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EXAMINING THE MEDIATING ROLE OF COMPETITIVE ADVANTAGE ON THE RELATIONSHIP BETWEEN GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND FIRM PERFORMANCE: EVIDENCE FROM THE PUBLIC SECTOR IN GHANA

BY

MAVIS ARTHUR

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DECLARATION

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

Arthur, Mavis (PG9450221)	…….	……..
Student & ID	**Signature**	**Date**

Certified by

Dr. Samuel Bruce Rockson	…….	……..
Supervisor	**Signature**	**Date**

Certified by

Prof. David Asamoah	…….	……..
Head of Department	**Signature**	**Date**

ABSTRACT

The mediating role of green supply chain management (GSCM) on the relationship between green supply chain management practices and organisational performance cannot be overemphasised. As such, conducting a study on how GSCM mediates the relationship between green supply chain management practices and organisational performance was relevant. Therefore, the study selected some firms in the Sekondi-Takoradi metropolis in the Western region of. A sample of 100 respondents was selected out of which a response rate of 96% was achieved. The findings revealed that there is high extent of green supply chain management practices firms within the Sekondi-Takoradi metropolis. From the findings, it was found out that only green purchasing had a positive and significant effect on organisational performance. Again, it was found that green purchasing had a positive and significant effect on green production as well as reverse logistics whereas exgreen purchasing practices had a positive and significant effect on organisational performance. Though none of the GSCM practices had a significant effect on organisational performance, the mediation analysis using the Sobel Test revealed that ecological design mediates the relationship between green purchasing practices and organisational performance whereas green production mediates the relationship between exgreen purchasing practices and organisational performance. It is recommended for firms to concentrate on providing education on green purchasing on the environment. By so doing, it would have an effect on their GSCM and organisational performance.

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DEDICATION

This work is dedicated to my sister, Miss Augustina Essouman, of blessed memory

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The concept of supply chain management has gained massive attention in research for the past two decades; however, green supply chain management or sustainable supply chain management research and interest have only come more into the fore in the last decade (Suryanto *et al*., 2018; Vijayvargy *et al*., 2017; Mitra and Datta, 2014). Since, then sustainability and green environment issues have emerged and become key competitive priorities for organisations aside cost, quality, delivery, flexibility and innovation which are indicators of operational performance of organisations (Çankaya and Sezen, 2019; Zaid *et al*., 2018; Younis *et al*., 2016; Krause *et al*., 2009).

The interest in green supply chain management is mirrored in the increasing interest in the environment and climate change and the efforts by governments and businesses across the world to minimise their impact to the organisation (Vijayvargy *et al*., 2017; Khan and Qianli, 2017; Laosirihongthong *et al*., 2013). Again, Sarkis (2012) argued that the integration of environmental issues and supply chain management (SCM) has become a thriving past two decades.

Hollos *et al*. (2012) with reference to the resource-based view (RBV) indicated that sustainability is one of the valuable, rare, inimitable and non-substitutable resource that may come as a competitive advantage to firms. As such, incorporating green concepts and sustainable supply chain management practices not only help organisations to gain competitive advantage but also build systems which are difficult to imitate, and been able to explore new markets and

opportunities to would add to their advantage (Çankaya and Sezen, 2019; Zaid *et al*., 2018; Younis *et al*., 2016; Hazen *et al*., 2011; Narasimhan and Schoenherr, 2012; Schoenherr, 2012).

There has been little doubt in a firm's commitment towards green supply chain management practices that lead to its sustainability performance improvement as extant literature rarely explains which particular environment practices or strategies are more effective in improving a firm's performance (Choi *et al*., 2017). This dilemma necessitated an investigation which Çankaya and Sezen (2019), Suryanto *et al*., (2018) Zaid *et al*., (2018) investigated effects of green supply chain management practices on sustainability performance, the correlates of developing green supply chain management practices: Firms level analysis in Malaysia and the impact of green human resource management and green supply chain management practices on sustainable performance: an empirical study.

In spite of the increasing popularity of the concept of green supply chain management (GSCM) in advanced countries, there are still several areas which require further research especially the aspect of greening the supply chain as identified as a key issue of sustainable supply chain management (Çankaya and Sezen, 2019; Zaid *et al*., 2018; Younis *et al*., 2016; Large and Thomsen, 2011; Kenneth *et al*., 2012). However, most studies of these nature are conducted in developed countries, but there have been little studies of GSCM in developing and emerging economies such as Ghana.

This study is set to conduct a survey to assess the extent of adoption of green supply chain management practices in Ghanaian businesses and explore the causal relationships between GSCM practices and sustainability performance. Though there has been much studies in this area in extant literature, the effect of GSCM practices on sustainability performance has not been

conclusive (Çankaya and Sezen, 2019; Zaid *et al*., 2018; Younis *et al*., 2016). As a contribution, this study seeks to ascertain the moderating role of green innovation on the relationship between green supply chain management practices and sustainability performance.

1.2 Problem Statement

Over the last decade, the planet earth has been bedevilled with harsh and cycle of unprecedented heat waves, droughts, floods, wildfire, global warming (Choi *et al*., 2017) with Ghana not excluded from these conditions. The rapid rise in carbon dioxide emitted into the atmosphere and its adverse effects is attributed to human activities including use of vehicles, waste disposal, product manufacturing and energy creation among others (Choi *et al*., 2017).

To deal with this menace, there have series of attempts made to examine the impact of environmental (environmental-friendly) management on sustainability performance, growth and return on investment (Green *et al*., 2012; Zhu *et al*., 2012). There has been a number of studies including Claver *et al*., (2007), Yang *et al*., (2011), Schrettle *et al*., (2014) and Lannelongue *et al*., (2015) which have all ascertained the link between green supply chain management (GSCM) practices and sustainability performance with varied findings. This study rather seeks identify some GSCM practices including green purchasing, ecological design, green production and reverse logistics and explore their extent of usage among firms in Ghana and their effect on performance.

Ghana presents many growth opportunities and challenges for firms (Adomako et al., 2018a; Banin et al., 2016; Boso et al., 2013a). Notwithstanding, numerous factors challenge the sustainability Ghana's growth prospects and the competitiveness of firms. Moreover, experts

continue to question the sustainability of Ghana's recent policies and programmes and its growth base (e.g., natural resources).

As such, this study examines the deployment of green supply chain management (GSCM) practices and its effect on sustainability performance in Ghana, an emerging economy. The implementation of GSCM practices is expected to result in improved sustainability performance. Similarly, the green innovation is also expected to lead to sustainability performance. However, extant literature is inconclusive, although it often indicates a positive relationship between green innovation and sustainability performance (Tang *et al*., 2016). For today's companies, implementing green practices is an essential factor (Shu *et al*., 2016). The need for a more sustainable approach to economic growth and environmental sustainability is motivated by resource constraints, increasingly sophisticated customers, social pressures and regulatory policies.

Over the past two decades, interest in green innovation and related principles (e.g., eco-innovation, sustainable innovation, and environmental innovation) has also grown within the management literature (Schiederig *et al*., 2011). Green innovation comprises product, process and managerial innovation. This includes changes in product design and production processes that save energy, reduce emissions, mitigate waste and reduce the negative effect of a business on the environment (Woo *et al*., 2014; Dangelico and Pujari, 2010; Chang, 2011; Chen, 2008; Chen *et al*., 2006).

Firms have various pressures to face in addition to public and regulatory environmental policies. These include the ability to boost the corporate brand, increase the growth of customer and supplier base to the growth of new markets and competitive advantage (Weng *et al*., 2015; Chen,

2008). Fundamentally, it remains unknown whether or when it is possible that the pursuit of green innovation is profitable for a business.

Recent research indicates that green innovation is likely to influence the degree to which green supply chain management practices will eventually be converted into sustainability performance (Przychodzen *et al*., 2016). There remains, however, uncertainty about the effect of green innovation on sustainability performance (Çankaya and Sezen, 2019). Based on the relevance of green innovation (Przychoden *et al*., 2016; Testa *et al*., 2016), this study proposes and analyses the moderating role of green innovation on the relationship between green supply chain management practices and sustainability performance of firms.

This study has adopted the resource-based view (RBV) and contingency theories to explore how green supply chain management practices and a firm's sustainability performance relationship is manifested when subject to the moderating role of green innovation. This research builds on the RBV and contingency theory, which suggests that improvement in sustainability performance (exogenous variable) is the result of the proper coordination with endogenous variables of a company (e.g., green supply chain management practices) (Tariq *et al*., 2019). As the conceptual framework of the study is underpinned by the RBV and contingency theories, this research seeks to find the independent role that green innovation has and how significantly it moderates the green supply chain management practices and firm's sustainability performance relationship.

1.3 Objectives of the Study

The general objective of the study is to assess the mediating role of competitive advantage on the relationship between green supply chain management and organisational performance: empirical

study of public sector firms in the Western region in Ghana. However, the specific objectives are as follows;

1. To examine the relationship between green supply chain management practices and organisational performance among public sector firms in the Western region in Ghana.
2. To assess the relationship between green supply chain management practices and competitive advantage among public sector firms in the Western region in Ghana.
3. To determine the effect of competitive advantage and organisational performance among public sector firms in the Western region in Ghana.
4. To examine the mediating effect of competitive advantage on the relationship between green supply chain management practices and organisational performance among public sector firms in the Western region in Ghana

1.4 Research Questions

From the specific objectives outlined in the previous section, the study seeks to find answers to the following research questions:

1. What is the relationship between green supply chain management practices and organisational performance among public sector firms in the Western region in Ghana?
2. What is the relationship between green supply chain management practices and competitive advantage among public sector firms in the Western region in Ghana?
3. What is the effect of competitive advantage and organisational performance among public sector firms in the Western region in Ghana?

4. What is the mediating effect of competitive advantage on the relationship between green supply chain management and organisational performance among public sector firms in the Western region in Ghana?

1.5 Justification of the Study

A study on the mediation effect of competitive advantage on the relationship between green supply chain management practices and organisational performance is relevant as it would provide the needed information for policy makers of business organisations in the country. The findings would contribute immensely for different stakeholders of the business arena in Ghana.

There are three reasons why this research study is relevant. First, it may be one of the few empirical studies in Ghana that attempts to confirm and affirm the results of previous research work by testing the various drivers or factors green supply chain management. Some scholars have argued that repeating previous research using different data set in a different setting adds value to the quality of operations management research (Singhal et al., 2008).

Second, the present research study seeks to capture the environmental impact on business performance in a comprehensive way. Scholars argued that the impact of green supply chain management practices and on business performance had been empirically investigated by a limited number of studies (Yook et al., 2017).

Third, this work makes a key contribution by examining the mediating role that competitive advantage plays on the relationship between green supply chain management practices and firm performance. This would be an attempt to fill the empirical gap in Ghana and the sub-region in terms of studies on green or sustainable procurement and mediation analysis of such on firm performance.

The study is to assess the mediation effect of competitive advantage on the relationship between green supply chain management practices and organisational performance in Ghana. Based on the findings of the study, the study seeks to recommend the incorporation of competitive advantage in the procurement process to achieve an effective implementation of green supply chain management practice thereby achieving green organizations in Ghana.

