MEDIATING EFFECT OF CUSTOMER INTEGRATION ON THE RELATIONSHIP BETWEEN CUSTOMER ORIENTATION AND SUPPLY CHAIN PERFORMANCE

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Abstract

Marketers are encouraged to be customer-centric and delight the customers. How well petroleum marketers live up to this commitment remains a debatable area of research. The aim of this study is to examine the mediating effect of customer integration (CI) on the relationship between customer orientation (CO) and the supply chain performance (SCP) in the downstream petroleum sector. This study employed the descriptive survey design through a cross-sectional strategy. A total of 253 copies of questionnaires were distributed to managers of filling stations located in Abuja metropolis and the surrounding local government councils in Nigeria. A total of 211 copies were returned and 192 were found usable. The sampling method adopted was the simple random sampling. Descriptive statistics using mean and standard deviation, exploratory factor analysis (reliability and factor loading) as well as structural equation modelling were the techniques of data analysis. The study found that CI has full mediating effect on the relationship between CO and SCP. CO → CI (β = .91, $p < .001$), Ci → SCP (β = .82, $p < .001$), CO → SCP (β = .15, $p > .005$). The study concluded that CI is the mechanism through which CO influences SCP. *Practically, it is expected that the best practices identified will utilized by managers and marketers to achieve competitive advantage. The study will also help to find a sustainable solution to the recurring fuel scarcity in Nigeria. Theoretically, the transaction cost theory was used to explain how customer orientation and customer integration will be combined to enhance supply chain performance.*

Key words: Customer orientation, customer integration, downstream petroleum sector, transaction cost theory, supply chain performance.

Introduction

The integration of the customer into supply chains is an interesting academic theme that is attracting the curiosity of academics and practitioners. The thoughtfulness started since the 1980s as companies realized the need for demand-driven customerizing culture. In the 1990s, researchers focused was on managing the upstream relationships (agile

manufacturing) but realized that this could not be effective and efficient without the downstream (customer) relationships. In the 2000s, researchers started to know that companies have to develop customer-oriented culture, integrate with customers, and improve customer service to increase their competitive advantage and performance (Martinelli, Tunisini, Martinelli, & Tunisini, 2018). This means that companies have to be reconfigured in a more customer-centric approach. The Nigerian downstream sector is intensively competitive with numerous firm classified as major marketers, independent marketers and the NNPC retail stations. As petroleum marketers strive to grow their market share, achieve competitive advantage, and improve its overall position, they must adopt business customerizing strategies and always treat the customer as king. However, in period of scarcity, customers of petroleum products are often treated more of servants.

They go out of their convenience and queue for long hours or even many days seeking for 1-25 gallons of petroleum product. The situation is worsened in periods of peak demand, festivity and strike. In these periods, it is difficult for them to get enough petroleum products. Although issues with smuggling of petroleum products and the silo supply source of the product are among the problems confronting the distribution of petroleum products, the need for customer-oriented culture and customer focus are important. This means that petroleum marketers ought to be customer-oriented and puts the customer's interest first.

The adoption of a company-wide customer culture may be viewed as the the *raison dêtre* and the logical starting point for a firm aiming to satisfy customers at a profit (Deshpande, Farley, & Webster, 1993). One of such culture is customer orientation, a philosophy which view the customer as the central controlling influence to be satisfied at least more than the competitor. However, customer-oriented culture is not a standalone concept. It has to be blended with some strategic constructs to produce the desired company outcome. In this study, the strategic variable is identified as customer integration. Customer integration is concerned with downstream part of the supply chain and specifically to satisfy the customers more than competitors. Thus, the research question raised is "how will customer orientation and customer integration be implemented to influence the supply chain of the Nigerian downstream petroleum sector"?

