



Supply Chain Collaboration and Sustainable Competitive Advantage of Energy Companies in Rivers State, Nigeria

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ABSTRACT

This study investigated the relationship between supply chain collaboration and sustainable competitive advantage of energy companies in the Rivers State. The study adopted the correlational survey research method to operationalize the two hypothetical models. The population of the study is 295 registered energy companies in Rivers State of Nigeria, while the respondents are 510 management staff of 170 energy companies operating in Rivers State that were randomly sampled through the Taro Yamane's sample determination' formula. A structured questionnaire was used for data collection. A reliability coefficient of 0.81 was established using Cronbach Alpha. The study adopted descriptive statistics; simple regressions and analysis of variance and stepwise regression course of action to establish that supply chain collaboration dimensions; vertical collaboration and horizontal collaboration, were beneficial in influencing sustainable competitive advantage of energy companies. It was revealed from the findings that vertical collaboration has a strong, significant and positive influence on sustainable competitive advantage, while horizontal collaboration has a very strong, significant and positive influence on sustainable competitive advantage. Conclusion was drawn and it was recommended among others that management of energy companies should use adequate supply chain collaboration strategies to gain sustainable competitive advantage in business environment

Keywords: Supply chain, Horizontal, Vertical, collaboration, Sustainable, competitive-advantage

INTRODUCTION

There is extant literature supporting the significance of sustainability as an aspect of supply chain management. An assumption that is generally agreed by researchers is that sustainability cannot be attained by firms without corresponding inputs by supply chain members (Beske & Seuring, 2014). The sustainable competitive advantage thus, necessitates that firms set up grounds that make imitation challenging through relentless conjectures to increase the strength, making this a continuing persistence process. A sustainable competitive advantage becomes visible as an indispensable tool in the perception of goods and services value and is taken as fundamental to competitive advantage. As a result of the importance of sustainable competitive advantage to the stable success of firms, the reachable literature takes in hand its content as well as its sources, and the diverse categories of strategies that possibly will help companies grasp sustainable competitive advantage.

The rapid spiraling in the global supply chain has need of inter bond amongst stakeholders. The outcome will be a lofty height of interdependency and involvedness enhancement in supply chain (Kamalahmadi & Parast, 2016; Christopher, Mena, Khan & Yurt (2011). According to Simatupang and Sridharan (2005:258) supply chain collaboration express "the close cooperation among autonomous business partners or units engaging in joint efforts to effectively meet end customer needs with lower costs". On the other hand, Singh and Power (2009) dispute that collaboration is

subsequent to firms' substituting required information and enfold some continuing relations with several suppliers or customers. Supply chain collaboration is valuable to managers and scholars for the reason that it is well deliberated as a leading dynamic in supporting a supply chain's competitive position and it has taken delivery of improved attention in the field of supply chain management with the quantity of piece of writing published annually.

As interdependence augments between firms, they are required to collaborate to efficiently administer flows of products to the length of the complete value-added supply chain to be accessible for end customers (Whipple & Russell, 2007). Collaboration permits both partners to fuse knowledge and know-how better than performing in seclusion (Harcourt & Songo, 2021). Supply chain collaboration brings advantages to drawn in partners, and allows them to experience advancement in their standard market shares and profitability (Gold, Seuring & Beske, 2010). These advantages can be treasured basically if shared partners work cooperatively to speed up the decision-making process in conveying the right product to the right place at the right time in the right condition for the right cost (Cao & Zhang, 2011).

In this highly competitive business climate (Kotzab, David, Christoph & Halldorsson, 2009), creating sustainable competitive advantage in a company ought to direct the way to accomplishment (Laseter & Gillis, 2012; Cao & Zhang, 2011). However, the search for mutual understanding of sustainable competitive advantage for all the supply chain partners is still not yet impactful as challenge for both academics and practitioners exists (Fawcett, Stephen & Amydee, 2012; Halldórsson & Skjott-Larsen, 2009). A growing number of scholarly writings over the past decade, which are devoted to the field of collaborative exertions in bringing about more sustainable supply chains have accumulated (Beske & Seuring, 2014; TheiBen, Spinler & Huchzermeier, 2014; Ramanathan, Bentley & Pang, 2014; Van Hoof & Thiell, 2014; Benjaafar *et al.*, 2013; Albino, Dangelico & Pontradolfo, 2012; Green, Zelbst, Bhadauria & Meacham, 2012). Despite these contributions, the problem of lack of sustainable competitive advantage still persists.

