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Asante-Darko, Disraeli

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Sustainable Supply Chain Management and Firm Performance in Ghana: Examining the Mediating and Moderating Factors

by

Disraeli Asante-Darko

Student No: 2330350

A thesis submitted to the Faculty of Commerce, Law, and Management, The University of the Witwatersrand, in partial fulfilment of the requirements for the degree of PhD in Management.

Supervisor: Dr Fanny Saruchera

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ABSTRACT

In the wake of increasing environmental degradation and human rights violations and their effect on firm performance in Ghana and the rest of the world, sustainable supply chain management has increasingly become recognised as a critical component for business advancement and competitiveness. Subsequently, this study sought to investigate the role of Supply Chain Integration, Firm Capabilities, Business Environment Uncertainty, and Operational Competitiveness in the inextricable relationship between Sustainable Supply Chain Management (SSCM) and firm performance. Drawing on the political economy theory, an integration of institutional, legitimacy, and stakeholder theories, this study proposed and tested a model using the PLS variance-based structural equation modelling. The proposed model suggested that the relationship between sustainable supply chain management and firm performance, from a triple bottom line (TBL) perspective, is mediated by firm capabilities and supply chain integration and moderated by business environment uncertainty and operational competitiveness. Grounded in deductive reasoning and a probabilistic sampling technique, the study adopted a cross-sectional quantitative approach to evaluate the proposed model. Data was collected from the managers of 455 sample firms in Ghana's service and industrial sectors using a self-administered questionnaire. From a TBL perspective, the study revealed a direct, positive, and significant relationship between sustainable supply chain management and firm performance. Additionally, firm capabilities mediate the relationship between sustainable supply chain management and firm performance from a TBL standpoint. Supplier integration, a component of supply chain integration, was also found to mediate the relationship between economic and environmental supply chain management and firm performance but not the relationship between social supply chain management and firm performance. It further emerged that customer and internal integration mediate the relationship between sustainable supply chain management and firm performance. Finally, the study discovered that when business environment uncertainty and operational competitiveness are high, the positive direct effect of sustainable supply chain management on firm performance (from a TBL standpoint) is strengthened. The study's findings provide a plausible explanation for the disparate and often contradictory results reported on the direct sustainable supply chain management-firm performance relationship. The theoretical implication is that multiple variables and elements account for the SSCM-firm performance relationship. There is a need to adequately address these factors to realise the full benefits of sustainable supply chain management and firm relationships from a TBL perspective. SSCM practitioners and policymakers are advised to take cognisance of the role of supply chain integration, firm capabilities, business environment uncertainty, and operational competitiveness in their implementation and legislation of SSCM practices.

Keywords: Sustainable supply chain management, Firm performance, Supply chain Integration, Business environment uncertainty, Operational competitiveness, Firm capabilities, Ghana

DEDICATION

I dedicate this thesis to God, my family, and friends to appreciate their support, encouragement, and love.

DECLARATION

I, **Disraeli Asante- Darko**, declare that the study entitled "Sustainable Supply Chain Management and Firm Performance in Ghana: Examining the Mediating and Moderating Factors" is my own work. It is submitted in fulfilment of the requirements for the award of the Degree of Philosophy in Management at the Wits Business School, University of Witwatersrand, Johannesburg, South Africa. It has not been submitted for examination or any degree in any other university. I further declare that I have appropriately acknowledged all sources of information used in this study.

Disraeli Asante-Darko

Signed at ……

On the …14th …. day of March 2022

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LIST OF ABBREVIATIONS AND ACRONYMS

AVE	Average Variance Extracted
BEUC	Business Environment Uncertainty
CA	Cronbach Alpha
CFA	Confirmatory Factor Analysis
CI	Customer Integration
CMB	Common Method Bias
CR	Composite Reliability
EBIT	Earnings Before Interest and Taxes
ECSCM	Economic Supply Chain Management
EFA	Exploratory Factor Analysis
EM	Expectation- Maximization Algorithm
ENSCM	Environmental Supply Chain Management
FC	Firm Capabilities
FRP	Firm Performance
GRA	Ghana Revenue Authority
GSS	Ghana Statistical Service
II	Internal Integration
IT	Institutional Theory
LT	legitimacy Theory
MS	Market Share
OPCC	Operational Competitiveness
OVP	Overall Profitability
PCA	Principal Component Analysis
PLS	Partial Least Square
REST	Regression Equation Specification Error Test
ROE	Return on Equity
ROIC	Return on Invested Capital
SAI	Increase in Sales
SC	Supply Chain

SCI	Supply Chain Integration
SCM	Supply Chain Management
SCSCM	Social Supply Chain Management
SD	Standard Deviation
SD	Sustainable Development
SEM	Structural Equation Modelling
SI	Supplier Integration
SLR	Systematic Literature Review
SSCM	Sustainable Supply Chain Management
ST	Stakeholder Theory
VIF	Variance Inflator Factor

CHAPTER ONE

GENERAL INTRODUCTION

1.0 INTRODUCTION

The concepts of sustainable supply chain management (SSCM) and firm performance are deliberated in this chapter. The essence of this chapter is to give a broad overview of sustainable supply chain management (SSCM) and how it affects firm performance from a financial standpoint. This chapter discusses the research background that serves as a foundation for the study, the problem statement that identifies the research gap that needs to be filled, the research objectives that define the study's purpose, the study rationale that discusses the study's justifications, and the study delimitations.

1.1 BACKGROUND

Over the last decade, sustainability and its related activities have been identified as one of the essential components of business development and advancement (Alkahtani et al., 2021; Kassaneh et al., 2021; Luthra & Mangla, 2018; Trivellas et al., 2020; Zimon, Tyan & Sroufe, 2020). According to the Brundtland report (1987, p. 43), the concept of sustainability is known as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This definition has encouraged collaboration among many governments, investors, customers, and stakeholders from various organisations in determining and establishing best practices for business sustainability worldwide(Nave, Ana & Mário Franco, 2019). The adoption of sustainable practices and their underlying principles has not only led to significant innovation, financial gains, and improved livelihoods but has also ensured that organisations are committed to environmental conservation and social development regardless of the economic profitability of their operations (Gualandris, Klassen, Vachon & Kalchschmidt, 2015; Roy, Silvestre & Singh, 2020).

Over the past four decades, efforts to achieve global sustainability in the industry and the corporate world have been against a backdrop of formidable challenges such as climate change, global warming, high resource consumption and persistent fears of depletion of natural resources (Arslan

et al., 2021; Grydehøj, Adam & Ilan Kelman, 2017). In acknowledgement of the reality that sustainability and its related practices are to be at the heart of all business operations (Dutta, 2019; Luthra & Mangla, 2018; Neri et al., 2021; Shittu, 2020), practitioners are compelled to experiment with or resort to several approaches to attaining sustainability, all of which are minded to take into account the triple bottom line (TBL) approach (Carter & Rogers, 2008; Elkington, 1998). The triple bottom line approach seeks to ensure that firms concurrently balance their operational activities from a social, environmental, and economic standpoint (Ansoff, Kipley, Lewis, Helm-Stevens & Ansoff, 2018; Arqawi, Zaid, Jaaron, Hila, Shobaki & Abu-Naser, 2019; Lehtonen, 2004; Massa, Tucci & Afuah, 2017; Mori & Christodoulou, 2012).

The longstanding challenge of organisations concerning the attainment of global sustainability remains how firm sustainability and performance can be optimally balanced with sound supply chain management (GreenBiz, 2018; Zeng et al., 2017). The effective integration of sustainable practices into the supply chain operations of organisations remains the embodiment of SSCM practices (Chkanikova & Sroufe, 2021; Rajeev, Pati, Padhi & Govindan, 2017; Seuring, Sarkis, Müller & Rao, 2008). SSCM delves into and characterises the relationship between supply chain participants and the effects of their actions on society, the economy, and the environment at large (Barbosa-Póvoa, Silva & Carvalho, 2018; Carter & Washispack, 2018; Reefke & Sundaram, 2017; Sánchez-Flores, Cruz-Sotelo, Ojeda-Benitez & Ramírez-Barreto, 2020).

Despite the increasing attention given to SSCM, most SSCM research and models focus on the implications of such responsible practices rather than the antecedents or motivations for such practices (Eltantawy et al., 2015). The few studies that have examined corporate motivations have been predominantly qualitative, with few large-scale empirical analyses (Paulraj et al., 2017). In addition to these, qualitative explorations have sought to bring to bear the fundamental driving forces behind SSCM practices. Also, there have been studies that have sought to develop a semantic model of SSCM based on an in-depth analysis of literature involving specific case studies (Ali, Kaur, Ersöz, Altaf, Basu & Weber, 2020; Ahi & Searcy, 2015; Gold et al., 2013; Govindan, Rajeev, Padhi & Pati, 2020; Hong, Zhang & Ding, 2018; Kitsis & Chen, 2019; Luthra & Mangla, 2018; Mathivathanan, Kannan & Haq, 2018; Wang & Dai, 2018; Winter & Knemeyer, 2013; Zhao, Li & Song, 2019).

Whether theoretical, conceptual, or empirical, these studies, mostly conducted in developed economies, have confirmed and, in most cases, demonstrated to a large extent the presumed or inferred positive relationship between SSCM practices and firm performance, with a few exceptions. For instance, Esfahbodi, Zhang, Watson, and Zhang (2017) found that implementing SSCM practices does not always improve economic performance. Wang, Zhang, and Goh (2018) found that SSCM practices for medium and small-sized businesses do not improve financial performance, and Davis-Sramek et al. (2018), whose study indicated that business performance (economic objective) remained a major concern for any organisation to adopt SSCM activities, as it is believed that business performance is negatively associated with the achievement of SSCM objectives.

This means that, whether the study focused on the integrated approach of SSCM thus, the TBL standpoint or approached the question through an exploration of the individual components of SSCM (i.e., the environmental, social, and economic supply chain management), the findings have generally suggested a positive effect of SSCM on performance with rather few opposing views. With this, it can be suggested that the successful implementation of SSCM practices would most often than not contribute significantly to improving a firm's performance.

Thus, the question that must be addressed now is what mechanisms define the SSCM practices and firm performance relationship, particularly from a global supply chain standpoint considering a TBL perspective. This question of what mechanism influences SSCM practices and firm performance relationship from a TBL approach, either directly or indirectly (via mediating and moderating variables), remain unclear (Bendul, Rosca & Pivovarova, 2017; Subramanian, Alexiou, Steele & Tolani, 2020; Wang & Dia, 2018). This critical gap in literature needs to be filled and understood to create a better appreciation of SSCM practices to ensure the long-term viability of organisations and the sustainability of firms and the globe at large.

Various attempts have been made in the literature to fill this crucial gap (Ahi & Searcy, 2015; Beske & Seuring, 2014; Carter & Easton, 2011; Hong et al., 2018; Kitsis & Chen, 2019; Luthra & Mangla, 2018; Mathivathanan et al., 2018; Wang & Dai, 2018; Zhao, Li & Song, 2019). However, pertinent among these attempts is the relative conceptualisation of the relationship between SSCM practices and firm performance. This conceptualisation has resulted in the use of various theories, including contingency, relational, legitimacy, resource-based view, stakeholder, dynamic

capability and institutional theories. In the stakeholder theory, the different stakeholders of the firm are identified, along with their associated interest, as it relates to SSCM practices, to ensure that the focal firm understands what is required of them and how best to achieve them.

The institutional theory explains that the effective implementation of SSCM practices depends on understanding the social system, such as the authoritative bodies and agencies, and their role in SSCM practices (Chowdhury & Quaddus, 2021; Saenz, Koufteros, Touboulic & Walker, 2015). The legitimacy theory seeks to explain the license that stakeholders provide institutions when the practices of the institutions appeal to the demands of these stakeholders. Stakeholders have driven sustainability practices, and firms have been forced to obey the request of these stakeholders in order to get the licence to operate in their various communities (Laosirihongthong et al., 2021)

In these diverse but varied implementations of theory and its related methodologies, it can be inferred that understanding of how SSCM practices affect firm performance, particularly from a financial standpoint, is broad, complex and uncertain from the global point of view of supply chains due to the many mediums that account for the relationship.

In these diverse applications of theory to SSCM, many possible variables (Formentini, 2021; Hartmann, 2021; Jermsittiparsert, Joemsittiprasert & Phonwattana, 2019; Kitsis & Chen, 2019; Qorri, Gashi & Kraslawski, 2020; Shahid, Waseem, Khan, Waseem, Hasheem & Shi, 2020; Wang et al., 2018; Wang, Yang & Qu, 2020) have been suggested in the literature as channels to improve our understanding of the possible mechanism that defines the relationship between SSCM practices and firm performance (Biswal, Muduli, Satapathy & Tripathy, 2018; Das, 2018; Islam et al., 2020). However, the recurring concerns about sustainability events in supply chains reveal that global supply chain firms continue to fail to improve their social, environmental, and economic performance (Khan, Zkik, Belhadi & Kamble, 2021; Koberg & Longoni, 2019; Müller & Voigt, 2018). Observations of numerous disruptions to global supply chains, such as the most recent COVID-19 pandemic, agree with the literature's assertion that additional factors such as supply chain integration, firm capability, business environment uncertainty, and operational competitiveness should be investigated in the inferred relationship between SSCM and firm performance, particularly because these variables have been shown to influence a firm's knowledge and abilities, which allow it to translate its existing resources into exceptional performance (Klymenko & Halse, 2021; Magableh, 2021; Sharma, Luthra, Joshi, & Kumar, 2020). The distinct

role of supply chain integration, which explores the dynamic relationships between a company (internal stakeholders), its suppliers and customers, must also be considered. This relationship may provide an opportunity to understand the complex relationship between SSCM practices and firm performance. Businesses seeking to be competitive and stay ahead of their competitors, specifically in consumer-driven markets, often suggest that operational competitiveness, which is a crucial driver of firm performance in global supply chain literature, could enhance our understanding of SSCM practices and firm performance (Das, 2018). Moreover, recognising the immediate environment of a focal firm and its dynamic nature known as business environment uncertainty, which is a global phenomenon in supply chain management and seeks to elucidate the nature of the relationship between companies and their environment, may also contribute some understanding to the inferred relationship between SSCM practices and firm performance (Farndale & Paauwe, 2018).

Thus, to extensively address the *how* questions which remains a critical void in the SSCM literature, this study seeks to examine the role of some mediators and moderators from a TBL approach in understanding the generally inferred positive relationships between SSCM practices and firm performance from a global standpoint using data from a developing country such as Ghana. Ghana provides an intriguing and one-of-a-kind setting for the subject matter in a variety of ways. Ghana, as a developing country, is confronted with a number of environmental issues as a result of its reliance on the traditional linear business model (Kwarteng et al., 2021). Despite widespread environmental challenges, Ghana has been recognised as one of the few Sub-Saharan African countries committed to overcoming these obstacles through the advancement and achievement of the Sustainable Development Goals, which include sustainable supply chain management. Because of the country's commitment to the SDGs, it is critical to investigate the impact of SSCM practices on firm performance, as well as the accompanying mechanisms that aid in establishing this relationship, in order to improve the country's understanding of its long-term development goals.

1.2 RESEARCH PROBLEM

Supply chains face rising threats due to globalisation, unpredictable financial markets, and high product and service sophistication (Wilding, Wagner, Ashby, Leat & Hudson-Smith, 2012; Zhu & He, 2017). Notably, the globalisation of supply chains has resulted in the need to understand the effect of their operations from a social, economic, and environmental standpoint, otherwise known as sustainable supply chain management. The strategic importance of SSCM practices to global sustainability, particularly from the perspective of TBL (i.e., social, economic, and environmental), has led to a plethora of studies across a wide range of industries (Ahi & Searcy, 2015; Formentini, 2021; Hartmann, 2021), geographical settings (Hong et al., 2018; Jermsittiparsert et al., 2019; Shahid et al., 2020; Wang et al., 2018), using different theories (Kitsis & Chen, 2019; Touboulic & Walker, 2015; Zimon et al., 2019) and methodological approaches (Beske & Seuring, 2014; Carter & Easton, 2011; Luthra & Mangla, 2018).

These studies notwithstanding, there is a call in literature to understand the various mechanisms that underscore the relationship between SSCM practices from a TBL perspective and firm performance at the strategic and operational levels (Govindan et al., 2020; Pagell & Shevchenko, 2014; Qorri et al., 2020). Thus, the issue of the call is to clearly understand the "if, when and how" the practices of SSCM affect firm performance as well as the context in which the relationship is established (Bastas & Liyanage, 2018; Carter, Hatton, Wu & Chen, 2019; Crum et al., 2011; Elbaz & Iddik, 2020; Hoejmose & Adrien-Kirby, 2012; Sarkis, Helms & Hervani, 2010; Shahid et al., 2020). This is because the sustenance of SSCM and, subsequently, its impact on firm's performance has been identified to be very complex and depends wholly on the relational capabilities of the firm as well as upon other mediating and moderating variables between the supply chain partners and stakeholders (Carter et al., 2019; Saenz et al., 2015).

Extant literature suggests that, in addressing this issue, limited attention has been paid to the call to understand the role of supply chain integration, firm capabilities, business environment uncertainty and operational competitiveness as the mechanism that explains the complex relationship between SSCM practices and firm performance (Dubey, Gunasekaran & Papadopoulos, 2017; Esfahbodi et al., 2017; Govindan et al., 2020; Hong et al., 2018; Wang et al., 2018). The lack of understanding of the role of these causal variables and their impact has resulted in the inconsistent findings associated with the study of SSCM practices and firm

performance (Elbaz & Iddik, 2020; Shahid et al., 2020). Also, recurring concerns about sustainability events in supply chains reveal that global supply chains fail to improve their social, environmental, and economic performance (Biswal et al., 2018; Das, 2018; Islam et al., 2020). This goes to reemphasise the lack of understanding of the causal mechanisms such as supply chain integration, firm capabilities, business environment uncertainty and operational competitiveness in the SSCM -firm performance relationship (Fantazy & Tipu, 2019; Hsu, Tan, Zailani & Jayaraman, 2013; Jia, Zuluaga-Cardona, Bailey & Rueda, 2018; Zimon et al., 2020).

To improve sustainable outcomes in supply chains, there is a consistent call for a more contextual assessment of the causal mechanisms of SSCM and firm performance from a developing economy perspective (Esfahbodi et al., 2016; Islam et al., 2020; Koberg & Longoni, 2019; Silvestre, 2015; Yadav, Luthra, Jakhar, Mangla & Rai, 2020). These developing countries, such as Ghana, that contribute to supply chain globalization face unique environmental, economic, and social challenges, the majority of which stem from a lack of understanding of the mechanisms that define the SSCM-FP relationship. These issues must be addressed if supply chains are to become globally sustainable (Jia, Zuluaga-Cardona, Bailey & Rueda, 2018). Exiting studies on SSCM in Ghana have focused on the environmental perspective of SSCM practices and their effect on performance (Agyabeng-Mensah et al., 2020; Famiyeh et al., 2018; Kwarteng et al., 2016; Kusi-Sarpong et al., 2016). Baah and Jin (2019) examined the overall effect of SSCM practices and the intermediary role of competitive advantage on organisational performance in the logistics sector of Ghana, and Nuertey (2015) examined the SSCM practices within the cocoa sector of Ghana and the moderating effect of supply chain improvements. It is against this backdrop that this quantitative study sought to investigate the role of mediators (i.e., supply chain integration, business capabilities) and moderators (i.e., Business Environment uncertainty, Operational Competitiveness) in examining the inextricable relationship between SSCM and firm performance utilising data from manufacturing and service firms in Ghana.

1.3 RESEARCH OBJECTIVES

The primary purpose of this study was to use integrated theories to explore the mechanism that helps link SSCM with firm performance. More specifically, the study sought to:

1. Examine the relationship between SSCM and firm performance.
2. Examine the mediating effect of supply chain integration in the relationship between SSCM and firm performance.
3. Examine the mediating effect of firm capability on the relationship between SSCM and firm performance.
4. Examine the moderating effect of business uncertainty on the relationship between SSCM and firm performance.
5. Examine the moderating effect of operational competitiveness on the relationship between SSCM and firm performance.

1.4 RESEARCH QUESTIONS

Guided by the research objectives above, the study sought to answer the following questions:

1. What is the effect of SSCM on firm performance?
2. What is the mediating effect of supply chain integration on the relationship between SSCM and firm performance?
3. What is the mediating effect of firm capability on the relationship between SSCM and firm performance?
4. What is the moderating effect of business uncertainty on the relationship between SSCM and firm performance?
5. What is the moderating effect of operational competitiveness on the relationship between SSCM and firm performance?

1.5 RATIONALE OF THE STUDY

The study sought to contribute to the literature by examining the role of Supply Integrations, Firm Capabilities, Business Environment Uncertainty, and Operational Competitiveness in defining the relationship between SSCM and Firm performance. From a theoretical perspective, the study sought to contribute by combining three theories in examining the phenomena of SSCM and firm performance. From a managerial perspective, the study sought empirical evidence to help

practising managers incorporate SSCM practices to improve their business performance. Lastly, from a policy perspective, the study sought to help policymakers develop a suitable framework that could aid in the integration of sustainable practices for effective business management. Additionally, this study aims to add to the body of academic knowledge by elucidating the nature and structure of the SSCM-Firm performance relationship.

1.6 DELIMITATIONS

This study focused on integrating three major theories (institutional theory, stakeholder theory, and legitimacy theory), collectively referred to as political economy theory. The study was further conceptually delimited to the SSCM dimension from the TBL approach (i.e., social, economic, and environment). It examines the arguments of SSCM from the emerging economy perspective. Despite the various mechanisms that may affect SSCM and firm performance, this study only examined the mediating and moderating effects of supply chain integration, firm capability, business environmental uncertainty, and operational competitiveness. The research examined firms in Ghana's manufacturing and service sectors that practiced sustainable supply chain management in the country's northern, middle, and southern belts. The study was quantitatively examined; specifically, the structural equation model was examined with the PLS-SEM statistical tool. The analysis of the data was limited to 455 responses.

1.7 STRUCTURE OF THE STUDY

The study is organised into six (6) key chapters to facilitate the accomplishment of the study's objectives, as follows:

Chapter 1: Introduction

This chapter introduces the thesis and gives a general overview or background on the topic. It also emphasises the study's problem (the gaps identified in existing literature), its aim and objectives, and research questions. The chapter also discusses the study's relevance to industry, academia, and policy, as well as its delimitations.

Chapter 2: Literature Review

The second chapter of this study was a review of the literature. In this review, the key constructs (Sustainable supply chain management (i.e., social supply chain management, Environmental supply chain management, and Economic supply chain management, Firm performance, supply

chain integration (i.e., supplier integration, customer integration, and Internal integration), firm capabilities, operational competitiveness, and business environment uncertainty) and how they have been conceptualised and linked with other constructs are discussed. Additionally, the chapter discusses the study's theoretical foundations. The political economy theory is discussed, as are its connections to the concepts under study. The hypothesis is then developed using this theoretical perspective and some empirical findings identified during the literature review. There are a total of 21 hypotheses discussed in this chapter.

Chapter 3: Research Methodology

The third (3) chapter of this study discusses the methodology. The chapter discusses the philosophical underpinnings of the study, the research design, and the sampling procedure. Additionally, it discusses the construct measures, data collection strategies, questionnaire administration procedures, data analysis, ethical concerns, and the study's context.

Chapter 4: Data Analysis and Results

The analysis and presentation of results is the focus of the fourth chapter. The chapter, in particular, provides information on descriptive statistics of the firms involved in the study, which are used to describe the respondents' and their firms' characteristics. The chapter also covers the common method and non-response bias issues and the strategies used to examine the validity and reliability of the measurement items. Finally, the analytical strategy and techniques used to test the hypothesis of the study are described.

Chapter 5: Discussions of Findings

The findings of the study are discussed in Chapter Five. The obtained results were discussed alongside other information synthesised from the existing literature to achieve the study's objectives. With this, the chapter sorts to validate or repudiate the various findings obtained from the data analysis.

Chapter 6: Summary, Conclusions and Recommendations

The sixth chapter presented a summary of the study's findings, the conclusion, and the study's theoretical and managerial implications. Finally, it discussed the study's limitations and suggested future research directions.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter discusses SSCM literature. The primary goal of this chapter is to review relevant literature and develop the conceptual framework for the research. Given the research field's multidisciplinary and interconnected nature, this chapter will focus on key theories and establish key research groups in the field to aid in the resolution of key research questions. The chapter begins with definitions of the constructs under consideration and how they are defined for the purposes of this study. The study's theoretical underpinnings are then discussed, followed by a discussion of generic themes. Following that, the hypothesis is developed, followed by the proposed conceptual model.

2.1 DEFINITION OF KEY CONCEPTS

2.1.1 Supply Chain Management (SCM)

Universally there is no recognised definition for the term "supply chain." Numerous researchers have defined supply chain from various angles (Ellram, Tate & Billington, 2004; Martinez & Mathiyazhagan, 2020; Van Hoek, 1998). A global network of institutions involved in the acquisition of goods and conversion of raw resources into intermediate products, finished goods, and final goods for end-customers is known as a supply chain or value chain (Ben-Daya, Hassini & Bahroun, 2019; Frazelle, 2002; Gibson, Mentzer & Cook, 2005; Hunka et al., 2011; Lee & Billington, 1993; Stock & Boyer, 2009). Value chains are also known as a system of organisations designed to meet end-user needs by transferring physical, information, and financial resources (Ribas, Lusa & Corominas, 2019). Value chains are composed of four processes: design, sourcing, production, and distribution. Each distribution network primarily addresses all interdependencies between suppliers and end-users.

Supply Chain Management (SCM) emerged in the 1980s as a novel integration principle aimed at centralising control over the entire material flow from suppliers to consumers. The fundamental concept of supply chains is that they are designed as a single entity with the primary goal of optimising storage and resource utilisation (Hunka et al., 2011). According to the Supply Chain

Management Professional Council, supply chain management encompasses "the planning and management of all activities relating to sourcing and procurement, conversion, and all logistics management activities" (Vitasek, 2013, p.187). For instance, Slack et al. (2010) state that SCM manages the relationships between upstream and downstream organisations that provide value to the end customer in goods and services. SCM integrates critical business activities inside and across organisations into a coherent and solid business template that comprises all logistics and manufacturing functions (Vitasek & Manrodt, 2012).

2.1.2 Sustainability Shift in Supply Chain Management

As market demand for various products increased towards the end of the 20th century, several companies experimented with risky but cost-effective manufacturing methods. Generally, these methods of production had long-term social and environmental consequences. These negative repercussions compelled stakeholders, including regulatory authorities and manufacturers, to adopt a zero-tolerance policy. As a result, the need for changes in manufacturing practices and consumption habits toward a more sustainable approach arose. The Brundtland Report, issued in 1987 by the World Commission on Environment and Development (WCED) following the Kyoto Protocol (Dehghanian & Mansour, 2009), sought to establish the necessary framework for comprehending sustainable related issues. Sustainable Development (SD), according to WCED, 1987, p. 8) is “(a) development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Since the inception of this framework, there has been a steady rise in the importance of sustainability-related research, particularly in supply chains (Joyce & Paquin, 2016).

Over the years, conventional SCM has transitioned from focusing exclusively on financial and operational issues to a concept that encompasses broader social, economic, and environmental concerns (Carter & Easton, 2011; Emmet & Sood, 2010; Sarkis, 1999). This was due to several isomorphic drivers and pressures that forced the old-fashioned supply chains of firms to be more socially and environmentally responsible, as illustrated in Figure 2.1 (Diabat & Govindan, 2011).

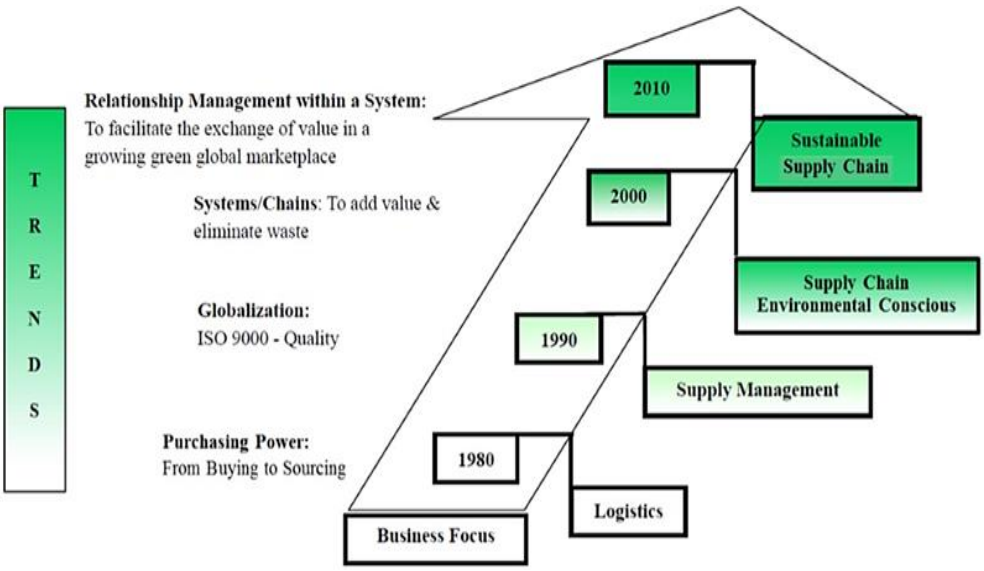


Figure 2.1: Supply Chain Sustainability evolution

Source: Gilbert (2001, p. 3)

Srivastava (2007) asserts that businesses were made eco-responsible and environmentally conscious during the late 1980's supply chain industrial revolution. There was much production during this period (Nahm & Vonderembse, 2002). The large volume of production exacerbated significant environmental problems such as acid rain and global warming due to the inefficiency of supply chains at the time (Sarkis, 2006). These grave environmental concerns compelled policymakers, consumers, and businesses to pursue a post-industrial agenda balancing high production volumes, economic growth, and environmental concerns (Carter & Easton, 2011; Nahm & Vonderembse, 1991; 2002; Nelson et al., 2012). Implementing a post-industrial agenda resulted in significant changes that laid the foundation for transitioning from traditional SCM to Sustainable SCM. As a result of this shift, traditional SCM has transitioned away from the conventional economic objectives and toward a more holistic approach that seeks to address the environmental, social, and economic issues concurrently (Emmett & Sood, 2010; Sarkis, 2010).

Natural resources also played a vital role in the transition from conventional SCM to Sustainable SCM. Organisations, particularly manufacturers, have recognised that their supply chains contain significant environmental risks, particularly in terms of natural resources (Seuring & Muller, 2008; Zhou et al., 2008). Globally, population growth continues to strain the world's resources, which are becoming increasingly scarce (Lu et al., 2007; Srivastava, 2007). To combat the depletion of natural resources, consumers have helped companies transition from conventional supply chain

strategies to sustainable supply chain strategies by increasing their appetite for more green and sustainable goods (Lewis & Gretsakis, 2001; Seuring & Muller, 2008; Sarkis et al., 2010).

As a result of increased customer demand for environmentally sustainable products and concerns about natural resource depletion, businesses have generally integrated renewable inputs into their supply chains (Lewis & Gretsakis, 2001; Seuring & Muller, 2008; Sarkis et al., 2010). With this integration, supply chain management practices have expanded to include sustainable procurement (Zaidi et al., 2019), sustainable production (Kumar et al., 2020), goods distribution (Melo, 2021), sustainable delivery (Hosseini et al., 2018), and reverse logistics (Saruchera & Asante-Darko, 2021).

Finally, sustainable strategy in SCs focuses on the three dimensions of sustainability (Sauer & Seuring, 2017; Yawar & Seuring, 2017): 1) Enhance the well-being of stakeholders and society as a whole; 2) minimise adverse environmental consequences; and 3) total profit maximisation while preserving the SC (Gopalakrishnan et al., 2012; Rajeev et al., 2017; Seuring & Muller, 2008). Organisations must strike a balance between these three dimensions in accordance with their operation field, scale, geographic region, capabilities, regulatory frameworks, cultural practices, and institutional practices (Alonso-Martinez et al., 2021; Fischer et al., 2020; Meckenstock et al., 2015; Oláh et al., 2019).

2.1.2.1 Sustainable Models and Supply Chains

The social, economic, and environmental aspects of SSCM theory can be divided into three categories. These categories, according to the literature, are interconnected and vary in complexity. The two distinct models generally demonstrate the degree of convergence between all three pillars of sustainability, namely environmental, social and economic. To depict the degree of interaction between the dimensions of sustainability, two common models have been developed. Three concentration spheres are used in the first model, dubbed the three-nested dependence model (McKenzie, 2004). Human society's economic and social aspects are depicted here as environmentally centred (McKenzie, 2004; Tang et al., 2012). This reflects the idea that our society is a wholly owned subsidiary of the environment, which determines how economic activity is conducted in society (Tang et al., 2012). For this study, the second model, known as the overlapping or TBL model, was used. (See Figure 2.2).

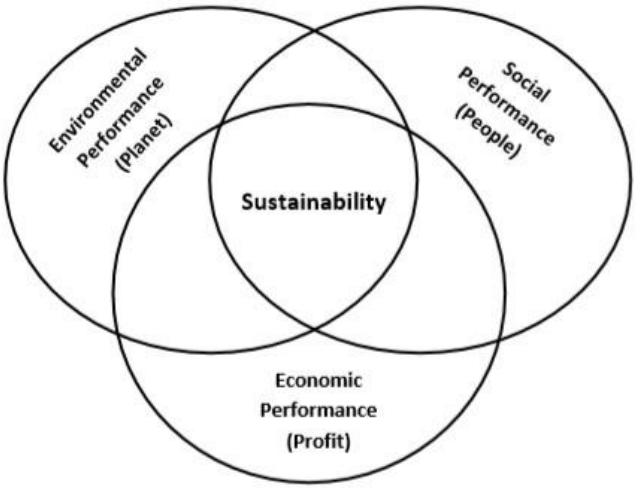


Figure 2.2: Triple bottom line (TBL) framework

Source: Carter and Rogers (2008)

TBL illustrates the convergence of environmental, social and economic factors. In this model, if any one pillar is not strong, then the system in its entirety is unsustainable. The TBL instructs managers to identify and engage in activities that improve economic well-being without compromising the social and environmental implications (Alvarez et al., 2016; Carter & Easton, 2011). SSCM is achieved when the supply chain activities from a social and environmental perspective intersect with the economic perspective of the organisation's operations (Brandenburg, Gruchmann & Oelze, 2019). Supply chain specialists and avid users have postulated that for a supply chain to keep being sustainable, all TBL dimensions must be met concurrently (Kasemsap, 2020). This is because of environmental and social effects on the people and the environment irrespective of the economic windfall (Sisco, Chom, Pruzan & Compact, 2010).

The TBL framework, in general, considers environmental, social, and economic objectives concurrently and seeks to achieve synergy across the three performance areas to increase market efficiency and ensure long-term success (Srivastava et al., 2021). In addition, this is consistent with the SSCM methodology, which integrates environmental concerns, economic issues and social factors into supply chain activities (Islam et al., 2020; Li et al., 2019). TBL activities consist of cost savings as a result of decreased waste, more efficient design for reuse; reduced safety and health costs, decreased recruitment costs, reduced turnover due to safer warehousing conditions and improved scheme of service, i.e., decreased labour costs through increased efficiency and

motivation and less absenteeism due to improved scheme of service (Carter & Easton, 2011; Laghari et al., 2013; Zimon et al., 2021). Lead times are shorter, lower disposal costs and improved quality due to the adherence to ISO 4000 standards. This has resulted in an enhanced corporate reputation making the corporation more appealing to both suppliers and customers (Kaufmann, Michel & Carter, 2008; Pantha et al., 2020).

The SSCM approach adopted, therefore, follows the TBL framework principles. In this framework, the benefit of integrating TBL principles into SSCM from a strategic perspective and its resulting benefit to firm performance is examined.

2.1.3 Sustainable Supply Chain Management

SSCM is thought to include elements of the TBL dimensions: economic, environmental, and social (Brandenburg et al., 2019; Elkington, 1997). According to the TBL philosophy, businesses must engage in environmentally and socially responsible behaviour to make a profit (Alvarez et al., 2016; Gopalakrishnan et al., 2012). To put it another way, to achieve development, SSCM considers the social, economic, and environmental implications of all of its activities and operations. SSCM must protect the environment from the negative consequences of its operations while generating financial gains and meeting the needs of stakeholders (Siems & Seuring, 2021).

The number of publications in the field of SSCM has increased dramatically in recent years, indicating that it is a rapidly growing field. Companies worldwide are looking for a more conservative medium for profitability while addressing growing social and environmental sustainability concerns (Seuring & Müller, 2008; Tseng et al., 2015). Despite this expansion, the SSCM domain is still new, particularly in developing economies like Africa (Ortas, Moneva & Álvarez, 2014; Patel & Desai, 2019; Siems & Seuring, 2021).

Over 300 research articles on sustainable and green supply chain management have been published in the last 15 years, but less than 50 of these studies have come from Africa, highlighting the continent's dearth of knowledge in SSCM (Seuring, 2013). SSCM has a number of literary meanings with no definite consensus (Carter, 2005; Carter & Rogers, 2008; Green, Morton & New, 1996; Hall, 2000; Helen, Stephen & Brammer, 2009; Krause, Vachon & Klassen, 2009; Laura, Spence, Michael & Bourlakis, 2009; Srivastava, 2007; Seuring & Muller, 2008; Tate, Ellram & Kirchoff, 2010; Wolters, 2003; Zhu & Gent, 2001). However, in the modern descriptions of SSCM, as expressed by Seuring and Müller (2008), which show how environmental and socio-

economic outcomes are handled in a firm supply chain is increasingly necessary (Carter & Rogers, 2008; Carter & Easton, 2011; Ho & Choi, 2012; Sisco et al., 2010). Table 2.1 summarises several SSCM definitions.

Table 2.1: Definitions of Sustainable SCM

Definition	Source
"Green supply refers to how innovations in supply chain management and industrial purchasing may be considered in the context of the environment."	Green, Morton and New, (1996, p. 188)
"Environmental Supply Chain Dynamics (ESCD) is a phenomenon where environmental innovations diffuse from a customer firm to a supplier firm, with environmental innovation defined as either a product, process, technology or technique developed to reduce environmental impacts."	Hall (2000, p. 456)
"Therefore, green purchasing and the integration of environmental considerations into purchasing policies, programmes, and actions is critical for enterprises because it leads to eco-efficiency, cost-saving and improved public perception."	Zhu and Geng (2001, p. 28)
"SSCM is understood as an integration of sustainable development and supply chain management, where sustainable development is also identified as three-dimensional – merging environmental, social, and economic issues for human development – which also affects corporate strategy and action."	Dyllick and Hockerts (2002, p. 34).
"Sustainable chain management (…) involves issues of sustainable development insofar as companies can be held responsible for the social and environmental impacts arising along the supply chain. It demands that companies integrate ecological and social aspects into their decisions and actions, not only internally but also along those supply chains that determine the economic value of their business."	Wolters (2003, p. 8)
"The systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole."	Mentzer et al. (2002, p. 18)
"[Purchasing Social Responsibility consists] of five unique dimensions: the environment, diversity, human rights, philanthropy, and safety."	Carter (2005, p. 183)
"The integration of key business processes from end-user through original suppliers, that provides products, services, and information that add value for customers and other stakeholders."	Lambert et al. (2006, p. 2)
"How companies manage their social responsibilities across dislocated production processes spanning organisational and geographical boundaries."	Jorgensen and Knudsen (2006, p. 450)
"GrSCM is defined as 'integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life."	Srivastava (2007, p. 54)
"Sustainable supply chain management is the management of supply chains where all the three dimensions of sustainability, namely the economic, environmental, and social ones, are taken into account."	Ciliberti, Pontrandolfoa and Scozzi (2008, p. 1580)
"The strategic, transparent integration and achievement of an organisation's social, environmental, and economic goals in the systemic coordination of key inter-organisational business processes for improving the long-term economic performance of the individual company and its supply chains."	Carter and Rogers (2008, p. 368)
"The management of material, information and capital flow as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account, which are derived from customer and stakeholder requirements."	Seuring and Müller (2008, p.1700)
"The integration of sustainable development and supply chain management by merging these two concepts, environmental and social aspects along the supply chain have to be taken into account, thereby avoiding related problems, but also looking at more sustainable products and processes."	Seuring (2008, p. 132)
"Adding sustainability to existing supply chain management processes, to consider environmental, social and economic impacts of business activities."	Font et al. (2008, p. 260)

"The specific managerial actions that are taken to make the supply chain more sustainable with an end goal of creating a truly sustainable chain."	Pagell and Wu (2009, p. 38)
"Involvement of the planning and management of sourcing, procurement, conversion and logistics activities involved during pre-manufacturing, manufacturing, use and post-use stages in the life cycle in closed-loop through multiple life-cycles with seamless information sharing about all product life-cycle stages between companies by explicitly considering the social and environmental implications to achieve a shared vision."	Badurdeen et al. (2009, p.285)
"The set of supply chain management policies held, actions taken, and relationships formed in response to concerns related to the natural environment and social issues concerning the design, acquisition, production, distribution, use, reuse, and disposal of the firm's goods and services."	Haake and Seuring (2009, p. 285)
"Procurement that is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance."	Helen, Walker and Brammer (2009, p. 128)
"The chain-wide consideration of issues beyond the narrow economic, technical and legal requirements of the supply chain to accomplish social (and environmental) benefits along with the traditional economic gains, which every member in that supply chain seeks."	Laura et al. (2009, p. 291)
"Firms are increasingly under pressure from stakeholders to incorporate the triple-bottom-line of social, environmental and economic responsibility considerations into operations and supply chain management strategies."	Tate, Ellram and Kirchoff (2010, p. 19)
"The degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organisation processes for sustainability."	Wolf (2011, p. 223)
"Reflection of the firm's ability to plan for, mitigate, detect, respond to, and recover from potential global risks. Risks involving substantial marketing and supply chain considerations include product development, channel selection, market decisions, sourcing, manufacturing complexity, transportation, government and industry regulation, resource availability, talent management, alternative energy platforms, and security."	Closs et al. (2011, p. 102)
"Involvement of the planning and management of sourcing, procurement, conversion and logistics activities involved during pre-manufacturing, manufacturing, use and post-use stages in the life cycle in closed-loop through multiple life cycles with seamless information sharing about all product life-cycle stages between companies by explicitly considering the social and environmental implications to achieve a shared vision."	Beske (2012, p. 232)
"An extension to the traditional concept of Supply Chain Management by adding environmental and social/ethical aspects."	Wittstruck and Teuteberg (2012, p. 142)
"SSCM is creating the supply chains through the voluntary commitment to the economic, environmental, and social issues in the key organisational business systems."	Ahi and Searcy (2013, p. 339)
" The concept of SSCM is usually defined by evaluating the components of its integrated structure.	Turker and Altuntas (2014, p. 837)
" SSCM often refers to evaluation and selection of suppliers, as the risks of various sustainability aspects have in practice "either-or" nominal measurement characteristics such as child labour or slavery."	Schaltegger and Burritt (2014, p. 234)
"SSCM framework covers the constructs and their interrelations, starting from the strategic orientation level through the structural and design aspects to the process and operational part of a respective sustainable supply chain. ."	Khalid et al. (2015, p. 683)
"Sustainable supply chain management can be understood as maintaining a balance among social responsibility, environmental stewardship and economic viability along the entire supply chain, improving the long-term economic performance of an individual and the company and also meeting the customers' need competitively throughout the life cycle of goods and services."	Ansari and Qureshi (2015, p. 26)
"Sustainable Supply Chain Management is considered as the management of consequences on the natural ecosystem, corporate reputation, financial exposure, as well as compliance with laws, rather than disruptions in supply chain operations."	Giannakis and Papadopoulos (2016, p. 456)
"SSCM and/or GSCM is referred to the management of raw materials and reduction of waste from upstream to downstream, and after shelf life back to the upstream with the improvement of the environmental and social impact."	Khan and Dong (2017, p. 174)

"SSCM practices help to mitigate the harmful effects of the industry and contribute to enhancing the business profitability through friendly and socially beneficial environmental practices."	Mathivathanan et al. (2018, p. 286)

Source : Authors Compilation (2021)

Considering all of the SSCM definitions in Table 2.1 and striving to balance these SSCM definitions and the TBL perspective, this study adopts the SSCM view by Carter and Rogers (2008). p. 368) SSCM has been defined as "the strategic, transparent integration and achievement of an organisation's social, environmental, and economic goals in the systemic coordination of key inter-organisational business processes for improving the long-term economic performance of the individual company and its supply chains" (Carter & Rogers, 2008, p. 368). In this definition of SSCM, there are various variables in the literature that are highlighted. Moreover, the complexity of supply chains in terms of the various interactions and stakeholders' requirements is brought to bear. The definition adopted can also be observed that the concept of SSCM is a strategic tool used to improve economic performance.

This makes SSCM unique and challenging when an attempt is made to provide a cross-industry framework for SSCM due to various sector-specific problems (Pullman, Maloni & Carter, 2009). However, this definition is the most appropriate for this research because it acknowledges the role of both internal and external players in SSCM practice activities. According to this adopted definition, SSCM is increasingly being viewed as critical for long-term profitability by executives (Ehrgott, Reimann, Kaufmann & Carter, 2011). SSCM is not only a social objective; it is also a critical source of strategic differentiation for organisations (Ho & Choi, 2012). A sustainable supply chain is one in which environmental and social considerations are balanced against the business's economic bottom line (Ansari & Qureshi, 2015; Laosirihongthong et al., 2020). According to Carter and Rogers (2008), supported by Carter and Easton (2011), the following events fall within the TBL framework from an SSCM perspective: Cost reduction is possible due to effective waste management and an efficient system for reuse and dismantling. Well managed health and safety costs decreased turnover and recruitment costs, improved working conditions, lower production costs, and decreased absenteeism due to improved working conditions.

Implementing ISO 14000 standards and designing for disassembly and reuse has resulted in a cleaner environment, lower production costs, reduced waiting times, improved quality, and relatively low disposal costs. When the three dimensions of TBL are well integrated, an

organisation's reputation improves, resulting in a more sustainable, profitable, and appealing supply chain (Carter et al., 2019). To summarise, promoting SSCM activities entails an understanding of both the individual components and the integration of all three TBL dimensions, as this enables organisations to reduce costs, develop new products, avoid long-term environmental hazards, enhance competitive advantages, and ensure firm sustainability (Callieri et al., 2007; Carter et al., 2019). The following section discusses the individual role of the three dimensions of the TBL as they pertained to the SSCM.

2.1.3.1 Economic Sustainable Supply Chain Management

SSCM economic practices encompass all profits accrued to the organisation because of the performance of the supply chain and societal gains. The gains are obtained because of measures and policies implemented in ensuring sustainable competitive advantages within the supply chains (Sloan, 2010). In other words, the economic component of SSCM in terms of TBL refers to profit-making and the maintenance of competitive advantage through sustainability practice (Gopalakrishnan, Yusuf, Musa, Abubakar & Ambursa, 2012). Economically, a sustainable supply chain prioritises revenue growth, cost control, and market share expansion while minimising negative environmental and social impacts (Xu & Gursoy, 2015). Economic supply chain management initiatives fall into three broad categories: institutional or system-level, waste reduction, and strategic sourcing.

Strategic sourcing encompasses all processes of institutional procurement that enhance and reassess the buying practices of the company (processes, methods, and sources) to maximise the company’s value and returns. Waste reduction focuses solely on minimising substandard products or grades of poor quality in the chain. Institutions and systems refer to institutional policies and systems implemented within an organisation to ensure economic prudence; these policies are usually centred on cost reduction and incentives. Economic supply chain management is examined in this study from three perspectives: institutions or systems, waste reduction, and strategic sourcing. The policies and systems put in place by a company to cut costs and manage institutional waste are addressed.

2.1.3.2 Social Sustainable Supply Chain Management

SSCM practices, particularly from the social dimension, have gained traction in academic and industrial circles (Bubicz, Barbosa-Póvoa & Carvalho, 2019). Klassen and Vereecke (2012, p. 103) described the social dimension of supply chains as "product or process-related aspects of operations that impact human safety, welfare, and community development." Social issue management encompasses, but is not limited to, choices that prevent a company from acting unethically. However, what establishes a social issue varies significantly between stakeholders due to its dynamic nature and sensitivity to the business environment (Clarkson, 1995; Hoejmose et al., 2013, 2014).

Socially sustainable practices include checking on suppliers, developing social policies and procedures, and employing social management frameworks such as health, safety, and well-being systems for suppliers and the focal firm (Awan, 2019; Fletcher et al., 2016; Marshall et al., 2015). Compliance with health and safety regulations and audits of all supply chain partners are part of monitoring practices (Flectcher, 2016). Additionally, it entails adhering to regulations about working children, labour exploitation, and other forms of involuntary servitude and conditions.

Firms, whose obligations may exceed those mandated by law, social requirements may include workforce diversity, voluntary overtime, and equitable wages (Awan, 2019). Implementing socially sustainable management practices entail establishing management structures with suppliers that include policies and procedures governing fair wages, work hours, autonomous work policy, and stress-reducing job design (Pfeffer, 2010). For workplace practices, OHSAS18001 and SA8000 are two social supply chain management systems (Awaysheh & Klassen, 2010; Klassen & Vereecke, 2012; Pfeffer, 2010). Social well-being encompasses changes in education and employment conditions, the advancement of societies, and the production and distribution of goods and services in a socially responsible manner (Mahler, 2007). According to Torjman (2000), social sustainability should entail the development of safe and caring communities, social investments, and poverty alleviation. Businesses that incorporate social supply chain management into their operations have received much positive feedback. “Social Supply Chain Management” is defined as “every socially responsible activity and method, as well as the development of human capital that promotes a healthy and safe community,” according to Klassen and Vereecke (2012, p. 103).

2.1.3.3 Environmental Supply Chain Management

Environmental factors of supply chain management have been a primary focus of sustainability research in recent years. Naturally, the environment is a critical component of the TBL and has recently been in the news due to growing concerns about climate change and environmental pollution. The words "sustainability" and the “environment" are usually used interchangeably to a certain extent. This misunderstanding was particularly dominant in the early phases of the conceptualisations of the term *sustainability*. This is a common occurrence when a new concept is established. However, as perceptions formed, a more consistent definition and application of the concept of sustainability as it relates to the TBL became widely accepted. In SSCM, environmental practices include behaviour and policy monitoring and the advancement of environmental management systems with the desired firm and its suppliers (Famiyeh et al., 2018). In some instances, environmental management systems initiatives are referred to as 'green purchasing,' which entails ensuring supplier certification (Trivedi et al., 2018; Yang et al., 2012). Environmental supply chain management systems are built based on the monitoring. This entails assessing and analysing the supplier's environmental performance and ensuring consistent and updated practices via certification (Verdecho et al., 2020). For example, ISO14001 certification or total quality environmental certification are two examples of certifications that some suppliers must obtain (Bravi et al., 2020; Famiyeh, 2018; Oenning et al., 2020).

Environmental sustainability, which has been recognised as a considerable component of firm performance in numerous studies, involves making decisions and taking actions to protect the earth, emphasising preserving the environment's capacity to support human life (Miemczyk et al., 2012). Environmental supply chain management is used in the study to refer to the process of minimizing significant environmental impacts associated with a business's operations throughout a product or service's lifecycle. These policies are applicable throughout the supply chain, from manufacturing to procurement and advertising at the point of sale.

2.1.4 Firm Performance

Central to strategic management is the measurement of firm performance (Venkatraman & Ramanujam, 1986). Because of its complexity and multi-dimensional nature, there is no universally accepted definition for firm performance (Kaplan & Norton, 1996). However, since

there is no definite operational term for firm performance, it has been synonymous with various definitions and interpretations (Taouab & Issor, 2019). Firm performance was thought to be synonymous with organisational productivity in the 1950s. The performance metrics used were productivity, adaptability, and inter-organisational tensions (Georgopoulos & Tannenbaum, 1957). Following that, in the 1960s and 1970s, organisations began experimenting with new methods of performance evaluation. Performance was defined during this period as an organisation's ability to efficiently access and utilise its resources (Yuchtman & Seashore, 1967). Price (1968) defined firm performance as an appreciative criterion synonymous with organisational efficiency with the following as measures (i.e., productivity, conformity, and institutionalization). Verboncu and Zalman (2005) define performance as a specific outcome achieved in management, economics, and marketing that confers on the organisation and its institutional and procedural elements efficiency, quality, and effectiveness. Then, as Bartoli and Blatrix (2015) state, performance should encompass elements such as piloting, evaluation, productivity, effectiveness, and quality. This study adopts Verboncu and Zalman's (2005) definition, noting that firm performance is a precise measure obtained by evaluating various organisational dimensions such as economics, management, and marketing. This study identifies with the accounting dimension of firm performance by evaluating specific financial metrics, as proposed by Bartoli and Blatrix (2015).
Academic researchers have identified and used a variety of metrics to measure a firm's performance, especially from a financial standpoint. In general, these metrics may be categorised as objective or subjective, each having its own set of consequences (Richard, Devinney, Yip & Johnson, 2009).

2.1.4.1 Objective versus Subjective Indicators

Objective firm performance metrics are considered autonomous and neutral from the research unit. These indicators accurately evaluate a particular performance dimension and verify its accuracy externally (Boyne, 2006). There are six distinct clusters of objective firm performance indicators: (1) accountable action, (2) market action, (3) growth action, (4) market and accounting hybrid action measures, (5) metrics to ensure the firm's existence, and (6) operational determinants (Shook, 2005). While quantitative performance indicators are founded on verifiable data, subjective performance indicators are founded on personal information and the subjective assessment of potentially knowledgeable individuals, such as managers, creators, or regular staff.

On the one hand, subjective measures of firm performance can be classified into quasi-objective and completely subjective indicators (Richard et al., 2009). Quasi-objective firm performance indicators focus on the exact performance dimensions as the objective performance indicators previously introduced, though it has been established that secondary data sources are equally reliable sources of objective measures (Richard et al., 2009). In these dimensions, data for quasi-objectives is collected by self-reporting methods and personal judgement of knowledgeable persons (Dess & Robinson, 1990).

