

SUPPLY CHAIN FLEXIBILITY, AGILITY AND FIRM PERFORMANCE

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ABSTRACT: *Supply chain flexibility is widely seen as one major response to the increasing uncertainty and competition in the marketplace. That is to say a firm with a flexible supply chain is likely to survive and grow its market share. Despite several evidences suggesting that performance improvements are related to SCM, managing supply chains today and practicing flexibility has become more difficult due to the fact that business environments are highly competitive, businesses are going more global, dynamic, and customer-driven. Therefore, this study assessed the path between supply chain flexibility and firm performance using supply chain agility as a moderating variable. A total of 77 manufacturing and service firms operating in the Kumasi metropolis were selected as sample. The sample was made up of key management staff as well as non-management operatives of the firms. Questionnaires was used as instrument for data collection. The findings revealed that SC Flexibility and SC Agility positively correlated firm performance ($p < 0.01/0.05$). Additionally, moderating SC Agility on SC Flexibility, produced a positive effect, however the effect was insignificant and this implies that SC agility does not significantly moderate the positive impact the SC Flexibility has on firm performance. SC flexibility better predicts firm performance through SC Agility as a moderator and not moderator. Therefore, it is rather necessary to appreciate the individual roles that both SC Flexibility and SC Agility play to ensure value for customers and thereby contributing to firm performance and not necessarily moderating each other.*

KEYWORDS: Supply Chain, Flexibility, Agility, Firm Performance

INTRODUCTION

Over the years, firms have continuously sought to develop unique strategies in each phase of the business development process. Lee (2004) in his study contends that organizations that are successful most often create supply chains that are aligned, adaptable, and agile. This author further perceived that organizational success depends on the ability of all supply chain partners (both internal and external) to focus on ultimate customers and quickly respond to changes in the demands of those customers without compromise. Supply chain according to Vickery (1999) extends the value delivery cycles of the manufacturer, as well as its upstream, and downstream channel members. Generally, the success of every supply chain depends on how agile it is to deliver the value the customers expect and this can be done by firms looking beyond the boundaries of their own firm and further than manufacturing manoeuvrability (Zhang et al. 2002). That is to say, the concept of supply chain management has gained much attention at the strategic level in most firms and industries given the ever-increasing need for firms to continuously improve customer satisfaction while also maximizing shareholder's wealth in the unstable business environment (Lambert, 2008).

Supply chain management (SCM), Vickery (1999) contends, seeks to improve competitive performance by integrating the internal functions within an organization and effectively linking them with the external SC partners and has over the years been accepted by professionals and researched into by academicians (Krishnapriya and Baral, 2014). Reviews of literature have

over the years shown that effective supply chain management flexibility in several instances improves overall firm performance in the aspect of customer satisfaction and financial performance (Huo, 2012; Danese and Romano, 2011). With flexible supply chains, firms are able to adapt effectively to disruptions in supply and changes in demand whilst maintaining customer service levels and shareholder's returns thereof (Stevenson & Spring, 2007). According to Merschmann and Thonemann (2011), supply chain flexibility is also widely seen as one major response to the increasing uncertainty and competition in the marketplace. That is to say a firm with a flexible supply chain is likely to survive and grow its market share. In addition, supply chain flexibility can help firms improve upon their competitiveness, particularly for the decision-making process of implementing technologies (Grigore, 2007).

Also, flexible supply chains help firms to reduce the number of backorders, lost sales, late orders, increased customer satisfaction, as well as endow firms with the ability to respond to and accommodate demand variations, such as seasonality, respond to and accommodate periods of poor manufacturing performance, respond to and accommodate periods of poor supplier performance and respond to and accommodate new products, new markets, or new competitors (Beamon, 1999). Despite several evidences suggesting that performance improvements are related to SCM, managing supply chains today and practicing flexibility have become more difficult due to the fact that business environments are highly competitive, businesses are going more global, dynamic, and customer-driven (Duclos et al., 2003). In addition, customers have become sophisticated by demanding more variety, better quality and service, including both reliability and faster delivery. Technological developments are now disruptive, resulting in new product innovations and improvements in manufacturing processes (Skintzi 2007; Tachizawa and Thomsen 2007).

The focus of this study is therefore to investigate the path between supply chain flexibility and firm performance by incorporating supply chain agility into the path as a moderating variable. The researcher hopes that, the findings of this study will give an understanding of the extent of supply chain flexibility among Ghanaian firms and also help in better appreciating the path between supply chain flexibility and firm performance at a given level of how agile the supply chain is.

Problem Statement

In today's business environment, supply chain flexibility is very important and a number of factors has brought this supply chain flexibility to the top of the agenda (Sun, 2013). Firms these days face a difficult, uncertain and persistently changing business environment through trends and changes in the area of intense competition, globalization, technology, innovations, disruptions as well sophisticated customers who continuously seek changes in their needs and expectations (Duclos et al. 2003; Pujawan 2004; Skintzi 2007; Tachizawa and Thomsen 2007; Sun 2013). In addition, recent trends such as outsourcing and mass customization are putting pressure on organizations to find and adopt flexible ways to satisfy the customer requirements. Organizations' focus is on optimizing core activities to maximize the speed of response to changes in customer expectations (Chase *et al.* 2000).

Conclusions are however that effective supply chain flexibility adoption has a positive effect on organizational performance. However, there exists a problem on supply chain flexibility since companies are just beginning to understand the concepts of supply chain management and most of the research is confined to evaluating one aspect of supply chain flexibility, such as selecting flexible suppliers on business performance (Duclos et al, 2006). To better

understand the path from supply chain flexibility and firm performance requires supply chain flexibility, which would include the supplier flexibility that improves firm performance when measured across the entire supply chain and before this can be achieved, the various dimensions of supply chain flexibility must be identified (Gupta and Somers 1996).

According to Duclos et al. (2006), research must be conducted that can aid these firms in understanding how supply chain flexibility can improve their competitive position (Duclos et al, 2006). Also, if existing theories about supply chain flexibility (SCF) are not considered when determining the relationship between SCF and performance, poor conclusions will be made (Beamon, 1999). It is for these issues that this study is carried out to investigate the path from supply chain flexibility to firm performance within the Ghanaian business context and also evaluate the effects supply chain agility moderating the link between SCF and firm performance.

LITERATURE REVIEW

Supply Chain Management Definitions and Theoretical Concepts

There are various definitions for the concepts of supply chain management just like any other managerial discipline. That is to say that, there is no one definition for supply chain management according to the Council of Supply Chain Management Professionals (CSCMP). Therefore, this subsection seeks to provide the meaning of this concept by various authors.

