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EXAMINING THE EFFECT OF SUPPLY CHAIN EFFICIENCY, EFFECTIVENESS AND DIFFERENTIATION ON COMPETITIVE ADVANTAGE: EVIDENCE FROM FIRMS IN GHANA

BY

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DECLARATION

I hereby declare that this thesis is the result of my original work towards the MSc in Logistics and Management and that, to the best of my knowledge, it neither contains materials published by another person, nor materials which have been accepted for the award of any other degree of the University, except where due acknowledgements have been made in the text.

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DEDICATION

I dedicate this thesis to my father Mr. John Wallace Koomson, God bless you.

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I thank everyone who in one way or the other contributed to the completion of this thesis. I give thanks to God for his protection and sustenance.

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ABSTRACT

This study sought to establish the connection between supply chain management practices and competitive advantage from the standpoint of effectiveness, efficiency, and differentiation especially among Ghanaian firms. As such, it sought to test statistically the direct effect of supply chain efficiency, effectiveness, and differentiation on gaining an edge in competition. The study therefore adopted a quantitative survey approach to select a sample of one hundred (100) respondents to whom questionnaires were administered. The individuals forming the pool of potential participants within the sample size consisted of management, senior staff, and junior staff of Ghanaian firms in the Western region. Among the 100 questionnaires distributed, 79 were returned, resulting in a 79% response rate. The analysis was conducted solely on the valid responses collected during the field study. The findings revealed that the companies ensure a high extent of supply chain effectiveness, efficiency, and differentiation. Also, the level of competitive advantage is generally as per the study findings. From the regression estimate the study's findings lead to the conclusion that though supply chain effectiveness, efficiency, and differentiation all had a positive effect on competitive advantage, only supply chain effectiveness was a significant factor. Hence, it is advisable for management to underscore the significance of supply chain effectiveness. Supply chain effectiveness should avoid being limited to the employees of the stores, warehouse, or logistics department alone. Each individual within the organization should recognize the significance of the right is done and adhere to related processes. There should also be improvement in the firms' relationships with suppliers. This is one means of enhancing supply chain effectiveness as it would avoid situations such as the bullwhip effect.

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CHAPTER ONE

INTRODUCTION

1.1 Study Background

In the context of supply chain for every organization, it is crucial to put into practice management approaches that not only result in improved supply chain performance but also organizational performance. However, this must be done with a focus on social, economic, and environmental concerns that lead to competitive advantage (Amin and Zhang, 2014; Beske, 2012; Alzaman, 2014;). This suggests that supply chains ought to operate with efficiency, effectiveness, and differentiation in order to contribute to organizational gain a competitive edge and consequently resulting in enhanced performance.

In doing business in contemporary times, efficiency has become paramount such that organizations are focusing on how to ensure customer value at the least possible costs (Vencataya et al., 2016). However, this comes with intense competition and as such it is also necessary for organizations to manage their supply chains effectively. Over the past decades, the idea of supply chain management has gained significant traction as a vital vehicle through which firms can achieve competitive advantage (Vencataya et al., 2016; Fugate et al., 2010). To add to this, Collin (2009) contended that supply chain management serves as a means to attain a competitive advantage in the marketplace. Notwithstanding, there have not been enough studies that have explored the impact of supply chain efficiency, effectiveness and differentiation regarding gaining a competitive edge.

Fawcett and colleagues (2007) emphasized that the competitive landscape for organizations has evolved, with firms no longer exclusively competing based solely on product quality, but

how effectively they link their partners within their supply chain. This assertion was supported by Petrovic-Lazarevic et al. (2007) that the contemporary form of competition now centers around their capacity to link up effectively with their external partners and ability to offer differentiated products. In effect, it is valid to claim that effective and efficient supply chain management coupled with differentiation of products and service delivery leads to competitive advantage (Matton, 2002).

Kulkani and Sharma (2008) have defined the supply chain as a network encompassing the suppliers' distributors, suppliers, and all other participants involved in the process of generating value. Fantazy and colleagues (2010) emphasized that supply chain management is regarded as a pivotal component of an organization's business processes which helps in integrating all other elements of the organization for effective and efficient response to changing dynamics in the business environment. Other existing studies, such as those conducted by Singh and colleagues (2008) and Weingarten and associates (2010), have also delved into the examination of how supply chain management contributes to organizational performance and competitiveness.

One could contend that among all the investments made by organizations, particularly in developing nations, supply chain management (SCM) investment occupies a crucial role in guaranteeing the smooth material flow to production units and the subsequent supply of finished goods to the end consumer (Chopra and Meindl, 2007). Since the ultimate aim of SCM is to ensure customer satisfaction, it is necessary to effectively and efficiently manage the network whiles providing differentiated products to the customer with the aim of gaining a competitive edge over competitors. The supply chain encompasses not just suppliers and manufacturers but also retailers, warehouses, transportation services, and, importantly,

customers. It encompasses various functions, including but not limited to marketing, distribution, operations, new product development, customer service, and finance (Chopra and Meindl, 2007).

There is therefore the need to finding the link from supply chain effectiveness, efficiency and differentiation to competitive advantage. To the best of the researcher's awareness, there has been a limited amount of research conducted within the business sector in Ghana to look at this linkage. This study therefore seeks to replicate the study of Fugate et al. (2010) on Logistics performance: effectiveness, efficiency and differentiation in the Ghanaian context but replace the predictor variable with competitive advantage to delve into that study from a different perspective. The subsequent sections cover the problem statement, objectives and research questions, justification, methodological approach, study's' scope, and the organization of the research.

1.2 Study Problem

Markets and the business environment have grown increasingly competitive and volatile, undergoing constant change. This shift is due to market conditions transitioning from simplicity to complexity, from static to dynamic, and from being tame to becoming hostile (Neu and Brown, 2005). This suggests the necessity for having an effective, efficient and differentiated supply chain network to meet these challenges. But, there have been some kind of responses to this, organizations have evolved to become more customer-centric, they are adapting to changing market conditions by developing products that align better with customer needs (Johnson and Selnes, 2004; Treacy and Wiersma, 1993).

Various terms have been employed to describe service differentiation in organizations, such as the shift from products to services, high-value solutions, and service business development (Oliva and Kallenberg, 2003; Gustafsson et al., 2010; Davies, 2004). Hover, the ability to gain competitive advantage through service differentiations stems from an efficient and effective supply chain management (Vencataya et al., 2016; Fugate et al., 2010). Having effective, efficient and differentiated supply chain management practices becomes an opportunity and provides a lasting basis for gaining a competitive edge (Heskett et al., 1997).

For certain Ghanaian firms, SCM stands as a fundamental strategy for enhancing operational effectiveness. This importance is on the rise, especially as the complexity of supply chains in terms of markets, products, and chain members continues to expand. Conducting research and implementing supply chain management (SCM) practices to enhance competitive advantage is of paramount significance for any global company in the present day.

There have been studies that had looked at supply chain management and competitive advantage holistically (Vencataya et al., 2016). However, exploring the effect on competitive advantage by integrating service differentiation with elements such as supply chain effectiveness and efficiency has not been explored (Hoopes et al., 2003). Hence, there has been insufficient research to confirm the correlation between supply chain management (SCM) practices and competitive advantage, especially when considering the perspective of effectiveness, efficiency, and differentiation especially among Ghanaian firms. This study is being undertaken with the aim of addressing this gap in the existing literature.

1.3 Objectives of the Study

The principal objective is to examine the effect of supply chain (SC) effectiveness, efficiency and differentiation on competitive advantage; evidence from firms in Ghana. However, the specific objectives of the study seek to look at;

1. To examine the effect of supply chain (SC) effectiveness on competitive advantage among Ghanaian firms.
2. To examine the effect of supply chain (SC) efficiency on competitive advantage among Ghanaian firms.
3. To examine the effect of supply chain (SC) differentiation on competitive advantage among Ghanaian firms.

1.4 Research Questions

To fulfill the study's objectives, it aims to uncover solutions to the following research inquiries:

1. What constitutes the impact of SC effectiveness on competitive advantage within Ghanaian organizations?
2. What is the effect of SC efficiency on competitive advantage within Ghanaian firms?
3. What is the impact of SC differentiation on competitive advantage among Ghanaian firms?

1.5 Justification of the Study

In theoretical terms, this study contributes substantial contributions to the literature available concerning competitive advantage and the practices related to supply chain management. The study offers additional insights within the realm of scholarly work concerning how supply chain management practices impact competitive advantages, with a particular focus on companies operating in Ghana. While numerous researchers have established the presence of a connection between SC competitive advantage and management practices (Vencataya et al., 2016; Fugate et al., 2010; Fawcett et al., 2007), the research will serve to validate and substantiate the suggested relationship, affirming its validity and accuracy.

In addition, the study seeks to serve as a guide to organisations means of properly handling and implementing supply chain management practices that the study's findings lead to enhancements in competitive advantage.

On a broader scope, the study would be significant to firms in Ghana that employ supply chain management practices as well as other developing countries as tt will reveal the means by which competitive advantage can be attained through the effective, efficient, and distinctive management of supply chain business procedures.

Finally, the findings will advance the horizon in academia as it will act as a valuable point of reference for other researchers and students who seeks to conduct a study in the area of SC management.

1.6 Methodology Overview

To accomplish the study's objectives, the researcher utilized a quantitative research methodology, combining an analytical framework with the collection of primary data.

Primary data was gathered by distributing questionnaires, while secondary data was obtained from books, journals, and a comprehensive review of existing literature.

The questionnaire's content was developed by adopting scales from previous literature in alignment with the study's objectives. This approach was employed to collect responses from top management, staff, and customers of Ghanaian firms, and the obtained data was analyzed using relevant statistical techniques, including correlation and regression analysis. Software tools including Microsoft Excel and the Statistical Package for Social Scientists (SPSS) were utilized to assist in the analysis.

1.7 Scope of the Study

The research is situated within the context of SC management and concentrates on the practices related to managing supply chain businesses. The study examines whether effective, efficient, and differentiated SCM practices positively relate to competitive advantage among firms in Ghana especially in the Western region of Ghana.

1.8 Limitations of the Study

This study encountered various challenges. One of the primary limitations was the restricted access to objective, verifiable quantitative data, partly due to commercial confidentiality maintained by certain stakeholders. Furthermore, the study faced financial constraints and a tight time frame for completion. Additionally, some respondents had difficulty reading and interpreting the survey questions, which limited the breadth of data coverage. In addition to these challenges, there were instances of data loss in the responses, and some questionnaires were not returned. Consequently, the collected data had to undergo thorough checks and re-

testing through alternative methods to enhance its validity and reliability. Nevertheless, the results of these statistical tests were highly satisfactory, making such errors inconsequential.

1.9 Organization of the Study

The work is structured into five chapters. Chapter One serves as an introduction to the study, encompassing the background, problem statement, objectives, and research questions. Chapter Two delves into the literature review, encompassing previous related studies linked with the current study, with a focus on SC management and competitive advantage. Chapter Three provides a comprehensive explanation of the methodology, covering research design, population, sampling frame, sampling selection and sample size, method of data collection, data analysis, and a profile of the case study area. Chapter Four displays the study's results, along with discussions and result analysis. Chapter Five offers a summary and conclusion pertaining to the study and suggests further research studies.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides a scholarly review of books, journal articles, and other sources on SC effectiveness, efficiency, and differentiation on competitive advantage. It reviews the concept of SC, SC management, its efficiency, effectiveness, differentiation, and competitive advantage. The chapter ends with the theoretical framework and a review of the hypothetic relationships based on the framework.

2.1 Overview of Supply Chain

A SC is a complex system of entities involved in the process of transforming raw materials into finished products and distributing them. However, historically, the SC has been viewed as a linear sequence of stakeholders. Moreover, SC was seen as a type of long-lasting collaboration in the upstream direction. During the 1990s, SCs were predominantly seen as straightforward chains of corporations (Kemppainen and Vepsäläinen, 2003). Nonetheless, in contemporary understanding, the idea of a SC is more commonly seen as a network rather than a simple linear chain.