This clearly presents elusiveness and such elusiveness implies that contact into the mechanism of supply chain collaboration is at this time desirable (Quinn, 2012). This informs the researcher's interest in this regard and brings about a research plot that hooks energy companies with supply chain collaboration as a driver of most advantageous sustainable competitive advantage. For this reason the exploration of the link among the variables; using horizontal collaboration (HC) and vertical collaboration (VC) on sustainable competitive advantage of energy companies in Rivers State of Nigeria is studied.

Supply Chain Collaboration

The subject matter collaboration in logistic has been scrupulously investigated and widely talked about from both, scholars and practitioners (Caputo & Minnino, 1996); (Schmoltzi & Wallenburg, 2012). Moreover, it has been passed on to as a critical dynamic for firms' competitiveness. Ramanathan *et al.* defined collaboration as "a tailored business relationship based on mutual trust, openness, shared risk and shared reward that attracts a competitive advantage resulting in business performance better than would be pulled off by the firms individually. Collaboration is defined as two or more firms sharing the duty of exchanging common planning, management, execution, and performance measurement information. Supply chain collaboration becomes obvious when concerned affiliates share information openhandedly, work cooperatively to resolve frequent difficulties, originate multiparty planning, and make their accomplishments reciprocally reliant (Spekman, Kamauff & Myhr (1998). Supply chain collaboration entails two or more firms operating reciprocally to engender a competitive advantage and superior profits than can be accomplished by acting unaccompanied (Simatupang & Sridharan, 2002). There are two dimensions of supply chain collaboration (Barratt, 2004) Vertical collaboration and horizontal collaboration.

Vertical Collaboration: The degree to which a business has ownership of its upstream suppliers and its downstream buyers is referred to as vertical integration (Grant, 2010). Vertical collaboration involves collaborations between suppliers and customers. Vertical integration can encircle a considerable influence on a company in situating itself in the industry with respect to cost, differentiation and other strategic concerns and for that reason, vertical scope of a business is an essential thoughtfulness in corporate strategy.

Horizontal Collaboration: Horizontal collaboration as defined by European Union (2001) is a concentrated work out between companies functioning at the same level(s) in the value system. This is in line with Cruijssen (2006:12), portrayal of an “active collaboration between two or more firms that operate on the same level of the supply chain and perform a comparable logistics function on the landside”. Horizontal collaboration is the collection of logistics activities and consolidation of supply chains between two manufacturers (can be non-competitors or semi/direct competitors) for shared benefits.

Sustainable Competitive Advantage

Scores of scholarly enquiries recognize the strategic significance of sustainability as a flourishing topic in the supply chain management literature, that it is broadly accepted that sustainability cannot be realized by companies in aloofness and have need of the participation of supply chain members (Beske & Seuring, 2014). A growing quantity of previous investigations, dedicated to the field of collaborative exertions in bringing about more sustainable supply chains have accumulated (Beske & Seuring, 2014; TheiBen *et al.*, 2014; Ramanathan *et al.*, 2014; Van Hoof & Thiell, 2014;Benjaafar *et al.*, 2013; Albino *et al.*, 2012; Gold *et al.*, 2010; Vachon & Klassen, 2008).

Thus, sustainable competitive advantage necessitates that firms set up confines that make copying demanding all the way through relentless speculation to heighten the potency, making this a durable chronic process. Competitive advantage revolves on a company’s aptitude to be a discounted producer in its industry, or to be incomparable in its sector in some facets that are universally treasured by customers (Harcourt, Kayii & Ikegwuru, 2020).