Supply Chain (SC)

Before supply chain management can be defined, one needs to understand what supply chain is all about and below are various definitions presented by various authors. Christopher (2011) defines supply chain as involving network of organizations and business processes, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services delivered to the final consumer. Lu (2011) also defines supply chain as basically a group of independent organizations connected together through the products and services that they separately and/or jointly add value on in order to deliver them to the ultimate consumer. In Mentzer et al. (2001), as cited by Nopember et al. (2009), the supply chain, is considered here as a set of three or more entities which work together to procure raw materials, produce and deliver final products from sources to customers. According to this same author, these entities include suppliers, focal firm, distributors, retailers and the end consumer or customers.

To add to the above definitions, Webster (2008) sees SC as “two or more parties that are linked by a flow of resources in the form of materials, funds and information”. A point made by this author in his definition is that, the use of the term “parties” here in the definition of SC is not limited to only organizations (external) but includes functional units and departments (internal) within the organizations. Hence, from the above definitions and perspectives provided so far on supply chain, the researcher, for the purpose of this study, also defines supply chain as a network of organizations, internal processes or activities that work collaboratively in meeting the customer’s order. The first thing to note from these definitions is that, supply chain is seen as ‘networks’ rather than ‘chains’ as its name connotes. This is because, today’s SCs according to Lazzarini et al. (2001) are more directed to an interconnected systems or complex structures and relationships with globalization and third part logistics service providers being the drivers

of this change. The authors see SC as more of a 'netchain' which is a set of networks comprising horizontal ties between firms within a particular industry or group, that are sequentially arranged based on vertical ties between firms in different layers. Another point to note from the above definitions is that, the supply chain aims at satisfying one utmost person which is the final consumer. This means all interconnected structures, organizations, business processes and complex relationships among these parties all aim at satisfying the ultimate user of the product or service.

Supply Chain Management (SCM)

Similar to the various definitions of SC as presented by various authors, definition of supply chain management also differs across authors. From Christopher's (2011) point of view, SCM deals with issues across the SC that aid in delivering superior customer value at the lowest total cost by managing relationships with suppliers and customers. Beske and Seuring (2014) in their work also defined SCM as "the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, (i.e. economic, environmental and social, into account which are derived from customer and stakeholder requirements)."

Another notable definition of SCM is that of the Council of Supply Chain Management Professionals (CSCMP). They defined supply chain management to "encompass the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Croxton *et al.* (2001) see supply chain management as the management of key business processes across the network of organizations that comprise the supply chain. The "key business processes" as used in this definition includes all activities across the network of organizations that make up the supply chain. From the various definitions and views presented on SCM, the concept boards strongly on the widely known management principles which include planning, organizing, directing, controlling and coordinating activities that are directly and indirectly involved in fulfilling customers' request.

Supply Chain Flexibility

Business firms are responding by introducing flexibility as a dimension to their operation strategies, as diversity and uncertainty in the environment increases. One strategy for gaining and keeping a competitive advantage in a dynamic environment is to create a flexible organization (Grigore, 2007), where customers are demanding more variety, better quality and service, including both reliability and faster delivery, according to Singh (2010).

Definitions of Supply Chain Flexibility

Grigore (2007) defines flexible as "*the ability to vary as you like, according to the needs*" and also refers to flexibility as "*the ability to adapt, in a reversible manner, to an existing situation, as opposed to evolution, which is irreversible*". Liu *et al.* (2005) refer to supply chain flexibility as suppliers' ability to respond quickly to changes in downstream demand with a smaller increase in time and cost. Supply chain flexibility may be defined as the robustness of the buyer supplier relationship under changing supply conditions. A highly flexible relationship is one in which there is little deterioration in the procurement price under different supply conditions (Das and Abdel-Malek, 2003).

The five defined flexibilities according to Vickery *et al.*, (1999) include:

- 1.Product flexibility or the ability to customize product to meet specific customer demand.
- 2.Volume flexibility or the ability to adjust capacity to meet changes in customer quantities.
- 3.New product flexibility or the ability to launch new or revised products.
- 4.Distribution flexibility or the ability to provide widespread access to products.
- 5.Responsiveness flexibility or the ability to respond to target market needs.

Bai et al. (2004) define supply chain flexibility as the capability of supply chains to respond quickly to changes in market and customer demand, with the lowest possible costs and best possible customer service level. Xiao et al. (2006) also point out that supply chain flexibility is the capability of the supply chain to adjust its speed, target and capacity in a timely manner to respond to market changes; these may be brought about by different demand quantities, or demand for customised or new products. Few researchers such as Wu et al. (2007) and Wang (2011), have explored supply chain flexibility from a theoretical viewpoint. Supply chain flexibility has developed into make-or-break factors for the fashion industry. On the other hand, with regard to the intensification of competition among different organization supply chains, Zhang et al. (2011) point out that improving supply chain flexibility to deal with changes in internal and external environments are the future directions for the manufacturing and service industry.

Dimensions of Supply Chain Flexibility

Xu (2006) suggests that supply chain management mainly encompasses four areas: logistics, raw materials supply, production planning, and customer demand; correspondingly, supply chain flexibility can be classified according to logistics flexibility, manufacturing flexibility, procurement flexibility, and the flexibility to launch new products. Ma (2009), on the other hand, suggests that supply chain flexibility includes a different version of the four dimensions, namely supply, R&D, manufacturing and distribution. Supply flexibility is the supply chain's ability to reconfigure itself for product supply changes according to customers' needs. R&D flexibility is the ability of the supply chain to design new products and allocate relevant resources flexibly at low cost.

Manufacturing flexibility refers to chain enterprises' capabilities to manufacture different types of products in various quantities within a short period of time, at low cost. And finally, distribution flexibility provides the capability to distribute different types of products in various quantities quickly and again, at low cost. Xiao and Wang (2006) propose that supply chain flexibility can be observed in five aspects, including the chain's operational system, logistics process, organizational design, supply network and information system. Meng and Zhang (2007), on the other hand, classify supply chain flexibility into product flexibility, capital flexibility, outcome flexibility, and information flexibility.

