The Effects of Supply Chain Management Strategies on Competitive Advantage on Food and Beverage Processing Companies; A Case Study in the Ashanti Region Of Ghana

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ABSTRACT

The food and beverage industry plays a unique role in expanding economic opportunities because it is universal to life and health. However, the industry's performance was below average in Ghana and was facing intense competition from the imported food stuffs from overseas. The study adopted quantitative approach with food and beverage processing companies in the Ashanti Region of Ghana as the target population. The target population for the study was hundred selected companies in the SME's which comprises of fifty respondents in food and fifty respondents in beverage. Structured questionnaires were used to gather primary data in the Ashanti Region of Ghana. Linear regression and correlation statistics were applied to investigate relationship between SCM Strategies and competitive advantage. The study concluded that companies' competitive advantage is achieved through implementing supply chain agility, collaboration and integration strategies in their networks. The study recommends that the companies should develop a clearly laid down policies and procedures for handling customers' concerns and also develop interactive websites to achieve effective information sharing and concerns that can be addressed in real time.

KEYWORDS: Supply Chain Management Strategies (SCM), Competitive Advantage, Supply Chain Collaboration, Supply Chain Integration Strategies, Supply Chain Agility.

1. INTRODUCTION

Turbulent change in the business environment has brought change in customer expectations, preferences and changes in their taste never static as a result of the change in external environmental factors. The consistent change in the environment makes it imperative for all organizations to constantly adapt to their activities to succeed in the global environment Ansoff (1987).

Corporations and organizations have increasingly turned to global sources for their supplies which have greatly forced companies to look for more effective approaches to coordinate the flow of materials in and out of the organization (John et al., 2001). In this study, SCM is defined as a strategic view of material and distribution management that shows the importance to the individual organizations from enhanced performance of the supply chain as a whole through the lens of the business processes across functional and corporate borders to the ultimate consumer (Kemppainen and Vepsalainen, 2003).

Supply Chain Concept has become more complex than ever before in struggling to meet the supply base globalization and product diversification to meet a change in customer needs and expectations.

SCM excellence has become a critical factor for many organizations in this modern dispensation. Some leading firms have built world-beating businesses on cost-effective, fast and agile supply chains, others too have brought to their own knees inability to supply increasing complex and has led to a dispersed market (Ansoff, 1987).

SCM practices has helped senior management of most organization to achieve better services, lower cost, and inventory by ultimately creating a competitive advantage. To be able to survive and thrive in the turbulent environment, managers must learn how to communicate, coordinate and corporate all activities in the supply chain nodes and links within all its strategic partners.

Bourlakis and Weightman (2004), also argue that SCM as a concept is widely recognized in the global market as a major contributor and a key to many industries to cut down cost as well as enhancement in service because firstly, the business model in the past was often based upon a philosophy of vertical integration whereby upstream and downstream facilities and activities were owned and managed by one organization.

In today's business, all activities other than our core business are outsourced to third parties. The extent of this outsourcing in some instances is such that we refer to supply chains as supply 'networks'. Secondly, the continuous rise in the globalization of industry is a major driver. The norm 'local for local' manufacturing and distribution is being replaced by a global sourcing and focused manufacturing in fewer but bigger facilities. Thirdly, the growing demands placed upon suppliers by ever more powerful retailers. Retail concentration is now a fact of life in many markets and is increasing as we see the emergence of global retailers. Their demands for just-in-time delivery, for higher product quality and tailored logistics solutions, means there must be a review of supply chain strategies (Bourlakis and Weightman, 2004).

According to Michael Porter (1985), the concepts help us to know how activities build competitive advantage. According to Porter, a firm can achieve its sustainable competitive advantage by focusing on its operational effectiveness and distinctive strategic positioning in the market. Porter (1985), argue that Competitive advantages are conditions that allow a company or country to produce a good or service of equal value at a lower price or in a more desirable fashion. These conditions allow the productive entity to generate more sales or superior margins compared to its market rivals. Competitive advantages are attributed to a variety of factors including cost structure, branding, and the quality of product offerings, the distribution network, intellectual property, and customer service.

Competitive advantage as also defined by Porter (1995), is the ability of organizations to respond to changes in their marketplaces by modifying their competencies in ways in which they can position themselves. O'Farrell et al., (1993), argue that each of these components is intricately related and ultimately contributes to firms' competitive advantage hence creating economic value rather than being something that is used within the strategy, they see the competitive advantage as the objective of the strategy. Porter's, Generic Strategies of cost, differentiation and focus are some of the forms of strategies, to succeed, firms must strategize with a view of meeting the customers need, an inside and out approach becomes more volatile in the external environment making it more flexible and agile strategies are required.