Like quasi-objective tests, the subjective performance metrics are not attached to a single objective metric (March & Sutton, 1997). A typical example of a completely arbitrary performance measure is an estimation of a top manager's performance in relation to global competition regardless of specific criteria. On the plus side, the absence of a fixed reference parameter permits greater subjective measure flexibility (Richard et al., 2009). On the negative side, entirely subjective metrics compete with possible psychological effects, such as the halo effect, which impact individual performance evaluations (Rosenzweig, 2007). This comes even though it has been established that there is no significant difference between the objective assessment of firm performance and the subjective assessment of it.

2.1.4.2 Firm Performance Indicators

Considering the above, this study employs a model for evaluating firm performance based on subjective metrics. These metrics include market share, which indicates how well a business performs in comparison to its competitors (Fars et al., 2010), and a firm's revenue growth rate, which indicates the rate at which a business increases revenue from sales over a specified period (Viguerie et al., 2011). A company's overall profitability is a metric used to evaluate a company's historical ability to generate returns over a specified time period (Glick et al., 2005), whereas return on invested capital (ROIC) is a metric used to ascertain a business's efficiency by allocating controlling capital to profitable investments. That is, ROIC quantifies a firm's efficiency in generating revenue through the use of its resources (KaradenİZ et al., 2019).

2.1.5 Supply Chain Integration

Supply chain integration (SCI) is a well-researched topic in the market and supply chain management literature (Ataseven & Nair, 2017). Considerable effort has been expended to

investigate key supply chain management performance indicators and their relationship with various supply chain integration elements and performance indicators (Jajja et al., 2018; Munir et al., 2020; Saragih et al., 2020; Zhu et al., 2018). SCI is defined as the degree to which suppliers collaborate tactfully with their supply chain partners and collectively manage intra- and inter-organisational processes (Bagchi et al., 2005). SCI encompasses both internal business processes and external relationships with consumers and suppliers. SCI has been classified as a three-dimensional construct that consists of supplier integration, internal integration, and customer integration. External integration refers to the extensiveness of relationships between firms and their vertical and horizontal business partners, whereas internal integration is concerned with a broader range of intra-organisational issues. External integration is primarily composed of two components: Supplier and customer integration (Jaija et al., 2018)

2.1.5.1 Supplier Integration

Supplier integration is a broad term that refers to the process by which focal firms integrate with their suppliers through the sharing of critical characteristics and close collaboration that enables collaborating firms to develop a set of unique characteristics that are frequently hard to emulate and are occasionally indispensable (Barney, 2015a; Zimmermann & Foerstl, 2014). The term "supplier integration", according to Schoenherr and Swink (2012, p. 100), as cited in Ragatz et al. (2002), describes the process of “coordination and information sharing activities with key suppliers that provide the firm with insights into suppliers’ processes, capabilities and constraints, ultimately enabling more effective planning and forecasting, product and process design, and transaction management”. In other words, it aids a company's supply chain integration with internal operations and external demand. Supplier integration is a term that describes a situation in which suppliers are engaged in the firm's critical decision-making operations and exchange intelligence about demand forecasts, production, and inventory levels. It comprises firms collaborating with their major suppliers to maximise relationship benefits such as reduced lead times, increased innovation, and improved quality. Supplier integration aims to establish connections between all suppliers to facilitate decision-making and enable all chain components to collaborate more flexibly. Its primary objective is to maximise the value of information and physical flows between producers and suppliers, resulting in seamless processes and cohesive supply networks that are hard to replicate (Abdallah et al., 2017; Zhang et al., 2018).

These steps facilitate visibility into the supply chain and identify bottlenecks (Chadha & Gagandeep, 2013; Pakurar et al., 2019). The perspective taken in this study is that of Zhang, Pan, Jiang, and Feng (2020), who define SI as an environmental, social, and economic strategy aimed at achieving sustainability goals and enhancing firm performance through the integration of firms' and suppliers' unique resources (Du et al., 2018).

2.1.5.2 Internal Integration

Internal integration can be described as "inter-firm collaboration and information sharing activities that take place through interconnected and synchronised processes and systems" (Schoenherr & Swink, 2012, p.100). "It refers to the degree to which an organisation optimises its internal structures and processes in order to meet customer requirements and interact with suppliers in order to gain a competitive edge and long-term viability" (Flynn et al., 2010 p.4). It encompasses intra-firm collaboration and knowledge transfer across integrated and coordinated methodologies (Schoenherr & Swink, 2012). On the other hand, internal integration measures refer to cooperation among the various functional areas of an organisation, such as manufacturing, transportation management, advertising, and prices, to achieve supply chain objectives (Ataseven & Nair 2017). Internal integration occurs when a business structures its functional departments' practices, procedures, and behaviour into integrated and synchronised processes to meet customers' needs (Du et al., 2018).

Internal integration simplifies the process of translating manufacturing requirements into purchasing specifications and material movement and ordering (Horn et al., 2014). Employees with the procurement and productions departments can use planned inter-departmental gatherings and informal contacts to exchange information and receive feedback on their performance (Paulraj & Chen, 2007). Furthermore, procurement and production units can work collaboratively on decisions by leveraging cross-functional teams (Williams et al., 2013). Internal integration links functional areas and facilitates the flow of information and physical goods (Du et al., 2018). As a result, internal integration has been viewed as a crucial strategy for firms seeking to improve their SD capabilities (Amoako et al., 2020; Riley et al., 2016). Internal integration is defined in this study as a company's capacity to maximise performance by integrating its various internal processes (Zhang et al., 2018; Zhao et al., 2020).

2.1.5.3 Customer Integration

Customer integration is the process whereby a target firm collaborates with its primary customers to organise their inter-organisational policies, structures, operations, and perceptions into coordinated, integrated, and manageable processes that satisfy their requirements (Stank et al., 2001). Consumer integration entails collaborative efforts and continuous communication between a focal company and consumers, knowledge exchange, forecasting customer orders, and product/service reviews to increase supply chain exposure, joint customer preparation, and product/service development opportunities for a focal firm (Afshan et al., 2020; Boer et al., 2019; Feng et al., 2021). Customer integration is also viewed as a technique for gathering and comprehending customer needs and desires and the division of mutual knowledge to enhance firm performance (Boer et al., 2019; Swink et al., 2007). Customer integration allows a business to establish long-term relationships with its most valued clients, lowering the acquisition cost for those customers. Customer integration is a concept that is discussed in this study as the "…close collaboration and information sharing activities with key customers that provide the firm with strategic insights into market expectations and opportunities, ultimately enabling a more efficient and effective response to customer needs" (Schoenherr & Swink, 2012, p. 100).

2.1.6 Firm Capabilities

The term "firm capabilities" refers to the organisational structure and business process design (Chatterjee & Chaudhuri, 2021; Feng et al., 2017). Firm capabilities, alternatively referred to as integrative capabilities, refer to an organisation's ability to deploy its resources rapidly and effectively for its benefit (Easmon et al., 2019; Gupta & Chauhan, 2020). Organisational capabilities encompass a variety of firm-specific assets, including organisational routines, history, culture, and fundamental organisational design principles (Barney, 1986, 1995, 1997; Chatterjee & Chaudhuri, 2021; Feng et al., 2017; Gupta & Chauhan, 2020). Firm capability refers to a business's ability to leverage its expertise, strengths, and resources to gain a competitive advantage while maintaining and improving its value and performance over time (Cruz-Ros & Gonzalez-Cruz 2015). Firm capabilities are the tasks and activities that businesses must excel at to achieve their corporate goals (Dierickx & Cool, 1989, Safizadeh et al., 2000). A firm's capabilities are a

complex collection of knowledge and abilities that enable it to transform its available resources into operational excellence (Feng et al., 2017).

While the literature frequently conflates capability with competing urgencies or manufacturing competence, the basic premise is that capabilities should reflect how an organisation's operational function contributes value (Competitive priorities are aspects of operations that companies believe are critical to their success) (Baark et al., 2011; Falciola et al., 2020; Parida, 2008). The study defines firm capability as a composite of a firm's strategic capability, organisational capability, and external stakeholder relations capability, as well as how the firm deploys and leverages all of these capabilities, in addition to its expertise, strengths, and resources, to achieve a competitive advantage while sustaining and growing its value and performance over time (Cruz-Ros & Gonzalez-Cruz 2015).

2.1.7 Business Environment Uncertainty

Uncertainty is crucial in organisational theory, especially in theories that attempt to elucidate the relationship between businesses and their ecosystems (Bastian & Muchlish, 2012; López-Gamero et al., 2011; Mascarenhas, 1982). The environment in which businesses operate has become increasingly unpredictable as environmental dynamism and uncertainty have increased. Management's primary responsibility is thus to ensure that processes have been established to reduce, counter, or completely evade uncertainty (Jauch & Kraft, 1986). The literature on uncertainty indicates that the term has a variety of meanings. When it comes to decision-making, uncertainty is associated with a lack of facts and communication (Duncan 1972; Lawrence & Lorsch, 1967). It is also thought to result from an ambiguous structure underlying a company's internal activities, its surroundings, and the dynamic connection between the company and the environment (Collis, 1992). Environmental volatility (Emery & Trist, 1965), unpredictability (Cyert & March, 1963), and the complexity of influential variables are all considered to be sources of uncertainty (Galbraith, 1973). Due to the diversity, interdependence, and interconnectedness of influential variables in the environment (Fahey & Narayanan, 1986). Davis' (1993) Business Environment Uncertainty Dimension is used in this study.

Davis (1993) proposed that a supply chain is subject to three distinct types of uncertainty: demand, supply chain, and technological. The rapid advancement of information technology (IT) has increased by digitalising information, reshaping the conventional supply chain model. Deloitte

(2017) discovered that the digitization of supply chains in terms of information technology and the application of big data in SCM had increased product demand. As a result, increased service customization, information sharing, faster delivery, and real-time transparency have been requested by customers. In this age of technological uncertainty, the cost of competitive pressure has increased in terms of fulfilment and increased sustainability initiatives. Integration of business systems has become increasingly important during this period of technological uncertainty, especially in light of rapidly changing technological systems (Chang et al., 2019; Fynes et al., 2004). With this, firms face increased competition and market uncertainty, thereby creating opportunities and challenges (Cong & Zhou, 2020; Purnama & Subroto, 2016).

The unpredictable variations in product timing, preference, and quantity demand are examples of demand uncertainty (Chang, Wong & Chiu, 2019; Fynes, De Brca & Marshall, 2004). Supply uncertainty refers to an unpredictably fluctuating quantity and timing of supply in a supply chain, as well as the switching and adjustment costs associated with changing outputs or product specifications. These are considered to be critical dimensions for this study. Frequently, organisations are internally focused on supply chain sustainability, looking inward to identify supply chain challenges. While looking within the organisation for solutions to long-term supply chain issues is beneficial, it is practically ineffective. External factors (consumers, suppliers, competitors, and technology) must also be considered.

2.1.8 Operational Competitiveness

Operational competitiveness is a term that refers to a business's ability to develop and sustain a defendable advantage over its competitors (Afum et al., 2020; Abdul Malek et al., 2015). Alternatively, it can refer to a business's capabilities to define its competitive advantage and differentiate itself from competitors. (Afum et al., 2020). Ma (1999) similarly defines operational competitiveness as the differential in any factor that enables a firm to satisfy its customers than competitors better, thereby increasing consumer demand and achieving competitive advantage. According to Harrison and Hoek (2002), operational competitiveness is achieved by the competitiveness of the supply chain, which suggest that "meeting end-customer demand by supplying what is required in the form required, at the time required, at a competitive price." Generally, developing operational competitiveness entails an analysis of the factors that may put a business in a better position concerning its significant competitors (Conner, 2003; Wheelwright,

1984) describe four strategic capabilities that contribute to operational competitiveness: quality of high standard, flexibility in operations, timely delivery of products and a moderate cost of operations. Firms compete based on operational capabilities in world markets, including cost, quality, and flexibility (Miltenburg, 2008;Voss, 2005). According to Phusavat and Kanchana (2007), the four strategic capabilities are defined as follows:

Low defect rates, product reliability, serviceability, product accreditation, and environmental stewardship are all examples of quality.

Cost: The ability to effectively oversee production expenses, including administrative costs, inventory, and value-added.

Delivery refers to the speed with which a product or service is delivered to a customer. Delivery is thought to be a time-bound event. It also considers how long it takes to bring a new product to market.

Flexibility refers to the capacity to leverage resources in response to changes in contractual agreements, most of which are spearheaded by customers. It includes a variety of functions, including design/planning adjustments, volume adjustments, and product selection expansion.

This study makes use of these four strategic components of operational competitiveness. To stay competitive, a company must focus on the roles of cost, quality, flexibility, and delivery.

2.2 GENERIC THEMES OF SSCM

2.2.1 GSCM and SSCM

To explain the concept of sustainability in SCM literature, the terms sustainable supply chain management (SSCM) and green supply chain management (GSCM) are often used interchangeably (Carter & Easton, 2011). However, there are several conflicting definitions for these two terminologies, stressing the significance of separating them and deciding which one is more appropriate for this research and the principles of sustainability.

Throughout time, there have been several variations in the terminology used to describe the definition of GSCM (Emmett & Sood 2010; Wang & Gupta, 2011). Notwithstanding, most of these diverse GSCM definitions are explicitly directed at environmental supply chain activities. (Wang & Gupta, 2011). According to Emmett and Sood (2010), green supply chain management seeks to integrate environmentally friendly standards and concerns into a firm's supply chain

operations. The primary aim of GSCM is to improve the supply chain's environmental efficiency by avoiding detrimental effects on the environment (Esty & Winston, 2009). SSCM, unlike GSCM, blends economic and social objectives with environmental goals in SCM contexts (Carter & Easton, 2011; Kuik et al., 2011; Pagell & Wu, 2009; Svensson, 2007). The SSCM approach discusses social concerns, economic priorities and ecological problems related to the supply chain operations of corporations (Carter & Easton, 2011;Seur & Muller, 2008). Ultimately, SSCM aims to improve SC efficiency by taking a comprehensive approach to sustainability. This approach attempts to strike a balance between economic, social, and environmental issues instead of focusing exclusively on ecological concerns, as GSCM does. In other words, unlike GSCM, SSCM will address social, environmental, and economic impacts through the entire supply chain (Carter & Easton, 2011). Although there are numerous sustainability models, this study adheres to the previously described triple bottom line approach. As a result, this research cannot agree on the interchangeability of GSCM and SSCM. Additionally, the study employs Carter and Rogers' (2008) definition of SSCM, which incorporates all facets of the TBL approach, as previously demonstrated. Considering the above, GSCM that focuses exclusively on the environmental component of supply chains cannot be referred to as SSCM at any point, as it reflects only one dimension of sustainability when considering the triple bottom line approach to sustainability.

2.2.3 Driving Forces of SSCM

As discussed previously concerning the transition to a sustainable supply chain, environmental degradation, social problems, and resource scarcity prompted numerous stakeholder groups and regulatory bodies to request environmentally friendly products and services (Zhu et al., 2013). As a result of these increased demands, businesses have assumed complete accountability, compelling them to understand their operations' social and environmental consequences. This has resulted in companies adhering to sustainable practices and adopting SSCM practices in terms of SCM. This is important since most manufacturing and service firms are involved in at least one supply chain operation that has a significant environmental impact during the product's life cycle (Matos & Hall, 2007).

Various external pressures from stockholders, consumers, rivals, and government authorities are compelling companies' supply chains to reconsider their strategic objectives to include social well-being, consumer focus, and environmentally friendly practices (Green & colleagues, 2012). As a

result of the demands above, businesses have recognised that the responsibilities of their supply chain do not end at their organisation's borders and that they include the ultimate responsibility of protecting the environment and community across their supply chains (Seuring & Gold, 2013). These demands have necessitated that firms' supply chains pay careful attention to their supply chains' economic, social, and environmental issues. As a result, supply chains now incorporate sustainable inputs.

Manufacturers have recognised the importance of TBL standards in supply chains and begun implementing SSCM practices to meet inventory and customer requirements, as well as economic and regulatory pressures (Hsu et al., 2013). It has been argued explicitly that companies pursue SSCM adoption in response to various factors, such as governmental environmental regulations and related enforcement issues; the needs of stockholders to boost the environmental and public reputation picture and their sufficient demands for internal commitment; increased environmental awareness of the present-day community and increased public perceptions have led to the adoption of SSCM practices. It can be observed from figure 2.3 that the discourse on the implementation of SSCM goes beyond the focal firm to comprise of the diverse stakeholder groups.

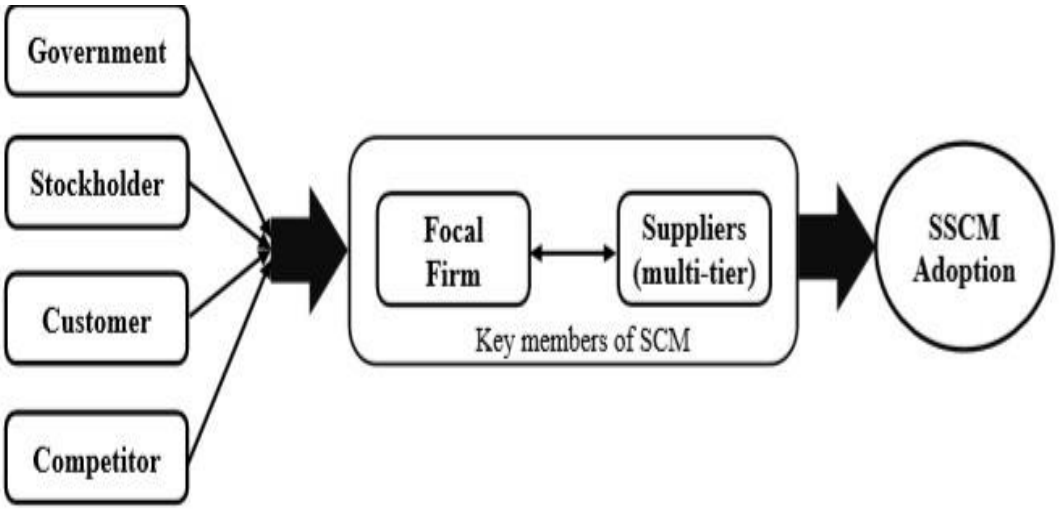


Figure 2.3: Triggers for sustainable supply chain management

Source: Esfahbodi (2016, p. 81)

2.2.4 Theories that have been used in SSCM

2.2.4.1 What does theory contribute to a field's development?

A vital measure of publication in high-ranking journals is theoretical contributions (Carter, 2011; Colquitt & Zapat-Phelan, 2007; Hambrick, 2007). The topic of theory construction has fostered discussions among academicians, one with supporters of collective agreement and unity (Pfeffer, 1995) and, another, with advocates of a plurality of theory building inquiries and the ability to contend with multiple theories (Bello et al., 2012; Black, Mendenhall & Oddou, 1991; Ghoshal, 2005). The testing and development of theory are narrowly connected within a discipline throughout the formation of information (Colquitt & Zapata-Phelan 2007). There must be adequate equilibrium between theoretical construction, which can introduce a novel concept, and theory testing, which might be lacking in the application of lenses of antique paradigms as vital facets of a novel concept (Black et al., 1991; Bello et al., 2012).

Many academics have recognised the relationship between a theory's reliability and efficacy and its association to observable reality (Bain, Lee & Engelhardt, 2017; Barlow & Proschan, 1975). Data is used to demonstrate the validity of a theory (Goodenough & Gerhart, 1975). Engaging with real-world issues, on the other hand, creates an opportunity for good theory to unfold. It is a widely accepted fact that the empirical informs the conceptual (Van Maanen et al., 2007). Developing a "reliable" conceptual framework (Chen & Paulraj, 2004) will aid in explaining the nature and intent of SSCM as a discipline focused on academia and practice. Researchers of SSCM must be mindful because a lack of a clear conceptual framework could stunt the growth of a valid management discipline (Carter, 2011).

2.2.4.2 Theories in SSCM

Recent years have seen the publication of several literature reviews, each of which examines the condition and progress of studies in SSCM (e.g., Carter & Easton, 2011; Jia et al. 2015; Roy et al., 2018; Seuring & Müller, 2008). Several of these authors have lamented the lack of theoretical diversity in SSCM and have advocated applying many theories (Craig & Easton, 2011; Carter et al., 2019; Sarkis, Zhu & Lai, 2011). The incorporation of theory into SSCM research began to grow after these advocates. Between 2010 and 2018, over 28% of studies did not use any form of

theory, compared to 33.33% between 2001 and 2010 and 87.50% between 1991 and 2000 (Carter et al., 2019). While it is true that theory is not required for all types of SSCM research and that the study of SSCM has a variety of missions, the role of theory in better appreciating the complexities surrounding SSCM cannot be overstated.

In order to demonstrate their understanding of the field, SSCM authors use a variety of theoretical perspectives. While many articles are non-theoretical, others conceptualise SSCM using one or more theoretical perspectives. According to Handfield and Melnyk (1998), theories are the bedrock of knowledge development, and as such, consideration must be given to the design and application when examining any field of study. Table 2.2 provides a comprehensive analysis and description of the SSCM theories developed over the last decade.

Table 2.2: Theories Applied in SSCM

Theory	Description	The Unit of Analysis	SSCM challenges	References
The resource-based view (RBV)	The value, rareness, inimitableness, and non-substitutability of a company's resources and the exclusive way they are used are the source of a firm long-term competitive advantage.	Firm-level	Classification and development of critical material necessary for the supply chain to achieve environmental, social, and economic objectives. Inter-organisational resources are just as critical as intra-organisational resources in terms of driving supplier engagement with SSCM practices.	Barney (1991)
Natural RBV	Environmental and social challenges can be used to acquire a competitive advantage by integrating them into business capabilities. Sustainable development provides the avenue for distinct and improved market advantage.	Firm-level	Identification and development of critical resources necessary to ensure the supply chain achieves its environmental, social, and economic objectives. Inter-organisational resources are just as critical as intra-organisational resources to ensure that suppliers are carefully integrated with the practices of SSCM.	Hart (1995)
Stakeholder theory	The operations of firms have an impact on both internal and external stakeholders. The responsibility of a company to fulfil the expectations of its various stakeholders is known as corporate social responsibility. Firms can ensure the continued survival of their operating licenses by incorporating a wide range of stakeholders into their strategy.	Firm-level	The extent to which SC stakeholders are involved in the social and environmental practices of the organisation. Identifying and evaluating the influence of identifiable stakeholders on the practices of SSCM.	Freeman (1984)
Institutional theory	The normative, coercive, and mimetic pressures compel organisations to adopt socially oriented behaviours and	Individual and Firm-level	The factors that influence the implementation and dissemination of social and environmental practices.	DiMaggio and Powell (1983)

	convert their practices to achieve legitimacy. Firms ensure that their corporate practices conform to social expectations by adhering to regulators' and emulating their competitors' successes.		The regulatory effect of government in the practices of SSCM. Organisational imitation as a source of encouragement for the adoption of SSCM practices.	
Transaction Cost Theory	Both parties must incur costs and exert effort in order to trade. The parties must devise appropriate governance and safeguards in order to keep the trading going.	Firm-level and individual	In order to implement social and environmental practices in buyer-supplier relationships, different modes of governance and organisational action are used. Within a SC, the impact of transaction costs on the adoption and spread of sustainability practices.	Williamson (1981)
Complexity Theory	Complications within an organisational context can be described by the variability or complexity of environmental factors such as customers, suppliers, government rules, and technological developments.	Firm-level	According to this theory, businesses operate in a state of order and disorder, which includes the system.	Prigogine (1984)
Structuration Theory	In the context of duality, re relationships between agency and structure, in which environmental management strategies such as SSCM are co-developed to achieve environmental and productivity gains.	Firm-level	In theorizing actor (agent) and context (structure) interdependence, this theory provides a solid foundation for understanding the relationship between SSCM practices and driving forces.	Giddens (1984)
Social embeddedness theory	the degree to which institutions are related to other actors through social network connections or the degree to which human behaviour (including economic behaviour) occurs within a web of social connectors such as friendship and kinship.	Firm-level	Companies must be appropriately integrated into ongoing social networks in order for us to understand and implement SSCM initiatives with supply chain partners.	Granovetter (1985)
Diffusion of Innovation Theory	The term "diffusion of innovation" refers to the process by which new ideas are communicated among members of a social system over time via a variety of channels.	Firm-level	Innovations are created to address operational or technical issues, and these organisations are almost certainly under pressure to address these issues through the adoption of innovations.	Kraatz and Zajac (1996)
Resource Dependence Theory	According to the resource dependency theory (RDT), members will rely on and collaborate for long-term performance gains rather than short-term gains at the expense of those in the supply chain.	Firm-level	The adoption of SSCM practices is dependent on a network of available resources	Pfeffer and Salancik (1978)
Information Theory (information asymmetry and signalling theory)	It can be used to explain how two parties behave when they have access to different information. Buyers examine signals to determine the	Firm-level	Businesses may attempt to communicate their environmental performance to external stakeholders, but this is not always easy due to a lack of complete awareness of their supply	Reza (1994

	credibility and validity of a seller's qualities.		chains processes. Suppliers can usually provide more information about their environmental performance, and consumers can sense the impact on their performance. Asymmetry of details is the term for this situation.	
Contingency theory	The ability of a company to carry out its responsibilities is influenced by a variety of internal and external factors.	Firm-level	The availability of resources determines whether a company will adopt SSCM practices.	Buttermann et al. (2008)

Source : Authors Compilation (2021)

Table 2.4: Numerical Distribution of Applied Theories in SSCM

Theory	**Number of Articles**
Actor-Network Theory	1
Agency theory	3
Complexity theory	1
Contingency theory	2
Dynamic capabilities	7
Ecological modernisation theory	1
Ethical climate theory	1
Ethical theory	1
Exchange theory	1
Global value chain	3
Industrial network theory	1
Institutional Theory	16
Legitimacy theory	1
Network theory	4
Organisational learning theory	1
Population ecology	1
Relational theory	5
Resource advantage theory	1
Resource Base View	33
Resource dependence theory	8
Social network theory	1
Stakeholder Theory	25
Structuration theory	1
Systems theory	3
Transactional cost theory	14

Source: Saenz et al. (2015)

Table 2.4 demonstrates how SSCM is implemented using a variety of theories. First, the table displays the various theories that have been widely tested and applied in the SSCM and SCM literature. The findings of this table suggest that a saturation point has been reached, given the number of theories that have been examined. Secondly, the SSCM discipline as a whole appears to be maturing, with scholars becoming familiar with a broader range of theories and able to draw on the most appropriate theory(ies) to assist in answering research questions of various studies. The SCM-specific theory is becoming more prevalent in the SSCM discipline (Carter, 2011). The increased use of existing theories is commendable, as it indicates that SSCM researchers are utilizing a more comprehensive and presumably more applicable palette of theories to advance research. According to Carter et al. (2019), the percentage of studies that used multiple theoretical lenses decreased from 33.33 per cent in 2001 to 28.66 per cent in 2019. (Carter et al., 2019). This could be because of a more substantial and more deliberate reliance on a single theory when developing hypotheses or developing propositions or taxonomies inductively. However, to convey the essence of theory in SSCM research more precisely, theoretical activities in the field must be assessed and analysed to guide future studies.

The definition of corporate sustainability has evolved from the traditional economic perspective (Angus-Leppan, Benn & Young, 2010). There are uncertainties in trying to comprehend the role of various economic, human, and ecological dimensions play on each other and how these elements are of relative importance. It is difficult to interpret the notion of sustainable development into concrete activities and integrate these activities internally and externally within organisations (van der Heijden, Cramer & Driessen, 2012). SSCM work has underlying interdisciplinary and dynamic dimensions. In this respect, it is critical to understand that there are several opportunities to investigate the best medium for sustainability, considering the various dimensions.

Various researchers investigating SSCM suggests that the area is increasingly developing and becoming more noticeable. Nevertheless, the conclusions of these studies suggest a troubling deficiency in theory development (Craig, Carter & Easton, 2011; Craig, Carter & Rogers, 2008). Specifically, Carter's and Easton's 2011 IJPDLM literature review of SSCM suggested that researchers prefer to use a few common hypotheses, whereas additional lenses may provide new knowledge in this field. Mollenkops, Stolze Tate & Ueltschy (2010), on the other hand, find that

theoretical work in SSCM is relatively lacking given the rising number of experimental research on the subject matter. The highly complex nature of present work, particularly experimental research, is beneficial in understanding facts but is not a significant theoretical contribution (Hoejmose & Adrien-Kirby, 2012). The field can, therefore, be regarded as not theoretically reliable and developed.

Winter and Knemeyer (2013) explored the intersections of "sustainability" and "SCM," providing an overview of how the literature addresses sustainability and the SCM dimensions. They observed that the studies conducted principally used discrete or single sustainability dimensions, particularly that of the environment and that there was a significant inadequacy in the use of integrated approaches which persist. They noted concisely that not many theoretical frameworks had been developed and tested in current literature, considering the three dimensions of sustainability (Carter et al., 2019;Winter & Knemeyer, 2013). However, they note the theories that have been applied directly.

The analysis of the implementation of theories in SSCM provides a means to examine the possible theoretical reasons, which seems to prefer a narrow emphasis on the sustainability of the environment. Thus, there is an avenue to provide scholars in SSCM with a comprehensive examination of theories to facilitate theory building and implementation through the application of the most appropriate theoretical lens(es), thereby fostering a deeper understanding and appreciation of various, potentially relevant theories that may apply to SSCM phenomena. Single theories or multiple theories and their adaptation should be taken into account because they allow for the consideration of possible alignments between theories, the testing of the limits of existing theories within the SSCM, and the application of existing theories to the SSCM.

In addition, the studies of Pagell & Shevchenko (2014) and Saenz et al. (2015) indicate that all the impacts of Sustainability from a TBL perspective, i.e., economic, social, and environmental, have not been fully captured by current research in this field, mainly due to theoretical distortions in favour of the income maximization and economically positive practices. Against this backdrop, researchers must develop a grand theory of SSCM that considers the integration of existing theory to provide more detailed, ground-breaking, and theoretically based perspectives of SSCM, ensuring all the TBL dimensions have been taken into consideration (Cater et al., 2019).

2.2.5 Mechanism or Factors affecting SSCM Adoptions and its Implications

In the adoption and proper implementation of SSCM practices, various variables have been proposed to mediate or moderate the relationship between SSCM practices and other dependent variables of interest. Table 2.5 provides a thorough examination of the various variables that have been investigated as mechanisms for explaining the medium through which SSCM practices relate to other dependent variables of interest.

Table 2.5: Highlighted Mechanism in SSCM Practices

Authors/Year	Moderator	Mediator	Sector	Country	Dependent Variable
Baig, Abrar, Batool, Hashim and Shabbir (2020)	Firm Size	-	Textile companies	Pakistan	Firm performance
Shahid et al. (2020)	Process Innovation	-	Manufacturing firms	Pakistan	Sustainability performance
Isnaini, Nurhaida and Pratama (2020)	Supply chain dynamic capabilities	-	Restaurant industry	Indonesia	Organisational sustainable performance (OSP) indicators, namely, "economic performance, environmental performance, social performance."
Sessu, Sjahruddin and Santoso (2020)	Supply chain dynamic capabilities		Restaurant industry	Indonesia	supply chain integration (SCI) and business performance (BP)
Hong, Guo, Chen and Li (2020)	Organisational culture.	-	Chinese firms	China	SSCM practices
Baah and Jin (2019)	-	Competitive Advantage	Logistic Firms	Ghana	Organisational Performance
Gong, Gao, Koh, Sutcliffe and Cullen (2019)	Stakeholder engagement	Firm's sustainability capability.	Global firms	Global	SSCM
Ni and Sun (2019)	Supplier integration, Customer integration	Outbound sustainability	Manufacturing sector	China	Business Performance
Wang, Zhang and Goh (2018)	Firm Size	-	Large and Small Business	China	Sustainability performance
Gilal, Zhang, Gilal and Gilal (2017)	organisation structure	research and development	national and multinational fast-moving consumer goods companies	Pakistan	Product Development
Zeng, Chen, Xiao and Zhou (2017)	Institutional pressures (Memetic, Coercive, Normative) and SSCM practices	-	Chinese eco-industrial park firms	China	circular economy capability
Nuertey (2015)	supply chain improvements	-	Cocoa processing Firms	Ghana	Firm Performance
Wolf (2014)	Stakeholder Pressure	Sustainable supply chain management	Manufacturing Sector	France	Corporate sustainability performance
Paulraj (2011)	Internal Resources, Capabilities	-	Manufacturing Sector	United States of America	Organisational sustainability

Source : Authors Compilation (2021)

According to the findings in Table 2.5, little to no attention has been paid to the role of operational competitiveness, business environment uncertainty, firm capabilities, and supply chain integration (internal integration, customer integration, and supplier integration) in the relationship between SSCM firm performance. While Baah and Jin (2019)'s study examined the mediating effect of competitive advantage on the SSCM-firm performance relationship, they did not do so from a TBL perspective. From a TBL perspective, there is a dearth of understanding regarding the role of operational competitiveness, the uncertainty of the business environment, firm capabilities, and supply chain integration (internal integration, customer integration, and supplier integration) in the SSCM-firm performance relationship**.**

2.2.6 Methods Applied in SSCM

According to the findings of Carter et al. (2019), various quantitative and qualitative techniques have been used in the SSCM literature, as illustrated in (table 2.6). The qualitative techniques include data coding, matrix analysis, and content analysis, whereas the quantitative techniques include Confirmatory Factor Analysis, Structural Equation Modeling, Exploratory Factor Analysis, Descriptive Statistics, Regression Analysis, ANOVA, and Conceptual Theory Building.

Table 2.6: Quantitative and qualitative techniques applied in the studies of SSCM

Authors/Year	Contributions	Methodological Stance	Methods	Results
Carter et al., (2019)	This article presents a systematic analysis of the ongoing trends of SSCM empirical study over 28 years.	Qualitative Analysis	The use of systematic literature review (SLR) technique. The author also shows a high degree of methodological validity using the Modified AMSTAR criteria.	The study identified the substantive growth in the study of SSCM with particular emphasis on the various theories and the diverse methodologies applied.
Kirchoff et al, (2011)	Building on the RBV, the researchers studied how a firm's performance can be shaped based on two theoretically significant determinants of sustainable SSCM practices.	Quantitative Analysis	The structural equation modelling method is used.	The study iterated the strategic implications of firm positioning, and the results challenge the current theoretical construct of SSCM
Chacón and Mantilla (2014)	The analysis offers an overview of the capacities of (SSCM) mainly from the	Qualitative Analysis	Non-systematic approach and search criteria method is used.	The results of their study point out that it is not only the stakeholder's pressures or pressures

	resources point of view, the complex capability and philosophy of stakeholders, including their existence, sources, and impact on company performance.			from industry and markets that triggers the capabilities of sustainable supply management but the internal factors independent of external factors that can also cause this trigger.
Markley & Davis (2007)	This is the first to discuss and analyse the effect on the TBL of a firm on a sustainable supplier.	Exploratory Analysis and Qualitative Analysis	Systematic literature review (SLR) methodology is used.	Using a more robust triple bottom line, businesses will boost their competitive edge. The research produces ideas from a resource-based viewpoint driven on a business perspective backed by accounting theory, management policy, green logistics and supply chain literature.
Koberg and Longoni (2019)	The work contributes by defining structures and governance frameworks as crucial elements that define SSCM and synthesise their relationship with sustainability outcomes in global supply chains.	Qualitative Analysis	Systematic literature review (SLR) methodology is used.	Overall frameworks characterised by a broader partnership between the target company and tiered suppliers operated centrally or through third parties are growing tendencies to support sustainable development better and provide many areas for further study.
Wang, Zhang and Goh (2018)	The model investigated the moderating effect of firm size on SSCM practices and the firms' long-term sustainability (economic, environmental, and social)	Qualitative Analysis	hierarchical regression analysis	SSCM practices and firm size appear to be positively related to a company's environmental and social performance. The impact of SSCM practices on economic performance is moderated by firm size. Furthermore, SSCM internal practices significantly impact big enterprise economic performance, but not so much on small and medium enterprise economic performance (SMEs).
Zang, Henry and Wang (2018)	The article offers a matrix detailing supply chain coverage and supplier success of product growth activities, despite facilitators and inspectors' absence or positive participation.	Exploratory and qualitative analysis	A systematic literature review, based on structured content analysis.	Supplier cooperation drives the implementation of sustainable business practices by suppliers. Enhancing Triple - bottom - line output includes cooperation across purchasing and external parties.
Chen and Aleksandr (2017)	The paper establishes performance indicators (economic, environmental, and social) to promote	Qualitative Analysis	A systematic literature review based on structured content analysis.	Implementing SSCM includes connecting stakeholder demands, moral motivations and involvement with

	empirical analysis of several theoretical models derived or extended from the specified assertions.			relational practices in management. The paper further clarifies how, when grouped, relational practices can create a set of relational capabilities that, in turn, reshape stakeholders increasing pressure into business sustainability.
Rameshwar, Angappa and Thanos (2016)	The paper presents measurement metrics for GSCM/SSCM network performance. The authors took account of environmental uncertainty and product ambiguity that has not been explored in GSCM literature in the past.	Qualitative Analysis	A systematic literature review (SLR), which is the key contribution of the current paper, has been used by the authors to define the conceptual structure's building blocks.	External uncertainty (i.e., supply, innovations, and demand uncertainty) must be managed to take the variations between organisations into account.
Isnaini, Nurhaida and Pratama (2020)	The current study is investigated the empirically moderating effect of Supply chain dynamic capabilities (SCDC) on the relationship of SSCM practices and sustainable organisational performance (OSP) indicators, namely, "economic performance, environmental performance, social performance" in the restaurant industry of Indonesia.	Quantitative Methods	Smart PLS 3 software and PLS Structural Equation Modelling (SEM)	the findings of the current study also show that SCDC is significantly moderated on the relationship of SSCM practices and OSP in the restaurant industry of Indonesia
Rameshwar et al. (2017)	The paper calls for the use of alternative approaches to deal with SSCM driver issues. In addition, it suggests and demonstrates the use of a TISM and Cross Impact Classification Matrix (MICMAC) analysis to develop a system that extrapolates SSCM drivers and their links.	Mixed-Method	Total Interpretive Structural Modelling (TISM)	The framework shows how drivers are distributed on different levels and how a specific driver affects the other through transitional connections.
Shahid et al. (2020)	This research paper aims to make a significant contribution to empirical research on the impact of sustainable supply chain management (SSCM) practices on the sustainability	Quantitative Analysis	SEM (Variance-Based)	The findings show that SSCM practices used by both internal and external management have a positive and significant impact on a company's long-term performance.

	performance of firms in Pakistan's manufacturing sector, focusing on the moderating effect of process innovation (PI).			
Sessu et al. (2020)	The goal of this study was to ascertain the effect of supply chain dynamic capabilities (SCDC) in moderating the relationship between sustainable supply chain management (SSCM) practices, supply chain integration (SCI), and business performance (BP) in Indonesia's restaurant industry.	Quantitative Analysis	The Structural Equation Modelling (SEM)	The indirect effect demonstrated that SCDC moderates the relationship between SSCM practices, SCI, and BP positively and statistically significant. In this regard, the findings suggest that SCDC is a key moderating variable that could improve SSCM practices and SCI to enhance business performance.
Zeng, Chen, and Zhou (2017)	The paradigm of "institution-conduct-performance" is used to build a conceptual model based on institutional theory. 363 questionnaires were then used to collect data from eco-industrial park firms in China to test the mechanism and relationships between institutional pressure, supply chain relationship management, sustainable supply chain design, and circular economy capability.	Quantitative Analysis	Structural Equation Modelling (SEM) and hierarchical regression analysis.	The findings indicate that institutional pressure has a significant positive effect on supply chain relationship management and sustainable supply chain design; sustainable supply chain management practices are critical for companies to improve their circular economy capability; coercive, normative, and mimetic pressure all have varying degrees of moderating effect. This research explains the factors that influence sustainable supply chain management and offers theoretical guidance for successful green production practices in eco-industrial park businesses.
Hong et al. (2020)	Scholars have paid little attention to the drivers of sustainable supply chain management (SSCM) in developing countries at the moment. This study examines how the drivers of SSCM influence Chinese firms' adoption of SSCM practices and how these effects are moderated by organisational culture, using the Theory of Planned Behaviour (TPB) and the Competing Value	Quantitative Analysis	Multiple regression analysis	According to the findings of a survey of 209 firms in China, the eight driving factors for SSCM adoption have a sizable impact on SSCM adoption. Furthermore, the role of organisational culture in the relationships between these three dimensions of the driving force and SSCM adoption is sophisticated. The relationship between SSCM drivers and practices is not moderated by team-based culture or

	Framework (CVF) of organisational culture.			hierarchy culture. The relationship between subjective norm and SSCM practices is positively moderated by market-oriented culture, while the relationship between perceived behavioural control (PBC) and SSCM practices is negatively moderated by it. The relationship between attitude and SSCM practices and the relationship between subjective norm and SSCM practices is positively moderated by active culture, but the relationship between PBC and SSCM practices is negatively moderated by active culture.
Gong, Gao, Koh, Sutcliffe and Cullen (2019)	This study looks at how a company's sustainability capability develops and then applies it to SSCM.	A quantitative Analysis	fixed-effect model	This research demonstrates that a company's information environment, measured by customer awareness, has a significant positive impact on its sustainability performance and SSCM implementation. Our findings suggest that a firm's sustainability capability mediates the impact of its information environment on its SSCM performance. We also discovered that stakeholder engagement has an impact on this relationship.
Ni and Sun (2019)	Proposes an integrative framework for examining the supply chain management (SSCM) contribution to business performance. Three dimensions of sustainable supply chain management have been proposed: inbound sustainability, internal sustainability, and outbound sustainability.	Quantitative Analysis	partial least squares structural equation modelling	Outbound sustainability was found to be directly related to business performance, whereas inbound and internal sustainability indirectly impacted business performance. Customer integration improved the relationship between internal and outbound sustainability, according to the model. The findings suggested that supply-side and demand-side sustainability played distinct roles and that when investigating the

				link between SCCM and business performance, the entire supply chain should be considered. A supply-side collaborative advantage was necessary but insufficient, and business performance could only be realised once demand-side value creation was realised. The findings emphasise the importance of integrating the entire supply chain and the unique role of each SSCM dimension.
Wolf (2014)	This study assumes that SSCM can help an organisation's reputation as a "good citizen" and, as a result, counter the perception that SSCM is driven solely by external stakeholder pressure.	Quantitative Analysis	Regression Analysis	Stakeholder pressure and SSCM, according to the findings, both contribute to an organisation's sustainability performance. As a result, supply chain managers will see benefits from SSCM beyond just reducing the risk of reputational damage resulting from stakeholder activism.

Source : Authors Compilation (2021)

According to the literature above, SSCM research continues to improve in terms of methodological rigour. However, there are avenues to enhance methodological rigour – such as a more comprehensive review of empirical validity and social desirability bias – and to explore under-researched pertinent areas like the social and economic dimensions and the underlying mechanisms that defined SSCM-firm performance relationship. The percentage of studies that did not address validity did not change significantly between 2010-2018 (23.68%) and 2001-2010 (26.67%) (Carter et al., 2019). This is a cause for concern. Validity is often cited as the most critical aspect of empirical research (Hair et al., 2014), implying that scholars cannot be confident in their conclusions unless they demonstrate validity.

This study makes a compelling case for demonstrating empirical validity whenever possible. Validity assessments differ in approach (See "reliability" and "validity" vs "credibility" and "trustworthiness"). Social desirability bias all affects validity assessment (Carter et al., 2019). Social desirability bias occurs once survey respondents respond to questions, express opinions, or behave in a way they believe will be deemed acceptable by the researcher, societal norms, or their

peers (Crowne & Marlowe, 1960). Social desirability bias is irrelevant in some studies, particularly those that do not involve human subjects. The effect of social desirability bias was investigated and addressed in studies where it was applicable. The percentage of relevant studies that addressed social desirability bias decreased slightly between 2001 and 2010, from 25% in 2001 to 23.47 % in 2010 (Carter et al., 2019). This demonstrates that the SSCM literature continues to be divided on issues of validity and social desirability.

2.3 GAPS IN LITERATURE

In the sections above, a detailed review of research on SSCM was done. This was to help ascertain the current state of SSCM research and identify the knowledge gaps yet to be explored and addressed. In the ongoing debates on the potential of SSCM, there are various research concerns and the theoretical frameworks used to provide proof of the efforts made by firms to circumvent the environmental and socio-economic problems associated with their supply chains. However, several issues tend to be lacking in SSCM research (Reefke & Sundaram, 2017); first, there is little attention given to the social and economic dimension of sustainable supply chain management as compared to the environmental dimension, which is generally referred to as GSCM (Carter et al., 2019). Second, the sustainability implementation has improved across a variety of supply chains. However, there is no acceptable framework to help its implementation across all industries, demonstrating the need to consider how SSCM can be extended to various industry sectors (Yun, Yalcin, Hales & Kwon, 2019).

Third, there appears to be a dearth of understanding of the exact process and the mechanism that affects or determines sustainable supply chain management practices and firm performance (Shahid et al., 2020; van Donk, van der Vaart, Awaysheh & Klassen, 2010). Specifically, the role of certain variables, such as operational competitiveness, the business environment of uncertainty, firm capability, and supply chain integration in SSCM (Lin & Tseng, 2016; Roy, Schoenherr & Charan, 2018; Sauer & Seuring, 2018; Sessu et al., 2020). Another gap noted by Khan, Yu, Golpîra, Sharif and Mardani (2020) is that most of the SSCM studies originated in developed countries, which show that sustainable practices are widely accepted among these countries, while very little is known from the point of view of developing countries as to whether the benefits of SSCM would be as profound as those seen in developed countries. Methodologically, some gaps include addressing the scientific validity and social desirability bias of the SSCM data and

exploring under-researched quantitative areas, including the social dimension of the SSCM (Carter et al., 2019). Theoretically, there is a lack of knowledge regarding the application of the grand theory, which seeks to apply integrated theories in the field of SSCM (Bals & Tate, 2018; Carter et al., 2019).

From an integrated theoretical perspective, this study investigates and evaluates the mechanisms underlying the relationships between SSCM practices and firm performance in the Ghanaian manufacturing and service organisations context by examining the role of operational competitiveness, business environment uncertainty, firm capabilities, and supply chain integration.

2.4 THEORETICAL FRAMEWORK

This session examines the interrelationships between theories deemed essential to the dynamics of the subject matter at hand. The primary objectives of this section are to explain the various theories relevant to the study, to discuss how the theories relate to one another (to establish critical relationships between these variables), and to provide a schematic diagram of the theoretical framework that enables readers to see and understand the theoretical relationships easily.

According to Carter et al. (2019), SSCM research is complicated, and no single theory can be applied universally. As a result, the political economy theory is employed in this study, which is a synthesis of three fundamental theories (i.e., legitimacy theory (LT), stakeholder theory (ST), and institutional theory (IT)) is used to provide a better understanding of the dynamic relationship between SSCM practices from a TBL approach and their subsequent impact on firm performance. The political economy theory is integrated into the SSCM literature from an integrative theoretical perspective to understand the relationship between the study variables better, thus the ‘if, when and the how the relationship occurs, eliminate competing explanations, and improve the predictive accuracy of the study variables (Mayer & Sparrowe, 2013).

2.4.1 Political Economy Theory

In this study, the 'political economy' theory serves as the primary theoretical framework. Gray, Owen and Adams (1996, p. 47) posit that political economy theory is "the social, political, and economic context through which human life occurs." The government, society, and economy are all inextricably linked, according to this theory. This implies that the economic viability of any activity cannot be scrutinised meaningfully without taking into account the socioeconomic,

sociocultural, and institutional contexts in which economic activity occurs. By studying political economy, a greater understanding of how an organisation operates and the details of its operations it chooses to share can be gained from the larger society (Gray et al., 2010). Gray et al. (2010, p. 20) further describe Political Economy Theory as having two main branches. These branches are "classical and 'bourgeois' political economy". "Classical Political Economy Theory is connected to the works of philosophers such as Karl Marx and explicitly places a focus on 'sectional (class) interests, structural conflict, inequity, and the role of the state" (Gray et al., 2010, p. 20). The focus of the classical political economy theory is on societal structural conflicts. In contrast, Gray, Kouhy, and Lavers (1995, p. 53), claim that Bourgeois Political Economy theory "largely ignores the elements of structural conflicts and, as a result, is content to perceive the world as essentially pluralistic." Legitimacy, Institutional and Stakeholder theories, according to Gray, Owen and Adams (2010), are all inferred from the Bourgeois Political Economy Theory. The three theories and their interactions form the fundamental tenants of political economy theory.

The Political economy theory applies to management and sustainability research in various ways because management and sustainability studies are viewed through the lens of political economy as issues that are inextricably linked to social, political, and economic challenges (Wieland, 2021). As a result, the political economy theory is viewed as a tool for constructing, maintaining, and legitimizing economic, social, and political structures that benefit organisational interests. To fully appreciate the significance of political economy in such studies, it is necessary to expand on its central components, i.e., Institutional, Legitimacy and Stakeholder theories.

2.4.2 Legitimacy Theory

According to Legitimacy Theory, organisations are constantly attempting to operate within the boundaries and standards of their respective communities to ensure that their operations are viewed as "legitimate" by external parties. These constraints and standards are not considered as fixed but rather evolve with time, necessitating the organisation's responsiveness to the environment in which it operates. Lindblom (1993) distinguishes between legitimacy as a state or situation and legitimation as the process through which an organisation is considered legitimate. According to Lindblom (1993, p. 2), legitimacy is: …"a condition or status which exists when an entity's value system is congruent with the value system of the larger social system of which the entity is a party".

Legitimacy is "a state or condition that exists when an entity's value system is consistent with the value system of the larger social system to which it belongs" (Lindblom 1993, p. 2). According to Suchman (1995, p. 574), "legitimacy is a widespread perception or assumption that an entity's actions are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." Legitimacy is frequently viewed as a resource upon which an organisation is reliant for survival in Legitimacy Theory (Dowling & Pfeffer, 1975; O'Donovan, 2002). When there is an actual or potential conflict between the two value systems, the entity's legitimacy is jeopardised. Legitimacy is a relative concept; it is contextual and time- and place-specific.

Legitimacy is something that society bestows on the organisation, and it is something that the organisation desires or seeks. According to Legitimacy Theory, when the supply of a particular resource becomes critical to the organisation's survival, those resources are pursued as strategies to ensure their continued supply, thereby providing legitimacy to the company. Legitimacy may also be acquired by targeting disclosures, as well as collaborating with parties perceived by society as legitimate and thus capable of providing "legitimacy by association," are all examples of strategies for acquiring, sustaining, or restoring legitimacy (commonly referred to as "legitimation strategies") (Deegan & Blomquist, 2006; Oliver, 1991). It is not the organisation's actual behaviour that matters when it comes to being perceived as legitimate; what matters is what society collectively knows or perceives about its behaviour.

Legitimacy theory has been used to better understand company operations and activities, particularly those involving sustainability issues. As such, it is deemed as an accountability theory that is predicated on the social contract concept. Although the word "social contract" is difficult to define, it refers to a wide range of formal and informal expectations society has for how a company should operate. Profit maximization may be argued to be the best metric for company performance in the past (Abbott & Monsen, 1979; Heard & Bolce, 1981; Patten, 1991, 1992; Ramanathan, 1976). Profitability was viewed as the ultimate criterion of organisational legitimacy in this theory (Ramanathan, 1976). However, in recent decades, public expectations have shifted dramatically. Apart from financial viability, “it has been argued that consumers, employees, and residents of communities where products are manufactured, and waste is disposed of increasingly expect

businesses to take steps to repair or prevent damage to the physical environment in order to ensure the health and safety of consumers, employees, and residents"(Tinker & Neimark, 1987, p. 84).
Businesses with a bad track record of social and environmental performance face significant obstacles in obtaining the resources and support necessary to operate in a community that values a clean environment. As a result, Legitimacy Theory emphasises the importance of the organisation appearing to consider the general public's rights rather than just its investors' rights. Failure to live up to societal expectations may result in societal sanctions being imposed. Society is assumed to permit the organisation to continue operations as long as the society's general expectations are met. Given that sustainable supply chain management is a societal requirement and expectation of most 21st-century societies, firms must ensure that their organisations have the necessary policies and practices in place to ensure that their supply chain activities are not just economically prudent but also environmentally and socially responsible that is to say that the state/nature of the environment and society is of great importance to firms. According to the legitimacy theory, when this public expectation is met, the targeted enterprise obtains community approval to operate.

2.4.3 Stakeholder Theory

According to Freeman and Reed (1983), a stakeholder is "any identifiable group or individual who can affect or is affected by the attainment of an organisation's objectives." Stakeholder theory is divided into two branches: ethical (moral), or normative, and positive (managerial, or instrumental, as it is sometimes called). Stakeholder Theory's moral (and normative) perspective asserts that an organisation's stakeholders have a right to equal treatment. However, initial concerns about stakeholder power are irrelevant. The positive or management component of stakeholder theory is explicitly concerned about the various stakeholders in society and how their expectations may have a more significant (or lesser) effect on corporate goals.
This research employs the ethical (moral) or normative branch of stakeholder theory. This is because the perspectives of all stakeholders within the three highlighted groups, namely economic, social, and environmental, are considered equally important when implementing SSCM practices, particularly from a TBL perspective. According to Hasnas (1998, p. 32), the normative (ethical) branch of stakeholder theory believes that managers should manage the firm to benefit all stakeholders, regardless of whether increased financial performance results from stakeholder

management. It considers management to have a fiduciary responsibility to all stakeholders, not just some, and views the company as a mechanism for aligning stakeholder concerns instead of enhancing stockholder financial returns. This means that, from a normative stakeholder management perspective, all stakeholders' interests must be given equal weight and, where they clash, the firm must be managed to create the optimal balance between them. Thus, the normative stakeholder approach effectively asserts that firms bear actual social responsibilities. Furthermore, the ethical branch of Stakeholder Theory believes that stakeholders have inherent rights (such as the right to a safer environment, better working conditions, and reasonable remuneration) which should not be ignored. Thus, each stakeholder deserves to be considered on their own merits, rather than solely for their capacity to advance the interests of another, such as shareholders (Donaldson & Preston, 1995). Stakeholders must be defined before a normative debate of stakeholder rights can take place. Freeman and Reed's (1983, p. 91) stakeholder definition is quite general and does not 'dive deep' to the specific 'influencing factors' or 'effects' discussed when discussing a stakeholder's concept. As a result, it is ineffective for determining the range of stakeholders considered by particular organisations. Surprisingly, because of the vagueness and lack of purposefulness that cloaked the definition of who a stakeholder is, this generic definition of stakeholders is pretty much identical to that provided generally by authors such as (BHP Billiton, Sustainability Report, 2012, P. 25; Amcor Ltd, Sustainability Report, 2012, P. 10). Clarkson (1995, p. 106) attempted to separate secondary and primary stakeholders.

