

*Article*

# Effects of Supply Chain Design and Collaboration on Customers' Satisfaction of Instant Noodles in Ekiti State, Nigeria

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**Abstract:** The degree of collaboration among supply chain partners and the structure of the network are important determinants of the level of satisfaction customers derive from the products or services. However, the effects of these dimensions on customer satisfaction at the downstream section of the supply chain remain under-researched in Nigeria. This study precisely examined the effects of collaboration and supply chain design on customers' satisfaction at the downstream end of the chain using Ekiti State as study area. The study employed descriptive survey design with the use of structured Likert scale questionnaire administered to 381 retailers of noodles in Ekiti State. The research hypotheses were analysed using simple linear regression as statistical technique with the aid of SPSS version 22.0. At the end of the study, it was observed that both collaboration and supply chain design were significant predictors of customers' satisfaction of instant noodles in Ekiti State. However, collaboration among supply chain partners emerged as stronger determinant of customers' satisfaction than supply chain design. The study concludes that these two practices of supply chain management are highly important criteria any manufacturing firm especially in the noodles industry must pay close attention to in order to satisfy her consumers.

**Keywords:** supply chain management; logistics; collaboration; cooperation; supply chain design; customer satisfaction; distribution; regression; noodles

## 1. Introduction

Supply chain management is a set of measures employed to adequately unify the activities of suppliers, manufacturers and partners in distribution process to ensure optimal production and distribution of goods in right quantities to appropriate places and in timely manner so as to minimize overall cost while creating value and satisfaction for customers [1]. Distribution or movement of finished goods to the final consumers at reduced cost is considered the primary focus of any profit-oriented manufacturing firm and is therefore one of the most readily available yardstick to measure a firm's performance[2]. In consonance with this, Arogundade [3] noted that in the supply chain management, the most logical and common logistic is the feed-forward logistic pattern where goods travel from the manufacturer to the ultimate consumer. Surprisingly, large number of instant noodles manufacturers in Nigeria have not done enough in terms of timely delivery of their products to their teeming customers across the length and breadth of the country[4]. MarkMonitor's Noodles Customer Satisfaction survey recently conducted on the competing noodles brands in Nigeria indicated that brands such as Honeywell and Golden Penny noodles have become scarce commodities in some parts of the country, Ekiti State inclusive [5]. This explains the reason why Indomie noodles continue to dominate the market because of its continuous innovations in distribution, promotions and advertisement.

Instant noodles have become popular staple food around the world with Nigeria named the 12<sup>th</sup> largest noodles market with estimated annual consumption of over 1.79 billion packs by nearly 14 million Nigerians as at 2011 [5,6]. Available in different flavours across many cultures, some of the basic ingredients in noodles production include wheat flour, iodized salt and vegetable oil while flavour, yeast extract, sugar and spices are common in the seasoning powder. Improved shelf life, shinny lustre and ready-to-eat attributes of instant noodles are achieved due to the tradition of flash-frying the thin wheat dough in highly saturated vegetable oil [7,8].

Despite the introduction of instant noodles into the Nigerian market in 1988 under the brand name Indomie by importation from Indofood, the world largest manufacturer of instant noodles based in Indonesia, production of instant noodles in Nigeria did not start until 1995 when the largest noodles manufacturing plant in Africa was established by De United Foods Industries Limited to produce Indomie brands in different variants and sizes [4,6]. From four noodle manufacturing companies operational in Nigeria in 2006, the sector now records over 16 brands fighting for market share in Nigeria's ever-growing marketplace, making it one of the fastest growing among Fast Moving Consumer Goods (FMCG)[4]. Some of the popular noodle brands in Nigeria include Indomie, Chikki, Dangote, Mimeo, Honeywell and Golden Penny[4,6].

Though several authors around the world have conducted studies on the relationship between different supply chain management practices including supply chain design, collaboration and customers' satisfaction, most of these researches focused more on supplier-manufacturer supply chain relationship at the upstream section while assessing the level of customers' satisfaction [9–16]. It is noteworthy that none of these studies addressed the effects of supply chain design and collaboration as predictors of satisfaction enjoyed by the numerous buyers of the finished products at the downstream or lower end of the supply chain. This has presented manufacturers of instant noodles in Nigeria with the challenge of identifying which practices of supply chain are of utmost concern to their teeming customers [5,6].

This study was therefore conducted to fill the identified gap in literature by investigating the effects of supply chain design and collaboration on customers' satisfaction at the downstream section of the supply chain. This was achieved by directly engaging the resellers (retailers) of instant noodles at the downstream end of the supply chain as respondents. In so doing, the level at which the aforementioned supply chain management practices affect customers' satisfaction among retailers of Nigerian-made instant noodles spread across the three senatorial districts of Ekiti State was empirically established. At the end of the study, it was concluded that both supply chain design and collaboration among the partners play important role in determination of the level of satisfaction derived by the customers at the lower end of the supply chain.

## 2. Literature Review

### 2.2. Conceptual Clarifications

#### 2.2.1. Supply Chain Management

Supply chain management (SCM) is defined as a set of measures put in place to adequately harmonise the activities of suppliers, manufacturers and partners in distribution process to ensure optimal production and distribution of goods in right quantities to appropriate places and in timely manner in a bid to minimize overall cost while creating value and satisfaction for customers [1]. La Londe [17] described supply chain management as that integrating function which links major business components and processes into a cohesive and highly efficient model. Integration in the system is achieved through collaborative activities of firms who share resources and expertise to create value added processes that meet consumers' dynamic needs at the right time [2,18–21].

