

Integrating the Supply Chain to Excel: The Moderating Role of Competitive Advantage

Richmond Kwesi Ansah^{a,*} and Grace Ayoka Akipelu^b

^a Department of Management Hong Kong Baptist University, Hong Kong, Ghana

^b Department of Economics, Lingnan University, Hong Kong, Ghana

Abstract

This research expands the evolving information body about supply chain management (SC) activities by re-evaluating the links that supply chain integration (SCI) has with financial and operational performance by subjecting under-tier competitive strategy. Quantitative data was gathered from 120 Ghanaian firms and analyzed using descriptive statistics, factor analysis, and regular regression models. The study found that a reasonable level of SCI has already been achieved by firms with average performance but the degree of integration varies greatly when it comes to supplier integration. The study results support the contingency theory and reinforce the latest findings of empirical research that SCI positively affects firm performance. The study further found that internal integration is much more accessible than the integration of consumers and suppliers, and the integration of suppliers is less practiced among Ghanaian firms. The results confirmed that there is a moderate role played by competitive strategy on the relationship between SCI and operational performance.

Keywords: Supply chain integration; Firm performance; Competitive strategy.

1. Introduction

1.1. Background

Supply Chain Integration involves an integration of internal departments, suppliers and customers of a focal firm. SCI should not focus on just an individual firm within the supply chain (Chandra and Kumar, 2000), but it requires all the nodes within the supply chain to communicate and share information (Thoo et al., 2017). A review by Novais et al. (2019) showed that cloud computing in supply chains positively impact the integration of supply chains' information, product, and financial flow, highlighting that Information System is necessary for supply chain integration. Review on prior SCI literature by Kesidou and Sovacoo (2019) indicated that SCI is a multi-dimensional concept with different measures and constructs. Supply Chain Integration literature portray three perspectives of Supply Chain Integration (Kesidou and Sovacoo, 2019) which are inter-organizational perspective, Systems perspective and Inter-personal perspective. The majority of the supply chain Integration literature focuses on the inter-organizational SCI perspective and the relational theory and Resource-Based View Theory are mostly used in these literatures (Thoo et al., 2017). The systems perspective of Supply Chain Literature which sees supply chains a network of several systems such as financial system, production system, information system, demand system, supply system, etc. has received less attention. To drive attention towards the systems perspective, this study incorporates the competitive strategies of the individual firms in the supply chain as a representation of the systems in supply chains, hence, putting together the inter-organizational perspective and systems perspective. The study adopts the contingency theory, which is hardly used in SCI studies to adjudge the moderating role of competitive strategies to provide grounds for further research into the systems perspective of Supply Chain Integration.

* Corresponding author email address: richmondansah@hotmail.com
DOI: 10.22034/IJSOM.2021.4.3

1.2 Introduction

Generally, worldwide rivalry and intensifying client expectations have directed businesses to progressively pay more attention to flexibility, dependability, and speed of delivery (Boyer and Lewis, 2002; Zhao et al., 2008). Owing to this, many firms over the years have continuously engaged themselves in business process reengineering from local optimization to vertical integration strategies to improve their business performance (Stonebraker and Liao, 2006). Even though firms are reengineering their processes, the actions of other firms thwart their efforts. Therefore, firms are looking for ways to expand their business capabilities and competencies by affiliating and adjusting decisions in range, processes, and structures with all the actors in their value network, rather than individually (Naslund and Williamson, 2010; Yan et al., 2010). Sweeney (2011) indicated that as firms seek to position themselves well in the market, customers become wiser and request better quality items or goods, more elevated amounts of management and lower costs. To improve customer satisfaction and consequently maximize shareholder wealth, supply chain management has to be placed in a strategic position and every strategic decision taken should be a collaborative effort of all the concerned actors in the supply chain (Fabbe-Costes and Jahre, 2008; Lambert, 2008). Getting a collaborative effort in the supply chain is by first linking all the internal cross-function within the organizations in the supply chain, then efficiently connecting all the external processes of the customers, suppliers, and all the other supply chain network associates (Narasimhan, 1997; Lambert, et al. 1998; Hussain and Nassar, 2010). The quest to seek for a collaborative effort to maximize value for supply chains introduces firms to the concept of Supply Chain Integration. Even though firms pursue supply chain integration with the hope that they will enhance their performance, there is evidence from literature proving that there is inconsistency in the findings on the integration-performance relationship (Flynn et al., 2010; Huo, 2012; Zhao et al., 2013). There is contention on the linkage between SCI and firm performance with regards to whether it is universal or contingent on various environmental factors or corporate strategies. Certain types of SCI in improving firm performance have been proposed by the universalist viewpoint to be more effective than others (Frohlich and Westbrook, 2001; Flynn et al., 2010; Huo, 2012). Based on the Universalist perspective, Flynn et al. (2010) stated that internal integration is significantly linked to performance than supplier and customer integration. On the other hand, the contingent viewpoint proposes that the level of contingent variables determines the effectiveness of the categories of SCI (Wong et al., 2011). Even though most studies conducted in the area of supply chain integration concluded that it enhances firm performance, to clearly understand the relationship between supply chain integration and firm performance, it is very important to adequately appreciate the appropriate business environmental factors. This is necessary because business environment continues to change, subjecting supply chains to different forms of risks and disruptions (Tang, 2006) and this can affect the performance of Supply Chains and the overall firm performance. Cost leadership, differentiation, and market focus are strategies recognized by strategic management researchers as scopes of competitive strategies relevant to Supply Chain Integration (Porter, 1990; Miller, 1988). These three generic strategies (cost leadership, differentiation and focus) were identified by Porter (1980) for the implementation of a company, essentially at the level of the business unit, to achieve gains higher than the average performance in business. Porter (1980) explained that these three suggested generic competitive strategies can be used effectively to influence the strength of a firm in counteracting problems in the business environment. In essence, the Supply Chain Integration- Performance relationship is contingent on the strategy adopted by the individual firms to compete in the business environment.