The term "primary stakeholder" was used to identify “one without whose ongoing participation the corporation cannot continue to exist as a going concern”. Secondary stakeholders were classified as “those who influence or impact, or are influenced or affected by, the corporation, but are not involved in transactions with the business and are not necessary for its survival” (Clarkson, 1995, p. 107). From an ethical (and normative) standpoint, stakeholders (primary and secondary) have certain fundamental rights that must not be infringed. This can be extended to imply that all stakeholders have a right to education about how the organisation affects them (for example, through pollution, culture, the environment, society, community sponsorship, or the provision of employment safety programs) and how the organisation should operate to maximise its effectiveness. According to stakeholder theories, the successful implementation of SSCM and its consequent good return on a firm is contingent on all major stakeholders' careful but strategic

integration - in this scenario, the capabilities of the focal firm, suppliers, customers, and the internal structures of the focal firm.

2.4.4 Institutional Theory

Institutional Theory has a long and illustrious history. According to Scott (2008), the first institutional arguments appeared in the 1880s, primarily in the social sciences. The institutional theory was used in early works in economics, political science, and sociology. Organisations and organisational structure were unimportant to these early proponents of the concept. Authors such as Meyer and Rowan (1977) in the 1970s, on the other hand, linked organisations' institutional structures and activities to a diverse array of societal expectations. The basic view of organisations, as perceived by such theorists, was that an ‘organisation' becomes an institutionalised form reflecting not only the technical necessities required to function efficiently but also, more importantly, the cultural rules and beliefs of the social environments from which they operated (Scott, 2008b). The social and institutional framework in which organisations operate has a significant impact on forming organisational structures (Meyer & Rowan, 1977).

Because the concept of ‘institution' has so many different meanings and applications, no definite all-inclusive interpretation is attainable (Scott, 1987). Scott (2008, p. 48) provided the following general and complex definition' of institutions: “Institutions are made up of regulative, normative, and cultural-cognitive elements that, when combined with associated activities and resources, provide social life with stability and significance.” Meyer, Boli, and Thomas (1987, p. 13) propose a marginally different definition of ‘institution' similar to the previous definition. In their definition, “institutions were considered as cultural standards that gave collective meaning and value to specific entities and activities, and when integrated evolved them into larger schemes.” Scott (2008)'s definition of institutions, used in this study, includes three components: regulative, normative, and cultural-cognitive. These regulatory, cultural-cognitive, and normative, elements serve as three critical 'pillars' of 'institutions’ (Scott, 2008).

The regulatory is comprised of instructions, legislation, and sanctions that accompany them. This pillar underlines that 'there is a requirement legally to do business in a particular manner, or else punitive measures may apply.' This pillar upholds a range of "coercive" mechanisms. The majority of which are imposed by the law enforcement constituents on whom the organisations rely. The

normative pillar includes values and standards that reflect social obligations or expectations; particular procedures or structures become socially accepted (and 'institutionalised') as the 'corrector moral methods' to do things. A variety of factors, including professional and educational experiences, will shape expectations about the "correct or proper way to do things." Accreditations, reputable affiliations, and relevant experience all support this normative pillar. Institutional Theory's third pillar, cultural-cognitive, is a crucial component (Scott, 2008b). Several "assumptions taken for granted" are essential in social behaviour (Zucker, 1987, p. 440). This cultural-cognitive foundation is made up of presumed symbolic systems and their meanings. Although cognitive beliefs are held subjectively, they exist as "facts, and the component of objective reality, and can be communicated as such" (Zucker, 1977, p. 726).

To the point where doing things differently becomes unthinkable, cultures and values are communicated through the language of "this is how these things are done" (Scott, 2008b, p. 125) or "this is how other legitimate parties engage in an activity." This pillar is supported by mimetic mechanisms, allowing organisations to emulate (or copy) others in a gentle, difficult-to-detect, assertive manner. These three pillars are "essential building blocks of institutional structure" (Scott, 2008b, p. 49) that use coercive, mimetic, and normative mechanisms to limit and empower social behaviour (DiMaggio & Powell, 1983). These pillars are constantly interconnected and coexisting, and one or more of them may take the lead at any given time (Hoffman, 2001). The regulative, normative, and cultural-cognitive are directly linked to the concept of isomorphism proposed by DiMaggio and Powell (1983). In Institutional Theory, the term "isomorphism" is often used, and DiMaggio and Powell (1983, p. 149) explained this concept as "a restrictive process that pushes one unit in a population to resemble other units experiencing the same set of external variables." As a result of the differences, organisations that adopt structures or processes that differ from those of other organisations may receive backlash. Organisations have become increasingly homogeneous within specific domains due to isomorphic processes, and they adhere to the expectations of the larger institutional context.

DiMaggio and Powell (1983) distinguish three types of isomorphism: coercive isomorphism, mimetic isomorphism, and normative isomorphism. Coercive isomorphism, mimetic isomorphism, and normative isomorphism (institutionalism arises through coercion, normative processes, and mimetic mechanisms). Coercive isomorphism is defined by formal and informal

constraints imposed on organisations by other organisations on which they rely and cultural norms within the society in which organisations operate, as per DiMaggio and Powell (1983, p. 150). Coercion, persuasion, or incentives to cooperate may be used to apply these pressures. A mimetic isomorphism is the second isomorphic process proposed by DiMaggio and Powell (1983). This is when a company tries to imitate (or duplicate) or improve another company's institutional practices to gain a competitive advantage.

To put it another way, one organisation may model itself after another that it considers being successful. DiMaggio and Powell (1983, p. 151) define mimetic isomorphism as follows: "A powerful motivator of imitation is uncertainty." Organisations may model themselves after other organisations when organisational technologies are poorly understood, goals are ambiguous, or the environment creates symbolic confusion.

DiMaggio and Powell (1983) coined the term normative isomorphism to refer to the final isomorphic process. This refers to the demands imposed by group norms on individuals to adhere to specified institutional practices. Based on these three isomorphic processes, it is possible that the implementation of sustainable practices in SCM, also known as SSCM, is due to coercive isomorphism, which means that various governmental and regulatory bodies require individual focal firms to adopt these sustainable practices to maintain their license to operate. The struggle for survival as organisations in a highly competitive yet uncertain business environment necessitates the adoption of SSCM practices; thus, this study employs institutional theory to examine the moderating effect of operational competitiveness and business environment uncertainty on SSCM practices and firm performance.

2.4.5 Integration of the Three Theories for this Study

The preceding theoretical discussions of stakeholder theory, legitimacy theory, and institutional theory viewed as complementary rather than competing theories and collectively referred to as political economy theory best describes the effective implementation of SSCM practices and their subsequent effect on firm performance. The political economy theory proposes that a firm’s economic viability and associated benefit are meaningless unless the political, social, and institutional environment in which the firm operates is appropriately considered. In our discussion of Legitimacy Theory, we saw how managers could influence perceptions of legitimacy through

specific actions, such as SSCM practices. This influence of perceptions is to enable the firm to acquire societal support for their operations. In this study, the legitimacy theory implies that the 21st-century society is concerned about the sustainability of their environment and compels all operational firms to embrace sustainable practices, particularly from the TBL standpoint. In our discussion of Legitimacy Theory, we saw how firms could use specific actions, such as SSCM practices, to influence perceptions of legitimacy. The firm can gain societal support for its operations, reflecting the influence of perceptions.

The stakeholder theory is employed in this study to identify the various players who are equitably affected by the focal firm's operations. Following identification, these stakeholders' perspectives of the firm and its practices are carefully incorporated into its operations to ensure long-term viability and profitability. By equitably integrating the various stakeholder perspectives, the firm can guarantee the essential stakeholder support to operate effectively. Significant stakeholders identified in this research include firm capabilities, supplier integrations, internal integrations, and customer integrations.

This study suggests that it is necessary to investigate the roles of these essential stakeholders in the effective implementation of SSCM management and its effect on firm performance. Institutional Theory tries to explain how organisations might use mechanisms to align views of their practices and characteristics with the social and cultural values of the operating environment. These mechanisms include those proposed by Stakeholder Theory and Legitimacy Theory, but they may also contain a broader spectrum of legitimating mechanisms. The institutional theory demonstrates how corporations can replicate their working environment's technological, social, and cultural beliefs to remain viable.

The pursuit of survival and profitability necessitates those enterprises, more often than not, mimic the methods of "successful" enterprises in their operational environment. SSCM has been highlighted as a requirement for business viability and profitability; firms are undoubtedly imitating organisations that have effectively implemented SSCM practices and are reaping the related performance advantage. This implies that the level of uncertainty in the business environment and the competitiveness of the operating environment must have an impact on the deployment of SSCM practices. The significance of operational competitiveness and business environment uncertainty in the relationship between SSCM practices and firm performance is

explored in this research. The preceding discourse demonstrates how much overlap exists between Institutional Theory, Legitimacy Theory, and Stakeholder Theory. Regardless of the overlap that permits them to be referred to collectively as political economy theory, their roles in describing their role in applying SSCM practices and firm performance have been rigorously shown.

2.5 HYPOTHESES DEVELOPMENT

This section aims to develop theoretical and empirical relationships for the theorization of the final model between the embedded concepts. Following theoretical considerations regarding SSCM practices and firm performance, the theoretical structure and consequently the conceptual model has been established in this section. This takes the study a step closer to achieving the study's primary objective of investigating the mechanism, which contributes to the relationship between sustainable supply chain management and firm performance.

2.5.1 Social Supply Chain Management- Firm Performance

Social supply chain management aims to integrate social networks, social connections, and social data to improve relationship management for all stakeholders. This is to increase value in the final marketplace at a cheaper cost to the supply chain (Govindan et al., 2020; Wilding & Proctor, 2015). By definition, social practices and efficiency in supply chain operations encompass all management strategies affecting how an organisation adds value to human capital growth or protects people from harm, taking into account both advantages and disadvantages (Chen et al., 2019; Sheu & Choi, 2019). It has been established that a socially sound community can positively contribute to the advancement of firms. Any firm that successfully meets the societal needs of its stakeholders (as defined by the stakeholder theory) obtains the approval of its operational community and stakeholders at large, hence improving the firm's performance. This approval is described by political economy theory's legitimacy theory (Grey et al., 1996; Scoones, 2016; Zimon et al., 2020). Effectively integrating societal concerns into a business's operations is considered a competitive advantage (Chen et al., 2017; Paulraj et al., 2017; Santiteerakul et al., 2015). Firms seeking a competitive edge frequently emulate this trait, as evidenced by political economy theory's institutional theory. McGuire et al. (1988) conducted one of the earliest studies on the effect of social supply chain practices on corporate performance. The study discovered that entities that fail to perform in CSR earn a lower return on their assets.

There are two types of socially inclusive practices that benefit employees (SPE) and the community (SPC). SPE includes provisions for fair salaries and benefits, a protected, healthy, and pleasant business environment, medical benefits, paid holidays, and other benefits packages, as well as opportunities for advancement. (Lu et al., 2012; Mani et al., 2016; Marshall et al., 2015; Zhu et al., 2016). Das (2018) asserts that when these social activities are carefully integrated into a corporation's operations, the firm's performance improves. Furthermore, firms that implement anti-child labour and labour rights protection mechanisms have been studied under SPE and positively affect firm performance (Mani et al., 2016; Zhu et al., 2016).

SPC, which refers to a business's investments in the nearby communities in creating employment and business development, as well as in teaching, learning, training, and healthcare centres, has shown to improve a business's progressive status in the eyes of stakeholders (Hutchins and Sutherland, 2008; Zhu et al., 2016; Perry et al. 2013) conducted an exploratory study on the cashmere industry in Scotland. The findings of this study indicate that socially responsible supply chain practices have a significant positive effect on firm performance. Wang and Sarkis (2013) assert that social supply chain activities improve financial performance as measured by return on assets and equity. Stakeholders will reward ethical and socially responsible behaviour through CSR initiatives that improve firm performance, according to Jones (1995). Internal enterprise management, company compensation structure, and developing an incentive system for employees are all known components of social supply chain practices that positively affect business performance (Ramus et al., 2000; Sila et al., 2006).

Furthermore, socially responsible practices improve firm performance by significantly reducing supply chain risk and raising stakeholder engagement (Fahimnia & Jabbarzadeh, 2016 ;Gualandris et al., 2015). The activities of external stakeholders, such as non-profit organisations (NGOs), have also been found to improve a company's brand image, environmental, social, and financial performance (Chen et al., 2019). The survey found that the most influential people management techniques for social supply chain management practices were performance appraisal, team effectiveness, SHRM alignment, and talent management. These social activities have a strong correlation with firm performance (Loo-See & Leap-Han, 2013). Social supply chain management contributes to an organisation's business and financial performance in a variety of ways. Aside

from cost reductions and the ability to operate, business continuity and supply chain resiliency can also significantly contribute to long-term supply chain benefits (Sarkis, 2009). Wang and Sarkis (2013) observed beneficial relationships between the joint deployment of social and environmental sustainability strategies and organisational financial performance. According to Govindan et al. (2020), incorporating environmental and social practices into supply chains benefits firms across all economies and industrial sectors in terms of operational and financial performance. Based on the findings of the preceding studies, the following hypothesis was thus proposed:

H1a: Social Supply Chain Management has a direct positive effect on firm performance.

2.5.2 Environmental Supply Chain Management and Firm Performance

The justification for adopting environmental management practices (EMP), particularly in supply chains, may be traced back to the results from various studies (e.g., Famiyeh et al., 2018; Hart, 1995; Klassen & Whybark, 1999; Porter & Linde; 1995; Saruchera & Asante- Darko, 2021). With its associated theories, the political economy theory best exemplifies the rationale underlying this acceptance of these findings. Environmental management methods were emphasised as a prerequisite for stakeholders to ensure the well-being of their communities. This requirement drove organisations to implement these methods to gain social acceptance, which became a source of competitive distinction, necessitating trailing firms to adopt these practices to remain viable. The findings above prompted several academics to conduct studies in environmental, GSCM, SSCM and identify relevant items that would capture the behaviours critical to environmental or environmentally sustainable constructs.

Several items about environmental practices were discovered across the entire supply chain by Zhu and Sarkis (2004, 2007) and Zhu et al. (2007; 2008; 2012). Offering design requirements to suppliers for supplied items that include compliance with environmental regulations; suppliers' ISO 14001 certification; a collaborative effort with clients for eco-design, pollution prevention, and green innovation; and brand development for reduced material and energy consumption are some of these items. The majority of the EMP items are found in various studies (e.g., Diabat & Govindan, 2011; Green. et al., 2012; Laosirihongthong et al., 2013, Marshall et al., 2015; Mitra & Datta, 2015; Zailani et al., 2012). These findings, which have been established as components of environmental supply chain management by numerous scholars, have been empirically tested to

determine their impact on firm performance when implemented. As demonstrated below, there is a positive correlation between environmental supply chain management and firm performance. Research notes that the adoption of environmental management programs along the supply chain will bolster the environmental performance of firms, which will, in turn, contribute significantly to the firm's performance (Rao, 2005; Zhu & Sarkis, 2007). Effective environmental management practices implemented throughout the supply chain can help firms improve their performance through product recovery, which ensures that toxic and hazardous materials are properly managed, and their negative impact on the environment is mitigated reduced carbon emissions and associated taxes, and a deterrent penalty for pollution (Dong et al., 2019). Additionally, EMP can raise revenue by selling environmentally friendly products to environmentally sensitive customers, hence improving the firm's performance (Kim & Han, 2010; Sheu & Choi, 2019). Klassen and Whybark (1999) discovered that focusing on pollution prevention rather than pollution control improves an organisation's environmental performance, improving its overall performance, notably its finances. Rao et al. (2009) demonstrated that integrating EMP throughout supply chains increases environmental performance (EPR), resulting in increased firm performance and competitiveness.

Furthermore, Yang et al. (2011) found a significant positive relationship between EMP and firm profitability. According to Laosirihongthong et al. (2013), green purchasing leads to improved firm performance. SSCM practices, according to Paulraj et al. (2017), have a significant positive association with a firm's EPR and financial performance. Corporations can improve their performance by focusing on pollution avoidance, sustainable development, and product stewardship as their primary strategic capabilities. Hasan (2013) investigated five typical organisations, including Coca-Cola Enterprises and Eastman Chemical Company, and revealed the positive effects of environmental supply chain strategies on firm performance. Based on the above research findings, the following hypothesis was proposed:

> *H1b: Environment Supply Chain Management has a direct positive effect on firm performance.*

2.5.3 Economic Supply Chain Management and Firm Performance

According to political economics theory, the economic dimension of sustainable supply chain management is viewed as an internal stakeholder necessity of the focal firm to ensure prudent resource management. Effective deployment and management of these resources is also a competitive advantage frequently replicated by organisations without the necessary know-how and expertise but aspiring to be as relevant. To ensure good economic supply chain management and firm performance, one is expected to pay attention to stakeholders, maintain legitimacy, and adapt to competitors' techniques to remain relevant. Economic supply chain management includes the profits earned by the network's participants and the economic advantages experienced by the participants' host nations, regions, and communities. Thus, this dimension extends beyond a company's internal profit, and some of the characteristics that fall under this category may be difficult to quantify in financial terms. In this study, three main economic factors of supply chains are considered against firm performance. These factors include institutions or systems, waste reduction and strategic sourcing, as indicated earlier.

Sustainable procurement is an essential aspect of strategic sourcing. Sustainable procurement is commonly referred to as an environmental purchasing technique that guarantees acquired commodities meet desirable financial and ecological features such as reusability, recyclability, and nontoxic materials (Zsidisin & Siferd, 2001). Sustainable procurement is also viewed as an economic management technique that assists institutions in ensuring the prudent use of their financial resources. The study by Santiteerakul, Sekhari, Bouras and Sopadang (2015) indicates a significant positive relationship between economic supply chain management and firm performance from the perspective of institutions and systems. Sustainable procurement also addresses proper raw material sourcing and waste reduction through hazardous material waste minimization (Min & Galle, 2001). When correctly integrated into a firm's operations, this approach has positively improved firm performance, particularly from a financial standpoint (Esfahbodi et al., 2016; Mefford, 2011).

A strategic partnership is a component of economic supply chain management (Nudurupati, Bhattacharya, Lascelles & Caton, 2015). In this component, third party firms are picked by the focal firm to improve the efficiency of the focal firm's operations. This efficiency is achieved by

lowering operational costs and taking on some of the focal firm's responsibilities. According to Awe, Kulangara and Henderson (2018), strategic partnership, a component of economic supply chain management, has improved firm performance significantly. The economic supply chain management component of sustainable supply chain management views waste reduction as a critical issue (Fiksel, 2012). According to Liu et al. (2021), waste reduction is a systematic procedure and strategy that aims to minimise an entity's waste generation to improve its financial fortunes. The effective implementation of waste reduction programs for economic gains has been demonstrated by several studies to have a considerable positive effect on firm performance, particularly from an SSCM perspective (Fakoya, 2020 ; Namagembe et al., 2019; Ochiri et al., 2015; Simpson, 2012). Based on the above research findings, the following hypothesis was proposed:

H1c: Economic Supply Chain Management has a direct positive effect on firm performance.

2.5.4 The Mediation Effects

2.5.4.1 Role of Supply Chain Integration

2.5.4.1.1 Customer Integration

Customer Relationship Management (CRM) is increasingly being seen as a corporate strategy, process-oriented, cross-functional, value-creating for both buyers and sellers, and a process of attaining financial results (Blühdorn, 2016; Fernando & Lawrence, 2014; Koch & Mont, 2016; Sabau, 2020). When a business promotes a sense of integration with its customers, it is willing to exchange resources and information to better understand one another's requirements, which reduces opportunistic behaviour and increases firm profitability. This customer-firm relationship is best exemplified by political economy theory. According to this theory, a firm has consumers who are considered stakeholders and individuals whose opinions and approval enable the focal firm to continue operating. As a result of institutional theory, firms continue to copy organisations that have successfully incorporated their consumers' perspectives.

As a result, political economy demonstrates the need of including clients in a business's operations. The perspectives of customers are crucial to the success of SSCM practices. Customer integration

promotes the synchronization of business operations between manufacturers and customers, which lowers operating costs and enhances the company's social, economic, and environmental factors (Hooshangi et al., 2017; Ni & Sun, 2019; Sessu et al., 2020). Customer integration positively correlates with financial performance and acts as a conduit for an organisation's strategic objectives to be realised, as having the goals alone is insufficient for performance (Ataseven & Nairb, 2017; Zhao et al., 2021). This means that having an efficient SSCM practice is thus insufficient for performance; instead, a good relationship with clients and knowing their expectations is crucial, particularly in SSCM practices.

This is because if a firm's products and processes are not designed to meet the needs of its customers, which in this case means ensuring that all processes about the firm's operations are socially, economically, and environmentally responsible, the value of the product, as well as the firm's value, is limited. This demonstrates that when SSCM techniques are integrated with the viewpoints of the organisation's customers, who are viewed as the organisation's primary stakeholders, they result in positive business performance. The structural analysis of Hooshangi et al. (2017) & Wang et al. (2021) discovered that customer integration is a mechanism for protecting firm investments from various opportunists, obtaining employee commitment, and improving organisational performance. Sessu et al. (2020) indicated in their study that there is a positive effect of customer integration on social factors, economic factors, environmental factors, and firm performance. Therefore, this research asserts the importance of customer integration on SSCM practices and firm performance; hence the following hypotheses were proposed:

H2a: Customer Integration mediates the positive relationship between Social Supply Chain Management and Firm Performance.

H2b: Customer Integration mediates the positive relationship between Environmental Supply Chain Management and Firm Performance.

H2c: Customer Integration mediates the positive relationship between Economic Supply Chain Management and Firm Performance.

2.5.4.1.2 Supplier Integration

A firm that integrates with its suppliers gains more insight into its key suppliers' capabilities, processes, and constraints. This insight allows firms to plan and forecast, engage in product, and process design, and manage transactions more effectively (Schoenherr & Swink, 2012). It is impossible to overestimate the significance of political economics theory in comprehending the role of supplier integration in SSCM practices and the firm-performance relationship. According to this theory, legitimacy, which confers on a focal firm the right to operate in any community, can be achieved when the customer is aware of the source and orientation of such a firm's goods. Knowledge of your suppliers, their activities, and the orientation of their products has been found to instil confidence in consumers, employees, and society (Bozzetto et al., 2020; Setyadi, 2019; Zimon et al., 2020).

This confidence provides the focal firm's legitimacy to operate, resulting in increased patronage of the firm's product and improved firm performance. As a result of this quest for legitimacy, the supplier becomes a significant stakeholder in the supply chain. Their operations are viewed as critical components of the supply chain and are subjected to compliance monitoring. Firms that have successfully implemented their supplier integration structure and are reaping the benefits of doing so are regularly consulted for other firms to replicate the technique that enables such integrations. As a result, political theory explains why a firm implementing SSCM practices from a social, economic, and environmental perspective to improve firm performance will be unable to fully achieve this goal unless the role of their suppliers as (stakeholders and a medium for obtaining societal legitimacy) is adequately understood. According to Liu et al. (2018), Supplier integration serves as a medium for implementing sustainable business practices and improves the Triple - bottom - line output, which involves cooperation between purchasing and external partners.

Amoako-Gyampah et al. (2020) discovered, using confirmatory factor analysis and covariance-based structural equation modelling, that supply chain integration is a significant medium via which enterprises can execute their varied strategies, thus improving their performance. Supplier integration creates a networked system that enables collaboration and interaction with suppliers and consumers to respond to uncertainty demands and improve sustainability practices and operational performance (Azadi et al., 2015; Ecer & Pamucar, 2020; Fayezi, Zutshi & O'Loughlin, 2015; Song et al., 2017). Supplier integration has been recommended for businesses to integrate

environmental management systems, social supply chain management practices, and economical supply chain management practices (Turkulainen et al., 2017).

Supplier integration has been described as a tool for supply chain management that can help increase industrial competitiveness in terms of cost, output, and quality (Yang et al., 2018). Businesses that collaborate with their suppliers and customers develop organisational capabilities, resulting in improved social, economic, and environmental strategy implementation (Luke et al., 2013 ; Zimon et al., 2020). Therefore, this research asserts the importance of supplier integration on SSCM practices and firm performance hence proposing the following hypotheses:

H3a: Supplier Integration mediates the positive relationship between Social Supply Chain Management and Firm Performance.
H3b: Supplier Integration mediates the positive relationship between Environmental Supply Chain Management and Firm Performance.
H3c: Supplier Integration mediates the positive relationship between Economic Supply Chain Management and Firm Performance.

2.5.4.1.3 Internal Integration

Internal integration refers to how well intra-organisational functions collaborate within a company (Amoako et al., 2020). It is a crucial operational capability that helps the company improve its performance by breaking down organisational barriers and encouraging information sharing across departments (Brusset, 2016). According to Zhao et al. (2011; 2013), internal integration is the extent to which an organisation organises its intra-organisational functions such as operational strategies, systems, and procedures into synergetic mixed processes for competitive advantage and enhanced performance. Thus, internal integration is the ability of a firm to cooperate and share information among internal arms, which strategically creates partnerships among cross-functional units (Zhao et al., 2011). The political economy theory best illustrates the internal integration and its application from an SSCM, firm performance relationship (Arndt, 1983; Chen et al., 2018). As previously stated, this theory views SSCM practice as a vital technique for a firm to acquire legitimacy to operate. When applied effectively, this technique has been shown to improve firm performance. However, to guarantee the organisation's viability, the role of many stakeholders

must be understood, and their perspectives integrated equitably into company operations. One such stakeholder is an organisation's internal functional department. These departments are directly responsible for the firm's objectives, which in this instance are SSCM practices. This makes internal integration a critical element for a business if it wishes to obtain a license to operate, remain competitive, and serve as a model for other businesses to emulate.

Thus, political theory and its complementary theories demonstrate that for a corporation to be viable, its internal structures must be considered because they are a critical stakeholder, provide legitimacy to the firm, and serve as a model for the competitive market. Internal integrations involved in SSCM have been demonstrated to be crucial in creating and maintaining consistency across supply chains, resulting in enhanced company performance (Mello et al., 2017). Mekhum (2020) discovered that efficient integration of an organisation's internal activities increases the long-term sustainable performance of manufacturing enterprises from an (economic, environmental, and social) standpoint. Internal integration was deemed a critical component of SSCM practice application in the Kwamega et al. (2018) study.

According to Bruque-Cámara et al. (2016), internal integration and supply chain responsiveness, green supply chain practices, and social supply chain practices have a positive relationship. Graham (2018) established a positive significant relationship between internal integration, environmental supply chain management, and economic supply chain management using structural equation modelling, as these supply chain activities were highly dependent on the executing firm's internal departments. Therefore, this research asserts the importance of internal integration on SSCM practices and firm performance and therefore proposed the following hypotheses:

H4a: Internal Integration mediates the positive relationship between Social Supply Chain Management and Firm Performance

H4b: Internal Integration mediates the positive relationship between Environmental Supply Chain Management and Firm Performance

H4c: Internal Integration mediates the positive relationship between Economic Supply Chain Management and Firm Performance

2.5.4.2 Role of Firm Capabilities

As previously stated, this study examines firm capability from the strategic, operational, and external relations perspectives of focal firms and their relationship with SSCM practices and firm performance. Firm capabilities refer to the distinct resources that a firm possesses to accomplish its strategic objectives to remain sustainable and competitive (Feng et al., 2017; Kang & Paus, 2020; Krammer et al., 2018**;** Seifert, 2015). The importance of firm capabilities in the SSCM practices and their relationship to firm performance is examined using political economy theory. According to this approach, firm capabilities are considered as strategic stakeholders in organisations. This is because a firm's unique resource set includes, but is not limited to, highly qualified human resources and experience, dynamic strategic plans, and deployment strategies that differentiate it in a competitive market. These resources or capabilities of a firm can be broadly defined as a diverse group of stakeholders whose unique individual contributions enable a business to gain legitimacy from both its employees and the community in which it operates(Rehman et al., 2019; Koufteros et al., 2014). When these resources or capabilities are effectively deployed, the firm can prosper in a competitive context by becoming a model firm worthy of imitation. As a result, the political economy theory explains that the distinctive qualities a firm possesses become vital stakeholders of a firm, helping it to achieve legitimacy and become an emblem to many, allowing enterprises to mimic their operations (Baker & Sovacool, 2017**;** Cimoli et al., 2009; Foss, 1996).

Basheer et al. (2019) discovered that firm capabilities were a strategic tool necessary to efficiently deploy sustainable business practices, particularly from the TBL aspect, in their study of textile enterprises. This implies that it is critical first to understand a firm's capabilities when executing its strategies, such as SSCM practices because these capabilities provide the firm with the know-how necessary to carry out its activities (Beske, 2012; Chacón & Mantilla, 2014; Chen & Kitsis, 2017; Hong et al., 2018; Jermsittiparsert et al., 2019). In their investigation of service firms, Cruz-Ros et al. (2015) found that any firm seeking to improve its performance, particularly financial performance, must ensure that it has a good awareness of its capabilities because performance and capabilities are positively associated. It is advantageous for a business to have long-term sustainable distinctive capabilities and skills critical in successfully adopting SSCM practices, especially when such activities are capabilities-driven (Hong et al., 2018). From the above, this

research suggests that the impact of SSCM practices on firm performance could be mediated by the capabilities of the focal firm and proposes the following hypothesis:

H5a: Firm Capabilities mediates the positive relationship between Social Supply Chain Management and Firm Performance.
H5b: Firm Capabilities mediates the positive relationship between Environmental Supply Chain Management and Firm Performance.
H5c: Firm Capabilities mediates the positive relationship between Economic Supply Chain Management and Firm Performance.

2.5.6 Moderating Effect

2.5.6.1 Business Environment Uncertainty

The concept of business environmental uncertainty has been a significant construct on several research endeavours that have focused on the characteristics of a firm's relationship with its external surroundings (Lo & Shiah, 2016; Mohamad et al., 2017; Qi, Zhao & Sheu, 2011; Rhee, Park & Shin, 2020). The environment in which enterprises operate has grown increasingly unstable as environmental dynamism and complexity have increased, particularly exacerbated by the emergence of the COVID-19 pandemic. As a result, managing uncertainty will continue to be the primary work of management, necessitating systems and policy development to reduce, absorb, counteract, or altogether eliminate uncertainties (Lo & Shiah, 2016). Firms have implemented policies such as SSCM practices to manage business environmental uncertainty (Aragón-Correa & Rubio-López, 2007; Farndale & Paauwe, 2018).

The dynamic nature of the business environment and the uncertainties they bring necessitates that a firm's operations be adaptable yet sturdy enough to withstand the always-changing market pressures (Samsami et al., 2015). The relationship between environmental uncertainty and the deployment of SSCM practices and firm performance is explored in this study using political economy theory (Chari, 2018; Cuervo-Cazurra et al., 2018; Jauch & Kraft, 1986; Sharma et al., 2020). According to this theory, a firm's ability to adapt and remain viable in the face of ever-changing uncertain demand is a critical stakeholder required to obtain a license to operate. Firms that have shown this adaptability and remained viable in the face of uncertainty have been regarded

as exemplary, and their operations have been emulated. Technological advancements, shifts in consumer preferences, and fluctuations in product demand and/or material supply all indicate the dynamic nature of the business environment.

Environmental uncertainty cannot be ignored in inter-firm collaboration, and the effect of SSCM adoption from a TBL standpoint on a firm's performance may vary enormously when environmental uncertainty is high (Fernandes, 2017; Li et al., 2019; Srinivasan, 2011; Samsami et al., 2015; Wu et al., 2016). Due to the constrained rationality of business, it has been discovered that businesses and their related partners cannot consistently forecast and stipulate every possible contingency that may arise in their operations (Ince et al., 2020; Sun, Hsu & Hwang, 2009). When businesses cannot identify the risks posed by new strategies/approaches, they will resort to general strategies to ensure that their core operations run smoothly (Gölgeci & Ponomarov, 2015; Samsamiet al., 2015). With this, firms can lessen negative influence from environmental uncertainty (Lo & Shiah, 2016). Numerous stakeholders in business, particularly in the twenty-first century, require enterprises to have an evolving adaptation strategy for the highly dynamic market in which they operate; failure to do so results in the firm losing consumer confidence and ultimately profitability (Samsamiet al., 2015). When environmental uncertainty is high, numerous unforeseen contingencies may occur, enhancing the role of SSCM practices and adaptations to address these eventualities. Based on the above, the study, therefore, proposed the following hypotheses:

H6a: Business environmental uncertainty positively moderates the relationship relationships between Social Supply Chain Management and Firm Performance.

H6b. Business environmental uncertainty positively moderates the relationship relationships between Environmental Supply Chain Management and Firm Performance.

H6c: Business environmental uncertainty positively moderates the relationship relationships between Economic Supply Chain Management and Firm Performance.

2.5.6.2 The Role of Operational Competitiveness

Industrialists have long recognised operational competitiveness as a critical performance metric for a supply chain's performance (Przychodzen & Przychodzen, 2015). Improved operational competitiveness refers to a company's ability to meet customer demands for timely delivery of

high-quality products, operational flexibility, price, and waste elimination in the manufacturing process (Feng et al., 2018; Laosillapacharoen & Karuhawanit, 2019). Operational Competitiveness capabilities describe the activities that a firm excels at within its operations to be profitable and thrive in the marketplace. This includes the firm's ability and capacity to adapt to new operational and product trends to remain relevant to consumers (Gupta et al., 2020; Ogaga & Owino, 2017).

This study employs political economy theory to demonstrate the relationship between operational competitions, SSCM practices, and firm performance (Bhawsar & Chattopadhyay, 2015; Hartley, 2014; Hay, 2004; Savina, 2021). Every firm views its operational environment as a stakeholder, and the ability of the focal firm to satisfy and consistently surpass this environment's expectations to remain relevant and be viable in the marketplace is referred to as staying competitive. The operating environment can direct company trends, and any corporation that is unable to withstand the competitive nature of the market will fail since consumers expect firms to remain highly competitive and possess the requisite skills to adapt to the competitive requirements of the market (Freeman & Reed, 1984; Gray et al., 1996).

Operational competitiveness cannot be overlooked in inter-firm collaboration, and the effect of SSCM adoption on a firm's performance from a TBL perspective might vary greatly when operational competition is high. SSCM techniques have been extensively viewed as a competitive tool by organisations, and as such, their application is viewed as a means of remaining relevant while also yielding benefits to business performance (Nath, Nachiappan & Ramanathan, 2010; Tan, Kannan & Narasimhan, 2007). Based on the above, the study proposed the following hypotheses:

H7a: Operational competitiveness positively moderates the relationship relationships between Social Supply Chain Management and Firm Performance.

H7b: Operational competitiveness positively moderates the relationship relationships between Environmental Supply Chain Management and Firm Performance.

H7c: Operational competitiveness positively moderates the relationship relationships between Economic Supply Chain Management and Firm Performance.

2.6 CONCEPTUAL FRAMEWORK

From the various hypothesised relationship discussed above, the research framework of the study is presented below.

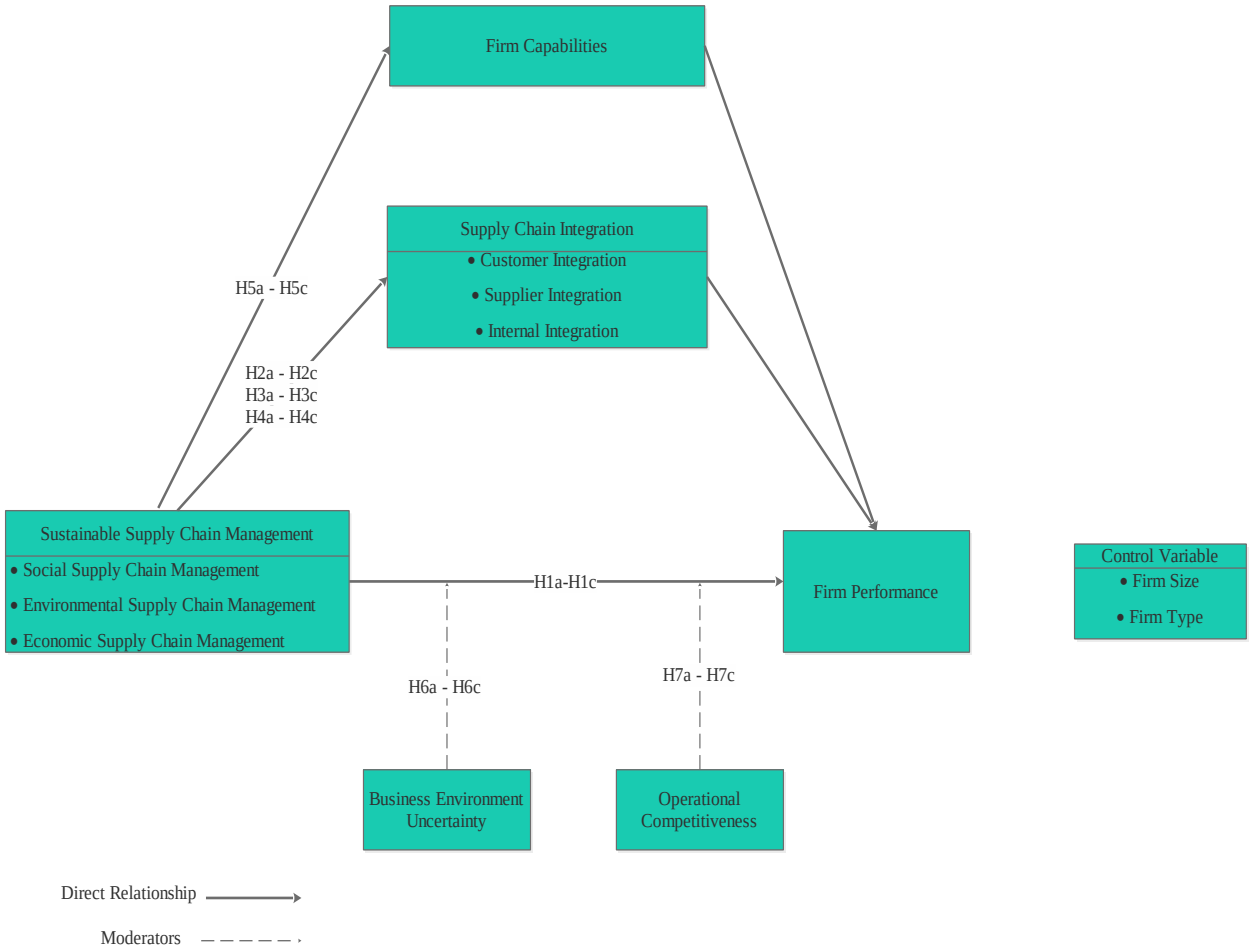


Figure 2.4: Conceptual Framework

Source: Author's Construct (2021)

2.7 CHAPTER SUMMARY

The conceptual model and hypotheses describe the theoretical linkages (direct and indirect) of SSCM practices and firm performance. The central roles played by supplier integration, customer integration, internal integration, firm capabilities, business environmental uncertainties, and operational competitiveness have been uncovered and presented in this chapter. Following these study objectives, the chapter discussed political-economic theory as the theoretical underpinnings of the study. A complete theoretical appraisal of the hypothesised relationship was also provided in this chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter addresses the different methodological methods used in the study. The chapter begins with an examination of the research's purpose and philosophical underpinnings. In this section, the research's nature as well as the philosophies are discussed. The research design and sampling technique are then discussed. Additionally, the chapter discusses various construct measures, data collection strategies, questionnaire administration procedures, data analysis, ethical issues, and the study's context.

3.1 RESEARCH PURPOSE

The systematic approach of obtaining and analysing data to increase and deepen our understanding of a particular knowledge area is referred to as research (Saunders, Lewis & Thornhill, 20016). The fundamental aim of undertaking research is to address some research objective or meet some research aim (Rojon & Saunders, 2012). As frequently expressed in the research methodology literature, research purpose is categorised into descriptive studies, explanatory studies, and descripto-explanatory studies (Robson, 2002; Saunders et al., 2016).

Descriptive analysis or research from the perspective of Saunders et al. (2016) is a type of research used to answer research questions that begin with 'What,' 'When,' 'Where,' 'Who' and 'How'. In this approach, a precise profile of individuals, incidents, and circumstances are relatively quickly and easily obtained but make no significant contribution to the development of theories. Studies that are descriptive but go beyond the resulting solution to evaluate the “why” is known as descripto-explanatory studies. In this type of study, the descriptive component is used as a medium to explain a phenomenon under consideration further.

As explained by Robson (2002, p. 59), an explanatory study or research is conducted to identify “what is happening; to seek new insights; to ask questions and assess phenomena in a new light”. Explanatory studies are conducted to build new theoretical insights, assess phenomena in a new light, and test resulting hypotheses (Rojon & Saunders, 2012; Saunders et al., 2016).

This study adopted an explanatory research approach because of its ability to develop new theoretical insights, and formulate hypotheses, explain the causal relationship between variables and clarify uncertainties in the understanding of the particular research phenomenon (Bryman, 2004; Hair, Black, Babin & Anderson, 2014; Saunders et al., 2016). Specifically, this research adopted the explanatory analysis approach from an integrated theoretical perspective to understand and clarify the contextual intent of operational competitiveness, business environmental uncertainty, supply chain integration and firm capabilities in the relationship between SSCM practices and firm performance.

3.2 RESEARCH PHILOSOPHY

Research Philosophy is among the most fundamental aspects of natural and social science research (Bahari, 2010). Research philosophy takes a critical role in acquiring knowledge, as they help acquire systematic, verifiable, and replicable knowledge (Hiller, 2016). Research Philosophy encompasses every aspect of a research study, i.e., research questions, methodological decisions, choice of data analysis, etc. (Crotty, 1998; Pascale, 2011). In social science, research philosophy describes the development of knowledge and understanding the purpose of knowledge in the social world (Baškarada, & Koronios, 2018). Philosophical assumptions in research include epistemology, ontology, and axiology. Thus, based on the research philosophy about what can exist (ontology) and how to best know it (epistemology), diverse approaches can be invented and adopted towards the development and design of effective research (Hiller, 2016). This research focused on the paradigm of objectivism and positivism, which is part of the philosophy of ontology and epistemology, respectively.

3.2.1 PHILOSOPHICAL ASSUMPTIONS

3.2.1.1 Ontology

According to Smith (2012), the concept "ontology" (or *ontologia*) was first formed in the year 1613, with two Greek philosophers, Jacob Lorhard (Lorhardus) and Rudolf Göckel (Goclenius) being the inventors. However, in English, ontology was first recorded by Bailey's dictionary in 1721. In this dictionary, ontology is defined as "an Account of being in the Abstract". In Hiller (2016, p. 1), "Ontology is the study of being, of the nature of existence". In ontological orientation, a definitive and exhaustive classification of nature in all spheres of being is sought for. The nature

of social reality, thus what exists, how it exists, what constitutes it, and how the various components interact to form what exists, are the fundamental assumptions of ontology (Gruber, 2018). The study of Cohen (2007) indicates that a researcher's ability to choose the best research design depends critically on understanding ontological issues. Objectivism and subjectivism or constructivism are the two-primary perspectives of the ontological orientation (Bryman, 2016; Crotty, 1998; Grix, 2002).

The study of Jonassen (1991), relying on the findings of George (1987), defined objectivism as a perspective or paradigm in which the world is real, systematic and can be modelled by the learner or observer. Subjectivism is the state of mind where reality can only be found in the knower's mind; thus, the knower is solely responsible for forming and constructing his reality and its interpretation (Given, 2008; Jonassen, 1991). This study relied on the objectivism paradigm of the ontological paradigm. With this paradigm, an objective examination of the connection between SSCM and firm performance and its mechanism, i.e., supply chain integration and Business Firm Capabilities, Operational Competitiveness and Business Environmental Uncertainty, was explored.

3.2.1.2 Epistemology

In the study of Hiller (2016), citing Giacomini (2010, p. 131), Epistemology is defined as a philosophy of knowledge that concerns itself with the beliefs about "how phenomena can come to be known". It seeks to account for how reliable and dependent knowledge is produced (Crotty, 1998; Hiller, 2016). Questions like "what is knowledge" and "how is knowledge acquired" are examined in the epistemology philosophy. In other words, as elaborated by Pascale (2011, pp. 4-5), the theory that deals with "the nature, sources, limits and a justificatory account of knowledge" is epistemology.

In epistemology, Positivism is founded on a scientific understanding of knowledge and the world. (Eichelberger, 1989). The data collection is based on statistics and a large number of respondents. Positivist research entails attempting to view data objectively and moving forward with a hypothesis and additional insights. As a result, positivist research is quantitative and aims to be as generalisable as possible. (Gray, 2014). The interpretivism philosophy is predicated on the notion that analyst is a subject in the study, analyses and interprets results, and thus can never be purely objective and alienated from the study (O'Gorman, & MacIntosh, 2015). Interpretivists are

concerned with specific, context scenarios and acknowledge that reality and knowledge are not unbiased but are shaped by the people who inhabit them (Gray, 2014). Because this philosophy is subjective and susceptible to bias than the positivist, it cannot be generalised. To examine the objectives of this study, the positivist paradigm of epistemology is assumed.

3.2.1.3 Axiology

Axiology originates from the Greek words axios, which means "to have value," and logos, which means "theory" or "reasoning." Axiology, as a term, is defined as a theory of desirable values or a theory of good and chosen values (Yulianto, 2021). It investigates the philosophical method of making value-based or rational choices (Shokhin, 2020). In relation to the research, it aids in the definition, evaluation, and comprehension of issues concerning right and wrong conduct (Yulianto, 2021). It considers the relative weight we will give to different aspects of our research, such as the respondents, the data, and the audience to whom our findings will be presented (Killam, 2013). Simply put, it asks, "What is the nature of ethics or ethical behavior?" It is critical to consider everyone who will be involved with or participate in your research project's regard for human values when answering this question (Shokhin, 2020). The following questions will aid in this process. As you conduct your research, "what values will you live by or follow?" "What can be done to ensure that all participants' rights are respected?" "What are the moral considerations and characteristics that must be considered?" "What are the cultural, intercultural, and moral issues that arise, and how should they be dealt with?" "How can the goodwill of participants be guaranteed?" "How can the study be conducted in a way that is socially just, respectful, and peaceful?" "How can risk or harm, whether physical, psychological, legal, social, economic, or other, be avoided or minimised?" (Yulianto, 2021).

All inquiries, according to the positivist, should be value-free (Killam, 2013). To maintain objectivity and neutrality throughout the research process, data should be collected using scientific methods. This should be accomplished by acknowledging that the researcher's choice of theories, hypotheses, and prior knowledge can have a significant impact on what is discovered, how it is ascertained, and the outcome of what is reported. Post-positivists questioned the idea that the researcher and the subject of study were completely separate entities (Ryan, 2019). Because reality is constructed and dependent on the mind, and knowledge is subjective, constructivists argue that social inquiry is intrinsically value-bound and value-laden. Your values will influence the inquiry

paradigm you use, the topic you investigate, the data collection and analysis methods you employ, the way you interpret the results, and the way you report the results (Taylor, 2018). As a constructivist researcher, you acknowledge the study's value-laden nature and disclose any values or biases about the subject under investigation that could obstruct neutrality (Taylor, 2018). The positivist axiological stance is taken in this study because the study seeks to examine the relationship between SSCM and firm performance objectively and without bias.

3.2.2 PHILOSOPHIES

3.2.2.1 Interpretivism

Interpretivism refers to research methods, which take the view that human understanding of reality is a social construction made up by human actors, and therefore does not accept natural science approaches (Alharahsheh & Pius, 2020; Eliaeson, 2002; Jon, 2007; McIntosh, 1997; Walsham, 1995). The theory of interpretivism describes the significant essence of human character and its role in social and cultural life. The origin of Interpretivism is based on the fact that the exact methods of physical science cannot be applied in analysing human knowledge and social science (Alharahsheh & Pius, 2020). This is because humans interpret the world in which they inhabit and then proceed to act according to their interpretation, while the real world follows no such routine (Hiller, 2016; Hoejmose & Adrien-Kirby, 2012). Interpretivism seeks to understand the motives responsible for human actions, their interactions in the communities, organisation, and culture (Whitley, 1984).

According to Kaplan and Maxwell (2005), the interpretivism paradigm uses qualitative data in advancing knowledge. It concerns providing contextual depth and uniqueness despite the diverse concerns raised about how valid, reliable, and generalizable the resulting knowledge is (Creswell & Tashakkori, 2007; Eisenhardt, 1989; Myers, 1997; Perry, 1998). To do this, it adapts the relativist ontology. In summary, the interpretivism paradigm advocates that the researched and researcher are active players in constructing understanding and knowledge, despite its associated complexity (Cohen, 2007; Crotty, 1998).

3.2.2.2 Positivism

The positivist research paradigm postulates that reality is orderly, predictable, and ultimately understandable through objective scientific methods (O'Sullivan & Irby, 2014). The positivist paradigm is characterised by scientific methods and is structured to discover what exists through prediction and control (Caldwell, 2015). Positivism is a methodological philosophy in quantitative research that has been used since the 19th century and is part of the objectivism epistemology. Positivism is used to better understand human and social research (Crotty, 1998; Pascale, 2011). It is a phenomenon that only accepts observable or measurable data supported by evidential experiences of the world. The results are seen positively as absolute truths about reality (Hiller, 2016; Pascale, 2011). With this paradigm, as illustrated by Cohen, Manion and Morrison (2011) and cited by Pham (2018), a causal inference can be determined among variables (independent variables and dependent variables) through the careful development of an experimental research design. The inference of results to the population is possible in this paradigm through variable observation, empirical testing, sampling technique, focus groups, questionnaires, and measurements (Cohen, 2007; Johnson & Onwuegbuzie, 2004). Over the years, the positivist approach has provided a sound solution to numerous research problems and has gained recognition for its replicability, as well as for its use of statistical analysis to identify issues of validity, reliability, correlation, and internal consistency (Cohen et al., 2011; Dörnyei, 2007; Johnson, 2014; Johnson & Onwueguzie, 2004).

Despite the increasing applicability of this paradigm, its inability to examine variables that are difficult or impossible to explicitly observe or measure, such as "intentions," "attitudes", and "thoughts" of human beings, has been challenged (Hammersley, 2012).

On the basis of the paradigm's proclivity for dealing with quantitative research. The positivist paradigm was used to model this study in order to identify the mechanisms underlying the SSCM-FP relationship objectively. A research questionnaire was developed and used to measure the SSCM variable, firm performance, business environment uncertainty, firm capability, supply chain integration and operational competitiveness. The results of the variables observed were then subjected to rigorous statistical analysis to assess the presence of any causal interaction (mediating and moderating effects of the variables) and make any possible inference.

3.3 RESEARCH APPROACH

There are two primary approaches of research: inductive and deductive (Bonom, 1985; Parkhe, 1993; Perry, 1998; Romano, 1989). However, Cohen (2007) suggested a third approach known as the abductive approach, which incorporates the inductive and deductive approach (Bonoma, 1985; Parkhe, 1993; Romano, 1989). These approaches or ways of reasoning in research are based on the research philosophy or paradigms adopted for the study (Perry, 1998). The deductive approach makes use of the positivist paradigm (Perry, 1998). With this approach, the validity, reliability, and inconsistency of existing theoretical knowledge and how they apply to current studies are examined using empirical evidence (Alvesson & Sköldberg, 2008; Cohen, 2007). However, the inductive approach uses the phenomenological, constructivism, and the realism paradigm (i.e., interpretivism paradigm) (Easterby-Smith & Lowe, 1991). Thus, in the inductive approach, "the researcher begins with an area of study and allows the theory to emerge from the data" (Strauss & Corbin, 1998, p. 12).

This study, nonetheless, adopted deductive reasoning because it aligns with the study's objectives, and this research was predominantly quantitative and had the sole purpose of identifying and demonstrating the theoretical relationship between the variables under consideration. It used existing theories in the development and formulation of all hypotheses. This served as a method for answering all research questions and achieving research objectives (Cohen, 2007; Saunders et al., 2016).

3.4 RESEARCH DESIGN

Research designs stem from the research purpose and philosophy. According to Saunders et al. (2016), the research design is a blueprint for how a researcher intends to address research questions. Various strategic mediums used to logically align the different components of a study are described in this plan. It follows a well-structured process to generate a valid and reliable output for the study. Research design is a phenomenon that helps identify the relationship between constructs and help to a large extent in avoiding plausible misinterpretations of hypotheses (Heppner & Kivlighan Jr, 2008). The research design includes detailed information about how best to collect data, time horizon, the technique to use, the choice of population, the size of the sample, the measuring methods, the research instrument to be used and the data analysis tool to be used (Cavana, Delahaye & Sekaran, 2001).

In research design, one of the focal things to consider is the concept of time horizon (Saunders et al., 2016). Time horizon usually refers to the expected duration of a study or the chronological horizon of the diverse scopes of knowledge to be covered in a study (Melnikovas, 2018). The time horizon comes in two forms: cross-sectional and longitudinal studies (Saunders et al., 2016). The cross-sectional design of the study falls within the scope of the observational design. This type of study design will simultaneously produce interested measures and results from qualified respondents within a definite time interval (Setia, 2016). Thus, a cross-sectional design study gives a 'snapshot' of the population's perception under study at a specific point in time (Cohen, 2007; Saunders et al., 2016). The cross-sectional study design is relatively faster and less expensive for data acquisition, despite its associated timing issues (Lyon, Lumpkin & Dess, 2000; Olsen & St George, 2004). Longitudinal study design, unlike the cross-sectional design, is used when a researcher seeks to observe the changing dynamics of a variable over a long period (Saunders et al., 2016). This design offers researchers the opportunity to observe change progressively. In a repeated manner, it is used to gather data information from a defined population or subject over some extended period (Caruana et al., 2015). Longitudinal study designs are often known to better address common method bias (CMB) and causal inference (CI) issues.