Research findings of the work will help to improve upon the environmental issues that bedevil the operations of businesses. It would also improve social well-being by reducing poverty and enhancing the standard of living. The economic benefit would also not be left out which would encompass the generation of income, cost reduction and transfer of knowledge and innovation. Effective green supply chain management practice will help the promoting transparency, fairness, efficiency, value for money etc. which are the objective of public procurement systems.

This study would also serve as a secondary source of information for other researchers. Thus, it would broaden the frontiers of learning and expand literature in the area of green supply chain management, green supply chain management and organisational performance.

1.6 Overview of Research Methodology

The study adopted an explanatory research design as it sought to test a research model. The main objective was to determine the extent of green supply chain management practices on organisational performance with green competitive advantage as a mediator. A quantitative approach was used since that seeks to measure a particular phenomenon and depicts the relationships the study seeks to test.

Green supply chain management practices are identified as the independent variables of the study whereas organisational performance is the dependent variable with competitive advantage

as the mediating variable. The conceptual model was tested in quantitative survey using questionnaire to gather data and test the relationships.

The study population constituted public sector firms in the Western region of Ghana. Purposive and convenience sampling techniques were used to select a sample of firms been represented by middle level managers in charge of their supply chain management activities. The data gathered were analysed quantitatively with the aid of relevant statistical tools such as frequency tables, measures of location and dispersion among others. Simple linear regression was adopted to test the relationships among the variables with the aid of SPSS software. Finally, the data was interpreted and summarized in order to draw conclusions and suggest some useful recommendations.

1.7 Scope of the Study

This study is limited to assess the effect green supply chain management practices on organisational performance through competitive advantage. The subjects of the study are top level management top procurement staff of public sector firms in the Western region of Ghana. Some of the organisations selected include educational sector, health sector, financial institutions, legal and revenue and local government in Ghana. However, because of limited resources and time constraints with respect to the researcher, only selected public sector firms in the Western region were contacted and selected for this study.

1.8 Limitations of the Study

For every study, there are a number of limitations encountered. For this study, the main limitation was availability of literature in Ghana and the Sub-Saharan sub region. As such, most of the adopted studies were adopted from advanced countries and applied to the Ghanaian context to determine whether similar or contradicting finding would be ascertained. Also, the

study was limited to only organisations in the Western region due to financial and time constraints with respect to the researcher. However, these limitations did not affect the quality of this study in terms of validity and reliability of the study.

1.9 Organization of the Study

This research work is organized into five (5) chapters. These are briefly described below:

Chapter One: This chapter covers the introduction, background of the study, and statement of the problem, objectives of the study, research questions, significance of the study, overview of methodology, scope of the study, limitations of the study and the organization of the study.

Chapter Two: The chapter two also contains the theoretical framework and literature review of the research. Thorough research concerning this study will be made through reading books that relate to this research; extracts from other related long essays, magazines, journals, the internet, and other relevant sources.

Chapter Three: The Methodology used in this research is presented under this chapter. The Methodology will concern the research design, population, sample size, sampling method, research instrument, analysis tools used and the profile of the organization. Questionnaires will be developed and sent to respondents in the organization to seek their view.

Chapter Four: This chapter discusses the data analysis and the research findings which will be a conclusive outcome of the findings. The questionnaires administered to the respondents will be critically discussed and analyzed.

Chapter Five: Chapter five is the concluding part of the study where the whole findings of the study will be summarized; make recommendations and drawn conclusion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This Chapter entails a scholarly review of extant literature related to the subject matter of the study. It reviews past studies done by different authors from Ghana, Africa and other developed nations in Europe, America and Asia from peer-reviewed journals. The review has been done in sub-sections including conceptual review, theoretical review and empirical review. It ends with the conceptual framework of the study.

2.2 Conceptual Review

This section reviews scholarly works that have been done in the past in relation to the key variable and concepts of the current study. As such, definitions and overview of concepts such as green supply chain management practices, supply chain management, competitive advantage and organisational performance have been reviewed under this section.

2.2.1 The Concept of Supply Chain Management

The concept of supply chain management (SCM) became known in business operations in the early 1990s. Before its recognition, the term “logistics” and “operations management” were popularly used and still some studies use the term SCM and Logistics Management interchangeably.

Chopra and Meindl (2007) define SC as the various direct and indirect stages involved in the process of meeting the requirement of customers. They argue that SC encompasses a number of elements including production, supplies, warehouse, transport, retails and customers. Peck (2005) defines SC as the network of organizations, which works by means of upstream and

downstream linkages throughout the processes of the organizational activities and results in the creation of value for the customers. According to Peck (2005), SCM is aimed at enhancing the competitiveness of companies and is achieved through the integration of both the internal and the external functions of companies. Hence, SCM is based on collaboration, trust, information and technology sharing and partnerships between the internal activities and that of the external activities of a company.

Otchere et al. (2013) adopted the definition by the Council of Supply Chain Management Professional (CSCMP) and defined SCM as a concept that integrates key business processes which involve the final consumer of a good or service, via authentic suppliers that provide product, services and information which provide value for customers and stakeholders. Otchere et al. (2013a) postulate that the main aim of SCM is to effectively improve the business processes of companies via effective coordination of the company's activities down the SC so that competitive advantages would be attained.

Mentzer et al. (2001) also describe SCM as a system, which strategically coordinates the traditional business function in an enterprise as well as the business function strategies within a company and across businesses down the SC which is aimed at boosting the overall long-term operation of the enterprise. The existence of SC in every organization is aimed at improving efficiency, and this is realized through the coordination of the SC within the main business functions within the organization.

2.2.2 Green Supply Chain Management

The main independent variable for this study was green supply chain management and it was necessary to conduct empirical review on key GSCM practices identified for this study.

Empirical literature reviews studies previously carried out on the dependent variables as well as the independent variable (Kumar, 2005). In this study, empirical literature will cover definitions and overview of green supply chain management concept.

Green supply chain management (GSCM) has emerged as an organizational philosophy to help companies and their partners achieve their goals, such as benefit and market share, reducing risks and impacts on the environment and improving environmental performance (Kuik et al., 2011; Zhu et al., 2008). GSCM can be defined as the incorporation into SCM of environmental considerations, including product design, material selection and outsourcing, production processes, customer delivery of the final product and management of the disposal of the product at the end of its life cycle (Srivastava, 2008).

GSCM practice implementation depends on multiple driving forces and internal and external stresses (Xu et al., 2013). For Hall (2000), one of the key factors affecting the implementation of GSCM is the external burden (on the organization). GSCM practice implementation depends on multiple driving forces and internal and external stresses (Xu et al., 2013). The external strain (on the organization) for Hall (2000) is one of the key factors influencing the execution of GSCM.

In this regard, Zhu and Sarkis (2007) found that firms facing higher regulatory pressures prefer to implement GSCM faster. There are, in turn, various obstacles to the introduction of GSCM, including the cost of implementation and technical barriers (Jalali Naini et al., 2011) and supplier qualifications (Thun and Muller, 2010).

In the management of goods and procedures, productivity from start to finish requires ensuring that environmental values are integrated and visible throughout the supply chain. GSCM practices should also include all supply chain operations, from green buying to integrated life cycle management, ending the reverse logistics cycle (Kuik et al., 2011; Rao and Holt, 2005; Srivastava, 2008; Blome et al., 2014). Talbot et al. (2007) underline that the supply chain of the closed loop is a necessary factor for achieving successful environmental performance.

In turn, Zhu et al. (2007) established that legal requirements and external market pressure are main factors for the Chinese supply chain's adoption of environmental practices. The primary emphasis of GSCM for Zhu et al. (2008) was on cost savings and environmental performance improvements.

Similarly, Kumar and Chandrakar (2012) talks about the application of green supply chain management and argues about the waste and emission produced by the companies. Further, Kumar et al. (2012) talks about sustainability in green supply chain management and introduces a simple model to help understand the reader for improvement in supply chain sustainability. Then Bhattacharjee (2015) explains the differences between the conventional supply chain management and green supply chain management in addition to the necessity of green supply chain management in the modern era.

Green Supply Chain Management is the practice of monitoring and improving environmental performance in the supply chain by integrating environmental thinking into a supply chain management throughout a product's life cycle (Muma et al., 2014). In fact, Ngugi and Nderitu (2014) have argued that waste and emissions caused by the supply chain have become the main sources of serious environmental problems including global warming and acid rain.

Organizations have a number of reasons for implementing these green supply chain policies, from reactive regulatory reasons, to proactive strategic and competitive advantage reasons (Li, 2011). From an overall environmental and organizational perspective, it is important to understand the situation and what issues exist in this field of study (Muma et al. 2014).

With increased pressures for green supply chain management, it is expected that enterprises will need to implement strategies to reduce the environmental, economic and social impacts of their products and services (Sannes, 2008). Success in addressing green supply chain system may provide new opportunities for competition, and new ways to add value to core business programs (Ngugi and Nderitu, 2014). Green supply adoption influence appears at all stages of a product's life cycle. Therefore, GSCM has emerged as an important new archetype for companies to achieve profit and market share goals in terms of lowering their environmental, economic and social risks and influence while raising their ecological efficiency (Erasmus and van Hock, 2000). It is generally perceived that green supply chain management promotes efficiency and synergy among business partners and their lead corporations, and helps to enhance environmental performance, minimize waste and achieve cost savings. This synergy is expected to enhance the corporate image, competitive advantage and marketing exposure (Li, 2011). On the global perspective, with the globalization of economies, supply chain management has become a promising area in achieving sustainability due to international environmental pressures and the concept of “green supply chain management (GSCM)”. The concept of supply chain environmental management has been observed as a recent and novel managerial principle. The novelty of this topic makes it difficult to truly determine contradictory and conflicting issues that could be considered true "debates". In fact, Sarkis, (2005) provides a comprehensive view of the state of research in this evolving topic, tracing the work of researchers who have investigated the

issues involving, the reasons for incorporating these practices and also the way they have been practiced in different organizations.

According to Sarkis (2005), the supply chain system should include purchasing and in- bound logistics, production, distribution and reverse logistics. This shows how firms focus on total quality management (TQM), with its emphasis on improving product quality, zero defects, customer satisfaction, training and employee empowerment, etc., and integrate it with environmental management resulting in total quality environmental management (TQEM) (Sharfman, 2009). Different researchers have defined Green Supply Chain Management from different perspectives, driving forces and purposes.

In this study, green supply chain management is divided into four phrases: green purchasing, ecological design, green production and reverse logistics.

