Journal of Economics, Management & Social Science Volume 6 No 1, March 2020,

SUPPLIER INTEGRATION: AN EMPIRICAL INVESTIGATION OF MARKETING PERFORMANCE OF DOWNSTREAM PETROLEUM SECTOR IN NIGERIA

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ABSTRACT

This paper empirically evaluated the relationship between supplier integration and measures of marketing performance which are product availability and customer satisfaction, using downstream petroleum sector in Nigeria as organization of interest. Two research objectives, research questions and two hypotheses were formulated. Questionnaire was administered to 280 top management staff of seven (7) petroleum major oil marketers and 218 copies of the questionnaire were used for data anlaysis. Psychometric integrity of instrument were conducted. Descriptive statistics were generated with the aid of SPSS version 22.0, while partial least square-structural equation modeling was deployed to test the measurement and structural aspects of the model with the use of SmartPLS 3.2.6. The study revealed that significant and positive relationship exist between supplier integration, product availability and customer satisfaction.

Keywords: Supplier integration, marketing performance, product availability and customer satisfaction.

INTRODUCTION

Petroleum industry in Nigeria is described as the largest among all industries, and serves as the major source of revenue to the nation (Odusola, 2006). It is noted that there are several mineral resources in Nigeria but petroleum is the major source that drives the nation's economy (Lukeman, 2003). The author further stated that petroleum accounted for 80% of the nation's Gross Domestic Product (GDP). Other scholars emphasized that the rapid growth of petroleum industry from 1956 that oil was discovered in commercial quantity in the Niger Delta region of Nigeria replaced agriculture which was once dependable source of revenue upon which the nation's economy was

driven (Obadan, 1988). The petroleum industry comprises the upstream, midstream and downstream, Each of the stream has peculiar functions but dependent on the efficacy of the other.

The upstream sector is concerned with oil exploration, mining, production and transportation. The midstream activities involve processing, storage and transportation of crude oil and gas, while the downstream is concerned with refining, distribution and marketing of petroleum products to the consuming publics (Aigbedon and Ijayi, 2007). This chain of activities by various sectors of the petroleum led to the integration of supplier for effective marketing performance that lead to product, availability and customer satisfaction. Scholars submit that an organization can integrate with suppliers by strategically cooperating with them and collaboratively managing noter-organization processes (Flynn, Huo and Zhao, 2010). Supplier integration aims to improve the efficiency and effectiveness of the information and physical flows between a manufacturer and suppliers, which can lead to seamless processes and cohesive supply networks that cannot be easily matched by competitors (Jeeng et al, 2009; Lai et al, 2012; Zhao, Huo, Sun and Zhao 2013). Several studies have suggested that higher levels of supplier integration had to greater potential benefits (Frohlich and Westbrook, 2001; Huo 2012).

In spite of the integration of supplier in the petroleum sector to enhance effective and efficient marketing performance, the industry is bedeviled with unethical practices, such as smuggling, hoarding, products diversion as well as product scarcity. The study ascertained the relationship between supplier integration and marketing performance of downstream petroleum sector in Nigeria. The following questions were addressed in the study. Thus:

- What is the relationship between supplier integration and product availability?
- What is the correlation between supplier integration and customer satisfaction?

Premised upon the above questions, the following objectives were drawn.

- To determine the influence of supplier integration on product availability.
- To evaluate the role of supplier integration on customer satisfaction.

REVIEW OF RELEVANT LITERATURE

Supplier integration and product availability supplier integration has to do with closer collaboration and coordination with key suppliers in order to achieve, mutual benefits such as reduction of inventory and supplier lead time (Thun, 2010). Supplier integration is viewed as the practices amongst companies and their suppliers, which enables efficient transfer of knowledge and resources required for generating mutual benefits (Danese, 2013; Lauselmer et al, 2013). This implies that successful supplier integration necessitates cooperative rather they adversarial attitude. Boon-Itt and Wong (2011) submit that joint efforts in developing products, exchanging technology, mutual problem solving initiatives, and design support are great features in cooperative attitudes.