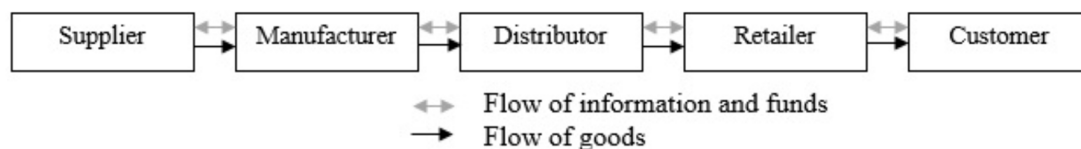
The link among supply chain partners is a function of collaborating firm's proximity to one another [2], the type of design architecture and form of technology incorporated to harmonise the supply chain towards achieving management objectives [22,23]. Suffice to say that supply chain

design and collaboration are germane supply chain management practices which are interlinked for optimisation of the entire system.

### 2.2.2. Supply Chain Design

Waters [24] pointed out that a well-designed supply chain permits unhindered movement of production materials and components upstream, work-in-progress within and delivery of finished goods downstream. This flow from one stage to another determines the degree of efficiency of the entire supply chain [25].

The pattern of travel or movement of goods to the final consumers along the supply chain is highly determined by the supply chain design employed. This is characterised by the number of middlemen through which the goods pass before getting to its final destination. The length of delivery process determines accessibility which in turn defines the level of satisfaction derived by the consumers or customers. The basic supply chain design involves the movement of materials through the supplier to the manufacturer and distribution of finished goods from the producer through wholesaler to the retailer until accessible by the final consumers [26,27]. However, the structure has been abridged in order to hasten the delivery process especially in the case of perishable products [1,25,26]. Adapted from the work of Pulevska-ivanovska and Kaleshovska [27], Figure 1 highlights the basic players in a typical supply chain and the direction of movement of goods, information and funds within the system.



**Figure 1.** Typical Supply Chain. Source: [27]

The flexibility of a supply chain in design allows the parties to interact and harmonize their functions with the use of technology to process information on supply chain activities in real-time towards creating value in the system [22]. A well-integrated supply chain structure cuts costs and saves time of operation at the various levels.

Based on the empirical research conducted by Zailani et al.[23], integration of modern IT solutions like Enterprise Resource Planning, Electronic Data Interface and so on significantly improves resource sharing and cooperation among partners especially in areas of transaction processing, planning and some other supply chain activities. This integrated design brings about improved service and product delivery thereby enhancing customers' satisfaction in the long run.

### 2.2.3. Collaboration

Collaboration or cooperation is the backbone of any social structure involving human relations [28] and the level of interaction between partners in the supply chain determines the results of the management process [29]. Smith et al. [30] defined collaboration as that process by which a set of people or firms within a system interact and create connections for mutual benefit. This level of interaction among the partners goes a long way in fostering customers satisfaction[10–12,15,31].

Collaboration entails a situation whereby firms and individuals involved in a supply chain jointly relate to pull resources together and share operational information in order to attain the common objective of improving the supply chain functions [31]. In order to deliver value to customers at reduced cost, it is essential for the manufacturer to ensure collaborative efforts mandating efficient resource sharing within its departments as well as among firms in the supply chain[2,30].

Lysons and Farrington [32] affirmed that collaboration among functional groups within a supply chain, with customers and material suppliers often result in optimal performance of the system and

alignment of these functions definitively optimises process design, customers' satisfaction and suppliers' return on investment. To corroborate this assertion, researchers [33] pointed out that firms in the supply chain collaborate to help each party focus on its area of core competence thereby improving service delivery and value creation within the network. Since no firm can function optimally in isolation, the need to actively collaborate with other organisations has become a priority in supply chain management discourse [20,21,34].

Efficiency of supply chain collaboration largely depends on the efforts, expertise and skills of individual firm working together in the value-creation relationship [20,35] as each has peculiar role to play for goods and services to reach the final consumers in the right quantity and quality, at the right place, in the right condition, at the right time and the right cost [10,16,23,25,36]. The final consumers are thus considered passive participants in the supply chain management process and prime beneficiaries of the values created by the stakeholders from raw material suppliers to the retailers.

The advent of information and communication technology (ICT) has further enhanced the level of collaboration among supply chain partners through seamless integration of inter-firm activities. "Members of logistics collaborative networks that take advantage of affordable information communication technologies have a significant advantage in making use of the opportunities the collaborations may bring" [21] especially in maximising network benefits and simplifying business processes for better value creation [18,19].