2.2.2.1 Green Purchasing

One of the widely recognized aspects of GSCM practice is the introduction of green purchasing. A purchasing organisation with a green supply chain initiative, according to Lee (2008), would pay attention to the green practices of its suppliers, especially small and medium-sized enterprises. The buying firm can introduce collaborative activities that include training, the sharing of environmental information and joint research to ensure that suppliers achieve their environmental goals. A less collaborative approach may be followed by other organisations by simply requiring that their manufacturers implement environmental programs such as ISO 14001. External motivators and, in particular, customer pressure, are main drivers of the adoption of ISO 14001, according to Heras-Saizarbitoria et al. (2011) and Vachon (2007). The facilitation of recycling, reuse and cost reduction are other aspects of green buying that have

been addressed in the literature (Large and Thomsen, 2011; Diabat and Govindan, 2011). There is also evidence that some companies are following a compliance and evaluative approach to their suppliers' GSCM activities. This involves assessing suppliers based on environmental standards and requiring suppliers to create and maintain some form of Environmental Management System (EMS) (Sarkis, 2012; Large and Thomsen, 2011).

2.2.2.2 Ecological Design

Buyukozkan and Cifci (2012) established the value of eco-design when they reported that during design, about 80 percent of product-related environmental impacts can be affected. The activities of eco-design fall into two major categories: product-related design and design-related packaging. Al-Sheyadi et al. (2019) indicated that cost saving opportunities appear to be greater at the beginning of the supply chain with regard to product design and that buying organizations need to actively explore opportunities to use recycled and reused materials. Wu et al. (2011), however, emphasized that a product's environmental impacts arise at all stages of its life cycle and defined lifecycle evaluation as a widely used GSCMM attribute. Building on the theme of lifecycle impacts, Field and Sroufe (2007) observed that post-consumer waste is one of the sources of recycled materials, while Zhu et al. (2008) proposed that goods or their contents could be sold or reused. The implication is that it is important for organizations to ensure that their goods contain reusable or recyclable content. This study assessed the product-related eco-design by the proportion of the products of the focal company containing recycled or used materials, the use of lifecycle evaluation to determine the environmental load of the products, and the design of recyclable or reusable content in the products.

With regard to packaging-related eco-design, a discussion by Zhu et al. (2008) of GSCM practices proposed that companies and their suppliers should cooperate to ensure that their goods

use green packaging. Other studies have defined elements of green packaging to include ensuring that packaging is reusable and recyclable (Large and Thomsen, 2011), minimizing waste through eliminating packaging (Walker et al., 2008), and avoidance of hazardous material (Buyukozkan and Cifci, 2012).

2.2.2.4 Green Production

Industry greening refers mainly to the greening of industry, as pollutants are produced mainly during the production process of goods and services (Syakili, 2016). In order to achieve the optimal use of raw materials, water and energy conservation and to eliminate or mitigate emissions and waste generation, cleaner production, total quality environmental management, eco-efficiency and lean production are among the principles being applied right now (Cousins et al., 2019). Companies aim to incorporate environmental concerns into their product design, raw material choice, technology and even their suppliers and business partners by broadening the responsibility of manufacturers. In addition, the engagement and participation of workers in the company must also become a reality in order to make the greening of production a reality (Caniëls et al., 2016).

2.2.3.2 Reverse Logistics

A significant trend in GSCM has been identified as recognizing the strategic significance of reverse logistics and it has been shown that successful reverse logistics networks can provide lucrative economic benefits and enhance organizational competitiveness (Buyukozkan and Cifci, 2012; Murphy and Poist, 2003). Although the effect of reverse logistics on the greening of the supply chain is significant, other aspects of GSCM usually lag behind the creation of the reverse logistics feature (Xie and Breen, 2012). Moreover, according to Lau and Wang (2009), in most developing countries, the implementation of reverse logistics is in its infancy, while such

countries are increasingly responsible for a large proportion of world production. They further claimed that the majority of reverse logistics studies have been performed in developing countries.

Stock returns and remanufacturing (Olorunniwo and Li, 2010), recovery, recycling and reuse (Field and Sroufe, 2007) and redistribution (Field and Sroufe, 2007) include reverse logistics activities described in previous studies (Das, 2012). These approaches refer to finished products, their components and packaging materials (Das, 2012) (Field and Sroufe, 2007). In addition, reverse logistics activities refer to both the upstream and the downstream supply chain from the perspective of the focal organization in a supply chain (Lau and Wang, 2009).

2.2.3 Competitive Advantage

Competitive advantage is defined as the "capability of an organization to create a defensible position over its competitors" (Li et al., 2006). Tracey et al. (1999) argue that competitive advantage comprises distinctive competencies that set an organization apart from competitors, thus giving them an edge in the marketplace. They further add that it is an outcome of critical management decisions.

Competition is now considered a "war of movement" that depends on anticipating and quickly responding to changing market needs (Stalk et al., 1992). Competitive advantage emerges from the creation of superior competencies that are leveraged to create customer value and achieve cost and/or differentiation advantages, resulting in market share and profitability performance (Barney, 1991; Day & Wensley, 1988). Sustaining competitive advantage requires that firms set up barriers that make imitation difficult through continual investment to improve the advantage, making this a long-run cyclical process (Day & Wensley, 1988). Porter's approach to competitive advantage centres on a firm's ability to be a low cost producer in its industry, or to be unique in its industry in some aspects that are popularly valued by customers (Porter, 1991).

Most managers agree that cost and quality will continue to remain the competitive advantage dimensions of a firm (D'Souza, 2002). Wheelwright (1978) suggests cost, quality, dependability and speed of delivery as some of the critical competitive priorities for manufacturing. There is widespread acceptance of time to market as a source of competitive advantage (Holweg, 2005). Price/cost, quality, delivery dependability, and time to market have been consistently identified as important competitive capabilities (Fawcett & Smith, 1995; Vokurka et al., 2002; Tracey et al., 1999). 'Time' has been argued to be a dimension of competitive advantage in other research contributions (Stalk, 1988; Vesey, 1991; Handfield & Pannesi; 1995). In a research framework, Koufteros et al. (1997) describe the following five dimensions of competitive capabilities: competitive pricing, premium pricing, value- to-customer quality, dependable delivery, and product innovation. These dimensions were further described and utilized in other contributions as well (Koufteros et al., 2002, Li et al. 2006; Safizadeh et al., 1996; Vickery et al., 1999). Based on these studies, the five dimensions of competitive advantage most applicable to this study are:

1. Price/Cost - "The ability of an organization to compete against major competitors based on low price" (Li et al., 2006).
2. Quality- "The ability of an organization to offer product quality and performance that creates higher value for customers" (Koufteros, 1995).
3. Delivery Dependability- "The ability of an organization to provide on time, the type and volume of product required by customer(s)" (Li et al., 2006).
4. Product Innovation. "The ability of an organization to introduce new products and features in the market place" (Koufteros, 1995).

Time to Market. "The ability of an organization to introduce new products faster than major competitors" (Li et al., 2006)

2.2.4 Organizational Performance

The greening of procurement can yield higher profitability, which is an important reason why the topic has reached increased attention over the past decade (Theyel et al. 2001) and (Vachon and Klassen, 2006). For example, (Carter et al. 2000) shows that environmental purchasing can lead both to increased net income and lower costs, thus promoting improved firm performance. Despite of the cradle research on green purchasing focused on product suppliers, the interest has somewhat shifted to include services (Bjorklund, 2011). Carter and Rogers (2008) developed a framework for sustainable supply chain, and further identified its relationship with environmental, social, and economic related firm performance measures. Zhu et al. (2005) explored the factors that determine the firm performance, namely, environmental, operational and economic performance.

Further on, Bai et al. (2012) developed sustainable performance measures for supply chains with reference to supply chain operations reference model (SCOR) that integrates business and environmental performance. Bjorklund et al. (2012) developed a framework for performance measurement by considering environmental logistics and 'green' supply chain management. Recently, Digalwar et al. (2013) identified the performance measures of 'green' manufacturing practicing firms in Indian manufacturing firms, namely, top management commitment, knowledge management, employee training, green product and process design, employee empowerment, environmental, health and safety, supplier and materials management, production planning and control, quality, cost, customer environ- mental performance requirement, and customer responsiveness and company growth Zhu et al. (2005) explored the factors that determine the firm performance, namely, environmental, operational and economic performance. Bai et al. (2012) developed sustainable performance measures for supply chains with reference to

supply chain operations reference model (SCOR) that integrates business and environmental performance. Bjorklund et al. (2012) developed a framework for performance measurement by considering environmental logistics and 'green' supply chain management. Recently, Digalwar et al. (2013) identified the performance measures of 'green' manufacturing practicing firms in Indian manufacturing firms, namely, top management commitment, knowledge management, employee training, green product and process design, employee empowerment, environmental, health and safety, supplier and materials management, production planning and control, quality, cost, customer environ- mental performance requirement, and customer responsiveness and company growth (Sarkis et al., 2005).

2.3 Theoretical Review

A theory is a supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained. This section therefore presents theoretical foundations that underlie the importance of green supply chain management practices on organization performance. This study will be guide by the resource-based view theory.

2.3.1 Resource-Based View Theory (RBV)

A resource is the total means available to a company for increasing production or profit including plant, labour, raw materials and assets (Clark, 2007). Therefore, this theory is used to answers the question why do firms in the same industry vary systematically in performance over time? Or why do some firms persistently outperform others? According to Porter (1982) who came up with this ground breaking concept of the value chain to explain why some firms have

competitive advantage over others. According to RBV, it is because internal capabilities and resources yield competitive advantage where the firm emphasizes that the resource must be valuable, rare, imperfectly imitable, and non-substitutable (Miles and Covin, 2010).

These resources can consist of assets, capabilities, organizational processes or information that is classified into tangible and intangible resources (Dickinson et al. 2010). The theoretical mainstays are that resources that are entirely controlled or owned by the focal organization should be cultivated in order to enhance their contribution to the organization's competitive advantage in its industrial context (Hoffman and Sandilands, 2005). This theory links the research variable where we want to answer the question after adoption of green production is there any effect to the firm performance (Li and Geiser, 2009).

A resource is rare if the number of firms in competitive arena possessing a resource is less than the number of firms needed to generate perfect competition (Pfeffer, 2003) in this context in those factories that have adopted eco design which is unique in nature could better positioned than others (Hooley and Greenley, 2005) and answer the question whether after adoption of Eco-design there is change in firm's performance. While competences express what a firm is able to do well (Prahalad and Hamel, 1990), core competencies encompass what the firm is able to do better than others (Lawson and Lorenz, 1999). In the resource-based view, the allocation of resources to non-core activities leads to opportunity costs.

This is particularly important in green purchasing in the tea sector. There is compelling evidence suggesting that most green products, services and works tend to cost more than non-green counterparts (Bouwer et al., 2006; Brammer and Walker, 2011). This ensure that after adoption of green purchasing in tea factories, they create a positive impression to the mind of their

consumers thus customer loyalty. A firm is also able to utilize the resources to its advantage is able to gain a competitive advantage. According to Tea Development Authority, (2014) those tea factories near large rivers are able to generate hydroelectric power making the cost of production cheaper and green therefore ensuring positive.

2.4 Empirical Review

This section reviews extant studies on the relationship among the key variables of the study. Thus, the relationships among green supply chain management practices, green supply chain management practices and performance are reviewed were.