As essential as petroleum products, for instance, Petrol Motor Spirit (PMS), Automotive Gas Oil (AGO), and domestic prove kerosene (APK) non availability of these commodities to satisfy the needs of consumers will not be appropriate. This implies that supplier integration is obtained through data sharing, collaborations amongst focal companies with their suppliers (Ragatz et al, 2002). When this occurs, there is a chance to facilitate regular deliveries of petroleum products in relation to quality as well as creating long-term relationships with suppliers to enhance performance (Handfield et al, 2009). Scholars argue that the supplier is mostly considered as the main provider of the goods, and they affect the focal company in terms of process/product quality, cost, and flexibility (Kim, 2009; Koufteros et al, 2007).

An empirical investigation of Frohlich and Westbrook (2001) suggest that higher degrees of supplier integration was positively associated with product availability. Furthermore, cousins and Menguc (2006) suggested that higher degrees of supplier integration by the focal firm had a significant positive impact on supplier communication performance that leads to availability of products. Swink, Narasimhan and Wang (2007) submitted that greater level of supplier integration is often reflected by mutual commitments, dedicated associations and co-developed systems. The scholars equally submitted that better supplier integration is likely to produce product quality

improvement (Swink et al, 2007). Premise upon the above scholarly arguments it is obvious that significant and positive relationship exists between supplier integration and product availability.

Supplier Integration and Customer Satisfaction

Supplier integration occurs when a firm partners with its suppliers to structure inter-organizational strategies, develop synchronized process and share information and knowledge (Flynn, Huo and Zhao, 2010). It is equally considered to be a critical source of competitive advantage as it improves inter-enterprise operations (Stank, Daugherty and Ellinger, 1999; Wang, Yeung and Zhang, 2011). Supplier integration provides a unity of effort in meeting customer requirements for products (Narasimhan and Kim, 2002) as well as responding to markets charges (Zhao et al 2013). Scholars emphasized that firms can acquire insights into suppliers' process, capabilities and constraints, and ultimately enable more effective planning and forescasting, better product and process designs and reduced transaction costs (Zhang and Huo, 2013; Yenng et al, 2009, Huo, 2012).

This implies that the essence of firms integrating supplier is to meet up with customer needs and wants. A firm can integrate with suppliers through information sharing, process synchronization and strategic alignment in order to provide the products that is capable to satisfies customer needs and wants at a specific period of time (Alfalla-Luque, Medina-Lopez and Dey, 2013); Zhang and Huo, 2013). This is in consonance with the explanation of other scholars which emphasizes on the fact that supplier integration involves closer collaboration and coordination with key supplier in order to achieve mutual benefits such as a reduction of inventory, and supplier lead-time so that the needed products by customers are always available when needed which eventually leads to customers satisfaction (Thun, 2010).

As earlier mentioned in this paper that firm integrates suppliers in order to provide products and services needed by the customers. In connection to this, customer satisfaction is the result of a customer's perception of the value received in a transaction or relationship where value equals perceived service quality relative to price and customer acquisition costs (Jahanshahi et al, 2011). In the words of keller and Armstrong (2012) customer satisfaction is the extent to which a product's perceived performance matches a buyer's expectation. This is a pointer that firms integration of supplier is predicated upon its intend to meet up customers need by providing goods and services to satisfy customers. Therefore, there is a positive and significant relationship between supplier integration strategy adopted by firms and customer satisfaction drawing from the above scholarly analogy, the research mode in the figure below was formulated. Thus:

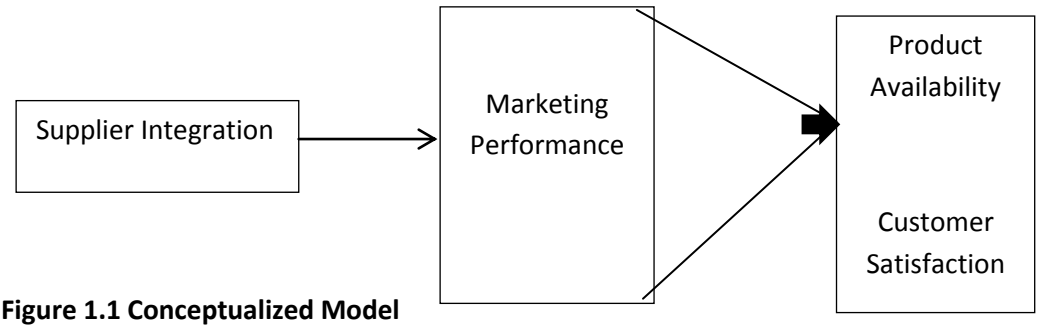

Figure 1.1 Conceptualized Model

Thus: The following hypotheses

Hypothesis 1

Supplier integration positively and significantly impact on product availability of downstream petroleum sector.

Hypothesis 2

Supplier integration positively and significantly influenced customer satisfaction of downstream petroleum sector in Nigeria.

RESEARCH METHODOLOGY

This paper aimed at ascertaining the relationship between internal integration and marketing performance that will produced product availability and customer satisfaction which is

the total point in this paper. The research was conducted in downstream petroleum sector in Nigeria. seven (7) petroleum major oil marketers which comprises: Conoil PLC, forte oil PLC, MRS PLC, Mobil oil PLC Oando oil PLC, Total oil PLC and NNPC Mega. The unit of analysis was top management cadre. Simple random sampling technique was used in this study and questionnaire was structured in five point likert formant to chief information from respondents.

Pilot test was conducted on 28 respondents which is 10% of 280 as the sample size of the study deduced from 930 accessible population with the used of Taro-Yemane's technique. A reliability test was conducted through the instrumentality of Cronbach's alpha and results reveals ≥ 0.7. Statistical Package for Social science (SPSS) version 22.0 output was used to analyzed descriptive statistics of variables while partial least square-Structural Equation Modeling (SEM) was used to analyzed inferential statistics of variables.

ANALYSIS AND DISCUSSIONS

Table 1: questionnaire distribution and retrieval

Questionnaire	Frequencies	Percent
Distributed	280	100
Retrieved	221	78.9
Not retrieved	59	21.1
Discarded	3	11
Useful response	218	77.9

Sauce: Survey data 2020.

Table 1, indicates that a total of 280 copies of questionnaire were distributed, 221 (78.9%) were retrieved, 59 (21.1%) were not retrieved, 3(1.1%) were retrieved but not useable. 218 (77.9%) were accepted for entry and subsequent analysis.

Table 2: Reliability analysis of variable

Variables	**Items**	**Cronbach's Alpha**
Supplier Integration	5	0.72
Product Availability	5	0.72
Customer Satisfaction	5	0.70

Source: Research's Desk, 2020

Table 2, Show that all the variables recorded Cronbach's alpha value greater than or equal 0.70 which is the minimum threshold.

Table 3: Descriptive statistics on Supplier Integration

Items	**N**	**Min**	**Max**	**Mean**	**Std. Deviation**	**Skewness** (S_k)		**Kurtosis (Ku)**	
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
SI_1	218	1	4	2.38	.672	.422	.212	2.97	.165
SI_2	218	1	4	2.19	.572	.313	.198	3.104	2.001
SI_3	218	1	4	2.60	.550	-.288	.115	2.911	1.774
SI_4	218	1	4	2.56	.421	.513	.069	3.072	1.498

SI_5	218	1	4	2.77	.659	-.602	.152	3.085	1.510

Source: SPSS Computation from Data, 2020

Table 3 shows the mean, standard deviation, kurtosis, and skewness of each item for Supplier Integration. The results show that all indicators, except $SI_4$and SI_5, fall within the acceptable range of normality, with SI_5 scoring the most skewed value and kurtosis scores of -0.62 and 3.085 respectively.