SC activities provide a good avenue and this has explained why supply chain experts must take a proactive role in guiding their organizations appropriately in the changing optimum operations spectrum as they flex to match the realities of the intense competitive landscape (Porter, 1985). The food and beverage industries in Ghana are faced with increasing and transformational complexities, a rapidly changing business landscape engineered by globalization, competition, technological advancement, changing demographics and with a very informed customer base, who dictates what they need, how and when.

 The focus of this research is to assess the effects of supply chain management strategies on competitive advantage in food and beverage processing companies in the Ashanti Region of Ghana.

Figure 1   **Conceptual Framework Model**

Independent Variable   Dependent Variable

Supply Chain Management Strategies   **Competitive Advantage**
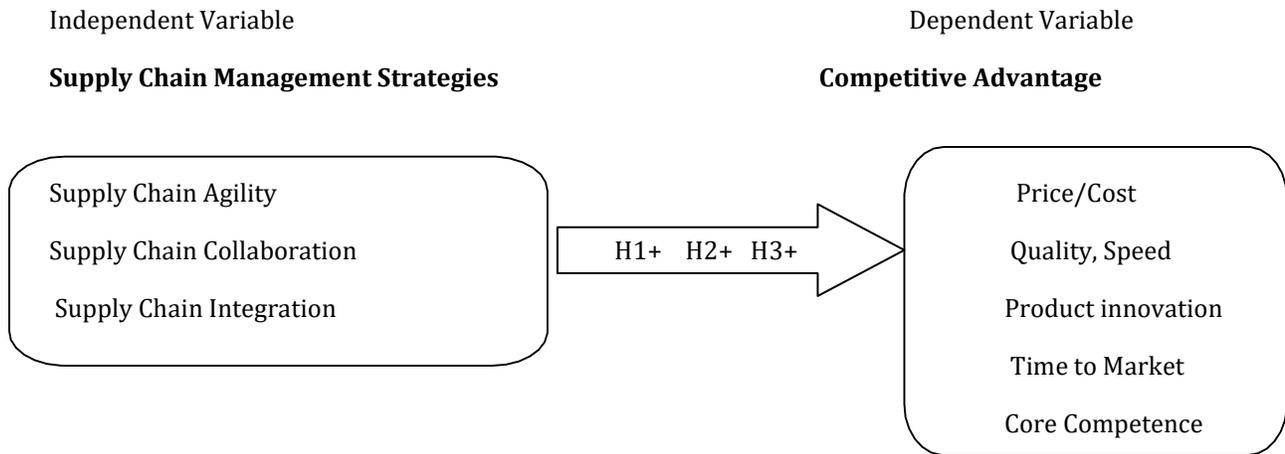
Source: Authors Construct, (2024)

Hypothesis Development

H1. Supply chain agility has a positive relationship on competitive advantage in food and beverage processing companies in Ghana.

H2. Supply chain collaboration has a direct impact on competitive advantage in food and beverage processing companies in Ghana.

H3. There is a positive relationship between supply chain integration and competitive advantage in food and beverage processing companies in Ghana.

2. MATERIALS AND METHODS

The researcher selected 100 registered companies in the food and beverage companies consisting of 50 respondents in food (meat products, bakery wares, confectionery) and 50 respondents in beverages (alcoholic and non-alcoholic). One of these companies either operated in a service or a manufacturing industry. The target respondents were CEO's and the general managers of the various selected companies, thus evident that the research was conducted on organisational level of companies in the small and medium enterprises (SME's).

More than one person participated in the study reason being that, the researcher wanted to find out how other participants exhibited their job-related characteristics, such as past experience, intelligence, knowledge, skills and abilities, and *greater* selectivity which leads to desirable outcomes as high performance (for the organizations) and job satisfaction.

2.1 Types and Sources of Data

The data was collected by means of questionnaires. Questionnaires were used because it's relatively more economical, convenient for the respondents to answer and can be applicable in instance where large respondents are involved. Secondly, the questionnaires boost the provision of a true and honest response on sensitive issues in the survey.

2.2 Data Collection Method

The main aim for designing the questionnaire was to get a lot of responses from the various respondents. The respondents were selected from the 100 selected companies based in Ashanti Region. The questionnaires were administered on drop and pick format and emails format for most CEO's to answer. Appointment were booked and secured to administer questionnaires to the target population of the 100 companies selected.

Questions were designed to get specifics respondents behaviours, attitudes, intentions, motivates and their demographical characteristics. The duration for the collection was two weeks due to time constraints. The questions explained the purpose of the research and assured the respondents of confidentiality and commitment to share the findings of the research to them

2.3 Data Analysis and Presentation

The study adopted quantitative method of analysing the data which helped in easy analyses. Questions were being coded according to each variable components of the study to minimize error and ensure system accuracy during the data analysis. Statistical Package for Social Sciences were used to analyses data program and were plotted graphically and presented using tables and charts.