Therefore, this research addresses these three key fundamental questions that drive the success of supply chain integration:

1. What is the degree of integration that firms in a supply chain pursue?
2. What is the effect of Supply Chain Integration on firm performance?
3. How do the various competitive strategies influence the effect of Supply Chain Integration on firm performance?

The paper contributes to theory and practice. For theory, the research identifies the various factors that constitute the contingent variables and explains how these contingent variables influence the supply chain integration - performance relationship. There are two schools of thought on the effect of supply chain integration on performance – the universalist view and the contingent view. The universalists believe that SCI positively affects firm performance but internal SCI affects it more than external SCI does (Flynn et al., 2010). The contingent view posits that various contingent factors influence the effect of the various categories (internal and external) of SCI on organizational performance (Wong et al., 2011). However, the contingency view has not spelled out what exactly constitute the contingent variables and the research into the influence of these contingent factors is limited leaving a research gap. This research focuses on filling the gap: It supports businesses to greatly understand and acknowledge the linkage between SCI and organizational performance at different levels of competitive strategies.

In practice, this research is of great significance to the development of the economy of Ghana. Several managers rely on past practices of their businesses in managing their activities: strategic decisions taken are usually not based on critical

assessment of empirical data but a matter of trial and error or from experience which in a way keeps the business in a status quo, ignoring the fact that the business environment keep changing. Therefore, this study provides available data on the areas to be looked at in supply chain integration, hence, serving as a point of reference for managers to make sound decisions in supply chain integration. This research also gives an overview of supply chain management which happens to be a neglected concept in the business world in Ghana. Through this research, businesses will better understand the concept of supply chain and implement them to improve their performance. This study also provides data for all the actors in supply chains to understand the fact that the business environment keeps changing, and thus it induces the firms to adopt the best competitive strategy during each trend of the economic condition in the country. Finally, this study contributes greatly to academia. The study confirmed the applicability of contingency theory in the context of Ghana.

2. Relevant Literature Review

2.1. Definitions of Theoretical Perspectives on the Underlying Concepts

2.1.1. Supply Chain

SCM and its related concepts like any other managerial discipline have been defined in numerous ways by various authors over the years. According to Christopher (2005), Supply Chain “consists of managing relationships of downstream and upstream of customers and suppliers to provide excellent value at a cost that is very low for the entire supply chain.” Chopra and Meindl (2007) also backed up this definition and added that Supply chain “raises activities of products or services from manufacturers down to retailers and finally to the customers” Langley et al. (2009) also defined supply chain as an extended enterprise where activities and processes cut across all borders of each organization. Considering the definitions by these authors, it can be concluded that a Supply Chain is a network of individual organizations actively managing their processes, maximizing client values and improving through information sharing, relay of funds and distribution of generated value.

2.1.2. Supply Chain Management (SCM)

Lambert and Cooper (2000) defined Supply Chain Management as managing multiple relationships, processes and activities within and across a supply chain. Webster (2008), also explained SCM to mean “the management of resources and flow of funds between sections in an organization and external parties.” Langley et al. (2009) defined SCM as the “art and science of integrating product, information and finance flows from the original supplier or (mother earth) through to the consumer or the last user.” Looking at the definitions by these authors, SCM can be seen as the management of all activities from the stage of raw materials through all logistics activities to end-users.

2.1.3. Supply Chain Integration

Flynn et al. (2010) defined supply chain integration as the tactical collaboration of manufacturers with all actors in its supply chain network with internal and external organizational functions. Fabbe-Costes and Jahre, (2008) categorized supply chain integration into four perspectives, which are:

1. Integration of organizations (customer, supplier and internal integration)
2. Integration of processes
3. Integration of flows: products and services, information, money and decisions
4. Degree of integration (low cost and high speed).

This means that SCI ultimately measures the degree or level of collaboration between the actors and the seamless flow of elements in the network. In the above insights, SCI is measured in various dimensions, but for this study, the dimensions mentioned by Flynn et al. (2010), that is, internal, customer and supplier integration of measurement of SCI was considered.

2.1.4 Firm Performance

With logistics and SC literature, performance is considered to be a difficult and multidimensional construct. Fabbe-Coste and Jahre (2008) defined firm performance as the measurement and establishment of “causal links” between the activities performed by an organization and their outcomes. In this study, organizational or firm performance is perceived as a two-

dimensional construct which comprises of operational and financial performance. When assessing the effect of supply chain integration on operational performance, the variables that are often used are cost-effectiveness, quality, delivery speed, efficiency and flexibility (Wong et al., 2011). In this study, the following adjusted variables are used to measure operational performance: overall product quality, customer service levels, products support, responsiveness to customers, delivery speed and dependability, volume flexibility and product mix flexibility. Flynn et al. (2010) used variables such as return on investment (ROI), return on sales (ROS), yield, market share, ROI growth, ROS growth, and market sales growth to measure financial performance of firms.

2.2. Supply Chain Integration Barriers

Although smooth coordination is needed for SCI, it is hardly attained. In the implementation of SCI, experts face many challenges regarding the SC integration procedures and the general corporate business methodology (Hussain and Nassar, 2010; Otchere et al., 2013). Many challenges relating to supply chain integration arise from the inability to coordinate or collaborate with various activities and partners. Sweeney (2011) considered three different challenges of SCI. That is, (1) Internationalization (or globalization) of SCs, (2) Vertical disintegration and (3) The changing role of the SCs as a basis of planned influence. Besides, different authors have identified distinguished comparable obstacles to integration. Some of the identified obstructions include, however not limited to, inaccurate objectives and interests, mixed costs, poor understanding, absence of SC visibility, inward policies, absence of confidence, short-term goals, absence of knowledge, powerless economic data frameworks or absence of majority of the data technology, conventional administration philosophy and framework similarity (Chopra and Meindl, 2007; Lambert, 2008; Kartunzi, 2011; Samuel and Kashif, 2013). Although the above challenges are possible hitches that can limit the efficiency of SCI, effective management of the problems can turn them into driving forces for integration. This implies that SC leaders who strive to improve integration must be sufficiently aware of the most prevalent challenges.