When the SCM activities evolve, policymakers work with businesses and their supply chain partners to reduce environmental issues with a view to eliminating waste, energy and emissions, mitigating environmental risks and increasing community goodwill. The collaboration will encourage shared learning for the environment (Zhu et al., 2007). Companies adopting GSCM activities benefitted from cost savings (conservation of resources, decreased energy and water consumption), enhanced public image and decreased environmental liability (Wisner et al., 2012). Bad environmental performance can have significant environmental impacts and contribute to monetary losses for businesses, such as lower stock prices. According to Flammer (2013), the eco-friendly behaviour of companies is directly linked to large stock price rises, whereas companies with an eco-harmful behaviour face stock price decline.

Sustainable development and the effect of industry on society and the environment are becoming increasingly of concern. This is clear from media patterns, industrial practices and scientific literature (Walker and Brammer, 2012). With global warming reaching unprecedented rates (Haseeb et al., 2019), the urgent need for scarce resources to be conserved and a healthy

environment has pushed governments and several companies worldwide to adopt environmentally friendly practices and goods (Salam, 2008).

Businesses are also prone to environmental impact, potentially drawing capital from socially conscious investors. Global warming mitigation will cause businesses to demonstrate significant dedication to green practices such as recycling, reuse and materials reduction. In actuality, businesses respond actively to social values for their long-term survival and competitiveness may gain a social identity and social credibility (Hoffman, 2000). In support, Uchida and Ferraro (2007) found that businesses can build a competitive advantage by integrating environmental and operational practices to improve competitiveness, access to new market, reinforce consumer relationships and gain competitive edge. As such, other businesses can also mimic environmental policies implemented by influential leading firms.

The subject of company success has changed to the global environmental demands of today. It previously concentrated primarily on the development of wealth through higher economic performance in terms of asset growth, liabilities and overall market strength, but now focuses on environmental and social performance while achieving high economic performance (Carter and Rogers, 2008). To achieve maximum productivity for sustainability. Sustainability is an organizational policy that is directly connected to social responsibility for corporations. Organizational sustainability requires the intersection of economic, environmental and cultural superiority to achieve a long-term competitive advantage (Thoo et al., 2011; Paulraj, 2011). This means companies will concentrate on long-term sustainability that could reduce environmental and social risks at the same time (Porter and Kramer, 2006). Therefore, GSCM practice is in a prime position to leverage economic, environmental and social sustainability performance.

However, very little academic work was done on firm performance and how green supply chain management practices impacts it especially in emerging economies like Ghana. There has been no study that looks at green supply chain management practices' mediating role on the relationship between environmental knowledge and organisational performance. This research is therefore a novelty that closes the literature gap.

2.5 Conceptual Framework of the Study

Conceptual framework refers to a pictorial representation showing the relation between independent variables and a study's dependent variables (Cajaiba-Santana, 2014). It is where the researcher in the analysis conceptualizes the relationship between various variables in a dramatic or graphical way. The conceptual structure for the whole research analysis is the basis on which. As such, the network of relationships among the variables under study and the direction of relationships is logically established, defined and elaborated. The conceptual framework can be said to be a model of how one makes sense of the relationships among several factors that were established as relevant to the research problem (Sekaran, 2003).

The research defines green supply chain management practices as the independent variable with organisational performance as the dependent variable for this analysis while the mediating variable is green supply chain management. This can be seen in Figure 2.1 below:

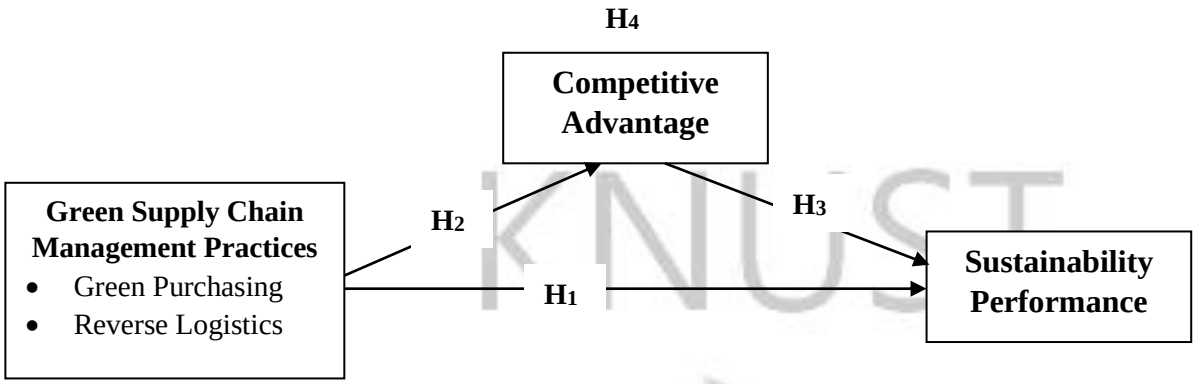

Figure 2.1: Conceptual Framework

Source: Researcher's Construct, 2022

2.5.1 Green supply chain management practices and Organisational performance

A number of studies addressing the direct link between GSCM practices and organizational performance have been conducted. These studies have established contradictory findings. Some found out positive relationships between GSCM practices and organizational performance (Rao and Holt, 2005; Chien and Shi, 2007; Zeng et al., 2010; Kirchoff, 2011). Others revealed that there is no significant relationship between such practices and organizational performance (Pullman et al., 2010; Testa and Irlado, 2010; Lee et al., 2012). Yet, others found a combination of positive and negative relationships because they were investigating the relationship between individual GSCM practices and organizational performance (Eltayeb, Zailani, and Ramayah, 2011; Mittra and Datta, 2013; Laosirihongthong et al., 2013). The lack of consensus on this link causes a research gap in the literature. The other gap arises from the fact that the studies have not looked at GSCM in its entirety as advocated by Kung et al., (2012) and Hart (1995). Moreover, the organizational performance variable for some studies (Rao and Holt, 2005; Chien and Shi, 2007; Pullman et al., 2010; Testa and Irlado, 2010) does not include both the financial and market component.

This study therefore proposed that the implementation of GSCM practices is positively related to organizational performance. In this light, the study's third hypothesis with four sub-hypotheses are formulated as follows;

The task of green purchasing is the participation of recycling, sourcing-reduction operations in the supply chain, according to Carter and Carter (1998). Green purchasing was further clarified by Min and Galle (2001) as the task of reducing waste sources promotes recycling activities without any device disruption. The effects of green purchasing on firm financial and environmental performance were examined by Carter et al. (2001). They found that pollution control costs were not only decreased, but also increased environmental efficiency and firm credibility in the sector due to the successful implementation of green buying activities.

Zailani al. (2015) conducted a study on the correlation between green purchasing and business performance. They discovered that eco-friendly buying has a direct and beneficial effect on company performance. Green procurement protects the world from dangerous and harmful products and also has a big effect on company results. Yang et al. (2014) divided eco-friendly purchasing into five main dimensions: supply chain management, management of design activities, environmental authentication, ecological authentication and management of the external environment have a clear and positive effect on corporate performance. They also say that it would have improved company results if businesses are better at embracing green buying. The implementation of green purchasing is a very reliable method for pollution control, and it also plays a role as a corner stone in the environmental and economic success of companies (Chen, 2005) and also generates a positive picture. The first sub-hypothesis is as follows;

H1a: Green purchasing has a significant and positive effect on firm performance.

One of the most widely used GSCM practices in the current literature is reverse logistics. For example, in their analysis of some logistics providers in Italy, Perotti et al. (2012) included reverse logistics along with other GSCM initiatives in order to evaluate the level of acceptance of such initiatives and their possible effect on different CP dimensions. Likewise, Diabat et al. (2013) used the method of Fuzzy TOPSIS to explore how reverse logistics can contribute to enhanced CP along with other GSCM initiatives. Similarly, reverse logistics was among the three Tattletale and Zailani (2009) GSCM activities intended to rank in terms of the levels of adoption in Malaysia. The last sub-hypothesis is as follows;

H1b: Reverse logistics has a significant and positive effect on firm performance.

2.5.2 Green supply chain management practices and Competitive Advantage

From the resource-based perspective, a firm's strategic orientation (e.g., green supply chain management practices) can be conceptualized as its valuable intangible resource that guides strategic practices, and consequently enhances performance (Aboelmaged, 2018). Empirically, prior marketing and business researchers also found evidence to support this orientation to strategy proposition. For instance, Murray, Gao, and Kotabe (2011) demonstrated that export ventures in China with higher levels of marketing orientation are more apt to undertake strategic activities in areas of pricing, new product development and marketing communication. Likewise, Chan (2010) also showed that both internal and exgreen purchasing practices serve as important determinants for firms' practices of environmental strategies at the strategic level and within the marketing functional area. In short, the above discussion provides both theoretical and empirical support for the positive influence of these two types of green supply chain management practices on corporate environmental practices such as GSCM. Despite the plausibility for both internal and exgreen purchasing practices to positively influence GSCM, the fact that these two

orientations originate from two different sources (i.e., internal vs. external) suggests that their respective influence on GSCM may be derived from different pathways.

Regarding green purchasing practices, organizational learning theory suggests that its influence on GSCM is largely attributed to intra-organizational learning and knowledge sharing among firm members. From this perspective, green purchasing practices can be conceived as part of the core corporate values and beliefs of a firm. It is often initiated by corporate leaders out of their own pro- environmental ideology. Owing to the exhortations of these leaders, this personal ideology will eventually be fused throughout the entire firm (Dickel et al., 2018; Magon et al., 2018). In short, the above analysis suggests that green purchasing practices will help firm members develop a collective consciousness of the importance of ecologically responsible operations, and eventually motivate them to seek ways to minimize environmental impacts of these operations (Banerjee et al., 2003).

As regards exgreen purchasing practices, its influence can be best explained by institutional theory. According to this theory, firms need to tackle different constraints imposed by various important institutions (Dickel et al., 2018). If firms operate within the constraints permitted by these institutions, they will enhance their stability and legitimacy, and ultimately the likelihood of survival (Magon et al., 2018). In environmental management research, these institutions can further be construed as salient external stakeholders that impose formal (e.g., regulations) or informal (e.g., norms) rules on how firms should manage their relationship with the natural environment (Banerjee, 2001). From this perspective, it is likely that managers who perceive a strong need to respond to environmental demands of salient stakeholders will be more inclined to engage in pro-environmental practices (e.g., GSCM) to cope with these demands. As this managerial perception, in turn, falls into the definition of Banerjee's (2001) exgreen purchasing

practices, it is thus probable that this orientation exerts a positive impact on GSCM. Taken together, the above discussion suggests the following hypotheses:

H2a: Green purchasing has a positive and significant relationship with competitive advantage.

H2b: Reverse logistics has a positive and significant relationship with competitive advantage.