Common method bias (CMB) is a systematic variance error typically found within variables evaluated with the same measuring or research instrument (Jakobsen & Jensen, 2015). Causal inference refers to an estimation technique used to infer causal association within the data set (Deschenes, 1990; Hill & Stuart, 2015: Rindfleisch, Malter, Ganesan & Moorman, 2008). However, due to time and cost constraints associated with academic bound research (Bryman, 2004; Cao & Lumineau, 2015), the lack of clarity surrounding the "when" and "how" this design is best implemented, the high level of attrition in respondents associated with longitudinal study design, as well as the possible biases and inconsistency that may be associated with the responses obtained (Bryman, 2004; Rindfleisch et al., 2008), the cross-sectional design is most preferred for studies of this nature.

With this, the study adopted a cross-section study design. However, to minimise and enhance the issues related to CMV and CI, which are known challenges related to the cross-sectional design, the study used multiple respondents, multiple data, and multiple data sources as a means of resolving these challenges (Rindfleisch et al., 2008). A 4-year time lag, as suggested by Kohlbergs

(1986), was also adopted, which was used to resolve the issue of timing and ensure that some variability existed in the chosen population (Lyon et al., 2000). The study further employed survey strategy to build some new theoretical insights in examining the mediating and moderating effect of supply chain integration, firm capability, business environmental uncertainty and operational competitiveness on the relationship between SSCM and firm performance.

3.4.1 Survey Strategy

Research strategy refers to various empirical and qualitative tools to better understand real-world phenomena (Thomas, 2000). There are diverse research strategies: case study, experiments, action research, grounded theory, ethnographic research, archival and survey. However, as Jakobsen and Jensen (2015) and Saunders et al. (2016) explained, the survey strategy is the most popular and commonly used in organisational and management research. The survey strategy, associated with the deductive approach, is used in answering questions like "who", "what", "where", "how much", and "how many" (Saunders et al., 2016). The survey strategy also allows researchers to test hypotheses, deduce the relationship between the variables observed and construct models for the variables observed, all in order to improve theoretical insights (Bryman, 2004; Saunders et al., 2016). To achieve this, a self-report (i.e., questionnaire) was used in this study to measure respondents' thoughts, feelings, behaviour, attitudes, and perceptions as suggested by Jackson (2011), supported by Krosnick (2018).

A well-structured questionnaire is a core component of the survey strategy; surveys can be lengthy or brief. They can be conducted in person (face to face interviews), by telephone, through the mail (questionnaires), over the Internet (online questionnaires), self-administered and interviewer-administered (Bryman, 2004; Churchill, Brown & Suter, 1996; Jackson, 2011; Saunders et al., 2016). Considering the target respondents' availability, inclination, and time required and specific socio-economic characteristics of the study context, the study adopted a self-administered questionnaire for data collection. The analytical survey strategy was used based on its ability to establish and explain relationships among variables (Parfitt, 2005). The questionnaire was developed following the four types of variables (i.e., dependent, independent, controlled, and uncontrolled) proposed by Oppenheim (2000) for analytical surveys. For this study, the independent variable was sustainable supply chain management, which comprised social, environmental, and economic supply chain management. Firm performance was the dependent

variable. Control variables are usually held constant to help better and clearly identify the relationship between independent and dependent variables (Parfitt, 2005). In this research, the controlled variables were firm type, firm age, and firm size. Uncontrolled variables, however, are simply variables that are not controlled for in the study.

This study used the proposed mediators (i.e., supply chain integration and firm capability) and moderators (i.e., Business environmental uncertainty and operational competitiveness) as uncontrolled variables. A self-administered questionnaire distributed over the Internet (online questionnaires) centred on the study's objectives was used.

3.5 RESEARCH POPULATION

Research population refers to a comprehensive, well-defined group of individuals or persons, institutions, and objects with a common characteristic used as the focus of a scientific inquiry (Black, 2019). When it comes to research sampling, the general, target, and accessible populations are the three main types of population (Asiamah, Mensah & Oteng-Abayie, 2017). The general population refers to the entire segment of the population or objects which share a common characteristic. The target population is a subdivision of the population that possess some underlying characteristics and is identified as the intended audience from which a generalization of conclusions is being sought (Saunders et al., 2009). The accessible population, popularly called the study population, is a subdivision of the target population. Samples are drawn from the accessible population for research (Asiamah et al., 2017; Banerjee et al., 2007; Black, 2019; Saunders et al., 2009). Therefore, it is imperative to note that the first step is to identify an appropriate population (Bryman, 2012).

The general population of this research is all the service and manufacturing companies in Ghana. The target population for this study comprised firms in Ghana's service and manufacturing sectors that were in the practice of SSCM. SMEs are classified by the United Nations Industrial Development Organisation (UNIDO) according to their employee strength: micro enterprises have fewer than five employees, small enterprises have between 5 - 19 workers, medium enterprises have between 20 -29 workers, and large enterprises usually have more than 100 workers (Kwarteng et al 2021;UNIDO, 1983). In Ghana, the National Board for Small Scale Industries (NBSSI) describes SMEs based on the number of workers, where micro-enterprise consists of employees between 1-5, small enterprises 6-29, medium enterprises 30-99, while enterprises with

employees above 100 are classified as large. Based on NBSSI's definition, this study regards firms with employees between 6-29 as small, employees between 30 and 99 as medium and those with 100 and above are classified as large. The rationale for targeting these firm categories (i.e., small, medium, and large organisations) as data sources was informed by two key reasons.

First, all the firms within the research setting face similar sustainability pressures, given that they all operate within the same regulatory and socio-cultural jurisdiction. Second, these sectors accurately defined the operational characteristics needed to better explain the concepts and relationships being examined in the study. In fact, in terms of the research population, the use of the large, medium, and small organisations in this study resonated with past research (e.g., Amoako-Gyampah et al., 2020; Famiyeh et al., 2019; Saruchera & Asante-Darko, 2021).

Generally, obtaining a reliable database on businesses in Ghana is a challenge (Adomako et al., 2018; Amoako-Gyampah et al., 2020). Different institutional databases (such as Ghana Statistical Service (GSS), Registrar General's Department, the Association of Ghana Industries (AGI), the Ghana Business Directory, Yellow Pages Ghana, and Ghana Yello) provide different information and thus make it challenging to obtain a reliable population in Ghana. In addressing this challenge, prior studies conducted in Ghana have used different approaches. While some draw on single sources (e.g., Acquaah et al., 2011; Adomako et al., 2018) to obtain a list of firms of interest to study, others (e.g., Adomako et al., 2016; Boso et al., 2013) draw on multiple sources. Much as using multiple sources seems appropriate, the difficulty of harmonising the information (due to different formats) makes its implementation particularly challenging. Accordingly, in following some previous works in Ghana, the study used the Integrated Business Establishment Survey (GSS, 2016) to identify the firms that could be utilised in the study. As an authoritative source, the GSS database was used because of the wealth of information about firms (e.g., size, date of registration, location addresses and contact information). This information made it simple to locate and contact the firms of interest. As an authoritative source, the GSS database was used because of its wealth of information about firms (e.g., size, date of registration, location addresses and contact information). This information made it simple to locate and contact the firms of interest (Kwarteng et al., 2021). Furthermore, GSS (2016) data shows that the service sector constitutes over 80% of Ghana firms, while manufacturing accounts for less than 20%. Based on the GSS

report, the estimated population for the study and its distribution across the service and manufacturing sectors was determined as shown in Table 3.1 below.

Table 3.1: General Population Distribution of Respondents

Cluster	Total number of Establishment	Service Sector	Manufacturing Sector	Percentage (100%)
Southern Sector	31,738	25,390	6,348	61
Middle Sector	11, 668	9,334	2,334	22
Northern Sector	8,776	7,021	1,755	17
Total	**52,182**	**41,745**	**10,437**	**100**

Source: GSS (2016)

3.6 SAMPLE SIZE

A study sample represents a section of the study population (Asiamah et al., 2017). Obtaining an appropriate sample size is critical for survey research (Bryman, 2012). As Ding et al. (1995) proposed, a sample size of 100-150 individuals is sufficient for quantitative research, whereas others (see, e.g., Kelloway, 1998) recommend a minimum sample size of 200 because it offers an acceptable margin of error. Schumacher and Lomax (2004) recommend a rule of thumb of 10-20 cases per unit. Relatedly, Hair et al. (2014) suggests that a ratio of 1 item to 10 cases is ideal for determining an appropriate sample size.

In addition, Krejcie and Morgan (1970) established a well-known scientific table that determines the sample size adequate and appropriate for scientific research based on the target or estimated population. Chin (2010) proposed the 10 -times or minimum R^2 rule for minimum sample size determination. However, according to Hair et al. (2017), Kock and Hadaya (2018), and Rigdon (2016), the ten times rule is no longer a recommended statistical technique for estimating the minimum sample size. As a result, in determining the sample size for this study, two approaches were adopted. That is the statistical power analysis and Krejcie and Morgan's (1970) scientific table. First, the Cohen (1992) statistical power analysis was chosen for its ability to provide knowledge on the minimum sample size required to obtain adequate statistical reliability to detect the effects of interest in the population. To do this the Cohen's power table for multiple regression was used. Cohen's power tables can be applied to estimate the minimum sample size needed to reach the desired power level. Four parameters, namely effect size, power, significance level and the number of independent variables of the equation containing the considered path

coefficient/weight was determined. Cohen (1992) proposed a medium effect size of 0.15, a significance level of 0.05, 7 independent variables, and a power of 0.9 were used to determine the minimum sample size for this research. As illustrated in Figure 3.1, a minimum sample size of 130 was required for this study following the statistical power analysis. Once the minimum sample size was estimated, the Krejcie and Morgan (1970) scientific model was also used to determine the sample size related to the population. The study's estimated total population per the integrated business establishment survey (GSS, 2016) was 52,182 (see Table 3.1). Following Krejcie and Morgan's (1970) model, a sample size of 655 at a (confidence level of 99% and 5.0% margin of error) was arrived at. Accordingly, 655 service and manufacturing firms were the target sample for this study, comprising 524 and 131 services and manufacturing firms, respectively. (See Table 3.2). This is consistent with previous research (Ding et al., 1995; Hair et al., 2014; Kelloway, 1998) and exceeds the statistical power analysis's estimated minimum sample size.

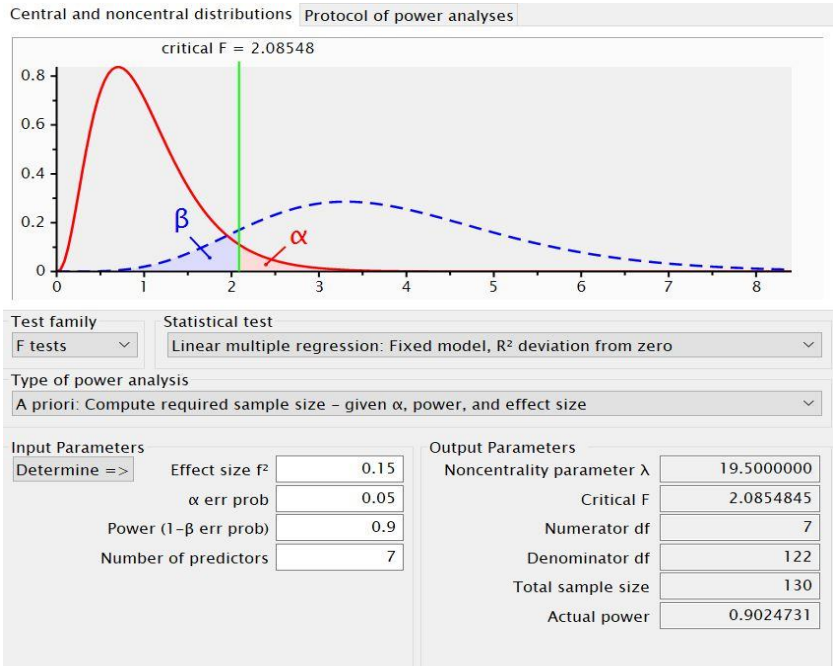


Figure 3.1: Minimum Sample Size required (Power Analysis)

Table 3.2: Sample of the Study

Cluster	Service Sector	Manufacturing Sector	Total Sample	Percentage (%)
Southern Sector	318	80	398	61
Middle Sector	118	29	147	22
Northern Sector	88	22	110	17
Total	**524**	**131**	**655**	**100**

Source : Authors Compilation (2021)

3.7 SAMPLE TECHNIQUE

Sampling is the selection process of a sub-set of cases as a segment of the population to conclude on the entire set (Bryman, 2004; Singleton & Straits, 2005). Broadly, this study relied on probability sampling. Following the recommendation of Bryman (2012), in dealing with a geographically dispersed and heterogeneous population, cluster sampling was used for this study. The study population was divided into three clusters (i.e., northern, southern, and middle of Ghana). The subjects within the various clusters were proportionately selected until the minimum overall sample size target for the study (i.e., 665) was met. In contacting the sampled firms, names, contact addresses and telephone numbers provided by Ghana Statistical Service were used as a guide. The following criteria were used to determine which firms should be included in the various clusters: (1) the firm must have been in operation for a minimum of four years; (2) the firm must have a minimum of six employees, and (3) the firm must be in the service or manufacturing sectors. A single managerial respondent (such as a Managing Director, General Manager, Accountant, or Operations Manager) was chosen at the firm level. As Amoako-gyampah et al. (2020) suggest, these categories of individuals were chosen because they are thought to be very knowledgeable about SSCM practices in their firms and thus have reasonable confidence in answering related questions about the firm's performance and operations, particularly on sustainability practices and inter-organisational collaboration. In order to meet the study's time-lag, only those who had consistently been with their company for at least four years were included in the collection of respondents.

3.8 UNIT OF ANALYSIS

Managers' perceptions of sustainable supply chain management vary across sectors and industries of a particular country (Jia et al., 2018). Consequently, following prior research (Abdi & Aulakh, 2012; Adomako & Danso, 2014; Boso et al., 2013), the empirical model for the current study was tested by measuring the sustainable supply chain management at the firm level. The theoretical reasoning underpinning this approach is that measuring sustainable supply chain management at a firm-level allows for variability in firms perception of their business environment and subsequent influence on strategic decisions they make (Abdi & Aulakh, 2012).

3.9 QUESTIONNAIRE DESIGN

A questionnaire is defined as a survey strategy instrument used to objectively collect information about individual perception, beliefs, knowledge, attitude, behaviours, and concepts (Beatty et al., 2019; Oppenheim, 1992). In cross-sectional study designs and primary data collection, the questionnaire is usually the only and most essential research tool used (Boynton & Greenhalgh, 2004; Parfitt, 2005). Given the crucial role of questionnaires in improving and advancing knowledge, they must be well-constructed and structured to avoid validity, reliability, and inaccurate data acquisition (Parfitt, 2005). This section discusses the questionnaire design process of this study. This study adopted the Labaw (1980) framework, as referenced in Gendall (1998), in developing the research questionnaire.

The questionnaire used for this research considered the four integrated layers of Labaw (1980) framework, i.e., the objective, question, word, and layout. The aim of the questionnaire is defined in the objective layer. In this layer, the objectives and the proposed hypotheses of the study should be carefully integrated into the questionnaire, and a detailed literature review must be carried out to help structure the constructs and items to be used (Churchill, 1979; Gendall, 1998). Following the requirement of the objective layer, a careful literature review was done to reflect the relative conceptualisation of hypothesis in the area of SSCM (i.e., social, environmental, and economic supply chain management), firm performance, supply chain integration, firm capability, business environmental uncertainty and operational competitiveness. Pre validated multiple indicator items were identified for the various latent constructs (i.e., social, environmental, and economic supply chain management, firm performance, supply chain integration, firm capability, business environmental uncertainty and operational competitiveness) and adopted for this study. This was done following the findings of Boynton and Greenhalgh (2004), which indicated that using previously validated and published questions (measurement items) saves time and resources and allows the researcher to compare findings with others. It must also be noted that the adoption of pre-validated multiple items also aided in reducing measurement error and improved validity and reliability issues (Boynton & Greenhalgh, 2004; Churchill Jr, 1979).

The question layer deals with how best measures are adopted and phrased into questions that best represent the desired conceptualisation, hypothesis, and study context (Gendall, 1998). The study presented the adopted items to academics of good standing, practitioners, and managers with a wealth of experience, which helped frame the questions and ensured that they adequately

represented the intended construct. This was done to ensure that the questionnaire provided accurate and reliable measures, and that questions could be easily interpreted by the intended respondents (Fowler Jr. & Fowler 1995; Gendall, 1998) and finally, that questions reflected the study context as well as the intended conceptualisation and hypothesis (Sudman, Bradburn & Schwarz, 1997).

As suggested by Gendall (1998), cited in Belson (1981), the word layer seeks to encourage researchers to avoid using unfamiliar terms, broad meanings, big names, suggestive or leading words, and multiple-meaning words unless otherwise stated in the questionnaire. Astute researchers, seasoned corporate managers, and competent editors were consulted to ensure that the questionnaire met the requirements of this layer and was devoid of any ambiguous terms.

The layout layer discusses the physical characteristics of the questionnaire. It is reported that the questionnaire must be readable, explicit (clarity of instructions and expected response) and answerable by the respondent (Fowler Jr & Fowler, 1995). In order to encourage participation and commitment of respondents, researchers are urged to take this layer very seriously. In order to ensure that the questionnaire used for this study met the standard requirement of this layer, readable font type and size were used. A good printer and a copy machine were used to print questions submitted in person to ensure they were well presented. For all those presented online, the services of a graphic designer were acquired to give the questionnaire an extra touch of elegance to ensure that they were appealing to the eye. The influence of the layout layer cannot be overemphasised if it is appropriately handled; it increases the response rate, gives the questionnaire a somewhat presentable look and avoids lengthy questionnaires, which most often reduced the interest of the respondents (Churchill et al., 1996; DeVellis & Thorpe, 2021).

The detailed presentation of the items adopted for the different constructs is shown below.

- ***Sustainable Supply Chain Management (i.e., Social, Economic and Environmental Supply chain Management):*** With these constructs, respondents were expected to report on how effectively their companies have implemented sustainable supply chain management practices from a strategic, policy and day-to-day management perspective.
- ***Firm performance:*** With this construct, respondents were required to report on their respective firms' growth, profitability, market share, and return on investment.

- ***Supply Chain Integration (supplier and customer, internal integration):*** With this construct, the respondents were required to report on how well their firms collaborate and incorporate the views of their stakeholders, both internal and external.
- ***Firm Capability:*** Respondents were required to report on the capabilities of their respective firms from a strategic, operational, and external perspective.
- ***Business Environmental Uncertainty:*** In this construct, respondents were asked to report on the dynamics and uncertainties of their business environment from an operational point of view.
- ***Operational competitiveness:*** With this construct, respondents were asked to report on the competitive nature of their sector from a cost, delivery, flexibility, and quality point of view.
- ***Firm profile:*** The respondents were required to view firm size, firm size, and type of operations.

The questionnaire was structured into sections (see Appendix 1) covering nine key constructs, firm, and respondent profiles. The measures for these constructs are described in detail below.

3.9.1 Sustainable Supply Chain Management

There exist various understandings and conceptualisations of sustainability and its relationship to supply chain management. However, one key concept to consider in operationalizing sustainable supply chain management is the triple bottom line approach. i.e. (social, environmental, and economic) (Shittu, 2020).

With this in mind, this study adopted the definition of Carter and Rogers (2008) on SSCM. According to Carter and Rogers (2008), SSCM is the strategic, transparent integration and advancement of an organisation's environmental, social, and economic goals through systemic coordination of critical inter- and intra-organisational business processes to enhance the long-term financial performance of firms and supply chains. In order to operationalise sustainable supply chain management, the study identified measurement items that reflected the degree to which firms had incorporated SSCM practices from an institutional and policy point of view into their operations. To this end, the measures were examined from three critical perspectives, i.e., social, environmental, and economic supply chain management. Social supply chain management dealt

with the monitoring of suppliers, the implementation of socially sustainable practices and management processes within operations, policies, and protocols such as the health and safety of workers and suppliers, the well-being of the community engaged in supply chain activities and the social effect of supply chain activities on populations (Marshall, McCarthy, Heavy & McGrath, 2015). It is worth noting that social supply chain management construct also covered items such as compliance of child labour, forced labour, working practices, ethics, workforce diversity, fair wages, and voluntary overtime (Awaysheh & Klassen, 2010; Baden, Harwood & Woodward, 2009; Weaver, Trevino & Cochran, 1999).

Environmental supply chain management took into consideration the effective and efficient use of resources and their impacts on the environment (Marshall et al., 2015) from a management and operational point of view. In this aspect of sustainable supply chain management, suppliers' practices, policies, and activities are monitored and examined from an environmental perspective. Factors such as the environmental managements system of suppliers as well as that of partnering firms and the environmental impact of their operations were carefully reviewed. This was to ensure that they demonstrated their ability to meet the minimum compliance threshold, such as environmental regulations, consumer preferences, pollution reduction, stakeholder interest and effective use of resources (Kleindorfer, Singhal & Van Wassenhove, 2005; Reuter, Foerstl, Hartmann & Blome, 2010; Zimmerman & Foerstl, 2014).

In this study, economic supply chain management was addressed. In this, the role of policy, strategies and protocols were examined to understand best the extent to which firms were able to ensure a reduction in material use from an operational and management perspective. Factors such as pollution emission, waste, and energy consumption for economic or financial gain were considered (Zhu, Sarkis & Lai, 2013).

Various items were used to measure environmental, social, and economic sustainable supply chain (see Appendix 2). Respondents were asked to indicate the appropriate response on a 7-point Likert scale ranging from 1 to 7, with 1 indicating "strongly disagree" and 7 indicating "strongly agree" for each item under the constructs.

3.9.2 Firm Performance

Firm performance is a concept with many different definitions, interpretations, and measures, as demonstrated by the research of Taouab and Issor (2019). In order to explore the mechanisms that

influence the relationship between SSCM practices and firm performance, the study defines firm performance from a financial perspective, as has been done in previous studies such as (Amoako-Gyampah et al., 2020; Garengo & Panizzolo, 2013; He, Sun, Ni & Ng, 2017; Whipple, Wiedmer & Boyer, 2015; Zhang, Lettice, Chan & Nguyen, 2018). However, in order to operationalise a firm's performance in this research, firm performance was defined as "the ability of a firm to effectively integrate and use its resources to achieve its management, financial and marketing objectives in order to enhance its competitiveness and remain relevant to its external and internal customers" (Peterson, Gijsbers & Wilks, 2003; Verboncu & Zalman, 2005).

Four items, namely, firm growth, market share, profitability and return on investment, were used to measure firm performance (See Appendix 3).Respondents were asked to indicate the appropriate response on a 7-point Likert scale ranging from 1 to 7, with 1 indicating strongly disagree and 7 indicating strongly agreed for each item under the constructs.

3.9. 3 Operational competitiveness

Operational competitiveness refers to how well a firm dynamically competes with other firms through its operations' cost, delivery, quality, and flexibility (Ageron, Gunasekaran & Spalanzani, 2012; Gunasekaran, Patel & Tirtiroglu, 2001). With this construct, the study sought to understand how operational competitiveness could strengthen the relationship between sustainable supply chain management and firm performance, or not. Various metrics were sought from literature to help measure and understand the variables that define operational Competitiveness; factors such as pricing of products, adaptability, speed of delivery and product lifespan were considered. Pre validated items for Delivery (Agarwal, Shankar & Tiwari, 2007; Cai, Lui, Xiao & Lui, 2009; Soni & Kodali, 2009), Flexibility (Beamon, 1999; Sheffi & Rice Jr. 2005), Quality (Cai et al., 2009; Martin & Patterson, 2009; Soni & Kodali, 2009) and Cost (Goldsby, Griffis & Roath, 2006; Sheffi & Rice Jr, 2005; Wong et al., 2011) of a firm's operations and outputs were adopted.
Various items under cost, flexibility, quality, and delivery were used to measure operational competitiveness (See Appendix 4) reflectively. Respondents were asked to indicate the appropriate response on a 7-point Likert scale ranging from 1 to 7, with 1 indicating strongly disagree and 7 indicating strongly agreed for each item under the constructs.

3.9.4 Business Environment Uncertainty

Business environment uncertainty refers to the complexity, unpredictability and dynamism that associates business environment (Fynes, De Búrca & Marshall, 2004; Li, Menon & Liu, 2019; Slater & Narver, 1994). From a supply chain management perspective, literature notes that business environment uncertainty consists of three main things, supply uncertainty, demand uncertainty, and technological uncertainty (Chang, Wong & Chiu, 2019; Davis, 1993). In this study, demand uncertainty refers to the variability associated with the order quantity and the time of order of both customers and suppliers within the supply chain. In some instances, demand uncertainty goes beyond the quantity ordered and placement time of products. Demand uncertainty includes adjustments to the nature of the product and a call for a reorientation of the product. This is due to the current impact of consumers and suppliers' social, economic, and environmental well-being (Bernstein & Federgruen, 2005; Gupta & Maranas, 2003). Supply uncertainty looked at the diverse issues suppliers and producers encounter due to the business environment within which they operate. It examined the challenges associated with the quantity, timing, cost switching and adjustment in product specifications and product output (Fynes et al., 2004).

The technological uncertainty examined the rapid changes and growth that marked the technological industry and its effect on business operations. In supply chain management, technological uncertainty examines how business systems are appropriately integrated into the rapid growth in technology (Chang et al., 2019; Fynes et al., 2004). It must be noted that business environment uncertainty is attributed to the negatives of the business environment and can also be identified with positive demands such as the request for technological and product improvement to ensure that they are socially, economically, and environmentally viable to the consumer. The business environment uncertainty construct was estimated in this study using measures of technological uncertainty, supply uncertainty and demand uncertainty, as done in some previous studies (Abdelkader & Abed, 2016; Chang et al., 2019; Charoenwong, Han & Wu, 2020; Davis, 1993; Widyaningdyah & Aryani, 2016; Wong, Tian & Poon, 2016).

Various items were used to measure business environment uncertainty (see Appendix 5). Respondents were asked to indicate the appropriate response on a 7-point Likert scale ranging from 1 to 7, with 1 indicating strongly disagree and 7 indicating strongly agreed for each item under the constructs.

3.9.5 Supply chain Integration

Supply chain integration is the effective incorporation of customers, suppliers, and internal activities of a firm, with the sole purpose of enhancing the firm's operations and improving its competitiveness and performance (Panayides, 2017; Somjai, Girdwichai & Jermsittiparsert, 2019). This study explored the mediating effect of supply chain integration (i.e., internal integration, supplier integration and customer integration) on sustainable supply chain management and firm performance. Supplier integration, a component of supply integration, describes how a business collaborates to fulfil consumer needs with essential suppliers. This is achieved by synchronising inter-organisational strategies, procedures, practices, and behaviours and solid collaborative relationships (Amoako-Gyampah et al., 2020; Stank, Keller & Daugherty, 2001). Internal integration is associated with the effective coordination of a firm's internal functional units. This is aimed at ensuring that the various functional units are interconnected and that their processes and structures are harmonised to allow the firm to meet its internal and external expectations (Lee, Kwon & Severance, 2007; Schoenherr & Swink, 2012; Wiliams, Roh, Tokar & Swink, 2013). Customer integration refers to how well a firm can work with its key consumers to improve its operational and competitive edge (Danese & Romano, 2011; Stank et al., 2001).

This study used various items to measure supplier integration, internal integration, and customer integration of the supply integrations factor (See Appendix 6). Respondents were asked to indicate the appropriate response on a 7-point Likert scale ranging from 1 to 7, with 1 indicating strongly disagree and 7 indicating strongly agreed for each item under the constructs.

3.9.6 Firm Capability

Firm capability, also known as organisational capability, is the ability of a firm to engage in activities that improve its performance and give it a competitive advantage by deploying its tangible and intangible resources effectively and efficiently (Grant, 1991; Rehman, Mohamed & Ayoup, 2019). Like previous research (Koufteros, Verghese & Lucianetti, 2014; Rehman et al., 2019), this study adopted the firm's operational capability, strategic capabilities, and external stakeholder relations capability as the three main components in measuring firm capability. In firm operational capability, a firm's ability to make use of its operational strengthen was examined. Factors such as relevant and adequate technology, skilled labour, appropriate infrastructure etc.,

were dealt with (Iqbal, Shaikh, Mahmood & Shafiq, 2010). Firm strategic capability deals with how well a firm makes use of its strategic strengths. Factors such as the strategic goal, the operational policy and the general management process were examined here (Iqbal et al., 2010). The extent to which suppliers and consumers are engaged to ensure productivity is known as a firm external relation capability (Obeidat, Abdallah, Aqqad, Akhoershiedah & Maqableh, 2016; Rehman, Mohamed & Ayoup, 2018; Shurafa & Mohamed, 2016).

Various items under firm operational capability, strategic capability, and external stakeholder relations capability were identified from the literature and reflectively used to measure firm capability (See Appendix 7). Respondents were asked to indicate the appropriate response on a 7-point Likert scale ranging from 1 to 7, with 1 indicating strongly disagreeing and 7 indicating strongly agreeing for each item under the constructs.

3.9.7 Control Variables

Control variables aid in the identification of factors that are presumed extraneous to achieve the desired effect, also known as "nuisance" variance (Meehl, 1970; Spector & Brannick, 2011). Many variables can be used as control variables. However, the choice depends on the purpose and context of the research design adopted for the study (Becker 2005; Kennedy & Fiss, 2009; Spector & Brannick, 2011). Bernerth and Aguinis (2016) proposed that control variables must be chosen to reflect the relationship between the examined variables and support the study's theoretical and empirical position. For this study firm size, firm age and industry type were the two variables used as control variables as pertinent in the management literature (Andi, Isnaeni & Widiyanti, 2019; Carlson & Wu, 2012; Tosi Jr & Gomez-Mejia, 1994). This choice of control variables, as discussed in prior studies, aids researchers to control the extraneous influence likely to exist in the dependent variable, the mediating and the moderating variables (Carlson & Wu, 2012; Modi & Mabert, 2010; Rai, Patnayakuni & Seth, 2006; Wang, 2013; Wang, Zhang & Goh, 2018; Younis, Sundarakani & O'Mahony, 2019). This was done to better understand the relationship between the variables being reviewed. It has been suggested in management literature that firm size, firm age, and industry type (service or manufacturing) may affect a firm's financial performance (Boso, Donbesuur, Bendega, Annan & Adeola, 2017). The number of employees in a firm served as a proxy for the firm's size (Dang, Li & Yang, 2018; Rogers, Helmers & Koch, 2010), using a Likert scale. 1 = 1 - 5, 2 = 6- 29, 3 = 30 - 99, 4 = 100 and more, while industry type categorised as either service or

manufacturing. The use of 0 or 1 is arbitrary and not permanent (Lean 1996; Rai et al., 2006). Firm Age was measured using (1) = 0 – 5 years, (2) = 6 – 10 years, (3) = 11 – 20 years and (4) = 20 years and above (Kwarteng et al 2021). Responding participants were asked to indicate the industry and sector their firms operate in. Specifically, respondents were asked to indicate whether they were in manufacturing or services.

3.10 RESPONSE FORMAT

Response format refers to how answers (responses) are obtained from the respondent (Churchill et al., 1996). The Response format for questionnaire items can be grouped into several categories. These include but are not limited to; forced choice, Likert-scale type, multichotomous answers, dichotomous answers, close and open-ended answers (Birenbaum, Tatsuoka & Gutvirtz, 1992; Russell, 1993). In this study, a closed-ended answer format was used. The rationale for using this format was based on the following reasons; first, as Churchill (1995) and Boso (2010) explained, the closed-ended answer format reduces potential misinterpretations among respondents. Second, because the closed-ended answer format requires a relatively shorter time to complete, respondent fatigue is minimised whiles reducing the non-response rate. Finally, compared to other response formats, the closed-ended format was considered a more cost-effective method of collecting data (DeVellis, 1991).

For each question in the questionnaire, respondents were asked to fill in boxes with the appropriate values provided. Respondents were sometimes asked to tick or circle the number that best reflected their opinions. The sort of measurement scale to be used was taken into consideration when designing the questionnaires. The interval and ratio scale have been extensively used in SCM research (Amoako-Gyampah et al., 2020; Fynes et al., 2004; Ortas et al., 2014; Somjai et al., 2019). The interval scale is a mathematical scale that measures so that the order is preserved, the difference between two variables is meaningful and equal, and zero is arbitrarily included (Black, 2019). Ratio scale is a quantitative type of measurement scale, for example, Likert scale, Net promoter scores, and bipolar matrix table. Ratio scales are a type of scale that essentially allows researchers to compare intervals or variations. The ratio scale provides unique possibilities for statistical analysis. Accordingly, interval and ratio scales were used in this study. Also, the study's key constructs were conceptualised as continuous and were considered as normally distributed. The interval and ratio scales are appropriate to use (Hair et al., 2014). As with similar studies in

prior research (Amoako-Gyampah et al., 2020; Fynes et al., 2004; Ortas et al., 2014; Stank et al., 2001), multiple rating scales were used to rate the responses of respondents. In particular, Likert types with different anchors were used.

3.11 Pilot Test

Pilot testing was a developmental stage in the design of data collection research instruments. Pilot test allows researchers to assess the accuracy and efficacy of the questionnaire (Reynolds, Diamantopoulos & Schlegelmilch, 1993). It is conducted before administering questionnaires to the targeted population. Piloting helps refine, identify, and minimise errors with the questionnaire and its design (Hardesty & Bearden, 2004). According to Hague (1987), piloting a research instrument allows a researcher to do two things. In the first case, the researcher can perform a face validity test, which allows the researcher to analyse the content of the questions being asked and how reflective they are of the construct being evaluated (Hardesty & Bearden, 2004; Oppenheim, 1966). Second, the general nature of the questionnaires and their theoretical importance to the research design may be evaluated (Hardesty & Bearden, 2004). This is done to ensure that the data collected from the questionnaire are compatible with all validation and reliability issues, an attribute that is important for theoretical testing (Hair et al., 2014).

In piloting the questionnaire for this study, the questionnaire was submitted to subject area experts of both local and international repute, researchers, students, and industrial managers. Approximately 150 questionnaires were distributed among these key industrial players to criticise, evaluate, examine, and scrutinise the questionnaire's structure, content, and appropriateness for the study following (Hague, 1987; Reynolds et al., 1993). Out of these one hundred and fifty (150) questionnaires sent, one hundred and ten (110) were received. However, ninety (90) were usable and subjected to a reliability test.

An Exploratory Factor analysis (EFA), as well as a Cronbach's Alpha (CA) test, were run using the ninety (90) usable questionnaires. EFA was done to determine the cross-factor loadings of the various items, while CA was done to determine the internal consistency of the constructs being examined. It was found that all constructs had an internal consistency meeting or exceeding the recommended minimum threshold of 0.7 (Hair et al., 2014). It was discovered using the EFA that most items under observation loaded correctly under their respective construct, and their factor

loadings in some cases met and exceeded the expected recommended minimum threshold of 0.5, the items that did not load well were dropped (Hair et al., 2014).

3.12 Survey Administration and Data Collection

As indicated earlier in this chapter, a questionnaire was the primary tool used for this study. The final version of the pre-tested questionnaire was distributed to the different target sample respondents. The data collection effort lasted roughly three months, beginning in November 2020, and concluding in March 2021. This was done to ensure that there was sufficient data for the proposed hypotheses to be analysed. Collecting data, especially in developing countries, can be particularly challenging in terms of data quality, study population, and response rate (Amoako-Gyampah et al., 2020), more so with the emergence of the COVID-19 pandemic. In order to provide trust in the data collected and support other researchers in similar environments, the collection was carried out as follows: taking into account the apparent difficulties surrounding the data collection environment.

As a result of the COVID-19 pandemic and its subsequent health protocols, which limited the physical distribution of the survey instrument, an online survey technique was adopted for this study. The Qualtrics Online survey application was a platform used to distribute the questionnaire instrument to the target respondent. In order to prevent a low response rate, this study did not use a strictly randomised data collection method. Given this and its possible impact on the common method bias (CMB), later sections of this study explain the systemic methodology used to tackle potential issues of CMB. The research sample consisted of respondents with the relevant knowledge and the necessary skills and information on the subject under consideration. Directors, line managers, and corporate heads of the different firms sampled were identified and given adequate time to complete the questionnaire Gligor (2014) proposed. These senior managers who were best identified and suited as respondents, in conformance with recent literature, were chosen because they were deemed to possess the needed experience and skills in management, strategic decisions, policy and governance (Conway & Monks, 2009; Du, Zheng, Xie & Mahalingam, 2014; Mbugua & Kinyua, 2020).

However, the questionnaires had to be physically delivered to the target respondents in some very unusual cases. This arrangement was made for respondents who had challenges with accessing the Internet. In this case, the physical distribution of questionnaires was done in compliance with all

the health protocols of Covid 19. A face-to-face approach was also offered to respondents who were challenged in the reading and writing of English. Respondents who were similarly constrained in the use of computers were also not left out. The recommended procedure for coping with such a situation, as suggested by literature (Salazar, 1990; Ziegler, Stierand, Bahrs & Ahrend, 2020), included reading and interpreting questions and their associated scales without giving out any leads or pointers. These were strictly and carefully observed to avoid induced biases of any kind in the study.

It must be noted that the study by Wells, Bailey, and Link (2014) established that irrespective of the mode used in administering the questionnaire, there will be no significant effect or differences in the responses received from respondents. Gentle reminders were sent every other week to respondents on the need to return their completed questionnaires (Al-Yousef, Wajid & Sales, 2019). Three months were spent conducting the primary survey in Ghana's northern, middle, and southern regions. Six hundred and fifty-five (655) questionnaires were administered, and four hundred and sixty-eight (468) were returned, indicating a 71.5% response rate. After removing partially completed surveys, the data analysis (discussed in greater detail later in Chapter 4) was conducted based on four hundred and fifty-five (455) completed responses, representing a 69.5% usable response rate. This high rate of response guarantees that respondents are not subjected to systematic bias (Klein, Rai & Straub, 2007), which is consistent with previous supply chain management research, such as (Amoako-Gyampah et al., 2020). The analysis procedure and the statistical methods used for the data analysis are discussed in the following section.

3.13 DATA ANALYSIS

This section discusses the main statistical tools and procedures employed in analysing the conceptual model of this study. The primary statistical tool employed for this study is the structural equation model (SEM). SEM is a popular statistical technique in behavioural research used for concept and theory development among variables with multiple constructs and complex associations (Mia, Majri & Rahman, 2019). SEM is a more sophisticated form of generalised linear modelling. It is used to evaluate "whether a hypothesised model is consistent with the data collected to reflect [the] theory" (Lei & Wu, 2007, p. 34).

Additionally, SEM can be defined as a multivariate analytical approach for testing and estimating multifaceted causal relationships between variables. These relationships could be hypothetical or not directly observable (Bowen, 2011). Furthermore, SEM can also be defined as an analytical technique for simultaneously evaluating multi-level dependence relationships, "where a dependent variable becomes an independent variable in subsequent relationships within the same analysis" (Shook et al., 2004, p. 397). Finally, SEM is a systematic and comprehensive statistical technique that enables the quantitative evaluation of proposed theoretical models as well as the investigation and understanding of relationships between variables that may or may not exist by utilizing a variety of models to explain the relationship between observed-observable, observed-latent, and latent-latent variables (Joreskog & Sörbom, 2001; Schumacker & Lomax, 2004). A latent variable is a conceptual variable that cannot be directly measured, while an observed variable is a variable that can be measured and is used to infer the construct (Lam & Maguire, 2012).

Despite the numerous variant analysis techniques in the literature, this study adopted SEM for the following reasons: (i) it served as a verifiable data analysis technique rather than just descriptive; (ii) Unlike the weakness associated with most multivariate analysis techniques in evaluating and correcting measurement errors, the SEM method provided a more accurate estimation of the measurement error variance parameters; (iii) While the strict use of observable variables is needed in conducting data analysis using regression models, path models, and confirmatory factor analysis models, the SEM was able to combine for data analysis both latent variables (not directly observable variables) and observable variables (Byrne, 2010).

The covariance-based SEM (CB-SEM) and variance-based SEM (PLS-SEM) are the two most popular types of SEM in the literature despite their associated advantages and disadvantages (Hair et al., 2014; Mia et al., 2019; Rigdon, Sarstedt & Ringle, 2017). The variance-based SEM (PLS-SEM) is used in this study due to its strength in dealing with complex structural models, non-normally distributed data points, the ability to predict key target constructs or to identify key "driver" constructs, and the capacity to handle adequately with small sample sizes (Hair et al., 2014; Mia et al., 2019). Hair et al. (2014) discovered that the PLS-SEM, which employs the variance approach, is one of the most appropriate approaches for an exploratory investigation like this one. Analysis in PLS-SEM involves a two-stage approach, the measurement model analysis and structural model analysis (Hair et al., 2014).

The measurement model analysis entails validating the study's measures through exploratory and confirmatory factor analysis (EFA and CFA). In contrast, the structural model analysis entails assessing the structural relationships between constructs in the research model through Structural Equation Modelling (SEM) (Hair et al., 2019). Common method and non-Response bias were also performed to ensure they were not problematic (Awang, 2012; Mia et al, 2019; Podsakoff, MacKenzie, Lee & Podsakoff, 2003; Rindfleisch et al., 2008). PLS-SEM has increased significantly in the last decade for supply chain management research (Green, Inman, Sower & Zelbst, 2019; Hazen, Overstreet & Boone 2015; Irum et al., 2018; PLS-SEM 2018; Rigdon et al., 2017). In line with its definitions, the PLS-SEM is used to investigate the direct effect; which is simply the relationship that exists between a dependent variable (i.e. Firm performance) and an independent variable (i.e. sustainable supply chain management), the indirect effect, which includes the relationship between independent and dependent variables that are mediated(i.e. supply chain integration and firm capabilities) or moderated(i.e. Business environmental uncertainty and operational competitiveness), and total effects, which is the sum of two or more direct or indirect effects. In line with the objectives of this study and the above, the PLS statistical package was used in conducting the SEM of this study.

3.13.1. Common Method Bias

Common Method Bias (CMB) is a form of systematic error variance resulting from the method employed for data collection, which, when not dealt with properly, tends to cause observed correlations among variables to differ from their expected population values, giving rise to possible data misrepresentation and interpretation (Doty & Glick, 1998; Meade, Watson & Kroustalis, 2007; Simmering, Fuller, Richardson, Ocal & Atinc, 2015). As such, as established in the findings of Podsakoff et al. (2003), the occurrence of CMB in a research study can be categorised into four (4) main categories, namely; (i) When there is the concurrent measurement of predictor and criterion variables using a single respondent also referred to as measurement context effect; (ii) The item context effect (i.e. ambiguity in measurement items); (iii) the item characteristic effect and (iv) lastly the common rater which is birth out of leniency and social desirability of the respondent. This research, cognizant of the value of CMB, as it relates to the integrity and validity

of measurement items, employed both ex-ante and ex-post methods (Rindfleisch et al., 2008) in dealing with CMB.

In using the ex-ante remedy, the procedural structure of our questionnaire design was examined; The study mixed the questions that were asked, the questionnaire was structured with breaks in mind, and the respondent was given full assurance of the anonymity and confidentiality that surrounding the answers they provided and was therefore encouraged to be as truthful and transparent as possible, bearing in mind that the question sought only to measure their perceptions of the subject matter and not to evaluate they themselves. This was done to minimise any potential errors. Next, the study proceeded to apply the ex-post approach, which is statistically inclined to further ensure that CMB was not a problem. Following the fact that both the dependent and the independent variables were grouped in the questionnaire distributed.

Harman's (1967) single factor test was used to assess the presence of common significant variance in the measurement items of study (CMB). Using the chi-squared ($\chi 2$), the TLI, RMSEA, CFI, and SRMR values obtained from the single factor analysis, the statistical significance or otherwise as to the effect of common variance can be examined (Amoako-Gyampah et al., 2020). The single factor test is not the only statistical test that is used in assessing CMB; other methods exists as such, the marker–variable technique prescribed by Lindell and Whitney, (2001) and McIntosh, (1997), correlational marker technique and the CFA marker technique (Richardson, Simmering & Sturman, 2009). In this study, the CFA marker technique was adopted since it could detect and resolve the presence of CMB better than others (Richardson et al., 2009; Williams, Hartman & Cavazotte, 2010). According to Richardson et al. (2009), theoretically unrelated makers were adopted *a priori* for this study. Marlowe-Crowne social desirability, recommended as "one of the most powerful causes of common method biases" (Podsakoff et al., 2003, p. 893), was used as a maker variable. The CFA marker technique was then performed following the standard protocols (Loo & Loewen, 2004; Loo & Thorpe, 2000) to establish and resolve the presence of CMB. The results presented later in chapter four show that CMB did not substantially affect the study.

3.13.2 Non- Response Bias

In this study, the non- response bias test was conducted following the guidance of the extant literature (Studer et al., 2013). Non-response bias refers to the biases that may arise when the response of non-respondents and late respondents differ from early respondents in observable

characteristics (Studer et al., 2013; Whitehead, Groothuis & Blomquist, 1993). “The bias created by non-response is a function of both the level of non-response and the extent to which non-respondents are different from respondents" (Kano et al., 2008, p. 1). Non-response to questionnaire surveys can skew results, as respondents may vary in some orderly manner from non-respondents or late responders (Boström et al., 1993; Hill, Roberts, Ewings & Gunnell, 1997; Kano et al., 2008; Smith & Nutbeam, 1990). There are several proposed remedies in the literature for dealing with non-response bias. These include; (i) ignoring the non-response as proposed by (Miller & Smith, 1983), (ii) following up on respondents with routine messages and calls as proposed, (iii) comparing respondents' sample estimates to population estimates (Oppenheim, 1992), (iv) comparing respondents to non-respondents, (v) re-sampling non-respondents, and (vi) comparing respondents' sample estimates to other sources. Each method has a unique set of advantages and disadvantages.

This study employed point (iii) to use the independent t-test with known population parameters to compare the means of early respondents to late or non-respondents. This approach was adopted based on its rigour and wide acceptability in social science research (Miller & Smith, 1983; Oppenheim, 1992; Smith, 1984). The result of this analysis is presented in the fourth chapter of this study.

3.13.3 Data validity and Reliability

Trustworthiness is a crucial concern in survey research, and for this reason, steps were taken prior, during and after data collection to ensure trustworthiness, as discussed previously. In quantitative research, trustworthiness, such as the current study, revolves around reliability, validity and bias in research study design, data collection and data analysis (Heal & Twycross, 2015; Sajimandani, 1996; Thatcher, 2010). The PLS-SEM Measurement Model Analysis was used to determine the reliability and validity of the data collected in this study.

3.13.3.1 Measurement Model Analysis

The measurement model analysis was used to examine the underlying relationships between the measurement items and their respective latent construct. In other words, the measurement model helped to assess how well the identified measurement items represent their underlying constructs (Awang, 2012). To examine this representation, the EFA and the confirmatory factor analysis

(CFA) tests were done. The EFA was first used to ascertain the factor structure of the study items as well as the reliability of the scale items. The CFA was used to confirm the construct validity and reliability of the items obtained from the EFA. This was done to address the issue of measurement items. In order to address the issue of validity and reliability, the indicator loadings of each measurement item, as well as the Cronbach alpha, composite reliability, AVEs, cross-loadings, Fornel and Lacker criteria, and the Heterotrait-Monotrait ratio (HTMT) of correlations were examined. Measurement items that were found to have low factors loadings were deleted and re-specified to ensure that the fitness indexes of their representative construct were improved. To improve the construct fitness indexes, measurements with high modification indices were deleted due to the high correlation between pairs of items in the measurement model.

3.13.4 Exploratory Factor analysis

In this study, the Exploratory Factor Analysis (EFA) was used to ascertain the underlying relationship between the measured variables and reduce the data set to a smaller set of summary variables while exploring the underlying theoretical structure within the variables. EFA is an analytical tool that aids a researcher to determine the number of measurement items influencing variables and identifying which of the measurement items 'go together'. EFA's objective is to minimise the dimension of construct measurement items. The underlying principle is that quantifiable and observable variables can be reduced to a smaller number of latent variables that share a common variance but are unobservable (Bartholomew, 1980; Bartholomew, Knott & Moustaki, 2011). These unobservable factors are not directly quantifiable and are primarily used to define variables (Cattell, 1988). In other words, EFA is a statistical tool used to reduce internal measurement items and in determining the interrelationships among sets of variables that define a construct (Clark & Watson, 2016; Hair et al., 2014). In line with the objectives of this study, the EFA was performed prior to the CFA test to confirm the factor loadings and the interrelation of the measurement items used in measuring the various constructs (Mia et al., 2019). Following extant literature (Dien, 2010; Jahrami & Buheji, 2012), the maximum likelihood extraction method and the ProMax with Kaiser normalization were used to extract the measurement items (latent factors) of their respective construct (i.e. sustainable supply chain management, firm performance, supply chain integration, firm capabilities, business environment uncertainty and operational competitiveness). It must be noted that EFA requires a minimum factor loading of 0.50 to confirm

measurement items validity and reliability (Hair et al., 2014; Mia et al., 2019). Eighty-one- (81) items were used for the EFA. The results of the EFA indicated that after five iterations, a solution with ten (10) variables and 48 items (see Table 4.7)had Eigen values >1 and accounted for 73.07% of the total variance. According to the selection criteria suggested by Hair et al. (2006, p. 129), thirty-three (33) items were dropped because they did not have a factor loading value greater than 0.50. Details of this analysis are presented in chapter four.

3.13.5 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was the statistical tool used to confirm or reject the measurement items. It is a multivariate statistical procedure used to test how well measurement items represent their respective constructs (Brown, 2015; Bryant & Yarnold, 1995; Harrington, 2009). A confirmatory factor analysis (CFA) was done in this study following Anderson and Gerbing (1988) and Straub's (1989) guidelines. CFA was done in this study to help ascertain the validity of measures, confirm measures, and guide model re-specification. In comparison to other methods, confirmatory factor analysis is a more robust method for testing discriminant and construct validity (Amoako-Gyampah et al., 2020; Hair et al., 2014). There are several ways of conducting a CFA (Hair, Matthews, Matthews & Sarstedt, 2017; Henseler, 2017). One is using the good fit model. Model fit in CFA simply examines the overall fit of the data set by looking at the discrepancy between the study sample and the covariance matrices. This is usually done in covariance-based SEM. In the test of good model fit, the chi-square ($\chi 2$) value obtained must have an associated P-value = > 0.05. In addition to the chi-squared value, a root means square error of approximation (RMSEA) simply a parsimony-adjusted index must be examined. If a value closer to 0 is obtained for RMSEA, it represents a good fit (RMSEA < 0.08). The comparative fit index (CFI) with a good fit point of CFI ≥.90 compares the fit of a target model to the fit of an independent model. (Non) Normed Fit Index (NNFI) or Tucker Lewis index (TLI) with a good fit of NFI ≥ 0.95 or NNFI ≥ 0.95 examines the extent to which a model was improved(i.e. An NFI of .95, indicates the model of interest improves the fit by 95% relative to the null model) (Hair et al., 2014; Hair et al., 2017; Hu & Bentler, 1996). Another approach for CFA is to use the Cronbach alpha (CA) cross loadings, Fornel and Lacker criteria, Hetrotriate monotriate (HTMT), composite reliability (CR) and average variance extracted (AVE) statistics methods. This method of CFA was used in this study since it relates to the variance-based SEM. With this, the reliability of the

study constructs was estimated (Fornell & Larcker, 1981; Hair et al., 1998). Following the recommendation of Sarstedt et al. (2021), the CFA began by examining the loadings of the indicator. Loadings greater than 0.708 indicate that the construct adequately accounts for more than half of the variance in the indicator, indicating a high level of item reliability. The subsequent step was to evaluate the internal consistency and reliability of the constructs. This step evaluated the construct's internal reliability using the composite reliability (CR) and Cronbach alpha (CA) measures proposed by (Sarstedt et al., 2021). CR measures the internal consistency of the construct (Nunnally, 1994). CR indicates the degree to which items reflect a common underlying construct. Hair et al. (2021) defines acceptable CR values as those between 0.60 and 0.70, whereas results between 0.70 and 0.95 indicate satisfactory to good reliability levels. Cronbach's alpha is another internal consistency reliability metric that uses the same thresholds as the composite reliability metric but generates lower values.

The next stage of CFA began after the CR and CA yielded a good measure validating the study construct's internal consistency and reliability. This stage evaluated convergent validity. The degree to which a construct converges in its indicators by explaining the variance of the items is referred to as convergent validity (Sarstedt et al., 2021). The AVE was used to examine convergence validity by measuring the variance captured by the construct's indicators compared to measurement error (O'Leary-Kelly & Vokurka, 1998). A threshold of 0.50 or greater is considered appropriate for AVE. This level or above indicates that, on average, the construct accounts for (more than) 50% of the variance in its items (Sarstedt et al., 2021). After establishing the reliability and convergent validity of reflectively measured constructs, the final step is to assess their discriminant validity. This analysis determines the extent to which a construct is empirically distinct from other constructs (Hair et al., 2014). To evaluate the discriminant validity, the study used the Fornell and Larcker criteria (Fornell & Larcker, 1981), Cross Loadings (Chin, 2010) and Henseler et al.'s (2015) heterotrait-monotrait ratio (HTMT) of correlations. Using the Fornel and Lacker criterion, the square root of the AVEs was compared to the inter-item correlations. The square root of the AVEs should be greater than the inter-item correlation to obtain discriminant validity.

Further, for cross-loadings, as a rule, the indicator loadings should be greater in their respective construct than the other constructs. Finally, the HTMT proposed by Dijkstra and Henseler (2015), which has been found to be a better measure of discriminant validity than the others, was used to

ascertain the discriminant validity of the study construct. A threshold of 0.85 was defined as acceptable, as indicated by Henseler et al. (2015). Once internal validity, convergent validity and discriminant validity were achieved, further statistical analysis was done. Details of this CFA analysis is presented in the fourth chapter of this study.