2.5 SCI and Competitive Strategy

For Supply Chain integration to be successful, the objective of the parties of the whole supply chain must be detailed when implementing or forming a strategy for the Supply Chain as a whole (Mann et al., 2008). Cost leadership, differentiation, and market focus are strategies recognized by strategic management researchers as scopes of competitive strategies relevant to Supply Chain Integration (Porter, 1990; Miller, 1988). Companies compete mostly on reduced prices or cost of products when adopting cost leadership strategy and this is mainly done through economies of scale leading to lower cost of sourcing to the production of goods and services through to the distribution point. On the other hand, differentiation strategy is concerned with the creation of a unique brand, innovative and superior quality of products that comes at higher prices (Miller, 1988). The companies' products or services are often differentiated from the distinctive character of their competitors. Firms that are pursuing a focus strategy divide the market into segments and select a particular segment and tailor their products to suit the needs of that particular target (Miller, 1988).

2.6 The Effect of SCI On Firm Performance

The observed progressive explanation given over the years on empirical findings on the impact of supply chain integration on firm performance has been encouraging. Most of these empirical findings are based on many theories of SCI and performance relationships. This research was based on the contingency view theory. The contingency states that in all cases, there is no hard and fast rule or theory that can be practical in all instances and there is no one way of designing an organization (Scott and Cole, 2000). According to Sinha et al., (2005), the contingency theory uses an eliminating methodology, which treats some firm as distinct and self-determining components are factored in. The systems and operations of firms are structured by the environment in which they function. It is advocated that firms increase their performance by taking note of all activities in the sector that they operate in and also focus on the activities and needs of suppliers and customers (Donaldson, 2001).

3. Theoretical Background

3.1. The Contingency Theory in Supply Chain Integration- Firm Performance Relationship.

This study employs the Structural Contingency Theory as a lens to investigate the effect of supply chain integration on a firm’s financial and operational performance subject to the role of the competitive strategies adopted by the firms to compete in the business environment. The Structural Contingency Theory states that the level of adoption and designing of strategies adopted by firms influences the performance levels of the organization (Huo et al., 2014; Chandler, 1962). The performance-strategy relationship is well defined or explained in the literature of strategic management as the economic “fit” (Huo et al., 2014; Chandler, 1962). When applying structural contingency theory to SCI, specific variables have to be adjusted to attain effective performance in an organization (Huo et al., 2014).

The contingent viewpoint suggests that the degree of contingent factors plays a role in determining the efficiency of the supply chain integration – performance relationship (Wong et al., 2011b) and can affect the efficiency of the SC performance, just as SCI literature in these current years emphasize (Huo et al., 2014).

3.1 Research Model and Hypotheses

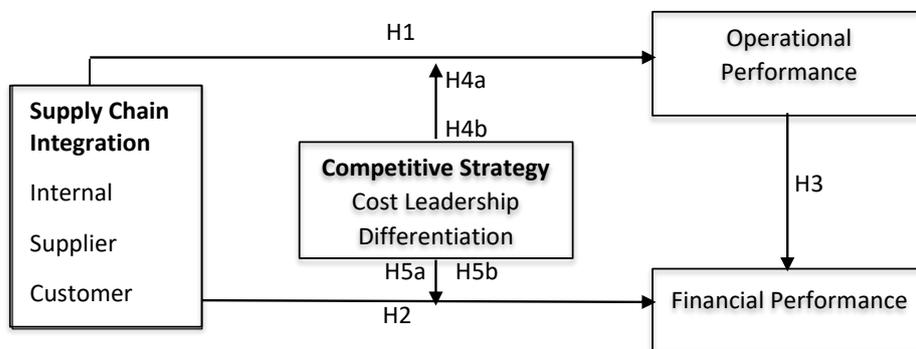


Figure 1. Proposed Theoretical framework

Most literature on the linkage between SCI and firm performance widely agree that SCI improves the financial performance of an organization. Great performance achieved in respect of higher share of the market segment and profitability can be determined by the degree of customer and supplier integration. Zailani and Rajagopal (2005) found that supplier and customer integration play a key role in overall performance improvement. Also, they noted that proper management of internal processes and functions can increase the operational performance of a firm and this eventually has a positive impact on financial performance. Also, Elgazzar et al. (2013) and Inman et al. (2011) showed that financial performance is positively influenced by operational performance.

3.2.1 The Effect of SCI On Firm Performance

SCI, which is defined as an improvement of strategic intra-firm and inter-company collaboration along SC is largely considered as an effective strategy for improving firm performance (Flynn et al., 2010; Wong et al., 2011; Huo et al., 2014, Yu et al., 2018; Zhu et al., 2018). Flynn et al. (2010) in their study on “The impact of supply chain integration on performance: A contingency and configuration approach,” collected data from 617 Chinese firms and used hierarchical regression to analyze the data on the effect of SCI (internal, supplier and customer integration) on firm performance under configuration and contingency theories. The authors found a positive relationship between the SCI and performance variables under the two theories. Findings from the study by Wong et al. (2011) showed that supply chain integration has a positive impact on corporate performance, mainly within operation results (i.e. delivery, production costs, product quality, and production flexibility). Looking at the arguments put forth and the empirical facts presented, it is hypothesized that:

H₀: Supply chain integration is not related to operational performance.

H₁: Supply chain integration is positively related to operational performance.

Zailani and Rajagopal (2005) found that supplier and customer integration plays a key role in overall performance improvement. Besides, they noted that proper management of internal processes and functions can increase the operational performance of a firm and this eventually has a positive impact on financial performance. Also, by Elgazzar et al., 2013; Inman et al. (2011) show that the financial performance is positively influenced by operational performance. Therefore, the second set of hypotheses was proposed:

H₂. Supply chain integration is positively related to financial performance.