Descriptive statistics of mean and standard deviation were considered by the researcher as well statistical Inferences. Linear regression and correlation statistics were used to analyse the relationship that exist between SCM Strategies and Competitive advantage. The above equation were used to predict the effects of SCM Strategies on Competitive advantage (CA as dependent variable)

$Y= Q_0 + Q_1X_1 + Q_2X_2 + Q_3X_3 + e$

Where X_1 = Supply Chain Collaboration

X_2 = Supply Chain Agility

X_3 = Supply Chain Integration

e = error term

Y= Competitive advantage (CA)

3. RESULTS AND DISCUSSION

3.1   Demographic Data on Respondents

Demographic data was collected on the respondents to the survey on their gender, how long they have been working in their organizations, their level of education, and their current salary levels. The data was analysed using frequency tables. Analysis of the individual level demographic data revealed that majority of the respondents were male (60.9%), with females forming 39.1% of respondents. Majority of the respondents had worked in their organizations for more than 5 years (38%), and were thus in a position to respond with meaningful information on their organizations. The respondents were mostly managers and supervisors, and majority had been in their current positions for more than five years (29.3%). All the respondents had received formal education, with majority (59.8%) having bachelor's degree. Analysis of the salary range of the respondents revealed that majority (52.2%) had salaries less than 1,500. The full demographic data on the respondents is presented in Table 3.1 below.

Table 3.1   Demographic Data on Respondents

Gender	Frequency	Percentage
Male	56	60.9
Female	36	39.1
Total	92	100.0
Length of working in organization	**Frequency**	**Percentage**
Up to 1 year	9	9.8
2 years	16	17.4
3 years	19	20.7
4 years	13	14.1
More than 5years	35	38.0
Total	92	100.0
Length of working in current position	**Frequency**	**Percentage**
Less than 1 year	13	14.1
2 years	21	22.8
3 years	20	21.7
4 years	11	12.0
5 years or more	27	29.3
Total	92	100.0
Education level	**Frequency**	**Percentage**

Senior High	28	30.4
Bachelor's degree	55	59.8
Master's degree	9	9.8
Total	92	100.0
Salary range	**Frequency**	**Percentage**
Up to 1,500	48	52.2
1,501 to 2,500	28	30.4
2,501 to 3,500	13	14.1
More than 3,500	3	3.3
Total	**92**	**100.0**

Source: Field study (2024)

3.2 Demographic Characteristics of Respondents

Demographic data was also collected on the firms involved in the study and analysed using frequency tables. It was revealed that the vast majority (96.7%) of the participating firms had been in existence for more than 5 years. All the organizations reported being national, with no international or multinational firms involved in the study. Manufacturing firms accounted for 81.5% of the firms, with service firms forming the remaining 17.5% of firms. Again, majority of the firms (81.5%) reported being limited liability firms, with 17.4% being sole proprietorships, and firm being unregistered. By way of employee size, majority of the firms (62%) reported having more than 40 employees. In terms of products the firms were involved in, majority of the respondents indicated they were involved in beverages 41.3%, followed by bakery wares (21.7%) and then meat products (18.5%). Firms dealing in "other" products accounted for 18.5%. Finally, when quizzed on how long the logistics department of the organization has been in existence, it was revealed that majority (41.3%) had been in existence for 11 to 20 years, followed by those that have been in existence for up to a year (37.0%), and then those that have been in existence for more than 50 years (21.7%). The full demographic data on the responding firms is presented in Table 3.2 below.

Table 3.2 Demographic Data on Firms

Years of existence	**Frequency**	**Percentage**
3 years	1	1.1
4 years	2	2.2
More than 5 years	89	96.7
Total	92	100.0
Type of organization	**Frequency**	**Percentage**
National	92	100.0

Multinational	0	0
International	0	0
Total	92	100.0
Industry	**Frequency**	**Percentage**
Manufacturing	75	81.5
Service	17	18.5
Total	92	100.0
Legal form of entity	**Frequency**	**Percentage**
Not registered	1	1.1
S-457 6ole Proprietorship	16	17.4
Limited Liability	75	81.5
Public Limited		
Total	92	100.0
Employees	**Frequency**	**Percentage**
Up to 20 employees	0	0
20 to 30 employees	17	18.562
31 to 40 employees	18	19.6
More than 40 employees	57	62.0
Total	92	100.0
Products category	**Frequency**	**Percentage**
Meat products	17	18.5
Bakery wares	20	21.7
Beverages	38	41.3
Other	17	18.5
Total	92	100.0
Logistics department length	**Frequency**	**Percentage**
Up to 1 year	34	37.0
1 to 10 years	0	0
11 to 20 years	38	41.3