3.14 STRUCTURAL MODEL AND HYPOTHESES TESTING

After obtaining an acceptable measurement model devoid of any significant biases, the study conducted the second part of the PLS-SEM, i.e., structural path analysis. Structural path analysis involves using path analysis to confirm or disprove the study's proposed hypotheses (Hair et al., 2014; Lee, Petter, Fayard & Robinson, 2011). To do this, a collinearity test was first performed on the constructs used in this study. This was done to ensure no issues that could skew or distort the regression analysis results. In doing this, the study followed the proposed guidelines discussed in the following research (Bentler & Bonett, 1980; Byrne, 2010; Hair, Anderson, Babin & Black, 2010; Hair et al., 1998; Jöreskog & Sörbom, 1993; Sarstedt et al., 2021). Using the variance inflation factor (VIF), the collinearity of the study constructs was determined.

For appropriate fitness, VIF must be lower than 3, as proposed by literature (Hair et al., 2014; Sarstedt et al., 2021). Once the collinearity issues are addressed, the study then examined the direct effect model (Amoako-Gyampah et al., 2020; Srinivasan & Swink, 2015; Sarstedt et al., 2021). In doing this, the strength and significance of the path model were examined using the t-values and p-values of the path coefficients. A path coefficient is significant at 95 per cent if the p-value is less than 0.05 or if zero does not fall within the 95 per cent per centile confidence interval, as proposed by Hair et al. (2021) and Aguirre-Urreta and Rönkkö (2018). Path coefficients are typically significant between -1 and +1, with coefficients closer to +1 implying strong positive relationships and those closer to -1 implying strong negative relationships (Sarstedt et al., 2021). In the structural analysis, the coefficient of determination (R2) is examined. The R2 measures the model's explanatory power since it measures the variance explained by each endogenous construct (Rigdon 2012). (R2) values are usually between 0 and 1, with higher values indicating greater explanatory power. (R2) values of 0.75, 0.50, and 0.25 are considered significant, moderate, and weak, respectively (Henseler et al., 2009; Hair et al., 2011).

In this study, all direct paths of the conceptual model (H1a, H1b, and H1c), specifically the influence of social supply chain management, economic supply chain management and environmental supply chain on firm performance, were examined (Hair et al., 2014; Hair et al., 2017). Further, in line with the study's objective and the proposed conceptual model of the study, the indirect effect model was also examined. In this model, a mediation test analysis was done. The purpose of mediation analysis is to determine whether a third intermediate variable can adequately explain the relationship between two variables (Lapointe-Shaw et al., 2018). There is a widely accepted approach for mediation analysis proposed by Baron and Kenny (1986). This approach, however, especially its step one (1), which states that; the direct effect model (i.e. the relationship between the original set of the independent variable and the dependent variable) must first be examined and must be found to be significant (Baron & Kenny, 1986), before proceeding to test for the indirect effect model has been criticised by many researchers (Amoako-Gyampah et al., 2020; Preacher & Hayes, 2004). In their critique, they suggest the indirect effect model (mediation)can be assessed without satisfying step one (1) of Baron and Kenny (1986) (Hair et al., 2014; Hair et al., 2010; Preacher & Hayes, 2004). The Sobel test, which plays a significant role in assessing mediation analysis (Preacher & Hayes, 2004) and assumes that indirect effect follows a normal distribution, has as well been criticised since Edwards and Lambert (2007) indicate that indirect effect models have been established as a non -normal distribution. In light of the above, (Amoako-Gyampah et al., 2020; MacKinnon et al., 2002; Preacher & Hayes, 2004) suggest a more rigorous bootstrap test must be adopted for mediation analysis. Bootstrapping is a statistical test that resamples a single dataset in order to generate a large number of simulated samples (Memon, Jun, Ting & Francis, 2018). The bootstrap test methodology was used for this study to test the mediation hypotheses set in this study (i.e., H2a, H2b, H2c, H3a, H3b, H3c, H4a, H4b, H4c, H5a, H5b, H5c) due to its ability to deal with non-normal and asymmetric related issues. When the mediation analysis was completed, the study then moved on to test for the moderation effect as proposed in the study's conceptual model.

Within a causal relationship, moderation occurs when a third variable, usually known as a moderator, causes the influence an independent variable has on a dependent variable to vary or change when they interact (Baron & Kenny, 1986; Cohen, 1978; James & Brett, 1984). Before introducing the moderator into the model, the effects of the independent variable on its dependent variable must exist and be significant (Hair et al., 2021). To examine the moderation effect of the

study hypotheses (H6a, H6b, H6c, H7a, H7b, H7c) in explaining the effect of sustainable supply chain management on firm performance, the "effects" of the independent variable on the dependent variable were examined when the moderators were introduced into the relationship. In other words, the effect of the independent variable on its dependent variable was determined by the level of the moderator variable (i.e., operational competitiveness and Business environment uncertainty) (Hair et al., 2017). If a moderator effect exists, the regression model's interaction term will be significant (p.05) (Hair et al., 2017). To interpret statistically significant interactions, a regression plot (representing the association between the independent and dependent variables) is plotted for high and low values of the moderator. This enables researchers to observe how the relationship between X and Y varies according to the moderator's level. The results of the structural analysis are presented later in chapter four.

3.15 SUMMARY OF ANALYSIS

In total, twelve distinct statistical analyses will be conducted in accordance with the study's objective and the methodology discussed above. Figure 3.2 summarises all required analyses in detail, including the order and purpose of each method used in the analysis.



Figure 3.2: Summary of all required analysis

3.16 RESEARCH ETHICS

Research ethics refers to the standards and laws governing the conduct of a specific study (Bryman, 2004; Saunders et al., 2016). Some ethical issues have been considered and discussed in this study in compliance with ethical standards. First, because respondents' involvement in the research project should be voluntary (Bryman, 2004; Saunders et al., 2016), only firms willing to participate in the study were considered. Prior to initiating the study, an ethical clearance was obtained from the University of Witwatersrand. After obtaining ethical clearance, letters of introduction from Wits Business School were distributed to participating companies in accordance with ethical principles. This exercise was done to seek the respondents' official consent (Robson, 2002). Second, the anonymity and confidentiality of respondents and their information were also taken into account. In particular, respondents were assured of non-disclosure, and all responses were treated anonymously. The data collected has been kept safe and will be discarded after five years.

3.17 THE CONTEXT OF GHANA

In several ways, Ghana provides an intriguing and one-of-a-kind setting for the subject matter. Ghana is a West African country with a population of approximately 28,206,728 million people and a GDP per capita of (US$) 1,380 (World Bank Group, 2018). Ghana's economy is market-based, with few trade and investment barriers. Ghana is confronted with several environmental issues as a developing country due to its reliance on the traditional linear business model (Kwarteng et al., 2021). Despite widespread environmental challenges, Ghana has been recognised as one of the few Sub-Saharan African countries committed to overcoming these challenges through the advancement and achievement of the Sustainable Development Goals, including sustainable supply chain management. Because of the country's commitment to the SDGs, it is critical to examine the effect of SSCM practices on firm performance and the accompanying mechanisms that aid in establishing this relationship to improve the country's understanding of its sustainable development goals.

Ghana faces unique social, environmental, and political challenges. These challenges include rapid population growth, sophisticated consumers, high rate of youth unemployment, depleting natural resources, illegal mining that is wreaking havoc on the natural environment, perennial flooding, as well as wholly inadequate technological capacity, rapid and widespread health challenges, unequal

income distribution, and underutilised factors of production, all of which are obstructing development and suggest that the country must begin to manage its affairs in the most productive, cost-effective and socially responsible manner (Tilt, 2018). Due to the sub-region's rapid economic growth (African Union Commission, 2018), as well as rapid institutional and structural changes (World Bank, 2017), firms in Ghana (i.e., Small, Medium, and Large) that are mainly engaged in sustainable supply chain management face increasing levels of competition, uncertainty, and dynamism (Dadzie, Winston, and Hinson, 2015). As a result, there is a greater need for collaboration and an understanding of the best medium through which SSCM practices can be implemented to produce the best results. According to Wu and Baah-Boakye (2008), Ghana's economic, social, and environmental context makes it ideal for testing the generalizability of existing foreign theories that are thought to be 'universally acceptable.'

In this study, Ghana was utilised as a surrogate for the rest of Africa, based on the assumption that most African countries' institutional and governance structures are generally considered to be strikingly similar. Policymakers in most of these countries are struggling to address the significant social and environmental problems they face. These countries must achieve quick economic expansion and growth, and as a result, they must seek policies that attract foreign investment. While economically sound, some of these policies have detrimental social and environmental effects. The interaction and mutual influence of improving human lives and preserving the natural environment and the tension between economic progress and sustainability are critical to this study because they create an enabling environment for firms to engage in and speak about the social and environmental issues that affect their operations. Ghana's unique context, combined with its challenging socioeconomic environment, necessitates special consideration to assist policymakers.

3.18 CHAPTER SUMMARY

This chapter presented the study's methodological stance. The Positivist paradigm served as the study's primary philosophical orientation. The study used a cross-sectional research design that was adequately justified. Following this research design, a sampling technique, study population, and sample size were determined. The survey method was used in this study. The study's primary data collection method was a questionnaire-based survey, with the organisational level serving as the unit of analysis. Respondents to the survey were senior managers with extensive knowledge

and experience. The variance-based SEM was considered more appropriate for data analysis given the study's goal of estimating structural links between the constructs under consideration (Hair et al., 2014). During the data analysis, efforts were made to address potential non-response and common method bias. This was done to ensure the data's validity and reliability. Finally, in order to adhere to ethical norms, several ethical issues were explored and handled during the data collection process, including seeking consent, protecting respondents' anonymity and confidentiality, and protecting the information obtained. The geographical setting of the study was also discussed.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.0 INTRODUCTION

In line with the study's objectives of examining the mechanisms that facilitate the SSCM-firm performance relationship, this chapter describes and analyses the data collected using the methodology described in the preceding chapter. The findings and results of this research are summarised in two parts: The first section of this chapter discusses the descriptive and measurement model analysis (response rate, the missing data, non-response bias, exploratory and confirmatory factor analysis) of data sets. The second section examines the study's hypotheses (direct, mediation and moderation hypothesis) using the path analysis.

4.1 RESPONSE RATE

Six hundred and fifty-five (655) questionnaires were distributed via email (online) to Ghanaian respondents employed in various manufacturing and service firms. The questionnaires were administered electronically to ensure strict adherence to the COVID-19 health protocols. Specifically, 340, 180, and 135 questionnaires were administered to firms located within Ghana's southern sector, middle sector, and northern sector, respectively. Out of the six hundred and fifty-five (655) questionnaires distributed, five hundred and five (505) were returned. One hundred and fifty (150) of the six hundred and fifty-five (655) questionnaires were not returned because managers could not be reached to return them or took an unreasonable amount of time to complete them. Following Hair et al., (2014)' recommendation, fifty (50) of the five hundred and five (505) accepted applications were rejected due to their incompleteness. Thus, four hundred and fifty -five (455) responses were received and deemed usable for this study's data analysis. This reflects a 69.47% effective response rate. A response rate of 30% is considered adequate for the generalization of results and provides a good representation of the population, according to Yin and Bargozzi (2004).

Furthermore, one of the criteria for determining the appropriateness of a sample size for statistical analysis is that it must be at least ten (10) times the size of the total number of variables in the

study (Hair et al., 2019). This study examined ten variables in total. With this, a response rate of 69.47% and 455 valid responses were deemed sufficient for further statistical analysis.

4.2 MISSING VALUE ANALYSIS AND REMEDY

As Hair et al. (2014) and Kline (2011) point out, missing values are a major issue in statistical research, particularly in SEM analysis and exploratory and confirmatory factor analysis, all of which were applied in this research. As a result, it was essential to recognise and treat all missing values before analysing the data. The research statistically tested the magnitude of missing values in the data set using the missing value analysis method in SPSS. The findings showed that the percentage of missing values was less than 5%. There are various methods of dealing with missing values each with its own set of issues (Hair et al., 2014). The expectation-maximization (EM) algorithm is one of the most frequently utilised techniques in the literature for dealing with missing values. (Cox et al., 2014;Hair et al., 2014; Schafer and Graham, 2002; Schafer and Olsen, 1998). The EM algorithm was used in this study to deal with missing values in the data set. Mean values were used to fill in gaps in the data when they were discovered. Because it prevents the researcher from guessing, the mean has been proposed as the best approximation for the value of a missing variable (Tabachnick and Fidell, 2001). Due to the small number of missing values in the study's key constructs, these substitutions were unlikely to pose significant problems.

4.3 NON – RESPONSE BIAS

Non-respondents and late respondents with observable characteristics that differ from early respondents have non-response bias (Studer et al., 2013; Whitehead, Groothuis & Blomquist, 1993). The alphanumeric pattern on the questionnaires was used to code the questionnaires in Excel. Following coding, the raw data sets were double-checked for any possible errors. If an error was discovered in the coded data, the alphanumeric pattern made it easier to retrieve a hard copy questionnaire. When a mistake was discovered, the initial questionnaire was consulted and reviewed to confirm or correct the mistake. This strategy was consistent with the recommendations by Baumgartner and Homburg (1996) and Churchill (1999). Not only did this coding process aid in data processing, but it also aided in the distinction of early and late responses. This was done to ascertain whether the data set contained non-response bias.

4.3.1 Results for Non – Response Bias

Several approaches were used to determine the accuracy of the sample in order to support the interpretation and relevance of the results. Armstrong and Overton's (1977) method was used to calculate the non-response bias. The scores of early and late respondents of the study's variables were compared. Early respondents were those who responded within seven weeks of receiving the questionnaire, and late respondents were those who responded after the seventh week. The independent-samples T-test was used to ascertain any significant difference in means among the two groups. At a 5% significance level, the test found no statistically significant difference between late and early respondents on the variables measured (Age and Experience). This proved that non-response bias had no bearing on the study's findings (See Table 4.1).

Table 4.1: Non – Response Bias Test

Independent Samples Test										
	Levene's Test for Equality of Variance			T-test for Equality of Means						
				t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
EXPERIE	Equal variances assumed	0.869	0.352	0.157	453	0.875	0.014	0.090	-0.163	0.192
	Equal variances not assumed			0.155	327.147	0.877	0.014	0.092	-0.166	0.195
AGE	Equal variances assumed	1.482	0.224	-0.740	453	0.460	-0.066	0.090	-0.242	0.110
	Equal variances not assumed			-0.727	326.837	0.468	-0.066	0.091	-0.245	0.113

Source : Authors Compilation (2021)

4.4 COMMON METHOD BIAS

As previously mentioned in Chapter 3, Common Method Bias (CMB), as cited in (Meade et al., 2007; Simmering et al., 2015), is a form of systematic error variance resulting from the method employed for data collection, which when not dealt with properly, tends to cause observed correlations among variables to differ from their expected population values, giving rise to possible data misrepresentation and interpretation (Doty & Glick, 1998). There are various methods for

examining the existence of CMB and dealing with it if it is present. However, in this analysis, the CMB test was first performed using Harman's single factor score and secondly with the measured marker variable approach. Items of all latent variables are loaded into one common factor in Harman's single factor score approach. CMB does not affect the data set if the total variance of a single factor is below 50 per cent (Podsakoff et al., 2003). The effect of marker variables on the R2 of the dependent variables was investigated using the measured marker variable method as proposed by various authors (Chin et al., 2013;Lindell & Whitney, 2001; Podsakoff et al., 2012). The model is tested first without the inclusion of marker variables, and the R2 values of this model are noted and compared to the R2 values of the second model that contains the marker variables. CMB does not affect the data set if the difference between the R2 values is less than 10 per cent (Podsakoff et al., 2003).

4.4.1 Results from Common Method Bias

The survey process, which employs a self-reporting instrument, suffered from common method bias. As such, a procedural and statistical test was conducted to ensure that CMB did not affect the results. Measures like grouping questionnaire items and posing a question between the dependent and independent variables were used to lessen the influence of CMB on the study's findings from a procedural approach. The statistical procedure began with the Harman single factor test, which included all the EFA's elements. As Podsakoff et al. (2003) note, the unrotated first-factor score must be less than 50 per cent. The unrotated first factor in this study was 11.63 per cent, which was less than the required threshold, eliminating CMB's possible issue in the data set. Second, the measured marker variable test was carried out to confirm the Harman single factor test results. As shown in Table 4.2, the findings show that the difference in R2 values between the model with and without a marker variable was less than 10 per cent, implying that the measured marker variable endorsed the Harman single factor test result that CMB had no impact on the data set.

Table 4.2: Marker Variable Test for CMB

Model 1 R-squared without Marker Variables		Model 2 R-squared with Marker Variables	
Variables	**R-squared Value %**	**Variables**	**R-squared Value %**
Customer Integration	62.1	Customer Integration	68.4
Firm Capabilities	58.3	Firm Capabilities	63.2
Supplier Integration	54.4	Supplier Integration	59.2
Internal Integration	57.1	Internal Integration	61.4
Firm Performance	72.1	Firm Performance	77.2

Source : Authors Compilation (2021)

4.5.1 Descriptive Analysis

This section describes a preliminary examination of the field data collected to determine the characteristics of the data set. The research begins with the respondent and firm profiles, accompanied by descriptive statistics for the variables used in this research.

4.5.2 Profile of the Study's Respondents

Despite the study's analysis unit being the "firm level," participant profiles were included to shed light on the respondents' demographics. The age, level of education of respondents, and gender are reported in Table 4.3 and their work experience, position, and educational level in the current firm. According to the findings, 97.8 per cent of the respondents had a tertiary degree (36.3 per cent of the respondents had a first degree, while 61.5 per cent had a second degree or higher). This indicates a well-educated workforce and demonstrates the respondents' ability to comprehend the survey questionnaire written in English. Almost all the respondents (72.7 per cent) were male (between 20 and 50 years old) and older, with the remainder (27.3 per cent) being female in the same age group as men. Among the respondents, 12.1 percent were first-line managers, 48.4 per cent were middle-level managers, and 39.5 per cent were top managers. Further, the analysis revealed that 58.2 per cent of respondents reported having less than eight years of experience in their current position, while it was observed that the remainder had more than nine years of experience. Respondents' average tenure at their current job was 6.2 years, with a standard deviation of 2.7. This distribution was reasonable, indicating that respondents had sufficient time and industry knowledge to provide accurate and reliable responses to the questions. The findings

summarised in Table 4.3 are consistent with those of the GSS (2016), which indicates that the majority of firms are managed by males with a postgraduate degree.

Table 4.3: Overall Profile of Survey Respondents

Respondent Variable	Category	Frequency	Per cent	Cumulative Per cent
Gender	Male	331	72.7	72.7
	Female	124	27.3	100.0
	Total	**455**	**100.0**	
Age	20 -29	55	12.1	12.1
	30 - 39	180	39.5	51.6
	40 - 49	130	28.6	80.2
	50 or more	90	19.8	100.0
	Total	**455**	**100.0**	
Respondent's Education	Secondary School or related Certificate	10	2.2	2.2
	1st Degree	165	36.3	38.5
	2nd Degree or more	280	61.5	100.0
	Total	**455**	**100.0**	
Respondent 's Position	First Line	55	12.1	12.1
	Middle Level	220	48.4	60.5
	Top line	180	39.5	100.0
	Total	**455**	**100.0**	
Work Experience in the Company (years)	0 – 2	25	5.5	5.5
	3 – 5	100	21.9	27.4
	6 – 8	140	30.8	58.2
	9 or more	190	41.8	100.0
	Total	**455**	**100.0**	

Source : Authors Compilation (2021)

4.5.2 Firm-Level Profiles

At the organisational level, the respondents were asked to provide details on the firm's size, age, firm type, and industry type. The study included a cross-sectional analysis of multiple industries. Table 4.4 summarises the findings from the data collection on these industries.

4.5.2.1 Firms' age distribution, size, type, and industry orientation

Table 4.4 displays the age distribution of the participating companies in Ghana. The majority of the companies (72.5%) were less than 24 years old, with 27.5% over 25 years old. With a 6.4 standard deviation, the average operational age of the responding companies was found to be 15.2

years. This finding is consistent with the studies of Famiyeh et al.,(2018) and Saruchera and Asante-Darko, (2021).

Table 4.4: Profile of Firm Age, Firm Type, Firm Size, and Industry Type

Respondent Variable	Category	Frequency	Per cent	Cumulative Per cent
Length of company operations (years)	5 – 9	20	4.4	4.4
	10 – 14	89	19.5	23.4
	15 – 19	101	22.2	46.1
	20 – 24	120	26.4	72.5
	25 – 29	55	12.1	84.6
	30 and above	70	15.4	100.0
	Total	**455**	**100.0**	
Company Size (No of workers)	1 – 5 workers	29	6.4	6.4
	6 – 29 workers	58	12.7	19.1
	30 - 99 workers	173	38.0	57.1
	100 or more workers	195	42.9	100.0
	Total	**455**	**100.0**	
Firm Type	Public Sector	51	11.2	11.2
	Private Sector (for Profit making)	270	59.3	70.5
	Private Sector (not for Profit making)	134	29.5	100.0
	Total	**455**	**100.0**	
Industry Type	Manufacturing	300	65.9	65.9
	Service	155	34.1	100.0
	Total	**455**	**100.0**	

Source : Authors Compilation (2021)

With respect to the firms surveyed, 6.4 per cent were micro-businesses with fewer than five employees, 12.7 per cent were small businesses with fewer than 29 employees, 38 per cent were medium businesses with fewer than 99 employees, and 42.9 per cent were large businesses with more than 100 employees. With respect to the firm type, 11.2 per cent were public sector firms, 59.3 per cent were profit-making private sector firms, and 29.5 per cent were non-profit private sector firms. According to the survey, 65.9 per cent of the companies were manufacturing-based, while 34.1 per cent were service-based.

Firm size, type and age were also used as control variables. This is because the scale of a firm's size can affect its capabilities and efficiency, and it will be important to see if this occurs in this study (Mallinguh, et al., 2020 ; Pervan, et al., 2017 ; ; Wang, 2008; Younis & Sundarakani, 2019).

The study also took into account the sector of the firm, as external market conditions can have an effect on firm performance. As a result of this effect, manufacturing and service firms may rank differently on various dimensions of firm performance. Furthermore, the study controlled for the effect of the firm's age/length of operation, as older organisations are thought to have better performance indicators than younger ones due to experience (Majumdar, 1997).

4.6 DESCRIPTIVE ANALYSIS OF STUDY VARIABLES

The descriptive results of the various variables under consideration in the study are discussed in this section. The constructs and various scale anchors are listed in Table 4.5. The standard deviation, mean, maximum and minimum value of each construct are included in these scales. As the results show, all of the construct scores were within the range of their respective scale lengths. The findings, in particular, revealed that the average score of all items fell within their respective constructs and was in some cases higher than the mid-point of their respective scale anchors. Mean ratings for environmental supply chain management (ENSSCM), social supply chain management (SCSSCM), economic supply chain management (ECSSCM), and firm performance (FRP) ranged from 2.24 to 2.39, 3.97 to 4.31, 4.14 to 4.26, and 2.37 to 2.73, respectively. Furthermore, operational competitiveness, firm capabilities (FC), and business environment uncertainty (BEU) earned mean scores ranging from 2.26 to 3.46, 3.72 to 4.12, and 2.82 to 3.07, respectively, while internal (II), supplier (SI), and consumer integration (CI) obtained mean scores ranging from 4.31 to 4.51, 3.31 to 3.48, and 2.74 to 3.01.

Table 4.5: The Study Constructs' Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Construct ENSSCM	455	1	7	2.32	1.041
Construct SCSSCM	455	1	7	4.15	0.996
Construct ECSSCM	455	1	7	4.19	1.055
Construct FRP	455	1	5	2.55	1.013
Construct OPCC	455	1	6	2.92	0.972
Construct FC	455	1	7	3.91	1.025
Construct BEUC	455	1	7	2.90	1.041
Construct SI	455	1	7	4.40	1.036
Construct II	455	1	7	3.40	1.021
Construct CI	455	1	6	2.90	1.043

Source : Authors Compilation (2021)

4.7 DATA ANALYSIS AND RESULTS

Studies conducted in less developed countries frequently suffer from small sample sizes and concerns about their validity (Amoako -Gyampah et al., 2019). As a result, this study takes a number of steps to ensure the accuracy of the findings and confidence in the findings. Following Anderson and Gerbing (1988)'s two-stage approach, exploratory and confirmatory factor analysis techniques were conducted to determine the measurement model's psychometric properties. To put it another way, the study assessed the measurement model to determine the constructs' reliability and validity. Second, structural equation modelling (SEM) was utilised for the hypothesised relationships to determine the path coefficients and their respective significance. The bootstrapping method proposed by Preacher and Hayes (2004) was used to conduct the mediation tests in this study. This was done to learn more about the various mechanisms that define the primary relationships in question (i.e., SSCM -Firm Performance). The effect of some critical variables on the primary relationship under consideration was determined using a moderation test. A robustness test was also conducted using objective measures of firm performance to confirm and validate the study's subjective findings.

4.7.1 Exploratory Factor Analysis

EFA is a common statistical technique in the social sciences (Costello et al., 2005; Williams et al., 2010). EFA is defined as the "analytic method used to condense a collection of empirical measures into a smaller set of composite factors or latent variables with minimal information loss" (Hair et al., 2014). EFA can determine the unidimensionality of a set of variables observed. Unidimensionality is defined by Gerbing and Anderson (1988, p. 186) as "the presence of a single construct underlying many observed variables. The size of the factor loading determines the magnitude of the 'connection' between the observed and latent variables." To put it another way, EFA makes it easier to find previously unknown (latent) factors that influence observed (manifest) outcomes (Hair et al., 2014; Watson, 2017).

All relevant information from the original data is retained by EFA-discovered factors, while redundant information and noise caused by sampling/measurement errors are removed. According to Watkins (2018), EFA investigates the latent factors within a data set and accounts for the observed variable differences and their interdependence. Promax rotation and Maximum likelihood extraction were used to extract the factors.

4.7.2 Component Selection

Numerous approaches to retaining factor components have been proposed in the literature. Five of these criteria include the proportion of total variance explained criterion, the interpretability criterion, the eigenvalue criterion, the parallel analysis, and the Scree plot test. All variables with estimated eigenvalues greater than 1.0 are retained by default in SPSS. This is commonly referred to as the Kaiser-Guttman criterion. However, this method overestimates the number of latent factors in some cases, rendering it inefficient (D'agostino & Russell, 2014). Cattell (1966) developed the Scree test based on subjective evaluation and "eyeball" perception of the scree plot. Nevertheless, this method may result in excessive factor extraction. Multiple factor tests can be used to assess the interpretability criterion. The number of retained factors is determined manually using an a priori factor structure and/or the Scree test's recommended number of retained factors. This value is then increased or decreased in order to conduct various factor analyses. After several rotations, the loading factor values for the various item loadings were compared, and the factor structure with the "cleanest" matrix is deemed to have the best representation of the data set (Watson, 2017).

This factor extraction method produces factors with item loadings greater than 0.30, little to no cross-loading, and three or more items. A "messy" or difficult-to-understand table indicates if there is an issue with the data that cannot be resolved by reducing the number of variables. Rerunning the study, as well as low-loading, cross-loading, or freestanding pieces, are all possible ways to improve an "untidy" table (Matsunaga, 2010; p. 101). This can occasionally result in an improvement, but attention must be taken to avoid jeopardizing the integrity of the data sets. According to Costello et al. (2005), if the factor structure does not improve after these checks and multiple runs, the data has more serious problems, most likely due to item scale design, item construction, or the hypothesis itself. The researcher may require additional data collection or, more likely, a larger sample size for the study. Researchers have used component retention methods parallel analysis, RMSEA-based maximum likelihood, minimum-average partial correlation, and Bartlett's 2 test (Watkins, 2018). These alternative methods are based on different rules and have produced varying results in terms of component retention. Guided by Bartlett (1950, 1951), this study adapted Bartlett's 2 test, the eigenvalue criterion, the proportion of total variance accounted for criterion, and the RMSEA-based maximum-likelihood approach with ProMax rotation was used to retain factors (Park et al., 2002).

4.7.3 Results of Factor Analysis from Exploratory Factor Analysis (EFA)

The study's Scale Refinement started with an examination of the Pearson's correlation and the Cronbach's alpha coefficient. First, the reliability of each variable was determined. This was done to assess item reliability (Narasimhan & Jayaram, 1998; O'LearyKelly & Vokurka, 1998). Table 4.8 presents the Pearson correlation matrix of the variables of interest. From this table, it can be observed that all the values were positive and below 0.50.

As O'Leary-Kelly and Vokurka (1998) recommended, the study used EFA for item selection, as stated earlier. Bartlett's test of sphericity yielded 17319.794 (p=0.000), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded values greater than 0.80 for both the overall test and each component. The results of five iterations showed a solution with ten (10) variables and 48 items that had Eigen values of >1 and accounted for 73.07% of the total variance, as shown in Table 4.7. A total of thirty-three (33) items were dropped. According to the selection criteria suggested by Hair et al. (2006, p. 129), these things were dropped because they did not have a factor loading value greater than 0.50.

Table 4.6 summarises the number of variables in the initially proposed model and the subsequent EFA solution derived using Promax rotation's maximum likelihood extraction method. Most of the communality values exceeded 0.50, indicating that the derived variables explain the majority of the variance in the items. The component factor loading and Cronbach's alpha coefficient both exceeded the recommended thresholds of 0.50 and 0.70, respectively (Table 4.7). The results demonstrated a strong model fit, with a total of 30 (2%) non-redundant residuals with an absolute value greater than 0.05. The findings showed preliminary proof of unidimensionality and convergent validity of each scale (O'LearyKelly & Vokurka, 1998). In conclusion, the scales were considered accurate based on Cronbach's alpha and Pearson's correlation values. Furthermore, the indicators remaining on each construct were consistent with Hair et al. (2017)'s conceptualization of the minimum number of indicators required by a construct for SEM analysis.

Table 4.6: Number of variables before and after EFA

Construct	No. of Variables	
	Initial Proposed Model	Final EFA Solution
Environmental Supply Chain Management	9	5
Social Supply chain Management	14	6
Economic Supply chain Management	5	3
Operational Competitiveness	8	2
Business Environment Uncertainty	8	6
Supplier Integration	7	5
Internal Integration	5	4
Customer Integration	10	6
Firm Capabilities	11	7
Firm Performance	4	4
Total	**81**	**48**

Source : Authors Compilation (2021)

Table 4.7: Pattern Matrix of EFA for Main Variables

	Factor										
ITEMS	ENVIRONMENTAL SUPPLY CHAIN MANAGEMENT	SOCIAL SUPPLY CHAIN MANAGEMENT	ECONOMIC SUPPLY CHAIN MANAGEMENT	OPERATIONAL COMPETITIVENESS	BUSINESS ENVIRONMENT UNCERTAINTY	SUPPLIER INTEGRATION.	INTERNAL INTEGRATION	CUSTOMER INTEGRATION	FIRM CAPABILITIES	FIRM PERFORMANCE	Cronbach alpha
ENSSCM1	0.758										
ENSSCM2	0.817										
ENSSCM3	0.812										**0.855**
ENSSCM4	0.758										
ENSSCM5	0.829										
SCSSCM1		0.864									
SCSSCM2		0.921									
SCSSCM3		0.885									
SCSSCM4		0.886									**0.941**
SCSSCM5		0.893									
SCSSCM6		0.803									
ECSSCM1			0.941								
ECSSCM2			0.815								**0.891**
ECSSCM3			0.940								
OPCC2				0.978							
OPCC3				0.877							**0.862**
BEUC2					0.812						
BEUC3					0.853						
BEUC4					0.837						
BEUC5					0.756						**0.909**
BEUC6					0.901						
BEUC7					0.778						
SI1						0.900					
SI2						0.900					
SI3						0.846					**0.933**
SI4						0.872					
SI5						0.919					
II1							0.904				
II2							0.881				
II3							0.865				**0.901**
II4							0.857				
CI1								0.838			
CI2								0.924			
CI3								0.904			**0.941**
CI4								0.887			

CI5								0.839			
CI6								0.861			
FC1									0.852		
FC2									0.903		
FC3									0.917		
FC4									0.861		**0.947**
FC5									0.829		
FC6									0.847		
FC7									0.883		
FRP1										0.816	
FRP2										0.846	**0.868**
FRP3										0.858	
FRP4										0.857	
Eigen value	**5.589**	**4.919**	**4.792**	**4.616**	**3.767**	**3.652**	**3.226**	**2.661**	**2.471**	**2.304**	
Variance Explained	**10.748**	**9.459**	**9.214**	**8.878**	**7.244**	**7.023**	**6.204**	**5.117**	**4.753**	**4.430**	
Cumulative Variance (%)	**10.748**	**20.207**	**29.421**	**38.299**	**45.543**	**52.566**	**58.77**	**63.887**	**68.640**	**73.070**	

Source : Authors Compilation (2021)

Table 4.8: Construct Correlation Table

	Business Environment Uncertainty	Customer Integration	Economic Supply Chain Management	Environmental Supply Chain Management	Firm Capabilities	Firm Performance	Firm Size	Firm Type	Firm Age	Internal Integration	Operational Competitiveness	Social Supply Chain Management	Supply Integration
Business Environment Uncertainty	1												
Customer Integration	0.018	1											
Economic Supply Chain Management	0.049	0.061	1										
Environmental Supply Chain Management	0.008	0.056	0.061	1									
Firm Capabilities	0.031	0.042	0.041	0.038	1								
Firm Performance	0.058	0.014	0.01	0.056	0.046	1							
Firm Size	0.106	0.029	0.052	0.049	0.03	0.073	1						
Firm Type	0.082	0.027	0.007	0.079	0.01	0.026	0.774	1					
Firm Age	0.101	0.013	0.003	0.051	0.061	0.007	0.034	0.019	1				
Internal Integration	0.069	0.086	0.034	0.059	0.024	0.134	0.022	0.024	0.021	1			
Operational Competitiveness	0.071	0.021	0.015	0.007	0.057	0.064	0.022	0.055	0.044	0.056	1		
Social Supply Chain Management	0.031	0.05	0.083	0.024	0.003	0.004	0.129	0.077	0.031	0.019	0.06	1	
Supply Integration	0.001	0.073	0.106	0.003	0.075	0.071	0.006	0.02	0.001	0.028	0.066	0..097	1

Source : Authors Compilation (2021)

4.8 CONFIRMATORY FACTOR ANALYSIS

4.8.1 Measurement Analysis

This section discusses the study's measurement analysis. Confirmatory Factor Analysis (CFA) is used in this measurement analysis. The validity, reliability, and discriminant validity of the study items and constructs are discussed in the CFA. However, prior to performing the statistical assessment of confirmatory factor analysis, a content validity test was performed

4.8.1.1 Content Validity

Face validity is a form of content validity that tests a metric at face value (Hair et al., 2006). Content validity is assessed by evaluating the literature in order to identify specific constructs that experts have validated as having functional relevance by academics and industrial experts. “It is necessary to understand each construct's items and their definitions in order to ensure a valid measurement” (Hair et al., 2006). This research included a pilot test that used content validity to verify the measurement scale adapted. Once content validity was achieved, the CFA was conducted.

4.8.1.2 Validity Tests for Measurement Scales

To validate the instrument, a rigorous validation process was used as guided by various authors (e.g., Chen & Paulraj, 2004; Flynn et al., 1990; Hair et al., 2014). The research used Cronbach alpha to test for reliability, as demonstrated in Table 4.7. Although reliability is important and required, it is not adequate (Hair et al., 2019). Validity is also needed for measurement scales. A measurement scale must be able to measure what it was designed to measure in addition to being reliable (i.e., valid). This ensures that the study's results are reliable and accurately represent the phenomenon being studied. This sets the stage for proper interpretation of the results. Thus, construct operationalization requires construct validity. A multi-step process is used to determine the adequacy of construct validation measures or study items (Schwab, 1980). It is a ‘‘crucial and significant component of the research method." (Schwab, p. 33, 1980). There are three components of construct validity, according to Hair et al. (2006, p. 776) and these are “content validity, convergent validity, discriminant validity and nomological validity”.

4.8.1.3 Reliability and Convergent Validity

The extent to which all items on a measurement scale quantify the same concept is known as convergent validity, which is related to unidimensionality (Hair et al., 2019). It is also known as "the degree to which measures of a construct converge or share a significant amount of variance" (Hair et al., 2006, p. 137). As proposed by Sarstedt et al. (2021), indicator loadings, internal consistency (Cronbach alpha) and composite reliability (CR) were used as a means of testing reliability, whiles the average variance extracted (AVE) were used for the convergent validity test. For convergent validity, the AVE of the construct must be 0.50 or greater (Hair et al., 2019; Sarstedt et al., 2021). The indicator loadings, Cronbach's alpha, and composite reliability were used to ascertain the constructs' reliability, as Sarstedt et al. (2021) recommended. For indicator loadings, values above 0.708 are deemed acceptable, as proposed by Sarstedt et al. (2021). Internal consistency is the most frequently quantified metric when calculating composite reliabilities. The appropriate criteria are values exceeding 0.70 but less than 0.95. However, values ranging from 0.60 and 0.70 are also valid if other construct validity metrics are adequate (Hair et al., 2019; Sarstedt et al., 2021). Cronbach's alpha values have the same threshold as that of the composite reliability. In this study, the different results of these measures are presented in Tables 4.9, 4.10, 4.11 and 4.12.

4.8.1.4 Discriminant Validity

After determining reliability and convergent validity, it is crucial to determine how distinct two related concepts within the data set are from each other (Hair et al., 2007). Discriminant validity analysis tells how unique and uncorrelated constructs are within a data set. When a measurement model does not include redundant elements, discriminant validity is created. According to Hair et al. (2007), observed variables can have a higher correlation with their own latent factor than with another. The observed variables in this study loaded significantly on only one factor, according to the pattern matrix from the SPSS analysis. This shows that discriminant validity exists. After removing some cross-loading factors, Table 4.7 presents the rotated component matrix for the ten-factor structure obtained from this study's EFA solution. The results in Table 4.7 demonstrate an orderly factor structure with correspondingly high item loadings within the factors. In addition to the EFA analysis for distinctness, cross-loadings, Fornel Lacker criteria and the HTMT correlation

method, all of which are components of CFA analysis, were all used in this research to examine discriminant validity.

4.8.1.5 Results from Confirmatory Factor Analysis

CFA was performed to validate the initial proof of unidimensionality by running convergent and discriminant validity tests on the items discovered using EFA (Hair et al., 2019). Unlike EFA, CFA is used to test hypotheses (relating to the relationships between objects and their theoretical constructs), and it is a robust statistical tool for evaluating scale unidimensionality, reliability, and validity (Bagozzi & Yi, 2012; Hair et al., 2014; O'Leary-Kelly & Vokurka, 1998). All of the items in Table 4.7 were subjected to the analysis. The CFA was conducted in two stages. First, the reliability and convergent validity of the items were determined using the average variance extracted (AVE), composite reliability, Cronbach alpha, and indicator loadings (Hair et al., 2021;Henseler et al., 2015;Sarstedt et al., 2021). To determine item reliability, the indicator loadings must be greater than 0.708 (Sarstedt et al., 2021). As a test of reliability, the composite reliability and Cronbach alpha must be higher than 0.7 but less than 0.95 (Cronbach, 1951; Sarstedt et al., 2017; Sarstedt et al., 2021). As a test of convergent validity of the study construct, the average variance extracted (AVE) must be 0.50 or greater.

The discriminant validity of the study's construct, which examines the "level to which a construct is genuinely distinct from other constructs according to empirical standards" Henseler et al. (2015, p.116), was tested in the second stage of the procedure using four criteria, namely, the HTMT ratio of correlations, Fornell and Larcker criterion, the cross-loading, and VIF. When it comes to the cross-loadings of items, "an indicator's outer loading on the related construct should be greater than any of its cross-loadings (i.e., its correlation) on other constructs" (Hair et al., 2017 p. 116). For the Fornell-Larcker criteria, "compare the square root of the AVE values with the latent variable correlations." "The square root of the AVE of each construct should be greater than its highest correlation with any other construct" (Hair et al., 2017 p. 115-116). HTMT ratio was used in the analysis, and the original test suggested by Henseler et al. (2015) to assess discriminant validity. According to Henseler et al. (2015), HTMT is defined as the measure of similitude between latent variables. The maximum bound of the HTMT's 95% confidence interval should be below 0.90 or 0.85 to achieve discriminant validity (Hair et al., 2014). The CFA was carried out using PLS 3.3.3 (Smart PLS) as the statistical software package.

Table 4.9: Reliability and Convergent Validity

Constructs	Items	Indicator Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Business Environment Uncertainty	BEUC2	0.812	0.807	0.909	0.679
	BEUC3	0.853			
	BEUC4	0.837			
	BEUC5	0.756			
	BEUC6	0.901			
	BEUC7	0.778			
Customer Integration	CI1	0.838	0.832	0.941	0.769
	CI2	0.924			
	CI3	0.904			
	CI4	0.887			
	CI5	0.839			
	CI6	0.861			
Economic Supply Chain Management	ECSSCM1	0.941	0.827	0.891	0.809
	ECSSCM2	0.815			
	ECSSCM3	0.940			
Environmental Supply Chain Management	ENSSCM1	0.758	0.804	0.855	0.627
	ENSSCM2	0.817			
	ENSSCM3	0.812			
	ENSSCM4	0.758			
	ENSSCM6	0.829			
Firm Capabilities	FC1	0.852	0.886	0.947	0.758
	FC2	0.903			
	FC3	0.917			
	FC4	0.861			
	FC5	0.829			
	FC6	0.847			
	FC7	0.883			
Firm Performance	FRP1	0.816	0.848	0.868	0.711
	FRP2	0.846			
	FRP3	0.858			
	FRP4	0.857			
Internal Integration	II1	0.904	0.900	0.901	0.770
	II2	0.881			
	II3	0.865			
	II4	0.857			
Operational Competitiveness	OPCC2	0.978	0.897	0.862	0.863
	OPCC3	0.877			
Social Supply Chain Management	SCSSCM1	0.864	0.882	0.941	0.768
	SCSSCM2	0.921			
	SCSSCM3	0.885			
	SCSSCM4	0.886			
	SCSSCM5	0.893			
	SCSSCM6	0.803			
Supply Integration	SI1	0.900	0.899	0.933	0.788
	SI2	0.900			
	SI3	0.846			
	SI4	0.872			
	SI5	0.919			

Note: Reliability and converge validity has been achieved with AVE > 0.5, CR > 0.7, CA > 0.7 and indicator loadings > 0.708

Source : Authors Compilation (2021)

For the first stage of the CFA, the composite reliability, Cronbach alpha, and average variance of the research constructs are shown in Table 4.9 above. As shown in Table 4.9, there is a relationship between the observed items and the latent variables, according to the measurement model obtained from the analysis. The constructs' Cronbach Alpha values were all above 0.7, indicating item reliability (Cronbach, 1951). Further, the values of the indicator loadings were all greater than the expected loadings of 0.708, indicating the item's reliability (Sarstedt et al., 2021). Finally, with a value greater than 0.7, the composite reliability suggests a high degree of internal consistency, and the AVEs of all constructs are greater than the cut-off points of 0.5. Table 4.9 shows that all the recommended thresholds were met for the reliability and convergent validity of the construct (Hair et al., 2019; Sarstedt et al., 2021).

The HTMT ratio of correlations, Fornell Larcker criterion and cross-loading, are used in the second stage to determine the discriminant validity of the construct. (See Tables 4.10, 4.11, and 4.12). Table 4.12 shows that cross-loadings were not a concern with the study construct. Items loaded higher on their respective constructs than any other construct, indicating that the constructs are independent of one another. The Fornell Lacker criterion was also met, as seen in Table 4.10. Table 4.10 demonstrates that the AVE's square root of each construct is significantly larger than its correlation with any other construct. The results of the HTMT analysis of the study's constructs are presented in Table 4.11. The HTMT requirement for discriminant validity was met. All the values were less than the conservative cut-off of 0.85. This adds to the distinctness of the constructs under consideration (Dijkstra & Henseler, 2015; Henseler et al., 2015). When the three criteria were considered together, they demonstrated that discriminant validity had been achieved at the end of the measurement model analysis and the measurement model had no issues.

Table 4.10: Discriminant Validity (The Fornell & Larcker Criterion)

	Business Environment Uncertainty	Customer Integration	Economic Supply Chain Management	Environmental Supply Chain Management	Firm Capabilities	Firm Performance	Internal Integration	Operational Competitiveness	Social Supply Chain Management	Supply Integration
Business Environment Uncertainty	**0.824**									
Customer Integration	0.017	**0.877**								
Economic Supply Chain Management	-0.049	-0.058	**0.900**							
Environmental Supply Chain Management	-0.002	-0.066	-0.066	**0.792**						
Firm Capabilities	-0.031	-0.042	0.041	0.037	**0.871**					
Firm Performance	-0.057	-0.014	-0.009	-0.045	0.047	**0.843**				
Internal Integration	0.069	0.087	-0.034	-0.057	0.024	0.137	**0.877**			
Operational Competitiveness	-0.071	0.022	-0.014	0.008	-0.058	-0.066	0.056	**0.929**		
Social Supply Chain Management	0.031	-0.048	0.084	-0.024	0.003	-0.006	0.019	0.06	**0.876**	
Supply Integration	0.001	0.074	0.108	-0.004	-0.076	0.069	0.028	0.066	0.097	**0.888**

Note: As Fornell and Larcker (1981) proposed, the diagonals' values MUST be greater than those of the row and column. The diagonal correlations were significantly greater than the off-diagonal correlations, indicating that respondents understood the questions and could differentiate among the variables. **Source : Authors Compilation (2021)**

Table 4.11: Discriminant Validity (The heterotrait-monotrait ratio [HTMT] of correlations)

	Business Environment Uncertainty	Customer Integration	Economic Supply Chain Management	Environmental Supply Chain Management	Firm Capabilities	Firm Performance	Internal Integration	Operational Competitiveness	Social Supply Chain Management	Supply Integration
Business Environment Uncertainty										
Customer Integration	0.035									
Economic Supply Chain Management	0.049	0.061								
Environmental Supply Chain Management	0.051	0.066	0.072							
Firm Capabilities	0.045	0.045	0.055	0.05						
Firm Performance	0.061	0.031	0.028	0.072	0.053					
Internal Integration	0.074	0.101	0.037	0.073	0.048	0.139				
Operational Competitiveness	0.097	0.048	0.053	0.045	0.063	0.062	0.063			
Social Supply Chain Management	0.039	0.047	0.077	0.057	0.029	0.04	0.042	0.061		
Supply Integration	0.029	0.083	0.098	0.056	0.093	0.075	0.034	0.061	0.091	

Table 4.12: Discriminant Validity (Cross Loadings)

	Business Environment Uncertainty	Customer Integration	Economic Supply Chain Management	Environmental Supply Chain Management	Firm Capabilities	Firm Performance	Internal Integration	Operational Competitiveness	Social Supply Chain Management	Supply Integration
BEUC2	**0.810**	0.002	-0.023	-0.022	0.019	-0.016	0.05	-0.083	0.025	0.008
BEUC3	**0.851**	0.012	-0.045	0.001	-0.001	-0.049	0.023	-0.084	0.016	0.022
BEUC4	**0.836**	0.021	-0.036	-0.027	-0.037	-0.039	0.035	-0.087	0.006	-0.026
BEUC5	**0.756**	0.03	-0.076	-0.02	-0.022	-0.035	0.054	-0.08	0.071	0.018
BEUC6	**0.901**	-0.003	-0.019	-0.028	-0.018	-0.048	0.084	-0.063	0.014	-0.026
BEUC7	**0.781**	0.019	-0.04	0.046	-0.057	-0.062	0.08	0.002	0.027	0.01
CI1	0.005	**0.836**	-0.049	-0.01	-0.049	-0.024	0.053	0.047	0.018	0.079
CI2	0.044	**0.918**	-0.09	-0.052	-0.052	-0.03	0.078	0.024	-0.079	0.052
CI3	0.018	**0.901**	-0.065	-0.047	-0.008	-0.003	0.072	0.038	-0.037	0.066
CI4	-0.04	**0.889**	-0.054	-0.068	-0.037	-0.02	0.072	-0.028	-0.04	0.061
CI5	0.032	**0.846**	-0.019	-0.074	-0.037	0.016	0.071	0	-0.024	0.081
CI6	0.026	**0.869**	0.005	-0.078	-0.044	-0.004	0.109	0.066	-0.033	0.078
ECSSCM1	-0.047	-0.028	**0.942**	-0.056	0.052	-0.005	-0.053	0.008	0.078	0.121
ECSSCM2	-0.014	-0.045	**0.81**	-0.054	0.077	-0.032	-0.003	-0.046	0.02	0.01
ECSSCM3	-0.056	-0.084	**0.94**	-0.069	0.008	-0.004	-0.02	-0.021	0.098	0.11
ENSSCM1	-0.015	-0.078	-0.064	**0.779**	0.054	-0.053	-0.001	0.026	0.005	-0.062
ENSSCM2	-0.03	-0.018	-0.054	**0.766**	0.027	-0.07	-0.068	0.048	0.019	0.007
ENSSCM3	-0.001	-0.01	-0.04	**0.769**	0.025	-0.056	-0.046	-0.032	-0.042	0.048
ENSSCM4	0.026	-0.085	-0.085	**0.827**	0.02	0.012	-0.048	0.011	-0.014	-0.014
ENSSCM6	-0.001	-0.038	-0.006	**0.816**	0.021	-0.038	-0.069	-0.033	-0.072	0.035
FC1	-0.021	-0.055	0.031	0.033	**0.853**	0.038	0.031	-0.093	0.009	-0.069
FC2	-0.005	-0.063	0.045	0.04	**0.904**	0.053	0.013	-0.024	0.005	-0.094
FC3	-0.062	-0.028	0.039	0.023	**0.919**	0.057	0.048	-0.045	0.014	-0.076
FC4	-0.03	-0.039	0.046	-0.004	**0.861**	0.072	0.042	-0.064	-0.012	-0.035
FC5	-0.077	-0.02	0.033	0.063	**0.826**	-0.023	-0.019	-0.04	-0.029	-0.045
FC6	-0.006	-0.03	0.026	0.073	**0.846**	-0.001	-0.044	-0.064	-0.014	-0.061
FC7	-0.006	-0.009	0.024	0.02	**0.883**	0.055	0.051	-0.028	0.033	-0.069

FRP1	-0.016	0.022	-0.022	-0.037	0.032	**0.803**	0.091	-0.032	-0.039	0.074
FRP2	-0.058	0	-0.021	-0.05	0.024	**0.853**	0.074	-0.059	-0.013	0.034
FRP3	-0.086	-0.022	-0.009	-0.054	0.036	**0.837**	0.087	-0.033	0.04	0.081
FRP4	-0.033	-0.03	0.008	-0.021	0.057	**0.878**	0.174	-0.084	-0.014	0.047
II1	0.058	0.09	-0.009	-0.051	0.034	0.135	**0.903**	0.082	0.019	0.012
II2	0.037	0.134	-0.013	-0.06	0.049	0.113	**0.881**	0.064	-0.019	0.03
II3	0.063	0.012	-0.043	-0.048	0.001	0.133	**0.865**	0.006	0.068	0.026
II4	0.088	0.088	-0.06	-0.04	0.001	0.087	**0.859**	0.052	-0.021	0.032
OPCC2	-0.062	0.04	-0.039	0.007	-0.059	-0.075	0.058	**0.978**	0.063	0.082
OPCC3	-0.079	-0.023	0.046	0.009	-0.045	-0.033	0.043	**0.878**	0.044	0.018
SCSSCM1	0.005	-0.048	0.057	-0.014	0.024	0.005	-0.036	0.084	**0.865**	0.074
SCSSCM2	0.04	-0.034	0.102	-0.064	0	-0.017	0.037	0.031	**0.921**	0.115
SCSSCM3	0.026	-0.038	0.044	-0.008	-0.01	0.017	-0.002	0.085	**0.885**	0.084
SCSSCM4	0.014	-0.009	0.083	-0.062	0.027	-0.026	0.029	0.007	**0.886**	0.065
SCSSCM5	0.033	-0.071	0.082	0.016	-0.015	-0.004	0.039	0.069	**0.893**	0.098
SCSSCM6	0.037	-0.038	0.055	0.012	0.012	-0.011	0.019	0.021	**0.802**	0.026
SI1	0.001	0.059	0.067	0.015	-0.073	0.074	0.037	0.067	0.093	**0.899**
SI2	0.016	0.09	0.117	0.02	-0.08	0.061	0.012	0.079	0.094	**0.9**
SI3	0	0.062	0.081	-0.021	0.019	0.087	0.041	0.048	0.106	**0.846**
SI4	-0.011	0.064	0.114	-0.027	-0.103	0.017	0.025	0.054	0.055	**0.873**
SI5	-0.007	0.051	0.097	-0.01	-0.114	0.057	0.008	0.04	0.073	**0.919**

Note: Item indicator loadings on the latent variable to which it is assigned must be greater than their loadings on all other latent variables, as per Chin (2010). This is done to ensure discriminant validity. Convergent validity is achieved because bold loadings exceed all other loadings in the same column, as shown in the table above.