H₃. Operational performance is positively related to financial performance.

The objective of every business is to generate customer value which is measured by the ratio of quality to cost (Jacobs and Chase, 2011). This means that organizations can achieve a competitive advantage through cost reduction or lower prices. Narasimhan and Jayaram (1998) argued that a company can improve its competitiveness in terms of reliability, flexibility, cost and quality through the strategic management of suppliers. This means that the integration of supply chains leads to considerable cost improvements (i.e. material costs, product costs and production costs), quality of delivery and smaller turnover times (Ragatz et al., 2002). Based on these, it is hypothesized that:

H_{4a}. The positive relationship between SCI and financial performance is strengthened when firms pursue cost leadership strategy.

H_{4b}. The positive relationship between SCI and operational performance is strengthened when firms pursue cost leadership strategy.

Differentiation strategy, as opposed to cost leadership strategy, pursues "premium quality", rather than reduce prices to meet customers' needs (Porter, 1991). High technology and demand uncertainties characterize the external environment of the differentiator in the market or industry (Miller, 1988). Research and development activities are strengthened within firms that are pursuing a differentiation strategy to control challenging environmental demands. Therefore, SCI probably works perfectly in organizations with differentiation strategies in innovative and branded delivery of unique products and services. Therefore, the final set of hypotheses were proposed as:

H_{5a}. The positive relationship between SCI and financial performance is strengthened when the firms pursue a differentiation strategy.

H_{5b}. The positive relationship between SCI and operational performance is strengthened when firms pursue a differentiation strategy.

4. Research Methodology

4.1 Instrument Development

For the study using a descriptive research design, a survey approach was adopted in this study. A solitary instrument was utilized to gather the required information. A self-regulated survey was planned regarding measures adopted by past authors to measure comparable developments in their investigations. Data were collected using a survey instrument largely made up of measures from existing literature. The questionnaire for the study was developed by conducting an expanded review of the prevailing literature. Based on the set objectives, measures that were found relevant to the context of the study were adapted to measure the respective constructs. The structure of the questionnaire ensured ease of reading and understanding for respondents. The questionnaire was structured using a seven-point Likert scale where respondents were asked to state their agreement with a given statement on a scale that ranged from "strongly agree" to "strongly disagree" with its midpoint anchored as "neither agree nor disagree" Most of the items were positively worded with few negatively worded. The questionnaire had most of the items closed-ended.

4.2 Data Collection

Before the field study, the instrument was rigorously reviewed and necessary changes were made. The questionnaires were administered in 80 manufacturing companies and 40 service firms in Ghana. For each company visited, relevant personnel were contacted to respond to the questionnaire, such as Supply Chain Officer / Manager, Procurement Officer

/ Manager, or Operations Manager. These persons were found to be suitable and reliable for the study as they have a better understanding of the business of their companies and the issues designed in the questionnaire. Classically, the questionnaires were distributed and collected at a later date after completion. In many cases, informants were called on the progress of their responses to the instrument. Others were immediately administered and collected to avoid delays.

4.3 Measurement Model Validity

A rigorous process was employed to validate the instruments. Before the data was collected, content validity was supported by previous literature, scrutiny by an expert in the area including industry experts, and a pilot test. To test the reliability of the constructs, Cronbach alpha was used to assess scale reliability. 0.7 was considered by the researchers as the minimum threshold generally accepted. Tabachnick and Fidel (2013) suggested that before the data can be subjected to factor analysis, both Kaiser-Meyer-Olkin (KMO) for the sample acceptance test and the Bartlett test of the sphericity test should be carried out. According to Tabachnick and Fidel (2013), the KMO index should be significant from zero (0) and one (1) with 0.6 being the lowest value for adequate and upright use of factor analysis and the Bartlett test of sphericity to 0.5 levels. The test of the constructs satisfied both the KMO and Bartlett test of sphericity. The validity was then tested with the aid of the EFA with principal component analysis and Varimax rotation with KMO. Converged validity was observed in the suppression of indicators with a coefficient of less than (0.5). The details are presented in the table below:

Table 1. Validity and Reliability of constructs and indicators of the study
PCA: KMO =0.77, DF=4884.603 (666); P=.000

Construct	Indicators	Loadings	% of variance
Internal Integration CA=.87	Our firm integrates data among internal functions	.910	75.7%
	Our firm use enterprise application integration among internal functions	.879	
	Our firm uses integrative inventory management		
	We use periodic interdepartmental meetings among internal functions to address issues	.799	
	We use real-time searching of the level of inventory		
	Our firm use real-time searching of logistics-related operating data		
	We use cross functional teams in process improvement	.889	
	We use cross functional teams in new product development		
	We use real-time integration and connection among all internal functions from raw material management through production, shipping, and sales is used		
Supplier Integration CA=.88	Our firm establishes strategic partnership with our major suppliers		77.7%
	We work with our suppliers to improve inter-organizational processes		
	Our firm have strategic partnership with our major suppliers		
	We create linkage with our suppliers through information networks		
	Our firm shares information with our major suppliers		
	We establish quick ordering systems with our major suppliers		
	Our firm have stable procurement through networking with our major supplier		
	Our major supplier shares their production schedule with us.		
	Our major supplier shares available inventory with us.	.757	
	We share our production plans with our major supplier.	.730	
	We share our demand forecasts with our major supplier	.860	
	We share our inventory levels with our major supplier.	.826	
	We help our major supplier to improve its process to better meet our needs.	.712	