Customer orientation refers to a company's understanding of its buyers to be able to continuously create value for them (Narver and Slater, 1990). The objective of CO is to understand, develop, and implement a marketing culture to meet customer needs and wants. CO influences reduction of demand variability (Danese & Romano, 2013), return-on-assets, employee satisfaction, sustainable competitive advantage (Mueller & Gemunden, 2009), customer satisfaction, and firm's performance (Chahal, Dangwal, & Raina, 2016). Firms with a high degree of CO strive to build close relationships with customers and seek their feedback on a regular basis (Newman, Prajogo, & Atherton, 2016).

Customer integration refers to the company working closely with the customer and viewing the latter as an important component of the supply chain (Martinelli et al., 2018). Although marketers have long been encouraged to become close to their customers and adopt the supply chain integration concept, customer integration has not been adequately discussed by academicians in the Nigerian perspective. This is in spite of the practical steps that the concept will offer in enhancing the performance of the Nigerian downstream petroleum sector. An organization must formulate strategies to manage relations with its customers and to improve visibility regarding market expectations. It is in this regards that this study is interested in how customer orientation can blend with customer integration to achieve supply chain performance.

This study is influenced by three issues. The first is the mixed findings between CO and FP. For example, CO has a significant influence on FP during upturn, and the effect was insignificant during downturn (Huhtala, Sihvonen, Frösén, Jaakkola, & Tikkanen, 2014). Similarly, Neneh (2017) showed that CO influences SMEs performance. Nevertheless, Sørensen (2009) revealed that CO is detrimental to a firm's return on assets for firms in less competitive environments. Similarly, Afshan and Motwani (2016) did not find a significant relationship between CO and FP. Neneh (2017) also cautioned that the best performance outcome of CO can be achieved in combination with other strategic factors. A major argument for this study is that the strategic factor is CI.

Kara, Andaleeb, Turan, & Cabuk (2013) found a positive relationship between CO and the performance of pharmaceutical firms in Turkey. Sørensen (2009) indicated that CO has no relationship with ROA in highly competitive environments. A significant negative association between CO and FP was also found (Sorensen, 2011).Second, although CO has been

identified as the most essential part of the market orientation construct (Deshpande, Farley, & Webster, 1998), less systematic attention has been given to the construct, thereby warranting more research in this area and in different settings (Kadic-Maglajlic, Micevski, Arslanagic-Kalajdzic, & Lee, 2017). Thirdly, majority of the empirical literature in the area of CO and FP have explored the linear paths (Lengler, Sousa, & Marques, 2013; Mueller & Gemunden, 2009).

Notwithstanding, the mixed findings and linear exploration of CO and some outcome variables raise concern among practitioners and academics for advanced studies in different context (Pekovic, Rolland, & Gatignon, 2016). Inspired by arguments of Neneh (2017) that the best performance outcome of CO can be obtained in combination with other strategic factors than a single characteristics, this study contended that CI might serve as the complementary factor to resolve the conflicting linear paths of CO and FP. In order to cover the gaps raised and the inconsistencies of the findings in the literature, this study aims to examine the mediating effect of CI on the relationship between CO and SCP in the downstream petroleum sector.

Literature Review

Supply Chain Performance

Yul and Kyu (2015) define SCP as "the benefits derived from SC cooperation, including efficiency improvement, cost reduction, and enhancement in cycle time". SCP is a multidimensional construct consisting of operational measure, financial measures and non-financial measures. Operational measures focus on quality improvement, on-time delivery or time to market, flexibility, speed, costs, marketing effectiveness, customer loyalty/satisfaction reliability, new product success, and customer responsiveness. Financial measures consist of return on assets, return on investment, and market shares, and cost efficiency Seo, Dinwoodie, & Kwak, 2014). Non-financial measures are concerned with the fulfillment of clients' needs and expectations. Some researchers combined the three measures as one construct (Stevens, Mcconkey, Loudon, & Wrenn, 2004). The effect SCP on overall market or financial performance is well established (Abdallah et al., 2017; Seo et al., 2014; Wu, Chuang, & Hsu, 2014).