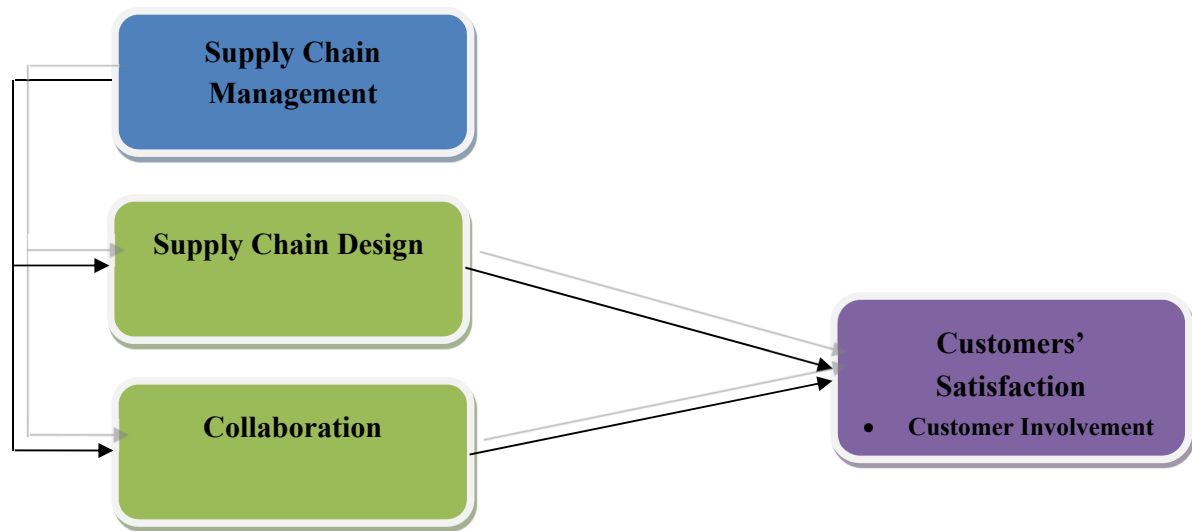
#### 2.2.4. Customer Satisfaction

Different scholars have defined customer satisfaction in different ways. Kotler and Keller [37] defined customers' satisfaction as the level of contentment or fulfilment a customer derive from the product or service being paid for or the feelings of fulfilment or disappointment which results from comparing the perceived performance of a product with conceived expectations. Customers' satisfaction can also be considered as the perception of a customer that the purchased product/service has effectively met or surpassed his/her expectations [38]. Ilieska[39] gave a layman definition of customers' satisfaction as the consumer's evaluation of a product or service in terms of the extent to which that product or service has met his/her needs or expectations

Retailers expect transaction processing to be seamlessly done at any given time and goods delivered as at when due; anything short of this results in dissatisfaction. The purpose of supply chain management is to ensure that appropriate measures are put in place to facilitate the attainment of customers' expectations. Customer's satisfaction is measured by customer involvement [40] and service satisfaction [41,42] scales to determine how inter-firm interactions within the supply chain drive expectations of the partners. Since supply chain practices have been defined in this context as inter-firm activities that take place between supply chain intermediaries in the course of value delivery [2], the focus of the study is restricted to the customers (retailers) at the downstream end of the chain rather than the final consumers who are less involved in supply chain activities. A customer is that individual who buys a product (mostly for resale or sometimes for usage) while the consumer is the one who eventually consumes it [43,44].

#### 2.3. Conceptual Framework

Francis and Waiganjo [11] in their study identified various supply chain dimensions capable of determining customers' satisfaction. They considered benchmarking, organisational leadership, collaboration and responsiveness as possible practices of supply chain that affect customers' satisfaction. The proposed model for this study was therefore founded on social capital theory and anchored on existing framework adapted from Francis and Waiganjo [11] with the introduction of an added variable (supply chain design) to the relationship. Figure 2 schematically presents a research model adapted from the work of Francis and Waiganjo [11] for testing relationship among the constructs of this study.