Based on the major activities in a supply chain, Zhang and Wu (2003) classify supply chain flexibility into eight subsystems, namely research and development flexibility, resources flexibility, logistics flexibility, manufacturing flexibility, decision making flexibility, information flexibility, corporate culture flexibility and supply flexibility. Subsequently, Zhang *et al.* (2004) developed an integrated model to support supply chain flexibility based on the relationships between different subsystems using systems analysis approach. (see figure 2.1)

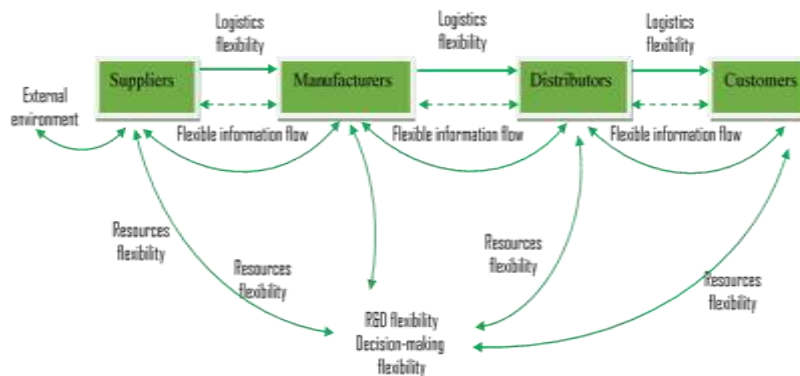


Figure 2.1: An integrated model for a supply chain flexibility system

Source: Zhang *et al.* (2004)

Wang and Xu (2006) offer a more detailed breakdown of supply chain flexibility. In their research, product flexibility is further classified into cost, quality, sales and price flexibilities; time flexibility is classified into flexibility of response and flexibility in delivery; resource flexibility is classified into flexibility as to material, energy, facility, human resources, information, technology and capital; quantity flexibility is classified into the out-of-stock rate, the delayed orders rate, the orders ahead of schedule rate, and the average waiting order. Fang and Deng (2002) conclude that supply chain flexibility should include 1) product flexibility, meaning the capability of the supply chain to introduce new products within a certain time period; 2) time flexibility, being responsiveness towards customer demand; and 3) quantity flexibility, or the capability to deal with changes in the quantity of demand.

Supply Chain Agility

Agility is measured to be one of the fundamental characteristics needed for a supply chain to survive and thrive in an environment of turbulent and volatile markets (Agarwal *et al.*, 2007; Braunscheidel and Suresh, 2009). As these conditions become the norm due to reduced product life cycles, increased demand for customized products and services, reduced visibility of demand, and constant change (Brown and Eisenhardt, 1998; Kumar and Deshmukh, 2006; Swafford *et al.*, 2008), organizations have acknowledged that agility is essential for their endurance and competitiveness more than ever before (Lin *et al.*, 2006). Agility has been noted as an organizational enabler of quick and effective reaction that enables the firm to establish a competitive advantage (Goldman *et al.*, 1995; Swafford *et al.*, 2006). Moreover, a firm's supply chain agility has been identified as a critical factor affecting its overall global competitiveness (Lee, 2004).

Agile companies are capable of operating profitably in a competitive environment of continually unpredictable and changing customer opportunities (Goldman *et al.*, 1995; Guisinger and Ghorashi, 2004; Kidd, 1994). Therefore, the primary meaning of agility according to Narasimhan *et al.* (2006) suggests "the ability to respond to customer demands in timely, and effective manner". To further understand the agility concept, we extract key facets from the definitions in Table 2.1. These are summarized in Table 2.2 along with explanations from definitions in the corresponding studies. A trend in these definitions was noted, which depicts agility as change-embracing and competitiveness-oriented. To achieve that, we see a dual emphasis across these definitions on two agility factors, speed and the capabilities of the

firm to use resources to respond to changes. For example, some studies take flexibility as a type of response capability (Zhang and Shariff, 2000; Yusuf *et al.*, 1999; Dove, 1994, 1999) while some regard flexibility as the antecedent of agility (Swafford *et al.*, 2006).

However, researchers are still at a formative stage of defining factors and determinants of agility (Giachetti *et al.*, 2003). The present lack of consensus about the agility concept makes it difficult to develop agility metrics. Of the sixteen studies summarized in Table 2.1, only four discuss possible measures of agility. The lack of validated agility metrics impedes researchers' attempts to conduct empirical studies to investigate relationships between agility and other important variables related to business performance (Sherehiy *et al.*, 2007).

Table 1: Agility Definitions and Metrics

Source	Definition	Agility Metrics
<i>Manufacturing</i>		
Goldman <i>et al.</i> (1995)	A construct having the following strategic dimensions: enriching the customer, cooperating both internally and externally to enhance competitiveness, organizing to both adapt to and thrive on change and uncertainty, and leveraging the impact of people and information	
Kumar and Motwani (1995)	A firm's ability to accelerate the activities on the critical path	A composite value of the strategic agility position of a firm, on a percentage scale, is computed based on the weighted sum of the firm's performance on each element of a matrix. The matrix represents all combinations of time-segments and agility determinants (material and information flow, state of technology, specialized functions, human resource factors, quality and flexibility)
DeVor <i>et al.</i> (1997)	The ability of a producer of goods and services to operate profitably in a competitive environment of continuous and unpredictable change.	
Quinn <i>et al.</i> (1997)	The ability to accomplish rapid changeover from the assembly of one product to the assembly of a different product	
Dove (1994, 1999)	The ability of an organization to thrive in a continuously changing, unpredictable business environment	Cost, time, robustness, and scope

Yusuf <i>et al.</i> (1999)	The successful exploration of competitive bases (speed, flexibility, innovation, pro-activity, quality, profitability) through integration of reconfigurable resources and best practices in a knowledge-rich environment to provide customer-driven products and services in a fast-changing market environment	
Zhang and Sharifi (2000)	A combination of three elements: (1) agility drivers, which are the changes/pressures from the business environment that necessitate search for new ways of running a business in order to maintain competitive advantage; (2) agility capabilities, which are the essential capabilities that a firm needs in order to positively respond to and take advantage of the changes; (3) agility providers, which are the means whereby the so-called capabilities could be obtained	Assessment model for agility: assessment of the organization's need for agility; assessment of the organization's current level of agility
Sarkis (2001)	Agility is the ability to thrive in environment of continuous and often unanticipated change	
<i>Logistics Management & Supply Chain Management</i>		
Global Logistics Research Team (1995)	Addresses how well a firm responds to customers' changing needs and is marked by the abilities to meet unique customer requests and adapt to unexpected circumstances	Relevancy, accommodation, flexibility
Naylor <i>et al.</i> (1999)	Use of marketing knowledge and virtual organization to exploit profitable opportunities in a volatile environment	
Van Hoek <i>et al.</i> (2001)	A management concept centered around responsiveness to dynamic and turbulent markets and customer demand	
Swafford <i>et al.</i> (2006)	Supply chain agility refers to the supply chain's capability to adapt or respond in a speedy manner to a changing marketplace environment	Procurement/sourcing flexibility, manufacturing flexibility, distribution/logistics flexibility
<i>Knowledge management</i>		
Dove (2005)	Skilled practices for knowledge management (providing awareness), value proposition (to select actions), and response ability (to enable change)	
Holsapple and Jones (2005)	The ability to be alert to unexpected changes and the ability to quickly adapt the use of existing resources to cope with challenges and opportunities presented by these changing circumstances	