21 to 50 years	0	0
More than 50 years	20	21.7
Total	**92**	**100.0**

Source: **Field study (2024)**

3.3 Level of Supply Chain Collaboration

The study was interested in examining the level of Supply Chain Collaboration practiced by the surveyed organizations. Supply Chain Collaboration was examined in this study as a higher order construct having Supplier Relationship and Customer Relationship as its dimensions. For Supplier Relationship, seven statements measuring the relationship of the firms with their suppliers were developed and respondents were asked to indicate the level to which they agreed to each statement using 5-point Likert scales anchored on 1 = Strongly Disagree and 5 = Strongly Agree. For each statement, the number of responses received (N), the minimum response (Min), the maximum response (Max), the mean and standard deviation (S.D) were calculated to provide a description of the level of supplier relationship practiced. The average of all Supplier relationship items was found to be 3.89, which was well above the mid-point level of 3. This suggests that firms surveyed had high levels of supplier relationships. The item with the highest mean was "My company has built long term relationships with its suppliers" with a mean of 4.0652, whist the item with the lowest mean was "The company deals with conflict as a result of competition and price terms among its supply chains" which had a mean of 3.7283.

The second dimension of Supply Chain Collaboration was Customer Relationship which examined the strength of the relationship between responding firms and their customers. Six items were used to measure Customer Relationship. Responses were analysed through descriptive statistics. The overall mean for Customer Relationship items was found to be 3.98, which again was well above the mid-point level of 3. This reveals that responding firms have strong relationships with their customers. The Customer Relationship item with the highest mean was "The company keeps a database of all its customers" which had a mean of 4.2717, whilst the item was the smallest mean was "The company involves customers in issues related to product design and quality" of 3.8043. The full descriptive results of the level of Supply Chain Collaboration items are presented in Table 3.3 below.

Table 3.3   Level of Supply Chain Collaboration practiced by Surveyed Firms

Supplier relationship	N	Min	Max	Mean	S.D.
My company has specialized channels whereby, participants depend on each other	92	1.00	5.00	3.8913	.87022
My company has common planning and synchronization of activities and business processes	92	2.00	5.00	3.8370	.66757
The company activities exchange information with suppliers	92	1.00	5.00	3.9348	.78172
The company encourages co-operation in the design and development of its products	92	2.00	5.00	3.8478	.85079
My company has built long term relationships with its suppliers	92	2.00	5.00	4.0652	.76753

The company deals with conflict as a result of competition and price terms among its supply chains	92	2.00	5.00	3.7283	.69698
All supply chains participants benefit from shared resources eg, technology, and information's	92	2.00	5.00	3.9239	.72980
Average of Supplier Relationship				*3.89*	*0.766*
Customer Relationship	**B**	**Min**	**Max**	**Mean**	**S.D.**
The company keeps a database of all its customers	92	2.00	5.00	4.2717	.72783
My company manages customer complaints promptly	92	2.00	5.00	3.9783	.75561
The company involves customers in issues related to product design and quality	92	2.00	5.00	3.8043	.66695
My company seeks profitable relations that is mutually beneficial with its customers request	92	2.00	5.00	3.8696	.77342
My company is keen to build trust amongst its customers	92	1.00	5.00	3.9022	.74214
My company strives to build permanent long-term relationships with customers	92	2.00	5.00	4.0435	.76909
Average of Customer Relationship				*3.98*	*0.739*

3.4 Level of Supply Chain Agility

The researcher also examined the level to which responding firms had achieved Supply Chain Agility. To achieve this, six items measuring Supply Chain Agility was developed and respondents were requested to indicate the extent to which they agreed to each measure using 5 point Likert scales anchored of 1 = Strongly Disagree and 5 = Strongly Agree. The mean and standard deviation were calculated for each measure, with a higher mean (closer to 5) indicating high levels of Supply Chain Agility and a lower mean (closer to 1) representing lower levels of Supply Chain Agility. A mean of 3 represents average level of Supply Chain Agility. From Table 3.4, it can be seen that Supply Chain Agility items ranged from a lowest mean of 3.6739 for "The company has an agile network that is holistic and strategic and extends beyond the traditional boundaries to encompass all operations within its supply chains" and a highest mean of 3.8913 for "My company is sensitive to quick response to customer's involvement and demand for customized products". The average level of Supply Chain Agility was 3.78, which was well above the average level of 3. This indicates that the responding firms had achieved fairly high levels of Supply Chain Agility. The full descriptive results for Supply Chain Agility is presented in Table 3.4 below