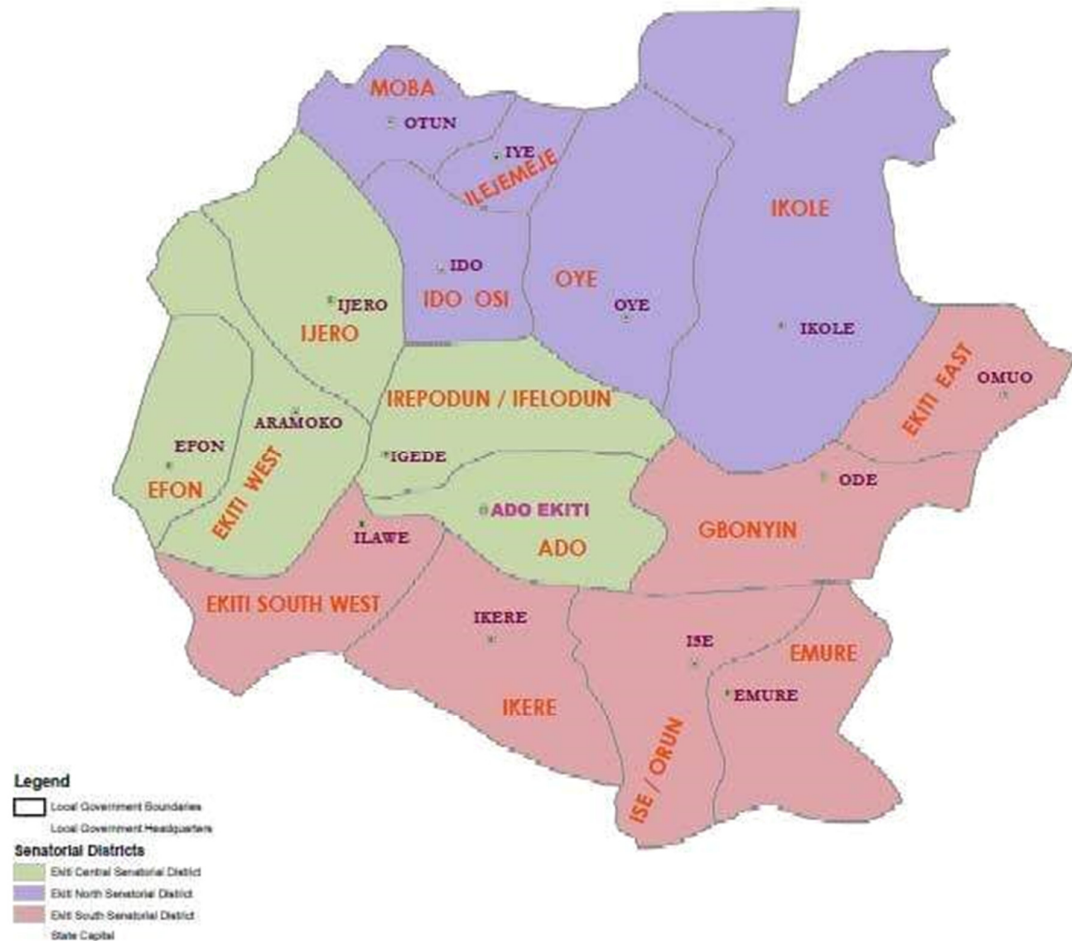


**Figure 2.** Proposed Research Model. **Source:** Adapted from [11]

### 3. Methodology

#### 3.1. Study Area

This study was carried out in Ekiti State which is one of the States in Southwest, Nigeria. Ekiti State was created on October 1, 1996 after it was carved out of the old Ondo State by the then military administration of General Sanni Abacha. Upon creation, Ado Ekiti became the capital and currently the economic hub of Ekiti State. According to the 2006 national census [45], the population of the State stood at 2,398,957. The State covers an expanse of land area measuring 6,353 square kilometres hosting 16 local government areas in three senatorial districts. Common mineral resources in Ekiti State include Kaolin, Clay, Granite, Feldspar and Syenite. Figure 3 shows the map of Ekiti State with the local government areas of the three senatorial districts depicted in varying colours as adapted from the official website of Ekiti State Government [46].



**Figure 3.** Senatorial Districts in Ekiti State. Source: [46]

### 3.2. Research Design

This research employed descriptive survey design in a bid to investigate the effects of supply chain design and collaboration on customers' satisfaction of instant noodles in Ekiti State, Nigeria. Data for the study was directly sourced from various respondents (retailers of instant noodles) across the State with the aid of five-point Likert scale questionnaire.

The questionnaire and its scales were adapted from previous studies including [2,40–42,47–49] and carefully reviewed then accordingly modified by experts in order to enhance content validity of the scale. Only questions relevant to supply chain design, collaboration and degree of customers' satisfaction were retained in the modified scales. The structured questionnaire consisted of questions in four different sections. Section A covered respondents' demographic profile, section B was used to elicit data on supply chain design, section C collated data on collaboration while section D fetched data on level of customers' satisfaction derived by the respondents (retailers).

### 3.3. Reliability and Validity of Questionnaire

The reliability and internal consistency of the research instrument as performed on the relevant variables was determined or measured by Cronbach alpha which is most commonly used in reliability tests. Under this measure, Cronbach alpha with value greater than or equal to 0.7 was found adequate in the measurement of internal consistency of an instrument [50].

**Table 1.** Reliability of Variables. Source: SPSS Reliability Analysis Output, 2018

Construct	N	No. of Items	Cronbach's Alpha
Supply Chain Design	369	5	0.800
Collaboration	369	5	0.753
Service Satisfaction	369	2	0.768
Customer Involvement	369	7	0.773
Total Cronbach's Alpha for Scale = 0.808			

Table 1 described the output of reliability test on the scale used in this study. The 19-item scale, comprising of 4 constructs (variables) has an overall alpha value ( $\alpha$ ) of 0.808 which surpassed the standard threshold of 0.7 establishing adequacy of the instrument in achieving desired objectives [50]. In the course of testing the scales, some items were dropped due to relatively low item-total correlation. From the results, supply chain design returned highest reliability coefficient of 0.800 while 5-item-scale collaboration recorded the lowest reliability coefficient of 0.753.

The questionnaire used in gathering primary data for this study was subjected to face and content validity to ensure it accurately measured the target parameters. In a bid to ensure content validity of the questionnaire, construct measurement items were carefully adapted from previous studies and modified where necessary. Modifications to the instrument which were done by professionals on the subject matter included simplifying used grammar, inclusion of items that most accurately address the constructs and dropping of others.

### 3.4. Data Collection and Sampling Technique

Population of this study was taken as the retailers at the lower end of the supply chain network who buy directly from the noodles manufacturer(s) or through designated middlemen. The retailers were targeted as respondents to this study because they are the major (in terms of number) supply chain stakeholders who take title to the goods and are most affected by practices and inter-firm activities in the entire supply chain network.

Population of the study therefore covered 8265 retailers of made-in-Nigeria instant noodles in the three senatorial districts of Ekiti State (Ekiti North, Ekiti Central and Ekiti South Senatorial Districts). This figure covered 1850 variety stores in Ekiti North, 3550 in Ekiti Central and 2865 in Ekiti South Senatorial Districts as presented in Table 2.

**Table 2.** Study Population by Senatorial Districts. Source: SPSS Reliability Analysis Output, 2018

Senatorial District	Study LGA	Headquarters	Store Population
Ekiti Central	Ado	Ado-Ekiti	3550
Ekiti North	Ido/Osi	Ido-Ekiti	1850
Ekiti South	Ikere	Ikere-Ekiti	2865
Total			8265

A total sample of 381 respondents generated from the total population with the aid of Yamane [51] formula was chosen for this study using purposive sampling method. This formula was adopted because of its reputation for presenting an unbiased sample from a large population.

A multistage sampling method was employed in the study as follows: At the first stage, simple random sampling technique was used to select one local government area each from the three senatorial districts of Ekiti state. At the second stage, purposive sampling method was employed to select the headquarters of each local government because of their commercial significance characterised by large concentration of stores and high trading activities and at the third stage, samples to be taken from each city was generated from the total sample using simple proportion formula. Sample to be taken from Ado-Ekiti was calculated as 164 respondents, Ido-Ekiti computed as 85 while sample from Ikere-Ekiti was calculated as 132. At the fourth stage, random sampling method was used to draw respondents from the various clusters of each city for equal representation and even coverage of all geographical locations in the senatorial districts.