Swafford <i>et al.</i> (2006)	Supply chain agility refers to the supply chain's capability to adapt or respond in a speedy manner to a changing marketplace environment	Procurement/sourcing flexibility, manufacturing flexibility, distribution/logistics flexibility
<i>Information Systems (strategy)</i>		
Sambamurthy <i>et al.</i> (2003)	The ability to detect and seize competitive market opportunities by assembling requisite assets, knowledge, and relationships with speed and surprise. Agility is comprised of three interrelated capabilities: Customer agility: ability to co-opt customers in the exploration and exploitation of opportunities for innovation and competitive action moves; Partnering agility: ability to leverage the assets, knowledge, and competences of suppliers, distributors, contact manufactures, and logistics providers through alliances, partnerships, and joint ventures; and Operational agility: ability of firms' business processes to accomplish speed, accuracy, and cost of economy in the exploitation of opportunities for innovation and competitive action	

Table 2: Agility facets

Articles	Alertness	Speed	Response capability	Flexibility	Proactivity	Quality/accuracy	Profitability/cost	Relevance	Accommodation/adaptation	Changes/uncertainty	Competitiveness
<i>Manufacturing domain</i>											
Goldman <i>et al.</i> (1995)			*							*	*
Kumar and Motwani (1995)		*	*								
DeVor <i>et al.</i> (1997)							*			*	*
Quinn <i>et al.</i> (1997)		*	*								
Dove (1994, 1999)			*	*			*			*	
Yusuf <i>et al.</i> (1999)		*	*	*	*	*	*			*	

Zhang and Sharif (2000)			*	*						*	*
Sarkis (2001)										*	*
<i>Logistics/supply chain management domain</i>											
Bowersox et al. (1995)			*	*				*	*	*	
Naylor et al. (1999)			*							*	
Van Hoek et al. (2001)			*							*	
Swafford et al. (2006)		*	*	*			*			*	
<i>Knowledge management domain</i>											
Dove (2005)	*		*					*		*	
Holsapple and Jones (2005)	*		*								
<i>Information system domain</i>											
Sambamurthy et al. (2003)	*	*	*			*	*				*

Firm Performance

According to Fabbe-Coste and Jahre (2008), measuring and establishing casual relationships between actions that are taken and their various outcome have been proven very important and yet very problematic in business and management literature. A thorough review of the literature on business and organizational performance suggests a wide range of opinions regarding firm performance. Chen and Paulraj (2004a) in their work argued that financial performance should be the main concept of measuring a company's performance since the primary goal of every organization is to make profits for shareholders.

In other fields as noted by Fabbe-Coste and Jahre (2008), performance is seen as a multifarious operational performance related measure (that is measuring performance in terms of delivery, service quality, response time, product availability and cost) and strategic related measure which is also measured in terms of profitability ratio, growth rate and market share. Generally, it is not within the scope of this study to argue about the benefits of each performance approach, given the complexity of issues regarding what constitute a firm's performance in various supply chain literature. In this study, the researcher follows one principle when measuring firm performance and this is the financial performance. A thorough definition and operationalization of this construct for the purpose of this study are discussed as follows:

Financial Performance

Reviewing various supply chain and logistics literature shows that different authors have used various metrics to measure an organization's financial performance. Vickery *et al.* (1999) in their study to examine the dimensions of supply chain flexibility and their relationship with business performance used measures such as Return on Investment (ROI), Return on Investment Growth (ROI Growth), Market share, Market share growth, Return on Sales (ROS) and ROS Growth to rate overall business performance. It must however be noted that, business performance as used by these authors could have a much wider meaning than the financial performance as used in other literature (Kim, 2009) to also include other performance measures such as growth in market share. With this lack of consensus, and for the purpose of this study, the researcher conveniently adopted these measures to rate overall financial performance: ROI, ROA, overall profitability, growth in profitability and overall sales.

Theoretical Framework, Empirical Evidence and Hypothesis Formulation

The main purpose of this study is to investigate the path from supply chain flexibility to business performance because of the different findings presented by different authors creating a gap in the existing literature. The theoretical framework developed to guide this study is depicted in the figure below:

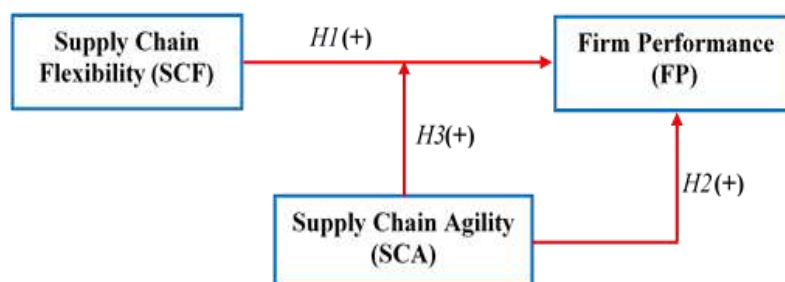


Figure 2.2: Proposed theoretical framework

The subsections below discuss the theoretical lenses for the framework, empirical evidence on the positive impact of supply chain flexibility on firm performance with supply chain agility playing a moderating role in the relationship. The subsections also present and discuss the hypotheses formulated on this framework. The study has utilized the resource-based view (RBV) of the firm augmented with the dynamic capabilities perspective for developing the proposed model.

RBV of the firm

The RBV of firm has been extensively used to study various aspects of supply chain operations. The extent to which a firm can gain a competitive advantage largely determined by its capacity to properly deploy its resources and capabilities that are often rare, valuable, not substitutable, and difficult to imitate (Barney, 1991). These resources and capabilities are often viewed as total tangible and intangible assets that may comprise a firm's management skills, processes, and routines, and so on (Barney, 2001). Because the resources and capabilities possessed by various firms are different; their respective performances are also different. While resources are viewed as a collection of factors owned and or controlled by a firm, capabilities are viewed as a capacity to deploy these resources (Amit and Schoemaker, 1993). Dyer and Singh (1998) argued that resources generating competitive advantage can span firm boundaries and

embedded in inter-firm relations. Hence, sources of competitive advantages are not only from the internal resources owned by a firm itself but also from the external resources in the relational networks (Dyer and Singh, 1998; Lavie, 2006). Therefore, this led to the transition of unit of analysis from firm to supply chain and is considered as a vital extension to RBV (Fawcett and Waller, 2011).