Table 1. Continued

Construct	Indicators	Loadings	% of variance
Customer Integration CA=.91	Our firm establishes strategic partnership with major customers	.762	63.5%
	We work with our customers to improve inter-organizational processes	.885	
	We have a great level of communication with major customers	.725	
	We create linkage with our customers through information networks	.884	
	We share market information with our major customers	.717	
	Our firm computerize our major customer's orderings		
	We establish quick ordering systems with our major customers	.817	
	Our firm follow-up with our major customer for feedback		
	We use periodic contacts with our major customer		
	Our major customer shares Point of Sales (POS) information with us.		
	Our major customer shares demand forecast with us.		
	We share our available inventory with our major customer.		
	We share our production plan with our major customer		
Cost Leadership CA= .82	Our firm have good operating efficiency	.683	59.7%
	We pursue cost advantage of raw material procurement	.740	
	We price below competitors	.670	
	We pursue economy of scale	.884	
	We find ways to reduce cost of production	.861	
Differentiation Strategy CA= .78	Our firm provides product with unique features	.765	53.4%
	Our firm provides product with many features	.850	
	Our firm targets high-priced product segments	.716	
	We invest in advertising	.645	
	We have control of distribution channels	.661	
Operational Performance CA= .78	Our overall product quality is	.765	60.2%
	Our customer service level is	.845	
	Our delivery of pre-sale customer service is		
	Our product support is		
	Our responsiveness to customers is	.617	
	Our delivery speed is	.841	
	Our delivery dependability is	.762	
	Our volume flexibility is	.803	
	Our product mix flexibility is		
	Our new product flexibility is		
Financial Performance CA =.92	Our return on investment is	.662	72.3%
	Our return on Sale is	.810	
	Our market share is	.881	
	Our growth in ROI is	.901	
	Our growth in ROS is	.920	
	Our growth in market share is	.900	

5. Results

5.1 Demographic Data

First of all, the data was analyzed to identify the characteristics of the organizations that participated in the study. The analysis revealed that 66.7% of the management that responded were from the manufacturing sector, and 33.3% were also from the services sector. The total number of firms studied was 120 and they were all in the Greater Accra region in Ghana. 0.7% of the firms studied had been in existence for three years or less, 22.5% of the firms had been in existence for more than 3 years but not more than 6years, 15% had been in existence for more than 6 years, but not more than 9 years and 46% had been in existence for more than 10 years.

5.2 Test of Hypotheses

5.2.1. Correlation Analysis of Results

The hypotheses developed from the research model were evaluated and examined based on the results obtained in the OLS analysis and presented in Table 3.

Supply chain integration was found to relate positively with operational performance, showing correlation coefficient of (r=.235) and a positive relationship was established between supply chain integration and financial performance with a correlation coefficient of (r=.361; p<.01). Supply chain integration was found to relate positively, but weak with cost leadership strategy, showing (r=.042) and a positive relationship was established between supply chain integration and differentiation strategy with a correlation coefficient of (r=.347). Operational performance was found to relate positively with financial performance, showing (r=.491; p<.01). The moderating relationship between operational performance and both competitive strategies is strong and positive with given correlation coefficients as; operational performance-cost leadership (r=.630; p<.01) and operational performance – differentiation strategy (r=.331; p<.01). A positive relationship was established between the competitive strategies and financial performance with a correlation coefficient of financial performance – cost leadership of (r=.438; p<.01) and financial performance – differentiation strategy as (r=.600; p<.01).

It was observed that SCI had a significant influence on operational performance (at R² = 5.5.0%, F (117) = 6.847, P <0.1) (SCI * CL + SCI * D + €) and it is significantly linked to the operational performance (change in R² = 57.0% F (113) = 37.651). The direct effect path of SCI, cost leadership and differentiation results in (P <0.1). The study also found out that the direct effects of SCI and Operational Performance were significantly associated with financial performance with (F (116) = 25.331, P <0.1, R² = 30, 4%). (SCI * CL + SCI * D + €) and together were also significant for the change in financial performance (with a change in R² = 19.2%, F (112) = 18.352, P <0.1). It was also observed that the direct effect path of financial and operational performance is a good one and has found (R² = 24.1%, F (117) = 37.085, P <0.1) significant association with financial performance.

These analyses are presented below in table 2, Table 3 and Table 4 below:

Table 2. Descriptive Analysis and Correlation among Variables

	1	2	3	4	5	6	7	Mean	STD
SCI	-							5.070	0.805
Operf	0.235*							5.977	0.601
Fperf	0.361**	0.491**						5.598	0.910
CL	0.042	0.630**	0.438**					5.803	0.690
D	0.347**	0.331**	0.600**	0.363**				5.413	0.725
SCICL	0.000	-0.411**	-0.101	0.000	-0.118			0.00	0.748
SCID	0.000	-0.285**	-0.125	-0.152	0.000	0.671**	-	0.00	0.710

Source: Field Study (2017)

5.2.2. Testing Models Fit and Regression Results

The statistical significance gave a value of $\alpha < 0.01$, hence the null hypothesis, H_0 was rejected. At a 99% confidence level that there is a relationship between supply chain integration and firm performance, a total of five models were tested for their accuracy, and the coefficients of the hypotheses and the associated values were also examined. In model 1 it was observed that the direct effect of variables used to comprise SCI had a significant influence on the operating performance (at $R^2 = 5.5.0\%$, $F(117) = 6.847$, $P < 0.1$) ($SCI * CL + SCI * D + \epsilon$) and are significantly linked to operational performance (change in $R^2 = 57.0\%$ $F(113) = 37.651$, the direct effect path of (SCI, cost leadership and differentiation) $P < 0.1$). The model 3 of the study found that the direct effects of (SCI and Operational Performance) were significantly associated with financial performance, and $F(116) = 25.331$, $P < 0.1$, $R^2 = 30.4\%$). ($SCI * CL + SCI * D + \epsilon$) and together they were also significant for the change in financial performance (with a change in $R^2 = 19.2\%$, $F(112) = 18.352$, $P < 0.1$). Model 5 also observed the direct effect path of financial and operational performance. Its result shows the model as a good one and has found ($R^2 = 24.1\%$, $F(117) = 37.085$, $P < 0.1$) significant association with financial performance