### 3.5. Distribution of Questionnaire

The distribution pattern of the questionnaire administered to respondents' of this study was presented in Table 3. From a total of 381 questionnaires administered to respondents, 369 (representing 96.85% return rate) were returned as 12 (representing 3%) were unaccounted for. The 369 returned questionnaires were therefore used for analysis purpose in the study.

**Table 3.** Number and Percentage of Questionnaire Distributed and Returned. Source: Field Survey, 2018

Location	Distributed	Returned	%	Unreturned	%
Ado-Ekiti	164	159	96.95	5	3.05
Ido-Ekiti	85	82	96.47	3	3.53
Ikere-Ekiti	132	128	96.97	4	3.03
Total	381	369	96.85	12	3.15

## 4. Results and Discussion

In this study, both descriptive and inferential statistics were used to analyse the data sourced. Descriptive statistics such as frequency tables and statistical charts were used to present respondents' demographic characteristics inter alia; gender, age, educational qualification, business location, business age and sales volume in other to conveniently compare the demographic information and relate with the eventual output of inferential statistics for the presentation of research findings.

Data analysis was by simple linear regression analysis using Statistical Package for Social Sciences (SPSS) version 22.0. The objective of this study was to quantitatively test the effects of supply chain management sub-constructs viz: supply chain design and collaboration (independent or predictor variables) on customers' satisfaction (dependent or criterion variable). Simple linear regression was considered for data analysis because of its reputable degree of accuracy, simplicity and suitability for predicting relationship between continuous variables.

### 4.1. Testing of Hypotheses

The implicit function of the relationship is given as:

$$CS = f(SCD, COL)$$

Where;

CS = customers' satisfaction

SCD = supply chain design

COL = collaboration

The general regression equation for the inferential analysis as adapted from [52] is given as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + e$$

Where;

Y = the dependent variable;

X = independent variable

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_n$  = Intercepts

e is the error term.

#### 4.1.1. Regression Analysis of Supply Chain Design and Customers' Satisfaction

**Ho1:** Supply chain design does not significantly affect customers' satisfaction of instant noodles in Ekiti State.

**Ha1:** Supply chain design significantly affects customers' satisfaction of instant noodles in Ekiti State.

**Table 3.** Regression Analysis of SCD and CS



Coefficients							
Model	Unstandardized Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tol	VIF
(Constant)	2.113	0.176		11.982	0.000		
Supply Chain Design	0.463	0.040	0.518	11.586	0.000	1.000	1.000
Model Summary:							
	R				0.518		
	R Square (R²)				0.268		
	Adjusted R²				0.266		
	F				134.234		
	Durbin-Watson				1.352		
Independent Variable: Supply Chain Design				Dependent Variable: Customer Satisfaction			
Source: Author's Regression Output, 2018							

From the model summary of regression output presented in Table 3, the computed value of R = 0.518 indicated a moderate positive relationship between the outcome and predictor variables. Also it could be observed that supply chain design was responsible for 26.8% (R<sup>2</sup> = 0.268) of variance in customers' satisfaction. Variance inflation factor of 1.000 under collinearity statistics indicated that there was no multicollinearity in the regression model [53]. The alternative hypothesis was therefore accepted as supply chain design was found to be statistically significant (B = 0.463; t = 11.586; p < 0.05). The model function could be written as: CS = 2.113 + 0.463\*SCD + e; meaning that for every 1% increase in supply chain design, there exist 46.3% increase in customers' satisfaction.

#### 4.1.2. Regression Analysis of Collaboration and Customers' Satisfaction

**H<sub>02</sub>:** Collaboration does not significantly affect customers' satisfaction of instant noodles in Ekiti State.

**H<sub>a2</sub>:** Collaboration significantly affects customers' satisfaction of instant noodles in Ekiti State.

**Table 4.** Regression Analysis of COL and CS

Coefficients							
Model	Unstandardized Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tol	VIF
(Constant)	2.080	0.159		13.110	0.000		
Collaboration	0.516	0.039	0.564	13.091	0.000	1.000	1.000
<b>Model Summary:</b>							
R					0.564		
R Square (R <sup>2</sup> )					0.318		

Adjusted R <sup>2</sup>	0.316
F	171.385
Durbin-Watson	1.368
Independent Variable: Collaboration	Dependent Variable: Customer Satisfaction
Source: Author's Regression Output, 2018	

Regression output of collaboration as predictor against customers' satisfaction as outcome variables presented in Table 4 indicated a fairly strong positive relationship between the outcome and predictor variables with  $R = 0.564$ . The model summary further revealed that collaboration explained 31.8% ( $R^2 = 0.318$ ) of variance in customers' satisfaction. 68.2% of variation in the outcome variable was thus accounted for by other extraneous factors outside the coverage of this model. Variance inflation factor of 1.000 indicated that there was no multicollinearity problem in the regression model [53]. The alternative hypothesis was supported and accepted as collaboration was found statistically significant ( $B = 0.516$ ;  $t = 13.091$ ;  $p < 0.05$ ). The regression function could be written as:  $CS = 2.080 + 0.516 \cdot CAC + e$ ; indicating that customers' satisfaction increase by 51.6% for every 1% increase in collaboration among supply chain partners.