Table 3.4   Level of Supply Chain Agility

Supply chain agility	N	Min	Max	Mean	S.D
My company is sensitive to quick response to customer's involvement and demand for customized products	92	2.00	5.00	3.8913	.73315
The company has an agile network that is holistic and strategic and extends beyond the traditional boundaries to encompass all operations	92	1.00	5.00	3.6739	.72792

within its supply chains					
The management team makes more responsive changes before entering the market place	92	1.00	5.00	3.7935	.81925
My company is market sensitive with capacity to flexibly adapt to the fast-changing environment	92	1.00	5.00	3.7717	.79977
The company has an information system that incorporates customers and suppliers and also increases levels of knowledge and competency allowing participants to broadly implement information technology	92	1.00	5.00	3.7391	.66083
My company has invested in product research and development	92	1.00	5.00	3.8696	.91648
Average level of Supply Chain Agility				*3.78*	*0.776*

3.5 Level of Supply Chain Integration

The study further assessed the level of Supply Chain Integration achieved by the responding firms. Supply Chain Integration was conceptualized as a higher order construct with IT Infrastructure and Supply Link was its dimensions. For both dimensions, items measuring the constructs were developed and presented to respondents to indicate their level of agreement using 5 point Likert scales anchored on 1 = Strongly Disagree and 5 = Strongly Agree. The mean and standard deviation of each item was calculated and assessed with a higher mean (closer to 5) indicating high levels of Supply Chain Integration and a lower mean (closer to 1) indicating lower levels of Supply Chain Integration.

For IT Infrastructure, the mean items ranged from a lowest mean of 3.7174 for "My company strives to share technology with all its supply chain partners" to a highest mean of 4.0326 for "My company has IT system that facilitates sharing information (real time connectivity)". The average level of IT infrastructure integration was found to be 3.86, which is well above the mid-point level of 3. This means the surveyed firms had high levels of IT Infrastructure integration. For the Supply Link integration items, the lowest mean was 3.3370 for "My Company's supply chain is two party logistics", whilst the highest mean was 3.9239 for "My Company manages an integrated chain information requirements, physical logistics and chain participants". The average of all Supply Link items was found to be 3.66, which was well above the mid-point level of 3. This indicates that the level of Supply Link integration achieved by surveyed firms was quite high. The full descriptive result for the level of Supply Chain Integration is showed in Table 3.5 below.

Table 3.5 Level of Supply Chain Integration

IT Infrastructure	N	Min	Max	Mean	S.D
My company has IT system that facilitates sharing information (real time connectivity)	92	2.00	5.00	4.0326	.81808
My company shares information with all participants in the supply chain	92	2.00	5.00	3.9348	.72331
My company has streamlined financial operations	92	1.00	5.00	3.7609	.78962
My company strives to share technology with all its supply chain partners	92	1.00	5.00	3.7174	.77497

Level of IT infrastructure integration				3.86	0.776
Supply Link	**N**	**Min**	**Max**	**Mean**	**S.D**
My company strives to build trust within the supply chain	92	1.00	5.00	3.7391	.83692
My company's supply chain is two party logistics	92	1.00	5.00	3.3370	1.01934
My company's supply chain is three or four party logistics	92	1.00	5.00	3.3804	.72388
My company has excelled in delivery service	92	1.00	5.00	3.9130	.84713
My company manages an integrated chain information requirements, physical logistics and chain participants	92	1.00	5.00	3.9239	.81515
Level of Supplier Link integration				***3.66***	***0.848***

3.6 Level of Competitive Advantage in Food and Beverage Processing Firms

The study sought to explore the extent to which food and beverage processing firms operating in Ghana had achieved competitive advantage. To achieve this, respondents were asked to use five point Likert scales anchored on 1= Strongly Disagree and 5=Strongly Agree to indicate their agreement to statements that sought to measure the level of competitive advantage of their firms. The responses received were collated and analysed using descriptive statistics (number of responses received, minimum response received, maximum response received, mean of responses received, and standard deviation of responses received). The descriptive statistics on the level of competitive advantage of food and beverage processing firms in Ghana is presented in Table 3.6 below.

Table 3.6   Level of competitive advantage of food and beverage processing firms

Competitive Advantage	N	Min	Max	Mean	S.D
CA1: My company's competitive position through cost leadership and differentiation is superior	92	3	5	4.0000	0.75593
CA2: My company's brand equity is our source of competitive advantage	92	2	5	4.0870	0.65720
CA3: My company focuses on delivering the product or service to the customer at a lowest possible cost and creates better superior benefits that justifies higher prices without sacrificing quality and has become a market leader	92	1	5	3.9239	0.77366
CA4: The company consistently through offering its high quality goods and services require a reliable, safe supply chain deliver on its promise	92	3	5	3.9783	0.67901
CA5: Speed delivery of customers products by the company has brought fierce competition	92	2	5	4.0652	0.67619
Average level of Competitive advantage				***4.0109***	***0.7084***