Empirical Review

Al-Doori (2019) examines the prospective benefits of supply chain collaboration in the direction of taking in operational performance in automotive industries in Pakistan by means of data composed from 232 members of the supply chain that comprise suppliers, manufacturers, and distributors. The factor analysis and multiple regressions through the aid of the statistical package for social sciences (SPSS) were used for data analysis. The outcome of the study illustrates that two supply chain management approaches information sharing (IS), joint decision making (JDM) significantly influence operational performance, whilst Electronic Data Interchange (EDI) does not have a significant influence on operational performance.

Hingley *et al.* (2011) assessed the advantages and barriers of fourth-party logistics (4PL) management as a catalyst for horizontal collaboration among grocery retailers, and found that the expensive investment involved in 4PL management was a discouragement to retailers, as it possibly will pessimistically influence their control and relationships with suppliers. However, the suppliers and logistics service providers were compassionate with 4PL and view it as an opportunity for improved customer service, competencies and cost efficiencies.

Ramaswami and Togar (2009) explored managerial perceptions on the relationship between supply chain collaboration practice and operational performance of companies in New Zealand by means of a survey research. The results illustrate that decision synchronization, information sharing, and incentive alignment has significant and positive influence on operational performance.

Theoretical Model of the Study

This study expects supply chain collaboration apparatuses to optimistically impact on sustainable competitive advantage. This study is inclined to admit as correct that supply chain collaboration by means of vertical collaboration and horizontal collaboration will influence sustainable competitive advantage. Following-up to this supposition the study cultivates the theoretical model for this study. Sustainable competitive advantage is a function of supply chain collaboration

Thus, $SCA = f(SCC)$

The study uses these equations as a theoretic formulation of the problem of study. These equations describing the study’s theoretical model are declared below.

SCA	=	f(SCC)	-	-	-	-	1
SCC	=	f(VC)	-	-	-	-	2

Where:

SCC = Supply chain collaboration,

SCA = Sustainable competitive advantage

VC=Vertical Collaboration
 HC=Horizontal collaboration.

These equations also gave impetus to the outline of the operational conceptual framework of this study transmitting the associations between supply chain collaboration dimensions and sustainable competitive advantage.

The study developed classes of associations, exclusively: (a) vertical collaboration and sustainable competitive advantage (b) horizontal collaboration and sustainable competitive advantage. These consortiums of associations specified the distinct hypotheses and describe the nature of these hypotheses. This equation gives impetus to the design of the operational conceptual framework of this study as illustrated in Figure 1