Christopher (1998) provides the following description of a SC:

The SC consists of a web of organizations involved in diverse processes and actions, spanning both earlier and later stages, all aimed at generating value in the shape of products and services that are ultimately provided to the final customer.

Lumsden (1998) posit that a supply chain is composed of five distinct flows, which are elaborated as follows:

1. The physical flow of materials involves the movement of products from the manufacturer to the end user.
2. The monetary flow typically progresses along a route starting with the consumer and looping back to the producer through the various entities within the SC.
3. The horizontal flow of information operates bidirectionally, moving from the end user to the manufacturer and vice versa. Knowledge is essential, for instance, for producing the correct products or for managing aspects like timeframes for delivery.
4. The vertical information flow connects the four lateral streams, such as a track-and-trace system on a truck that enables communication and data exchange across different stages of the supply chain.
5. Another aspect of the physical flow involves the movement of resources, like containers employed for transporting goods between various locations or forklift trucks used within a company's facilities.

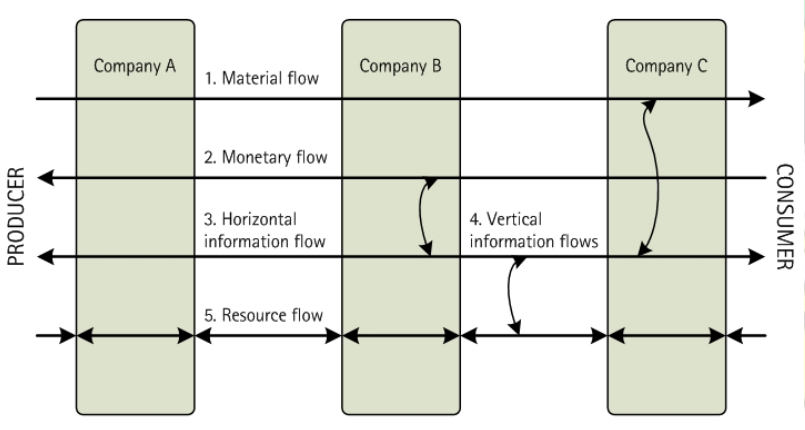

Figure 2.1: The flows in a supply chain

Source: (Adapted from Lumsden, 1998)

Closely related to the supply chain is the concept of the value chain. As previously explained, Porter (1985) defines the value chain as a company's interconnected functions. Moreover, the value chain concept elucidates how value-adding activities are linked. Just as a company optimizes its value chain to achieve a competitive edge, the supply chain can be optimized for the same objective.

Fundamentally, a supply chain can attain a competitive advantage through two primary methods: by executing its activities with greater efficiency or by carrying out these activities in a distinctive manner. Additionally, in related literature, the term "demand chain" is mentioned. Christopher (1998) suggests that "demand chain" should be the preferred term to emphasize that the chain should be guided by market demands rather than suppliers. However, the prevailing literature predominantly employs the term "supply chain," and for consistency, this thesis also utilizes the term "supply chain.

As previously stated, supply chains encompass operational activities executed by the chain's participants. Many of these activities can be associated with the cost drivers outlined by Porter (1985). Nevertheless, this thesis places its focus on the strategic dimension of logistics. Consequently, the activities are presented succinctly as follows: forecasting, sourcing and procurement, production planning, inventory and warehouse management, order management, customer service-related tasks, transportation, and various other functions.

2.2 Supply Chain Management

Supply chain management, often abbreviated as SCM, is the progressively prevalent term employed to characterize the procurement function within the private sector. This terminology, initially introduced by consultants during the early 1980s, has since garnered substantial attention in both academic literature and among private sector organizations (Chen & Paulraj, 2004). Supply chain management (SCM) has grown in importance as a manufacturing framework for enhancing organizational competitiveness. It has also emerged as a distinct business discipline within the academic realm and a recognized source of competitive advantage in the global marketplace. The theory and research related to supply chain management draw from various fields, including logistics and transportation, purchasing and supply, marketing, operations management, management information systems, strategic management, and organizational theory.

Moreover, supply chain management has been employed to elucidate and elucidate the planning and supervision of material and information flow, along with logistics operations both within individual organizations and across interorganizational boundaries (Fisher, 1997).

Supply chain management drew inspiration from several concepts, including the quality revolution; ideas related to materials management and integrated logistics; an increasing fascination with industrial markets and networks; the concept of heightened concentration; influential industry-specific studies. Supply chain management has become such a prevalent concept that it's challenging to peruse manufacturing, distribution, marketing, customer management, or transportation publications without encountering articles on supply chain management or topics closely related to it (Ross, 1998).

Stock and Boyer (2008) contended that establishing a clear definition of supply chain management holds significance for both researchers and practitioners. Firstly, the absence of a comprehensive and all-encompassing definition makes it challenging for researchers to establish continuity in supply chain theory research. This includes defining and investigating relationships between different components of supply chain management and building a coherent body of research that builds upon prior work (Stock & Boyer, 2008).

Secondly, Stock and Boyer (2008) asserted that supply chain management research is likely to fragment and diverge in various directions, rather than evolving in a progressive manner, if there is no consensus on a stable, agreed-upon definition. For practitioners of supply chain management, the diversity in definitions poses challenges in crafting the right blend of functions and processes. Both research and practical application face complications when there are no established criteria outlining the specific business practices, processes, and activities that fall within the purview of supply chain management. For instance, while there is a relatively widespread consensus that purchasing and logistics fall under the umbrella of supply chain management, there is less clarity regarding whether accounting and finance are inherently connected to supply chain management. Additionally, the process of benchmarking across different companies and industries becomes more challenging in the absence of a shared definition, considering the inherent disparities that exist (Stock & Boyer, 2008).

In the context of this dissertation, supply chain management strategy is defined as the management of a network of relationships that encompasses both internal interactions within an organization and external collaborations between interdependent organizations and business units. This network includes purchasing, material suppliers, logistics, production

facilities, associated systems, and marketing. It is designed to facilitate the smooth and efficient flow of services, materials, information and finances in both forward and reverse directions, from the initial producer to the ultimate customer. The overarching goals of this strategy are to enhance optimize profitability through operational efficiencies, value, and attain high levels of customer satisfaction (Stock & Boyer, 2008).

Supply chain management (SCM) signifies a substantial departure from traditional organizational functioning, encompassing transformations in the coordination and integration of supply and demand, as well as the management of relationships. This shift aims to efficiently and profitably meet customer needs, spanning both public and private sectors. Forester (1958) articulated a fundamental principle of supply chain management long before it gained recognition as a distinct field of study and practice.

Since Forrester introduced his theory, there has been a substantial body of literature and research on supply chain management strategy. In particular, this body of literature has sought to clarify what supply chain management is and how it relates to similar concepts such as purchasing, procurement, sourcing, as well as materials management and logistics. Distinctions among the definitions of purchasing, procurement, sourcing, and supply chain management often revolve around operational activities. Purchasing typically encompasses operational tasks conducted by a single department. Tempelmeier (1995) defined purchasing as a contract-focused function that doesn't necessarily encompass logistical activities or the physical movement of goods. These activities typically commence with the identification of needs and conclude with some form of monitoring or tracking of the purchasing process. This represents perhaps the oldest and most traditional role associated with "purchasing" (Kaufmann, 2002).

Tempelmeier (1995) defined procurement as encompassing all activities aimed at providing the company with the necessary inputs required for use in manufacturing or production processes. Traditionally, procurement is perceived as having a broader scope, encompassing activities of greater strategic significance. Instead, procurement encompasses all purchasing activities and tasks that possess a more strategic nature (Kaufmann, 2002). These terms are frequently used interchangeably and are generally defined as the functional activities associated with the daily management of material flows and information.

Sourcing, as defined by Monczka et al. (1998), is a cross-functional process that engages members of the organization beyond those working solely in the purchasing department. The sourcing management team may consist of individuals from various departments within the organization, such as quality, engineering, manufacturing, design, strategic planning, accounting, marketing, and others. Likewise, Kaufmann (1995) defined sourcing as an integrative management approach that encompasses the design of all supplier relations in the context of total relationship management.

Organizations need to grasp the distinctions between these separate yet interconnected functions, both in terms of their definitions and their operational aspects. Supply chain management serves as the overarching strategy that encompasses the management of all the activities outlined in the various functions mentioned above. Supply chain management encompasses a wide spectrum of activities, both strategic and operational. It covers all the processes involved in procuring an organization's direct and indirect materials, rights, services, and capital equipment from external sources. Supply chain management serves as the basis for collaborative procurement initiatives among organizations and acts as a facilitator for achieving competitive differentiation and advantage.

2.3 Supply Chain Efficiency

As per Christopher (1998), the primary aim of supply chain management is to enable the company to maximize its profitability. This entails minimizing costs while simultaneously maximizing sales. Keeping supply chain costs as low as possible is essential in this endeavor. To achieve low supply chain costs, the company must strive for optimal internal and external performance. Internal performance measures might include factors like yield and production lead-time, while external performance pertains to how these aspects impact customers. External performance metrics encompass parameters such as delivery precision, lead-time, customer service, and pricing. According to Christopher (1998), to attain a leadership position in the interconnected world of business networks, competitors must prioritize both network management and internal processes. In order to maintain competitiveness in the evolving global landscape, companies will need to find means to reduce costs while simultaneously improving service quality, in alignment with Christopher's perspective. Consequently, the efficiency and effectiveness of supply chains will become even more pivotal.

Efficiency, as defined by Beamon (1999), is a measure of how effectively resources are utilized. In the context of this thesis, efficiency is employed to describe how well a company optimizes its supply chain to maximize profitability. According to Dornier (1998), the ultimate goal of any logistics system is to maximize profitability. With an exceptional supply chain, a company can deliver high-quality products to its customers (De Meyer et al., 1989) at a low cost (Goonatilake, 1990), within short lead times (Haug, 1985), while also providing the desired level of customer support (Hoover et al., 2001).

Collin (2003) asserts that the success of supply chains can be attributed to three distinct dimensions including customer service; capital employed and total cost.

Customer service and cost are opposing factors that must be carefully balanced to achieve the best outcomes for a company. Reducing costs within the supply chain may, for instance, lead to longer lead times as the company cannot maintain buffer stock. Conversely, improving lead times can be achieved by maintaining buffer stock, but this incurs costs in terms of tied-up capital and the risk of wastage. Therefore, it is crucial for a company to strike a delicate balance between supply chain costs and its performance in meeting customer needs. There is no universal equilibrium that can apply to all companies and all products. Each company must discover its unique balance to optimize profitability. Moreover, some companies may have different equilibrium points for various products within their portfolio. Certain customers prioritize exceptionally high customer service and are willing to pay for it, while for others, cost is the predominant concern, and these companies are willing to accept diminished customer service to control expenses.

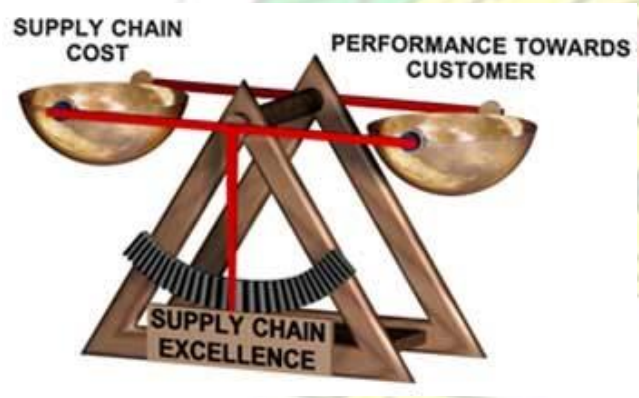

Figure 2.2: Supply chain excellence – the balance between Supply Chain Cost and performance

Source: Collin (2003)

According to Christopher (1998), when evaluating the effectiveness of supply chains, it is frequently observed that numerous activities within them end up increasing costs rather than enhancing value. Therefore, it is crucial to take into account both cost and the quality of customer service when formulating a supply strategy. Furthermore, according to Bowersox (1996), it is essential to assess the connection between the levels of customer service and the corresponding costs when concluding a logistics strategy. The concept of total cost represents a fundamental aspect of contemporary Supply Chain Management (SCM). Omitting the consumer from any developed SCM theory would result in an incomplete representation of the real world, as the consumer plays a pivotal role in determining the success of SCM outcomes.