Dynamic Capabilities Theory

Later, Teece et al. (1997) propounded the Dynamic Capabilities theory (DCT) that also advanced the RBV. According to this theory, firms must build, develop, integrate, and reconfigure their internal and external resources and competence for adapting to dynamic environments. DCT assumes that a firm can create a position for itself in the market by creating capabilities that can help it to perform better during environmental uncertainties. As the same may not be matched by its competitors and hence can be a source of competitive advantage for the firm (Teece, 2007). A dynamic capability is defined as the capacity of a firm to create, extend, and modify its resources so as to fulfil a desired purpose (Helfat et al., 2007). The resources that are owned or controlled by a firm normally include its physical, human, and organizational assets (Eisenhardt and Martin, 2000). Dynamic capabilities are learned, and stable patterns of behaviour through which a firm systematically generates and modifies its way of doing things, so that it can become more effective (Zollo and Winter, 2002; Ambrosini et al., 2009). Supply chain flexibility can be conceptualized as a dynamic capability for several reasons including the following: it meets the criteria of being a higher-level capability (Winter, 2003); it is dedicated to the modification of operating routines (Zollo and Winter, 2002); it facilitates resource reconfiguration; and it enables sensing and capitalizing on environmental threats and opportunities (Teece, 2007). Now, as a dynamic capability can be developed through the culmination of several competences.

Hypotheses Development

The hypotheses underpinning the study are discussed below.

Supply Chain Flexibility and Firm Performance

Liu et al. (2005) refer to supply chain flexibility as suppliers' ability to respond quickly to changes in downstream demand with a smaller increase in time and cost. Supply chain flexibility aims to devise and adopt alternate configurations so as to sustain supply chain operations when faced with a disruption (Gligor and Holcomb, 2012). Dynamic capabilities are such capabilities that are developed for adapting to changing environmental conditions and sustain a decent level of performance (Teece et al., 1997). Supply chain flexibility therefore helps a firm to gain competitive edge by switching to one of the alternate configurations and thereby helps the firm to sustain its performance. Extant research in supply chain management indicates a service perspective of measuring firm performance. As our study posited supply chain flexibility as a dynamic capability that is capable of sustaining a firm's performance in the event of a disruption, we hypothesize supply chain flexibility to have positive influences on both operational and relational performances of a firm (Gligor and Holcomb, 2012). This leads the researcher to the following hypothesis.

H1: Supply Chain Flexibility is positively associated with Firm Performance.

Supply Chain Agility and Firm Performance

The dynamic perspective of RBV facilitates a better understanding of how Supply Chain Agility impacts performance (Priem and Butler, 2001). Dynamic capabilities represent “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, 2007). Supply Chain Agility is a dynamic capability that results from the firm’s ability to reconfigure firm-level and supply chain-level resources (Gligor and Holcomb, 2012; Blome et al., 2013). Supply Chain Agility is a complex capability and a central component of the firm’s competitive strategy, particularly in an uncertain environment (Blome et al., 2013). Dynamic capabilities are hard to replicate and, therefore Supply Chain Agility can allow firms to achieve superior levels of performance (Gligor and Holcomb, 2012).

Supply chain research has also shown a direct link between Supply Chain Agility and improved firm performance (Swafford et al., 2008; Vickery et al., 2010; Gligor and Holcomb, 2012; Yusuf et al., 2014). For example, Gligor and Holcomb (2012) found empirical support indicating that Supply Chain Agility directly leads to superior levels of operational and relational performance. Research suggests that as processes become more efficient and effective, financial performance improves as well (Lambert and Pohlen, 2001). Fugate et al. (2009) found that financial performance improves as a result of improvements in logistics efficiency and effectiveness. As a result, the following hypothesis is suggested:

H2: Supply Chain Agility is positively associated with Firm Performance.

Interaction of Supply Chain Agility and Supply Chain Flexibility on Firm Performance

“A key characteristic of an agile organization is flexibility” (Christopher and Towill, 2001, p. 236). Agility involves flexibility (Narasimhan et al., 2006); thus, a distinction between flexibility and agility does exist. One distinction comes from the resource-based view that suggests a firm’s distinctive core competence lies in its inimitable organizational or coordinative capabilities (Wernerfelt, 1984; Teece et al., 1997). Agility is achieved by tapping the synergies among different forms of flexibility within a firm (Agarwal et al., 2006). Hence, from a resource-based perspective, agility is a core competence that relies on various capabilities, specifically various forms of flexibility. While flexibility is related to adaptability and versatility (Kidd, 2000), agility focuses more on speed. As a competence, agility relates to outcomes at the competitive level (Goldman et al., 1994), such as market responsiveness, delivery reliability, and frequency of product introductions; thus, it represents organizational-level abilities. Put in another way, agility is a measure of reaction time, while flexibility is a measure of reaction capabilities. The researcher argues that Supply Chain Agility and Supply Chain Flexibility are complimentary and have a cumulative positive impact on firm performance, leading to the following hypothesis

H3. The interaction effect of Supply Chain Agility and Supply Chain Flexibility is positively associated with the Firm Performance

METHODOLOGY

A survey instrument was developed to investigate the Path from supply chain flexibility to firm performance using agility as a moderator. The questionnaire was pre-tested several times to

ensure that the wording, format and sequencing of questions were appropriate. Data for this study were collected from a sample of 77 medium scale manufacturing and service firms in the Ashanti Region of Ghana. Specifically, firms operating in the Kumasi metropolis were selected. The region and specifically, Kumasi was chosen for the study due to its key role in the economic activities in the country. Actual estimation of samples was 80 participants from 100 firms. Three (3) questionnaires were rejected due to double entry of information, insufficient information and incomplete answers. Exploratory and Confirmatory factor analysis (CFA) and structural equation modelling (SEM) were run on SPSS (version 21.0) to test the hypotheses developed for the study.