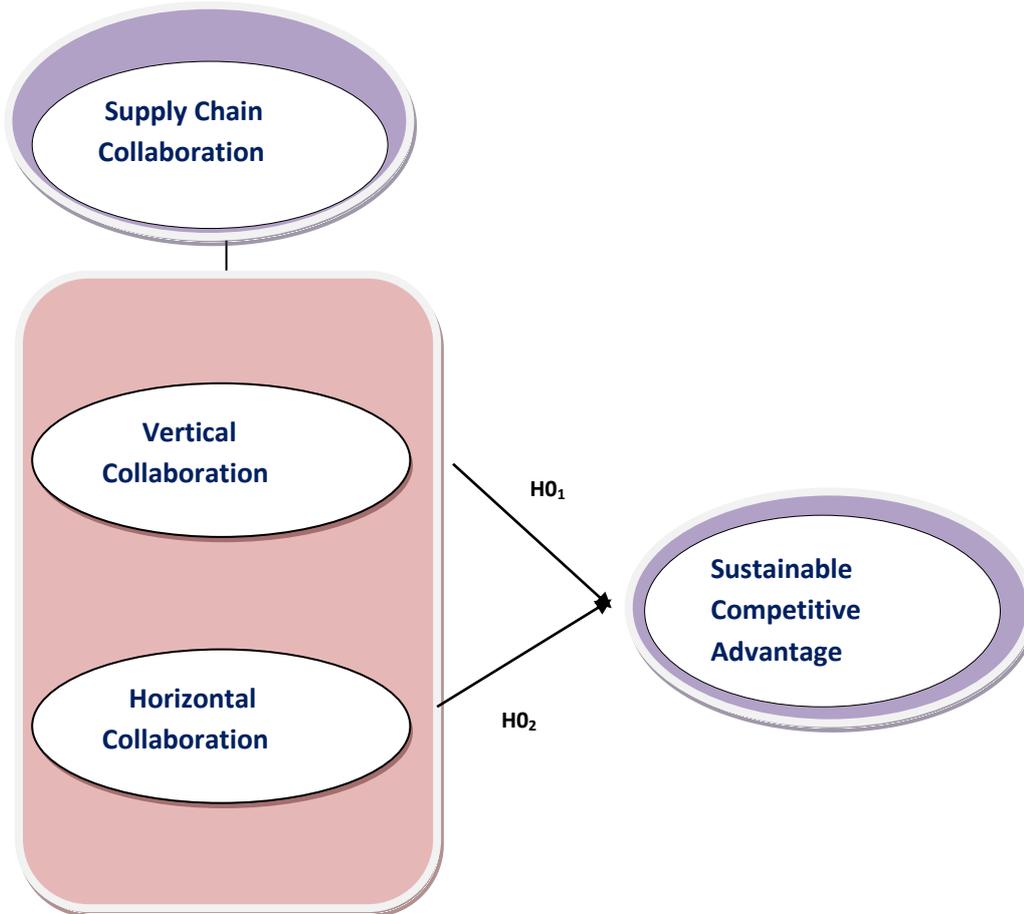


Figure 1: Operational Framework of Supply Chain Collaboration and Sustainable Competitive Advantage

Source: Researcher’s conceptualization from review of related literature (2021)

Based on the operational framework of supply chain collaboration and sustainable competitive advantage, the following hypotheses were formulated:

- H0₁:** There is no significant relationship between vertical collaboration and sustainable competitive advantage of energy companies in Rivers State of Nigeria.
- H0₂:** There is no significant relationship between horizontal collaboration and sustainable competitive advantage of energy companies in Rivers State of Nigeria.

RESEARCH METHODS

The Population of the study is 295 registered energy companies in Rivers State of Nigeria, while the respondents are 510 management staff of 170 energy companies operating in Rivers State that were sampled through the Taro Yamane’s formula. A structured questionnaire was engaged for data

assembly, and the key informants comprise the marketing manager, production manager and customer service manager of each company. The exact questionnaire sent out were 510, from which 445(87.3) responses were received, and after ascertaining the validity of the questions 334(75.1%). The 334 questionnaires produced the functional response rate. The Cronbach Alpha technique was used to determine the internal consistency of the instrument and a reliability index of 0.81 was obtained. The data acquired was used to calculate the Cronbach Alpha Reliability, and the results are presented in Table 1.

Table 1: Reliability Analysis of the Research Instrument.

S/N	Variables	Number of Items	Cronbach's Alpha
1.	Horizontal Collaboration	4	0.909
2.	Vertical Collaboration	3	0.828
3.	Sustainable Competitive Advantage	3	0.728

Source: *Researcher Field Data (2021).*

RESULTS

Decision Rule

Significant/probability value (Pv) < 0.05 (level of significance = conclude significant influence.

Significant probability value (Pv) > 0.05 (level of significance = conclude insignificant influence.

Influence of Vertical Collaboration on Sustainable Competitive Advantage

H₀₁: There is no significant influence of vertical collaboration on sustainable competitive advantage.

H₁: There is a significant influence of vertical collaboration on sustainable competitive advantage.

Table 2: Influence of Vertical Collaboration on Sustainable Competitive Advantage (N=334).

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.727	.684	.682	.647

a. Predictors: (Constant), Vertical Collaboration

b. Criterion: Sustainable Competitive Advantage

Source: SPSS Window Output, Version 22.0 (based on 2021 field survey data).

Given that for hypothesis one, the significant is .000 which is less than 0.05; there is a significant, effect of vertical collaboration on sustainable competitive advantage with the R (Coefficient of Correlation) that there is 72.7% direct relationship between vertical collaboration and sustainable competitive advantage. R-square value of 68.4% shows that vertical collaboration can affect sustainable competitive advantage to a high degree. The researcher also used ANOVA to test the hypothesis in this section. The results were presented in table 3.

Table 3: One way ANOVA for the difference in mean between Vertical Collaboration and Sustainable Competitive Advantage (N=334).

