

1 Article

2 **EFFECTS OF SUPPLY CHAIN DESIGN AND**  
3 **COLLABORATION ON CUSTOMERS'**  
4 **SATISFACTION OF INSTANT NOODLES IN EKITI**  
5 **STATE, NIGERIA**

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7 **Oluleye Seun Ogunmola**<sup>1\*</sup> and **Kayode Kingsley Arogundade**<sup>2</sup>

8 <sup>1</sup> Department of Business Administration, Ekiti State University, Ado Ekiti, Ekiti State, Nigeria;  
9 oluleyedadon@gmail.com

10 <sup>2</sup> Department of Business Administration, Ekiti State University, Ado Ekiti, Ekiti State, Nigeria; karog77@yahoo.co.uk

11 \* Correspondence: oluleyedadon@gmail.com; Tel.: +234-806-641-2448

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

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

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31 **1. Introduction**

32 Supply chain management is a set of measures employed to adequately unify the activities of  
33 suppliers, manufacturers and partners in distribution process to ensure optimal production and  
34 distribution of goods in right quantities to appropriate places and in timely manner so as to  
35 minimize overall cost while creating value and satisfaction for customers [1]. Distribution or  
36 movement of finished goods to the final consumers at reduced cost is considered the primary focus  
37 of any profit-oriented manufacturing firm and is therefore one of the most readily available  
38 yardstick to measure a firm's performance [2]. In consonance with this, Arogundade [3] noted that in

39 the supply chain management, the most logical and common logistic is the feed-forward logistic  
40 pattern where goods travel from the manufacturer to the ultimate consumer. Surprisingly, large  
41 number of instant noodles manufacturers in Nigeria have not done enough in terms of timely  
42 delivery of their products to their teeming customers across the length and breadth of the country  
43 [4]. MarkMonitor's Noodles Customer Satisfaction survey recently conducted on the competing  
44 noodles brands in Nigeria indicated that brands such as Honeywell and Golden Penny noodles have  
45 become scarce commodities in some parts of the country, Ekiti State inclusive [5]. This explains the  
46 reason why Indomie noodles continue to dominate the market because of its continuous innovations  
47 in distribution, promotions and advertisement.

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

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

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

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

## 82 **2. Literature Review**

### 83 *2.1. Theoretical Literature*

#### 84 Social Capital Theory

85 Coleman [17] hinged social capital on the structures of interpersonal and business relations  
86 which exists and determines the actions of actors in the social network. Social capital is defined as

87 the aggregate of all resources apparent within and obtainable from the network created by a group  
88 of people in a social setting [18].

89 Based on the inherent facts and similarities among the various definitions, Avery and Swafford  
90 [19] identified three characteristics that describe social capital as:

- 91 • existence of individual players within the social network,
- 92 • there must be exchange of available resources among the actors in the network,
- 93 • and sharing of these available resources brings about positive results.

94 The network is considered the most important function in the theory. It provides the platform  
95 for resource sharing among actors. According to the findings of Szeman and Kaposky [20], the  
96 primary proposition of the theory of social capital premise on the fact that relationship networks  
97 represent an indispensable resource in terms of activity coordination and presents members with  
98 co-owned capital which ultimately provides license of entitlement to credit or social benefits. It  
99 therefore proposes that for an actor to partake in the pool of social capital resources he must be  
100 connected to a lasting or reliable network of formally established relationships of bilateral  
101 recognition. The theory also proposes that for effective resource sharing to occur, there must be a  
102 well-defined structure.

103 Capital or resource is another salient factor in the theory. McGrath and Sparks [21] identified  
104 social capital as the active human elements such as shared values, trust, interdependence and  
105 bilateral collaboration which unite people or groups within a network towards attainment of unified  
106 objectives. Capital or resources, which forms the basis or goal of the entire relations, can be tangible  
107 (e.g. finance) or intangible (e.g. training, goodwill, reputation) as the case may be [22].

108 McGrath and Sparks [21] reported that researchers now appreciate the human network which  
109 forms the framework of collaboration between supply chain partners rather than the usual emphasis  
110 on economic position and this is evident in the popular application of the social capital theory. The  
111 social network is similar to supply chain which involves all supply chain partners.

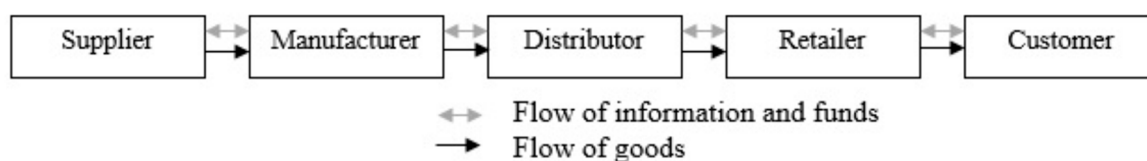
112 The structured business relations among these individual actors present opportunities in the  
113 form of expertise, skills, reputation, goodwill, facilities etc which can be related to the  
114 network-inherent capital or resources. In an atmosphere of trust, these resources can be pulled  
115 together by the actors to facilitate improved collaboration among partners and forge a more efficient  
116 supply chain network. This harmonious relations and bilateral collaboration among parties in the  
117 supply chain give rise to increased value creation at highly reduced cost thereby enhancing  
118 customers' satisfaction.