In the supply chain context, what constitutes customer service? Customer service encompasses all actions and performance measures aimed at enhancing value for the customer. Three key aspects highly valued by customers include affordability, quick order fulfillment, and precise delivery schedules. As per Bowersox et al. (2000), there exist a minimum of three viewpoints for generating value for customers via supply chains including economic value; market value and relevancy value.

Numerous metrics are available for assessing the effectiveness of a supply chain. A more comprehensive discussion of these measurements will be presented in the upcoming chapter dedicated to performance evaluation. According to Collin (2003), one of the most commonly

employed performance metrics for assessing the efficiency of a supply chain is inventory turnover, which signifies the speed at which materials progress through the supply chain.

Collin (2003) emphasizes that for a supply chain to operate efficiently, an organization's internal operations and processes must be adaptable and responsive to environmental factors. There is no one-size-fits-all supply chain that can cater to all customers. The specific environmental demands of customers should dictate the optimal configuration of a supply chain. It's insufficient for a company to possess competitive products and a supply chain suitable for the average customer. According to Hoover et al. (2001), the supply chain must align with the unique needs of individual customers as well.

According to Simchi-Levi (2000), in order to reduce costs and enhance service levels, effective supply chain strategies should consider the interdependencies that exist across different tiers within the supply chain. The supply chain, sometimes referred to as the logistics network, encompasses suppliers, manufacturing centers, warehouses, distribution centers, and retail outlets. It also encompasses the flow of raw materials, work-in-progress inventory, and finished products as they move between these various facilities.

In a supply chain involving external entities, it's crucial to recognize that efficiency enhancements must encompass the entire supply chain ecosystem. There is no viable solution when a company achieves profitability at the detriment of another party, such as a supplier. This might yield short-term gains but will inevitably lead to price hikes in the long run. When an entity seeks to optimize its own success, it must take into account both the optimal utilization of its internal resources and how it can best leverage collaborative efforts within the supply chain.

2.4 Supply Chain Effectiveness

Mentzer (1991) defines effectiveness as the degree to which objectives are achieved. Within Supply Chain Management (SCM), there are two primary performance goals: effectiveness and efficiency. Effectiveness involves ensuring that the correct actions are taken, such as meeting customer needs through appropriate service levels. Conversely, efficiency entails executing actions in the most cost-effective manner, essentially focusing on doing things correctly to optimize operational costs (cf. Mentzer et al., 2001). Supply chain differentiation has emerged due to a growing emphasis on effectiveness within Supply Chain Management (SCM). Traditionally, SCM research tended to prioritize efficiency over effectiveness, as highlighted by studies such as Ketchen et al. (2008) and Zokaei and Hines (2007). Moreover, the design of supply chains was primarily centered around manufacturing and was conducted downstream in the supply chain, from the manufacturer to the customer, rather than adopting a customer-oriented approach in upstream supply chain design (cf. Aitken et al., 2005).

Lee (2004) argues that solely prioritizing efficiency in Supply Chain Management (SCM) doesn't facilitate the development of long-term competitive advantages. Conversely, a customer-responsive SCM approach, which places emphasis on effectiveness, provides a lasting foundation for gaining a competitive edge, as observed in Reichhart and Holweg (2007). When a company caters to diverse customer segments with distinct needs, a viable strategy to effectively meet these varying requirements is through the adoption of a differentiated supply chain approach (cf. Godsell et al., 2011).

In many instances, companies are participants in multiple supply chains rather than being involved in just one. This situation is commonly referred to as having multiple memberships in supply chains (Stölzle and Bachmann, 2006; Bretzke, 2010).

2.5 Supply Chain Differentiation

The criteria and factors used to formulate differentiated supply chain (SC) strategies, also interchangeably referred to as segmented SC strategies, draw from various research areas within the fields of logistics and Supply Chain Management (SCM). Early studies in logistics research, for instance, focused on tailoring logistics service levels to meet the distinct demands of different customer segments (Gilmour et al., 1977; Fuller et al., 1993). Moreover, the discourse on lean versus agile supply chains has yielded criteria and factors for selecting an appropriate supply chain strategy, taking into account product characteristics. This discussion has been informed by the works of scholars like Shapiro (1984), Fisher (1997), and Lee (2002).

The concept of decoupling points, initially introduced in logistics literature (as seen in Bucklin, 1965, and Hoekstra et al., 1992), has been integrated into SCM research to develop hybrid supply chain strategies, as explored in studies such as those by Naylor et al. (1999), Mason-Jones et al. (2000), and Olhager (2003). This framework has also influenced criteria and variables for distinguishing between different supply chain strategies. Furthermore, literature related to hybrid supply chain strategies and decoupling points is closely associated with discussions on postponement (Pagh and Cooper, 1998) and mass customization (Liu and Deitz, 2011), which offer additional insights into the differentiation of supply chains.

The initial and widely recognized model for creating differentiated supply chain (SC) strategies is the DWV3 model, which was introduced by Christopher and Towill in 2000. In this model, they incorporate five key variables: the duration of the product's life cycle, the time window available for delivery, the demand volume, the product variety, and the demand variability. These variables are used to categorize products into various types of supply

chains, such as make-to-stock or make-to-order, based on the specific characteristics of both the product and the demand. These five variables have been integral to the discourse on appropriate supply chain strategies for specific product characteristics, as previously mentioned in the discussion of lean, leagile, and agile supply chain strategies. Childerhouse et al. (2002) provide an extensive overview of these variables and their origins in the literature. Additionally, Childerhouse et al. (2002) validate the DWV3 model through a case study involving a lighting manufacturer based in the United Kingdom.

Additional contributions in the field delve into various facets of the DWV3 model and corroborate its validity (as seen in the works of Aitken et al., 2003; Aitken et al., 2005; Christopher et al., 2006). Christopher et al. (2009) and Godsell et al. (2011) assert that the relevance of specific variables from the DWV3 model in making decisions about differentiated supply chain design depends on the specific case and the companies being considered. Furthermore, Lovell et al. (2005) introduce a model that closely resembles the DWV3 model.

Based on the existing literature, it is evident that supply chain differentiation is a concept that is not widely recognized. However, it is gradually gaining recognition and importance. Nevertheless, there is a notable dearth of empirical studies, particularly in the context of Sub-Saharan Africa, which makes it an underexplored area in this region.

2.6 Competitive Advantage from Successful Supply Chains

When assessing supply chains through a resource-based perspective, the central inquiry revolves around the uniqueness, value, and complexity of their attributes. If these strategic assets are exclusive to a single company within the market, that company gains a competitive

edge over its rivals (Ketchen, 2004; Barney, 1991; Rungtusanatham et al., 2003). Through the coordination of its operations, a company can secure a competitive edge. Another approach to attaining this advantage is by optimizing individual activities. Nonetheless, it's crucial to ensure that this optimization doesn't come at the detriment of other functions, requiring careful consideration (Porter, 1985; Lumsden, 1998).

As mentioned previously, Porter (1985) asserts that competitive advantage is achieved either by becoming the lowest-cost competitor or by differentiation. However, within the realm of supply chain management, competitive advantage is derived from two primary factors: cost reduction and enhanced responsiveness (agility) to meet customers' demands (Martin & Grbac, 2003). To achieve significant cost reductions, a company needs to place greater emphasis on fostering cross-firm cooperation, coordination, collaboration, and integration (Flint, 2004).

Because the ultimate objective of the supply chain is to meet the demands of end customers, global supply chain management must have an understanding of the service requirements of customers situated in various parts of the world. When market conditions undergo changes, it becomes imperative to adjust and prioritize supply chain strategies accordingly (Ekenstedt, 2004). Ahrens (1992) also contends that fast-growing companies expanding internationally require strategic logistical solutions to support their growth and operations.

By conducting a literature review, including works by authors such as Closs et al. (2004), Li et al. (2004), and Yusuf et al. (2004), the authors identified key attributes that define successful modern supply chains. The literature being examined collectively strives to improve organizational performance and achieve a competitive edge. The identified supply

chain practices are visually represented in Figure 2.2 and will be detailed in subsequent sections. These practices will then be applied in the empirical portion of this thesis to assess the operations of the case companies.

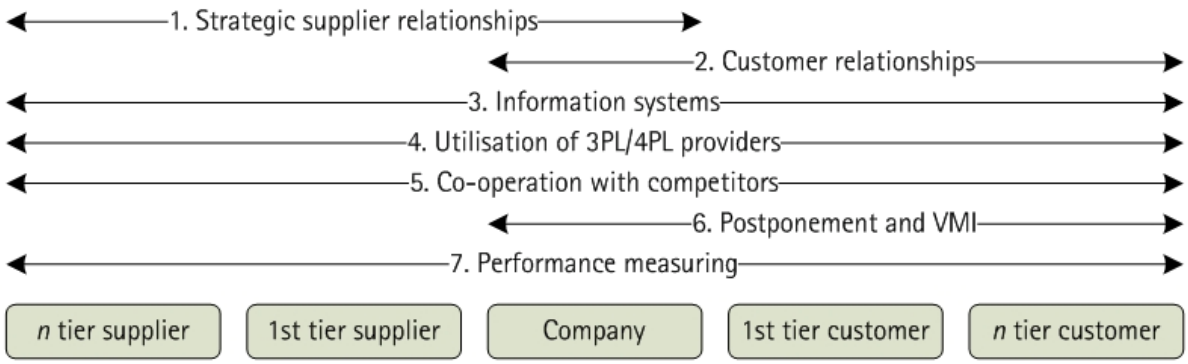

Figure 2.3: Practices in successful supply chains

Source: (Closs et al., 2004; Li et al., 2004, Yusuf et al., 2004)

2.7 Challenges of Supply Chain Management

Supply chain management (SCM) is a complex system fraught with numerous challenges that impact its efficiency and overall success. The operational landscape has grown increasingly intricate, making it imperative for companies to remain competitive and adept at mitigating risks in order to achieve favorable outcomes. Within this subchapter, we have compiled a list of significant challenges within supply chain management (SCM). These challenges can be categorized into both internal and external factors, and further delineated into various departments within a supply chain, including procurement, production, logistics, and others. In the present-day landscape, effective risk management has become an imperative aspect of supply chain operations.

2.7.1 External Challenges

2.7.1.1 Natural Disasters

One category of challenges pertains to natural disasters and their potential to disrupt supply chains. These disasters can stem from various sources, including meteorological events such as storms, tornados, blizzards, and hurricanes, geo-physical occurrences like earthquakes and tsunamis, climatic factors such as droughts and heatwaves, or hydrological events like floods. Natural disasters occurring worldwide often result in significant economic losses for affected countries. The Tohoku earthquake and tsunami in Japan in 2011 incurred a staggering total cost of losses amounting to $309 billion. Similarly, in 2005, Hurricane Katrina in North America resulted in losses totaling $200 billion, and the Sichuan earthquake in China in 2008 led to losses amounting to $146 billion. Natural disasters have the potential to severely disrupt supply chains, causing production stoppages that can last for days or even weeks, as was the case with the Tohoku earthquake. This event forced the shutdown of plants belonging to Toyota, Nissan, Honda, Ford, and others in Asia. Chrysler and General Motors also experienced shortages during this period (Manners-Bell, 2014)

2.7.1.2 Economic Risks

Supply chains are susceptible to a multitude of economic risks, one of which is supply shocks. These occur when an unforeseen event leads to a significant alteration in the aggregate supply curve. Such events may encompass natural disasters, abrupt rises in taxes or labor wages, fluctuations in oil prices, trade restrictions, and various other factors that can disrupt the supply chain's normal operations. The impact of supply shocks varies depending on the specific circumstances, but generally, customers tend to bear the brunt of these disruptions. Supply shocks can result in monetary inflation, causing prices of products to

surge and rendering them inaccessible when customers are unable to afford them or find them in the market (Ross, 2015).