The first item (SI_1) sought a response on whether suppliers are part of decision making. This item attracted a low mean score (*M* = 2.38, *SD* = 0.67). The second item (SI_2) was about the extent to which management of the firms welcome inputs from suppliers in order to reduce supply risk. This also gave a low output (*M* = 2.19, *SD* = 0.57). For the third item (SI_3), moderate score was obtained on whether the firms have legally binding partnership with key suppliers (*M* = 2.60, *SD* = 0.55). The fourth item (SI_4) indicates that there is a moderate extent to which firms forecast demand to aid quantity supplied (*M* = 2.56, *SD* = 0.42). Finally, output shows a moderate score on the issue of whether firms are mindful of stock level to prevent stock out (*M* = 2.77, *SD* = 0.66).

Table 4: Descriptive Statistics on Product Availability

Items	**N**	**Min**	**Max**	**Mean**	**Std. Deviation**	**Skewness**(S_k)		**Kurtosis (Ku)**	
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
PA_1	218	2	5	2.72	.443	.397	.232	2.831	.037
PA_2	218	2	4	2.53	.391	-.472	.179	3.104	.531
PA_3	218	2	5	3.14	.915	.388	.333	2.955	.524
PA_4	218	2	5	2.81	.603	-.295	1.582	3.121	.070
PA_5	218	2	4	2.57	.751	-.403	.208	3.042	.188

Source: SPSS Computation from Data, 2020

Table 4 shows the mean, standard deviation, kurtosis, and skewness of each item for Product Availability. The results show that all indicators are within the acceptable limits of normality, whereby PA_2 is the most skewed (- 0.472) and PA_4scoring 3.121 as the largest value of kurtosis.

Respondents agreed that their organisations are within moderate range on all the items under Product Availability. The first item, PA_1, which is about the extent to which products are available had a moderate score (*M* = 2.72, *SD* = 0.44). The second item, PA_2, which solicits responses regarding the availability of PMS also had a moderate score (*M* = 2.53, *SD* = 0.39). Similarly, item PA_3 which is directed towards getting a response on the extent to which AGO is available had a moderate score (*M* = 3.14, *SD* = 0.92). Also, on item PA_4, when respondents were asked if DPK is always available, the aggregate response indicated a moderate score (*M* = 2.81, *SD* = 0.60). Lastly, for PA_6, there was a moderate mean score on the extent to which the firms forecast demand and supply products accordingly (*M* = 2.57, *SD* = 0.75).

Table 5: Descriptive Statistics on Customer Satisfaction

Item	**N**	**Min**	**Max**	**Mean**	**Std. Deviation**	**Skewness**(S_k)	**Kurtosis (Ku)**

s					n				
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
CS_1	218	1	4	2.38	.491	.239	.350	3.031	2.012
CS_2	218	1	4	2.04	.384	-.442	.172	2.804	1.559
CS_3	218	1	4	2.55	.708	.411	.240	3.130	1.910
CS_4	218	1	4	2.49	.676	-.183	.098	3.106	2.001
CS_5	218	1	4	2.57	.513	-.038	.208	2.992	1.689

Source: SPSS Computation from Data, 2020

Table 5 shows the mean, standard deviation, kurtosis, and skewness of each item for Customer Satisfaction. The results show that all indicators are within acceptable limits of normality, whereby CS_2 is the most skewed (- 0.442) and CS_3scoring 3.130 as the largest value of kurtosis.

Responses on the five items of Customer Satisfaction reveal that the petroleum marketing firms are low in customer satisfaction rating on all indicators except on item CS_3 and CS_5. In the case of CS_1, the researcher sought to know if customers are satisfied with the products of the organisation. Response to this item attracted low mean score (*M* = 2.38, *SD* = 0.49). The second item on Customer Satisfaction (CS_2) which measures the ability of the firms to meet customers' demand had moderate mean score on the scale (*M* = 2.04, *SD* = 0.38). However, on the third item (CS_3), respondents agreed that customers in some instances get products from the organisations (*M* = 2.55, *SD* = 0.71). In item CS_4, respondents were asked the extent to which products are made available to loyal customers. Analysis on this item revealed a low mean score (*M* = 2.49, *SD* = 0.68). Lastly, as could be deduced from CS_5, the respondents believe the firms have a moderate propensity to weather environmental disturbances and continue to thrive (*M* = 2.57, *SD* = 0.51).