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3201393	1	3201393	648433	.0000
Within Groups	1481137	333		199595	
Total	4682530	334			

a. criterion: Sustainable Competitive Advantage

b. Predictor: Vertical Collaboration

Source: SPSS Window Output, Version 22.0 (based on 2021 field survey data).

Table 3 shows that there is difference in mean between vertical collaboration and sustainable competitive advantage $F(dfB,dfw) = F(333,1) = 648433$, $p < 0.05$. Significant value is 0.00, $r(1,333)$. This agrees with the regression result in table 3.

Influence of Horizontal Collaboration on Sustainable Competitive Advantage

Ho₂: There is no significant influence of horizontal collaboration on sustainable competitive advantage.

H₂: There is a significant influence of horizontal collaboration on sustainable competitive advantage.

Table 4: Influence of Horizontal Collaboration on Sustainable Competitive Advantage (N=334).

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.983	.963	.961	2.6751

a. Predictors: (Constant), Horizontal Collaboration

b. Criterion: Sustainable Competitive Advantage

Source: SPSS Window Output, Version 22.0 (based on 2021 field survey data).

Given that for hypothesis two, the significant is .000 which is less than 0.05; there is a significant, influence of horizontal collaboration on sustainable competitive advantage with the R (Coefficient of Correlation) that there is 98.3% direct relationship between horizontal collaboration and sustainable competitive advantage. R–square value of 96.3% shows that horizontal collaboration can influence sustainable competitive advantage to a high degree. The researcher also used ANOVA to test the hypothesis in this section. The results were presented in table 5.

Table 5: One way ANOVA for the difference in mean between Horizontal Sustainable Competitive Advantage (N=334).

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	0.63	1	0.63	233.264	.0000
Within Groups	002	333	000		
Total	0.66200	334			

a. Criterion: Organizational Agility

b. Predictor: Horizontal Collaboration

Source: SPSS Window Output, Version 22.0 (based on 2021 field survey data).

Table 5 shows that there is difference in mean between organizational collaboration and organizational agility $F(dfB,dfw) = F(333,1) = 233.264$, $p < 0.05$. Significant value is 0.00, $r(1,333)$. This agrees with the regression result in table 4.

DISCUSSION OF FINDINGS

The first and second hypotheses wanted to agree on the effect of vertical collaboration and horizontal collaboration on sustainable competitive advantage of energy companies in Rivers State of Nigeria using the simple regression analysis.. The concept of vertical collaboration and horizontal collaboration as calculated in this study showed that the hypotheses were affirmed in the null form, statistically tested and discarded. The alternative hypotheses that there is a significant influence of vertical collaboration and horizontal collaboration on sustainable competitive advantage were acknowledged issues adjoining on vertical collaboration and horizontal collaboration as affirmative drivers of sustainable competitive advantage. It becomes apparent that vertical collaboration and horizontal collaboration makes sustainable competitive advantage well-ordered and therefore competent of delivering realistic result. From the study’s result, it is figured out that when vertical collaboration and horizontal collaboration are suitably cuddled they stroke on positively on sustainable competitive advantage. This study’s findings agrees and supports the findings Shan *et al.* (2020) who found that supply chain market collaborative innovation has a significant indirect influence on sustainable supply chain performance.

CONCLUSION

This study assessed the degree to which supply chain collaboration affect sustainable competitive advantage of energy companies in Rivers State by means of a quantitative analysis, which makes it obvious that in attendance are ample confirmations that the components of supply chain collaboration investigated by this existing study were optimistically connected with sustainable competitive, presenting a good judgment to assert that these acknowledged variables (vertical collaboration and horizontal collaboration) have the latent to trigger sustainable competitive, and their nonexistence predicts business deterioration in the long run, thus impeding sustainable competitive advantage. The study therefore, concludes that there is a significant and positive influence of supply chain collaboration on sustainable competitive advantage of energy companies in Rivers State of Nigeria, and recommends that management of energy companies should use adequate supply chain collaboration strategies such as vertical collaboration and horizontal collaboration to connect to sustainable competitive advantage in business in order to enhance their competitiveness in this 21st century business milieu.

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