#### 4.2. Discussions and Managerial Implications

##### 4.2.1. Role of Supply Chain Design

Firms in the noodles industry are continually reviewing the strategies of delivering finished goods to the final consumers. No matter how painstaking and professional a manufacturing process is, it amounts to efforts in futility if the products cannot reach the consumers who are willing and ready to pay for it. This explains the reason why new and unconventional chains of product delivery are being deployed by competitors in the Nigerian noodles industry to further take goods closer to the consumers.

Supply chain design as predictor variable showed moderate positive correlation with customers' satisfaction as observed in the model summary ( $R^2 = 26.8\%$ ). The findings of this study were in consonance with that of previous researchers. Ibrahim[14] reported that of all the control variables of supply chain flexibility (Competitive Environment Evaluation, Supply Chain Diagnostic Review and Supply Chain Development) tested against customer satisfaction and retention, supply chain development recorded the highest effect on customer satisfaction. The author posited that the design and development of dynamic supply chain holds more benefits to the firm than any other distribution flexibility criteria. It promotes loyalty, boosts firm's reputation and enables easy resource sharing among supply chain partners. This assertion was in tandem with the postulation of the system thinking theory that operational proximity and position of the supply chain partners would determine the level of interaction and resource sharing which in turn enhances value creation and customers' satisfaction. Following the statistical values of the relationship ( $B=463$ ,  $t=11.586$ ,  $p<0.05$ ) the alternative hypothesis ( $H_{a1}$ ) was accepted while the null hypothesis ( $H_{o1}$ ) was rejected.

The implication of this is that management must take the design of the downstream supply chain as a priority and strategically done with the involvement of other partners. Structure decentralisation and dynamism are important for better product performance. This creates trust with the middlemen in the supply chain and loyalty with consumers of the goods on the far end of the chain.

##### 4.2.2. Role of Collaboration

Collaboration among partners in the supply chain is highly essential for the collective objective of the synergy to be achieved. Firms in the Nigerian noodles industry are also aware of this. This enhances resource sharing and improved decision making within the supply chain as observed in some networks today.

As observed from the regression output, collaboration exerted positive moderate effects on customers' satisfaction ( $B=.516$ ,  $t=13.091$ ,  $p=0.000$ ). The coefficient of determination of the model ( $R^2 = 0.318$ ) also implies that collaboration exerts higher effects on customers' satisfaction when compared to supply chain design. This implies that firms must, as matter of priority, enable the survival of collaboration within their supply chain network in order to operate optimally. These results conclusively led to the acceptance of the alternative hypothesis ( $H_{a2}$ ) while null hypothesis ( $H_{o2}$ ) was rejected.

The findings of this study were in line with that of Francis and Waiganjo [11] who stated that collaboration within the supply chain facilitates efficient movement of materials on the upstream and prompt delivery of value offerings on the downstream section of the network thereby establishing organisational competitiveness. Also, Haque and Islam[12] posited that collaboration generates friendly relationship with consumers and suppliers alike resulting in improved product quality and eventual satisfaction on both ends of the chain.

Furthermore, the findings of this study were in direct harmony with the stance of social capital theory which states that players in the social network get direct optimised access [29] to embedded social capital resources or benefits when there is trust and bilateral collaboration among the participants [54]. Collaboration positions the entire chain as a single firm in operation. The implication of this for the management of an organisation is that collaboration should not be limited to the internal organs of the firm but extended effectively to all parts of the supply chain in order to attain organisational effectiveness through improved customers' satisfaction.

## 5. Conclusions and Recommendations

### 5.1. Conclusion

It could be observed from the study results that the two practices of supply chain management, namely, supply chain design and collaboration emerged as statistically significant predictors of customers' satisfaction of instant noodles in Ekiti State. It followed that collaboration among supply chain partners showed higher correlation with customers' satisfaction while supply chain design exerted lower effects on customers' satisfaction among the tested predictor variables.

Conclusion could therefore be drawn from the statement above that there exists positive significant relationship between the level of customers' satisfaction and the two factors of supply chain management: supply chain design and collaboration. Inter-firm collaboration between the interacting supply chain partners highly determines the level of satisfaction derived by the parties. Since the supply chain is a social structure, management of the degree of interactivity or collaboration in the system is a top priority for supply chain optimisation. The study also concludes that the implemented supply chain design, which is a function of technology involvement in the exchange of transaction data, affects the level of customers' satisfaction in the supply chain network. This implies that these two practices of supply chain management are highly important criteria any manufacturing firm especially in the noodles industry must pay close attention to in order to satisfy her consumers and win big in terms of market share.

### 5.2. Recommendations

The following recommendations were drawn from the findings of this study:

- (i) Having observed from the research findings that collaboration among supply chain players yielded greater influence on customers' satisfaction than the supply chain design, it is recommended that supply chain decision makers pay more attention to policies that will enhance both vertical and horizontal integration with the organisation and among the supply chain partners in order to seamlessly harmonise production and distribution processes.
- (ii) Also, based on the finding that supply chain design is an important predictor of customers' satisfaction in the noodles industry, management of organisations should pay critical attention to the structure of their distribution networks and ensure flexibility in the delivery process with less bottleneck in the relationship between the partners in order to get timely and accurate

information of the chain performance and expectations of the final consumers who are closest to the retailers.

**Author Contributions:** O.S.O. conceived the research based on problems encountered by retailers of instant noodles in Ekiti State, Nigeria and K.K.A. formulated the design and appropriate title for the study. O.S.O. performed the analysis, data collection, discussion and writing while K.K.A. conducted data curation, editing and proof reading and supervision of the work.