Customer Orientation

CO is the "sufficient understanding of one's target buyers to be able to create superior value for them continuously" (Narver & Slater, 1990). In order to create value for their target markets, firms must establish continuous communication to acquire information about their actual and potential customers and create a customer-focused environment within the company (Mueller & Gemunden, 2009). Saxe & Weitz (1992) theorized that CO is the "degree to which businesses practice the marketing concept by trying to help their customers make purchase decisions that will satisfy customer needs".

CO is considered is an important components of strategic and marketing orientation (Sørensen, 2009) and a strategic driver that places customers at the pivotal or heart of the business management (Huhtala et al., 2014) for delivering superior value to customers (Narver & Slater, 1990; Pekovic, et al., 2016). CO influences product development and innovation and marketing activities (Mueller & Gemunden, 2009). CO generates higher levels of satisfaction, loyalty, and innovation, which in turn will enhance business performance (Newman et al., 2016; Pekovic et al., 2016). CO can be implemented separately from the other two-dimensional construct of market orientation i.e., competitor and inter-functional coordination (Brockman, Jones, & Becherer, 2012; Frambach et al., 2016; Kadic-Maglajlic et al., 2017). However, firms in the petroleum downstream sector can still miss out on opportunities identified from customer needs if they do not integrate their resources with suppliers (Kadic-Maglajlic et al., 2017). Two of such resources are SI and IC.

Customer Integration

Customer integration (CI) refers to the degree to which a firm collaborates with its customers to improve visibility and enable joint planning (Afshan & Motwani, 2016). It is also define as the degree to which a firm exchanges information, works closely and interacts for feedback with its customers (Danese & Romano, 2013). The goal is to build intimacy with customers and collaboratively manage material and information flows, in order to achieve mutually beneficial outcomes as well as providing more value for customers. As a source of resources and capabilities, CI helps companies to be more responsive to customer needs and requirement; to improve differentiation, cost efficiency,

competitive edge, market innovation, delivery and flexibility, and operational effectiveness (Afshan & Motwani, 2016). CI also contrasts the "bullwhip effect" (i.e. the natural tendency of decentralized decision making to amplify, delay and distort demand information moving upstream in a make-to-stock supply chain) to achieve supply chain effectiveness and overall business performance. CI best practices include vendor managed inventory (VMI), continuous replenishment or collaborative planning forecasting and replenishment. Other practices are frequent contacts with customers to get feedback on the output delivered **(**Flynn, Huo, & Zhao, 2010**)** and the firm's engagement in customers' improvement activities to ensure high product quality, low costs, or enhance operational effectiveness (Danese & Romano, 2013). In addition, CI reduces inventory obsolescence, helps manufacturer to detect demand changes more quickly and impact customer satisfaction, both directly and indirectly (Flynn, et al., 2010). Downstream (customer-side) integration has a positive impact on product innovation as well as offers short-term benefits in the form of financial performance for the focal firm, and long-term benefits of value creation for the customer which would partly and eventually help enhance the focal firm's financial performance (Feyissa, Sharma, & Lai, 2018). Although companies adopts CI to improve their innovation capabilities and reduce discontinuous innovations (Enkel, Perez-freije, & Gassmann, 2005), it can also harm innovativeness (Pedrosa, 2012).

Theoretical framework

This study is underpinned in the Transaction Cost Theory (TCT) introduced by Coase (1937) in "The Nature of the Firm". TCT compares the cost associated with the performance of a transaction within the firm and outside the firm. Extending the work of Coase (1937), Williamson (1995) proposed four types of transaction costs, which are search cost, contracting costs, monitoring costs and enforcement cost. From a transaction cost perspective, CI helps in reducing all the four types of transaction costs. When a firm establishes a high level of integration with its customers, it is willing to share resources and information to understand their requirement so as to reduce opportunistic behavior which in turn reduces the transaction cost. Further, the synchronization of the business processes between manufacturers and customers reduces monitoring cost. CI enables a firm to establish long term relationships with key customers which reduces the search cost. It reduces contracting costs by reducing the costs of negotiation and

writing contractual agreements and reduces enforcement cost by formulating collaborative strategies with major customers. Hence, Petroleum companies with high level of CI have the potential to lower the net costs of conducting business due to reduction in total transaction costs as well as satisfying the customers more than the competitors. Based on arguments, the research framework of this study was developed in Figure 1.