As highlighted by Lu (2011) and Manners-Bell (2014), another substantial risk that supply chains face is demand shocks and volatility. These involve sudden and substantial shifts in the demand for goods and services, coupled with market uncertainty. Demand shocks are particularly challenging for supply chains because predicting when they will occur and their exact impact, even if the change is positive, can be exceedingly complex, impacting production and supply in unpredictable ways. The crisis of 2008 stands out as one of the most significant recent instances of negative demand shock, leading to a collapse in production across many countries. A steep decline in demand can trigger a crisis throughout the entire supply chain, resulting in supplier failures and a decrease in customer loyalty as businesses grapple with the sudden and severe reduction in demand (Manners-Bell, 2014).

2.7.1.3 Corruption

Additionally, corruption within the logistics industry presents numerous challenges. The process of globalization has enabled companies to leverage low-cost labor markets, particularly in emerging nations. However, emerging economies often exhibit significant instability, fragile security conditions, and weak judicial and legislative systems, all of which contribute to the permeation of corruption within society and government. It's worth noting that a substantial percentage of multinational corporations have lost contracts as a result of the corrupt practices of their competitors, as highlighted by Burnson (2015).

2.7.1.4 Crime and Piracy

Moreover, there is the ongoing challenge of cargo crime and piracy, including theft from trucks and warehouses. Billions of dollars are pilfered annually and funneled into the black market. These criminal activities not only impact the financial health of companies but also reduce tax revenues. In the United States, for instance, food and beverages are a particularly popular target, accounting for a quarter of all such crimes and often involving thefts from vehicles. Pharmaceutical goods are another commonly targeted category in these criminal activities.

In different countries, the most commonly stolen products can vary. However, the global trend shows an increase in theft from trucks and warehouses. Shockingly, around one-fifth of drivers experienced attacks during a five-year span (Manners-Bell 2014).

2.7.2 Internal Challenges

2.7.2.1 Choice of Partners

Selecting the right partners is indeed a formidable challenge in supply chain management. There's always the risk of getting tied into partnerships that don't foster effective cooperation or yield desired outcomes. Engaging in SCM collaboration is a strategic decision that demands careful consideration. To ensure a successful partnership, it's crucial to clarify and align the expectations and objectives of the involved companies so that they complement each other (Jespersen & Tage, 2005).

An example of these challenges can be seen in supplier management. Numerous companies grapple with issues related to their suppliers, such as longer-than-desired lead times, suppliers' inability to consistently provide accurate information on orders and reliably fulfill

those orders on time and in full, and resistance to adhering to manufacturers' guidelines. These challenges in supplier relationships can significantly affect a company's supply chain efficiency and performance (Blanchard, 2010).

2.7.2.2 Opportunistic Behaviour

Another internal risk to consider is the threat of opportunistic behavior. This risk can emerge when one member of a supply chain identifies an immediate opportunity for substantial profit and decides to pursue it independently, without coordinating with other parties. In such cases, the company's unilateral actions may cause harm to the overall supply chain. This scenario is akin to a firm devising a crisis plan that focuses solely on short-term actions to boost annual results, potentially overlooking the long-term well-being of the supply chain (Jespersen & Tage, 2005).

2.7.2.3 Security Risks

Furthermore, supply chains face various security challenges that encompass the security of intellectual property, information, human resources, and physical goods. These risks often stem from third parties who may or may not be members of the supply chain. Examples include system hackers, the unauthorized release of critical information, freight breaches, tampering for criminal purposes, and various other security threats that can compromise the integrity and safety of the supply chain (Manuj et al., 2007)

2.7.3.4 Lack of Coordination

A prevalent challenge in supply chain management is the lack of coordination among its members, which can lead to numerous adverse consequences. This coordination gap often arises due to conflicting objectives among different stages of the supply chain or delays and

inaccuracies in the flow of information within the chain. In such instances, members may fail to consider the repercussions of their actions on other parties within the supply chain, resulting in inefficiencies and disruptions. This can lead to higher costs in manufacturing, labor, inventory, and transportation, along with extended replenishment lead times, reduced product availability, and the potential for strained relationships within the supply chain. Additionally, it can trigger the occurrence of the bullwhip effect as one of its potential consequences (Chopra & Meindl, 2010).

2.7.2.5 The Bullwhip Effect

The bullwhip effect materializes due to minor fluctuations in the demand of the ultimate company in the supply chain, which then ripple through the chain and magnify. This phenomenon often arises from incomplete or partially inaccurate information regarding the requirements of other members in the chain. Consequently, it leads to imbalanced increases in inventory levels and, in turn, triggers even more significant fluctuations in demand further downstream. This can result in inefficient production, excessive inventory, subpar customer service, and missed sales opportunities (Farooqui, 2010).

2.7.2.6 Strategic Challenges

Implementing strategies aimed at enhancing supply chain efficiency, as discussed in the preceding chapter, presents numerous challenges. Approaches such as supply chain integration, supply chain optimization, utilization of the SCOR model, lean methodologies, and Green Supply Chain Management (GSCM) all demand substantial efforts from each participating company to achieve success. This is particularly true for global supply chains, which encounter a multitude of challenges not typically faced by domestic ones. These challenges include managing vast physical distances, navigating cultural differences, coping

with time zone disparities, addressing infrastructural limitations, securing logistical resources, and contending with reduced visibility within the supply chain (Manuj et al., 2007).

2.8 Theoretical Review

A theory is a framework comprised of logically interconnected concepts, definitions, and propositions that are formulated to elucidate and forecast events or phenomena (Cooper and Schindler, 2014). In the context of researching the impact of e-procurement on organizational performance in Ghana, two prominent theories serve as the foundational basis for the study: the Resource-Based View (RBV) theory and Transaction Cost Economics (TCE).

2.8.1 Resource-Based View (RBV) Theory

A resource-based view (RBV) is the cornerstone of this analysis and this section will concentrate on evaluating and addressing its relevance, as all research elements are built on this theory. From this theory logistics capacity was developed; however, as it is such an important concept for this study.

The Resource-Based View (RBV), as defined in the field of Strategic Management, is a strategic concept positing that each company possesses distinctive resources and capabilities that serve as the foundation for its competitive advantage (Mohamed et al., 2014). An important aspect of the resource-based theory, as it pertains to this study, is the presumption that every company possesses a distinct combination of resources and capabilities. It is this unique bundle of resources and capabilities that serves as the wellspring of competitive advantage for each firm (Mohamed et al., 2014). Every organization possesses its own set of distinctive skills, personnel, resources, and capabilities, making it inherently unique. Similarly, each international logistics firm maintains its own unique characteristics.

Consequently, any practical theoretical framework must be customized to suit a specific company's needs in order to effectively and efficiently address its unique challenges and problems.

In its initial stages, a resource-based approach primarily emphasizes the examination of a company's internal resources and capabilities. This stands in contrast to the industrial or organizational perspective, which suggests that the industry or sector in which a company operates has a more significant influence on its performance than its internal resources. The latter view posits that a firm's success is largely influenced by its external environment (as mentioned by Mohamed et al., 2014), meaning it places greater emphasis on external resources and capabilities.

Resources are essential inputs to produce the final product or service, and are the basis for the productivity of a business. Capacity refers to a company's ability to distribute capital, typically in conjunction, using organizational processes, to achieve a desired ending. They are processes based on knowledge, tangible or intangible, which are firm-specific and evolved over time through complex interactions.

According to the RBV theory, company unique features contribute to organisational performance (Abadi and Cordon, 2012). Since many resources are firm-specific and not completely elastic or imitable, firms are increasingly heterogeneous as to their resource base. Sustained heterogeneity of firm capital, therefore, is a potential source of to organisational performance (Das and Teng, 2000).

For this study on effect of supply chain effectiveness, efficiency and differentiation on competitive advantage, the resource-based view (RBV) theory becomes a relevant theory that underpins the study.

2.8.2 Transaction Cost Economic (TCE) Theory

The transaction cost economics (TCE) refers directly to the issue of why businesses are formed and how they are hierarchically regulated and organized. A transaction is characterized as the transition from an upstream to a downstream manufacturing process of a pre-product or semi-produced product or service (Bremen et al., 2010).

TCE is looking at the efficient distinction between companies and markets. The TCE represents that economizing transaction costs is essential to organizational analysis, and saving is achieved by assigning transactions in a selective manner to governance structures. The TCE claims that transaction costs are the key concern when a company chooses between internal development and business acquisition (Hyuk, 2014). TCE defines the firm as an administrative instrument that promotes productivity and encourages trade between economic actors (Leiblein, 2003).

Originally, the Transaction Cost Economics (TCE) theory tackles several fundamental questions, including: Why do firms exist? What strategies are most effective for maximizing profits? What should firms produce internally? And what should firms procure or buy from external sources? The central theoretical premise of this theory delves into the circumstances in which specific attributes of a transaction or the subject of the transaction would result in its management either within the organization, through a combination of internal and external approaches, or through external governance (Coase, 2009). This theory is built upon two

significant foundational behavioral assumptions: bounded rationality and opportunism (Nderitu and Ngugi, 2014). These two assumptions address the following: Bounded Rationality: Bounded rationality acknowledges that individuals possess rational decision-making abilities, but these abilities are restricted or limited. In essence, people are capable of making rational choices, but their capacity for doing so is constrained by various factors, such as time constraints, cognitive limitations, and incomplete information. This assumption recognizes that individuals cannot always make perfectly optimal decisions due to these limitations.

As a result, it's typically the case that both parties involved in a transaction can only enter into an incomplete contract (William, 2008). Opportunism, on the other hand, pertains to individuals cunningly behaving in a self-serving manner at the detriment of others. The risk of opportunistic behavior is generally assumed to be less likely within a firm compared to market coordination. This is because within a firm, opportunism can be mitigated through hierarchical structures and authority, whereas outside the firm, such as in dealings with customers, suppliers, or shareholders, the risk of opportunism may be higher (Muma et al. 2014).

The fundamental premise here is that a principal transfers decision-making authority to an agent. In order to ensure that the agent acts in alignment with the principal's expectations, the principal establishes incentives. The primary purpose of firms is to generate profits, and as a result, a company that adopts sustainable supply chain practices is positioned more advantageously compared to its competitors.

As such, the transaction cost economic (TCE) theory therefore becomes a relevant theory that underpins this study. This is because the purpose of the firm is to increase their competitive edge, and it is necessary to adopt supply chain effectiveness, efficiency, and differentiation. Therefore, the extent to which supply chain effectiveness, efficiency, and differentiation help to achieve a firm competitive advantage can be influenced by the TCE in terms of how the relationship is structured and organised to maximize wealth.