RESULTS

Supply Chain Flexibility of Selected Firms

Table 2: Descriptive statistics on measures of Supply Chain Flexibility

Items	Min	Max	Mean	±SD	Reliability
1. We can quickly modify our product/service in response to customer requests	1	7	4.68	1.601	
2. We can modify existing products/services inexpensively	1	7	3.99	1.569	
3. We can easily take the lead in new product production	1	7	4.68	1.658	
4. We can introduce new products easily and inexpensively	1	7	4.31	1.533	
5. We can operate efficiently at different levels of output	1	7	4.58	1.533	
6. We have multiple delivery modes to meet schedules for deliveries	1	7	4.38	1.556	
7. We can take different customer orders with accurate available-to-promise	1	7	4.61	1.523	
8. We can quickly respond to multiple customers' delivery time requirements	1	7	4.84	1.497	
9. We involve customers to improve our services effectively	1	7	4.88	1.589	
10. We continuously experiment, learn, and improve our practices to improve customer satisfaction	1	7	5.04	1.342	
11. We continuously develop strategy based on maintaining a good relationship with our major suppliers	1	7	4.81	1.505	
12. We respond quickly to supplier and customer queries	1	7	4.88	1.469	
13. We quickly reorganize staff to fit organizational or operational changes	1	7	4.47	1.401	
14. We are capable of redesigning activities quickly and easily to adapt to environmental changes	1	7	4.68	1.312	
Cronbach's α					.917

Scale: 1=Not at all, 2=Somehow, 3=To some extent, 4=To a large extent, 5=To a larger extent, 6=To a much larger extent 7=To a largest extent

From all the 14 measures that were used to measure Supply Chain Flexibility, it could be seen that the respondents indicated positive responses to all of them except the 2nd item “We can modify existing products/services inexpensively” with mean response of 3.99 and $\pm SD = 1.569$. The highest response was achieved on the 10th item which indicated “We continuously experiment, learn, and improve our practices to improve customer satisfaction” with mean value of 5.04 (SD=1.342). Other items which received high responses include “We can quickly respond to multiple customers’ delivery time requirements”, “We involve customers to improve our services effectively”, “We continuously develop strategy based on maintaining a good relationship with our major suppliers” and “We respond quickly to supplier and customer queries” with mean values of 4.84, 4.88, 4.81 and 4.88 respectively. This implies that the manufacturing firms have supply chain flexibility in so many aspects. Reliability test on the constructs measuring supply chain Flexibility also obtained a high rate of internal consistency with Cronbach alpha value of .917 well above the threshold of .70 as indicated by Nunnally (1978).

4.2 Supply Chain Agility of Firms in the Kumasi Metropolis

Table 3: Descriptive Statistics on measures of Supply Chain Agility

Items	Min	Max	Mean	$\pm SD$	Reliability
1. My company always seeks to improve delivery reliability	1	7	5.03	1.347	
2. My company is quick to detect threats in its environment.	1	7	4.68	1.455	
3. We regularly improve products and customer service levels	1	7	4.91	1.339	
4. Our customers and suppliers are quick to share relevant information with us.	1	7	4.61	1.470	
5. We are able to mobilize resources to meet different requirements	1	7	4.83	1.389	
6. Usually, we can quickly access the data we need to make decisions.	1	7	4.62	1.487	
7. We are prepared and capable of adapting to future changing market needs	1	7	5.12	1.328	
Cronbach’s α					.904

Scale: 1=Not at all, 2=Somehow, 3=To some extent, 4=To a large extent, 5=To a larger extent, 6=To a much larger extent, 7=To a largest extent

From all the 7 measures that were used to measure Supply Chain Agility, it could be seen that the respondents indicated positive responses to all of them. The highest response was achieved on the 7th item which indicated “*We are prepared and capable of adapting to future changing market needs*” with mean value of 5.12 (SD=1.328). The first item also had a mean value of 5.03 (SD= 1.347). Other items which received high responses include “We regularly improve products and customer service levels” and “We are able to mobilize resources to meet different requirements” with mean values of 4.91 and 4.83 respectively. This implies that the manufacturing firms have supply chain agility in so many aspects. Reliability test on the

constructs measuring supply chain Agility also obtained a high rate of internal consistency with Cronbach alpha value of .904 well above the threshold of .70 as indicated by Nunnally (1978).

Firm Performance of Selected Firms

Table 4: Descriptive Statistics on Firm Performance

Measures	Min	Max	Mea n	±SD	Reliabilit y
Return on investment (ROI)	1	7	5.12	1.442	
Return on asset (ROA)	1	7	4.99	1.372	
Overall profitability	1	7	5.12	1.487	
Growth in profitability	1	7	5.12	1.504	
Overall sales/revenue	1	7	5.43	1.551	
Cronbach's α					.920

Scale: 1= Very dissatisfied, 2=Somehow dissatisfied, 3=To some extent dissatisfied
4=Satisfied, 5=To some extent Satisfied 6=Somehow Satisfied extent, 7=Very Satisfied

The dependent variable for the study was firm performance. From Table 4.4, it could be seen that all measures of Firm Performance had high responses indicating that respondents were satisfied with their firm performance. For Return on Investment (ROI), the mean value was 5.12 and standard deviation was 1.442. Also, Return on Asset also had mean response of 4.99 with SD of 1.372. Again, overall profitability and growth in profitability both had a mean value of 5.12 and SD values of 1.487 and 1.504 respectively. Overall sales/revenue had the highest mean value of 5.43 and SD of 1.551. This implies that relatively, the selected firms are doing well especially with their sales levels and their profitability.

Reliability statistics for the constructs measuring firm performance obtained Cronbach alpha (α) of .920 giving an impression of high rate of internal consistency.

Test of Model

Before estimating the research model for this study, it was necessary to determine the suitability of the items that were used to measure the main variables. Therefore, Exploratory Factor Analysis (EFA) was performed to ensure composite validity of the constructs to corroborate the reliability of the measuring constructs.

Exploratory Factor Analysis (EFA)

After the initial test of reliability, it was necessary to explore the interrelationships among the dimensionality of the constructs using EFA (Pallant, 2007) even though the Cronbach Alpha reliability test had been used to determine that there exists a strong internal consistency among the scales for their respective constructs. Therefore, to demonstrate convergent validity, it was necessary to run the EFA for each of the sub-constructs.

The study employed the Principal Components Analysis (PCA) and Direct Oblimin with Kaiser Normalization for rotation, with Varimax rotation, three constructs were fixed to extract. Also, the system was set to extract components with Eigenvalues above 1.0 and also suppress all co-efficient with smaller loadings of less than 0.50. The Kaiser-Meyer-Okin value was .758, exceeding the recommended value of .6 and Bartlett's Test of Sphericity reached statistical

significance, supporting the factorability of the correlation matrix (Pallant, 2007). Given a minimum loading of .50, the following items were retained. For SC Flexibility, items retained were SCF 1 – 5, for SC Agility, all items were retained and similarly for Firm Performance, Perf, all items were retained. Items removed from the SCF construct were those which could not load or had had cross-loadings with other components. After dropping the unwanted constructs and items, a satisfactory model was attained with each block of items loading onto its theoretically specified constructs. The remaining items after the EFA can be seen in Table 4.5.