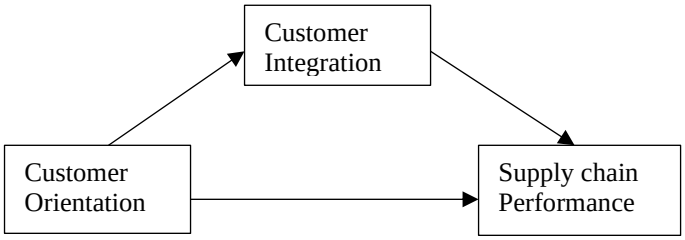

Figure1: Relationships of CO, CI, and SCP

Based on the conceptual framework, the following hypotheses are developed:

H1: Customer orientation outcome is not positively related to supply chain performance
H2: There is a no direct positive relationship between customer orientation and customer integration.
H3: There is no significant relationship between customer integration and supply chain performance.
H4: Customer integration does not mediates the relationship between customer orientation and supply chain performance.

Methodology

This study employed the descriptive survey design to examine the mediating effect of CI on the relationship between CO and SCP. The population of the study was 253 filling stations located in Abuja metropolis and its surrounding local government councils (Snowball Counting, 2017). The total population was arrived through database of Petroleum companies operating in Abuja, notably from major marketers, independent marketers and the NNPC retail outlets. Respondents were selected based on computerized Random Number Table of 253 entry. A total of 253 copies of questionnaires were distributed to the managers and 211 copies were returned and 192 were found usable. The sampling

method adopted was the census. The questionnaires were distributed with the aid of 2 research assistants. The research assistants were university graduates. The ethics of confidentiality, voluntary participation, and informed consent were preserved. The measurement of CO was adapted from Huhtala et al., (2014). The measurement items of CI was adapted from Danese and Romano (2013). Lastly, the measures for SCP were selected from Panayides and Lun (2009) and Qrunfleh and Tarafdar (2014). Respondents were asked to indicate their level of agreement with statements regarding their firms' CO, SI, IC, and SCP on a seven point Likert scale (1 = strongly disagree, 4 = neutral, and 7 = strongly agree). Descriptive statistics using mean and standard deviation were assessed. The mean and standard deviation were used to answer the research questions. A mean value greater than 2.5 and a standard deviation values of < 1.5 denotes acceptance of the measurement items or the construct. Exploratory factory analysis was also assessed to determine the factor loading and reliability values of the measurement items. Structural equation modeling was employed to analyze the structural mediation model. Statistical Package for the Social Science and Analysis of Moment Structure were the tools for the data analysis.

Data Analysis

Table 1: Descriptive statistics of Respondents' Profiles

Variable	Item Description	Frequency	Percent
Manager's level	Top management	45	23.5
	Middle management	47	24.5
	Others	98	51.0
	Missing	2	1.0
	Total	**192**	**100**
Years in current position	1-5 years	45	23.4
	6-10 years	45	23.4
	11-15 years	40	20.9
	Above 16 years	61	31.8
	Missing	1	.5
	Total	**192**	**100**

Table 1 shows that the respondents were senior managers of the petroleum marketing companies. 45 (23.5%) were top managers, 47

(24.5) were middle managers, and 98 (51%) were senior managers. There were 2 missing observation in this regard. This shows that senior managers filled the questionnaire. These managers should know the SCP of their companies. Similarly, 45 (23.4%) respondents were in the organizations for 1 to 5 years, 45 again (23.4%) for 6-10 years, 40 (20.9%) for 11-15 years, and 61 (31.8) were above 16 years. There was also I missing observation. This means that most of the respondent has been with their companies for more than 5 years.

