra region given a composite mean of 4.014 and standard deviation of 0.56

The results also show that although sustainable supply chain management has a positive effect on sustainability performance, the effect is not significant. The path coefficient results, specifically $\beta = .097$, $t = .971$, and $p > .05$, indicate that the t-value is below the 1.96 thresholds, which means that there is no support for the relationship

The study's finding also suggests that supply chain resilience does not positively and significantly moderates the relationship between sustainable supply chain management practices and sustainability performance. The coefficient results of $\beta = .066$, $t = 1.185$, and $p > .05$ indicate a positive but insignificant effect of the interaction between sustainable supply chain management and supply chain resilience on sustainability performance

The study's findings also suggests that dynamic capability positively and significantly mediates the relationship between sustainable supply chain management practices and sustainability performance. The coefficient results of $\beta = .165$, $t = 3.481$, and $p < .05$ indicate a positive full mediation effect of dynamic capability on the relationship between sustainable supply chain management and sustainability performance.

5.3 Conclusion

Improved sustainability performance and increased competitiveness depend on sustainable supply chain management. However, there is no clear correlation between the performance of sustainability and sustainable supply chain management strategies. The many performance metrics used to gauge sustainability success are somewhat to blame for this. Furthermore, a strong supply chain management strategy that takes supply chain resilience and dynamic capacities into account is needed for the implementation of sustainable supply chain management. In order to enhance a company's sustainable supply chain management practices,

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supply chain resilience is crucial, and dynamic capabilities are required to develop new skills that will boost long-term sustainable efficiency. Therefore, using the Resource-based View Theory as the theoretical underpinning, this research investigated the impact of supply chain resilience and dynamic capacities on the link between sustainable supply chain management and sustainability performance. By creating a research model that explores the moderating and mediating roles of supply chain resilience and dynamic capacities in the link between sustainable supply chain management practices and sustainability performance, the study aims to add to the body of current knowledge. The research has important ramifications for theory as well as practice since it will aid businesses in creating solid supply chain management plans that take supply chain resilience and dynamic capacities into account in order to improve sustainable performance.

5.4 Recommendations

The researcher, based on the findings of the study, makes the following recommendations

5.4.1 Recommendations for Managers

First, given the significant positive impact of dynamic capability on sustainability performance, businesses should prioritize the development of dynamic capabilities. This could include investing in employee training, encouraging cross-functional collaboration, and adopting agile processes that enable quick adaptation to changing circumstances. By building dynamic

capabilities, businesses can enhance their ability to respond to challenges and pursue sustainable practices.

Sustainable supply chain management strategies must still be given top priority by firms even if the research revealed no direct, meaningful impact on sustainability performance. This can include implementing environmentally friendly purchasing methods, cutting down on waste and emissions, and fostering social responsibility. Businesses may achieve this by developing a sustainable supply chain, which will eventually result in improved sustainability performance.

The research discovered that the association between sustainable supply chain management techniques and sustainability performance is mediated by dynamic capabilities. As a result, enterprises should emphasize the development of dynamic capacity as a method of attaining sustainable performance. It is vital for organizations to regularly measure and monitor supply chain resilience even if the research did not find a significant moderating influence of supply chain resilience on the link between sustainable supply chain management practices and sustainability performance. This can include doing routine risk analyses, including redundancy in the supply chain, and creating backup plans. Businesses may improve sustainability performance by doing this by ensuring that their supply chain is robust and capable of withstanding interruptions.