2.5.3 Competitive Advantage and Organisational Performance

Environmental management is a general strategy that businesses can use to enhance their sustainability performance. By successfully implementing environmental programs, organizations can enhance the value of their core business programs (Hansman and Claudia, 2001). By enhancing their firm performance, businesses can also improve their green corporate image, which in turn helps them gain a competitive edge and access to new markets (Chen, 2008). In their study of North American businesses, Vachon and Klassen (2008) found a link between sustainability performance and competitive advantage. Therefore, this study will expand on earlier research into the public sector in Ghana and gather further empirical data to determine whether there is in fact a relationship between competitive advantage and firm performance. Therefore, the following hypothesis is proposed;

H3: Competitive advantage has a significant and positive effect on firm performance.

2.5.4 The Mediating Role of Competitive Advantage on the Relationship between Green supply chain management practices and Organizational Performance

According to the resource-based approach, organizations' internal resources and capabilities give them a competitive advantage (Peteraf, 1993; Wernerfelt, 1984). This perspective contends that enterprises can gain a competitive edge thanks to the resources' rarity, value, imperfect imitable, and non-substitutable qualities (Barney, 1991). Being one of the original proponents of the

resource-based perspective, Hart (1995) asserts that such capacities as pollution prevention, sustainable development, and the generation of environmental issue solutions give the company a competitive edge. Therefore, it can be said that green innovation is a unique skill that gives service businesses a competitive edge (Berchicci & Bodewes, 2005; Chang, 2011; Chen, 2008). Through green innovation, service businesses could benefit from distinction and reduced costs. Green innovation has the potential to boost profitability and give services companies a competitive edge. In reality, service organizations can create distinctive products by using green innovation to improve the product's style and quality, which may allow them to differentiate themselves from their competitors (Shrivastava, 1995). As a result, service companies may raise their prices for their services while still making a profit. However, by ensuring that resource use is avoided, energy consumption is decreased, waste is recycled, and materials are conserved, green innovation may also lead to lower prices (Eiadat, Kelly, Roche, & Eyadat, 2008; Hart, 1995). As a result, green innovation lowers costs and gives companies a competitive advantage (Chang, 2011). Based on the arguments advanced above, the following hypothesis is posited:

H4: Competitive advantage mediates the relationship between green supply chain management practices and sustainability performance

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the methodology and methodological approach adopted for conducting the research. The chapter involves research design, study population, study population, sample

size and sampling methods, data sources, data collecting tools, data interpretation, data validity and reliability as well as ethical concern. The next sub-sections explain how each sub-section has been outlined and elucidated.

3.2 Research Design

Research design refers to the overall strategy or roadmap for undertaking a study in relation to relevant and realistic research within the conceptual framework (Creswell, 2014). The study design offers an overview of what data type to collect and how to interpret the data. The approach employed includes systematic analysis of a specific contemporary phenomenon using a particular evidence within its real-life context.

The motive behind the choice of this research design was that a quantitative approach to data collection and analysis was needed in the study. A survey research offers the opportunity for researchers to check the relationships among the variables under study. Another explanation is that to some degree the researcher has some influence over the choice of variables and questions to be examined.

3.3 Population of the Study

Research population refers to the total number of all units of the phenomenon to be studied that occurs in the research field. This applies to the focus population which would provide information for analysis studies. Research population, according to Cooper and Schindler (2003), refers to a list of elements from which the sample is basically drawn. The population for this analysis consisted of all employees including management and all workers of selected public sector firms in the Western region. These include middle-line managers who are in charge of logistics, supply chain, procurement, operations, warehouse, stores, among others. Their responses represented their respective.

3.4 Sampling Techniques and Sample Size

According to Saunders et al. (2009), sampling is defined as the sample collected from a population that allows data collection in the context of interest and is used to estimate population boundaries. A sample is often part of a population chosen for an experiment to prepare appropriate data on the technique of collecting a representative sample known as sampling.

3.4.1 Sampling Techniques

Because of budget and time limitations it was impracticable to gather data from the entire population, a sample was targeted. The researcher used the sampling methods purposeful and convenient for the analysis. The purposeful approach was used to identify management and senior management respondents that the researcher believes to have in-depth knowledge of their respective organizations' procurement management processes. Finally, the convenience sampling approach was also used to identify respondents who were eligible to take part in the study and were able to. These two approaches were used to access the data required to attain the research objectives.

3.4.2 Sample Size

Sample size is an important feature of any research work where the aim is to make inferences from a sample about a population. In practice, the sample size used in a study is calculated at the cost of gathering data and the need for appropriate and critical information to help efficiently achieve the desired objective. Fraenkel and Wallen (2003) stress that a sample size should not be too large or too small to obtain the necessary data at a lower cost and within a defined timeframe which would make the study credible and reliable.

Taking this theory into account, a convenient sampling approach was used to select the sample of one hundred (100) respondents based on cost and were presented with the questionnaires to

express their opinions. For multivariate analysis, a sample size of at least 100 is appropriate to run a model of less than five (5) variables (Hair et al., 2016). The sample size constituents included executives, senior staff and junior staff of selected public sector firms in the Western region.

3.5 Data Collection Method

The research used two key sources of procedure for data collection. Data had been compiled from both primary and secondary sources. A combination of both primary and secondary data sources provides a wide variety of accurate data and helped to establish the accuracy and reliability of the conclusions and recommendations made.

3.5.1 Primary Data

This is the type of data that the researcher has specifically obtained for the investigation at hand. The primary data sources for this study were derived from information collected directly from selected public sector firms' employees (managers and workers) via questionnaires that were administered in person or by mail.

3.6 Data Collection Tools

The researcher used the questionnaire as the principal instrument for data collection as part of the research activities. The selected public sector firms in the western region produced a standard questionnaire for the employees (management and workers). The items used to quantify the various constructs in the questionnaire were adapted from past studies to reflect green supply chain management. The questionnaire items were adopted in the Chan et al. (2012) research to measure the independent variable, whereas the Mitra and Datta (2013) studies helped measure dependent variable. The mediating variable with four dimensions were measured from several studies including Zhu et al. (2008a); Zhu et al. (2008b); Testa & Irlado (2010); Diabat &

Govindan (2011); and Laosirihongthong et al. (2013. These have been shown in the table below. The data gathered from the questionnaires were analyzed and, based on the study, the researcher then generated conclusions and findings.

Table 3.1: Variables, Types and Sources of Measures

Variable	Type	Number of Items	Sources
Green Supply Chain Management • Green Purchasing • Reverse Logistics		 5 5	Zhu et al. (2008a); Zhu et al. (2008b); Testa & Irlado (2010); Diabat & Govindan (2011); and Laosirihongthong et al. (2013).
Competitive Advantage	Mediating	8	Talaja et al. (2017); Li et al. (2006)
Organisational Performance	Dependent	10	Mitra and Datta (2013)

Source: Author's Construct, 2022

3.7 Data Analysis

The data collected were analyzed using basic statistics, such as a table for the frequency distribution. With the aid of Statistical Package for Social Sciences (SPSS) and Microsoft Excel software, tables and figures were created. As for the SPSS program, all the answers to the closing questions were fed into the SPSS program for data processing and analysis. The machine then provided the measured data (output) in the form of tables and figures for the frequency. For the test of validity (Exploratory Factor Analysis) and model tests, using SPSS software was employed. The above method was adopted because of its suitability to adequately describe the results so that very specific and appropriate observations, suggestions and conclusions can be drawn from the researchers. Correlation was used to identify the relationship between various performance variables. The data were also presented in line with the set objectives of the study.

From these, appropriate conclusions and recommendations were made from the findings of the research.

3.8 Data Validity and Reliability

Validity of data is data accuracy and reasonableness. For the above tasks the data requirement was collected from both primary and secondary data. The researcher had established the survey sample frame. This was to ensure the adopted method was reliable, true and consistent. Later, careful attention was paid to the method of data entry to ensure accuracy of the data method. Validity is data consistency, and reasonableness. Errors in data validity are popular so careful attention was paid to the data entry procedure.

3.9 Ethical Consideration

There was the need to ensure that the study did not contravene the ethical issues. Hence, the following measures were taken:

The research questions were presented in such a way as to not cause discomfort and humiliation to the research participants. The respondents from selected Western Area organizations were assured of their absolute confidentiality with respect to the information given. The data collected have been handled confidentially. Those who took part in the study were not pressured but volunteered to. The respondents' permission was sought before they took part in the study. The researcher practiced a great deal of caution and objectivity as much as possible during the study period.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the analysis of the field data collected and interpreted to answer the research questions for this study. The findings were discussed under the following headings in

line with the objectives of the study: demographics, draw implications for the firms. The result was presented in the form of frequency and distribution tables using Statistical Package for Social Sciences (SPSS) version 20 and Microsoft Excel 2016 software.

4.2 Response Rate

Out of the one hundred (100) questionnaires administered, 96 were returned representing 96% response rate. The response rate can be described as very good and this might mean that respondents found the questions quite convenient and easy to interpret. In all, only four (4) questionnaires, representing 4% were returned either unanswered or partially answered. The non-response was due to the following problems: time limit and ineligibility to respond.

4.3 Demographic Information of Respondents

The respondents for the study included key staffs of selected public sector firms in the Sekondi-Takoradi metropolis. The details of their demographic characteristics are shown in Table 4.1 below;

Table 4.1 Breakdown of Respondents' Demographics

Demography	**Categories**	**n**	**%**
Gender of Respondents	Male	65	67.7%
	Female	31	32.3%
	Total	**96**	**100.0%**
Age of Respondents	Less than 30 years	12	12.5%

Respondents' Number of Years Worked	30 - 40 years	49	51.0%
	41 - 50 years	23	24.0%
	51 years and above	12	12.5%
	Total	**96**	**100.0%**
	Less than 1 year	2	2.1%
	1 - 3 years	24	25.5%
	4 - 6 years	16	17.0%
	7 - 9 years	36	38.3%
	10 years and above	16	17.0%
	Total	**96**	**100.0%**
Educational Level of Respondents	Degree	51	53.1%
	Masters	41	42.7%
	Other	4	4.2%
	Total	**96**	**100.0%**
Existence of a transport/logistic/supply chain/distribution department	Yes	86	91.5%
	No	8	8.5%
	Total	**96**	**100.0%**

	Min	**Max**	**Mean**	**Std. Dev**
Number of Employees in the firm	5	500	70.39	64.01

Source: Field Survey, 2023

From Table 4.1, it could be seen that the selected key staffs of selected public sector firms for this study is dominated by males with 65 (67.7%) of respondents who are females and the rest 31 (32.3%) who were females.

With the ages of the respondents, it was realised that majority (n=49, 51%) were from 31 – 40 years, followed by those between 41 and 50 years (n=23, 24.0%), then either those below 30 years or those above 50 years (n=12, 12.5%).

With their years of working at their respective firms, it was realised that respondents have occupied their positions for 7 – 9 years, 1 – 3 years and 4 – 6 years representing 38.3%, 25.5% and 17.0% of responses respectively.

In terms of the number of their education qualification, it was realised that respondents have either degree, masters or other qualifications with 53.1%, 42.7% and 4.2% respectively of responses.

For their respective firms, respondents were asked if they had in existence, a transport/logistic/supply chain/distribution department and most of the respondents (n=86, 91.5%) been in the affirmative and only 8(8.5%) who responded no.