Table 2: Exploratory Factor Analysis, Mean and Standard deviation

Variables	Mean	Std. Deviation	Factor Loading	Cronbach's Alpha	Skew	Kurtosis
SCI1	5.0476	1.79327	.845	.953	-.754	-.545
SCI2	4.9630	1.86334	.811	.954	-.762	-.703
SCI3	5.1164	1.83848	.780	.955	-.738	-.707
SCI4	4.9630	1.84325	.770	.955	-.722	-.608
CO1	5.0476	1.98474	.828	.954	-.782	-.816
CO2	5.1015	1.95029	.807	.954	-.682	-.999
CO3	5.0350	1.97840	.872	.952	-.706	-.848
CO4	5.0324	1.90718	.807	.954	-.706	-.797
SCP1	4.8037	1.94297	.855	.953	-.756	-.744
SCP2	4.9706	1.98385	.813	.954	-.775	-.799
SCP3	4.9166	1.79643	.813	.954	-.681	-.683
SCP4	5.0329	1.90721	.772	.955	-.878	-.569
SCP5	4.9486	1.97530	.803	.954	-.763	-.748

Table 2 shows that the range of the mean for 13 measurement items of the 3 constructs was 4. 8037 - 5.1015, reflecting moderate levels of CO, CI, and SCP. The values are above the 3.5 cut-off point. This indicated that firms in the Nigerian downstream petroleum sector practice CO and CI, and the practice help to add to their SCP. Thus the research question raised is answered: 'How will orientation and customer integration be implemented to influence the supply chain of the Nigerian downstream petroleum sector? Table 2 also shows that the factor loading are above the .7 threshold values indicating that the measurement items explained their underlying constructs. The threshold for factor loading is 0.7 (Shevlin & Milesb, 1998). Reliability values are above the .7 cut-off mark for existing variable, signaling internal consistency among the items with their respective constructs. In addition, the normality test of skew and kurtosis have values within the range of +2 and -2, which indicate that the data came from a normal distribution, although negatively skew to the left.

Threshold Values of Model Fit

Table 3: Model fits

Table 3: Definition of fit indices

Name of category	Name of index	Level of acceptance
Absolute fit	RMR	The closer to zero the better
	Goodness of Fit Index (GFI)	GFI > 0.90
Incremental fit	Adjusted goodness of Fit Index (AGFI)	AGFI > 0.90
	Comparative fit index (CFI)	CFI > 0.90
	Tucker-Lewis index (TLI)	TFI > 0.90
	Normed fit index (NFI)	NFI > 0.90
Parsimonious fit	Chi square/ degrees of freedom (ChiSq/df)	Chissq/df < 3.0

Assessment of the Structural Model

The mediation is based on the four-stage arguments of Baron and Kenny (1986). The four conditions must be satisfied for mediation to occur: "(a) the total effect of X on Y (t) must be significant; (b) the effect of X on M (α) must be significant; (c) the effect of M on Y (β) must be significant; (d) the direct effect of X on Y adjusted for M (t′) must be smaller than the total effect of X on Y". Prior to the analysis of the structural model in Figure 3, the first step of the direct effect (X→Y) was evaluated in Figure 2 and result is presented in Table 3.