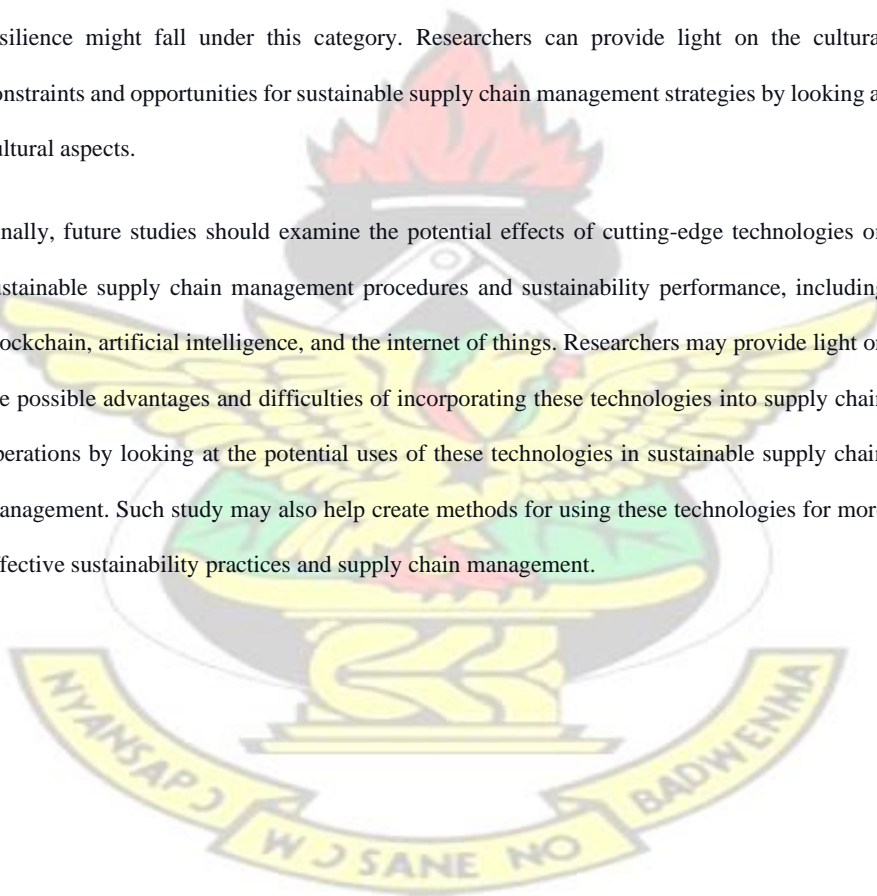
5.4.2 Suggestions for Future Research

Future studies should examine the possible moderating effects of external variables on the link between sustainable supply chain management techniques and sustainability performance, including governmental legislation, industry standards, and stakeholder pressure. Researchers may get insights into the larger environment in which sustainable supply chain management

strategies work and how these elements can affect the efficacy of sustainability performance results by analyzing the influence of external factors.

Examining the effects of cultural elements on sustainable supply chain management practices and sustainability performance is another possible area for future study. Investigating how cultural values and norms impact the adoption of sustainable supply chain management methods as well as how they ~~effect~~affect the growth of dynamic capacities and supply chain resilience might fall under this category. Researchers can provide light on the cultural constraints and opportunities for sustainable supply chain management strategies by looking at cultural aspects.

Finally, future studies should examine the potential effects of cutting-edge technologies on sustainable supply chain management procedures and sustainability performance, including blockchain, artificial intelligence, and the internet of things. Researchers may provide light on the possible advantages and difficulties of incorporating these technologies into supply chain operations by looking at the potential uses of these technologies in sustainable supply chain management. Such study may also help create methods for using these technologies for more effective sustainability practices and supply chain management.



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APPENDIX A

SURVEY QUESTIONNAIRE

Dear respondent,

I am a student at Kwame Nkrumah University of Science and Technology's School of Business, Department of Supply Chain and Information Systems. I am working on a research project titled "SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICES AND SUSTAINABILITY PERFORMANCE: THE ROLE OF SUPPLY CHAIN RESILIENCE AND DYNAMIC CAPABILITES." Your answers are needed for the researcher to accomplish the study's objectives. Any information provided would be handled with the greatest discretion.

SECTION A: RESPONDENTS' DEMOGRAPHIC INFORMATION

Please respond to the following questions about yourself by checking the relevant boxes.

(1) How long has your company been in operation?

- 1-5 6-10 11-15 above 15 years

(2) Respondents' gender

- Male Female

(3) Respondents' age

- Below 20 years 20-29years 30-39 years 40-50years Above 50years

(4) Respondent's highest level of education

- HND 1st degree Masters PHD Professional Others

(5) Respondent's working experience with the firm

- 1-5 years 6-10 years 11-15 years above 15 years



SECTION B: SUSTAINABLE SUPPLY CHAIN MANAGEMENT PRACTICES

The following assertions are relevant to your company's Sustainable Supply Chain Management Practices. Indicate your agreement or disagreement with the following statement using a seven-Likert scale of 1=strongly disagree and 7=strongly agree.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree
Sustainable product design						
When designing products, we pay attention to reduced consumption of material/energy						
When designing products, we pay attention to reuse, recycle, and/or recovery of material						