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## References

1. Kuo, R.; Han, Y. A hybrid of genetic algorithm and particle swarm optimization for solving bi-level linear programming problem—A case study on supply chain model. *Appl. Math. Model.* **2011**, *35*, 3905–3917.
2. Sezen, B. Relative effects of design, integration and information sharing on supply chain performance. *Supply Chain Manag. Int. J.* **2008**, *13*, 233–240, doi:10.1108/13598540810871271.
3. Arogundade, K.K. *Reverse Logistic Management and Product Pricing in the Nigerian Brewery Industry*; Ekiti State University: Ado-Ekiti, Ekiti State, 2014.
4. Abubakar, H.S. Brand loyalty and consumers of northern noodles Nigeria limited: An analysis of factors. *Eur. J. Bus. Manag.* **2014**, *6*, 67–72.
5. FinIntell Consumers Want more Value for Money—Noodles Industry’s Report Shows. Available online: <http://myfinancialintelligence.com/fmcg/consumers-want-more-value-money-noodles-industry’s-report-shows> (accessed on 25 October 2017).
6. MarketingEdge Battle of Noodles Brands over Market Share. Available online: <https://www.marketingedge.com.ng/2017/01/27/battle-of-noodle-brands-over-market-share/> (accessed on 27 October 2017).
7. Ray, S. A study of consumer acceptibility for noodles in Siliguri market. *Natl. Mon. Ref. J. Res. Commer. Manag.* **2014**, *1*, 57–70.
8. Errington, F.K.; Fujikura, T.; Gewertz, D.B. *The Noodle Narratives: The Global Rise of an Industrial Food into the Twenty-First Century*; University of California Press: Berkeley, CA, USA, 2013.
9. Omoruyi, O.; Mafini, C. Supply chain management and customers’ satisfaction in small to medium enterprises. *Stud. Univ. Babeş-Bolyai Econ.* **2016**, *61*, 43–58, doi:10.1515/subboec-2016-0004.
10. Chiarini, A.; Douglas, A. The impact of logistics solutions on customer satisfaction: An exploratory qualitative study of manufacturing companies. *Ital. J. Manag.* **2015**, *33*, 255–270.
11. Francis, G.H.; Waiganjo, E. Role of supply chain practices on customer satisfaction in the printing industry in Kenya: A case study of Morven Kester East Africa limited. *Int. J. Acad. Res. Bus. Soc. Sci.* **2014**, *4*, 128–143.
12. Haque, M.; Islam, R. Effective supply chain management practices on customers’ satisfaction: Evidence from pharmaceutical industry of Bangladesh. *Glob. Bus. Manag. Res. Int. J.* **2013**, *5*, 120–136.
13. Gilaninia, S.; Taleghani, M.; Mousavian, S.J.; Khanjani, S.; Rad, M.S.; Shadmani, E.; Shiri, Z.; Seighalani, F.Z. Impact of supply chain dimensions on customers’ satisfaction. *Kuwait Chapter Arab. J. Bus. Manag. Rev.* **2012**, *1*, 104–111.
14. Ibrahim, O. *Impact of Strategic Supply Chain Flexibility on Customer Retention in the B2B Segment*; Erasmus University Rotterdam: Rotterdam, the Netherlands, 2012.
15. Barve, A. Impact of supply chains agility on customer satisfaction. In *International Conference on E-Business, Management and Economics*; IACSIT Press: Hong Kong, China, 2011; Volume 3, pp. 325–329.
16. Sukati, I.; Hamid, A.A.; Baharun, R.; Tat, H.H. A study of supply chain management practices: An empirical investigation on consumer goods industry in Malaysia. *Int. J. Bus. Soc. Sci.* **2011**, *2*, 166–176.
17. La Londe, B.J. Supply Chain Management: Myth or Reality? *Supply Chain Manag. Rev.* **1997**, *1*, 6–7.
18. Hudnurkar, M.; Jakhar, S.; Rathod, U. Factors affecting collaboration in supply chain: A literature Review. *Procedia Soc. Behav. Sci.* **2014**, *133*, 189–202, doi:10.1016/j.sbspro.2014.04.184.
19. Soosay, C.; Hyland, P. A decade of supply chain collaboration and directions for future research. *Supply Chain Manag. Int. J.* **2015**, *20*, 613–630.