Source : Authors Compilation (2021)

4. 9 NORMALITY TEST

After demonstrating the measurement model's adequacy, the PLS-SEM 3.3.3 was used to analyse the structural model. Data normality is not required when using the variance-based SEM (PLS-SEM) (Hair et al., 2017; Jannoo et al., 2014). Nonetheless, the skewness and kurtosis tests and Mardia's multivariate normality tests were used to examine the data set's univariate and multivariate normality tests. The cut-off points for Mardia's multivariate skewness and kurtosis tests were ±1 and ±20, respectively. The threshold for data normality was violated for skewness and kurtosis, as seen in Figure 4.1 below, indicating that the dataset was not normally distributed. This is consistent with the majority of survey-based studies (Hair et al., 2017).

```
Sample size:  455
Number of variables:  15

Univariate skewness and kurtosis
             Skewness   SE_skew    Kurtosis   SE_kurt
FirmSize  -0.82219219 0.1144577  0.89527467 0.2284216
FirmType  -1.01806286 0.1144577  0.68082691 0.2284216
EDUCAT    -0.81225092 0.1144577 -0.49139304 0.2284216
EXPERIE   -0.59573631 0.1144577 -0.72343188 0.2284216
AGE        0.10677908 0.1144577 -0.84206666 0.2284216
AVENSSCM   0.67729449 0.1144577 1.11350466 0.2284216
AVESCSSCM 0.10007042 0.1144577  0.06678202 0.2284216
AVECSSCM  -0.09353050 0.1144577 -0.18572264 0.2284216
AVEOPCC    0.12556310 0.1144577 -0.17117351 0.2284216
AVEFRP     0.18085674 0.1144577 -0.53187994 0.2284216
AVEBEUC    0.29241359 0.1144577  0.12003831 0.2284216
AVESI     -0.15798069 0.1144577  0.07443218 0.2284216
AVEII     -0.02077109 0.1144577 -0.28920568 0.2284216
AVECI      0.25454917 0.1144577 -0.09376225 0.2284216
AVEFC     -0.06434006 0.1144577 -0.23570203 0.2284216

Mardia's multivariate skewness and kurtosis
                b          z      p-value
Skewness 11.34603 860.407059 0.0000028977
Kurtosis 249.77158 -2.469228 0.0135404745
```

Figure 4.1: Mardia multivariate skewness

4.10 STRUCTURAL ANALYSIS

After establishing a satisfactory measurement model, the next task was to examine the study's structural model in light of the study's various hypotheses (H1a-c – H7a-c). The variance-based structural equation model (PLS-SEM), SmartPLS 3.3.3, was used to explore the relationships among the constructs in the study. The structural model analysis began with an evaluation of the Coefficient of Determination R^2. R^2 reflects the proportion of variance accounted for by the endogenous variables, thus, Consumer Integration, Supplier Integration, Internal Integration, firm capabilities, and firm performance. It also indicates the modified model's efficiency. R^2 has a value between 0 and 1, according to Henseler et al. (2009) and Hair et al. (2011). R2 of 0.25 indicates a weak effect, R2 of 0.5 indicates a moderate effect, and R2 of 0.75 indicates a substantial effect. According to the findings, the research model explained 0.62, 0.544, 0.571, 0.58, and 0.721 of the variances in Customer Integration, Supplier Integration, Internal Integration, firm capabilities, and firm performance. This implies that the model clarified a moderate effect in Customer Integration, Supplier Integration, Internal Integration, firm capabilities, and firm performance.

Further, the predictive relevance of the structural model was tested by calculating the Q^2 values as long proposed by Geisser (1974) and Stone 1974). Q^2 values should be significantly larger than zero, as a rule. This indicates that the structural model's prediction accuracy for a specific dependent construct is greater than zero. The structural model in this study had a Q^2 value greater than zero, indicating that the model was predictive. Furthermore, the Variance Inflation Factor (VIF), a test used to determine the presence of multicollinearity among constructs, was performed. Multicollinearity can cause several problems, including the inability to estimate partial regression. The standard error values are almost certainly high in the presence of multicollinearity.

The confidence interval of the coefficient widens in the presence of Multicollinearity, and the statistic becomes very small. When multicollinearity, it is difficult to reject the null hypothesis of any analysis (Hair et al., 2014). Hair et al. (2014), supported by Sarstedt et al. (2021), state that a VIF test with a value less than 3.0 is required to ensure that multicollinearity is not a problem in the results. The VIF values for the various constructs considered for this study ranged from (1.005 – 1.018). Because the values were all less than 3, this range indicated that the VIF criterion was met, and multicollinearity was not an issue in this study. Following the determination of the

predictive power, multicollinearity and model's explanatory ability, the statistical significance and validity of the structural coefficients was examined.

To examine the significance of the path coefficients in the model, particularly for the first objective (H1a, H1b and H1c), the bootstrapping method in SmartPLS 3.3.3 was used with 5,000 re-samples (Hair et al., 2011). As illustrated in Table 4.13, most hypothesised relationships were significant when the effect of the control variables was considered (i.e., firm type, firm age, and firm size). Hypothesis 1 suggested that social, economic, and environmental supply chain management practices all positively affect firm performance. The results in Figure 4.3 and Table 4.13 show that *social supply chain management* is positively and directly related to *firm performance* ($\beta = 0.184$, $p < 0.001$), providing support for H1a., *environmental supply chain management* is also positively related to *firm performance* ($\beta = 0.217$, $p < 0.00$) among manufacturing and service firms, thus supporting H1b. Likewise, *economic supply chain management* is also positively related to *firm performance* ($\beta = 0.185$, $p < 0.001$), thus also supporting H1c.

Though not formally hypothesised, the data set showed a significant positive relationship between *social supply chain management* and *internal integration* ($\beta = 0.186$, $p < 0.002$), *as well as social supply chain management* and *firm capabilities* ($\beta = 0.166$, $p < 0.005$). It was also discovered that although the relationship between social supply chain management, customer integration ($\beta = 0.046$, $p < 0.281$, ns) and social supply chain management and supplier integration ($\beta = 0.089$, $p < 0.072$, ns) was positive, it was not significant. *Environmental supply chain management and supplier Integration* ($\beta = 0.176$, $p < 0.012$), *environmental supply chain management and internal Integration* ($\beta = 0.204$, $p < 0.000$), *Environmental supply chain management and customer integration* ($\beta = 0.226$, $p < 0.002$) *and environmental supply chain management and firm capabilities (*$\beta = 0.209$, $p < 0.002$) were all found to have a significant positive relationship. *Economic supply chain management and Supplier Integration* ($\beta = 0.145$, $p < 0.020$), *Economic supply chain management and internal Integration* ($\beta = 0.204$, $p < 0.000$), *economic supply chain management and customer integration* ($\beta = 0.226$, $p < 0.000$) and *economic supply chain management and firm capabilities (*$\beta = 0.209$, $p < 0.000$) were all found to have a significant positive relationship. Further *customer integration and firm performance* ($\beta = 0.198$, $p < 0.000$), *supplier integration and firm performance* ($\beta = 0.122$, $p < 0.023$), *business environment uncertainty and firm performance* ($\beta = 0.201$, $p < 0.002$), *operational competitiveness and firm*

performance (β = 0.197, p < 0.000)*internal integration and firm performance* (β = 0.177, p < 0.000) and *firm capabilities and firm performance* (β = 0.216, p < 0.000) were also found to have a significant positive relationship. The diagrams of the structural model to be analysed and the model that was analysed using PLS-SEM are presented in Figure 4.2 and Figure 4.3, respectively. The study model and the relationship under exploration are depicted in Figure 4.2. The study model is depicted in Figure 4.3, along with its loadings and parameters, as well as a summary of the findings.

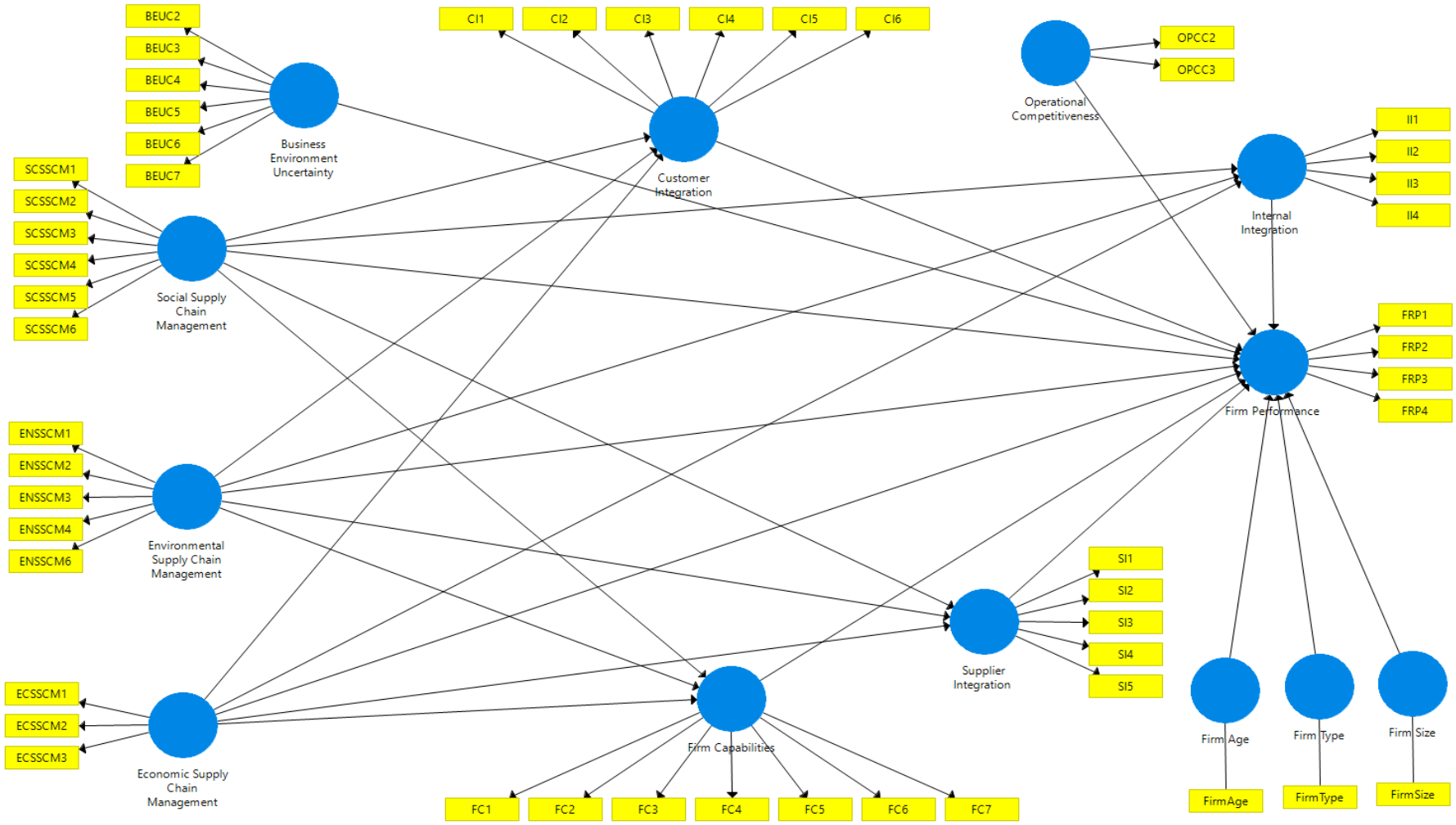


Figure 4.2: Diagram of the path without any loadings

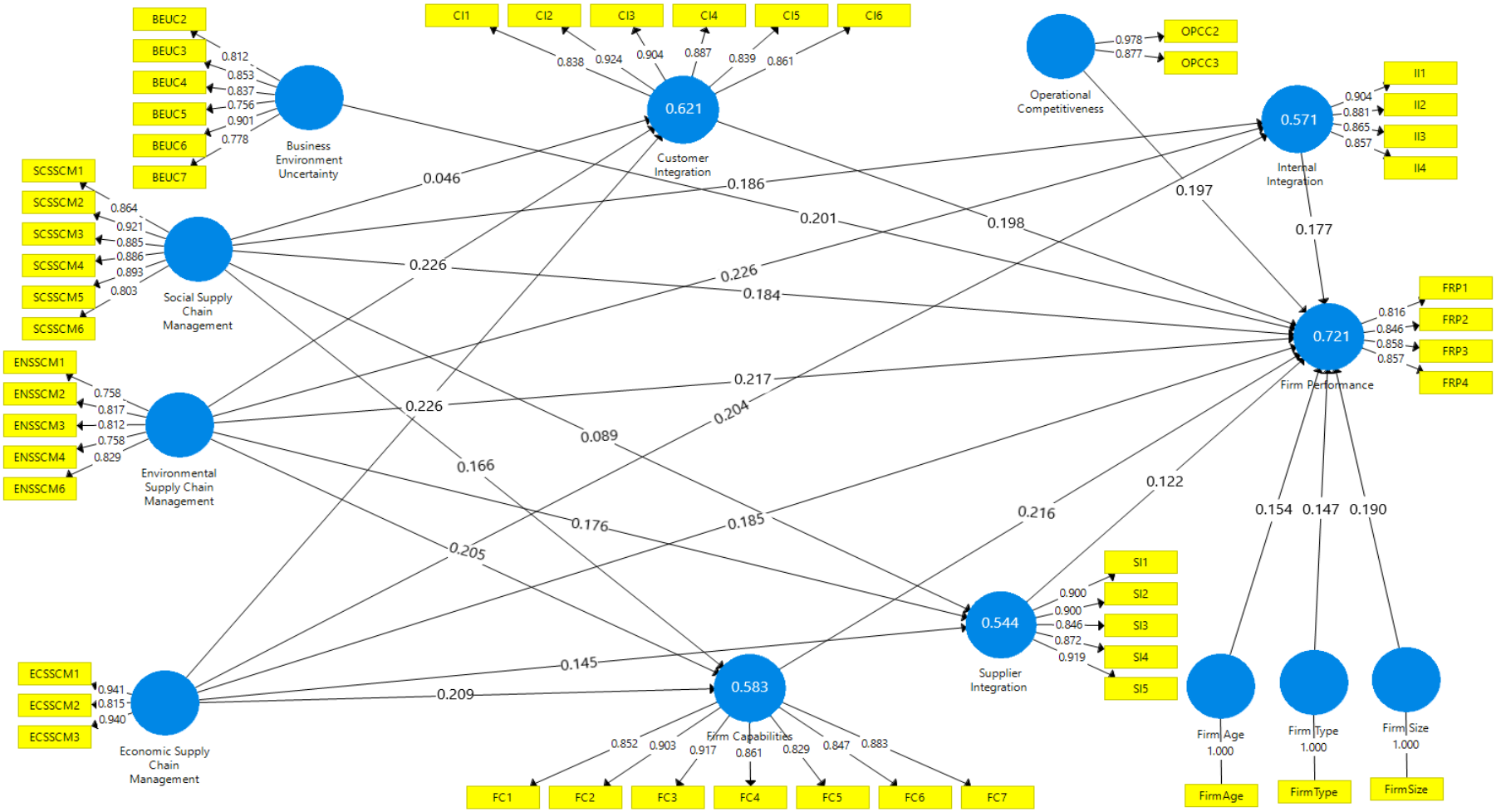


Figure 4.3: Path Diagram with loadings

Table 4.13: Main Empirical Results (Direct Relationships)

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Business Environment Uncertainty -> Firm Performance	0.201	0.061	3.295	0.002
Customer Integration -> Firm Performance	0.198	0.053	3.736	0.000
Economic Supply Chain Management -> Customer Integration	0.226	0.058	3.897	0.000
Economic Supply Chain Management -> Firm Capabilities	0.209	0.052	4.019	0.000
Economic Supply Chain Management -> Firm Performance	0.185	0.053	3.491	0.001
Economic Supply Chain Management -> Internal Integration	0.204	0.051	4.000	0.000
Economic Supply Chain Management -> Supply Integration	0.145	0.059	2.458	0.020
Environmental Supply Chain Management -> Customer Integration	0.226	0.070	3.229	0.002
Environmental Supply Chain Management -> Firm Capabilities	0.205	0.062	3.306	0.002
Environmental Supply Chain Management -> Firm Performance	0.217	0.058	3.741	0.000
Environmental Supply Chain Management -> Internal Integration	0.226	0.057	3.965	0.000
Environmental Supply Chain Management -> Supply Integration	0.176	0.066	2.667	0.012
Firm Capabilities -> Firm Performance	0.216	0.058	3.724	0.000
Firm Size -> Firm Performance	0.190	0.075	2.533	0.016
Firm Age -> Firm Performance	0.154	0.071	2.169	0.038
Firm Type -> Firm Performance	0.147	0.075	1.960	0.059
Internal Integration -> Firm Performance	0.177	0.048	3.688	0.000
Operational Competitiveness -> Firm Performance	0.197	0.049	4.020	0.000
Social Supply Chain Management -> Customer Integration	0.046	0.055	0.836	0.281
Social Supply Chain Management -> Firm Capabilities	0.166	0.056	2.964	0.005
Social Supply Chain Management -> Firm Performance	0.184	0.051	3.608	0.001
Social Supply Chain Management -> Internal Integration	0.186	0.058	3.207	0.002
Social Supply Chain Management -> Supply Integration	0.089	0.048	1.854	0.072
Supply Integration -> Firm Performance	0.122	0.051	2.392	0.023

Note: The path coefficients from the path analysis are presented in the above table. However, it must be noted that all except for two were significant at $P< 0.05$

Source : Authors Compilation (2021)

4.11 MEDIATION ANALYSIS (INDIRECT EFFECT)

The PLS-SEM analysis was used to ascertain whether supply chain integration and firm capabilities positively mediated the SSCM practices and firm performance relationship, as asserted in the second and third objectives of the study. Mediation occurs when a variable acts as a link between two other related constructs. By examining the strength of the mediator variable, the mechanisms that underpin or define the cause-effect relationship between an exogenous and endogenous construct can be substantiated. This exercise was aimed at conducting a series of mediations to gain a deeper understanding of the underlying mechanisms that define the positive relationship between sustainable supply chain management practices and firm performance. Twelve mediation analyses (H2a-H2c, H3a-H3b, H4a-H4c, and H5a-H5c) were conducted based on four variables: firm capabilities, supplier integration, customer integration, and internal integration. Below are the findings of these 12 mediation analyses (H2a-H2c, H3a-H3b, H4a-H4c, and H5a-H5c).

4.11.1 Variables mediating environmental supply chain management and firm performance

4.11.1.1 Internal Integration's Mediating Role in Environmental Supply Chain Management and Firm Performance

The Environmental supply chain management and firm performance relationship were mediated by internal integration, thus supporting hypothesis H2a. As illustrated in Figure 4.4, the standardised regression coefficient between Environmental Supply Chain Management and internal integration and the standardised regression coefficient for the internal integration and Firm performance relationship was statistically significant. (0.223) (0.181) =.040 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at 97.5^{th} and 2.5^{th} percentiles. 0.036-0.044 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.040. The indirect effect was found to be statistically significant as a result of this finding.

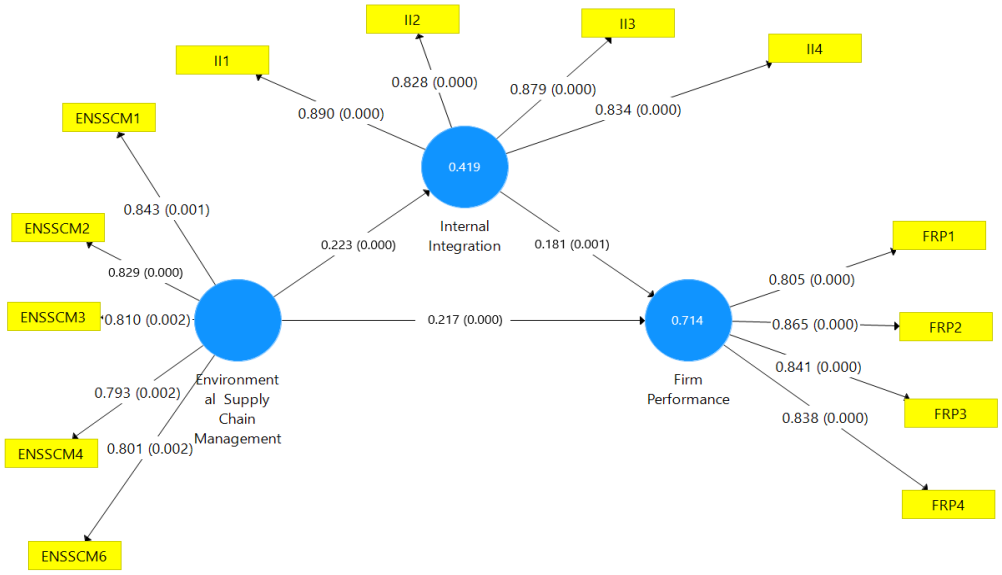


Figure 4.4: Indirect effect of Environmental Supply Chain Management and Firm Performance as mediated by Internal Integration

4.11.1.2 Customer integration plays a mediating role between environmental supply chain management and firm performance

The Environmental Supply Chain Management and Firm Performance relationship was mediated by customer integration, thus supporting hypothesis H2b. As illustrated in Figure 4.5, the standardised regression coefficient between Environmental Supply Chain Management and customer integration and the standardised regression coefficient for the customer integration and Firm performance relationship was statistically significant. (.223) (.195) = 0.043 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.029 -0.046 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.043. The indirect effect was found to be statistically significant as a result of this finding.

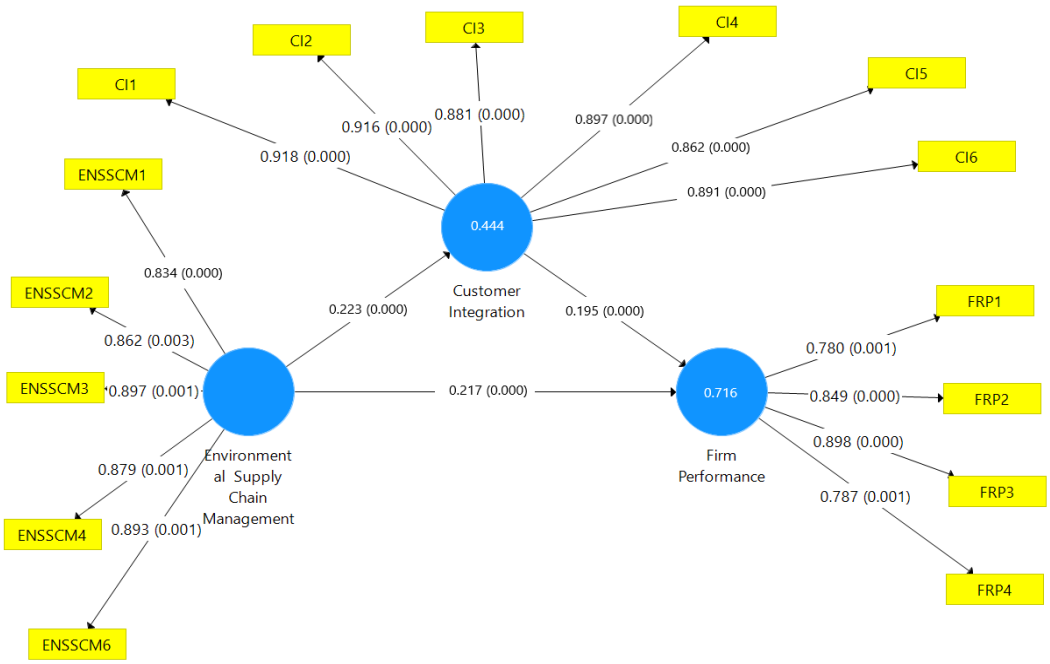


Figure 4.5: Indirect effect of Environmental Supply Chain Management and Firm Performance as mediated by Customer Integration

4.11.1.3 Supplier Integration as a Mediating Factor between Environmental Supply Chain Management and Firm Performance

The Environmental Supply Chain Management and Firm Performance relationship was mediated by supplier integration, thus supporting hypothesis H2c. As illustrated in Figure 4.6, the standardised regression coefficient between Environmental Supply Chain Management and supplier integration and the standardised regression coefficient for the supplier integration and Firm performance relationship were statistically significant. (.173) (.126) = 0.022 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.013 -0.025 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.022. The indirect effect was found to be statistically significant as a result of this finding.

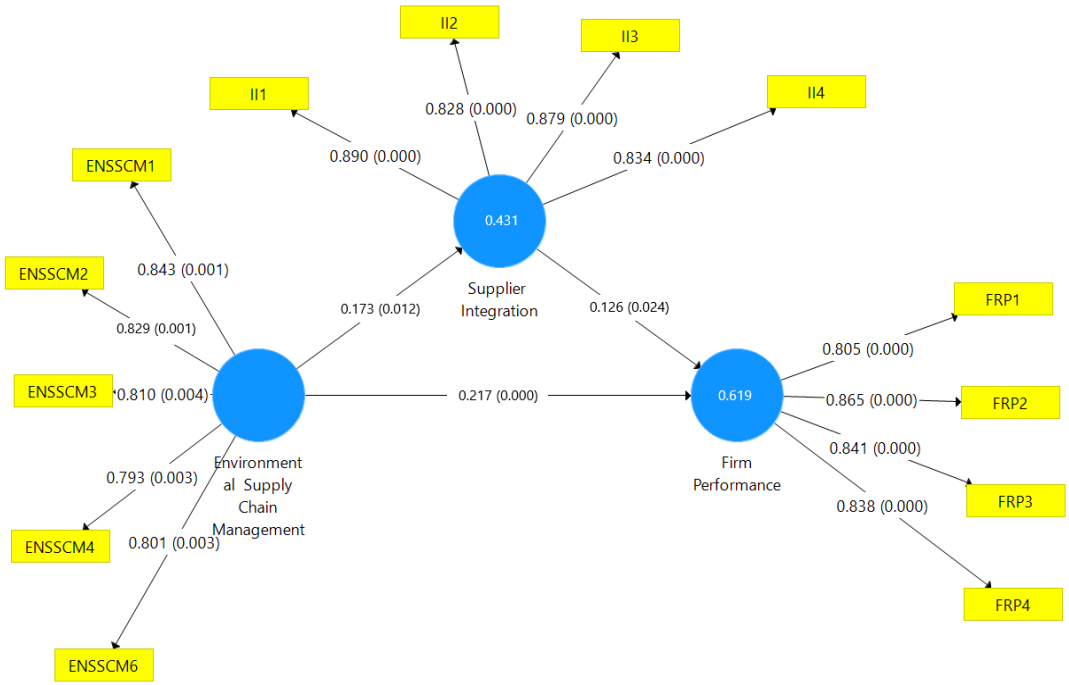


Figure 4.6 Indirect effect of Environmental Supply Chain Management and Firm Performance as mediated by Supplier Integration

4.11.1.4 Firm Capabilities as a mediating factor in the relationship between environmental supply chain management and firm performance

The Environmental Supply Chain Management and Firm Performance relationship was mediated by firm capabilities, thus supporting hypothesis H5a. As illustrated in Figure 4.7, the standardised regression coefficient between Environmental Supply Chain Management and firm capabilities and the standardised regression coefficient for the firm capabilities and firm performance relationship was statistically significant. (.202) (.220) = 0.044 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.020 - 0.048 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.044. The indirect effect was found to be statistically significant as a result of this finding.

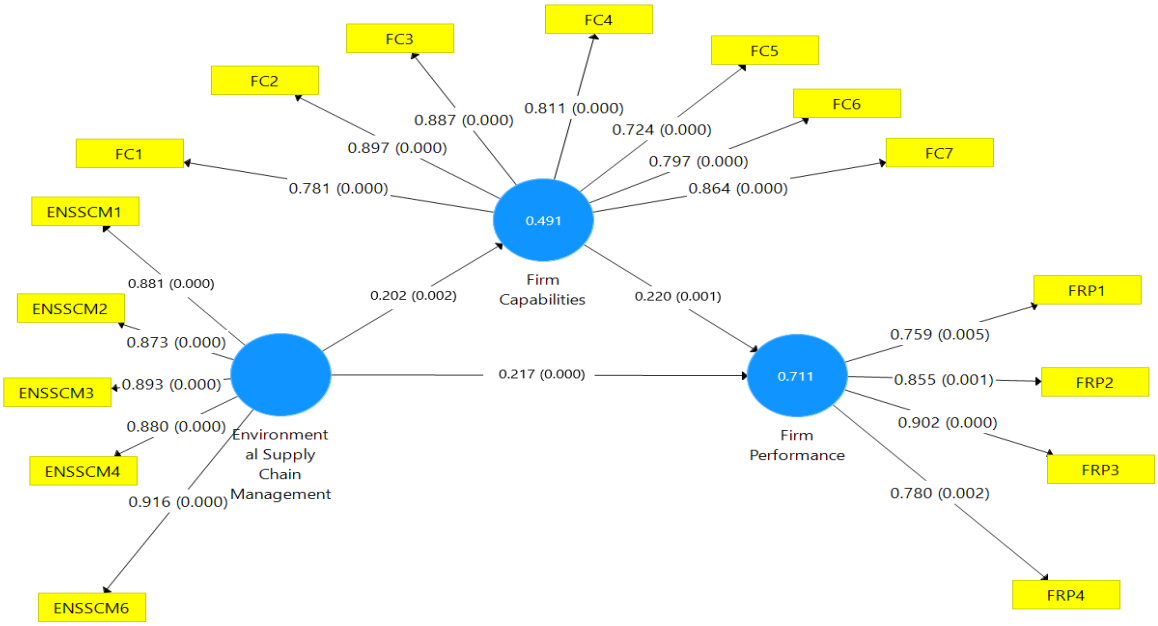


Figure 4.7: Indirect effect of Environmental Supply Chain Management and Firm Performance as mediated by Firm Capabilities

4.11.2 Variables mediating social supply chain management and firm performance

4.11.2.1 Internal Integration's Mediating Role in Social Supply Chain Management and Firm Performance

The social supply Chain Management and firm performance relationship was mediated by internal integration, thus supporting hypothesis H3a. As illustrated in Figure 4.8, the standardised regression coefficient between social supply chain management and internal integration and the standardised regression coefficient for the internal integration and firm performance relationship was statistically significant. (.190) (.181) = 0.034 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.026 -0.035 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.034. The indirect effect was found to be statistically significant as a result of this finding.

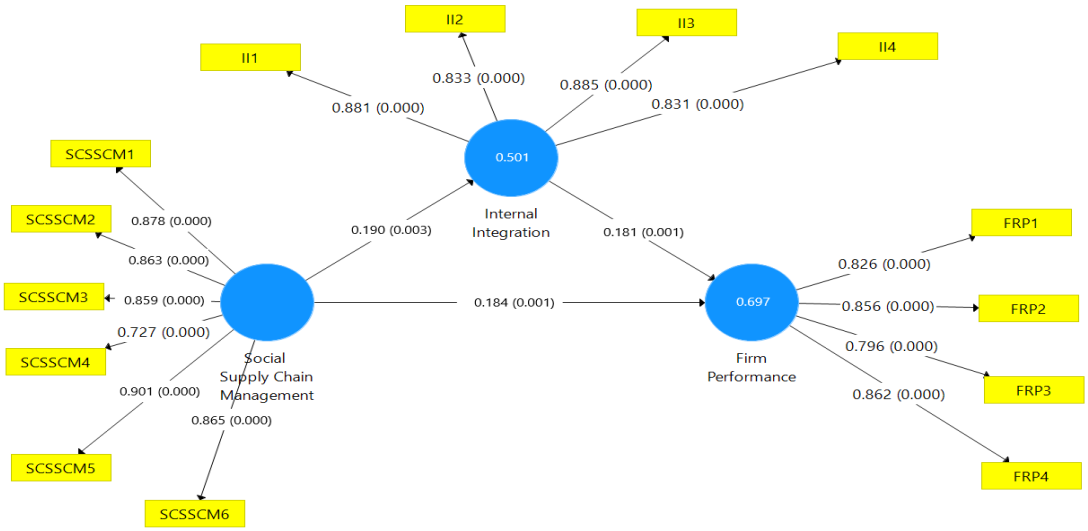


Figure 4.8: Indirect effect of Social Supply Chain Management and Firm Performance as mediated by Internal Integration

4.11.2.2 Customer integration plays a mediating role between social supply chain management and firm performance

The social supply Chain Management and Firm Performance relationship was mediated by customer integration, thus supporting hypothesis H3b. As illustrated in Figure 4.9, the standardised regression coefficient between social supply chain management and customer integration and the standardised regression coefficient for the customer integration and firm performance relationship was statistically significant. (.050) (.195) = 0.010 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.005 - 0.013 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.010. The indirect effect was found to be statistically significant as a result of this finding.

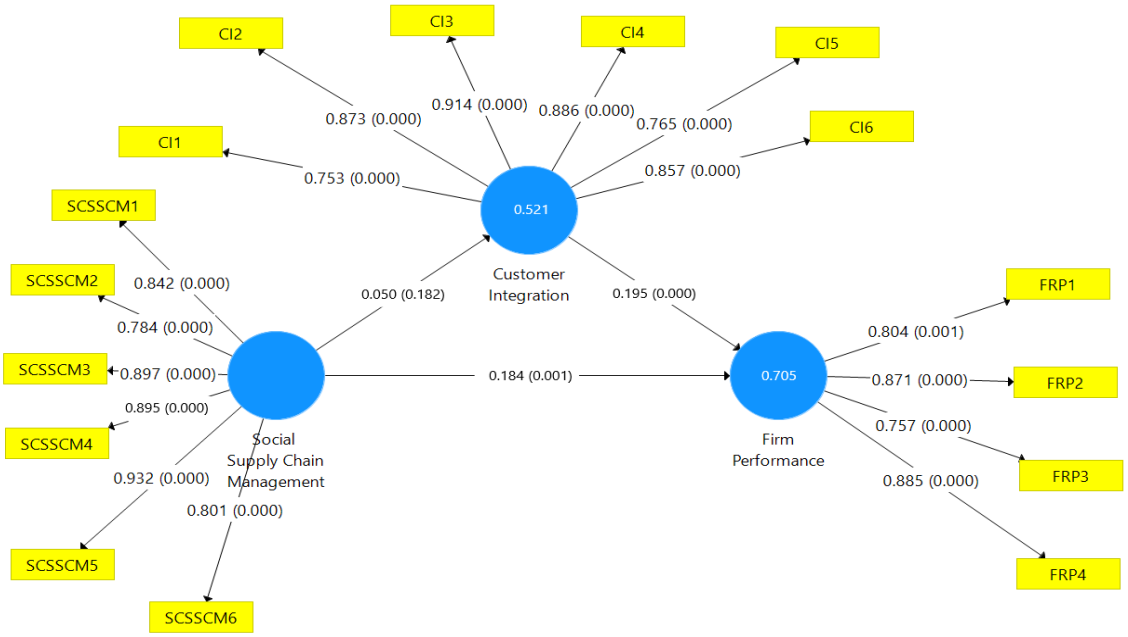


Figure 4.9: Indirect effect of Social Supply Chain Management and Firm Performance as mediated by Customer Integration

4.11.1.3 Supplier Integration as a Mediating Factor between Social Supply Chain Management and Firm Performance

The social supply chain management and firm performance relationship was not mediated by supplier integration, thus not supporting hypothesis H3c. As illustrated in Figure 4.10, the standardised regression coefficient between social supply chain management and supplier integration and the standardised regression coefficient for the supplier integration and Firm performance relationship were statistically not significant. (0.093) (0.126) = 0.012 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. - 0.009 - 0.014 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.012. The indirect effect was found not to be statistically significant as a result of this finding.

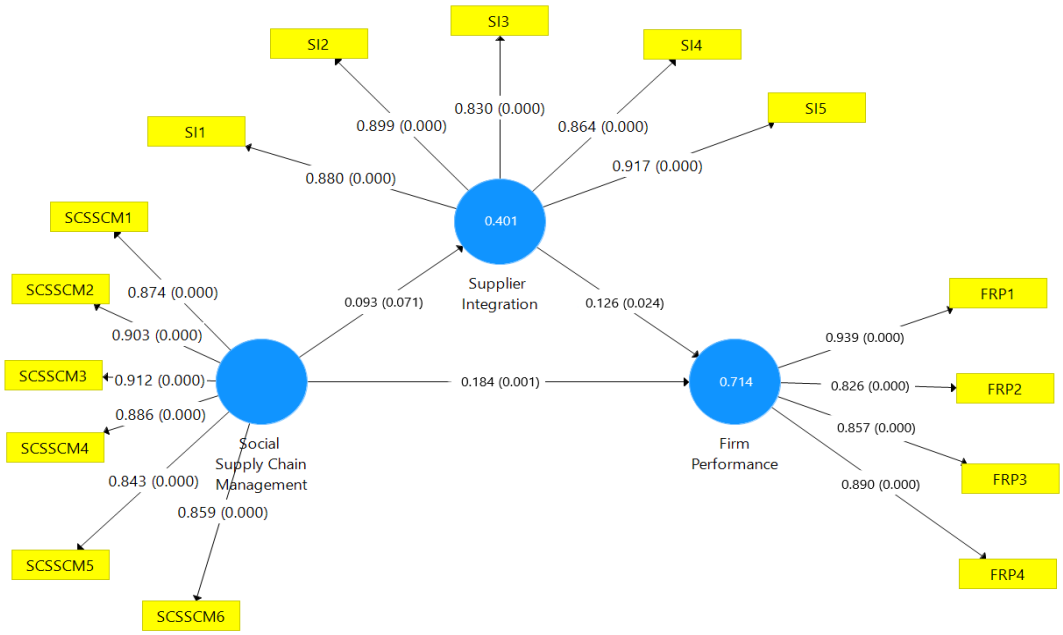


Figure 4.10: Indirect effect of Social Supply Chain Management and Firm Performance as mediated by Supplier Integration

4.11.2.4 Firm Capabilities as a mediating factor in the relationship between social supply chain management and firm performance

The social supply chain management and firm performance relationship was mediated by firm capabilities, thus supporting hypothesis H5b. As illustrated in Figure 4.11, the standardised regression coefficient between social supply chain management and firm capabilities and the standardised regression coefficient for the firm capabilities and firm performance relationship was statistically significant. (.170) (.220) = 0.037 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.022 - 0.039 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.037. The indirect effect was found to be statistically significant as a result of this finding.

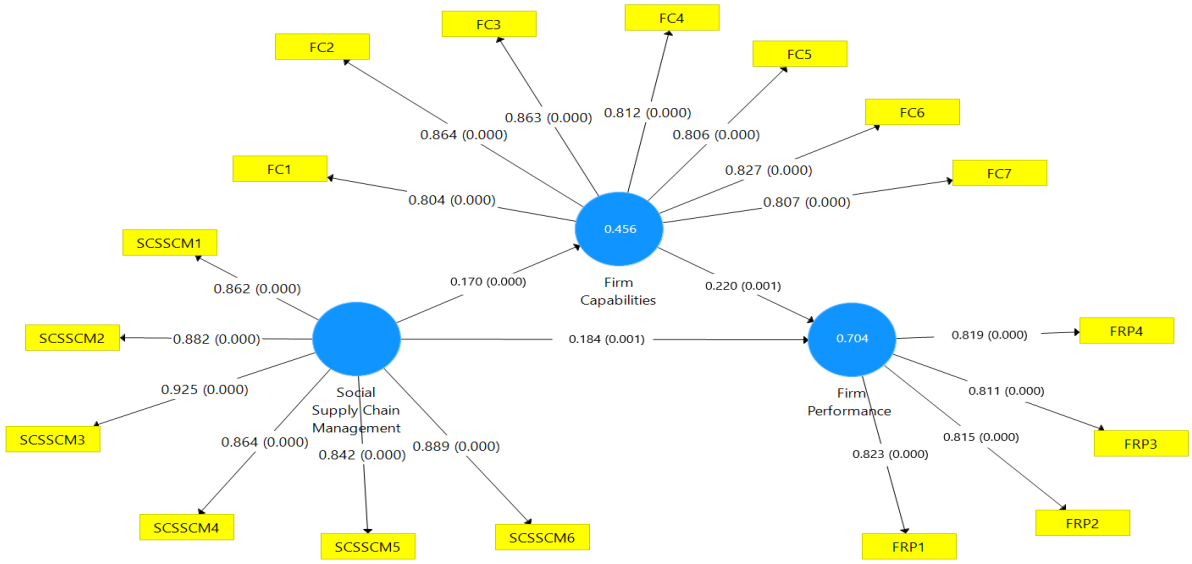


Figure 4.11 Indirect effect of Social Supply Chain Management and Firm Performance as mediated by Firm Capabilities

4.11.3 Variables mediating economic supply chain management and firm performance

4.11.3.1 Internal Integration's Mediating Role in Economic Supply Chain Management and Firm Performance

The economic supply chain management - firm performance relationship was mediated by internal integration, thus supporting hypothesis H4a. As illustrated in Figure 4.12, the standardised regression coefficient between economic supply chain management and internal integration and the standardised regression coefficient for the internal integration and firm performance relationship were statistically significant. (.201) (.181) = 0.036 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th percentiles. 0.029 - 0.038 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.036. The indirect effect was found to be statistically significant as a result of this finding.

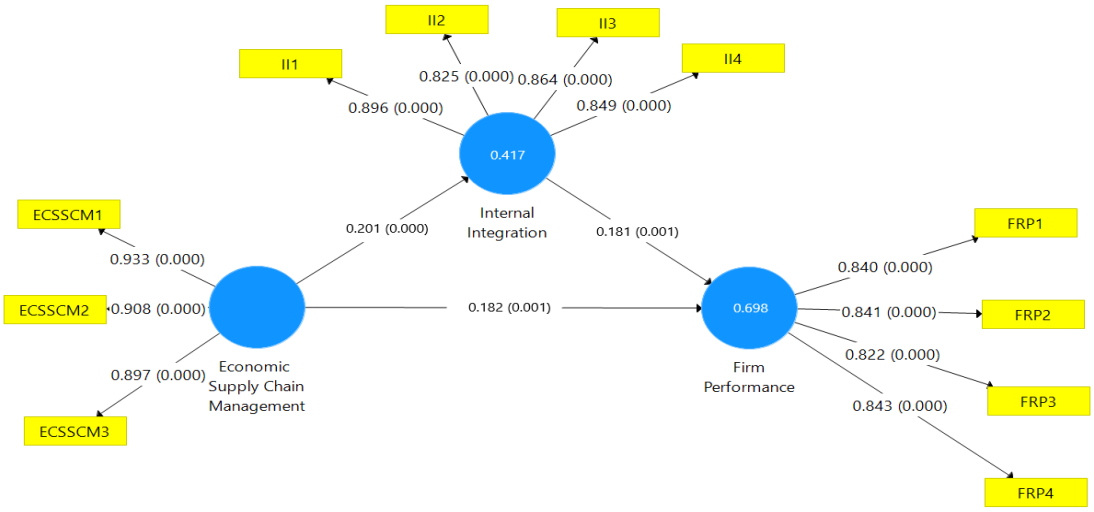


Figure 4.12: Indirect effect of Economic Supply Chain Management and Firm Performance as mediated by Internal Integration

4.11.3.2 Customer integration plays a mediating role between Economic supply chain management and firm performance

The economic supply chain management - firm performance relationship was mediated by customer integration, thus supporting hypothesis H4b. As illustrated in Figure 4.13, the standardised regression coefficient between economic supply chain management and internal integration and the standardised regression coefficient for the customer integration and firm performance relationship were statistically significant. (.223) (.195) = 0.043 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.024 - 0.046 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.043. The indirect effect was found to be statistically significant as a result of this finding.

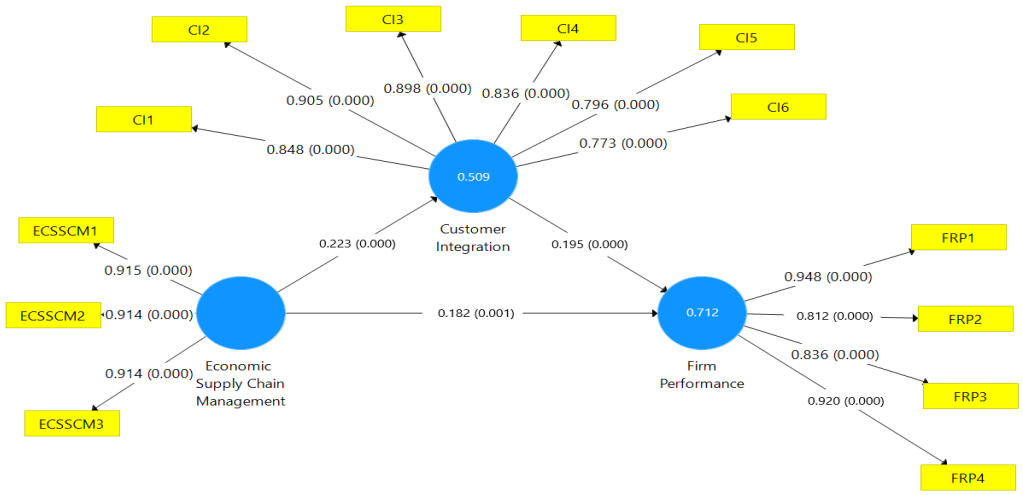


Figure 4.13 Indirect effect of Economic Supply Chain Management and Firm Performance as mediated by Customer Integration

4.11.3.3 Supplier Integration as a Mediating Factor between Economic Supply Chain Management and Firm Performance

The economic supply chain management and firm performance relationship was mediated by supplier integration, thus supporting hypothesis H4c. As illustrated in Figure 4.14, the standardised regression coefficient between economic supply chain management and supplier integration and the standardised regression coefficient for the supplier integration and firm performance relationship were statistically significant. (.142) (.126) = 0.018 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.010 - 0.021 was the estimated range of the confidence interval at 95 per cent. The unstandardised indirect effect was found to be 0.018. The indirect effect was found to be statistically significant as a result of this finding.

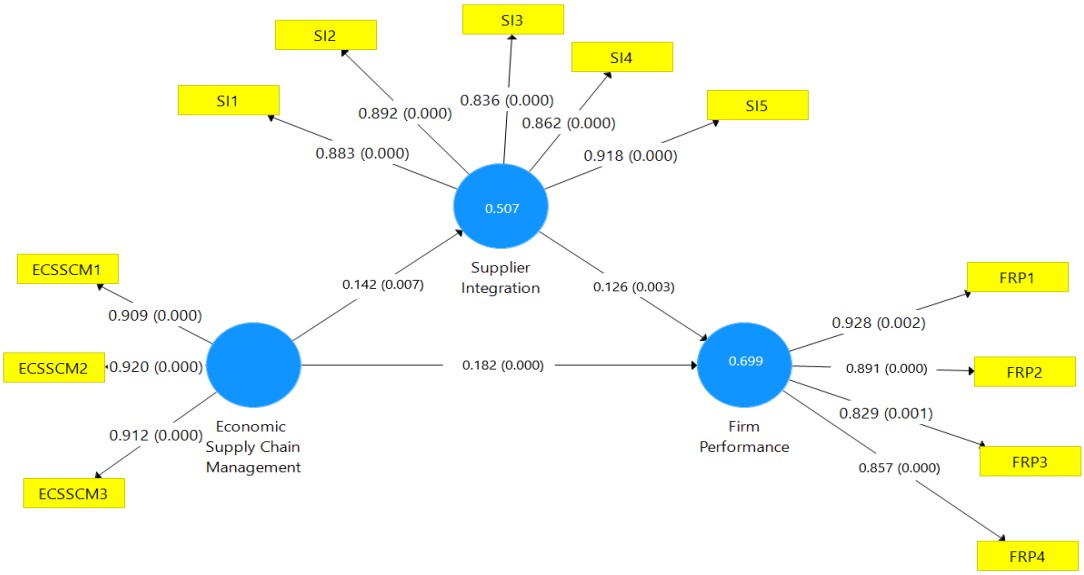


Figure 4.14: Indirect effect of Economic Supply Chain Management and Firm Performance as mediated by Supplier Integration

4.11.3.4 Firm Capabilities as a mediating factor in the relationship between economic supply chain management and firm performance

The economic supply chain management and firm performance relationship was mediated by firm capabilities, thus supporting hypothesis H5c. As illustrated in Figure 4.15, the standardised regression coefficient between economic supply chain management and firm capabilities and the standardised regression coefficient for the firm capabilities and firm performance relationship were statistically significant. (.206) (.220) = 0.045 was the standardised indirect effect. The bootstrapping procedure was conducted to determine the statistical significance of this indirect effect. The unstandardised indirect effects from Five thousand (5,000) bootstrapped samples were calculated using PLS 3.3.3. The unstandardised indirect coefficient for the 95 per cent confidence interval was obtained by calculating the indirect effect coefficient at the 97.5th and 2.5th per centiles. 0.024 - 0.049 was the estimated range of the confidence interval at 95 per cent, and the unstandardised indirect effect was found to be 0.045. The indirect effect was found to be statistically significant as a result of this finding.

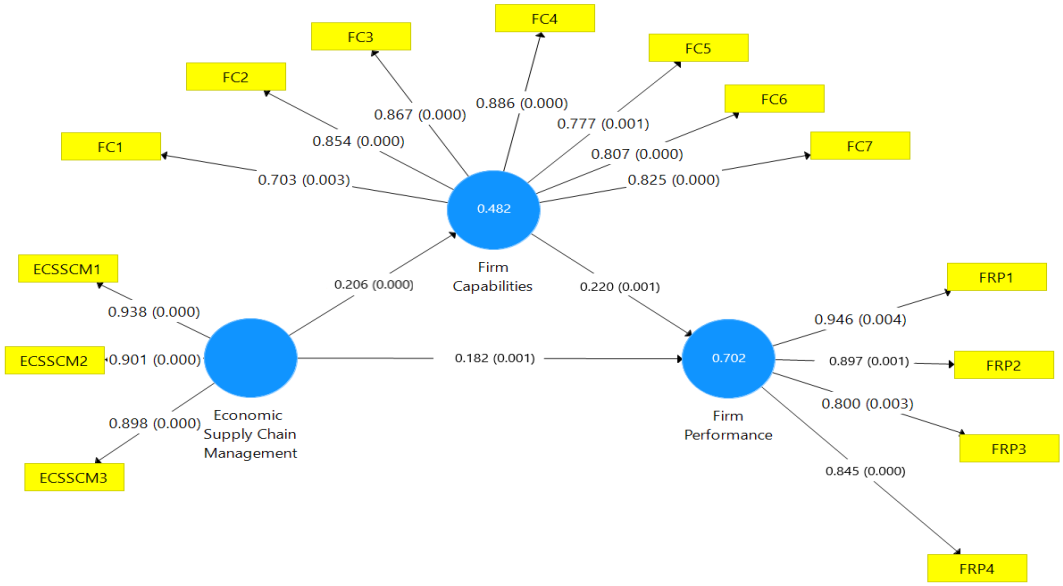


Figure 4.15: Indirect effect of Economic Supply Chain Management and Firm Performance as mediated by Firm Capabilities

4.11.4 Summary of Mediation Analysis

Tables 4.14 and 4.15 below provide a list of all 12 mediations analyses conducted, as well as the bias confidence levels associated with them. The tables below show that eleven(11) of the twelve (12) mediation analyses conducted were statistically significant, while one was not, as shown in the Tables below. This was supported by their associated bias confidence.

Table 4.14: Indirect Effect of Economic, Social and Environmental Supply Chain Management and Firm Performance as Mediated by Internal Integration, Customer Integration, Supplier Integration and Firm Capabilities

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Social Supply Chain Management -> Customer Integration -> Firm Performance	0.010	0.003	3.250	0.002
Environmental Supply Chain Management -> Customer Integration -> Firm Performance	0.043	0.005	8.697	0.000
Economic Supply Chain Management -> Customer Integration -> Firm Performance	0.043	0.005	8.697	0.000
Social Supply Chain Management -> Firm Capabilities -> Firm Performance	0.037	0.004	9.350	0.000
Environmental Supply Chain Management -> Firm Capabilities -> Firm Performance	0.044	0.005	8.888	0.000
Economic Supply Chain Management -> Firm Capabilities -> Firm Performance	0.045	0.004	11.330	0.000
Social Supply Chain Management -> Supply Integration -> Firm Performance	0.012	0.016	0.732	0.305
Environmental Supply Chain Management -> Supply Integration -> Firm Performance	0.022	0.006	3.633	0.001
Economic Supply Chain Management -> Supply Integration -> Firm Performance	0.018	0.005	3.578	0.001
Social Supply Chain Management -> Internal Integration -> Firm Performance	0.034	0.008	4.299	0.000
Environmental Supply Chain Management -> Internal Integration -> Firm Performance	0.040	0.009	4.485	0.000
Economic Supply Chain Management -> Internal Integration -> Firm Performance	0.036	0.007	5.197	0.000

Note: The coefficients of the mediation analysis are presented in the above table. It must be noted that all, except for one was significant at $p < 0.05$

Source : Authors Compilation (2021)

Table 4.15: Confidence Bias Level for the Indirect Effect of Economic, Social and Environmental Supply Chain Management and Firm Performance as Mediated by Internal Integration, Customer Integration, Supplier Integration and Firm Capabilities

Path Relationship	Original Sample (O)	2.50%	97.50%
Social Supply Chain Management -> Customer Integration -> Firm Performance	0.010	0.005	0.013
Environmental Supply Chain Management -> Customer Integration -> Firm Performance	0.043	0.029	0.046
Economic Supply Chain Management -> Customer Integration -> Firm Performance	0.043	0.025	0.470
Social Supply Chain Management -> Firm Capabilities -> Firm Performance	0.037	0.022	0.039
Environmental Supply Chain Management -> Firm Capabilities -> Firm Performance	0.044	0.020	0.048
Economic Supply Chain Management -> Firm Capabilities -> Firm Performance	0.045	0.024	0.049
Social Supply Chain Management -> Supply Integration -> Firm Performance	0.012	- 0.009	0.014
Environmental Supply Chain Management -> Supply Integration -> Firm Performance	0.022	0.013	0.025
Economic Supply Chain Management -> Supply Integration -> Firm Performance	0.018	0.010	0.021
Social Supply Chain Management -> Internal Integration -> Firm Performance	0.034	0.026	0.036
Environmental Supply Chain Management -> Internal Integration -> Firm Performance	0.040	0.034	0.042
Economic Supply Chain Management -> Internal Integration -> Firm Performance	0.036	0.029	0.038

Note: The confidence bias level of the coefficients of the mediation analysis is presented here.

Source : Authors Compilation (2021)

4.12 MODERATION ANALYSIS

Following the study's fourth and fifth objectives, moderation analysis was conducted to investigate whether operational competitiveness and business environmental uncertainty moderated the positive relationships between sustainable supply chain management practices and firm performance from a TBL stance point. When a moderator is introduced into a linear relationship, the causal effects change due to an "interaction effect" between the moderator and independent variables. The exogenous variables' "effects" on the endogenous variables can increase or decrease. That is, the effect of the exogenous variables on its endogenous variables is influenced by the magnitude of the moderator (Hair et al., 2019). In this study, operational competitiveness and business environment uncertainty were modelled as moderators that will interfere in the relationship between the SSCM practices from a TBL standpoint and firm performance. A total of 6 moderations analyses (H6a, H6b, H6c, H7a, H7b, and H7c) were conducted. The structural model from the PLS-SEM analysis for these 6-moderation analyses is shown in Figure 4.16.