Source: Field study (2024)

Ninety-two responses were received for all five (5) measures of competitive advantage. The mean of each of the competitive advantage measures was calculated and used as the principal measure of the level of competitive advantage of firms. A higher mean (closer to 5) represents a high level of competitive advantage for that item and a lower mean (closer to 1) represents a low level of competitive. A mean of 3 represents an average level of competitive advantage. Examining the means of the competitive advantage items reveals that the mean values ranged from 3.9239 to 4.0870, which represent high levels of competitive advantage. The highest Competitive Advantage item was "My company's brand equity is our source of competitive advantage" (Mean = 4.0870; S.D = 0.65720). This indicates that brand equity is one of the most important assets which can be leveraged to attain high competitive advantage. "Speed delivery of customer's products by the company has brought fierce competition" was the second most important competitive advantage item with a mean of 4.0652 and standard deviation of 0.67619. Next was "The company consistently through offering its high quality goods and services require a reliable, safe supply chain deliver on its promise" (Mean = 3.9783; S.D = 0.67901). The next most important competitive advantage item was "My company's competitive position through cost leadership and differentiation is superior" (Mean = 4.0000; S.D = 0.75593). The item with the lowest mean was "My company focuses on delivering the product or service to the customer at a lowest possible cost and creates better superior benefits that justifies higher prices without scarifying quality and has become a market leader" (Mean = 3.9239; S.D = 0.77366). The overall mean of all competitive advantage items was 4.0109, which confirms the level of competitive advantage enjoyed by firms was quite high.

3.7   Correlation between Supply Chain Collaboration, Supply Chain Agility,

Supply Chain Integration, and Competitive Advantage

The Pearson Correlation analysis was used to examine the nature and strength of association between Supply Chain Collaboration, Supply Chain Agility, Supply Chain Integration, and Competitive Advantage. Correlation refers to the extent of interdependence between two or more variables. The correlation coefficient (r) is used as a measure of the interrelatedness of two variables. A perfect negative relationship has the value of -1; a perfect positive relationship has a value of 1, and no association has a value of 0. Values in between these extremes will depend on how strong the relationship between the two variables is. The significance of the relationships was tested using a 1% significance level (two-tailed test). The results of the correlation analysis test are presented in Table 3.7 below.

Table 3.7   Correlation Analysis

		SCA	CA	SCC	SCI
SCA	Pearson Correlation	1	.430**	.566**	.607**
	Sig. (2-tailed)		.000	.000	.000
	N	92	92	92	92
CA	Pearson Correlation	.430**	1	.564**	.486**
	Sig. (2-tailed)	.000		.000	.000

		92	92	92	92
	Pearson Correlation	.566**	.564**	1	.537**
SCC	Sig. (2-tailed)	.000	.000		.000
	N	92	92	92	92
	Pearson Correlation	.607**	.486**	.537**	1
SCI	Sig. (2-tailed)	.000	.000	.000	
	N	92	92	92	92

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

As can be seen from Table 3.7, there is positive and significant correlation between all the constructs. The correlation values (r) range from 0.430 to 0.607, which sits within the recommended limits of 0.2 and 0.7, suggesting that multi-collinearity may not a serious concern. To further assess the issue of multi-collinearity, the variance inflation factor (VIF) was observed. The VIF values were far below the recommended minimum value of 10, which suggests that multi-collinearity was not issue.

3.8 Regression Analysis

In relation to the established correlation among the variable understudy, the study aimed at assessing the effects of supply chain management strategies on competitive advantage among SMEs. Regression was used to explain how significant the independent variable impacts the dependent variable. It explores the link between supply chain management strategies and competitive advantage as follows

3.9   Effect of Supply Chain Agility on Competitive Advantage

The study sought to explore the effect of Supply Chain Agility on Competitive Advantage. To ascertain this, a simple linear regression analysis was conducted with aggregated supply chain agility items being the independent variable and aggregated competitive advantage items being the dependent variable. The regression results are presented in Tables 3.9, Table 3.10 and Table 3.11.

Table 3.9   Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.430a	.185	.176	.45623

a. Predictors: (Constant), SCA

Table 3.10   ANOVA Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	4.256	1	4.256	20.449	.000b
1	Residual	18.733	90	.208		
	Total	22.989	91			

a. Dependent Variable: CA

b. Predictors: (Constant), SCA

Table 3.11   Coefficients Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.327	.375		6.196	.000
	SCA	.444	.098	.430	4.522	.000

a. Dependent Variable: CA

From Table 4.6, it can be seen that the co-efficient of determination (R^2), which is a measure of the extent to which the independent variable predicts the dependent variable, was 0.185. This means that changes in supply chain agility accounts for about 18.5% of the changes in competitive advantage. This represents a fairly low level of determination. From Table 4.7, it can be seen that the effect of supply chain agility on competitive advantage was significant at $p < 0.005$. Table 4.8 reveals that the regression coefficient was 0.430. Thus the effect of supply chain agility on competitive advantage was positive and significant (b = 0.43; t = 4.522; $p < 0.005$).