Table 6: Results of R^2 and Q^2

Endogenous	Correlation	Predictive	Adjusted	Predictive
Latent variable	Coefficient (R)	Accuracy (R^2)	R^2	Relevance (>)
PA	0.624	0.389	0.387	0.181
CS	0.591	0.349	0.348	0.107

Source: Smart Plc 3.2.6 output on research data, 2020.

The figures in table 6, Depict that there is positive moderate and significant correlation (R) between internal integration and measures of marketing performance. The correlation of internal integration on product availability is 62.4%; while customer satisfaction recorded R value of 59.1%. Thus, product availability attracted the higher correlation score whereas customer satisfaction recorded a lower score added to this is the R^2 which shows the predictive power (or accuracy) of the model, thus PA = f (INI), recorded a moderate R^2 of 0.389. This implies that internal integration explained 38.9% of the variance of product availability, while other unidentified variables are responsible for the remaining 61.1%. Thus, the model has a moderate predictive accuracy. Secondly, CS = f (INI) recorded moderate R^2 of 0.349. This means that internal integration explained 349% of the variance of customer satisfaction, which other unidentified variables are responsible for the remaining 65.1%. Thus, the model has a moderate predictive accuracy.

Table 7: Summary of Results on the Tests of Hypotheses H_{O1} and H_{O2}

Null Hypothesis	Path (Relationship)	Path Coefficient (β), (t – value)	Predictive Accuracy R^2	Effect Size- f^2	Predictive Relevance - Q^2	Decision
H_{O1}:	SI -> PA	0.346(2.531) Significant	0.389 Moderate	0.214 Medium	0.181 Relevant	Not supported
H_{O2}:	SI -> CS	0.374(3.370)	0.349	0.206	0.107	Not

		Significant	Moderate	Medium	Relevant	supported

Source: Smart PLS 3.2.6 output on research data, 2020

Discussion of Findings

From the finding the results revealed that supplier integration has positive, and significant relationship with product availability of the downstream sector of the petroleum industry in Nigeria. This is an indication that collaboration and interaction with supplier will enable the availability of petroleum products to serving units. reports on the test of Ho_1 implies that supplier integration has a positive, moderate and significant relationship with product availability. This equally shows that the more the collaboration and coordination with key suppliers in the company's supply chain, the more products will be available when needed and reduce supplier lead time. Furthermore, the results revealed that $\beta = 0.346$, $t=2.531$. This findings was supported by Boon-Itt and Wong (2011) who submitted that joint efforts in developing product design are mechanism for product availability. Results on supplier integration and customer satisfaction, it was revealed that $\beta = 0.374$, $t=3.370$, and $R^2=0.349$. These values show a significant and positive relationship between supplier integration and customer satisfaction. These findings was support by Ragatz, Handfield & Petersen (2002) which advocated that the integration of suppliers by production industry will enhance its ability to serve the customers more satisfactorily.

CONCLUSION

This paper established a relationship between supplier integration, product availability and customer satisfaction of downstream petroleum sector in Nigeria. Hypotheses were formulated and tested and results revealed that significant and positive relationship exist between supplier integration, product availability and customer satisfaction.

RECOMMENDATIONS

1. Petroleum major oil marketing firms should strategically align with their chain of suppliers for effective and efficient service delivery.
2. Management of petroleum major oil marketers should ensure collaboration and effective coordination with key suppliers in the company's supply chain so that products will be available when needed and reduced supplier lead time.
3. Management of Petroleum major oil marketers should ensure customer satisfaction is key in their daily operations by constantly interacting with their supplier network for product supply.

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