Finally, for the firm size, in terms of number of employees per firm selected for the study, it was realised that the firm size ranged from 5 to 500 with a mean of 70.39 and standard deviation of 64.01.

Therefore, to ensure the validity of the research, it could be inferred that the respondents were informed about the subject matter and were able to comprehend the questionnaires administered to them.

4.4 Extent of Green Supply Chain Management Practices among Selected public sector firms

The main independent variable for the study was green supply chain management practices. However, it was measured in two dimensions, namely green purchasing and reverse logistics. Items used to measure these variables were adapted from the study of Zhu et al. (2008). Tables 4.2 and 4.3 presents the descriptive statistics for green purchasing and reverse logistics respectively.

The questionnaire was used to assess the extent of Green purchasing by the selected public sector firms using a 5-Point Likert Scale. From the scale, 1 represented Strongly Disagree, 3

represented Neutral and 5 represented Strongly Agree. The responses to these are presented in the Descriptive Table in Table 4.2.

Table 4.2: Green Purchasing of the Selected Public Sector Firms

Measuring Items	Min	Max	Mean	Std. Dev
1. Our firm provides design specification on environmental requirements to suppliers for purchased items.	1	5	3.50	.808
2. Our firm cooperates with suppliers in order to attain environmental objectives.	1	5	3.39	.956
3. Our firm reduces use of paper during the purchasing process (e.g., ordering via email).	1	5	3.59	.924
4. Our firm makes purchases from suppliers who are compliant with legislation on the environment.	2	5	3.73	.857
5. Our firm purchases raw materials in bulk in order to minimize use of energy, labour, and packaging materials through bulk packaging.	1	5	3.66	.938
Composite Average	**1.80**	**5.00**	**3.57**	**.661**

Source: Field Survey, 2023

From Table 4.2, 5 items were used to measure Green purchasing as perceived by key staffs of selected public sector firms using a Five-Point Likert Scale with 1=Strongly Disagree, 3=Indifferent and 5=Strongly Agree. However, from the overall average assessment of green purchasing, the mean value of 3.57 with SD of 0.661 implies that respondents agree to the items used to measure the extent of green purchasing at the selected public sector firms. Among the 5 items, the highest mean was obtained from last item: "*Our firm makes purchases from suppliers who are compliant with legislation on the environment*" with mean of 3.73 and standard deviation of 0.857. All the remaining items measured mean values of more than 3.0 implying agreement include "*Our firm provides design specification on environmental requirements to suppliers for purchased items", "Our firm cooperates with suppliers in order to attain environmental objectives", "Our firm reduces use of paper during the purchasing process (e.g.*

ordering via email)" and "*Our firm purchases raw materials in bulk in order to minimize use of energy, labour, and packaging materials through bulk packaging".* This implies that there is high level of Green purchasing at the selected public sector firms.

The questionnaire was used to assess the extent of reverse logistics at the selected public sector firms using a 5-Point Likert Scale. From the scale, 1 represented Strongly Disagree, 3 represented Neutral and 5 represented Strongly Agree. The responses to these are presented in the Descriptive Table in Table 4.3.

Table 4.3: Reverse Logistics at the Selected Public Sector Firms

Measuring Items	**Min**	**Max**	**Mean**	**Std. Dev**
1. Our firm spreads awareness among customers on the firm's product or packaging return or take-back policy.	1	5	4.03	.801
2. Our firm installs collection points for used products and packaging for reuse and recycling.	1	5	4.05	.745
3. Our firm ensures safe disposal of unrecyclable or unreusable waste (especially hazardous waste).	1	5	4.04	.747
4. Our firm offers special incentives to those who return packaging materials.	1	5	4.10	.801
5. Our firm put in place systems to monitor reverse flows of materials.	1	5	4.01	.827
Composite Average	**1.40**	**5.00**	**4.05**	**.671**

Source: Field Study, 2023

Given a mid-point value of 3.00, which indicates "indifference" in a respondent's perception on the issues being evaluated, the results produced in Table 4.3 concerning the level of reverse logistics, indicate that a staff of the selected public sector firms, to some extent, agrees that there is high level of reverse logistics (given overall mean score =4.05). For the three items measuring "reverse logistics", the highest mean score was obtained on the third item: "*Our firm offers special incentives to those who return packaging materials*." (M=4.10; SD=0.801) while the

least mean score was obtained on the first item: "*Our firm put in place systems to monitor reverse flows of materials"* (M=4.01; SD=.827). This implies that there is high level of reverse logistics at the selected public sector firms.

4.5 Extent of Competitive Advantage among Selected Public Sector Firms

The mediating variable for this study was competitive advantage. As such it was necessary to ascertain the level of competitive advantage using measures from adapted items from the study of Talaja et al. (2017). A 7-point Likert Scale to measure the items with 1= Strongly Disagree, 4=Neither Agree nor Disagree and a 7=Strongly Agree. The summary of responses to measure this construct can be seen in the descriptive statistics table in Table 4.4.

Table 4.4: Level of Competitive Advantage among Selected Public Sector Firms

Indicators	Min	Max	Mean	Std. Dev
1. My organisation's general advantage over competitors	1	7	5.53	1.467
2. My organisation's quality and image of the products or services	1	7	5.60	1.327
3. My organisation's price of the products/services	1	7	5.17	1.304
4. My organisation's Production costs of products/Delivery costs of services	1	7	5.09	1.408
5. My organisation's customer satisfaction with products/services	1	7	5.54	1.331
6. My organisation's delivery dependability	1	7	5.53	1.480
7. My organisation's product/service innovation	1	7	5.46	1.338
8. My organisation's time to market	1	7	5.67	1.386
Overall Competitive Advantage	**1.00**	**7.00**	**5.45**	**1.129**

Source: Field Study, 2023

Given a mid-point value of 4.00, which indicates "Neither Agree nor Disagree" in a respondent's perception on the issues being evaluated, the results produced in Table 4.5 concerning the level of competitive advantage in the public sector indicate that a top procurement staff in the public

sector in Ghana, to some extent, agrees that the level of competitive advantage is high (given the overall mean value of 5.45). For the eight items measuring "competitive advantage", the highest mean score was obtained on the last item: "My organisation's time to market*"* (M=5.67; SD=1.569) while the least mean score was obtained on the 4th item: "*My organisation's Production costs of products/Delivery costs of services"* (M=5.09; SD=1.408).

4.6 Extent of Organisational Performance

The main dependent variable was organisational performance and it was measured with items from the study of Mitra and Datta (2013). It was thus necessary to measure each of them. A 5-Point scale was employed, measuring "1=strongly disagree" through to "3=neither agree nor disagree" to "5=Strongly Agree" each of these items. The results determining the level of agreements of respondents can be seen from Table 4.5 below;

Table 4.5: Organisational Performance Measures

Measuring Items	Min	Max	Mean	Std. Dev
1. Improvement in product and process quality	2	5	3.85	.740
2. Improvement in efficiency and productivity	2	5	4.02	.632

3. Cost savings in production and distribution	2	5	3.93	.676
4. Increase in sales of products	2	5	3.77	.897
5. Increase in market share	2	5	3.74	.714
6. Penetration of new markets	2	5	3.55	.844
7. Increase in organisational profits	2	5	3.89	.725
8. Increase in Organisational growth	2	5	3.97	.630
9. Enhancement of corporate image	1	5	4.08	.790
10. Influencing policy makers and regulators	1	5	3.92	.902
Composite Average	**2.00**	**5.00**	**3.87**	**.551**

Source: Field Survey, 2023

From Table 4.8, 10 items were used to measure Strategic CRM using a 5-Point Likert Scale with 1=Strongly Disagree, 3=Indifferent, and 5=Strongly Agree. Among the 10 items, the highest mean was obtained from ninth item: "*Enhancement of corporate image"* with mean value of 4.08 and standard deviation of 0.790 which showed absolute agreement. All other items measured more than 3.0 implying agreement and these include "*Improvement in product and process quality", "Improvement in efficiency and productivity", "Cost savings in production and distribution", "Increase in sales of products", "Increase in market share", "Penetration of new markets", "Increase in organisational profits", "Increase in Organisational growth"* and "*Influencing policy makers and regulators"*. This implies key staffs of selected public sector firms rates a stronger organisational performance by respective firms.

4.7 Measurement Model Analysis

Prior to estimating the theoretical framework developed for the study, it became necessary to assess the suitability of the items used in measuring the constructs. In doing this, reliability test using Cronbach's Alpha was adopted. In all, nine constructs were assessed.

4.7.1 Reliability of the Measures

In checking for reliability of the measures, Cronbach alpha was used to verify the internal consistency among the measures (Pallant, 2007). This was performed in SPSS version IBM 20. The results shown in table 4.9 indicate alpha values ranging from .799 to .920. This implies that the items used in measuring all constructs passed the initial test of reliability. This is because all items for each construct passed the initial test of reliability as they were far above the recommended threshold of .70 (Nunnally, 1978). The summary of results could be seen from Table 4.6.

Table 4.6: Reliability Test Results

Construct	Number of items	Alpha value
1. Green purchasing	5	0.865
2. Reverse logistics	5	0.853
3. Competitive Advantage	8	0.911
4. Organisational Performance	10	0.918

Dropped construct

Source: Field Study, 2023

4.7.2 Exploratory Factor Analysis

After the test of reliability, it was necessary to determine the uni-dimensionality of variables to determine convergent validity of the measures. As such, exploratory factor analysis (EFA) was employed. Using Principal Component Analysis and Varimax rotation, the EFA test was performed. The results can be seen from Table 4.7.

Table 4.7: Exploratory Factor Analysis Results

Variable	Code	Component			
		1	2	3	4
Green Purchasing	GREENP1				.740
	GREENP2				.926
	GREENP4				.695
	GREENP5				.695
Reverse Logistics	REVL1			.797	
	REVL2			.842	
	REVL3			.867	
	REVL4			.830	
	REVL5			.783	
Competitive Advantage	CADV1	.807			
	CADV2	.801			
	CADV3	.863			
	CADV4	.790			
	REVL5	.885			
Organisational Performance	PERF4		-.919		
	PERF5		-.938		
	PERF6		-.827		
	PERF7		-.657		

Note:

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

Source: Field Survey, 2023

Table 4.7 shows the EFA results of the measures of green supply chain management practices, competitive advantage and organisational performance with KMO value of 0.747 which was more than the minimum threshold of 0.6 and X^2 = 2283.673, df =496 and p=0.000. This was done using Principal Component Analysis with direct Oblimin rotation and all Eigen values were set to 1.

After the EFA, items that remained for each construct were Green Purchasing (GREENP1,2,4-5), Reverse Logistics (REVL1-5), Competitive Advantage (CADV1-5) and Organisational Performance (PERF4-7).

4.8 Test of Model

In establishing the effect of green supply chain management practices on organisational performance through green supply chain management practices of the selected public sector firms, green purchasing and reverse logistics were the independent variables, whereas Green production and Reverse logistics were the mediating variables; while the dependent variable was organisational performance.