3.10   Effect of Supply Chain Collaboration on Competitive Advantage

The study also explored the effect of supply chain collaboration on competitive advantage. Again, simple linear regression analysis was conducted with aggregated supply chain collaboration items being the independent variable and aggregated competitive advantage items being the dependent variable. The results of the regression analysis of the effect of supply chain collaboration on competitive advantage are presented in Table 3.12, Table 3.13 and Table 3.14.

Table 3.12   Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.564a	.318	.310	.41740

a. Predictors: (Constant), SCC

Table 3.13   ANOVA Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.309	1	7.309	41.950	.000[b]
	Residual	15.680	90	.174		
	Total	22.989	91			

a. Dependent Variable: CA

b. Predictors: (Constant), SCC

Table 3.14   Coefficients Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.111	.450		2.468	.015
	SCC	.737	.114	.564	6.477	.000

Dependent Variable: CA

From Table 4.12, it can be observed that the co-efficient of determination of the regression model was 0.310, suggesting that about 31% of the changes in competitive advantage was predicted by supply chain collaboration. This represents a relatively moderate level of prediction (Pallant, 2007). Table 4.10 reveals that the regression equation was significant at $p < 0.005$. The regression co-efficient was 0.564, which indicates a strong effect of supply chain collaboration on competitive advantage. Thus, the effect of supply chain collaboration on competitive advantage was positive and significant ($b = 0.564$; $t = 6.477$; $p < 0.005$).

3.11   Effect of Supply Chain Integration on Competitive Advantage

Finally, the study examined the effect of supply chain integration on competitive advantage. Simple linear regression analysis was conducted, with aggregated supply chain integration items serving as the independent variable whilst aggregated competitive advantage items served as the dependent variable. The full results of the regression analysis are presented in Table 3.15, Table 3.16 and Table 3.17 below.

From Table 4.15, it can be seen that the co-efficient of determination was 0.228, which means that about 22.8% of the changes in competitive advantage was predicted by changes in supply chain integration. This represents a fairly low level of prediction. Table 4.16 reveals that the regression analysis was significant at $p < 0.005$. Table 4.17 reveals that the co-efficient of regression was 0.486. Thus, it is concluded that the effect of supply chain integration on competitive advantage was positive and significant ($b = 0.486$; $t = 5.279$; $p < 0.005$).

Table 3.15   Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.486a	.236	.228	.44164

a. Predictors: (Constant), SCI

Table 3.16   ANOVA Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.435	1	5.435	27.867	.000b
	Residual	17.554	90	.195		
	Total	22.989	91			

a. Dependent Variable: CA

b. Predictors: (Constant), SCI

Table 3.17   Coefficients Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.129	.359		5.923	.000
	SCI	.500	.095	.486	5.279	.000

a.   Dependent Variable: CA

The results of the anova tables and the coefficients results shows as significant because the p value of 0.000 is less than 0.005 for all the models

3.12   Summary of hypotheses

The result of the regression analysis shows the impact / influence of Supply Chain Agility, Supply Chain Collaboration, and Supply Chain Integration on Competitive Advantage. It is evidentthat all the antecedents significantly has an influence on competitive advantage on organisational performance. Hence, all the three hypothesis of the study are all supported by the study findings.

Table 3.18 Summary of hypotheses

Hypothesis statements	b & p values	Decision

H1. Supply chain agility has a positive relationship on competitive advantage in food and beverage processing companies in Ghana.	*b = 0.430; p < 0.05*	Supported
H2. Supply chain collaboration has a direct impact on competitive advantage in food and beverage processing companies in Ghana.	*b = 0.564; p < 0.05*	Supported
H3. There is a positive relationship between supply chain integration and competitive advantage in food and beverage processing companies in Ghana.	*b = 0.486; p < 0.05*	Supported

The results of the study are discussed below in accordance to the research objectives.

3.13.0　　　　Effect of Supply Chain Agility on Competitive Advantage

The findings of the study indicate that on general basis a better supply chain agility is important and significant for competitive advantage which indicates that respondents agreed with the statements.

 In other studies by (Power et al., 2001), regression analysis revealed that overall the "more agile" group of companies model was significant and had a stronger relationships between the independent and dependent variables than the "less agile" group. It was found out that the "more agile" group had a greater number of significant relationships than the "less agile" group. This study found that companies have excelled more in most areas and as such they strive to achieve supply chain agility and competitive advantage.