2.9 Conceptual Framework

This section of the study introduces the theoretical framework that serves as the foundation for the research. The theoretical framework delves into the connections among the variables considered crucial to understanding the dynamics of the investigated situation. Key components of the framework encompass explicit descriptions of the pertinent variables, an exploration of how these variables are interconnected (particularly for significant theoretical relationships), and the provision of a visual schematic diagram. This diagram is included to assist readers in visualizing and comprehending the proposed relationships more readily. Subsequently, this framework is followed by the formulation of suitable hypotheses designed to test the theoretical relationships postulated, along with the underlying logic and concepts supporting each hypothesis. In addition, a precise operational definition of sustainable supply chain management is presented. This definition serves as a foundational element to help achieve the study's objectives and draw conclusions that are pertinent to the specific case being examined. Figure 2.4 below shows the theoretical framework of the study:

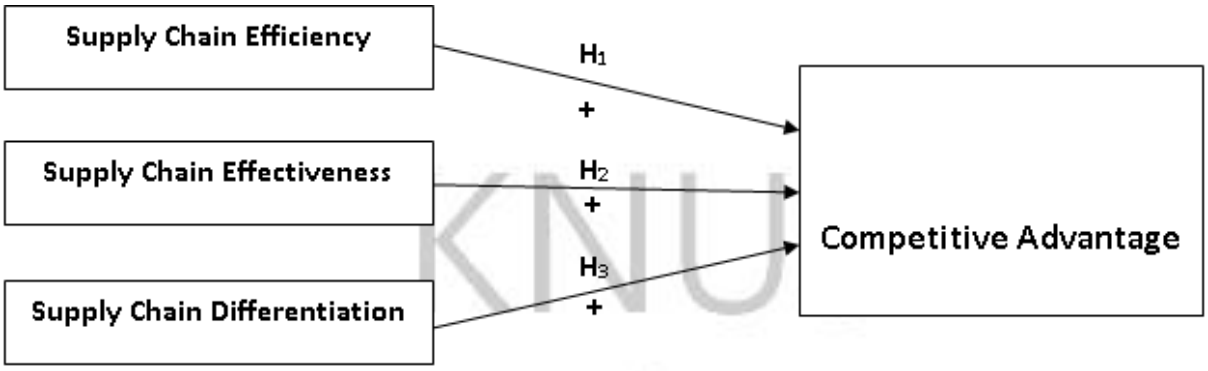

Figure 2.4: Research Model

Source: Researcher's Construct, 2023

From Figure 2.4 depicts theoretical the framework of the study, it can be seen that supply chain efficiency, effectiveness and differentiation among the Ghanaian firms lead to the competitive advantage for individual firms and the industry as a whole.

The theoretical framework depicts that each of the selected supply chain management dimensions – supply chain efficiency, effectiveness, and differentiation contribute positively to gaining a competitive edge for individual firms in the Western Region of Ghana.

Efficient supply chain management (SCM) has evolved into a highly valuable means of attaining a competitive advantage and enhancing organizational performance. This shift is attributed to the fact that competition now extends beyond individual organizations and is increasingly centered on competition among entire supply chains (Li et al., 2006). This implies that internal supply chain management processes are very key to ensure organisational performance and competitive advantage.

Competitive advantage, as defined by Yamin et al. (1999), pertains to how effectively an organization accomplishes its market-oriented objectives and financial goals. In the short

term, supply chain management (SCM) aims primarily to boost productivity and decrease inventory and cycle times. In the long term, the overarching goals include expanding market share and increasing profits for all participants within the supply chain (Tan et al., 1998).

The theoretical framework is essentially a simplified representation of the connections among the variables under examination. It serves to visually depict the cause-and-effect relationships, encompassing any mediating factors involved. This framework plays a crucial role in research by offering a clear and illustrative portrayal of the relationships among various factors within a particular study. It effectively outlines the research structure and serves as a guiding framework for researchers throughout the entire research process.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides a detailed account of the research methodology employed, elucidating the step-by-step process encompassing the design of the research approach and the administration of the questionnaires utilized in the study. In this section, the chapter elaborates on the diverse data sources harnessed for the project. It delves into details regarding the population under study, the selected sample, the techniques employed for sampling, and the research instruments utilized in conducting this study.

3.2 Research Design

A research design serves as the comprehensive strategy for establishing a connection between the theoretical research problem and the feasible empirical research process. Put differently, it outlines the blueprint for what data to collect and how to analyze that data. In this study, the chosen research design is the survey approach. A survey is a research strategy that involves the empirical examination of a specific contemporary phenomenon within its real-life context, utilizing a specific source of evidence. The selection of the survey approach for this study is driven by several factors. Firstly, the research demanded a specific source of evidence, which the survey method can effectively provide. Secondly, a survey research approach offers researchers the means to gain a comprehensive understanding of the problem or situation under investigation. Additionally, the choice of this approach is influenced by the researcher's lack of control over the issues being examined, making a survey an appropriate method for collecting data and insights from respondents.

3.3 Population of the Study

In the realm of research, the term 'population' denotes the complete count of all instances of the phenomenon under investigation within the specified study area. It pertains to the specific group of interest from which data will be gathered and analyzed in the research. The study's participant pool encompassed all personnel, encompassing both managerial and staff roles, employed by companies situated in the Western region of Ghana. The research sample was segmented into three distinct groups: management staff, senior staff, and junior staff. These individuals are directly engaged in the organization's supply chain management procedures.

3.4 Sample Size

The study included a total sample size of one hundred (100) participants. The individuals comprising the available respondents within the sample size encompassed The individuals comprising the available respondents within the sample size encompassed top management staffs of Ghanaian firms in the Western region.

3.4.1 Sampling Techniques

Because collecting data from the entire population was not feasible due to budget and time limitations, the research focused on using a sample. The researcher employed both purposive and random sampling methods for the study. The researcher employed the purposive technique to choose respondents from the management and senior management levels. This selection was based on the assumption that these individuals possess extensive knowledge of the supply chain management process. Ultimately, the convenience sampling method was employed to choose respondents who expressed willingness and capability to take part in the study. These two techniques were utilized to obtain the data necessary for accomplishing the research objectives.

3.5 Data Collection Method

The study employed two primary sources of data collection. Information was gathered from both primary and secondary sources. This blend of primary and secondary data sources offered a comprehensive and dependable dataset, thereby enhancing the precision and reliability of the drawn conclusions and recommendations. All the chosen customers and employees who were present on the data collection days received questionnaires to complete independently. The investigator was on hand to clarify any questions that were not clear or understandable to them.

3.5.1 Primary Data

This is the specific data that the researcher intentionally collected for the current research. The primary data sources for this study were acquired through information directly obtained from employees, including both management and workers, of selected firms. This information was collected using questionnaires administered either in person or via phone.

3.5.2 Secondary Data

Secondary data is data collected by organizations or sources for purposes other than the specific study at hand. It offers pre-existing data, thus saving time and resources that would otherwise be spent on primary data collection. Additionally, it offers the advantage of non-intrusive access to information. In this study, secondary data was sourced from books, journals, and internet sources.

3.6 Data Collection Tools

The items used to measure the various sources to measure the supply chain efficiency construct in the questionnaire included Beamon (1999), Bowersox and Closs (1996), and

Collin (2003). Also, items used to measure supply chain effectiveness as well as differentiation constructs were adopted from Bobbitt (2004) whiles the competitive advantage construct was measured with items from Talaja et al. (2017).

3.7 Data Analysis

The collected data were analyzed using basic statistical methods, including the creation of a frequency distribution table. To facilitate this analysis, tables, charts, and figures were generated with the assistance of statistical software tools like Microsoft Excel and Statistical Package for Social Sciences (SPSS).

Concerning the SPSS software, all responses to the closed-ended questions were inputted into the software for data processing and analysis. Subsequently, the system presented the analyzed data in the form of frequency tables and figures as the output. The chosen approach was selected for its appropriateness in effectively elucidating the findings, thereby enabling the researchers to derive precise and pertinent observations, recommendations, and conclusions. Correlation analysis was employed to uncover relationships among different performance variables. Subsequently, based on these findings, the research drew relevant conclusions and made appropriate recommendations.

3.8 Data Validity and Reliability

Data validity pertains to the accuracy and reasonableness of data. For the tasks mentioned above, the data needed was sourced from both primary and secondary sources. The researcher constructed the sample frame as part of the survey process. This was done to guarantee that the chosen approach was dependable, accurate, and consistent. Subsequently, specific focus was directed towards the data entry process to ensure the accuracy of data processing.

Validity, which signifies the correctness and reasonableness of data, is susceptible to errors, so extra care was taken during the data entry procedure.

CHAPTER FOUR

PRESENTATON OF FINDINGS, ANALYSIS AND DISCUSSIONS

4.0 Introduction

This chapter provides an overview of the findings and analysis derived from the data collected during the field study. Hence, it presents the responses pertaining to the examination of the impact of supply chain effectiveness, efficiency, and differentiation on competitive advantage; evidence from firms in Ghana. In addition, analysis of the effect of supply chain effectiveness on competitive advantage among Ghanaian firms; the effect of supply chain efficiency on competitive advantage among Ghanaian firms; the effect of supply chain differentiation on competitive advantage among Ghanaian firms; and the challenges that hinder effective and efficient supply chain management among Ghanaian firms are thoroughly presented and discussed.

Data collection involved distributing questionnaires to employees of firms in the Western region. Out of the 100 questionnaires distributed, 79 were returned, resulting in a response rate of 79%. Analysis was conducted solely on the valid responses obtained from the field study. The presentation and discussion of the findings adhered to the questionnaire's structure and aligned with the study's objectives.

4.1 Demographic Information of Respondents

Referring to Table 4.1, the study's findings indicate that 58% (n=46) of the participants, who are employees of the selected firms, were male, while the remaining 42% (n=33) were female. Furthermore, a significant portion (41%) of the respondents fell within the age range

of 30 to 40 years. This was succeeded by the next 30% who less than 30 years and then closely by 29% who were between 40 – 50 years.

On the educational ladder, majority (47%) were First Degree graduates whereas about 28% had Masters qualification with about 25% having HND or equivalents. Regarding the work experience of the respondents within their respective companies, it was observed that the majority (29%) had been employed by their respective companies between 1 – 3 years or 4 – 6 years respectively. This was followed by those who had been working for more than 10 years (18%) and then 16% who had less than a year experience. This information is depicted in Table 4.1 provided below;

Table 4.1: Demographic breakdown of respondents

Variable	Categories	Freq.	%
Gender of Respondents	Male	46	58%
	Female	33	42%
	Total	**79**	**100%**
Age of Respondents	Less than 30 years	24	30%
	30 - 40 years	32	41%
	41 - 50 years	23	29%
	51 years and above	0	0%
	Total	**79**	**100%**
Respondents' Number of Years Worked	Less than 1 year	13	16%
	1 - 3 years	23	29%
	4 - 6 years	23	29%
	7 - 9 years	6	8%
	10 years and above	14	18%
	Total	**79**	**100%**
Educational Level of Respondents	HND/Equivalents	20	25%
	Degree Holder	37	47%
	Masters Holder	22	28%
	Total	**79**	**100%**
Position of Respondents	Management Staff	21	27%
	Senior Staff	42	53%
	Junior Staff	16	20%
	Total	**79**	**100%**

Source: Field Work, 2023

As evident from Table 4.1, the demographic characteristics of the respondents exhibit a clear association with their understanding and perspectives on supply chain management activities within their respective companies. Considering the substantial length of service and the educational qualifications of the employees, there is confidence that the responses they provided regarding the study's subject matter genuinely reflect the issues under investigation. The connection between the demographic information and the study's objectives will be thoroughly discussed in the subsequent subsections.

4.2 Supply Chain Effectiveness of Selected Firms in Ghana

The initial objective of the study was to scrutinize the effect of supply chain effectiveness on competitive advantage among Ghanaian firms. To ensure this, questions were posed to the staff and management of selected companies in the Western region. The items used to measure supply chain effectiveness were adopted from the studies of Mentzer (1991), Beamon (1999), Simch-Levy (2000), and Collin (2003), among others. This section presents and discusses the findings that were revealed from questions posed to these sets of respondents. Using a 7-point Likert scale, 1 measured Strongly Disagree, 4 measured agreed and 7 measured Strongly Agree to gather the responses of participants of the study. Table 4.2 shows the descriptive statistics of responses to measure supply chain effectiveness.

Table 4.2: Supply Chain Efficiency of Firms

Measuring Items	Min	Max	Mean	Std. Dev
1. Sales (Dollars)	1	7	5.10	1.429
2. Transportation Costs	3	7	4.56	1.217
3. Warehousing Costs	3	7	4.68	1.069
4. Inventory Costs.	3	7	4.76	1.146
5. Total Logistics Costs	2	7	4.75	1.203
Average Response	**3.33**	**7.00**	**4.81**	**.905**

Source: Field Work, 2023

As Table 4.3 illustrates, companies prioritize Supply Chain Effectiveness (SCEFFT) as a dimension of supply chain management. This is evident from the mean responses, where most of the 5 items used to measure SCEFFT scored above 4.0, which is the midpoint indicating "Indifferent". It is apparent that the strongest indication of agreement was observed in response to the first item: "*Sales (Dollars)"* with mean, 5.10 and SD=1.429. This was followed by the 4th item which was "*Inventory Costs.*" with Mean=4.76, SD=1.146

Nonetheless, the lowest level of disagreement was expressed in response to the second item, "*Transportation Costs*," which exhibited mean and standard deviation values of 4.56 and 1.217 respectively.