The regression estimates were given as:

$PERF = b_0 + b_1S + \varepsilon$ …… ……Model 1

$PERF = b_0 + b_1S + b_2G + b_3R + \varepsilon$ ……. Model 2

$R = b_0 + b_1G + bR + \varepsilon$ …….. Model 3

$PERF = b_0 + b_1S + b_2G + b_3R + b_4C + \varepsilon$ ……Model 4

Where, $b_0 = constant\ of\ proportionality$

b_{1-5}= coefficient variables
PERF = Organisational Performance; S = Firm Size
G= Green purchasing; R = Reverse Logistics
C = Competitive Advantage

Table 4.8: Correlations of Variables and Descriptive Statistics

Variables	1	2	3	4	5
1. Firm Size	1				
2. Green purchasing	.030	1			
3. Reverse logistics	.149	.545**	1		
4. Competitive Advantage	-.084	.256*	.006	1	
5. Organisational Performance	-.017	.597**	.477**	-.004	1
Mean	**70.39**	**3.95**	**3.47**	**4.05**	**3.87**
Standard Deviation	**64.005**	**0.800**	**0.826**	**0.671**	**0.551**

Note:

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

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Field Study, 2023

The correlation results shown in Table 4.8 above generally revealed that respondents partly attribute respective firm's organisational performance to green supply chain management practices and competitive advantage as they the correlation between them were less than 0.5. However, the highest correlation between green purchasing and organisational performance was quite good and was more than 0.5 with r=0.597at p<0.01.

4.8.1 Model Assessment

From the reliability test run, all items which measured the constructs passed the initial test of reliability and were thus maintained. The model estimation process began with creating composite variables and interaction term and then examining relevant assumptions underlying the method of estimation employed in the study. Relying on each of the set of retained measures, arithmetic mean was used to create the composite variables. All the two green supply chain management practices variables as well as the mediator, competitive advantage were treated as

composite variables by averaging their respective items. Also, the remaining items for the organisational performance was also composited.

The researcher used ordinary least square (OLS) regression analysis to estimate the study's model. The main outcome variable was organisational performance, been predicted by green purchasing and reverse logistics with competitive advantage as mediator. Firm size (number of employees) was the only control variable.

The results can be seen in the OLS regression estimates table in Table 4.9.

Table 4.9: Ordinary Least Square Regression Estimates

Variables:	Standard Estimates			
	Organisational Performance		Competitive Advantage	Organisational Performance
	Model 1	Model 2	Model 3	Model 4
Control				
Firm Size	-0.083(-0.755)	-.051(-.475)		-.001(-.819)
Hypothesized				
Direct Effect				
Green purchasing		.218(2.261)*	.277(3.066)*	.320(4.659)**
Reverse logistics		.077(.876)	-.115(-1.357)	.154(2.488)*
Mediators				
Competitive Advantage				-.193(-2.090)*
FIT INDICES				
χ^2 (df)	0.261(1)	4.776(3)	3.933(2)	10.677(7)
χ^2/df	0.261	1.592	1.967	1.525
F-Statistics	0.570	3.826	4.704	7.809
R^2	**0.006**	**0.118**	**0.092**	**0.400**

Notes:

1. t-values are in the parenthesis
2. * represent significant path at 5% (1-tailed test: 1.645)
3. Hypothesized paths evaluated at 5% significance level (1-tailed test)

Source: Field Study, 2023

4.8.2 Mediation Analysis Using Sobel Tests

From the research model, there were two independent variables (green purchasing and reverse logistics), competitive advantage and one dependent variable (organisational performance). From the regression results from SPSS, the SOBEL tests for mediation are tested for all the mediating variable.

Table 4.10a: Green purchasing and Organisational Performance Mediated by Competitive Advantage

Input:			Test statistic:	Std. Error:	*p*-value:
a	0.181	Sobel test:	-0.23629564	0.01148984	0.81320327
b	-.015	Aroian test:	-0.21003856	0.0129262	0.83363758
s_a	0.094	Goodman test:	-0.27574264	0.00984614	0.78274574
s_b	0.063	Reset all	Calculate		

Table 4.13b: Reverse logistics and Organisational Performance Mediated by Competitive Advantage

Input:			Test statistic:	Std. Error:	*p*-value:
a	.274	Sobel test:	2.11238476	0.03554087	0.03465346
b	.274	Aroian test:	2.07366655	0.03620447	0.03811029
s_a	0.115	Goodman test:	2.15335601	0.03486465	0.03129071
s_b	.060	Reset all	Calculate		

4.8.3 Hypothesis Testing and Findings

Table 4.11: Ordinary Least Square Regression Estimates

Hypothesis	Path Coefficient	T Statistics	Results
H1a: ***Green purchasing has a significant and positive effect on organisational performance.***	.218	2.261	Supported
H1b: ***Reverse Logistics has a significant and positive effect on organisational performance.***	.077	.876	Not Supported
H2a: Green purchasing has a positive and significant effect on competitive advantage	0.277	3.066	Supported
H2b: Reverse Logistics has a positive and significant effect on competitive advantage -	-0.115	-1.357	Not Supported
H3: ***Competitive advantage has a significant and positive effect on organisational performance.***	-.193	-2.090	Not Supported
H4: ***Competitive advantage mediates the relationship between green supply chain management practices and organisational performance***		**P-values**	
		0.677	Not Supported
Green purchasing – CAdv – Performance (H4a)		0.934	Not Supported
Reverse Logistics – CAdv – Performance (H4a)			

Source: Field Study, 2023

Control Effect

The study used only firm size as the control variable. When it was regressed on organisational performance as can be seen in Model, it had a negative and insignificant effect on organisational performance (β = -0.083; t=-0.755). Similarly, in Models 3 and 5, it could be seen that the effect of firm size on organisational performance was negative and insignificant.

Main Effect

The first hypothesis (**H1**) was posited that ***green supply chain management practices has a significant and positive effect on organisational performance***. From the proposed research

model, two main sub-hypotheses were developed to test the direct effect of green supply chain management practices on organisational performance. Green purchasing was regressed on organisational performance and same was done for reverse logistics **(H1a)** as can be seen in Model 2. The results revealed that green purchasing had a ***positive and significant effect on organisational performance*** (β = .218; t=2.261). Reverse logistics was also regressed on organisational performance and same was done for reverse logistics **(H1b)** as can be seen in Model 2. However, ***reverse logistics rather had a positive but insignificant effect on organisational performance*** (β = .077; t=.876). From the standardized estimates of Model 2, **H1 was SUPPORTED** because the path from green purchasing to organisational performance was positive it was statistically significant at $p<0.05$.

The second hypothesis **(H2)** posited that green supply chain management practices had a positive and significant effect on organisational performance. Thus, ***green purchasing has a positive and significant effect on competitive advantage (H2a)*** and ***reverse logistics has a positive and significant effect on advantage (H2b).*** There were two green supply chain management practices. As such, there were 4 sub-hypotheses of H2a and 4 sub-hypotheses of H2b. The findings revealed that ***green purchasing had a positive but insignificant effect on competitive advantage*** (β = .098; t = .934). Also, it was found out that ***green purchasing had a positive and significant effect on competitive advantage*** (β = .277; t= 3.066). This implies that **H2a** was **SUPPORTED** for only green purchasing.

The findings revealed that ***reverse logistics had a negative and insignificant effect on competitive advantage*** (β = -0.570; t= -1.357). This implies that **H2b was NOT SUPPORTED** for only green purchasing.

The third hypothesis **(H3)** posited that competitive advantage have a positive and significant effect on organisational performance. The findings revealed that ***competitive advantage had a negative but significant effect on organisational performance*** (β = -.193; t= -2.090). This implies that **H3** was **NOT SUPPORTED**.

Mediation Effect

The fourth hypothesis (H4) posited that ***competitive advantage mediates the relationship between green supply chain management practices and organisational performance.*** There were two independent variables (green purchasing and reverse logistics). Also, there was a single mediator (competitive advantage) and a single dependent variable (organisational performance). As such, two (2) hypotheses were tested to test the mediation relationships. Using the Sobel test, the mediation tests were conducted. The condition for mediation is that the p-value should be close to zero for the mediation effect of the mediator on the relationship between the dependent and independent variables.

For H4a it was found that the mediation effect of green purchasing on the relationship between reverse logistics and organisational performance **was insignificant** as the p-value is far from zero (p = 0.104).

For H4b, it was found that the mediation effect of competitive advantage on the relationship between reverse logistics and organisational performance was **insignificant** as the p-value is far from zero (p = 0.934).

4.9 Discussion of Findings and Implications

This study sought to assess the mediation effect of competitive advantage on the relationship between green supply chain management practices and organisational performance among key staffs of selected public sector firms in Sekondi-Takoradi metropolis. There was review of extant literature to come out with two dimensions of green supply chain management practices (green purchasing and reverse logistics) and competitive advantage. The dependent variable was organisational performance.

These were modelled into a framework and hypothesized paths were tested empirically through the use of a sample of staffs and management of selected public sector firms in Sekondi-Takoradi metropolis. Using a 5-Point Likert Scale to measure the scales per construct, descriptive statistics were run for the individual constructs and reliability tests were also run before the models were run.

The first hypothesis postulates that green supply chain management practices had a significant and positive effect on organisational performance. The study found support for this assertion especially for green purchasing as it had a positive and significant effect on organisational performance. This presupposes that among key staffs of selected public sector firms in Sekondi-Takoradi metropolis, their extent of green purchasing practices affects the organisational performance of their respective firms. As revealed by extant literature, procurement sustainability could lead to better performance (Melnyk et al., 2003; Pullman et al., 2009). Cost may be minimized, for example, by decreasing unintended releases to the atmosphere and decreasing material waste (Klassen and McLaughlin, 1996). Managing an organization's green

supply chain management cycle would affect aspects of organizational efficiency such as product quality, lead time, flexibility, expense and would also improve these practices (Carter, 2005).

The second hypothesis posited that green supply chain management practices had a positive and significant effect on competitive advantage. The study found support for this assertion. This is because the findings revealed that green purchasing had a positive and significant effect on reverse logistics (β = .277; t= 3.066).

For the reverse logistics, the findings revealed that reverse logistics had a negative and insignificant effect on reverse logistics (β = -0.570; t= -1.357). This presupposes that among the selected public sector firms in Sekondi-Takoradi metropolis, green purchasing practices has a positive and significant effect on competitive advantage of their respective firms. As revealed by extant literature, Chan (2010) also showed that both internal and exgreen purchasing practicess serve as important determinants for firms' practices of environmental strategies at the strategic level and within the marketing functional area.

Despite the plausibility for green supply chain management practices to positively influence competitive advantage, the fact that these practices originate from two different angles suggests that their respective influence on competitive advantage may be derived from different pathways.