These finding is in consistent with an assertion by (Hoek et al., 2001), that customer sensitivity is paramount in today's changing turbulent environment but focusing much on business network structures which helps to respond to the changing in the external environment and seek emerging opportunities. (Power, 2005) said information technology provides useful information to connect customers, suppliers and add value services leading to competitive advantage which will help create connectivity. This lends to support the hypothesis HI which stated that supply chain agility has a positive relationship on competitive advantage.

3.13.1　Effect of Supply Chain Collaboration on Competitive Advantage

The findings of the study indicate that on a general basis a better supply chain collaboration is necessary and significant for competitive advantage. Supply chain collaboration has a positive sign implying that it is positively related to competitive advantage.

In other studies by Tunner, 2003), which indicated 95% confidence interval, suggests that, collaboration was significant implying that respondents engaged in making sure there is accurate information flow, developing and maintaining positive relationships with customers and suppliers, and maintaining a long term commitment. The study established that collaboration has contributed to companies in achieving competitive advantage whereby, companies understand the need of collaboration and have taken measures to build long term relationships with suppliers, customers and competitors.

These findings are consistent with assertion by Chen et al., (2004), that collaboration has the greatest potential which enables firms to partner in collaboration with others to ensure that their supply chain can respond to dynamic market needs and wants. (Walker et al., 2000), argue that suppliers are connected through long term relationships with each performing its own activity to its own best capability. It supports the H2 hypothesis testing that supply chain collaboration has a direct impact on competitive advantage in food and beverage processing companies in Ghana.

3.13.2   **Effect of Supply Chain Integration on Competitive Advantage**

The findings of the study indicate that on a general basis a better supply chain integration is necessary and significant for competitive advantage. Supply chain integration has a positive sign implying that it is positively related to competitive advantage. Other similar studies indicate that supply chain integration magnitude and significance supported the research model.

Studies findings by (Christopher et al., 2000), suggests that supply dimensions–information flow and integration of physical flow, shows that there was a strong significance. This was consistent with an emphasis in the literature on the importance of integration, pointing to the need to blend IT systems and information flow and supply chain link. Study findings reveal that majority of companies (73%) agreed while (9) disagreed that they share information with all participants in the supply chain.

These findings are consistent with assertion by Power (2005) that integration of the supply chains as the effort to elevate the linkages within the supply chain components, helps to get all pieces of the chain on board in a more efficient manner which helps to create supply chain visibility and decision making. It therefore supports the H3 hypothesis testing that there is a positive relationship between supply chain integration and competitive.

5. CONCLUSION

Based on the findings of the study, some conclusions can be derived based on the correlation and regression analysis that have a strong positive significant theoretical and managerial implications.

5.1 Theoretical Implications on the Effects of SCMS on CA

The study of the findings reveals that SCMS and CA reflect a strong positive relationship of these two theories and how generally they marry to yield results and good performance. This evidence shows that organisations that employ the use of SCMS theories captured under the literature review perform better than those who do not, and this keeps on widening the gap.

The findings in the study reveals that, effective implementation of SCMS and CA requires clear policies to be formulated, implemented and monitored to ensure that the theories remains absolute and relevant to the business. This evidence shows that strategic alignment of the two theories needs to correlate to meet changing requirements in the environment. The two theories was evidence from the resource based theory, used to predict the role of the SCMS for the understanding of sources of competitive advantage (Barney, 2012).

5.2 Managerial Implications.

On Effect of Supply Chain Collaboration on Competitive Advantage, the study concluded that companies in the food and beverage firms build long-term relationship with its suppliers, actively exchange information with its other trading partners, suppliers and all supply chains participants benefit from shared resources (technology, and information's).

On customer relations the study concluded that, the company keeps a database on all its customers, and strives to build long term relationship with its customers.

On Effect of Supply Chain Agility on Competitive Advantage. the study concluded that management tends to be more responsive to the changes in the market and sensitive to provide prompt response to customer needs and wants. Companies have also invested so much in product research and development.

On Effect of Supply Chain Integration on Competitive Advantage, the study concluded that companies have common goal information with all participants and have good financial operations systems. Again the study concluded that, the companies manages their supply link though a well-integrated chain information requirements, physical logistics and other chain participants. The company has also excelled well in delivery customer service through its three or four party logistics.

5.3 Recommendation

The study recommends that the companies should develop a clearly laid down policies and procedures for handling customers' concerns and also develop interactive websites to achieve effective information sharing and concerns that can be addressed in real time.

Compliance with Ethical Standards

Disclosure of conflict of interests
No conflict of interest.

Statement of Informed Consent
Informed consent was obtained from all individual participants included in the study

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