4.3 Supply Chain Efficiency of Selected Firms in Ghana

The second objective of the study aimed to assess the impact of supply chain efficiency on competitive advantage among Ghanaian firms. To achieve this, various parameters were used

to determine the extent of supply chain efficiency on competitive advantage among Ghanaian firms. The items used to measure the construct were adopted from the study of Bobbitt (2004). The study utilized a 7-point scale ranging from "1=strongly disagree" to "4=neither agree nor disagree" and up to "7=strongly agree." Specifically, 10 adapted items were employed to evaluate supply chain efficiency. Table 4.3 below displays the descriptive statistics of the responses as given by staff of the selected companies.

Table 4.3: Supply Chain Efficiency of Selected Firms

Measuring Items	Min	Max	Mean	SD
1. Your organisation provides products/services with high quality.	2	7	5.72	1.198
2. Your organisation provides products/services at low cost	2	6	4.99	1.204
3. Your organisation makes sure goals are accomplished	3	7	5.11	.987
4. Your organisation provides products/services within a short lead time (time between orders)	2	7	5.00	1.166
5. The relationship between customer services level and cost is important to your organization	3	7	5.52	1.153
6. Your organization's logistics systems ensures maximization of profitability	2	7	5.26	1.159
7. Your organization utilises available resources (human, financial, machinery) well.	2	7	4.94	1.202
8. Your organization's supply chain strategies take into account interactions at the various levels of the organization	2	7	5.46	1.430
9. Your organization is able to provide requested customer support	3	7	5.23	1.240
10. Your organization ensures appropriate mix of customer service, capital employed and total cost	3	7	5.01	1.149
Average Response_Efficiency	**3.60**	**6.60**	**5.22**	**.789**

Source: Field work, 2023

From Table 4.3, ten (10) items were used to signify supply chain efficiency (SCEFFCY) using a 7-point Likert Scale with 1=Strongly Disagree, 4 through to "4=Indifferent" to "7= Strongly Agree. Out of the 10 items, the highest mean score was achieved for the 1st item, "*Enhance continuous production,*" with a mean value of 5.72 and a standard deviation of 1.198. This result indicates a strong level of agreement among respondents. All other items measured more than 4.0 implying the contribution of supply chain efficiency and these include "*Your organisation provides products/services at low cost", "Your organisation makes sure goals are accomplished", "Your organisation provides products/services within a short lead time (time between orders)", "The correlation between the level of customer service and cost is significant to your organization", "Your organization's logistics systems ensures maximization of profitability", "Your organization utilises available resources (human, financial, machinery) well", "Your organization's supply chain strategies consider interactions at different levels within the organization", "Your organization is able to provide requested customer support",* and *"Your organization ensures an appropriate mix of capital employed, customer service, and total cost".*

This implies that firms in the Western region recognize of supply chain efficiency in their operations.

4.4 Supply Chain Differentiation of Selected Firms in Ghana

The third objective of the study aimed to investigate the impact of supply chain differentiation on competitive advantage among Ghanaian firms. To ensure this, questions were posed to the staff and management of selected companies in the Western region. The items used to measure supply chain effectiveness were adopted from the study of Bobbitt (2004). This section presents and discusses the findings that were revealed from questions

posed to theses sets of respondents. Using a 7-point Likert scale, 1 measured Far below Competitors, 4 measured At Par With Competitors and 7 measured Far Above Competitors to gather the responses of participants of the study. Table 4.4 presents the descriptive statistics of responses used to assess supply chain differentiation.

Table 4.4: Supply Chain Differentiation of Firms

Measuring Items	Min	Max	Mean	Std. Dev
1. How would you rate your organization's level of damage-free deliveries in relation to other organizations	1	7	4.61	1.372
2. How would you rate your organization's level of finished goods inventory in relation to other organizations	1	7	4.71	1.834
3. How would you rate your organization's level of forecast accuracy in relation to other organizations	3	7	5.06	1.170
4. How would you rate your organization's lead time (time between order receipt and delivery) in relation to other organizations	1	7	5.05	1.493
5. How would you rate your organization's time it takes to backorder (reorder from other firms) in order to meet customer's demand	3	7	5.44	1.366
6. How would you rate your organization's level of total inventory turns in relation to other organizations	3	7	4.99	1.204
7. How would you rate your organization's level of on-time (prompt) delivery in relation to other organizations	1	7	5.41	1.637
Average Response Differentiation	**3.14**	**7.00**	**5.04**	**.891**

Source: Field Work, 2023

The information in Table 4.4 reveals that companies prioritize Supply Chain Differentiation (SCDIFF) as a dimension of their supply chain management. This is evident because the

average scores for the majority of the 7 items used to assess SCDIFF were above 4.0, indicating that they are performing at a level comparable to their competitors. The item that received the highest agreement from respondents was the 5th, as evidenced by the data: "*How would you rate your organization's time it takes to backorder (reorder from other firms) in order to meet customer's demand"* with mean, 5.44 and SD=1.366. Following the fifth item, the last item in the sequence was "*How would you rate your organization's level of on-time (prompt) delivery in relation to other organizations*" with Mean=5.41, SD=1.637.

However, the response that received the lowest level of disagreement was the first one, which was "*How would you rate your organization's level of damage-free deliveries in relation to other organizations*" and had a mean value of 4.61 and standard deviation of 1.372.

4.5 Extent of Competitive Advantage of Selected Firms

The main outcome variable of this study was competitive advantage. As such, it was necessary to determine the extent to which the selected firms in the Western region are able to achieve competitive advantage. The items utilized to assess the construct were adopted from the research conducted by Talaja et al. in 2017. A 7 point scale was employed, measuring 1= Far Below Competitors, 4 measured At Par With Competitors and 7 measured Far Above Competitors. In all, 6 adapted items were employed to measure competitive advantage. The descriptive statistics for the responses are presented in the table below as Table 4.5 as given by staff of the selected companies.

Table 4.5: Level of Competitive Advantage of Selected Firms

Measuring Items	Min	Max	Mean	Std. Dev
1. How would you rate your organization's general advantage over competitors?	1	7	5.09	1.579
2. How would you rate your organization's sustainability of acquired competitive advantage?	1	7	5.03	1.544
3. How would you rate your organization's quality and image of the products or services?	1	7	4.97	1.561
4. How would you rate your organization's price of the products/services?	1	7	4.27	1.456
5. How would you rate your organization's Production costs of products/Delivery costs of services?	1	7	4.49	1.640
6. How would you rate your organization's customer satisfaction with products/services?	1	7	4.89	1.860
Average Response Competitive Advantage	**2.00**	**7.00**	**4.79**	**1.096**

Source: Field Work, 2023

It could be seen from Table 4.5 that companies achieve competitive advantage (CADV) as per the general response (4.79) and All six of the items employed to gauge CADV registered scores exceeding 4.0, which is the midpoint, indicating "At par with Competitors". The first item received the highest level of agreement among respondents, as evident from the data: "*How would you rate your organization's general advantage over competitors?"* with mean, 5.09 and SD=1.579. Following the first item, the second item in the sequence was "*How would you rate your organization's sustainability of acquired competitive advantage?*" with Mean=5.03, SD=1.544.

Nevertheless, the item that received the lowest level of disagreement was the 4th item which was "*How would you rate your organization's level of damage-free deliveries in relation to other organizations?*" with mean (4.27) and standard deviation (1.456).

4.6 Measurement Model Analysis

Prior to implementing the theoretical framework developed for this study, it was essential to assess the suitability of the items employed to gauge the concepts. This assessment consisted of two crucial stages: (1) conducting a reliability test and (2) carrying out an exploratory factor analysis (EFA). In total, four distinct constructs were evaluated.

4.6.1 Reliability of the Measures

To assess the reliability of the measures, Cronbach's alpha was employed to confirm the internal consistency among them, following the methodology outlined by Pallant in 2007. This analysis was conducted using IBM SPSS version 20. The outcomes, as presented in Table 4.7, revealed alpha values spanning from .722 to .860. This suggests that the items utilized to assess the variables successfully met the initial reliability criterion, as they all significantly exceeded the recommended threshold of .70, as proposed by Nunnally in 1978. A summary of these results can be found in Table 4.6.

Table 4.6: Reliability Test Results

Construct	Number of items	Alpha value
1. Supply Chain Effectiveness	6	.849
2. Supply Chain Efficiency	10	.860
3. Supply Chain Differentiation	7	.722
4. Competitive Advantage	5	.768

Source: Field study (2023)

4.6.2 Exploratory Factor Analysis (EFA)

While the results from the reliability test, as presented in Table 4.6, demonstrate strong internal consistency for all the scales pertaining to their respective constructs, it was still essential to conduct an exploratory factor analysis (EFA). This step was necessary to further investigate the relationships among the constructs and understand their dimensional aspects (Pallant, 2007).

To establish convergent validity, it was essential to conduct exploratory factor analysis (EFA) on each sub-construct. EFA was chosen as the preferred method because some of the items were created by the researcher, and the study's sample size was not sufficiently large to support confirmatory factor analysis (CFA). This analysis was executed using SPSS.

The analysis was conducted using Principal Axis Factoring and Direct Oblimin with Kaiser Normalization for rotation. For the rotation method, Varimax rotation was employed. Four factors were predetermined for extraction. Throughout all the analyses, the criteria for

component extraction were set to include only those with Eigenvalues greater than 1.0, and coefficients with loadings below 0.50 were suppressed.

The Kaiser-Meyer-Olkin (KMO) value was calculated to be .678, surpassing the recommended threshold of .6. Additionally, Bartlett's Test of Sphericity yielded statistical significance (p <), affirming the factorability of the correlation matrix (Pallant, 2007).

During the first stage, a block-wise technique was utilized to evaluate convergent validity. Each sub-construct was analyzed individually to determine if the items measuring it performed as expected. In many instances, the analysis did not result in a single component; instead, it yielded two components with items loading on them. As a result, convergent validity was not achieved.

In the second stage, all the items that were retained from the previous analysis were examined together. This step aimed to confirm discriminant validity. The extraction process resulted in four components, each with eigenvalues exceeding 1, explaining 41.32% and 33.03% of the variance, respectively. Upon inspecting the inter-correlations among these components, it became evident that there were numerous coefficients with values above .50.

Based on a minimum loading criterion of .50, the following items were retained – EFFCT 2-5, SCEFFCY 5 and 8, SCDIFF 1 and 7 and CADV 1,2,3 and 6 respectively. Following the elimination of undesired constructs and items, a satisfactory model was achieved in which each block of items loaded onto its theoretically designated constructs. The items that remained after the EFA are presented in Table 4.7.

Table 4.7: Factor Loadings and Validity and Reliability Results from EFA

Measures/Indicators	CODE	Component			
		1	2	3	4
Supply Chain Effectiveness	SCEFFT2	.734			
	SCEFFT3	.878			
	SCEFFT4	.746			
	SCEFFT5	.789			
Supply Chain Efficiency	SCEFFCY5			.770	
	SCEFFCY8			.874	
Supply Chain Differentiation	SCDIFF1				.537
	SCDIFF7				.874
Competitive Advantage	CADV1		.800		
	CADV2		.831		
	CADV3		.932		
	CADV6		.874		
Eigen Values		5.523	3.125	2.123	1.133
% of Variance		34.518	19.529	13.268	7.082
Cronbach's Alpha		0.838	0.895	0.728	.

KMO = .877

Bartlett's test of Spherity: x^2(DF) 1025.741(120); p=0.000

Notes:

1. Extraction Method: Principal Component Analysis.
2. Rotation Method: Varimax with Kaiser Normalization.
3. Rotation converged in 6 iterations.