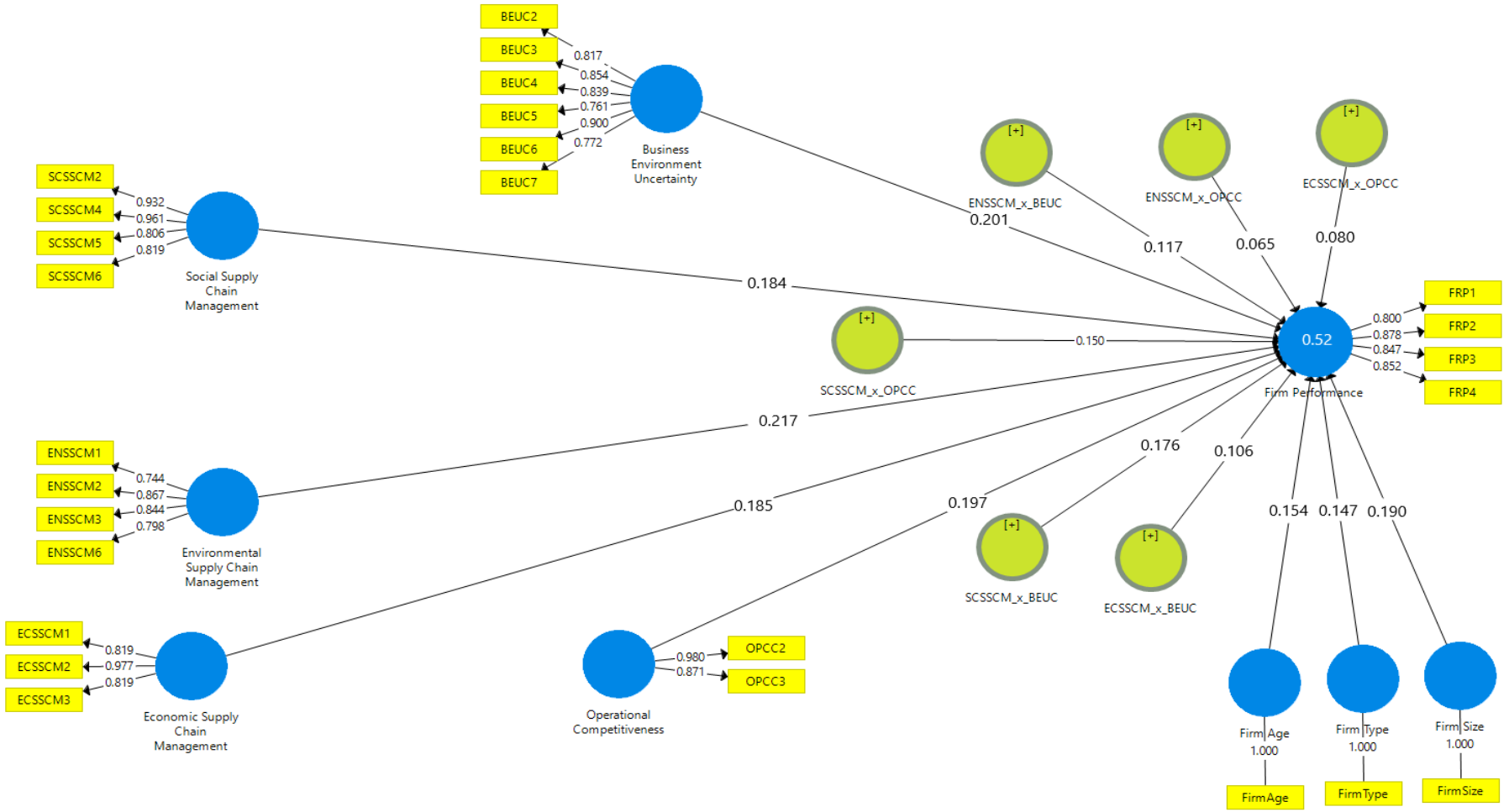


Figure 4.16: Path Diagram for Moderation Analysis

4.12.1 The Role of Operational Competitiveness as a Moderator in the Relationship between Economic, Social, and Environmental Supply Chain Management and Firm Performance

4.12.1.1 Operational Competitiveness's Moderating Effect on Social Supply Chain Management and Firm Performance

Table 4.16 show that the interaction effect of the independent variable (social supply chain management) and the moderator variable (operational competitiveness) on firm performance is significant, with a statistical value of ($\beta = 0.062$, $t = 6.200$, $\rho = 0.000$). These findings support hypothesis H6a, which states that operational competitiveness positively moderates the social supply chain management-firm performance relationship. This means that the influence of social supply chain management on firm performance in manufacturing and service firms is determined by the operational competitiveness of the market setting.

Table 4.16: Moderating effect of Operational competitiveness on social supply chain management and Firm performance

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
SCSSCM_x_OPCC -> Firm Performance	0.062	0.010	6.200	0.000
Operational Competitiveness -> Firm Performance	0.197	0.049	4.020	0.000
Social Supply Chain Management -> Firm Performance	0.184	0.051	3.608	0.001

Source: Authors Compilation (2021)

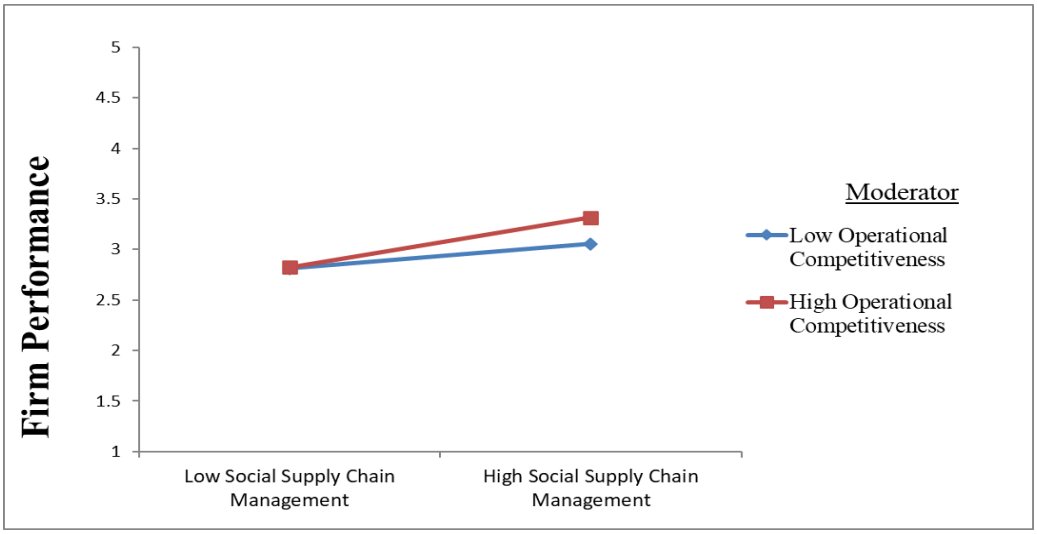


Figure 4.17: Interaction Plot of Operational competitiveness, social supply chain Management, and Firm Performance

As illustrated in the interaction plot (Figure 4.17), the social supply chain management practices - firm, performance relationship changes direction in response to the effect of operational competitiveness. It emerged from the findings that the social supply chain management practice and firm performance relationship is strengthened in a highly competitive operational environment.

4.12.1.2 Operational Competitiveness's Moderating Effect on Economic Supply Chain Management and Firm Performance

Table 4.17 and Figure 4.18 show that the interaction effect of the independent variable (economic supply chain management) and the moderator variable (operational competitiveness) on firm performance is significant, with a statistical value of ($\beta = 0.080$, $t = 7.692$, $\rho = 0.000$). These findings supported hypothesis H6b, which states that operational competitiveness positively moderates the economic supply chain management-firm performance relationship. This means that the influence of Economic supply chain management on firm performance in the context of manufacturing and service firms is determined by the operational competitiveness of the market setting.

Table 4.17: Moderating effect of Operational competitiveness on Economic supply chain management and Firm performance

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ECSSCM_x_OPCC -> Firm Performance	0.080	0.010	7.692	0.000
Economic Supply Chain Management -> Firm Performance	0.185	0.053	3.491	0.001
Operational Competitiveness -> Firm Performance	0.197	0.049	4.020	0.000

Source: Authors Compilation (2021)

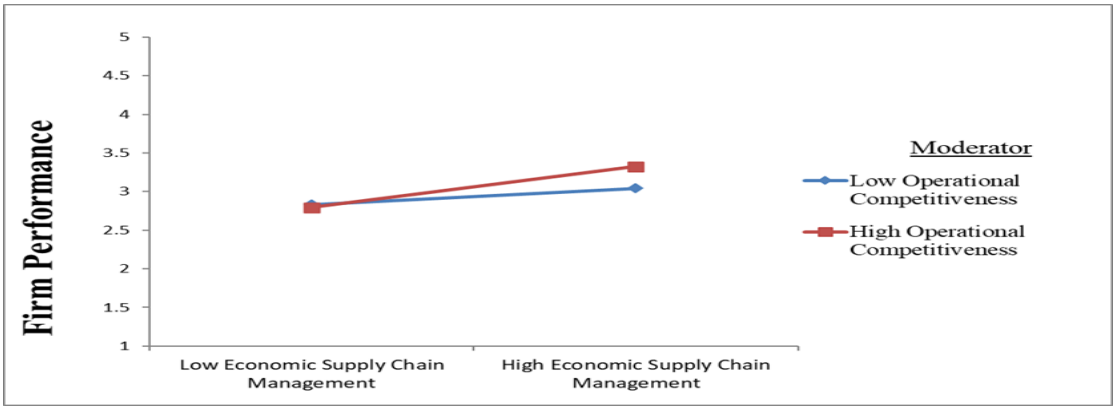


Figure 4.18: Interaction Plot of Operational competitiveness, economic supply chain Management and Firm Performance

As illustrated in the interaction plot (Figure 4.18), the economic supply chain management practices - firm performance relationship changes direction in response to the effect of operational competitiveness. Therefore, it emerged from the study that the economic supply chain management practice and firm performance relationship are strengthened in a highly competitive operational environment.

4.12.1.3 Operational Competitiveness's Moderating Effect on Environmental Supply Chain Management and Firm Performance

Table 4.18 and Figure 4.19 show that the interaction effect of the independent variable (environmental supply chain management) and the moderator variable (operational competitiveness) on firm performance is significant, with a statistical value of ($\beta = 0.065$, $t = 6.915$, $\rho = 0.000$). These findings support hypothesis H6c, which states that operational competitiveness positively moderates the environmental supply chain management-firm performance relationship. This means that the influence of environmental supply chain management on firm performance in the context of manufacturing and service firms is determined by the operational competitiveness of the market setting.

Table 4.18: Moderating effect of Operational competitiveness on Environmental supply chain management and Firm performance

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ENSSCM_x_OPCC -> Firm Performance	0.065	0.009	6.915	0.000
Environmental Supply Chain Management -> Firm Performance	0.217	0.058	3.741	0.000
Operational Competitiveness -> Firm Performance	0.197	0.049	4.020	0.000

Source: Authors Compilation (2021)

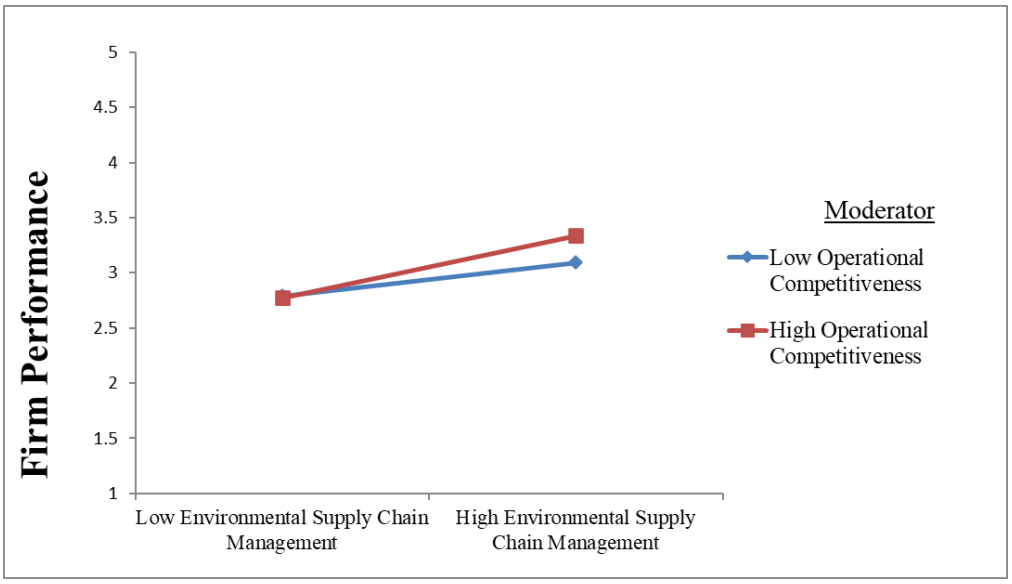


Figure 4.19: Interaction Plot of Operational competitiveness, environmental supply chain Management, and Firm Performance

As illustrated in the interaction plot (Figure 4.19), the environmental supply chain management practices- firm performance relationship changes direction in response to the effect of operational competitiveness. This implied that a highly competitive operating environment strengthens the relationship between environmental supply chain management practice and firm performance.

4.12.2 The Role of Operational Competitiveness as a Moderator in the Relationship between Economic, Social, and Environmental Supply Chain Management and Firm Performance:

4.12.2.1 Business Environment Uncertainty's Moderating Effect on Social Supply Chain Management and Firm Performance

Table 4.19 and Figure 4.20 show that the interaction effect of the independent variable (social supply chain management) and the moderator variable (business environment uncertainty) on firm performance is significant, with a statistical value of ($\beta = 0.176$, $t = 9.462$, $\rho = 0.000$). These findings support hypothesis H7a, which states that business environment uncertainty positively moderates the social supply chain management-firm performance relationship. This means that the influence of social supply chain management on firm performance in the context of manufacturing and service firms is determined by the degree of uncertainty within the business environment.

Table 4.19: Moderating effect of Business environment uncertainty on social supply chain management and Firm performance

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
SCSSCM_x_ BEUC -> Firm Performance	0.176	0.019	9.462	0.000
Business Environment Uncertainty -> Firm Performance	0.201	0.061	3.295	0.002
Social Supply Chain Management -> Firm Performance	0.184	0.051	3.608	0.001

Source: Authors Compilation (2021)

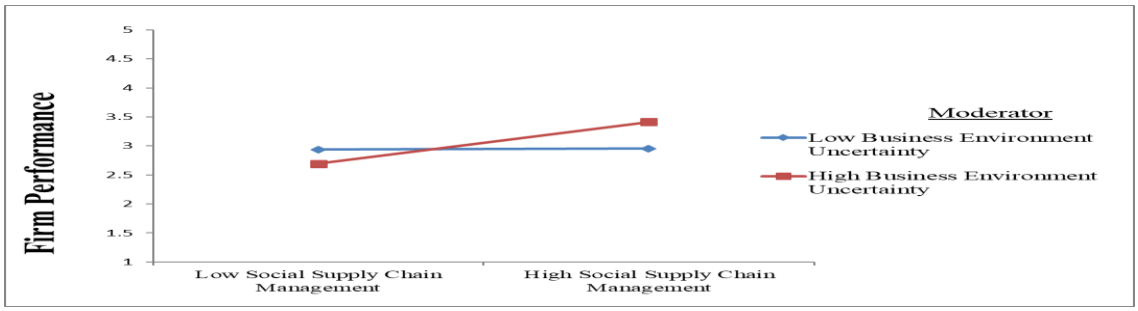


Figure 4.20: Interaction Plot of Business Environment Uncertainty social supply chain Management and Firm Performance

As illustrated in the interaction plot (figure 4.20), the social supply chain management practices - firm performance relationship changes direction in response to the uncertainty in the business environment. The social supply chain management practice and firm performance relationship is strengthened in a highly uncertain business environment.

4.12.2.2 Business Environment Uncertainty's Moderating Effect on Economic Supply Chain Management and Firm Performance

Table 4.20 and Figure 4.21 show that the interaction effect of the independent variable (economic supply chain management) and the moderator variable (business environment Uncertainty) on firm performance is significant, with a statistical value of ($\beta = 0.106$, $t = 17.097$, $\rho = 0.000$). These findings support hypothesis H7b, which states that business environment uncertainty positively moderates the economic supply chain management-firm performance relationship. This means that the influence of economic supply chain management on firm performance in the context of manufacturing and service firms is determined by the degree of uncertainty within the business environment.

Table 4.20: Moderating effect of Business environment uncertainty on economic supply chain management and Firm performance

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ECSSCM_x_BEUC -> Firm Performance	0.106	0.006	17.097	0.000
Business Environment Uncertainty -> Firm Performance	0.201	0.061	3.295	0.002
Economic Supply Chain Management -> Firm Performance	0.185	0.053	3.491	0.001

Source: Authors Compilation (2021)

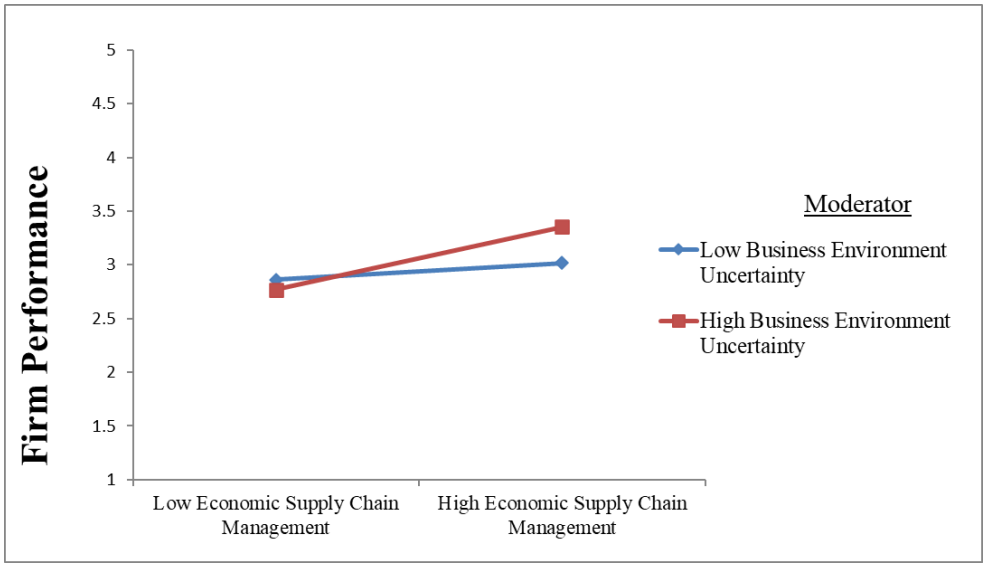


Figure 4.21: Interaction Plot of Business Environment Uncertainty economic supply chain Management and Firm Performance

As illustrated in the interaction plot (Figure 4.21), the economic supply chain management practices - firm performance relationship changes direction in response to the uncertainty in the business environment. The economic supply chain management practice and firm performance relationship is strengthened in a highly uncertain business environment.

4.12.2.3 Business Environment Uncertainty's Moderating Effect on Environmental Supply Chain Management and Firm Performance

Table 4.21 and Figure 4.22 show that the interaction effect of the independent variable (environmental supply chain management) and the moderator variable (business environment uncertainty) on firm performance is significant, with a statistical value of (β = 0.117, t = 7.647, ρ = 0.000), These findings lend support to hypothesis H7c, which states that business environment uncertainty positively moderates the environmental supply chain management-firm performance relationship. This means that the influence of environmental supply chain management practices on firm performance in the context of manufacturing and service firms is determined by the degree of uncertainty within the business environment.

Table 4.21: Moderating effect of Business environment uncertainty on environmental supply chain management and Firm performance

Path Relationship	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ENSSCM_x_BEUC -> Firm Performance	0.117	0.015	7.647	0.000
Business Environment Uncertainty -> Firm Performance	0.201	0.061	3.295	0.002
Environmental Supply Chain Management -> Firm Performance	0.217	0.058	3.741	0.000

Source: Authors Compilation (2021)

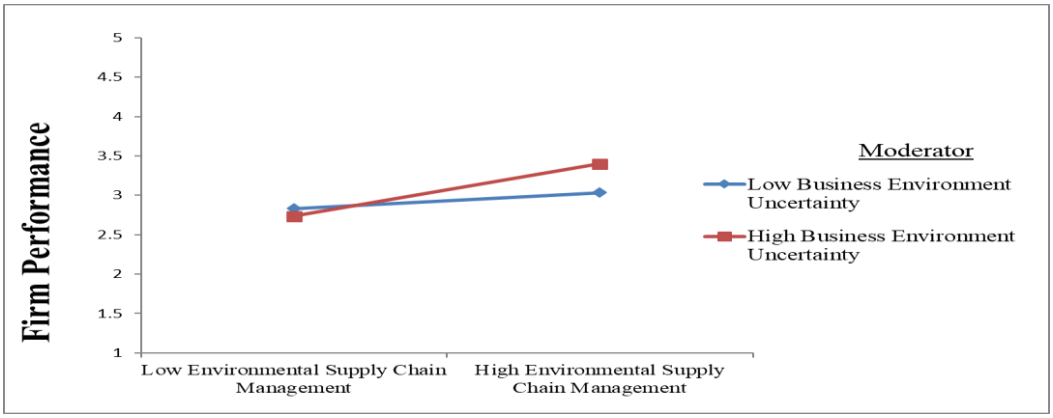


Figure 4.22: Interaction Plot of Business Environment Uncertainty environmental supply chain Management and Firm Performance

As illustrated in the interaction plot (Figure 4.22), the environmental supply chain management practices - firm performance relationship changes direction in response to the uncertainty in the business environment. The environmental supply chain management practice and firm performance relationship is strengthened in a highly uncertain business environment.

4.13 FURTHER ANALYSIS

4.13.1 Robustness checks

In structural models, endogeneity, unobserved heterogeneity, and Nonlinear effects should all be considered to ensure robustness (Sarstedt et al., 2019). Endogeneity in regression analysis refers to the concept in which an explanatory (endogenous) variable correlates with an error term or the condition in which two error terms correlate in structural equation modelling. As a result, endogeneity bias can result in incorrect theoretical interpretations, erroneous inferences, and misleading assumptions (Sarstedt et al., 2019; Ullah, Akhtar & Zaefarian, 2018). Unobserved heterogeneity refers to unmeasured (unobserved) differences in the characteristics of research respondents or samples related to the (observed) variables of interest. Due to unobserved variables, statistical conclusions drawn from observed data may be inaccurate (Sarstedt et al., 2019).

When estimating structural equation models, it is common to assume that the constructs under consideration have a linear relationship (Hair et al., 2014; Sarstedt *et al*., 2019). Given these assumptions, some statistical tests are commonly done to confirm the absence of any nonlinear effects. In this study, the Ramsey (1969) regression equation specification error test (RESET) was used to determine the presence or absence of any nonlinear effects. The Ramsey test result F (3, 452) = 1.54 and its associated probability F =0.221198 were statistically insignificant. This confirms that the structural model under consideration in this study is linear and does not demonstrate any nonlinear effects. The robustness test for this study was conducted using objective measures of firm performance. In order to obtain objective measures of firm performance, the official financial accounts of selected firms were retrieved from the Ghana Revenue Authority (GRA). In Ghana, all businesses are required to present their income tax returns and provide annual accounts. The GRA database is a reliable source because it is responsible for revenue mobilization, financial auditing, and management.

Financial statements of firms were analysed to extract the accounting-based financial measures such as Market Share (MS), Return on Equity (ROE), the overall profitability of businesses (OVP), and an increase in sales (SAI). Using Principal Component Analysis (PCA), composite scores for SSCM, ENSSCM, ECSSCM, OPCC, and BEUC were generated using Principal Component Analysis (PCA). A multivariate technique for identifying significant factors in a latent variable is PCA. PCA method extracts the highest variance factor scores from the dataset. (Brown, 2009).

The following steps were taken to operationalise the accounting-based financial measures of firm performance: A company's market share (MS) was calculated by dividing its sales for a specified period by the total sales of its operating industry for the same period. To calculate the return on equity (ROE), Earnings Before Interest and Taxes (EBIT) was divided by the company's total equity. The business's overall profitability (OVP) was calculated using the natural logarithm of the after-tax profit. SAI was defined as the percentage increase in a business's net sales from one fiscal period to the next. The following is how the control variables, firm size, firm age, and firm type, were operationalised: The natural log of the number of employees and the number of years a business has been in operation were used to determine the size and age of the business. One (1) and zero (0) were used as dummy codes for firm types. Manufacturing/extractive firms were coded one (1), while service firms were coded zero (0). Four (4) empirical models were constructed for this robustness test in order to estimate the study's hypothesised relationships as follows:

$$
\begin{aligned}
&MS \\
&= \beta_0 + \beta_1 SCSSCM_i + \beta_2 ENSSCM_i + \beta_3 ECSSCM_i + \beta_4 OPCC_i + \beta_5 BEUC_i \\
&+ \beta_6 (SCSSCM_i * OPCC_i) + \beta_7 (ENSSCM_i * OPCC_i) + \beta_8 (ECSSCM_i * OPCC_i) \\
&+ \beta_9 (SCSSCM_i * BEUC_i) + \beta_{10} (ENSSCM_i * BEUC_i) + \beta_{11} (ECSSCM_i * BEUC_i) \\
&+ \sum_{j=4}^{k} \beta_j X_j + \varepsilon_i \qquad (1)
\end{aligned}
$$

$$
\begin{aligned}
&ROE \\
&= \beta_0 + \beta_1 SCSSCM_i + \beta_2 ENSSCM_i + \beta_3 ECSSCM_i + \beta_4 OPCC_i + \beta_5 BEUC_i \\
&+ \beta_6 (SCSSCM_i * OPCC_i) + \beta_7 (ENSSCM_i * OPCC_i) + \beta_8 (ECSSCM_i * OPCC_i) \\
&+ \beta_9 (SCSSCM_i * BEUC_i) + \beta_{10} (ENSSCM_i * BEUC_i) + \beta_{11} (ECSSCM_i * BEUC_i) \\
&+ \sum_{j=4}^{k} \beta_j X_j + \varepsilon_i \qquad (2)
\end{aligned}
$$

$$OVP = \beta_0 + \beta_1 SCSSCM_i + \beta_2 ENSSCM_i + \beta_3 ECSSCM_i + \beta_4 OPCC_i + \beta_5 BEUC_i + \beta_6(SCSSCM_i * OPCC_i) + \beta_7(ENSSCM_i * OPCC_i) + \beta_8(ECSSCM_i * OPCC_i) + \beta_9(SCSSCM_i * BEUC_i) + \beta_{10}(ENSSCM_i * BEUC_i) + \beta_{11}(ECSSCM_i * BEUC_i) + \sum_{j=4}^{k} \beta_j X_j + \varepsilon_i \quad (3)$$

$$SAI = \beta_0 + \beta_1 SCSSCM_i + \beta_2 ENSSCM_i + \beta_3 ECSSCM_i + \beta_4 OPCC_i + \beta_5 BEUC_i + \beta_6(SCSSCM_i * OPCC_i) + \beta_7(ENSSCM_i * OPCC_i) + \beta_8(ECSSCM_i * OPCC_i) + \beta_9(SCSSCM_i * BEUC_i) + \beta_{10}(ENSSCM_i * BEUC_i) + \beta_{11}(ECSSCM_i * BEUC_i) + \sum_{j=4}^{k} \beta_j X_j + \varepsilon_i \quad (4)$$

Where MSi is the firm's market sales, ROEi is the firm's return on equity, OVPi is the firm's overall profitability, SAIi is the firm's sales increase, SCSSCMi is the firm's social supply chain management practices, and ENSSCMi is the firm's environmental supply chain management practices. $ECSSCM_i$ is the firm's economic supply chain management practices, $OPCC_i$ is the operational competitiveness of the environment, $BEUC_i$ is the effective management of the business environment uncertainty, $(SCSSCM_i * OPCC_i)$ is the interaction term between social supply chain management and operational competitiveness, $(ENSSCM_i * OPCC_i)$ is the interaction term between environmental supply chain management and operational competitiveness, $(ECSSCM_i * OPCC_i)$ is the interaction term between economic supply chain management and operational competitiveness, $(SCSSCM_i * BEUC_i)$ is the interaction term between social supply chain management and business environment uncertainty, $(ENSSCM_i * BEUC_i)$ is the interaction term between environmental supply chain management and business environment uncertainty, $(ECSSCM_i * BEUC_i)$ is an interaction term between economic supply chain management and business environment uncertainty. Variable Xj, which is a collection of {k} variables, accounts for the controlling effect of Firm Size, Age, and Type. The error term is ε_i while the parameter vectors are β's.

The empirical model results are presented in Tables 4.23 and 4.24, while descriptive statistics are presented in Table 4.22. Four (4) mathematical models were developed to

conduct the robustness test. MS is the dependent variable in model 1, while ROE, OVP, and SAI are the dependent variables in models 2, 3, and 4. The mean MS, ROE, OVP, and SAI were 0.019, 0.020, 0.201, and 0.202, respectively, as presented in Table 4.22. These variables have values ranging from -0.612 to 1.084 as their minimum and maximum values.

The results from the Table 4.28 and Table 4.29 below shows that the implementation of social supply chain management, environmental supply chain management, and economic supply chain management will have a positive direct impact on firm performance as shown by MS, that is social supply chain management (β =0.105, S.E = 0.047, ρ = 0.037), environmental supply chain management (β =0.117, S.E= 0.048, ρ = 0.020) and economic supply chain management (β =0.251, S.E = 0.047, ρ = 0.000). The finding hold true for other firm-level performance indicators, namely ROE, OVP, and SAI, social supply chain management (β= 0.107, S.E = 0.013, ρ = 0.000), environmental supply chain management (β= 0.201, S.E = 0.013, ρ = 0.000) and economic supply chain management (β= 0.101, S.E= 0.013, ρ = 0.000), social supply chain management (β= 0.205, S.E = 0.013, ρ = 0.000), environmental supply chain management (β= 0.102, SE= 0.013, ρ = 0.000) and economic supply chain management (β= 0.106, S.E= 0.014, ρ = 0.000), social supply chain management (β= 0.303, S.E= 0.026, ρ = 0.000), environmental supply chain management (β= 0.101, S.E= 0.036, ρ = 0.000) and economic supply chain management (β= 0.212, S.E= 0.046, ρ = 0.000) respectively. ^{2} percentages range between 70.53 and 78.03 per cent. As such result, implementing social, economic, and environmental supply chain management practices improves firm performance.

Furthermore, the findings indicate that operational competitiveness and business environment uncertainty have a positive effect on all firm performance indicators, including MS, ROE, OVP, and SAI. That is for Operational competitiveness on MS, ROE, OVP and SAI the following statistical value were observed respectively (β =0.159, S.E = 0.047, ρ = 0.000), (β = 0.313, S.E = 0.013, ρ = 0.000), (β = 0.107, S.E = 0.016, ρ = 0.000), (β =0.136, S.E = 0.056, ρ = 0.000). Business environmental uncertainty also had the following results on the same firm performance measures respectively (β =0.176, S.E = 0.048, ρ = 0.000), (β = 0.134, S.E = 0.014, ρ = 0.000), (β =0.101, S.E = 0.017, ρ = 0.000) and (β =0.209, S.E = 0.076, ρ = 0.000).

Operational competitiveness had a positive and significant interaction effect on social supply chain management, economic supply chain management, and environmental supply

chain management across all firm performance measures, including, MS, ROE, OVP, and SAI. On each of the four (4) firm performance measures, MS, ROE, OVP, and SAI, the interaction results of operational competitiveness on social supply chain management, economic supply chain management, and environmental supply chain management were as follows: for MS (SCSSCM * OPCC, $\beta = 0.020$, S.E = 0.007, $\rho = 0.001$), (ENSSCM * OPCC, $\beta = 0.041$, S.E = 0.005, $\rho = 0.000$), and (ECSSCM * OPCC, $\beta = 0.028$, S.E= 0.005, $\rho = 0.000$). For ROE (SCSSCM * OPCC, $\beta = 0.045$, S.E = 0.015, $\rho = 0.0000$), (ENSSCM * OPCC, $\beta = 0.032$, S.E = 0.011, $\rho = 0.000$), and (ECSSCM * OPCC, $\beta = 0.029$, S.E = 0.007, $\rho = 0.0000$). For OVP (SCSSCM * OPCC, $\beta = 0.011$, S.E = 0.003, $\rho = 0.001$), (ENSSCM * OPCC, $\beta = 0.031$, S.E = 0.005, $\rho = 0.0000$), and (ECSSCM * OPCC, $\beta = 0.042$, S.E = 0.006, $\rho = 0.000$) and lastly for Sale Increase (SCSSCM * OPCC, $\beta = 0.025$, S.E = 0.007, $\rho = 0.000$), (ENSSCM * OPCC, $\beta = 0.043$, S.E = 0.007, $\rho = 0.000$), and (ECSSCM * OPCC, $\beta = 0.022$ S.E = 0.006, $\rho = 0.000$).

Furthermore, the business environment uncertainty had a positive and significant interaction effect on social, economic, and environmental supply chain management across all firm performance metrics, including MS, ROE, OVP, and SAI. For each of the four (4) firm performance measures MS, ROE, OVP, and SAI, the interaction effects of business environment uncertainty on social supply chain management, economic supply chain management, and environmental supply chain management were as follows: for MS (SCSSCM * BEUC, $\beta = 0.040$, S.E = 0.005, $\rho = 0.001$), (ENSSCM * BEUC, $\beta = 0.015$, S.E = 0. 006, $\rho = 0.022$), and (ECSSCM * BEUC, $\beta = 0.100$, S.E = 0. 005, $\rho = 0.000$). For ROE (SCSSCM * BEUC, $\beta = 0.016$, S.E = 0.005, $\rho = 0.000$), (ENSSCM * BEUC, $\beta = 0.011$, S.E = 0. 003, $\rho = 0.000$), and (ECSSCM * BEUC, $\beta = 0.021$, S.E = 0.009, $\rho = 0.026$). For OVP (SCSSCM * BEUC, $\beta = 0.011$, S.E = 0.003, $\rho = 0.000$), (ENSSCM * BEUC, $\beta = 0.031$, S.E = 0.005, $\rho = 0.000$), and (ECSSCM * BEUC, $\beta = 0.042$, S.E = 0.006, $\rho = 0.000$) and lastly Increase in Sales (SCSSCM * BEUC, $\beta = 0.014$, S.E = 0.005, $\rho = 0.000$), (ENSSCM * BEUC, $\beta = 0.038$, S.E = 0.006, $\rho = 0.000$), and (ECSSCM * BEUC, $\beta = 0.019$, S.E = 0.007, $\rho = 0.000$).

The robust test results above involving operational competitiveness and business environmental uncertainty and their interactions with social supply chain management, economic supply chain management, and environmental supply chain management confirmed hypotheses 6a, 6b, 6c, 7a, 7b, and 7c. When integrated with other supply chain

management practices such as social supply chain management, economic supply chain management, and environmental supply chain management, operational competitiveness and business environment uncertainty were found to improve firm performance. The robustness test results in Tables 4.23 and 4.24 show that the objective and subjective performance measures are statistically insignificant.

Table 4.22: Descriptive Statistics for Accounting Measures (Objective Measure for Firm Performance)

Variable	N	Mean	SD	Minimum	Maximum
MS	455	0.0195	0.3387	-0.9413	1.0844
ROE	455	0.0201	0.2661	-0.6116	0.8639
OVP	455	0.0284	0.20067	-0.8884	0.2178
Sales Increase	455	0.01271	0.20237	-0.7894	0.2358
MS	455	0.0195	0.3387	-0.9413	1.0844

Source: Authors Compilation (2021)

Table 4.23: Results of the Robustness Test for Models 1 and 2

	MS as the Endogenous Variables in Model 1				ROE as the Endogenous Variables in Model 2			
	Regression Analysis: MS versus SCSSCM, ENSSCM, ECSSCM, OPCC, BEUC, Firm Age, Firm Type, Firm Size				Regression Analysis: ROE versus SCSSCM, ENSSCM, ECSSCM, OPCC, BEUC, Firm Age, Firm Type, Firm Size			
Variables	**Unstandardised Coef.**	**SE Coef.**	**95% CI**	**T-Value**	**Coef.**	**SE Coef.**	**95% CI**	**T-Value**
(Constant)	0.340	0.047	(0.254, 0.890)	7.220**	0.325	0.052	(0.223, 0.465)	6.250***
SCSSCM	0.105	0.047	(0.090, 0.930)	2.189**	0.107	0.013	(0.097, 0.567)	8.231***
ECSSCM	0.117	0.048	(0.103, 0.774)	2.451 **	0.201	0.013	(0.191, 0.324)	15.227***
ENSSCM	0.251	0.047	(0.108, 0.428)	5.301**	0.101	0.013	(0.098, 0.229)	7.731***
Operational Competitiveness	0.159	0.047	(0.126, 0.264)	3.356**	0.313	0.013	(0.291, 0.684)	23.564***
Business Environment Uncertainty	0.176	0.048	(0.103, 0.323)	3.681**	0.134	0.014	(0.113, 0.593)	9.926***
Firm Type	0.129	0.075	(0.110, 0.273)	1.723*	0.151	0.021	(0.150, 0.181)	7.215***
Firm Size	0.178	0.075	(0.098, 0.232)	2.359**	0.176	0.034	(0.168, 0.311)	5.108***
Firm Age	0.165	0.027	(0.155, 0.196)	6.157***	0.114	0.029	(0.105, 0.136)	3.951***
SCSSCM*OPCC	0.020	0.006	(0.017, 0.178)	3.492**	0.045	0.015	(0.032, 0.098)	3.061***
ENSSCM*OPCC	0.041	0.005	(0.027, 0.150)	7.983**	0.032	0.011	(0.021, 0.053)	2.909***
ECSSCM*OPCC	0.028	0.005	(0.014, 0.138)	5.978**	0.029	0.007	(0.017, 0.115)	4.143***
SCSSCM*BEUC	0.040	0.005	(0.034, 0.201)	7.999**	0.016	0.005	(0.010, 0.031)	3.200***
ENSSCM*BEUC	0.015	0.006	(0.011, 0.148)	2.413**	0.011	0.003	(0.006, 0.068)	4.520***
ECSSCM*BEUC	0.100	0.005	(0.015, 0.118)	19.971**	0.021	0.009	(0.014, 0.039)	2.333**
R Squared			0.7053				0.7727	
Adjusted R Squared			0.7147				0.7776	

Note: The dependent variables are Market Share (MS) and Return on Equity (ROE). This is regressed against social supply chain (SSCM), Environmental supply chain (ENSSCM), Economic Supply Chain (ECSSCM), Operational Competitiveness (OPCC) and Business Environment Uncertainty (BEUC). (SCSSCM*OPCC) is the interaction term between social supply chain and operational competitiveness, (ENSSCM*OPCC) is the interaction between Environmental supply chain and operational competitiveness, (ECSSCM*OPCC) is the interaction between economic supply chain and operational competitiveness, (SCSSCM*BEUC) is the interaction between social supply chain and business environmental uncertainty, (ENSSCM*BEUC) is the interaction between environmental supply chain and business environmental uncertainty, (ECSSCM*BEUC) is the interaction between economic supply chain management and business environment uncertainty. . firm size, type, age are control variables. ** indicate statistical significance at the 5% levels and * indicate statistical significance at the 10% levels.

Source: Authors Compilation (2021)

Table 4.24: Results of the Robustness Test for Models 3 and 4

OVP as the Endogenous Variables in Model 1 | **SAI as the Endogenous Variables in Model 1**

Regression Analysis: OVP versus SCSSCM, ENSSCM, ECSSCM, OPCC, BEUC, Firm Age, Firm Type, Firm Size					Regression Analysis: SAI versus SCSSCM, ENSSCM, ECSSCM, OPCC, BEUC, Firm Age, Firm Type, Firm Size			
Variables	**Unstandardized Coef.**	**SE Coef.**	**95% CI**	**T-Value**	**Coef.**	**SE Coef.**	**95% CI**	**T-Value**
(Constant)	1.290	0.019	(0.983, 2.657)	66.500***	0.979	0.041	(0.652, 0.189)	23.810***
SCSSCM	0.205	0.013	(0.103, 0.451)	15.916***	0.303	0.026	(0.241, 0.791)	11.639***
ECSSCM	0.106	0.014	(0.097, 0.174)	7.561***	0.212	0.046	(0.187, 0.271)	4.598***
ENSSCM	0.102	0.013	(0.074, 0.191)	7.890***	0.109	0.036	(0.071, 0.145)	3.023***
Operational Competitiveness	0.107	0.016	(0.081, 0.184)	6.720***	0.136	0.056	(0.121, 0.198)	2.419***
Business Environment Uncertainty	0.101	0.017	(0.095, 0.293)	5.958***	0.209	0.076	(0.201, 0.719)	2.744***
Firm Type	0.109	0.015	(0.102, 0.131)	7.442***	0.119	0.010	(0.114, 0.125)	12.196***
Firm Size	0.104	0.018	(0.088, 0.241)	5.909***	0.178	0.016	(0.151, 0.212)	11.068***
Firm Age	0.183	0.016	(0.112, 0.209)	11.207***	0.132	0.013	(0.122, 0.154)	9.821***
SCSSCM*OPCC	0.011	0.003	(0.007, 0.058)	3.259***	0.025	0.007	(0.019, 0.041)	3.590***
ENSSCM*OPCC	0.031	0.005	(0.028, 0.077)	6.002***	0.043	0.007	(0.032, 0.068)	6.553***
ECSSCM*OPCC	0.042	0.006	(0.034, 0.075)	6.877***	0.022	0.006	(0.015, 0.072)	3.450***
SCSSCM*BEUC	0.018	0.003	(0.009, 0.087)	5.821***	0.014	0.005	(0.011, 0.022)	2.802***
ENSSCM*BEUC	0.017	0.002	(0.013, 0.098)	9.401***	0.038	0.006	(0.024, 0.058)	6.496***
ECSSCM*BEUC	0.023	0.005	(0.018, 0.049)	4.653***	0.019	0.007	(0.015, 0.027)	2.684***
R Squared			0.7613				0.7803	
Adjusted R Squared			0.7609				0.7801	

Note: *The dependent variables are Overall profitability (OVP) and Increase in Sales (SAI). This is regressed against social supply chain (SSCM), Environmental supply chain (ENSSCM), Economic Supply Chain (ECSSCM), Operational Competitiveness (OPCC) and Business Environment Uncertainty (BEUC). (SCSSCM*OPCC) is the interaction term between social supply chain and operational competitiveness, (ENSSCM*OPCC) is the interaction between Environmental supply chain and operational competitiveness, (ECSSCM*OPCC) is the interaction between economic supply chain and operational competitiveness, (SCSSCM*BEUC) is the interaction between social supply chain and business environmental uncertainty, (ENSSCM*BEUC) is the interaction between environmental supply chain and business environmental uncertainty, (ECSSCM*BEUC) is the interaction between economic supply chain management and business environment uncertainty, firm size, type, age are control variables. ** indicate statistical significance at the 5% levels and * indicate statistical significance at the 10% level* .**Source: Authors Compilation (2021)**.

4.14 CHAPTER SUMMARY

The results of this study and the methods used to ascertain them were presented in this chapter. First, response analyses (i.e., response rate, non-response bias, common method bias, respondent profile, and firms involved in the study) were presented. The chapter then presented findings regarding the validity and reliability of the study's measures. Following that, results relating to the study's structural model and hypotheses evaluation were presented. The findings largely support the study's hypothesis that sustainable supply chain management from a TBL approach improves firm performance. This underlying relationship is mediated to some extent by supply chain integration (i.e. supply integration, internal integration, and customer integration) and firm capabilities and moderated by operational competitiveness and business environment uncertainty. It is also worth noting that the robustness test supports the results. The results are discussed in the following chapter.

CHAPTER FIVE

DISCUSSION OF STUDY RESULTS

5.0 INTRODUCTION

This study sought to establish the causal links and relationships between SSCM practices and Firm Performance in the context of a developing nation from a TBL perspective. This chapter discusses the empirical outcomes of the previous chapter's results in connection to the research objectives and hypotheses of the study. Additionally, the discussion on the study's results in relation to other findings in the literature is presented. Finally, the chapter addresses the theoretical implications of the study's findings and the robustness test results done in the previous chapter.

5.1 THE DIRECT EFFECTS OF SSCM PRACTICES ON FIRM PERFORMANCE

The first objective of this study sought to examine the effect of SSCM practices on firm performance from a TBL perspective. Stemming from this objective, three hypotheses were developed (H1a, H1b and H1c). All three hypotheses were confirmed as postulated. The study found that for hypothesis 1a, social supply chain management adoptions involving incentive policy, employee turnover management, absenteeism management, ethnic and cultural diversity policy, health and safety policy and social compliance policy has a positive effect on firm performance, thereby confirming the earlier studies such as (Chen et al., 2017; Hutchins & Sutherland, 2008; Pagell et al., 2004; Paulraj et al., 2017; Perry et al., 2013; Sila et al., 2006; Zhu et al., 2016). For hypothesis 1b, economic supply chain management adoptions involving cost savings through material management, waste reduction, energy consumption management, and pollution management have a positive effect on firm performance as postulated by various authors (e.g., Kirchoff, Omar & Fugate, 2016; Kulangara & Henderson, 2018; Mefford, 2011; Panigrahi, Bahinipati & Jain, 2019; Rajeev et al., 2017; Roy, Schoenherr & Charan, 2018; Svensson, 2007; Yadav et al., 2020; Zailani et al., 2012; Zhu et al., 2010). Finally, for hypothesis 1c, environmental supply chain management adoption involving the use of ISO certifications, supplier environmental policy, environmental management policy and reduction of environmental pollution has a positive effect on firm performance, and this validates earlier finding such as (Dong et al., 2019; Famiyeh

et al., 2018; Laosirihongthong, 2013; Ortas et al., 2014; Porter & Linde, 1995; Saruchera & Asante-Darko, 2021; Zhu et al., 2010). Thus, the three (3) hypotheses were confirmed as stated.

The results of hypotheses H1a, H1b, and H1c are consistent with the political economy theory, which is composed of stakeholder, legitimacy, and institutional theory (Gray et al., 1996). According to the political economy theory, sustainability policies and practices are strategic tools that shape an organisation's interactions and dealings with other parties (Fahimnia & Jabbarzadeh, 2016; Gualandris et al., 2015; Scoones, 2016). Thus, the political economy theory provides the necessary context, rationale, and knowledge for managers to make decisions, such as the adoption of SSCM practices from a TBL perspective (Glover et al., 2014; Morali & Searcy, 2013; Powell & DiMaggio, 1991; Zimon et al., 2020). With the adoption of SSCM initiatives particularly, from the TBL standpoint, activities such as employee incentive policy, employee turnover management, absenteeism management, ethnic and cultural diversity management, health and safety policy, ISO certification requirement, environmental management systems, supplier environmental management policy, material management as a cost-cutting tool, pollution management, waste reduction and strategic cost savings policies, contributes to the satisfaction of stakeholders, which in turn allows the organisation to be recognised as legitimate. The adoptions of these practices are also due to corporations imitating the successful qualities of competitors, which essentially demonstrates the effect of institutions on firms. Thus, stakeholder satisfaction and emulation of competitors' desirable characteristics increase business legitimacy and firm performance (Jones, 1995). This improvement in business legitimacy ensures that the firm maximises its profit. This supports the findings of Das (2018), Chen et al. (2019) and Santiteerakul et al. (2015).

The findings of hypotheses H1a, H1b, and H1c, which implies that SSCM practices from a TBL perspective have a positive effect on firm performance, also support the notion that adopting SSCM methods from a TBL perspective allows an organisation to integrate social networks, build human capital, maintain, and conserve the environment, and ensure efficient use of financial resources (Chen et al., 2019; Fakoya, 2020; Govindan et al., 2020; Sheu & Choi, 2019). This enables the firm to achieve a competitive edge, which in turn improves the firm's financial performance (Kim & Han, 2010; Loo-See & Leap-Han, 2013; Marshall et al., 2015; Namagembe et al., 2019; Ochiri et al., 2015; Wang & Sarkis, 2013; Wilding & Proctor, 2015). According to the

findings of hypotheses H1a, H1b, and H1c, adopting SSCM activities, particularly from a TBL perspective, is a strategic tool for advancing a firm's legitimacy, enhancing its competitive advantage, and maximizing its performance, as earlier confirmed by Govindan et al. (2020), Das (2018) and Chen et al. (2019).

5.2 THE MEDIATING EFFECT OF SUPPLY CHAIN INTEGRATION IN THE RELATIONSHIP BETWEEN SSCM AND FIRM PERFORMANCE

The study's second objective was to investigate the effect of supply chain integration (i.e., customer integration, supplier integration, and internal integration) in mediating the relationship between SSCM and firm performance. This was done to shed light on a more complex relationship between SSCM and firm performance. Nine (9) hypotheses were postulated (H2a-c, H3a-c, and H4a-c). Eight of the nine hypotheses proposed in this study (H2a-c, H3b-c, and H4a-c) were verified, while one (H3a) was rejected. The study discovered that for hypotheses H2a-c, Customer Integration, which entails integrating customer's needs, being highly responsive to customers' demands, receiving customers feedback on the quality, delivery, the social and environmental performance of products, mediates the positive relationship between social supply chain management, environmental supply chain management, economic supply chain management and firm performance. For hypotheses H3b-c, the study revealed that supplier integration, which includes strategic partnerships with suppliers, information sharing with major suppliers, inventory sharing with major suppliers, design specification sharing with suppliers, and ensuring that suppliers improve their processes to meet the needs of our operations, mediates the positive relationship between environmental supply chain, economic supply chain management and Firm Performance.

However, the analysis demonstrates that supplier integration did not mediate the positive relationship between social supply chain management and firm performance for hypothesis 3a. Furthermore, according to the findings, for hypotheses H4a-c, internal integration, which, in this study, includes the involvement of cross-functional team members in the development of new products, the effective integration of data among internal departments and the use of real-time integration among key internal departments, mediates the positive relationship between social supply chain management, environmental supply chain management economic supply chain management and firm performance. Thus, eight (8) out of the nine (9) mediation hypotheses were

confirmed as stated. The components of customer integration, supplier integration, and internal integration validate the findings of Amoako-Gyampah et al. (2020) and Yu et al. (2013). However, with respect to the mediating role of customer integration, supplier integration and internal integration in the SSCM-firm performance relationship, the results were scanty in the literature.
The findings of the hypotheses H2a-c - H4a-c were consistent with the ideology of the political economy theory, which states that "society, politics, and economics are inextricably linked, and that economic issues cannot be examined meaningfully without taking into account the political, social, and institutional context in which economic activity occurs" (Gray & Owen, 1996, p. 47). As a result, the theory suggests that in the SSCM -firm performance relationship, the role of key stakeholders and institutions such as customers, suppliers, and the internal organs of a firm must not be taken for granted and their activities must be thoroughly integrated into the firm's operations if the firm intends to maximise the potential of the SSCM-firm performance relationship fully. The political economy theory draws the attention of decision-makers to the fact that, aside from the effectiveness of their operations, such as SSCM practices, in this case, numerous elements contribute to a firm's economic viability (Blühdorn, 2016; Fernando & Lawrence, 2014; Koch & Mont, 2016; Sabau, 2020).

With customer integration serving as a meditator of the SSCM- firm performance relationship from a TBL perspective, efforts such as incorporating consumer views and feedbacks into firm production processes, being highly responsive to customer needs, and evaluating a firm's social, environmental, and economic performance from the perspective of customers as stakeholders facilitate a firm in gaining legitimacy. This legitimacy is achieved because of the efficient integration of stakeholder perspectives (consumer integration) into SSCM initiatives. As a result of consumer confidence and trust, a firm's performance will improve.

Furthermore, the findings of hypotheses (H2a, H2b, and H2c) were also consistent with the findings of previous studies, including Ataseven & Nairb (2017), Hooshangi et al., (2017); Ni & Sun, 2019; Sessu et al., 2020; Zhao et al., 2021, who elucidate that customer integration is one of the processes that account for the relationship between the SSCM and firm performance from a TBL perspective. Businesses should note that customer integration is one of the channels via which the SSCM -firm performance relationship is formed. The findings from hypotheses (H3a, H3b and

H3c) also demonstrate how well the political economy theory accounts for the relationship between supplier integration, SSCM practices and firm performance from a TBL standpoint. As a strategic stakeholder of a firm, supplier integration brings to bear the firm supplier relationship, which entails the strategic role of suppliers in the design specification of firm products, raw materials acquisitions, information sharing on products and inventory management. These relationships ensure that firms can consistently meet the demands and needs of their customers, which results in firm legitimacy and stakeholder satisfaction (Bozzetto et al., 2020; Setyadi, 2019; Zimon et al., 2020). Firm legitimacy and stakeholder satisfaction are two significant elements required in performance improvement (Luke et al., 2013). As indicated, hypotheses 3a and 3b were confirmed in this study, but hypothesis 3a was refuted. The findings of Hypotheses (H3b and H3c) validate prior studies such as (Azadi et al., 2015; Ecer & Pamucar, 2020; Liu et al., 2018; Schoenherr & Swink, 2012; Song et al., 2017), which demonstrates that supplier integration is one of the mediums that facilitate the relationship between SSCM and firm performance from an economic and environmental supply chain management standpoint. The ability to effectively integrate your suppliers into the firm's day-to-day operations reduces the waste and enhances the environmental performance of firms and improves the financial performance of firms since it enables firms to save cost (Zhang et al., 2018).