Table 5: EFA Factor Loadings, Eigenvalues and % of Variance

Constructs	Item Details	Component		
		1	2	3
Supply Chain Flexibility	SCF1 We can quickly modify our product/service in response to customer requests			.789
	SCF2 We can modify existing products/services inexpensively			.788
	SCF3 We can easily take the lead in new product production			.732
	SCF4 We can introduce new products easily and inexpensively			.865
	SCF5 We can operate efficiently at different levels of output			.797
Supply Chain Agility	SCA1 My company always seeks to improve delivery reliability	.722		
	SCA2 My company is quick to detect threats in its environment.	.752		
	SCA3 We regularly improve products and customer service levels	.786		
	SCA4 Our customers and suppliers are quick to share relevant information with us.	.569		
	SCA5 We are able to mobilize resources to meet different requirements	.794		
	SCA6 Usually, we can quickly access the data we need to make decisions.	.827		
	SCA7 We are prepared and capable of adapting to future changing market needs	.637		
Firm Performance	FP1 Return on investment (ROI)		.883	
	FP2 Return on asset (ROA)		.855	
	FP3 Overall profitability		.813	
	FP4 Growth in profitability		.836	
	FP5 Overall sales/revenue		.786	
Eigenvalues		7.825	2.504	1.630
% of Variance		46.032	14.728	9.588
Cronbach α		.904	.920	.885
KMO =0.862		Bartlett's test of Sphericity: = χ^2(DF) = 940.814		
(136); $p=0.000$				

Test of Model

In establishing the effect of supply chain flexibility on firm performance with moderation effect of supply chain agility, correlation and regression analysis were employed.

The independent variable was SC Flexibility (F) and the dependent variable been Firm Performance (P) with SC Agility (A) as a Moderating Variable.

The regression models ran included the following;

Model 1

$$P = F + \varepsilon$$

$$P = F + A + \varepsilon$$

$$P = F + A + FA + \varepsilon$$

The correlations among the variables can be seen in Table 4.6 below.

Table 7: Correlations of Variables and Descriptive Statistics

Constructs	1	2	3
1. SC Flexibility	1		
2. SC Agility	.531**	1	
3. Firm Performance	.327**	.559**	1
Mean	4.45	4.82	5.15
Standard Deviation	1.307	1.113	1.282

Note:

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

The correlation results shown in Table 4.7 above generally revealed that firms selected for this study attribute their firm performance to their supply chain flexibility and agility. Also, the SC Flexibility and SC Agility had positive correlations with firm performance and they were significant at 0.01 or 0.05. However, the relationship between SC Flexibility and Firm Performance was not strong since the coefficient (r) was less than 0.5 ($r=.3270$). But the correlation between SC Agility and Firm Performance was positive and quite high ($r=.559$) and significant at 0.05.

Model Assessment

From the reliability and validity tests ran, some of the SC Flexibility items did not pass the EFA and as such were removed. The model estimation process began with creating composite variables and interaction terms and then examining relevant assumptions underlying the method of estimation employed in the study. Relying on each of the set of retained measures, arithmetic mean was used to create the composite variables. The items of SC Flexibility that passed the reliability tests were treated as composite variables by averaging their respective items remaining. Same was done with the SC Agility and firm performance variables.

The researcher used ordinary least square regression analysis to estimate the study's proposed model. The main outcome variable was firm performance and the main predictor variable was SC Flexibility with SC Agility as a Moderator.

For Model 1, firm performance was predicted by the SC Flexibility.

In the case of Model 2, firm performance was predicted by both SC Flexibility and SC Agility.

Finally, for model 3, firm performance was predicted by SC Flexibility and also the moderating effect of SC Agility on SC Flexibility.

The results to these effect relationships could be seen from Table 4.7.

Table 7: Ordinary Least Square Regression Estimates

Variables:	Standard Estimates		
	Firm Performance		
	Model 1	Model 2	Model3
Hypothesized			
<i>Direct Effect</i>			
SC Flexibility	.321(3.000)**	.042(.376)	.042(.375)
SC Agility		.617(4.713)**	.617(4.695)**
<i>Moderating Effect:</i>			
SCF×SCF			.048(.667)
FIT INDICES			
χ^2 (df)	13.386(1)	39.140(2)	39.660(3)
χ^2/df	13.386	19.570	13.220
F-Statistics	8.999	16.876	11.315
R²	.107	.313	.317

1. t-values are in the parenthesis

2. [±] represents significant F value significant at 1%

3. * & ** represent significant path at 5% (1-tailed test: 1.645) and 1% (1-tailed test: 2.33) respectively

4. Hypothesized paths evaluated at 5% significance level (1-tailed test)

Hypothesis Testing and Findings

The study tested two hypotheses; that there is a positive effect between SC Flexibility and Firm Performance and also, that the positive effect of SC Flexibility on Firm Performance is enhanced by SC Agility. The summary to the regression results ran can be seen as follows;

Table 8 Summary of Results

Variables	Results	Remarks
<i>Dependent Variable: Firm Performance</i>		
<i>Independent Variables:</i>		
SC Flexibility	$\beta = .321$; $t = 3.000$	Positive effect, significant
SC Agility	$\beta = .617$; $t = 4.713$	Positive effect, significant
<i>Moderating Effect:</i>		
SCF \times SCA	$\beta = .048$; $t = .667$	Positive effect, Not Significant

From the results, in model 1, it could be seen both SC Flexibility and SC Agility variables had a positive effect on Firm performance and were significant at $p < 0.1$ or 0.5 . However, with the moderation of SC Agility on SC Flexibility, even though there was a positive effect, it was not significant at 0.01 or 0.05 . Therefore, it can be summarized that even though SC Flexibility has a positive impact on firm performance, the effect is not much influenced by SC agility.

Discussion of Findings

The study sought to investigate the path from SC flexibility to firm performance. There have been several studies which confirm this relationship. It makes to say that supply chain flexibility is an important determinant of performance as a flexible supply is capable of withstanding disruptions in business operations. As indicated in the study of Gligor and Holcomb (2012), supply chain flexibility aims to devise and adopt alternate configurations so as to sustain supply chain operations when faced with a disruption, it is necessary for chains to be capable in that regard. Dynamic capabilities are such capabilities that are developed for adapting to changing environmental conditions and sustaining a decent level of performance (Teece et al., 1997). Hence, with the hypothesis which was posited that Supply Chain Flexibility is positively associated with the Firm Performance, the study found support for this. It could be seen from the regression results in model one that SC Flexibility has a positive effect on firm performance.