Source: Field Study, 2023

4.7 Test of Model

In establishing the impact of supply chain effectiveness, efficiency, and differentiation on competitive advantage, correlation and regression analysis was utilized for the subsequent analysis.

Three main independent variables were used namely of supply chain effectiveness (A), supply chain efficiency (B) and supply chain differentiation (C); while the dependent variable was Competitive Advantage (Y).

The regression estimates was given as:

$$Y = b_0 + b_1A + b_2B + b_3C + \varepsilon$$

Where, $b_0 = constant\ of\ proportionality$

$b_{1-3} = coefficient\ of\ independent\ variables$

$\varepsilon = error\ term$

Y = Competitive Advantage

Table 4.8: Correlations of Variables and Descriptive Statistics

Variables	1	2	3	4
1. Supply Chain Effectiveness	1			
2. Supply Chain Efficiency	.216	1		
3. Supply Chain Differentiation	.067	.408**	1	
4. Competitive Advantage	.282*	.206	.242*	1
Mean	**4.69**	**5.49**	**5.01**	**4.99**
Standard Deviation	**0.952**	**1.152**	**1.247**	**1.431**

Note:

1. ** Correlation is significant at the 0.01 level (1-tailed).
2. * Correlation is significant at the 0.05 level (1-tailed).

Source: Field Study, 2023

As indicated in Table 4.8, it is evident that respondents attribute their Competitive Advantage to supply chain effectiveness, efficiency, and differentiation. It could be seen that, they all had a weak positive associations with Competitive Advantage as the coefficient of association (r) were less than 5.0 with only supply chain effectiveness and supply chain differentiation been significant at 0.01 or 0.05.

4.7.1 Model Assessment

The researcher employed ordinary least squares regression analysis to assess the study's model. The primary outcome variable in the study was Competitive Advantage, while the predictor variables included Supply Chain Effectiveness, Supply Chain Efficiency, and Supply Chain Differentiation.

One Model was run which was Competitive Advantage and has been predicted by supply chain effectiveness, efficiency and differentiation.

The results regarding these causal relationships are displayed in Table 4.9

Table 4.9: Regression Estimates of Variables on Competitive Advantage

	Standard Estimates
Variables:	**Competitive Advantage**
	Model 1
Hypothesized	
Direct Effect	
Supply Chain Effectiveness	.381(2.303)*
Supply Chain Efficiency	.089(0.554)
Supply Chain Differentiation	.224(0.101)
FIT INDICES	
χ^2 (df)	**21.328(3)**
χ^2/df	**7.109**
F-Statistics	**3.852**
R^2	**.134**

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 Work, 2023

From the regression result, it could be seen that supply chain effectiveness, efficiency and differentiation all had a positive effect on competitive advantage. Thus, supply chain effectiveness had a significant and positive effect on competitive advantage (β=0.381, t=2.303), at $p<0.05$. Supply chain effectiveness also had a positive effect on competitive advantage but it was not statistically significant at $p<0.05$ (β=0.089, t=0.554). Finally, supply chain differentiation also had a positive effect on competitive advantage, but it was also not statistically significant at $p<0.05$ (β=0.224, t=0.101).

Overall, supply chain effectiveness, efficiency and differentiation do not predict Competitive Advantage to a large extent as the R-square value of **.134** was relatively low. It implies that only about 13.4 % of changes in Competitive Advantage of selected firms is predicted by supply chain effectiveness, supply chain efficiency and supply chain differentiation. However, it was significant at 0.05.

Therefore, it is important to identify other supply chain management variables which rather contributes much to competitive advantage.

4.8 Discussions of Findings

Competitive advantage is a key determinant of organisational success or failure (Hatani et al., 2013). Competitiveness or competitive advantage is based on the notion that organisational performance is determined by resources and the unique or incomparable capability of an organisation (Peng et al., 2011). The effect of supply chain effectiveness, efficiency and differentiation on competitiveness is examined in this study was guided by established theoretical principles (Heizer and Render, 2010; Krawjeski et al., 2010) that implementation of supply chain management in an integrated manner could lead to opening up of strategic

opportunities for creating competitive advantage which would drive organisational performance.

In this study, a survey approach was employed to statistically evaluate the relationships among supply chain effectiveness, efficiency and differentiation and competitive advantage. A sample of 100 respondents was selected but 79% response rate was achieved. All analysis were based on the retrieved responses.

The findings revealed that companies ensures Supply Chain Effectiveness as a supply chain management dimension. Mentzer (1991) provided a straightforward definition of effectiveness as the degree to which objectives or goals are successfully attained. That, practically doing things right. This means that if organisations ensure supply chain effectiveness, then it implies that they are committed to making things right so as to sustain their competitiveness. As it has been asseted by Reichart and Holweg (2007), The notion here is that supply chain management focused on effectiveness serves as a sustainable means of attaining a competitive advantage. As such, if an organisation is able to serve different groups of customers with varying needs and do so effectively, it contributes to their competitiveness (Godshell, 2011).

Secondly, the study revealed that firms in the Western region recognize of supply chain efficiency in their operations. Beamon (1999) defined efficiency as the measure of how effectively and economically resources are utilized or allocated. This means that if firms recognises supply chain efficiency. Then it implies that they are able to utitlise resources to their maximum use without use. As Christopher (1998) succinctly states, the primary aim of supply chain management is to assist the company in maximizing its financial returns. Hence,

to maintain competitiveness in the global business environment, it is incumbent for organisations to find effective means to reduce cost and enhance service and this cannot be done without efficiency (Christopher, 1998).

The study again revealed that companies ensure supply chain differentiation as a supply chain management dimension. As iterated by Ketchen (2004), Another approach to gaining competitive advantages involves optimizing one or more specific activities within the organization. However, it's crucial to exercise caution to ensure that this optimization doesn't come at the detriment of other essential functions (Porter, 1985; Lumsden, 1998). So, this implies that if organisations ensures differentiation, then they are engaging in several activities that make them competitive.

From the regression results, it was realised that supply chain effectiveness, supply chain efficiency and supply chain differentiation all had a positive effect on competitive advantage, only supply chain effectiveness was a significant factor.

Supply Chain Management (SCM) revolves around two primary performance objectives: effectiveness and efficiency. Effectiveness pertains to "doing the right things," which involves meeting customer needs through appropriate service levels. On the other hand, efficiency involves "doing things right," focusing on achieving cost-optimal operations (cf. Mentzer et al., 2001). This implies that when all activities and processes that need to achieved along the supply chain is done and done well, it could lead to efficiency and in turn contribute to organisational performance. Therefore, practical measures should be implemented to ameliorate competitive advantage.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter provides a concise overview of the study's findings, presents the conclusions drawn, and offers recommendations for stakeholders to enhance the effectiveness and efficiency of supply chain management within selected firms in Ghana. These topics will be elaborated upon in the following subsections.

5.1 Summary of Findings

To ensure the attainment of the study's objectives, this section presents a summary of the study's findings in alignment with its predefined objectives. The discussion of the results in the preceding chapter reveals the following key findings.

5.1.1 Supply Chain Effectiveness of Selected Firms in Ghana

The first objective of the study was to examine the effect of supply chain effectiveness on competitive advantage among Ghanaian firms. To ensure this, questions were posed to the staff and management of selected companies in the Western region. The items used to measure supply chain effectiveness were adopted from the studies of Mentzer (1991), Beamon (1999), Simch-Levy (2000), Collin (2003), among others. This section presents and discusses the findings derived from inquiries directed at these specific groups of participants. A 7-point Likert scale was employed, where 1 signified "Strongly Disagree," 4 represented "Agreed," and 7 indicated "Strongly Agree" to collect the responses from the study's participants. The findings indicate that companies prioritize supply chain efficiency as a key dimension in their supply chain management practices. This is evident because the average

responses for the majority of the 5 items used to assess SCEFFT were above 4.0, which signifies a level of importance beyond indifference.

5.1.2 Supply Chain Efficiency of Selected Firms in Ghana

The second objective of the study was to examine the effect of supply chain efficiency on competitive advantage among Ghanaian firms. To accomplish this, several parameters were employed to assess the degree to which supply chain efficiency impacts competitive advantage among Ghanaian firms. The items used to measure the construct were adopted from the study of Bobbitt (2004). A 7-point scale was utilized, ranging from "1=strongly disagree" to "4=neither agree nor disagree" and extending to "7=strongly agree". The finding revealed that firms in the Western region recognize of supply chain efficiency in their operations as all items measured more than 4.0 implying the contribution of supply chain efficiency.

5.1.3 Supply Chain Differentiation of Selected Firms in Ghana

The third objective of the study was to examine the effect of supply chain differentiation on competitive advantage among Ghanaian firms. To ensure this, questions were posed to the staff and management of selected companies in the Western region. The items used to measure supply chain effectiveness were adopted from the study of Bobbitt (2004). This section presents and discusses the findings that were revealed from questions posed to theses sets of respondents. Using a 7-point Likert scale, 1 measured Far Below Competitors, 4 measured At Par With Competitors and 7 measured Far Above Competitors to gather the responses of participants of the study. The results indicate that companies prioritize Supply Chain Differentiation (SCDIFF) as a dimension within their supply chain management practices. This is evident because the average responses for most of the 7 items used to assess

SCDIFF were above 4.0, which signifies a level of performance that is on par with competitors.

5.1.4 Level of Competitive Advantage of Selected Firms in Ghana

The main outcome variable of this study was competitive advantage. As such, it was necessary to determine the extent to which the selected firms in the Western region are able to achieve competitive advantage. The items utilized to evaluate this construct were borrowed from the research conducted by Talaja et al. (2017).

The findings revealed that that companies achieve competitive advantage (CADV) as per the mean of the general response (4.79) and all six of the items used to gauge CADV had mean responses exceeding 4.0, which indicates a level of performance beyond the midpoint, signifying “At par with Competitors”.

5.1.5 Summary of Model Test Analysis

In establishing the effect of supply chain effectiveness, supply chain efficiency and supply chain differentiation on competitive advantage, correlation and regression analysis were employed.

The correlation results generally revealed that staff of firms partly attribute their competitive advantage to supply chain effectiveness, efficiency and differentiation. It could be seen that, they all had a weak positive associations with Competitive Advantage as the coefficient of association (r) were less than 5.0 with only supply chain effectiveness and supply chain differentiation displayed statistical significance at the 0.01 or 0.05 significance level.

Based on the regression analysis results, it is evident that supply chain effectiveness had a statistically significant and positive impact on competitive advantage (β=0.381, t=2.303), at

$p<0.05$. Supply chain effectiveness also had a positive effect on competitive advantage but it was not statistically significant at $p<0.05$ ($\beta=0.089$, $t=0.554$). Finally, supply chain differentiation also had a positive effect on competitive advantage but it was also not statistically significant at $p<0.05$ ($\beta=0.224$, $t=0.101$).

Overall, supply chain effectiveness, supply chain efficiency and supply chain differentiation do not predict Competitive Advantage to a large extent as the R-square value of **.134** was relatively low. It implies that only about 13.4 % of changes in Competitive Advantage of selected firms is predicted by supply chain effectiveness, supply chain efficiency and supply chain differentiation. However, it was significant at 0.05.

5.2 Conclusions

Investing in Supply Chain Management (SCM) plays a crucial role in ensuring the smooth flow of materials from suppliers to processing units and, ultimately, the delivery of finished goods to the end consumer (Chopra and Meindl, 2007). Since the ultimate aim of SCM is to ensure customer satisfaction, it is necessary to effectively and efficiently manage the network whiles providing differentiated products to the customer in order to gain competitive advantage over competitors.

As such, finding the link from supply chain effectiveness, efficiency and differentiation to competitive advantage is paramount as far as operations in organisations is concerned. However, as far as the researcher is aware, there hasn't been sufficient research conducted within the business sector in Ghana to thoroughly examine this connection. This study therefore seeks to replicate the study of Fugate et al. (2010) on Logistics performance:

effectiveness, efficiency and differentiation in the Ghanaian context but replace the predictor variable with competitive advantage to delve into that study from a different perspective.