Figure 2: Direct Effect of CO on SCP

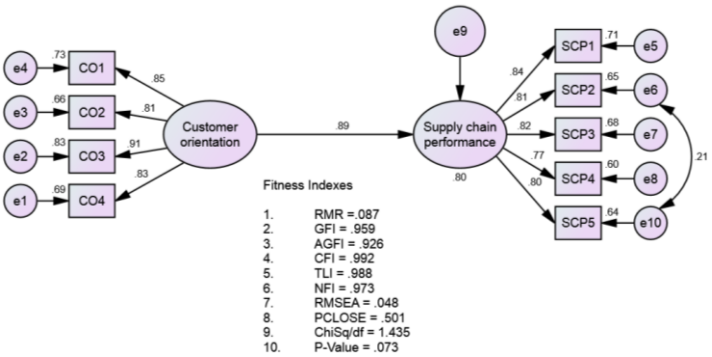

Table 3: Result Testing the Direct Hypothesis

Relationship	Estimate	P	Label
SCP <--- CO	.89	***	Significant

***=significant at the .001 level

Figure 3: Mediating effect of CI on the CO and SCP link

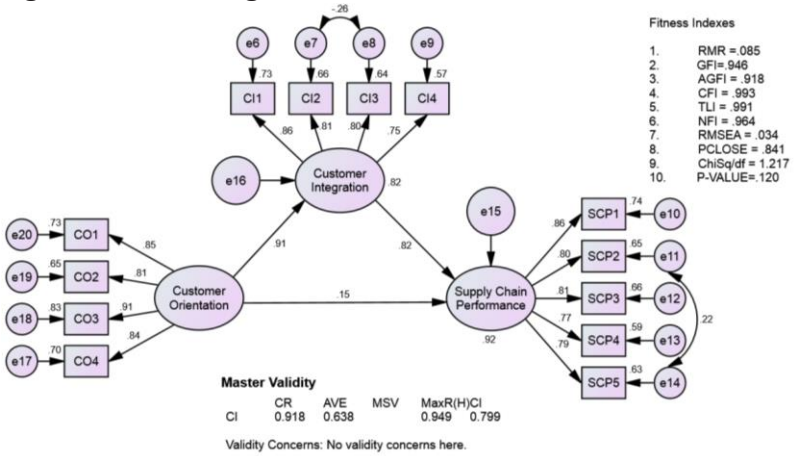

Table 4: Result Testing the Indirect hypotheses

Relationship			Estimate	P	Label
CI	<---	CO	.91	***	Significant
SCP	<---	CI	.82	***	Significant
SCP	<---	CO	.15	.268	Not Significant

***=significant at the .001 level

The following stages were followed assessing the mediating effect of customer integration on CO and SCP: The product of the indirect path effect (CO → CI x CI → SCP) =.91 x .82 = .75. The direct part (standardized path estimate) = .15. Both the indirect path (standardized path estimate) of X → M and M → Y are positive and significant and greater than (β = .051, P > 0.001). Since the product of indirect effects (.91 x .82 = .75) is greater than direct effect (.15), mediation occurs. The type of mediation is full mediation since the direct effect is no longer significant (P > 0.05) when CI was introduced into the direct model.

Discussion of Findings

Based on Figure 2 and 3 and Table 3 and 4, the four hypotheses formulated are tested in line with the suggestion of Baron and Kenny (1986). Figure 2 and Table 3 were used to test hypothesis 1. The result shows that there is a significant relationship between customer orientation and supply chain performance ($\beta = .89$, $p < .001$). This means that an increase in customer orientation by 1 standard deviation will lead to increase in customer integration by .89 standard deviation. The test of hypothesis 1 indicates that customer orientation practices such as customer service, customer satisfaction, customer value, after-sales service are the major determinants of supply chain performance of the petroleum downstream sector in Nigeria. Thus, customer-oriented culture will help to reduce inventory cost and out of stock rate, as well as improve customer responsiveness, sales growth, and market share. This finding is consistent with the study conducted by Neneh (2017) who found a positive relationship between CO and FP. Similarly, CO was the only component that significantly improved business performance during an upturn (Huhtala et al., 2014).