Similarly, in model one, the study tested the relationship between supply chain agility and firm performance. Even though the study sought to investigate the moderating role of SC agility on the path between SC Flexibility and Firm performance, it was necessary to test the direct path from SC Agility to firm performance. Supply Chain Agility is a dynamic capability that results from the firm's ability to reconfigure firm-level and supply chain-level resources (Gligor and Holcomb, 2012; Blome et al., 2013). Supply Chain Agility is a complex capability and a central component of the firm's competitive strategy, particularly in an uncertain environment (Blome et al., 2013). The findings revealed that there indeed is a positive relationship between supply chain agility and firm performance and as such, the findings found support for the hypothesis that supply chain agility is positively associated with the firm performance. This confirms extant literature by Gligor and Holcomb (2012) that Supply Chain Agility directly leads to superior levels of operational and relational performance. Research suggests that, as processes

become more efficient and effective, financial performance improves as well (Lambert and Pohlen, 2001).

The main focus of this study was to investigate the moderating role of SC Agility on the path from SC Flexibility to firm performance. Hence, the third hypothesis posits that the interaction effect of Supply Chain Agility and Supply Chain Flexibility is positively associated with the Firm Performance. However, the study did not find support for this hypothesis. As indicated by Christopher and Towill (2001), a key characteristic of an agile organization is flexibility. That means that already, SC Agility and SC Flexibility go hand in hand and cannot be separated. Agility involves flexibility (Narasimhan et al., 2006); thus, a distinction between flexibility and agility does exist. While flexibility is related to adaptability and versatility (Kidd, 2000), agility focuses more on speed. As a competence, agility relates to outcomes at the competitive level (Goldman et al., 1994), such as market responsiveness, delivery reliability, and frequency of product introductions; thus, it represents organizational-level abilities.

In looking at its practical implication, rather, a firm could be only agile when there is flexibility. This implies that, the path from SC Flexibility to firm performance can be strengthened through SC Agility as a mediator and not a moderator. Therefore, further studies in future could rather ascertain the mediating role of SC agility on the path from SC Flexibility to firm performance.

SC Flexibility and SC Agility cannot interact to determine firm performance as confirmed by the insignificance of the moderating variable in the regression estimation. Therefore, it is important to appreciate the significant roles that each of the two concepts play respectively to achieve firm performance and not important to interact them for a similar effect.

Implication to Research and Practice

Implementation of supply chain management strategy results in improvement of supply chain performance, based on which, organizational performance will be affected. Since supply chain performance has been considered as a basis of evaluation of supply chain management strategy, providers of logistics services should concentrate on increasing supply chain performance. Consequently, performance of the organization will be increased. Quality goods and services can be presented according to the requirement of customers appropriately in the shortest time possible and with fair price through implementation of a strategy based on universality and integration with customers and suppliers, processes and activities, and implementation of those activities which improve and intensify cooperation and trust relationship among participants. This is very necessary as far as supply chain flexibility and agility are concerned.

Information technology (IT) is one of necessary infrastructures for establishing integration in supply chain processes and activities, thereby helping to ensure supply chain flexibility. Implementation of supply chain management strategy will result in improvement of supply chain performance, in which, organizational performance will be affected. Since supply chain performance has been considered as a basis of evaluation of supply chain management strategy, providers of logistics services should concentrate on increasing supply chain performance, based on which, performance of the organization will be increased as well. Managers of industries and companies are encouraged to take this issue into serious consideration thanks to the severe and positive effect of supply chain performance on organizational performance of companies.

Since it is necessary for companies to go after establishing value for end customer, they can attain these objectives only through implementing a supply chain management strategy based on universality and integration (universality and integration with customers, suppliers and universality and integration) in intra-organizational processes and activities. This would help thereby to incorporate SC flexibility, agility and other useful tools to create value and ensure continuous improvement which would eventually lead to firm performance.

CONCLUSION

The success of every supply chain depends on how agile it is to deliver the value the customers expect and this can be done by firms looking beyond the boundaries of their own firm. Reviews of literature have over the years shown that effective supply chain management flexibility in several instances improve overall firm performance in the aspect of customer satisfaction and financial performance (Huo, 2012; Danese and Romano, 2011). With flexible supply chains, firms are able to adapt effectively to disruptions in supply and changes in demand whilst maintaining customer service levels and shareholder's returns thereof. In today's business environment, supply chain flexibility is very important and a number of factors has brought this supply chain flexibility to the top of the agenda (Sun, 2013).

Firms these days face a difficult, uncertain and persistently changing business environment through trends and changes in the area of intense competition, globalization, technology, innovations, disruptions as well as sophisticated customers who continuously seek changes in their needs and expectations (Duclos et al. 2003; Pujawan 2004; Skintzi 2007; Tachizawa and Thomsen 2007; Sun 2013). The focus of this study was therefore to investigate the path between supply chain flexibility and firm performance by incorporating supply chain agility into the path as a moderating variable.

Focusing on both manufacturing and service firms in the Kumasi metropolis, a sample of 100 firms were selected out of which 77 responded, giving a response rate of 77% response rate. The findings revealed that the firms have supply chain flexibility in so many aspects including quick modification of product/service in response to customer requests, lead in new product introduction, multiple delivery modes to meet schedules for deliveries, taking different customer orders with accurate available-to-promise, quick response to multiple customers' delivery time requirements, continuous experiment, learning and improvement practices to improve customer satisfaction, quick response to supplier and customer queries and capability of redesigning activities quickly and easy adaptation to environmental changes. The respondents attribute their firm performance to their supply chain flexibility and agility. Also, the SC Flexibility and SC Agility had positive correlations with firm performance and they were significant at 0.01 or 0.05. However, from the regression analysis, it was revealed that SC Flexibility had a positive effect on Firm performance ($\beta = .321$; $t=3.000$) and was significant at $p<0.1$ or 0.5.

Also, in test of model on the direct effect of SC agility on firm performance, it was found that SC Agility variables had a positive effect on Firm performance ($\beta = .617$; $t=4.713$). However, with the moderation of SC Agility on SC Flexibility, even though there was a positive effect, it was not significant at 0.01 or 0.05. This implies that SC agility does not moderate the positive impact the SC Flexibility has on firm performance. Therefore, it is rather necessary to appreciate the individual roles that both SC Flexibility and SC Agility play to ensure value for

customers and thereby contributing to firm performance and not necessarily moderating each other.

Future Research

Results from this research appear to support the prevailing belief in literature that SC flexibility is positively related to organizational performance. However, research was limited by the small data sample utilized. Future research should attempt to sample from a larger sample population size in order to obtain statistically defensible results. A larger sample size would allow for the use of more precise statistical analysis techniques in order to generate more significant findings.

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