Regarding green purchasing, organizational learning theory suggests that its influence on GSCM is largely attributed to intra-organizational learning and knowledge sharing among firm members. From this perspective, green purchasing can be conceived as part of the core corporate values and beliefs of a firm. It is often initiated by corporate leaders out of their own pro-environmental ideology. Owing to the exhortations of these leaders, this personal ideology will eventually be fused throughout the entire firm (Egri and Herman, 2000; Sharma, 2000). In short,

the above analysis suggests that green purchasing practices will help firm members develop a collective consciousness of the importance of ecologically responsible operations, and eventually motivate them to seek ways to minimize environmental impacts of these operations (Banerjee et al., 2003).

The third hypothesis posited that competitive advantage has a significant and positive effect on organisational performance. The findings of this study did not find support for this hypothesis. This is because the effect of competitive advantage on organisational performance was insignificant. This finding relates to extant literature which reveals that there is no significant relationship between competitive advantage and organisational performance. For instance, the studies of Pullman et al. (2010), Testa and Irlado (2010) and Lee et al. (2012) all revealed that there is no significant relationship between such practices and organizational performance.

For the mediation analysis, it was found out using the Sobel Test revealed that competitive advantage does not mediate the relationship between green supply chain management practices and organisational performance. Though competitive advantage not only helps businesses respond effectively to the needs of stakeholders, but also builds a strong reputation and establishes green capabilities (e.g., clean manufacturing, non-polluting and minimal waste production processes, green R&D and green products) that generate competitive advantage and increase company performance (Bu et al., 2020; Feng et al., 2018). Green supply chain management practices thus allows businesses to invest enhanced efforts and resources in GSCM, which in turn generates green potential and competitive advantage. Therefore, businesses gain superior efficiency from certain techniques for the environment.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study's findings, conclusions and recommendations of the study. These are presented in the next sub-sections.

5.2 Summary of Findings

In order to address the objectives of the study, the summary of the study's findings is presented in relation to the objectives to the study.

5.2.1 Relationship between Green supply chain management practices and Organisational Performance among Public Sector Firms in the Western region in Ghana

The first objective of the study was to examine the relationship between green supply chain management practices and organisational performance among public sector firms in the Western region in Ghana. This study adopted dimensions of green supply chain management practices from the study of Zhu et al. (2008). The findings revealed that only green purchasing had a positive and significant effect on organisational performance. However, reverse logistics had positive but insignificant effect. This presupposes that among key staffs of selected public sector firms in Sekondi-Takoradi metropolis, their extent of green purchasing practices affects the organisational performance of their respective firms.

5.2.2 Relationship between Green supply chain management practices and Competitive Advantage among Public sector firms in the Western region in Ghana

The second objective of the study was to examine the relationship between green supply chain management practices and competitive advantage among public sector firms in the Western region in Ghana. This study adopted competitive advt from the study of Talaja et al. (2017). It

was found that green purchasing had a positive and significant effect on competitive advantage (β = .277; t= 3.066).

For the reverse logistics, the findings revealed that reverse logistics had a negative and insignificant effect on reverse logistics (β = -0.570; t= -1.357).

5.2.3 Effect of Competitive Advantage and Organisational Performance among Public sector firms in the Western region in Ghana

The third objective of the study was to effect of competitive advantage and organisational performance among public sector firms in the Western region in Ghana. The findings revealed that the effects of competitive advantage on organisational performance was insignificant. This finding relates to extant literature which reveals that there is no significant relationship between competitive advantage and organisational performance.

5.2.4 Mediating effect of Competitive Advantage on the Relationship between Green Supply Chain Management Practices and Organisational Performance among Public sector firms in the Western region in Ghana

The last objective of the study was to examine the mediating effect of competitive advantage on the relationship between green supply chain management practices and organisational performance among public sector firms in the Western region in Ghana. It was found out using the Sobel Test revealed that competitive advantage does not mediate the relationship between green purchasing practices and organisational performance as well as between reverse logistics and organisational performance.

5.3 Conclusions

The mediating role of competitive advantage on the relationship between green supply chain management practices and organisational performance cannot be overemphasised. As such, conducting a study on how competitive advantage mediates the relationship between green

supply chain management practices and organisational performance was relevant. Therefore, the study selected some public sector firms in the Sekondi-Takoradi metropolis in the Western region of. A sample of 100 respondents was selected out of which a response rate of 96% was achieved. The findings revealed that there is high extent of green supply chain management practices firms within the Sekondi-Takoradi metropolis.

From the findings, it can also be concluded that only green purchasing had a positive and significant effect on organisational performance. Mediation was not achieved for competitive advantage on the relationship between green purchasing and organisational performance and also between reverse logistics and organisational performance.

5.4 Recommendations

Based on the findings of the study and the conclusions made in relation with the objectives of the study, the following recommendations are suggested for implementation by firms in Ghana:

It is recommended for firms to concentrate on providing education on green purchasing on the environment. By so doing, it would have an effect on their green supply chain management practices and organisational performance.

It was found out that reverse logistics do not have a positive effect on organisational performance. This implies that some organizations do not manage their product returns well. When this happens, it may cause negative effects. As such, there is the need to improve the reverse logistics activities with partners that are involved in their supply chain so as to improve their performance.

Therefore, it is recommended that all supply chain partners should do their best to take particular attention on the quality of products, delivery schedules, tools of trade, etc. for effective green production that would not affect the environment.

It is recommended that the supply chain partners collaborate in coming out with appropriate remedies that may arise in their purchasing transactions so as to improve their green supply chain management efforts.

There is the need for supply chain coordination and integration among firms. This a good strategy based on universality and integration with customers and suppliers, processes and activities, and implementation of those activities which improve and intensify cooperation and trust relationship among participants. It would help ensure free flow of information among partners and ensure easy problem solving.

5.4 Recommendation for Future Research

The study was limited in terms of the scope as it focused on only a single geographical region. It is therefore recommended that future studies can expand the scope of the study to cover other areas in Ghana that adopts Green supply chain management (GSCM) and have green supply chain management practices and also other towns and regions in the country. Future studies can also consider the moderating effect of Green supply chain management on the relationship between green supply chain management practices and organisational performance.

References

Appendix I

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
QUESTIONNAIRE

I am a Master of Science in Procurement and Supply Chain Management student of KNUST IDL. As part of the requirements for the award of Master's Degree, I am undertaking a research work to ***assess the mediating role of competitive advantage in the relationship between green supply chain management practices and organisational performance: empirical study of public sector firms in the Western region in Ghana***. This work is purely for academic purposes and the data collected and the results will not be used in any way to jeopardize the interest of our unit and our business as a whole. I guarantee our anonymity and complete confidentiality.

SECTION A: GREEN SUPPLY CHAIN MANAGEMENT

*Using a scale of **1 – 5 [where 1= Not at all; 3= Moderate Extent; and 5= Very Great Extent],** indicate this firm's green supply chain management in relation to that of key competitors for the past 3 years:*

Strongly Disagree ---Neutral---- Strongly Agree

	1	2	3	4	5
Green Purchasing					
1. Our firm provides design specification on environmental requirements to suppliers for purchased items.	☐	☐	☐	☐	☐
2. Our firm cooperates with suppliers in order to attain environmental objectives.	☐	☐	☐	☐	☐
3. Our firm reduces use of paper during the purchasing process (e.g. ordering via email).	☐	☐	☐	☐	☐
4. Our firm makes purchases from suppliers who are compliant with legislation on the environment.	☐	☐	☐	☐	☐
5. Our firm purchases raw materials in bulk in order to minimize use of energy, labour, and packaging materials through bulk packaging.	☐	☐	☐	☐	☐
Reverse Logistics					
1. Our firm spreads awareness among customers on the firm's product or packaging return or take-back policy.	☐	☐	☐	☐	☐
2. Our firm installs collection points for used products and packaging for reuse and recycling.	☐	☐	☐	☐	☐
3. Our firm ensures safe disposal of unrecyclable or unreusable waste (especially hazardous waste).	☐	☐	☐	☐	☐
4. Our firm offers special incentives to those who return packaging materials.	☐	☐	☐	☐	☐
5. Our firm put in place systems to monitor reverse flows of materials.	☐	☐	☐	☐	☐

SECTION C: COMPETITIVE ADVANTAGE

Indicate your agreement to the following as indicators of competitive advantage in your organisation. ***(Use the scale in such a way that a "1" will indicate that the aspect is far below competitors, "3"=at par with competitors and a "5" will indicate that the aspect is far above competitors).*** *You can circle the appropriate number that follows.*

Far Below Competitors 1	**At Par with competitors** 3	**Far Above Competitors** 5

For the following items, please rate the following factors as measures of organization's competitive advantage in comparison to your major competitors. **Please answer the following based on your company**	**Response**						
1. My organisation's general advantage over competitors	☐	☐	☐	☐	☐	☐	☐
2. My organisation's quality and image of the products or services	☐	☐	☐	☐	☐	☐	☐
3. My organisation's price of the products/services	☐	☐	☐	☐	☐	☐	☐

4. My organisation's Production costs of products/Delivery costs of services?	☐	☐	☐	☐	☐	☐	☐
5. My organisation's customer satisfaction with products/services?	☐	☐	☐	☐	☐	☐	☐
6. My organisation's delivery dependability	☐	☐	☐	☐	☐	☐	☐
7. My organisation's product/service innovation	☐	☐	☐	☐	☐	☐	☐
8. My organisation's time to market	☐	☐	☐	☐	☐	☐	☐

SECTION D: ORGANISATIONAL PERFORMANCE

*Using a scale of **1 – 5 [where 1=Strongly Disagree; 3=Neutral; and 5=Strongly Agree],** indicate this firm's performance in relation to that of key competitors for the past 3 years:*

Strongly Disagree ---Neutral---- Strongly Agree

What is the extent of organisational performance of your firm for the past 3 years??	1	2	3	4	5
1. Improvement in product and process quality	☐	☐	☐	☐	☐
2. Improvement in efficiency and productivity	☐	☐	☐	☐	☐
3. cost savings in production and distribution	☐	☐	☐	☐	☐
4. Increase in sales of products	☐	☐	☐	☐	☐
5. Increase in market share	☐	☐	☐	☐	☐
6. Penetration of new markets	☐	☐	☐	☐	☐
7. Increase in organisational profits	☐	☐	☐	☐	☐
8. Increase in Organisational growth	☐	☐	☐	☐	☐
9. Enhancement of corporate image	☐	☐	☐	☐	☐
10. Influencing policy makers and regulators	☐	☐	☐	☐	☐

Adapted from Mitra and Datta (2013)

SECTION E: RESPONDENT'S INFORMATION

1. Your Gender?
   Male ☐ Female ☐

2. What is your age?
   Less than 30 years ☐ 0-40 years ☐ 41-50 years ☐ 51 and above ☐

3. How long have you worked in your organisation?
   Less than 1 year ☐ 1 – 3 years ☐ 4 – 6 years ☐ 7 – 9 years ☐
   10 years and above ☐

4. What is your level of education?
   JHS ☐ SHS ☐ HND ☐ Degree ☐ Masters ☐
   ☐ Other, Please specify……

5. Does your firm have a transport/logistic/supply chain/distribution department?
   Yes ☐ No ☐