Table 3. Regression Results

Variables	standardized estimates					VIF
	operational performance		financial performance			
Hypothesized path	Mod 1	Mod 2	Mod 3	Mod 4	Mod 5	
Direct effect:						
Supply chain integration (SCI)	0.175 (2.617) **	0.168 (3.646) **	0.293 (3.248) **	0.140 (1.623) **		
Cost Leadership (CL)		0.578 (10.309) **		0.060 (0.438) *		0.998
Differentiation (D)		-0.044 (-0.782) *		0.579 (5.770) **		0.878
Operational Performance			0.653 (5.392) **	0.140 (2.852) **	0.745 (6.090) **	
Interaction effect						
SCI*CL		-0.428 (-6.597) **		0.219 (1.882) **		1.000
SCI*D		0.147 (2.137) **		-0.189 (-1.682) **		1.000
R^2	0.055	0.625	0.304	0.496	0.241	
Change in R^2		0.570		0.192		
Adjusted R^2	0.047	0.608	0.292	0.469	0.234	
F-Statistics (DF)	6.847 (117)	37.651 (113)	25.331 (116)	18.352 (112)	37.085 (117)	

Note: t-values are in the parenthesis; * $p < 0.5$ (one tail test); ** $p < 0.1$ (two tail test)

Table 4. Hypothesized Paths, Beta Values and Decision

HYPOTHESIZED PATHS	Path Coefficient: Beta And T-Value	DECISION
H1. Supply chain integration is positively related to operational performance.	$\beta=.175$; $t=2.617$, $p<0.5$	Supported
H2. Supply chain integration is positively related to financial performance	$\beta=.293$; $t=3.248$, $p<0.1$	Supported
H3. Operational performance is positively related to financial performance	$\beta=.745$; $t=6.090$, $p>0.1$	Supported
H4a. The positive relationship between supply chain integration and operational performance is strengthened when firms pursue a cost leadership strategy.	$\beta=-.428$; $t=-6.597$, $p>0.1$	Supported
H4b. The positive relationship between supply chain integration and financial performance is strengthened when firms pursue a cost leadership strategy.	$\beta=.219$; $t=1.882$, $p>0.1$	Supported
H5a. The positive relationship between supply chain integration and operational performance is strengthened when firms pursue a differentiation strategy.	$\beta=.147$; $t=2.137$, $p>0.1$	Supported
H5b. The positive relationship between supply chain integration and financial performance is strengthened when firms pursue a differentiation strategy.	$\beta=-.189$; $t=-1.682$, $p>0.1$	Supported

t-value are in the parenthesis

Paths evaluated at 5% (one tailed test) significant level

Critical value ≥ 1.645 .

Source: Field Study (2017)

Taking into account the results shown in Table 2 and Table 3, all the hypotheses have been supported

6. Discussion and Conclusion

6.1 Discussion

The principal focus of the study was to research the connection between SCI and firm performance and to assess the direct effect of the competitive strategy on the connection between SCI and organizational performance. For this research, firm performance was outlined as a two-dimensional construct that incorporates operational performance (Operf) and financial performance (Fperf). With theory and findings from existing empirical studies, seven broad hypotheses were formulated. According to theory, it is said that "organizations with larger amounts of SCI encounter higher operational performance" A study by Wong et al. (2011) in Thailand on the contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance, revealed that there is a positive relationship between SCI and operational performance. The study further revealed that under a high EU, the associations between supplier/customer integration, and delivery and flexibility performance, and those between internal integration, and product quality and production cost, will be strengthened. This affirmed the contingency theories by establishing that the strength of the relationship between SCI and operational performance is dependent on Environmental Uncertainty. Flynn et al. (2009) had also conducted a study on the impact of supply chain integration on performance using the contingency and configuration approach. The findings of both the contingency and configuration approach indicated that SCI was related to both operational and business performance. Furthermore, the results indicated that internal and customer integration were more strongly related to improving performance than supplier integration. Li et al. (2006) also conducted a study on the impact of supply chain management practices on competitive advantage and organizational performance. The results indicated that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. Also, it was revealed in the study that competitive advantage can have a direct, positive impact on organizational performance. Moreover, Lu et al. (2018) discovered that the relationship between the supply chain integration and operational performance is 'non-linear', and the 'non-linearity' can be significantly moderated by the market uncertainty as one of the key environmental factors for the supply chain. This research provided outcomes that supported all these prior studies. The results of the research strengthened the proposed hypothesis and some current experimental findings (e.g. Frochlich and Westbrook, 2001; Huo, 2012; Wong et al., 2011; Flynn et al., 2010; Huo et al., 2019) that declare that organizations profit emphatically from integrating their supply chains (SCs), and that, enhancing operational performance enhances financial related results. Since operational performance is highly and positively related to financial performance, SCI and operational performance can completely enhance the general financial related performances. This finding is consistent with past investigations such as Huo (2012) and Swink et al. (2007). Moreover,

the findings of the research provided results that support the view that competitive strategies impact on the associations between SCI and firm performance. The study also revealed that firms that follow a cost leadership strategy have more financial benefits from SCI than companies that pursue a differentiation strategy. Therefore, the interaction effect between SCI and cost leadership strategy in the Ghanaian context can be more useful in enhancing firm performance. This adds to the few SCI literatures that focus on systems perspective of SCI (Kesidou and Sovacoo, 2019).