20. Ralston, P. *Supply Chain Collaboration: A Literature Review and Empirical Analysis to Investigate Uncertainty and Collaborative Benefits in Regards to Their Practical Impact on Collaboration and Performance*; Iowa State University: Iowa Ames, IA, USA, 2014.
21. Vargas, A.; Patel, S.; Patel, D. Towards a business model framework to increase collaboration in the freight industry. *Logistics* **2018**, *2*, 22, doi:10.3390/logistics2040022.
22. Min, H.; Zhou, G. Supply chain modeling: Past, present and future. *Comput. Ind. Eng.* **2002**, *43*, 231–249.
23. Zailani, S.; Premkumar, R.; Fernando, Y. Factors influencing the effectiveness of operational information sharing within supply chain channels in Malaysia. *Oper. Supply Chain Manag. Int. J.* **2008**, *1*, 85–100.
24. Towil, D.R.; Childerhouse, P.; Disney, S.M. Speeding up the progress curve towards effective supply chain management. *Supply Chain Manag. Int. J.* **2000**, *5*, 122–130, doi:10.1108/13598540010338866.
25. Waters, D. *Logistics: An Introduction to Supply Chain Management*, 1st ed.; Palgrave Macmillan: New York, NY, USA, 2003.
26. Saremi, H.; Zadeh, S.M.M. Management of distribution channels. *Indian J. Sci. Res.* **2014**, *5*, 452–456.
27. Pulevska-ivanovska, L.; Kaleshovska, N. Implementation of e-supply chain management. *TEM J.* **2013**, *2*, 314–322.
28. Coleman, J.S. Social capital in the creation of human capital. *Am. J. Sociol.* **1988**, *94*, 121–132.
29. Avery, S.L.; Swafford, P.M. Social capital impact on service supply chains. *J. Serv. Sci.* **2009**, *2*, 9–16.
30. Smith, K.G.; Carroll, S.J.; Ashford, S.J. Intra and interorganizational cooperation: Toward a research agenda. *Acad. Manag. J.* **1995**, *38*, 7–23.
31. Maboodi, M.; Javanshir, H.; Rashidi, A.; Valipour, P. The effect of applying supply chain management on customer satisfaction in the textile industry. *Iran. J. Text. Sci. Technol. Res.* **2010**, *1*, 13–27, doi:10.3390/logistics2020011.
32. Lysons, K.; Farrington, B. *Purchasing and Supply Chain Management*, 7th ed.; Prentice Hall: London, UK, 2005; ISBN 9780273694380.
33. Esper, T.; Ellinger, A.; Stank, T.; Flint, D.; Moon, M. Demand and supply integration: A conceptual framework of value creation through knowledge management. *J. Acad. Mark. Sci.* **2010**, *38*, 5–18.
34. Ralston, P.M.; Richey, R.G.; Grawe, S.J. The past and future of supply chain collaboration: A literature synthesis and call for research. *Int. J. Logist. Manag.* **2017**, *28*, 508–530, doi:10.1108/IJLM-09-2015-0175.
35. Whipple, J.M.; Lynch, D.F.; Nyaga, G.N. A buyer's perspective on collaborative versus transactional relationships. *Ind. Mark. Manag.* **2010**, *39*, 507–518.
36. Li, S.; Ragu-nathan, B.; Ragu-nathan, T.S.; Rao, S.S. The impact of supply chain management practices on competitive advantage and organizational performance. *Int. J. Manag. Sci.* **2006**, *34*, 107–124, doi:10.1016/j.omega.2004.08.002.
37. Kotler, P.; Keller, K.L. *Marketing Management*, 13th ed.; Pearson Education Inc.: Upper Saddle River, NJ, USA, 2009.
38. Oladele, P.O. Causal direction between customers' satisfaction and service quality: A review of literature. *Eur. J. Hum. Soc. Sci.* **2011**, *2*, 2220–9425.
39. Ilieska, K. Knowledge for customers' satisfaction—As a base for new strategic management. *Skola Biznisa* **2011**, *5*, 25–31.
40. Shah, R.; Ward, P.T. Defining and developing measures of lean production. *J. Oper. Manag.* **2007**, *25*, 785–805, doi:10.1016/j.jom.2007.01.019.
41. Maxham, J.G.; Netemeyer, R.G. A longitudinal study of complaining customers' evaluations of multiple service failures and recovery efforts. *J. Mark.* **2002**, *66*, 57–71, doi:10.1509/jmkg.66.4.57.18512.
42. Walsh, G.; Beatty, S.E. Customer-based corporate reputation of a service firm: Scale development and validation. *J. Acad. Mark. Sci.* **2007**, *35*, 127–143, doi:10.1111/j.1467-8551.2007.00557.x.
43. Solomon, M.R. *Consumer Behaviour, Buying, Having and Being*, 8th ed.; Pearson Education Inc.: Upper Saddle River, NJ, USA, 2009.
44. Hom, W. An overview of customers' satisfaction models. In *RP Group Proceedings*; RP Group: New York, NY, USA, 2000; p. 101.
45. Population—Ekiti State of Nigeria. Available online: [population.gov.ng/ekiti-state](http://population.gov.ng/ekiti-state) (accessed on 22 January 2018).
46. Senatorial Districts in Ekiti State. Available online: <https://ekitistate.gov.ng/about-ekiti/overview/> (accessed on 21 November 2017).

47. Morris, M.; Carter, C.R. Relationship marketing and supplier logistics performance: An extension of the key mediating variables model. *J. Supply Chain Manag.* **2005**, *41*, 32–43, doi:10.1111/j.1745-493X.2005.04104004.x.
48. Min, S.; Mentzer, J.T. Developing and measuring supply chain management concepts. *J. Bus. Logist.* **2004**, *25*, 63–99, doi:10.1002/j.2158-1592.2004.tb00170.x.
49. Chen, I.J.; Paulraj, A. Towards a theory of supply chain management: The constructs and measurements. *J. Oper. Manag.* **2003**, *22*, 119–150, doi:10.1016/j.jom.2003.12.007.
50. Nunnally, J.C. *Psychometric Theory*; McGraw-Hill: New York, NY, USA, 1978.
51. Yamane, T. *Statistics: An Introductory Analysis*, 2nd ed.; Harper & Row, Evanston & London and John Weatherhill, INC.: New York, NY, USA, 1973.
52. Golberg, M.; Cho, H. *Introduction to Regression Analysis*; WIT Press: London, UK, 2010; ISBN 978-1-85312-624-6.
53. Field, A.P. *Discovering Statistics Using SPSS: (and Sex and Drugs and Rock “n” Roll)*, 3rd ed.; SAGE Publications: Los Angeles/Thousand Oaks, CA, USA; London, UK, 2009; ISBN 9781847879066.
54. McGrath, R.; Sparks, W.L. *Supply Chain Management: The Importance of Building Social Capital*; ASQ Quality Press: Washington, DC, USA, 2005; ISBN 0033524X.



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