The study therefore adopted a quantitative survey approach to select a sample of one hundred (100) respondents whom questionnaires were administered to. The individuals comprising the pool of available respondents in the sample size encompassed management, senior staff and junior staffs of Ghanaian firms in the Western region. Out of the 100 questionnaires distributed, 79 were returned, resulting in a response rate of 79%. The analysis was conducted solely on the valid responses collected during the field study.

It can be concluded from the study that the though supply chain effectiveness, supply chain efficiency and supply chain differentiation all had a positive effect on competitive advantage, only supply chain effectiveness was a significant factor. Mentzer (1991) defines effectiveness as the degree to which objectives are achieved. SCM revolves around two primary performance objectives: effectiveness and efficiency. Effectiveness is about "doing the right things," which means satisfying customers through appropriate service levels. Efficiency, on the other hand, involves "doing things right," which entails optimizing operational costs (cf. Mentzer et al., 2001). This implies that when all activities and processes that need to achieved along the supply chain is done and done well, it could lead to efficiency and in turn contribute to organisational performance. As a result, practical measures should be implemented to ameliorate competitive advantage.

5.3 Recommendations

In line with the study's findings and objectives, the researcher suggests the following guidelines to enhance supply chain effectiveness in the current practices adopted by firms in the business sector and other stakeholders in their supply chain management:

i. Emphasize the Significance of Supply Chain Effectiveness: Management should underscore the importance of supply chain effectiveness. It should not be limited to the responsibilities of staff in the warehouse, stores, or logistics department. Every individual within the organization should recognize the significance of doing things correctly and adhering to related processes. Assigning a dedicated individual to oversee supply chain management on a full-time basis ensures constant focus on this critical function. Additionally, rotating various oversight responsibilities among different individuals can enhance their understanding of supply chain effectiveness. These practices also foster accountability and a sense of ownership. By implementing such measures, selected firms can potentially reduce, if not eliminate, other significant issues such as material handling problems and material shortages.

ii. Implementing an integrated information system within firms is essential to facilitate the seamless exchange and distribution of project-related information. This system should effectively connect and share information among staff within the organization and establish links with the company's suppliers. To achieve this goal, it is advisable to adopt enabling technologies like a Logistics Information System (LIS), often in the form of Electronic Data Interchange (EDI), Value Added Network (VAN), or internet-based solutions. These technologies enable various parties within the supply chain to access essential information for decision-making, allowing them to respond

more effectively to market demands. This, in turn, will enhance supply chain effectiveness.

iii. Enhance Demand Forecasting: Improving demand forecasting should serve as the foundation for the company's internal operations and interdepartmental cooperation to meet market demand effectively. This entails determining which products will be in demand, the quantities required, and the timing of these needs. All forecasting efforts must consider four critical variables that collectively shape market conditions: demand, supply, product characteristics, and the competitive environment. To ensure effectiveness and reduce waste, there is the need to forecast demand so as to avoid over production or under production which was adverse implications.

iv. There should be improvement in the firms' relationships with suppliers. This is one means of enhancing supply chain effectiveness as it would avoid situations such as bullwhip effect. Foster Strong Supplier Relationships: One of the most critical procurement activities is the selection and maintenance of close relationships with multiple reliable and high-quality suppliers. This approach serves to reduce product costs, uphold product quality, and enhance customer services. Firms should actively work on improving their relationships with suppliers by ensuring timely payments, placing orders well in advance, promoting open information sharing, and maintaining honesty in their dealings. The study revealed that some suppliers may be hesitant to provide materials when orders are placed, especially when the company has outstanding debts with them.

v. Organisations should incorporate supply chain effectiveness in the policies so as to improve their competitive advantage. Utilize Multiple Models for Uncertain Demand: In organizations where demand is uncertain due to inadequate forecasting, it's essential to employ a combination of two or more efficient and effective models to approximate the future with a higher degree of accuracy. Flexible models are crucial for determining what to order, the quantity to order, and when to place orders. Establishing an effective communication infrastructure paves the way for Vendor Managed Inventory (VMI), which can enhance operational effectiveness within the organization. Additionally, regression and simulation models can be employed to determine the optimal lot size for orders.

5.4 Recommendations for Further Studies

The results of this study indicate that supply chain efficiency and supply chain differentiation had no significant impact on Competitive Advantage. Therefore, future research in this field should delve much into why this result was found and also in addition, a study should be carried out in respect of moderation and mediation effects of the three concepts of supply chain effectiveness, supply chain efficiency and supply chain differentiation on competitive advantage and firm performance.

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APPENDICES

Appendix I

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE

This questionnaire is part of a project work required by the Kwame Nkrumah University of Science and Technology as a partial requirement for the award of a Master of Science in Logistics and Supply Chain Management degree. The questionnaire is designed to solicit your independent views on "***examining the effect of supply chain efficiency, effectiveness, differentiation on competitive advantage".*** All information provided shall be treated as confidential and used strictly for Academic purpose. Please answer the following questions freely without indicating your name.

(Questionnaires for Key Staffs of Organizations)

PART 1: BACKGROUND DATA

1. Your Gender?
   Male ☐ Female ☐
2. What is your age?
   Less than 30 years ☐ 30-40 years ☐ 41-50 years ☐ 51 and above ☐
3. How long have you worked for your organization?
   Less than 1 year ☐ 1 – 3 years ☐ 4 – 6 years ☐ 7 – 9 years ☐
   10 years and above ☐
4. What is your level of education?
   HND/Equivalen ☐ 1st Degree ☐ Master's degre ☐
   Other, ☐ Please specify……
5. What is your position in your organization?
   Management staff ☐ Senior Staff ☐ Junior Staff ☐

PART 2: SUPPLY CHAIN EFFECTIVENESS

6. Indicate your level of agreement with respect to the extent of supply chain effectiveness in your organization. ***(Use the scale in such a way that a "1" will indicate that the aspect is much worse, "4"=Neutral and a "7" will indicate that the aspect is much better).*** *You can circle the appropriate number that follows.*

Much Worse	**Worse**	**Somehow Worse**	**Neutral**	**Somehow Better**	**Better**	**Much Better**
1	**2**	**3**	**4**	**5**	**6**	**7**

For the following items, please rate your business unit's **actual performance compared to budgeted performance,** based on the **previous fiscal year results**	**Response**						
1. Sales (Dollars)	1	2	3	4	5	6	7
2. Transportation Costs	1	2	3	4	5	6	7
3. Warehousing Costs	1	2	3	4	5	6	7
4. Inventory Costs.	1	2	3	4	5	6	7
5. Total Logistics Costs	1	2	3	4	5	6	7
6. Sales (Dollars)	1	2	3	4	5	6	7

PART 2: SUPPLY CHAIN EFFICIENCY

7. Indicate your level of agreement with respect to the extent of supply chain efficiency in your organization. ***(Use the scale in such a way that a "1" will indicate that the aspect you Strongly Disagree, "4"=Neither Agree nor Disagree and a "7" will indicate that the aspect you Strongly Agree).*** *You can circle the appropriate number that follows.*

Strongly Disagree	**Disagree**	**Somehow Disagree**	**Neutral**	**Somehow Agree**	**Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**	**6**	**7**

For the past 5 years, …	**Response**						
1. Your organisation provides products/services with high quality.	1	2	3	4	5	6	7
2. Your organisation provides products/services at low cost	1	2	3	4	5	6	7
3. Your organisation makes sure goals are accomplished	1	2	3	4	5	6	7
4. Your organisation provides products/services within a short lead time (time between orders)	1	2	3	4	5	6	7
5. The relationship between customer services level and cost is important to your organization	1	2	3	4	5	6	7
6. Your organization's logistics systems ensures maximization of profitability	1	2	3	4	5	6	7
7. Your organization utilises available resources (human, financial, machinery) well.	1	2	3	4	5	6	7
8. Your organization's supply chain strategies take into account interactions at the various levels of the organization	1	2	3	4	5	6	7
9. Your organization is able to provide requested customer support	1	2	3	4	5	6	7
10. Your organization ensures appropriate mix of customer service, capital employed and total cost	1	2	3	4	5	6	7

PART 4: SUPPLY CHAIN DIFFERENTIATION

8. Indicate your level of agreement with respect to the extent of supply chain differentiation in your organization. ***(Use the scale in such a way that a "1" will indicate that the aspect is far below competitors, "4"=at par with competitors and a "7" will indicate that the aspect is far above competitors).*** *You can circle the appropriate number that follows.*

Far Below Competitors	**At Par with competitors**	**Far Below Competitors**
1	**4**	**7**

For the following items, please rate your business unit's performance on logistics activities **in comparison to your major competitors**. Please answer the following based on your company	**Response**						
1. How would you rate your organization's level of damage-free deliveries in relation to other organizations	1	2	3	4	5	6	7
2. How would you rate your organization's level of finished goods inventory in relation to other organizations	1	2	3	4	5	6	7
3. How would you rate your organization's level of forecast accuracy in relation to other organizations	1	2	3	4	5	6	7
4. How would you rate your organization's lead time (time between order receipt and delivery) in relation to other organizations	1	2	3	4	5	6	7
5. How would you rate your organization's time it takes to backorder (reorder from other firms) in order to meet customer's	1	2	3	4	5	6	7

demand							
6. How would you rate your organization's level of total inventory turns in relation to other organizations	1	2	3	4	5	6	7
7. How would you rate your organization's level of on-time (prompt) delivery in relation to other organizations	1	2	3	4	5	6	7

PART 4: COMPETITIVE ADVANTAGE

9. Indicate your agreement to the following as indicators of competitive advantage in your organization. ***(Use the scale in such a way that a "1" will indicate that the aspect is far below competitors, "4"=at par with competitors and a "7" will indicate that the aspect is far above competitors).*** *You can circle the appropriate number that follows.*

Far Below Competitors	**At Par with competitors**	**Far Below Competitors**
1	**4**	**7**

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. How would you rate your organization's general advantage over competitors?	1	2	3	4	5	6	7

2. How would you rate your organization's sustainability of acquired competitive advantage?	1	2	3	4	5	6	7
3. How would you rate your organization's quality and image of the products or services?	1	2	3	4	5	6	7
4. How would you rate your organization's price of the products/services?	1	2	3	4	5	6	7
5. How would you rate your organization's Production costs of products/Delivery costs of services?	1	2	3	4	5	6	7
6. How would you rate your organization's customer satisfaction with products/services?	1	2	3	4	5	6	7

Thank you for being part of this research.

Appendix II

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.877
Bartlett's Test of Sphericity	Approx. Chi-Square	1025.741
	df	120
	Sig.	.000

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.365[a]	.134	.099	1.35852

a. Predictors: (Constant), Supply Chain Differentiation, Supply Chain Effectiveness, Supply Chain Efficiency

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.328	3	7.109	3.852	.013[b]
	Residual	138.419	75	1.846		
	Total	159.747	78			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Supply Chain Differentiation, Supply Chain Effectiveness, Supply Chain Efficiency

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.596	1.034		1.543	.127
	Supply Chain Effectiveness	.381	.166	.254	2.303	.024
	Supply Chain Efficiency	.089	.150	.072	.594	.554
	Supply Chain Differentiation	.224	.135	.196	1.660	.101

a. Dependent Variable: Competitive Advantage

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.523	34.518	34.518	5.523	34.518	34.518	3.905	24.407	24.407
2	3.125	19.529	54.047	3.125	19.529	54.047	3.792	23.697	48.104
3	2.123	13.268	67.315	2.123	13.268	67.315	2.200	13.753	61.857
4	1.133	7.082	74.397	1.133	7.082	74.397	2.006	12.540	74.397
5	.938	5.861	80.258						
6	.818	5.114	85.372						
7	.517	3.228	88.600						
8	.501	3.134	91.735						
9	.335	2.096	93.830						

10	.296	1.853	95.683						
11	.280	1.748	97.431						
12	.164	1.022	98.454						
13	.101	.634	99.088						
14	.077	.482	99.570						
15	.040	.251	99.821						
16	.029	.179	100.000						

Extraction Method: Principal Component Analysis.