For hypothesis 3a, the study found that supplier integration did not mediate the positive relationship between social supply chain management and firm performance. The results of hypothesis 3a contradict the findings of studies such as Halili and Fernando (2019) and Marshall et al. (2015), who revealed that supplier integration is a significant medium by which firm performance is improved. However, it is demonstrated in this study that, from the perspective of a developing country, that supplier integration is incapable of acting as a medium for social supply chain management and its resultant positive effect on firm performance. This disparity in findings is most likely due to the institutional setting of developing countries (Turkulainen et al., 2017). Suppliers of companies in most developing economies are not residents, so the social system of the operating environment finds it difficult to relate to such suppliers' activities and are thus unable to appreciate the role that suppliers play in social supply chain management and firm performance relationships. Businesses include supplier perspectives primarily to improve operations, performance, and customer satisfaction (Amoako-Gyampah et al., 2020). In the relationship

between social supply chain management and firm performance, the emphasis is on how well social activities, particularly the social well-being of personnel and society, are considered to promote performance, and supplier integration is not a medium that facilitates this relationship. Furthermore, this study confirmed hypotheses H4a, H4b and H4c as postulated. The hypotheses H4a-c were consistent with the concepts of political economy theory (Arndt, 1983; Chen et al., 2018). Internal integration, which includes activities such as involving cross-functional team members in the development of new products, effective data integration among internal departments, and the use of real-time integration among key internal departments, has been identified as one of the mediums that accounts for the SSCM -firm performance relationship from the TBL perspective. According to political economy theory, internal integration is crucial in the SSCM -firm performance relationships. As a significant stakeholder, its integrations, and subsequent results of satisfaction of all internal activities of the business contributes to firm legitimacy, unit among personnel and staff commitment. Committed employees, teamwork among employees, and firm legitimacy are all crucial factors in improving firm performance.

In addition to the foregoing, the findings of hypotheses H4a, H4b, and H4c support the past studies' findings (Graham, 2018; Kwamega et al., 2018; Liu et al., 2021; Mehdikhani & Valmohammadi, 2019; Mekhum, 2020; Mello et al., 2017). Internal integration is viewed as a medium in this research for establishing the SSCM -firm performance relationship from a TBL stance. Internal integration activities are recognised as an essential component of the SSCM firm performance relationship, and organisations should take note of them to achieve superior performance.

5.3 THE MEDIATING EFFECT OF FIRM CAPABILITIES IN THE RELATIONSHIP BETWEEN SSCM AND FIRM PERFORMANCE

The study's third objective was to investigate the effect of firm capabilities in mediating the relationship between SSCM and firm performance from a TBL perspective. In doing this, three hypotheses (H5a, H5b and H5c) were postulated. The three hypotheses were all confirmed in this study. The study revealed that for hypotheses 5a, 5b and 5c, firm capabilities, which consists of strategies that support the achievement of key firm objectives, strategies that ensures the firm and its products are leaders in the market, strategies that improve the operational performance of the firm, strategies that ensure that the right human capital is employed and developed, strategies that

maintain cordial relationships with customers and supplies and finally strategies that promote innovation at the workplace, mediates the positive relationship between social supply chain management, environmental supply chain management economic supply chain management and firm performance. The component of firm capabilities validates the findings of Koufteros et al. (2014) and Rehman et al. (2019) . However, with respect to the mediating role of firm capabilities in the SSCM-firm performance relationship, the results are limited in the literature. This is due to the scarcity of literature in the SSCM-firm performance domains that explore the role of firm capabilities. Thou Hong et al. (2018) and Jermsittiparsert et al. (2019) are two of the few studies that examined the role of firm capabilities in the SSCM-firm performance relationship. They did not evaluate firm capabilities as a whole but rather examined specific components of firm capabilities.

The findings of hypotheses 5a, 5b, and 5c are consistent with the reasoning of the political economy theory, in that firm capabilities are viewed as unique critical traits of a firm that enable it to achieve its aims and objectives (Baker & Sovacool, 2017**;** Cimoli et al., 2009; Foss, 1996). They are so important that, according to the political economy theory, firms regard their capabilities as key stakeholders and are thus willing to imitate capabilities of competitors who are doing well in order to ensure they possess similar or better capabilities in the discharge of their obligations (Kang & Paus, 2020; Krammer et al., 2018; Seifert, 2015). This is done in their attempt to improve their performance and remain viable as a business. The acquisition of these important capabilities enables a firm to be highly adaptable and efficient in its operations while positively distinguishing itself in the marketplace.

Adaptability and efficiency are critical to customer satisfaction, and with these comes firm legitimacy (Kwarteng et al., 2021). This allows the company to preserve its operating license and pursue profit-maximizing strategies. As a result of increased legitimacy and distinct organisational capabilities, firm performance improves. In terms of the mediating role of firm capabilities in the SSCM -firm performance relationship from a TBL perspective, the findings of hypotheses 5a, 5b, and 5c are consistent with various prior studies (*e.g.*, Beske, 2012; Chacón & Mantilla, 2014; Chen & Kitsis, 2017; Hong et al., 2018; Jermsittiparsert et al., 2019). In these past studies, a firm's capabilities are recognised as an essential medium across a wide range of industries that supports

the interaction between organisational practices like SSCM and firm performance from a TBL standpoint. For example, Hong et al. (2018) notes that dynamic capabilities, which are a component of firm capabilities, mediated the relationship between SSCM practices and enterprise performance, which corroborates the findings of hypotheses 5a, 5b, and 5c of this study. In the study of Jermsittiparsert et al. (2019), sustainability capability, which is part of a firm's capabilities, mediated the relationship between SSCM practices and firm performance in Thailand's tourism industry, confirming hypotheses 5a, 5b, and 5c as well. As a result of the abovementioned, firm capabilities are viewed as critical characteristics that aid a firm in transforming its social, environmental, and economic supply chain management strategies into performance.

5.4 THE MODERATING EFFECT OF BUSINESS ENVIRONMENTAL UNCERTAINTY IN THE RELATIONSHIP BETWEEN SSCM AND FIRM PERFORMANCE

The fourth objective of the study was to examine the moderating effect of business environment uncertainty in the relationship between SSCM practices and firm performance from a TBL standpoint. To realise this objective, three hypotheses H6a, H6b and H6c, were proposed. The study confirmed the acceptability of all three hypotheses, namely H6a, H6b, and H6c. From the analysis, the study found that for hypotheses H6a, H6b and H6c, business environment uncertainty which connotes the fluctuating nature of the demand and supply of products, the lack of consistency in the supplies of raw materials, the rapid changes in the technological space and how it affects the operations of the business and the strategies that are implemented to insulate the company from such uncertainties, moderates the positive relationship between social supply chain management, environmental supply chain management, economic supply chain management and firm performance. The findings of hypotheses H6a, H6b, and H6c were consistent with the understanding of political economy theory (Chari, 2018; Cuervo-Cazurra et al., 2018; Jauch & Kraft 1986; Sharma et al., 2020). An organisation must be well-versed in its operating environment (DeBoer et al., 2017; Qi, Zhao & Sheu, 2011; Rhee, Park & Shin, 2020). According to political economy theory, the operating environment is a social and economic stakeholder that must be appropriately considered if a firm is to be viable.

Firms that can adopt and implement structures that can deal with the changing nature of the business environment acquire consumer confidence because they can continuously meet the needs and desires of the consumer regardless of market changes (Gölgeci & Ponomarov, 2015). The

ability to build resilient strategies for dealing with environmental unpredictability, including but not limited to emulating the institutional systems of competitors, increases firm legitimacy (Aragón-Correa & Rubio-López, 2007; Farndale & Paauwe, 2018). Consumer trust and increased firm legitimacy improve firm performance. This means that, in the face of high business environmental uncertainties, firms are expected to devise a variety of strategies to keep them in business and profitable despite the obstacles they encounter (Fernandes, 2017; Lo & Shiah, 2016; Srinivasan, 2011; Samsami et al., 2015). This supports the study's findings, which show that SSCM practices change positively and significantly with firm performance in a high-uncertainty business environment.

In contrast, in a low-uncertainty business environment, the effect of SSCM practices on firm performance from a TBL perspective is relatively constant and does not change much. The hypotheses H6a, H6b, and H6c were also consistent with the findings of prior studies, such as Qi, Zhao, and Sheu (2011), who discovered that business environment uncertainty moderated the relationship between competitive strategy, performance, and supply chain strategy, of which SSCM is a component. Furthermore, Sun et al. (2009) discovered that business environment uncertainty moderated the positive relationship between supply chain strategy and firm performance. The relationship between collaboration, sustainable supply chain management, and performance from a TBL standpoint was found to be moderated by business environment uncertainty (Ince et al., 2020). The degree of uncertainty in the business environment has a positive moderating effect on the adoption of SSCM practices and their subsequent impact on performance, as indicated above.

5.5 THE MODERATING EFFECT OF OPERATIONAL COMPETITIVENESS IN THE RELATIONSHIP BETWEEN SSCM AND FIRM PERFORMANCE

The fifth and final objective of the study was to examine the moderating effect of operational competitiveness in the relationship between SSCM practices and firm performance from a TBL standpoint. To realise this objective, three hypotheses (H7a, H7b and H7c) were postulated. The study confirmed and accepted hypotheses 7a, 7b, and 7c. Hypotheses (H7a, H7b and H7c), operational competitiveness, which consists of the costing strategies of the firm products and how it relates to the price of substitute products on the market and the firm strategies in quickly adapting to changing needs of the market in terms of their flexibility, delivery and quality of products,

moderates the positive relationship between social supply chain management, environmental supply chain management, economic supply chain management and firm performance. This finding reflects the concepts of the political economy theory (Bhawsar & Chattopadhyay, 2015; Hartley, 2014; Hay, 2004; Savina, 2021). According to the theory, a firm's economic viability is determined by particular social and economic players. According to the theory, these social and economic players include the firm's working environment. Customers and competing firms that produce the same, comparable, or substitute items as the focal firm comprise the operating environment. This operating environment is thus viewed as a stakeholder in the environment since it can influence or drive the dynamics of products and practices in that environment (Freeman & Reed, 1984; Gray et al., 1996). With this ability, organisations either mimic the methods of successful competitors to remain competitive or have structures that respond fast to changing consumer and operational trends in the environment to remain relevant and improve their performance.

The ability to outperform competitors and maintain a steady lead offers organisations consumer satisfaction, loyalty, customer trust, and corporate legitimacy (Gupta et al., 2020). Firm performance improves because of increased consumer satisfaction, loyalty, trust, and legitimacy (Feng et al., 2018). In essence, the operating environment, as a stakeholder, tends to keep a company on its toes in terms of the policies it adopts and implements. This supports the findings that, in a high operational competitive environment, SSCM practices from a TBL perspective changes positively and significantly with firm performance. In contrast, in a low operational competitive environment, the effect of SSCM practices on firm performance from a TBL perspective is relatively constant and does not change much due to the lack of external pressures. In terms of the moderating effect of operational competitiveness, several previous studies have validated the findings of this study (Nath et al., 2010; Tan et al., 2007). Ogaga and Owino (2017) discovered that operational competitiveness positively impacts corporate strategy and organisational performance. Laosillapacharoen and Karuhawanit (2019) findings are also consistent with the fact that competitiveness has a moderating influence on SSCM practices and organisational performance, as established by this study. The degree of competitiveness in the operating environment influences the adoption of business models such as SSCM.

5.6 FURTHER FINDINGS AND IMPLICATIONS

This section presents the findings from additional analyses of the study results. These include the use of control variables in the firm performance model, the outcomes of some extracted relationships from the model, and the findings related to objective measurements of firm performance.

5.6.1 Controls in the Model of Firm Performance

Existing evidence indicates that firm age, size, and industry type may impact performance outcomes (Mallinguh et al., 2020; Pervan et al., 2017; Younis & Sundarakani, 2019). This study, like other prior investigations, controlled for these factors. According to the findings, firm characteristics such as firm size, age, and industry type did not account for any significant difference in firm performance from a financial standpoint in this study, hence validating prior research such as Mallinguh et al. (2020).

5.6.2 The Direct Effects of Operational Competitiveness on Firm Performance

Despite the lack of a defined hypothesis, the data analysis in the study demonstrates a significant positive relationship between operational competitiveness and firm performance. This result stresses the concept of political economy theory (Gray et al., 1996). According to political economy theory, stakeholders' obligations include the resources they supply that enable a firm to emerge and remain competitive (Chyhryn, Valentynovych & Kwilinski, 2020; Sum, 2015). When these stakeholders are satisfied in an equitable manner, the firm's legitimacy improves, thus increasing performance (Díez-De-Castro & Peris-Ortiz, 2018). The ability of a firm to remain competitive in its operating environment is a necessary condition for enhancing performance. This result is also consistent with prior studies such as Mei and Nie (2008), supported by Zain and Kassim (2012). In these studies, the positive relationship between operational competitiveness and performance is demonstrated. Because of these findings, firms are informed of the importance of having an operationally competitive environment and its significant impact on performance.

5.6.3 The Direct Effects of Business Environment Uncertainty on Firm Performance

From the study's findings, it emerged that business environment uncertainty has a significant positive relationship with firm performance. Though not explicitly hypothesised, these findings contribute to the narrative of the political economy theory (Chari, 2018; Cuervo-Cazurra et al., 2018; Jauch & Kraft, 1986; Sharma et al., 2020). According to this theory, a firm's ability to handle and effectively cope with the uncertainties of the business environment is a stakeholder expectation, and once this expectation is realised, customer trust and confidence are developed. This increases the firm's legitimacy, which leads to higher performance (Prado-Roman, Diez-Martin & Blanco-Gonzalez, 2020). This finding is consistent with previous research such as Hoque (2004), who discovered a positive relationship between business environment uncertainty and performance, as well as Bastian and Muchlish (2012), who also established that business environment uncertainty is positively correlated with performance. Firms have a unique opportunity to improve their performance by taking advantage of the uncertainties in their operational environment.

5.6.4 Robustness Analysis Using Objective Measures of Firm Performance

A robustness test was performed in this study to validate the conclusions derived from subjective measures of firm performance from a financial aspect. The robustness test was carried out utilizing objective measurements of firm performance on all the understudied putative; thus, the direct, mediated, and moderated relationships. The robustness test results supported and corroborated the findings of the subjective measure of firm performance in all cases. This research validates the findings of previous studies, which found no significant difference between the use of objective and subjective metrics in the study of firm performance (Dawes, 1999; Hughes et al., 2018; Kontane, 2017).

5.7 CHAPTER SUMMARY

This chapter presented a detailed discussion of the study's findings in relation to the SSCM-firm performance literature. This included supporting literature evidence for the confirmed hypotheses and reasons for the hypotheses not corroborated. In this study, as supported by literature, firm capabilities, and supply chain integration (i.e., customer integration, internal integration, and

supply integration) were found to mediate the SSCM – firm performance relationship whiles operational competitiveness and business environment uncertainty were found to moderate the relationship between SSCM practices and firm performance from a TBL standpoint. Supply integration was found not to mediate the relationship between social supply chain management practices and firm performance. The next chapter presents the study's concluding remarks.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The primary aim of this study was to explore the mechanisms by which the relationship between SSCM practices from a TBL standpoint and firm performance is established. Specifically, the role of firm capabilities, supply chain integration, business environment uncertainty, and operational competitiveness in SSCM practices and firm performance relationships were examined using data from Ghanaian service and industrial firms. Several relationships emerged in this study as a result of the application of political economy theory and variance-based structural equation modelling. This chapter summarises the study, documents the conclusions, implications for practice, policy and theory, recommendations, limitations, and suggestions for future research.

6.2 SUMMARY OF THE THESIS

This study aimed to examine the mediating effect of firm capabilities and supply chain integration and the moderating effect of business environment uncertainty and operational competitiveness in the SSCM - firm performance relationship from a TBL standpoint. As a result, the following objectives were formulated for this study:

- Examine the relationship between SSCM practices and firm performance.
- Examine the mediating effect of supply chain integration in the SSCM -firm performance relationship.
- Examine the mediating effect of firm capabilities in the SSCM -firm performance relationship
- Examine the moderating effect of business uncertainty on the SSCM-firm performance relationship.
- Examine the moderating effect of operational competitiveness on the SSCM-firm performance relationship.

To address these objectives to improve policy, management, and implementation of SSCM practices, particularly in developing economies such as Ghana, relevant literature was reviewed. This literature review covered areas such as supply chain management and sustainability shift in

Supply Chain Management. The main issues discussed were the sustainable models in supply chain management, SSCM, SSCM practices effect on firm performance, firm performance, supply chain integration, firm capabilities, business environment uncertainty, operational competitiveness, generic themes of SSCM, driving forces of SSCM, theories in SSCM, methods used in SSCM practice and a review of the mechanisms that facilitate the relationships between SSCM practices and other performance indicators. The political economy theory served as a basis for the development of the conceptual framework for this study.

This study was deductive in reasoning, cross-sectional in design and quantitative in approach. Guided by the objectives of this study, the survey method was the technical tool used in collecting the data for this study. Questionnaires were administered to four hundred and fifty-five (455) participating firms. The data collection process was done electronically via Qualtrics. In the analysis of the data, the PLS variance-based structural equation modelling was used. The analysis accessed the reliability and dependability of the data sets and revealed the relationships associated with the variables under study. The discussions of the results were presented in the context of the current SSCM literature. Additionally, the various relationship uncovered in this study was examined using literature. The study's findings are significant because they will aid policy makers, practitioners, and managers of SSCM practices to better understand the factors that account for the transition of the SSCM practices from a TBL standpoint in improving firms' financial performance.

6.3 CONCLUSIONS

The literature on supply chain management emphasises the need of adopting sustainable supply chain management methods from a TBL approach for firm survival and growth. However, earlier research studies on SSCM practices - firm performance relationship have shown mixed and inclusive results. Additionally, limited attention has been paid to elucidating and analysing the mechanisms and conditions that underpin the SSCM - firm performance relationship. To address this research problem, this study, which sought to explore the mechanisms underlying the SSCM practices - firm performance relationships from a TBL perspective, concluded as follows:

6.3.1 The Relationship between SSCM practices and Firm performance

The study concludes that SSCM practice and adoption from a TBL perspective improves the financial performance of firms. The following empirical evidence corroborates this: In both manufacturing and service firms, social supply chain management is positively and directly associated with firm performance ($\beta = 0.184$, $\rho = 0.001$). Additionally, environmental supply chain management has a positive and statistically significant relationship with firm performance ($\beta = 0.217$, $\rho = 0.000$). On the other hand, economic supply chain management is positively and significantly related to firm performance ($\beta = 0.185$, $\rho = 0.001$). These relationships are established through the effective implementation of policies and strategies such as incentive compensation, employee turnover management, absenteeism management, ethnic and cultural diversity policies, health and safety policies, and social compliance policies, as well as cost savings, realised through material management, waste reduction, and energy consumption management.

6.3.2 The Mediating Effect of Supply Chain Integration on the Relationship between SSCM Practices and Firm Performance

The study concludes that the relationship that exists between SSCM practices from a TBL standpoint and firm performance is in most cases mediated by the effective integration of customers, suppliers, and internal structures. However, the study revealed that supplier integration which includes strategic partnerships with suppliers, information sharing with major suppliers, inventory sharing with major suppliers, design specification sharing with suppliers, and ensuring that suppliers improve their processes to meet the needs of our operations, did not mediate the social supply chain management-firm performance relationship.

The following empirical data substantiate the preceding assertion:

- Internal Integration mediates the social supply Chain Management-Firm Performance relationship ($\beta = 0.034$, $\rho = 0.000$).
- Internal Integration mediates the environmental supply chain management-firm performance relationship ($\beta = 0.040$, $\rho = 0.000$).
- Internal Integration mediates the economic supply chain management-firm performance relationship ($\beta = 0.036$, $\rho = 0.000$).

- Customer Integration mediates the social supply Chain management-firm Performance relationship (β= 0.010, ρ = 0.002).
- Customer Integration mediates the environmental supply chain management-firm performance relationship (β= 0.043, ρ = 0.000).
- Customer Integration mediates the economic supply chain management-firm performance relationship (β= 0.043, ρ = 0.000).
- Supplier Integration does not mediate the social supply Chain Management-Firm Performance relationship (β= 0.012, ρ = 0.305).
- Supplier Integration mediates the environmental supply chain management-firm performance relationship (β= 0.022, ρ = 0.001).
- Supplier Integration mediates the economic supply chain management-firm performance relationship (β= 0.018, p = 0.001).

6.3.3 Mediating Effect of Firm Capabilities on the Relationship between SSCM and Firm Performance

This study revealed that firm capabilities (comprising of strategies that support the achievement of key firm objectives, strategies that ensures the firm and its products are leaders in the market, strategies that improve the operational performance of the firm, strategies that ensure that the right human capital is employed and developed, strategies that maintain cordial relationships with customers and supplies and finally strategies that promote sustainability and innovation at the workplace), mediate the positive relationship between social, environmental, economic supply chain management and firm performance.

The empirical data presented below provides support for the above conclusion:

- Firm Capabilities mediate the social supply Chain management - Firm Performance relationship (β = 0.037, ρ = 0.000).
- Firm Capabilities mediate the environmental supply chain management - Firm performance relationship (β = 0.044, ρ = 0.000).
- Firm Capabilities mediate the economic supply chain management - Firm performance relationship (β = 0.045, ρ = 0.000).

6.3.4 The Moderating Effect of Operational Competitiveness on the Relationship between SSCM and Firm Performance

The study concludes that when firms operate in a highly competitive operational environment, the relationship between SSCM practices and firm performance is strengthened, indicating that operational competitiveness moderates the relationship between SSCM practices and performance. The following statistical findings substantiate the above conclusion:

- Operational Competitiveness positively moderated the social supply Chain management-Firm Performance relationship (β= 0.062, ρ = 0.000).
- Operational Competitiveness positively moderated the environmental supply Chain management- Firm Performance relationship (β= 0.065, ρ = 0.000).
- Operational Competitiveness positively moderated the economic supply Chain management -Firm Performance relationship (β= 0.080, ρ = 0.000).

6.3.5 The Moderating Effect of Business Uncertainty on the Relationship between SSCM and Firm Performance

This study found that when operating in a highly uncertain business environment, the relationship between SSCM practices and firm performance is strengthened, indicating that business environment uncertainty moderates the relationship between SSCM practices and firm performance.

The following statistical findings substantiate the above conclusion:

- Business environment uncertainty positively moderated the social supply Chain management-Firm Performance relationship (β= 0.176, ρ = 0.000).
- Business environment uncertainty positively moderated the environmental supply Chain management -Firm Performance relationship (β= 0.117, ρ = 0.000).
- Business environment uncertainty positively moderated the economic supply Chain management-Firm Performance relationship (β= 0.106, ρ = 0.000).

6.3.6 Other Conclusions

- Furthermore, the study concludes that there is a direct positive relationship between business environment uncertainty and firm performance ($\beta = 0.201$, $p = 0.002$) and operational competitiveness and firm performance ($\beta = 0.197$, $p = 0.000$), based on the findings of the study.
- Firm age, size, and industry type, which were employed as control variables in this study, did not account for any significant variation in firm financial performance.
- Finally, based on the robustness test results, the study concludes that there is no statistically significant difference in firm performance outcomes when objective and subjective measures are used.

6.4 THEORETICAL CONTRIBUTIONS OF THE STUDY

While the findings above have facilitated the advancement of the study's primary objectives, the study also makes the following theoretical contribution. According to the political economy theory, which includes the stakeholder theory, institutional theory, and legitimacy theory, social, political, and institutional systems determine a firm's economic survival, the policies it adopts, and its strategies. The political system is concerned with the regulatory framework that governs a company's operations, the social system is concerned with both internal and external actors who tend to promote or otherwise influence a company's operations, and the institutional system is concerned with the various institutional frameworks that account for a company's behaviour both internally and externally. These three factors create an enabling business environment while also providing the necessary understanding of why activities like SSCM are carried out and their vital role in developing an economy. As a result, the political economy theory proposes that when an organisation adopts business strategies for economic advantages, such as Sustainable Supply Chain management practices, the organisation's political, social, and institutional setting be considered. This supports the existing literature's assertion that implementing Sustainable supply chain operations is economically justified (see Kirchoff, Omar & Fugate, 2016; Panigrahi et al, 2019; Rajeev et al., 2017; Roy, Schoenherr & Charan, 2018; Svensson, 2007; Yadav et al., 2020; Zailani et al., 2012). However, to minimise the inconsistencies identified in the existing SSCM literature, the influence of SSCM practices from a TBL stance on firm performance should be

analysed via the lens of institutional settings such as the country where the research is being done (Dai, Xie & Chu, 2021; Hong et al., 2020; Niesten et al., 2017; Sayed, Hendry & Bell, 2017). That is to say that the unique institutional context, such as the country of origin, the role of media, customers, stakeholders, social, political, cultural, and economic perspectives, as well as the institutional drivers of firm legitimacy, are all crucial factors in deciding whether to implement SSCM strategies, which eventually leads to improved performance. As much as the political economy theory has been used to demonstrate its applicability in other jurisdictions, as reiterated above, this study demonstrates the use of the political economy theory in explaining the role and effect of some mediating and moderating variables. The study focused on such variables as customer integration, supplier integration, internal integration, firm capabilities, business environment uncertainties and operational competitiveness in the SSCM-firm performance relationship in a developing country context.

6.4.1 Modified Conceptual Framework – A model for SSCM Practices

Following the findings of this study, a modified conceptual framework is presented. Figure 6.1 shows that the adoption and practices of SSCM have a positive direct effect on firm performance from a TBL standpoint. Social, environmental, and economic supply chain management has a positive effect on firm performance. That is, the integration of social, environmental, and economic activities has a direct positive effect on a firm's financial performance. From a TBL perspective, Firm Capabilities, which are components of an organisation's internal and external resources, mediate the relationship between SSCM practices and firm performance. Again, from a TBL standpoint, supply chain integration, specifically customer and internal integration, mediate the SSCM practices-firm performance relationship. Supply integration mediates the relationship between environmental and economic supply chain management and firm performance, but it does not mediate the social supply chain management practices-firm performance relationship. Business environment uncertainty and operational competitiveness moderates SSCM practices-firm performance from a TBL perspective. Firms using this model are advised to consider the strategic impact of SSCM practices, firm capabilities, supply chain integration, business environment uncertainty, and operational competitiveness in improving an organisation's financial fortunes.

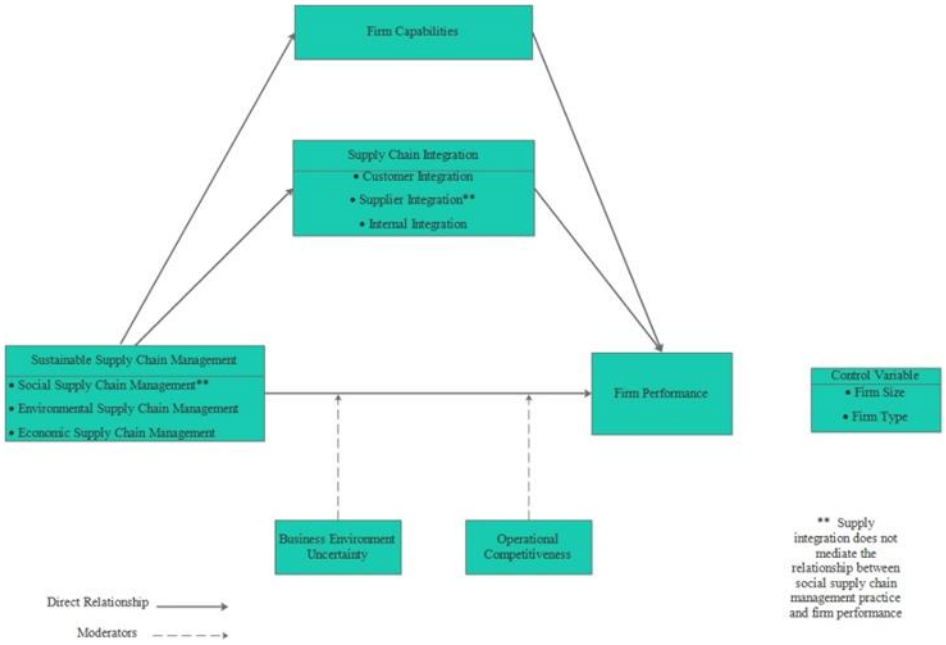


Figure 6.1: A modified conceptual framework

6.5 RECOMMENDATIONS

The findings of this study suggest the following strategies firms can consider improving their financial performance through the effective implementation of SSCM practices.

6.5.1 Training and Development of employees in SSCM

Management of various organisations should enrol their personnel in programs that would assist them in developing a better understanding of suppliers and consumers and the most effective ways to communicate with them. This would ensure that suppliers' and clients' inputs are meticulously documented and integrated into the company's SSCM activities, ultimately boosting the company's financial performance.

6.5.2 SSCM Strategic Systems and Policy

The management of firms should build strategic systems, infrastructures, and policies that keep them informed and updated on new and emerging trends in the SSCM industry. This would enable

the business to develop mechanisms that will help them stay ahead of the competition in their area, thereby effectively positioning them as the obvious choice for clients. This will result in the improvement of the financial performance of the business.

6.5.3 Invest in Strategic Partnerships

To improve the efficiency and effectiveness of their SSCM operations, the management of firms should form strategic alliances. This can be accomplished by employing the right human capital who are well-versed in the firm's area of operations or are eager to learn more about them and possess the requisite skills and knowledge required to advance the vision and mission of the firm. This will improve the firm's capabilities, which in turn will improve its financial performance.

6.5.4 Develop Administrative and Technological Infrastructure

Managers should develop both administrative and technological infrastructure to provide them with the necessary impetus for uncertainty management. These systems could include a detailed administrative layout on raw material supplies to avoid shortages and investment in IT software that keeps them up to date with market demands.

6.5.5 Implement Punitive Measures for SSCM Defaulters

Managers are admonished to impose appropriate sanctions on employees and suppliers who attempt to undermine or violate company rules and regulations, particularly those related to its SSCM operations.

6.6 IMPLICATIONS OF THE STUDY FOR MANAGEMENT

First, the study's research revealed a significant positive association between the adoption of SSCM practices from a TBL standpoint and firm performance. Managers and practitioners should be aware that, while there may be some extensive costs involved with the initial SSCM adoption and practice, as indicated by Sajjad, Eweje & Tappin, (2020), it will eventually improve the profitability of the focal firm. As a result, the initial capital investment should not be a hindrance to implementing SSCM practices.

Second, the study indicates a direct positive association between SSCM practices and firm performance, attained through several intervening variables such as supply chain integration (i.e., supplier integration, customer integration, internal integration) and firm capabilities. Managers should be cognisant that for their organisations to profiteer from SSCM adoptions and practices fully, the variables mentioned above must also be appropriately and efficiently integrated into their operations. These factors operate as a conduit, facilitating the SSCM practice - firm performance relationship from a TBL standpoint.

Third, the findings of this study reveal that when businesses operate in highly competitive and uncertain environments, customers, as major stakeholders, expect firms to demonstrate a comparable high level of flexibility that allows them to adjust to these circumstances. Consumers reward businesses that demonstrate this competence by remaining committed to their products. Managers should be mindful that their firms' ability to implement SSCM practices in a highly competitive and uncertain market is positively rewarded in terms of improved financial profitability, and should therefore not avoid such situations, but instead seek to establish an infrastructure that allows them to remain viable even in such challenging situations. Finally, managers are urged to invest in their firms' research and development departments in order to determine the best method for operationalising the aforementioned intervening variables. As a result, the firms will be able to realise the anticipated financial gains.

6.7 IMPLICATIONS OF THE STUDY FOR POLICY

For policymakers, the findings of this study demonstrate the financial benefits organisations can obtain from implementing SSCM principles; as a result, lawmakers are tasked with developing legislation that compels firms to incorporate sustainable practices into their operations. Such regulations would improve firms' financial performance and secure the conservation of society and the environment.

Additionally, a policy establishing incentive programs such as tax breaks and financial incentives should be made available to firms that can implement SSCM practices within a specific time frame. Such a policy would serve as a stimulus for organisations to embrace SSCM practices

6.8 LIMITATIONS OF THE STUDY AND AVENUES FOR FUTURE RESEARCH

While this study builds on previous empirical investigations into the effects of SSCM practices on firm performance, various additions to this line of research may be made to acquire a more profound knowledge of this relationship. The study's conclusions should be weighed against several limitations. First, the research model was estimated using cross-sectional data. This research model included moderators (operational competitiveness and business environmental uncertainty), mediators (consumer integration, internal integration, supplier integration, and firm capabilities), and control variables (firm age, industry type, and firm size). Cross-sectional data has been proven to be sufficient for explanatory research and is frequently used in research on SSCM and firm performance (Al-Odeh & Smallwood, 2012; Shahi et al., 2020; Touboulic & Walker, 2015). However, this study suggests that future studies should use longitudinal data to estimate future SSCM-firm performance models. This is because organisational responses to SSCM practice implementations, and the subsequent influence on firm performance, may take time to evolve; hence the use of longitudinal data could allow the researcher to investigate the effect of time in the SSCM – firm performance relationship.

Second, consistent with previous research (Das, 2018; Qi, Zhao & Sheu, 2011; Saruchera & Asante-Darko, 2021), this study collected data using a single line of respondents (i.e., senior executives). Despite applying appropriate procedural safeguards to minimise the incidence of common method bias, it may be impossible to eliminate it from data acquired from a single database (Podsakoff et al., 2012). As a result, future research, mainly focusing on large organisations, should collect data from various informants to obtain diverse views.

Third, the study examined the SSCM practices-firm performance relationship using four (4) mediator variables and two (2) moderating variables. Thus, future research should consider extending the current model by theorizing additional firm-level intervening and contingency factors, as Sharma, Sachdeva and Singh (2021) have recommended.

Finally, the study was conducted in Ghana, a developing country in sub-Saharan African. Ghana shares several characteristics with other developing African countries, including underdeveloped institutional structures and socioeconomic inequality (Famiyeh et al., 2019; Kwarteng et al., 2021), and thus provides an excellent context for validating the study's model and establishing the basis

for the generalizability of the findings to other emerging economies. While the Ghanaian context is appropriate for testing the proposed model, it may also be applicable in other countries due to institutional and contextual differences. Moreover, developing economies may have unique and varied contextual elements necessitating additional insight and theory development (Kwarteng et al., 2021). As a result, it will be interesting to observe how future research focuses on the performance implications of SSCM approaches by comparing data from a variety of emerging and developed nations. Finally, the concept of organisational performance is broad (Kaplan & Norton, 2001). While firm performance in this study was measured from a financial standpoint, it will be intriguing to see if future researchers can determine the effect of SSCM practices on firm performance from an operational and marketing perspective.

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APPENDICES

Appendix 1:

Data Collection Instrument



This research explores organisational behaviour concerning the practices of sustainable supply chain management. We have identified knowledgeable and experienced professionals like yourself because your views are of paramount importance to this study. The questionnaire will take less than 15 minutes to complete, and as a thank you, we are giving you the option to receive a report of the findings. You are kindly reminded that there are neither right nor wrong answers, and the questionnaire is not a review of individual employee performance. All responses will be treated anonymously. Respondents' email addresses and organisation names will be kept separate from other responses, and findings will not be reported in a way that makes the respondents identifiable. Hence, please answer honestly. Thank you in advance for participating; your co-operation is greatly appreciated. By continuing, you are consenting to participate.

SECTION A: FIRM BACKGROUND

1. Which of the following best describes your firm's industry?
☐ Service ☐ Mining/Extraction ☐ Agricultural/Agribusiness ☐ Manufacturing ☐ Other……

2. Which of the following sectors does your firm best fit in?
☐ Public sector ☐ Private sector (for-profit making) ☐ Private sector (not-for-profit making business)

3. If your firm is in the **private sector**, is it a family-owned business? ☐ Yes ☐ No ☐ Not sure

4. On average, how long has your firm existed? ……Years

5. Indicate the number of employees in your company?
☐ 1 - 5☐ 6 – 29 ☐ 30-99 ☐ 100 and More

6. Indicate your company's fixed assets in millions of US dollars?

☐ Less than 10 ☐ 11-25 ☐ 26-50 ☐ 51-75 ☐76-100 ☐ More than 100

SECTION B: RESPONDENT'S BACKGROUND

Kindly tell me about yourself in terms of
1. How long have you worked for this firm ☐ 0 to 2years ☐ 3 to 5 year's ☐ 6 to 8years ☐ 9years and more?
2. Education level ☐ Secondary school or related Certificate ☐ 1st Degree ☐ 2nd Degree or more
3. Number of years working in this firm
……Years
4. Managerial level ☐ first line (head of department/supervisor) ☐ Middle (e.g. manager) ☐ Top (e.g. MD)
5. Department ☐ Accounts/Finance ☐ Human Resource ☐ Marketing ☐ Operations ☐ IT
☐ Supply chain/logistics ☐ other……

SECTION C

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Environmentally Sustainable Supply Chain Management*		*Strongly Disagree*						*Strongly Agree*
SSCE1.	My company has a policy to lessen the environmental impact of its supply chain?	1	2	3	4	5	6	7
SSCE2.	My company uses an environmental criterion (e.g., ISO 14000, energy consumption) in the selection process for its suppliers or sourcing partners?	1	2	3	4	5	6	7
SSCE3.	My company terminates a partnership with a sourcing partner if environmental criteria are not met?	1	2	3	4	5	6	7
SSCE4.	My company monitors its suppliers' environmental performance?	1	2	3	4	5	6	7
SSCE5.	My company has a prescribed process embedded in its supply chain to lessen its overall environmental impact?	1	2	3	4	5	6	7
SSCE6.	My Company uses key performance indicators or a balanced scorecard to monitor the environmental impact of its supply chain?	1	2	3	4	5	6	7
SSCE7.	My company sets targets or objectives to be achieved for the environmental impact of its supply chain?	1	2	3	4	5	6	7
SSCE8.	My company is making progress towards achieving its objectives for the environmental impact of its supply chain?	1	2	3	4	5	6	7
SSCE9.	On occasions I have had doubts about my ability to succeed in life.	T	F					

Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Social Sustainable Supply Chain Management*		*Strongly Disagree*						*Strongly Agree*
SSCSO1.	My company has an incentive policy that ensures employee commitment?	1	2	3	4	5	6	7
SSCSO2.	My company has a strategy or policy to manage employee turnover.	1	2	3	4	5	6	7
SSCSO3.	My company possess a strategy for reducing employee absenteeism?	1	2	3	4	5	6	7
SSCSO4.	My company has a policy that measure key indicators of employee performance?	1	2	3	4	5	6	7
SSCSO5.	My company has a policy to manage health/safety accidents?	1	2	3	4	5	6	7
SSCSO6.	My company has an investment policy on health and safety?	1	2	3	4	5	6	7
SSCSO7.	My company has a policy that promote ethnic and cultural diversity.	1	2	3	4	5	6	7
SSCSO8.	My company has a way of measuring it recruitment cost?	1	2	3	4	5	6	7
SSCSO9.	My company has a policy on the require standards and conditions a supplier's site of operation needs to meet?	1	2	3	4	5	6	7
SSCSO10.	My Company has a policy on compliance with the law?	1	2	3	4	5	6	7
SSCSO11.	My company has a policy on how to strengthen and increase community's involvement with the company operations?	1	2	3	4	5	6	7
SSCSO12.	My company has a policy to measure key indicators of our corporate reputation and brand image?	1	2	3	4	5	6	7
SSCSO13.	My company has a policy on how customers are to be fairly treated?	1	2	3	4	5	6	7

SSCSO14.	I never make a long trip without checking the safety of my car.	T	F					
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Economic Sustainable Supply Chain Management*		*Strongly Disagree*						*Strongly Agree*
SSCECO1.	Our firm has a strategy for cost saving through the reduction of material use?	1	2	3	4	5	6	7
SSCECO2.	Our firm has a strategy for cost saving through the reduction in energy consumptions?	1	2	3	4	5	6	7
SSCECO3.	Our firm has a strategy for cost saving through cost saving through waste reduction?	1	2	3	4	5	6	7
SSCECO4.	Our firm has a strategy for cost saving through the reduction in pollution emission?	1	2	3	4	5	6	7
SSCECO5.	I have never deliberately said something that hurt someone's feelings	T	F					
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Competitive flexibility*		*Strongly Disagree*						*Strongly Agree*
F01.	Our products and services are quickly modified to meet the needs and requirements customers.	1	2	3	4	5	6	7
F02.	Our new products and services are quickly introduced into the market	1	2	3	4	5	6	7
F03.	I sometimes feel resentful when I don't get my way							
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Competitive Delivery*		*Strongly Disagree*						*Strongly Agree*
D01.	Our firm has an outstanding on-time delivery record to our customer.	1	2	3	4	5	6	7
D02.	Our firm has a reliable delivery track record with our customers	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Competitive Quality*		*Strongly Disagree*						*Strongly Agree*
Q01.	Our firm provides customers with high performing products that meet customer needs.	1	2	3	4	5	6	7
Q02.	Our firm produce consistently high-quality products with low defects.	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Competitive Cost*		*Strongly Disagree*						*Strongly Agree*
C01.	Our firm produce products at low costs.	1	2	3	4	5	6	7
C02.	Our firm offers prices are low as or lower than our competitors.	1	2	3	4	5	6	7
C03.	It is sometimes hard for me to go on with my work if I am not encouraged.							
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *How does your Organisation measure Firm Performance after the integration of Sustainable supply chain Management?*		*Strongly Disagree*						*Strongly Agree*
FP01.	There is an improvement in the market share of our firm's major products.	1	2	3	4	5	6	7
FP02.	There is an improvement in the growth rate of our firm's sales.	1	2	3	4	5	6	7
FP03.	There is an increase in the overall profitability of the firm.	1	2	3	4	5	6	7
FP04.	There is an increase in the return on invested capital of our firm.	1	2	3	4	5	6	7

Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** ***BUSINESS Environmental UNCERTAINTY***	*Strongly Disagree*						*Strongly Agree*
BUC01. The "market demand" for our company's products often fluctuates.	1	2	3	4	5	6	7
BUC02. The "product planning "for our company is often adjusted because of fluctuations in market demand.	1	2	3	4	5	6	7
BUC03. The "product supply" for our company is often adjusted because of fluctuations in market demand.	1	2	3	4	5	6	7
BUC04. The legal and regulatory framework for our company as well as in the country of operations keeps changing	1	2	3	4	5	6	7
BUC05. The "product design" for our company keeps changing due to demand	1	2	3	4	5	6	7
BUC06. The suppliers of our company consistently meet our requirements.	1	2	3	4	5	6	7
BUC07. The suppliers of our company consistently produce and supply us with raw materials of high quality.	1	2	3	4	5	6	7
BUC08. The technology in our industry changes rapidly.	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Supplier Integration*	*Strongly Disagree*						*Strongly Agree*
SI01. We have a high level of information exchange with our major suppliers through information networks.	1	2	3	4	5	6	7
SI02. We maintain close communication with suppliers about quality considerations and design specifications	1	2	3	4	5	6	7
SI03. We help our major suppliers to improve their process to better meet our needs.	1	2	3	4	5	6	7
SI04. We have a strategic partnership with our major suppliers.	1	2	3	4	5	6	7
SI05. We share our demand forecasts with our major suppliers.	1	2	3	4	5	6	7
SI06. We share our inventory levels with our major suppliers.	1	2	3	4	5	6	7
SI07. We believe many of our new product ideas have been made possible through technological breakthroughs with our supply chain partners.	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree***	*Strongly Disagree*						*Strongly Agree*
II01. We make use of real-time integration and connection among all internal functions of our organisation, from raw material management through production, shipping, and sales.	1	2	3	4	5	6	7
II02. We make use of cross functional teams in new product development.	1	2	3	4	5	6	7
II03. We make use of cross functional teams in process improvement.	1	2	3	4	5	6	7
II04. We make use of periodic interdepartmental meetings among internal functions.	1	2	3	4	5	6	7
II05. We make use of data integration among internal functions.							
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Customer Integration*	*Strongly Disagree*						*Strongly Agree*
CI01. Our customers give us feedback on our quality standards.	1	2	3	4	5	6	7
CI02. Our customers give us feedback on our delivery performance.							
CI03. Our customers give us feedback on our environmental performance.							
CI04. We strive to be highly responsive to our customers' needs	1	2	3	4	5	6	7
CI05. We frequently are in close contact with our customers	1	2	3	4	5	6	7

CI06.	Our major customer shares market information with us.	1	2	3	4	5	6	7
CI07.	We have a computerised system for our major customer's orders.	1	2	3	4	5	6	7
CI08.	We have a computerised system for our major customer's complaint.							
CI09.	We have a computerised system for our major customer's suggestions							
CI010.	Our major customer shares demand forecasts with us.	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Firm Strategic Capability*		*Strongly Disagree*						*Strongly Agree*
FCS01.	Our firm has a system that supports the achievement of key strategic objectives.	1	2	3	4	5	6	7
FCS02.	Our firm has a system that supports the prioritization of actions, projects and objectives.	1	2	3	4	5	6	7
FCS03.	Our firm has a system that provides feedback on the state of strategies and strategic direction.	1	2	3	4	5	6	7
FCS04.	Our firm has a system that provides feedback on operational processes.	1	2	3	4	5	6	7
FCS05.	Our firm has a system that ensures alignment of strategy and operations.	1	2	3	4	5	6	7
FCS06.	Our firm has a system that ensures adequate measures are in place for capital expenditure, budget allocation and financial support to projects.	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Firm Operational Capability*		*Strongly Disagree*						*Strongly Agree*
FCO01.	Our firm has a strategy that increase the innovation of working practices.	1	2	3	4	5	6	7
FCO02.	Our firm has a strategy that encourages the development of integrated solutions.	1	2	3	4	5	6	7
FCO03.	Our firm has a strategy that promote operational improvements.	1	2	3	4	5	6	7
FCO04.	Our firm has a strategy that encourages increase productivity	1	2	3	4	5	6	7
FCO05.	Our firm has a strategy that seeks to improve employee performance.	1	2	3	4	5	6	7
Please indicate the extent to which you agree or disagree with the following statements ***SCALE: 1=Strongly Disagree*** *to* ***7=Strongly Agree*** *Firm External Stakeholder Relations Capability*		*Strongly Disagree*						*Strongly Agree*
FESRCO01.	Our firm has a strategy that ensures the firm, and its products are leaders in the market.	1	2	3	4	5	6	7
FESRCO02.	Our firm has a strategy for maintaining a healthy relationship with our customers.	1	2	3	4	5	6	7
FESRCO03.	Our firm has a strategy for maintaining a healthy relationship with suppliers.	1	2	3	4	5	6	7
FESRCO04.	Our firm has a strategy for maintaining a healthy relationship with regulators or government institutions	1	2	3	4	5	6	7

Appendix 2:

Scale Items for Sustainable supply chain management (Environmental, Social and Economic supply chain management

Construct	Measurement Items	Item Sources
Environmental Supply Chain Management Practices	1. Policy to lessen the environmental impact of its supply chain. 2. Environmental criterion (e.g., ISO 14000, energy consumption) a factor in the selection of suppliers. 3. Terminates a partnership with sourcing partners if environmental criteria are not met. 4. Suppliers' environmental performance are monitored. 5. Prescribed process embedded in supply chain to lessen its overall environmental impact. 6. Performance indicators or a balanced scorecard to monitor the environmental impact of supply chain. 7. Targets or objectives are set to be achieved for the environmental impact of its supply chain. 8. Progress is being made towards achieving objectives for the environmental impact of supply chain.	Banerjee, Iyer and Kashyap (2003) Zhu, Sarkis, Lai and Geng (2008) Ortas, Moneva and Álvarez (2014)
Social Supply Chain Management practices	1. An incentive policy that ensures employee commitment. 2. Strategy or policy to manage employee turnover.	Chen et al. (2017) Paulraj, Chen and Blome (2017)

	3. Strategy for reducing employee absenteeism. 4. A policy that measures key indicators of employee performance. 5. A policy to manage health/safety accidents. 6. An investment policy on health and safety. 7. A policy that promotes ethnic and cultural diversity. 8. Measuring of recruitment cost. 9. A policy on the require standards and conditions a supplier's site of operation needs to meet. 10. A policy on compliance with the law. 11. A policy on how to strengthen and increase community's involvement with the company operations. 12. A policy to measure key indicators of our corporate reputation and brand image. 13. A policy on how customers are to be fairly treated	
Economic Supply Chain Management Practices	1. A strategy for cost saving through the reduction of material use. 2. A strategy for cost saving through the reduction in energy consumption. 3. A strategy for cost saving through cost saving through waste reduction. 4. A strategy for cost saving through the reduction in pollution emission	Banerjee et al. (2003) Zhu et al. (2013) White (1996) Mefford (2011)

Appendix 3:

Scale Items for Firm Performance

Construct and Definition	Measurement Items	Item Sources
Firm Performance	1. Improvement in the market share of our firm's major products. 2. Improvement in the growth rate of our firm's sales. 3. Increase in the overall profitability of the firm. 4. Increase in the return on invested capital of our firm	Amoako-Gyampah et al. (2020) Qrunfleh and Tarafdar (2013) Walker et al. (2014)

Appendix 4:

Scale Items for Operational Competitiveness

Construct and Definition	Measurement Items	Item Sources
Competitive Flexibility	1. Products and services are quickly modified to meet the needs and requirements customers. 2. New products and services are quickly introduced into the market 3. Firm responds quickly to changes in market demand. 4. Firm welcomes new product innovations.	Flynn, Huo and Zhao (2010)
Competitive Delivery	1. An outstanding on-time delivery record to our customer. 2. A reliable delivery track record with our customers. 3. A short lead time for fulfilling customers' orders.	Wong, Boon-Itt and Wong (2011) Flynn et al. (2010)
Competitive Quality	1. Firm provides customers with high performing products that meet customer needs. 2. Firm produces consistently high-quality products with low defects.	Wong et al. (2011)
Competitive Cost	1. Products are produced at low costs. 2. Firm offers prices as low as or lower than our competitors.	Wong et al. (2011)

Appendix 5:

Scale Items for Business Environment Uncertainty

Construct and Definition	Measurement Items	Item Sources
Business Environment Uncertainty	1. Market demand for our company's products often fluctuates. 2. Product planning for our company is often adjusted because of fluctuations in market demand. 3. Product supply for our company is often adjusted because of fluctuations in market demand. 4. Legal and regulatory framework for our company as well as in the country of operations keeps changing. 5. "Product design" for our company keeps changing due to demand. 6. Suppliers of our company consistently meet our requirements. 7. Suppliers of our company consistently produce and supply us with raw materials of high quality. 8. technology in our industry changes	Wong, Lai and Ngai (2009) Chang et al. (2019) Slater and Narver (1994) Germain, Dröge and Daugherty (1994)

Appendix 6:

Scale Items for Supply Chain Integration

Construct and Definition	Measurement Items	Item Sources
Supplier Integration	1. High level of information exchange with our major suppliers through information networks. 2. Maintain close communication with suppliers about quality considerations and design specifications. 3. Suppliers to improve their process to better meet our needs 4. Strategic partnership with our major suppliers. 5. Demand forecasts with our major suppliers. 6. Inventory levels are monitored by major suppliers. 7. New product ideas have been made possible through technological breakthroughs with our supply chain partners.	Koufteros, Cheng and Lai (2007) Koufteros, Vonderembse and Jayaram (2005) Yu, Jacobs, Salisbury and Enns (2013) Amoako-Gyampah et al. (2020) Flynn et al. (2010)
Internal Integration	1. Use of real-time integration and connection among all internal functions of our organisation. 2. Use of cross functional teams in new product development. 3. Use of cross functional teams in process improvement.	Flynn et al. (2010) Koufteros et al. (2005) Yu et al. (2013)

	4. Use of periodic interdepartmental meetings among internal functions. 5. Use of data integration among internal functions.	
Customer Integration	1. Customers give us feedback on our quality standards. 2. Customers give us feedback on our delivery performance. 3. Customers give us feedback on our environmental performance. 4. Highly responsive to our customers' needs. 5. Frequently in close contact with our customers. 6. Frequently in close contact with our customers. 7. Computerised system for our major customer's orders. 8. Computerised system for our major customer's complaints. 9. Computerised system for our major customer's suggestions. 10. Major customers share demand forecasts with us.	Koufteros et al. (2005) Koufteros et al. (2007) Flynn et al. (2010) Yu et al. (2013)

Appendix 7:

Scale Items for Firm Capabilities

Construct and Definition	Measurement Items	Item Sources
Firm Operational Capability	1. Strategy that increases the innovation of working practices. 2. Strategy that encourages the development of integrated solutions. 3. Strategy that promotes operational improvements. 4. Strategy that encourages increases in productivity. 5. Strategy that seeks to improve employee performance.	Rehman et al. (2019) Koufteros et al. (2014)
Firm Strategic Capability	1. System that supports the achievement of key strategic objectives. 2. System that supports the prioritization of actions, projects and objectives. 3. System that provides feedback on the state of strategies and strategic direction. 4. System that provides feedback on operational processes. 5. System that ensures adequate measures are in place for capital expenditure, budget allocation and financial support to projects.	Koufteros et al. (2014) Rehman et al. (2019)
Firm External Stakeholder Relations Capability	1. Strategy that ensures the firm and its products are leaders in the market. 2. Strategy for maintaining a healthy relationship with customers. 3. Strategy for maintaining a healthy relationship with suppliers.	Rehman et al. (2019) Koufteros et al. (2014)

Appendix 8:

Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Asante-Darko

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H20/09/01**
PROJECT TITLE	Sustainable supply chain management and firm performance in Ghana: Examining the mediating and moderating factors
INVESTIGATOR(S)	Mr D Asante-Darko
SCHOOL/DEPARTMENT	Business School/
DATE CONSIDERED	18 September 2020
DECISION OF THE COMMITTEE	Approved Risk Level: Minimal
EXPIRY DATE	22 October 2023

DATE 23 October 2020 **CHAIRPERSON** (Professor J Knight)

cc: Supervisor : Dr F Saruchera

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to completion of a yearly progress report.

Signature Date 23 / 09 / 2020

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix 9:

Confirmation of Proof-editing

EDITING CONFIRMATION

To whom it may concern:

This memo serves to confirm that the manuscript/research project detailed below has been language-edited and proof-read.

Best Regards,

-IETS-

IET Innocent *(Cert. Lang. Ed.)*
Language Editor
+27671878453

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Manuscript Title:

Sustainable Supply Chain Management and Firm Performance in Ghana: Examining the Mediating and Moderating Factors

Author:

Disraeli Asante-Darko

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