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We design our products to use environmentally friendly materials							
We design our products with standardized components to facilitate reuse							
We use life cycle analysis to evaluate the environmental impacts of our products							
Sustainable process design	1	2	3	4	5	6	7
The design of our processes is heavily dependent on sustainability goals							
We evaluate our existing processes to reduce their impact on the environment							
We have formal design for environment guidelines for process design							
We constantly reengineer our processes to reduce their environmental impact							
We improve the environmental-friendliness of our production							
Supply-side sustainability collaboration	1	2	3	4	5	6	7
We cooperate with our suppliers to achieve sustainability objectives							
We provide our suppliers with sustainability requirements for their processes							
We collaborate with our suppliers to provide products and/or services that support our sustainability goals							
We develop a mutual understanding of responsibilities regarding sustainability performance with our suppliers							
We conduct joint planning to anticipate and resolve sustainability-related problems with our suppliers							
Demand-side sustainability collaboration	1	2	3	4	5	6	7
We cooperate with our customers to achieve sustainability objectives							
We cooperate with our customers to improve their sustainability initiatives							
We collaborate with our customers to provide products and/or services that support our sustainability goals							
We develop a mutual understanding of responsibilities regarding sustainability performance with our customers							
We conduct joint planning to anticipate and resolve sustainability-related problems with our customers							

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Source: Paulraj et al. (2017)

SECTION C: SUPPLY CHAIN RESILIENCE

The following assertions are relevant to your company's Supply Chain Resilience. Indicate your agreement or disagreement with the following statement using a seven-Likert scale of 1=strongly disagree and 7=strongly agree.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree							
Proactive Dimension Supply Chain Resilience							1	2	3	4	5	6	7
<i>During crisis.....</i>													
1. Operations would be able to continue.													
2. We would still be able to meet customer demand.													
3. Our performance would not deviate significantly from targets.													
4. The supply chain would still be able to carry out its regular functions.													
Reactive dimension of supply chain resilience													
<i>During crisis.....</i>													
5. We are able to adapt to the environmental problem occurred in the supply chain easily.													
6. We are able to provide a quick response to the environmental problem occurred in the supply chain.													
7. We are able to cope with changes brought by the environmental problem occurred in the supply chain.													
8. We are able to recover normal operating performance easily.													

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Source: Ji et al. (2020)

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SECTION D: DYNAMIC CAPABILITES

The following assertions are relevant to your company's dynamic capabilities. Indicate your agreement or disagreement with the following statement using a seven-Likert scale of 1=strongly disagree and 7=strongly agree.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree
Strategic sense-making capacity						
Timely decision-making capacity						
Change implementation capacity						

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We can efficiently improve strategic change implementation									
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Source: Li and Liu (2014)



SECTION E: SUSTAINABILITY PERFORMANCE

The following assertions are relevant to your company's sustainability performance. Indicate your agreement or disagreement with the following statement using a seven-Likert scale of 1=strongly disagree and 7=strongly agree.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree									
<i>Economic Dimension</i>							1	2	3	4	5	6	7	Formatted: Line spacing: single	
Improvement in market share															Formatted: Line spacing: single
Improvement in profit															Formatted: Line spacing: single
Reducing environmental damage caused by the accident															Formatted: Line spacing: single
Improvement in return on assets															Formatted: Line spacing: single
Improvement in return on sales															Formatted: Line spacing: single
<i>Social Dimension</i>							1	2	3	4	5	6	7	Formatted: Line spacing: single	
Reduction in the impacts and risks to general public															Formatted: Line spacing: single
Improvement in occupational health and safety of employees															Formatted: Line spacing: single
Improvement in firm's social reputation															Formatted: Line spacing: single
Improvement in firm's image in the eyes of customers															Formatted: Line spacing: single
Improvement in product image															Formatted: Line spacing: single
<i>Environmental Dimension</i>							1	2	3	4	5	6	7	Formatted: Line spacing: single	
Reduction in air emission/waste water/solid waste															Formatted: Line spacing: single
Decrease in consumption of hazardous/harmful/toxic materials															Formatted: Line spacing: single
Reduction in energy consumption															Formatted: Line spacing: single
Decrease in frequency for environmental accidents															Formatted: Line spacing: single

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Improvement in the compliance to environmental standards

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Source: Wang and Dai (2018)

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