6.2 Conclusion

This study confirms the empirical contingency theory and improves SCI in Ghana which encompasses collaboration, sharing of information, coordination of activities and processes, alignment of systems and flows (materials, funds, and products). SCI can achieve greater capacity for performance enhancement. However, the efforts made by the integration could be flawed with issues such as, reliability, flexibility, cost reduction, pricing premium, quality, and the implementation process. The study has revealed that SCI with these issues hanging in them will not yield firm performance, or at least, not to the optimum. It is suggested that addressing these issues could be a source of advantage to excel in supply chain integration. The findings of the study provide information for managers to adopt SCI strategies under different competitive strategies. The customer's integration can directly improve a firm's operational performance while the internal, supplier and customer relationships are important for achieving the financial performance. Though the relative effects of internal and supplier integration on financial performance are insignificant, it does not mean that they should not be improved. This is because the findings of the study provided that operational performance improves financial performance. Internal and supplier integration can significantly increase operational performance, suggesting that when designing and implementing SCI practices, organizations should pursue long-term strategic plan rather than pursuing the short-term monetary objective.

References

- Boyer, K.K. and Lewis, M.W. (2002) Competitive priorities: investigating the need for trade-offs in operations strategy, *Production and Operations Management*, Vol. 11(1), pp. 9-20.
- Chandler Jr., A.D., (1962) *Strategy and Structure*. MIT Press, Cambridge, MA.
- Chandra, K. and Kumar, S. (2000). Supply Chain Management in Theory and Practice: A Passing Fad or a Fundamental Change? *Industrial Management and Data System*. Vol. 100(3), pp. 100-113.
- Chopra, S., and Meindl, P. (2007) *Supply Chain Management, Strategy, Planning and Operation* (3rd ed.). Upper Saddle: New Jersey: Pearson Education.
- Chopra, S., and Meindl, P. (2010) *Supply chain management: Strategy, planning, and operation* (4th ed.). Upper Saddle River, New Jersey: Pearson Education, Inc.
- Christoper, M., (2005) *Logistics and Supply Chain Management*. Pearson education limited.
- Christopher, M. (2011) *Logistics and supply chain Management strategies*. 4th ed. FT Prentice Hall, London
- Donaldson, L., (2001) *The Contingency Theory of Organizations*. Sage, Thousand Oaks, CA
- Fabbe-Costes, N., and Jahre, M. (2006) Logistics integration and disintegration - In search of a Framework. *In International Conference on Information Systems, Logistics and Supply Chain (ILS'06)* (841–50). Mons, Belgium: FUCAM edition.
- Fabbe-Costes, N., and Jahre, M. (2008) Supply chain integration and performance: a review of the evidence. *The International Journal of Logistics Management*, Vol. 19, pp. 130–154.
- Fabbe-costes, N., and Roussat, C. (2011) Supply Chain Integration: Views from a Logistics Service Provider. *Supply Chain Forum: An Internal Journal*, Vol. 12(2), pp. 20–30

- Flynn, B. B., Huo, B., and Zhao, X. (2010) The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management*, Vol. 28, pp. 58–71
- Flynn, B., and Flynn, E. (1999) Information-processing alternative for coping with manufacturing environment complexity. *Decision Sciences*, Vol. 30(4), pp. 1021-1052.
- Frohlich, M.T. and Westbrook, R. (2001) Arcs of integration: an international study of supply chain strategies, *Journal of Operations Management*, Vol. 19(2), pp. 185-200.
- Huo, B. (2012) The impact of supply chain integration on company performance: an organizational capability perspective, *Supply Chain Management: An International Journal*, Vol. 17(6), pp. 596 - 610
- Huo, B. (2012) The impact of supply chain integration on company performance: an organizational capability perspective. *Supply Chain Management: An International Journal*, Vol. 17, pp. 596–610
- Huo, B., Qi, Y., Wang, Z., and Zhao, X. (2014) The impact of supply chain integration on firm performance: the moderating role of competitive strategy. *Supply Chain Management: An International Journal*, Vol. 19(4), pp. 369–384
- Huo, B., Ye, Y., Zhao, X., and Zhu, K. (2019). Supply chain quality integration: A taxonomy perspective. *International Journal of Production Economics*, Vol. 207, pp. 236-246.
- Hussain, A. H. A., and Nassar, M. O., (2010) Supply Chain Integration: Definition and Challenges. *Proceedings of Multinational Conference of Engineers and Computer Scientist, I, Hong Kong*.
- Inman, R.A., Sale, R.S., Green, K.W. Jr. and Whitten, D. (2011) Agile manufacturing: Relation to JIT, operational performance and firm performance”, *Journal of Operations Management*, Vol. 29(4), pp. 343-355
- Jacobs, F.R. and Chase, R.B. (2011) Operations and Supply Chain Management, 13th ed., *The McGraw-Hill companies, New York, NY*.
- Kesidou, S. and Sovacool, B. K. (2019). Supply chain integration for low-carbon buildings: A critical interdisciplinary review. *Renewable and Sustainable Energy Reviews*, Vol. 113, 109274.
- Lambert, D. M. (2008) An executive summary of supply chain management: processes, partnerships, performance. Sarasota, USA: *Supply Chain Management Institute*.
- Lambert, D.M., Cooper, M.C. and Pagh, J.D. (1998) Supply Chain Management Implementation Issues and Research Opportunities. *The International Journal of Logistics Management*, Vol. 11(1), pp. 1-17.
- Lambert, M. D., Stock, R. J., and Ellram, M. L. (1998) Fundamentals of Logistics Management. *New York: McGraw Hill*
- Langlely, C. J., Coyle, J. J., Gibson, B. J., Novack, R. A, and Bardi, E. J. (2009) *Managing supply chains, a logistics approach (8th Edition)*. South-Western
- Lu, D., Ding, Y., Asian, S., and Paul, S. K. (2018). From supply chain integration to operational performance: The moderating effect of market uncertainty. *Global Journal of Flexible Systems Management*, Vol. 19(1), pp. 3-20.
- Mann, I.J.S., Kumar, V., Kumar, U. and Mann, H. (2008) Supply Chains: An Organization Theory Perspective. *The International Journal of Knowledge, Culture and Change Management*, Vol. 8(8), pp. 81-94.
- Miller, A. and Dess, G.G. (1993) Assessing Porter’s (1980) model in terms of its generalizability, accuracy and simplicity. *Journal of Management Studies*, Vol. 30(4), pp. 553-585.
- Miller, D. (1988) Relating Porter’s business strategies to environment and structure: analysis and performance implications, *Academy of Management Journal*, Vol. 31(2), pp. 280-308