Hypotheses 2, 3, and 4 were tested using Figure 3 and Table 4. The test of hypothesis 2 indicates that there is a significant relationship between customer orientation and customer integration ($\beta = .91$, $p < .001$). An increase in customer orientation by 1 standard deviation will lead to increase in customer integration by .91 standard deviation. The test of hypothesis 2 indicates that customer orientation practices such as customer service, customer satisfaction, customer value, after-sales service will influence the downstream petroleum companies to integrate with customers. The customer integration strategies to be adopted are information sharing through information technologies, joint planning and forecasting to anticipate demand visibility, and customer feedback mechanisms about the procurement and production processes. This finding is consistent with the study conducted by Tseng and Liao (2015) who found that market orientation (customer orientation) has significant impact on supply chain integration (customer integration) in 124 container shipping firms in Taiwan.

The investigation of hypothesis 3 revealed that there is a positive and significant relationship between customer integration and supply chain performance ($\beta = .82$, $p < .001$). An increase in customer integration by 1 standard deviation will influence an increase in supply chain performance

by .82 standard deviation. This predicts that companies that share information with customers through information technologies, engage in joint planning and forecasting with customers, and receive customer feedback from customers are more like to enhance their cost efficiency, stock management, customer responsiveness, sales growth, and market share. The finding is consistent with the study conducted by Martinelli, et al., (2018) who pointed that customer integration influences supply chain performance. Similarly, in a study of 214 Indian manufacturing companies, Afshan and Motwani (2016) pointed that customer orientation enhances financial performance.

The test of Hypothesis 4 about mediation is based on the suggestion of Baron and Kenny (1986). The structural model in Figure 3 and result in Table 4 were utilized. Although the study is new and distinct, it is closely related to the work Afshan and Motwani (2016) who found that there is no direct effect of customer integration on financial performance but the relationship is fully mediated through customer related performance outcome. It could be observed that the r^2 value due to the influence of CO on SCP was .16 in Figure 2. However, the introduction of CI in Figure 3 increased the r^2 i.e., the explanatory power of the model from .80 to .92. The r^2 of CI due to the influence of CO is .82. Similarly, the r^2 of SCP due to the combined influenced of CO and CI is .92. The statements testing the four hypotheses are approximately correct for large samples under suitable assumptions.

Conclusion

This study was inspired by the Transaction Cost Theory (TCT) introduced by Coase (1937) in “The Nature of the Firm”. TCT compares the cost associated with the performance of a transaction within the firm and outside the firm. Extending the work of Coase (1937), Williamson (1995) proposed four types of transaction costs, which are search cost, contracting costs, monitoring costs and enforcement cost. From a transaction cost perspective, CI helps in reducing all the four types of transaction costs by mediating the relationship between customer orientation and firm performance. The study thus shows that the downstream petroleum companies in Nigeria can improve their supply chain performance if they develop the philosophy of customer orientation as well as integrate with customers through information sharing using technologies and also through joint planning and proper feedback mechanisms.

Recommendations

To enhance the supply chain performance, the following business-customerizing best practices are recommended to the downstream petroleum companies in Nigeria: customer service, customer satisfaction, customer value, after-sales service. Others include information sharing through information technologies, joint planning and forecasting to anticipate demand visibility, and customer feedback mechanisms about the procurement and production processes.

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Instrument

Customer Orientation

CO1 - We are committed toward in serving customer
CO2 - We measure our customers' satisfaction systematically
CO3 - Our strategies are driven by increasing customer value
CO4 - We pay close attention to after-sales service

Customer Integration

CI1 - We have a high level of information sharing with major customers about the market
CI2 - We share information to major customers through information technologies
CI3 - We have a high degree of joint planning and forecasting with major customers to anticipate demand visibility
CI4 - Our customers provide information to us in the procurement and production processes

Supply Chain Orientation

SCP1 - Our supply chain helps us reduce inventory cost
SCP2 - Our supply chain helps us increase customer responsiveness/service
SCP3 - Our supply chain helps us reduce out of stock rate
SCP4 - Our supply chain helps us improve market share
SCP5 - Our supply chain helps us improve sales growth

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