- Miller, D. (1989) Matching strategies and strategy making: process, content and performance. *Human Relations*, Vol. 42(3), pp. 241-260.
- Narasimhan R, Jayaram J, (1998) Causal linkage in supply chain: An exploratory study of North American manufacturing firms. *Decision Sciences*, Vol. 29(3), pp. 579 – 605.
- Naslund, D., and Williamson, S. (2010) What is management in supply chain management? – A critical review of definitions, frameworks and terminology. *Journal of Management Policy and Practice*. Vol. 11 (4), pp. 11-28.
- Novais, L., Maqueira, J. M., and Ortiz-Bas, Á. (2019). A systematic literature review of cloud computing use in supply chain integration. *Computers and Industrial Engineering*, Vol. 129, pp. 296-314.
- Otchere, A. F., Annan, J. and Anin, E. K., (2013a) Achieving Competitive Advantage through Supply Chain Integration in the Cocoa Industry: A Case Study of Olam Ghana Limited and Produce Buying Company Limited. *International Journal of Business and Social Research (IJBSR)*, Vol. 3 (2), pp. 131-145.
- Otchere, A. F., Annan, J. and Quansah, E. (2013b) Assessing the Challenges and Implementation of Supply Chain Integration in the Cocoa Industry: a factor of Cocoa Farmers in Ashanti Region of Ghana. *International Journal of Business and Social Science (IJBSS)*.
- Porter, M.E. (1980) *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York, NY: Free Press.
- Porter, M.E. (1985) *Competitive Advantage: Creating and Sustaining Superior Performance*. New York, NY: Free Press.
- Porter, M.E. (1990) *The Competitive Advantage of Nations*. New York, NY: Free Press.
- pp. 418–29.
- Ragatz, G. L., Handfield, R. B. and Petersen, K. J. (2002) Benefits associated with supplier integration into new product development under conditions of technology uncertainty, *Journal of Business Research*, Vol. 55(5), pp. 389-400
- Scott, W.R., and Cole, R., (2000) Introduction. In: Cole, R., Scott, W.R. (Eds.), *The Quality Movement and Organizational Theory*. Sage, Thousand Oaks.
- Sinha, Kingshuk, K., Van de Ven, and Andrew, H., (2005) Designing work within and between organizations.
- Stank, T.P., Keller, S.B. and Closs, D.J. (2001) Performance benefits of supply chain integration”, *Transportation Journal*, Vol. 41(2), pp. 31-46
- Stonebraker, P.W. and Liao, J. (2006) Supply chain integration: exploring product and environmental contingencies, *Supply Chain Management: An international Journal*, Vol. 11 No. 1 supply chain strategies. *Journal of Operations Management*, Vol. 19, pp. 185–200
- Swink, M. and Song, M. (2007) Effects of marketing manufacturing integration on new product development time and competitive advantage, *Journal of Operations Management*, Vol. 25(1), pp. 203-17.
- Tabachnick, G. B., and Fidel, S. L. (2013) *Using multivariate statistics*. (6th Edition). Pearson Education Inc. New Jersey.
- Thoo, A. C., Tan, L. C., Sulaiman, Z., and Zakuan, N. (2017, June). A review of theoretical frameworks for supply chain integration. In IOP Conference Series: Materials Science and Engineering (Vol. 215, No. 1, p. 012010). IOP Publishing.
- Webster, S. (2008) *Principles and tools for supply chain management*. Boston: McGraw-Hill Irwin
- Westbrook, T. J. (2001) *Integrating the Supply Chain*. World Wide Wood Network, Ltd. Washington

- Wong, C.W.Y., Lai, K. and Cheng, T.C.E. (2011a) Value of information integration to supply chain management: roles of internal and external contingencies", *Journal of Management Information Systems*, Vol. 28(3), pp. 161-200
- Wong, Y. C., Boon-itt, S., and Wong, C. W. Y. (2011) The contingency effects of environmental uncertainty on the relationship between supply chain integration and operational performance. *Journal of Operations Management*. Vol. 29, pp. 604 - 615.
- Yan, Y., Zhang, H. S., and Zeng, F. (2010) The exploitation of an international firm's relational capabilities: an empirical study. *Journal of Strategic Marketing*, Vol. 18 (6), pp. 473, 487
- Yu, K., Luo, B. N., Feng, X., and Liu, J. (2018). Supply chain information integration, flexibility, and operational performance: An archival search and content analysis. *The International Journal of Logistics Management*, Vol. 29(1), pp. 340-364.
- Zailani, S., and Rajagopal, P. (2005) Supply chain integration and performance: US versus East Asian companies. *Supply Chain Management: An International Journal*, Vol. 10(5), pp. 379-393.
- Zhao X, Hou, B., Willem S, and Jeff Hoi Y.Y. (2011) the impact of internal integration and relationship commitment on external integration. *Journal of OperationsManagement*, Vol.29 (1-2), pp. 17-3.
- Zhao, L., Huo, B., Sun, L. and Zhao, X. (2013) The impact of supply chain risk on supply chain integration and company performance: a global investigation, *Supply Chain Management: An international Journal*, Vol. 18(2), pp. 115-131.
- Zhao, X., Huo, B., Flynn, B. and Yeung, J. (2008) The impact of power and relationship commitment on integration between manufacturers and customers in a supply chain, *Journal of Operations Management*, Vol. 26(3), pp. 368-388.
- Zhu, Q., Krikke, H., and Caniëls, M. C. (2018). Supply chain integration: value creation through managing inter-organizational learning. *International Journal of Operations and Production Management*, Vol. 38(1), pp. 211-229.