## 119 2.2. Conceptual Clarifications

### 120 2.2.1. Supply Chain Design

121 Waters [23] pointed out that a well-designed supply chain permits unhindered movement of  
122 production materials and components upstream, work-in-progress within and delivery of finished  
123 goods downstream. This flow from one stage to another determines the degree of efficiency of the  
124 entire supply chain [24].

125 The pattern of travel or movement of goods to the final consumers along the supply chain is  
126 highly determined by the supply chain design employed. This is characterised by the number of  
127 middlemen through which the goods pass before getting to its final destination. The length of  
128 delivery process determines accessibility which in turn defines the level of satisfaction derived by  
129 the consumers or customers. The basic supply chain design involves the movement of materials  
130 through the supplier to the manufacturer and distribution of finished goods from the producer  
131 through wholesaler to the retailer until accessible by the final consumers [25,26]. However, the  
132 structure has been abridged in order to hasten the delivery process especially in the case of  
133 perishable products [1,24,25].



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**Figure 1.** Typical Supply Chain

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**Source:** [26]

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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 [27]. A well-integrated supply chain structure cuts costs and saves time of operation at the various levels.

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Based on the empirical research conducted by Zailani et al. [28], 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.

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### 2.2.2. Collaboration

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Collaboration or cooperation is the backbone of any social structure involving human relations [17] and the level of interaction between partners in the supply chain determines the results of the management process [19]. Smith et al. [29] 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 [10–12,15,30].

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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 [30]. 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 [2,29].

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Lysons and Farrington [31] 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.

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### 2.2.3. Customer Satisfaction

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Different scholars have defined customer satisfaction in different ways. Kotler and Keller [32] 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 [33]. Ilieska [34] 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

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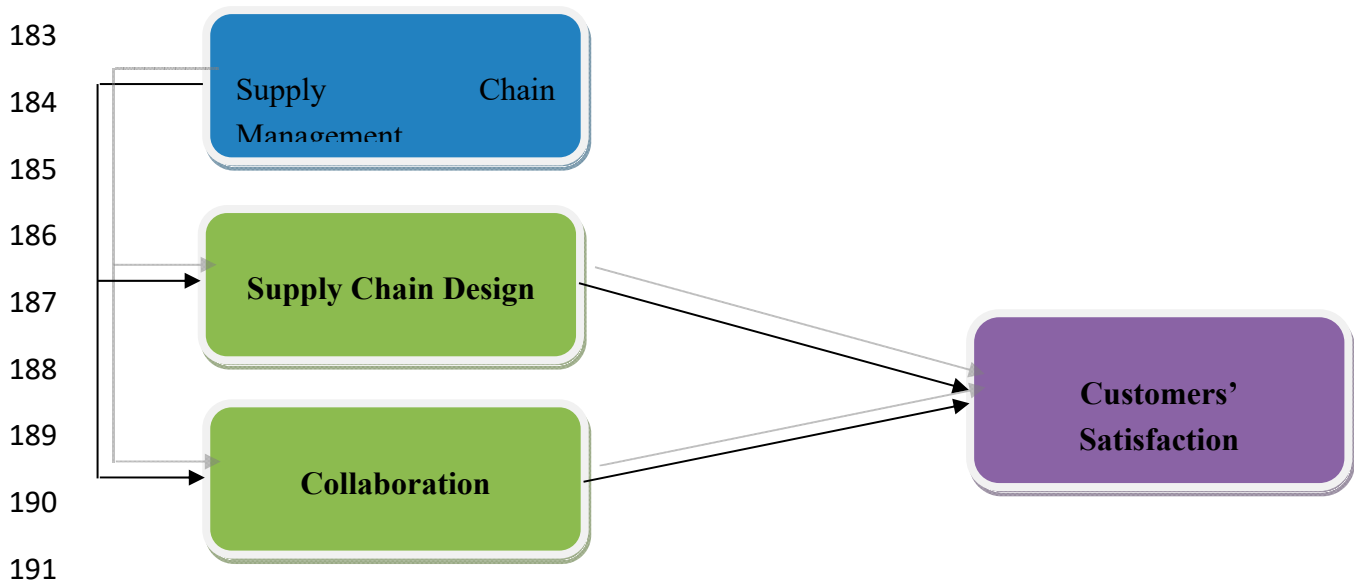
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Retailers expect transaction processing to be seamlessly done at any given time and goods delivered as at when due; anything short of this results in dissatisfaction. The purpose of supply chain management is to ensure that appropriate measures are put in place to facilitate the attainment of customers' expectations.

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### 176 2.3. Conceptual Framework

177 Francis and Waiganjo [11] in their study identified various supply chain dimensions capable of  
 178 determining customers' satisfaction. They considered benchmarking, organisational leadership,  
 179 collaboration and responsiveness as possible practices of supply chain that affect customers'  
 180 satisfaction. The proposed model for this study was therefore founded on social capital theory and  
 181 anchored on existing framework adapted from Francis and Waiganjo [11] with the introduction of  
 182 an added variable (supply chain design) to the relationship.



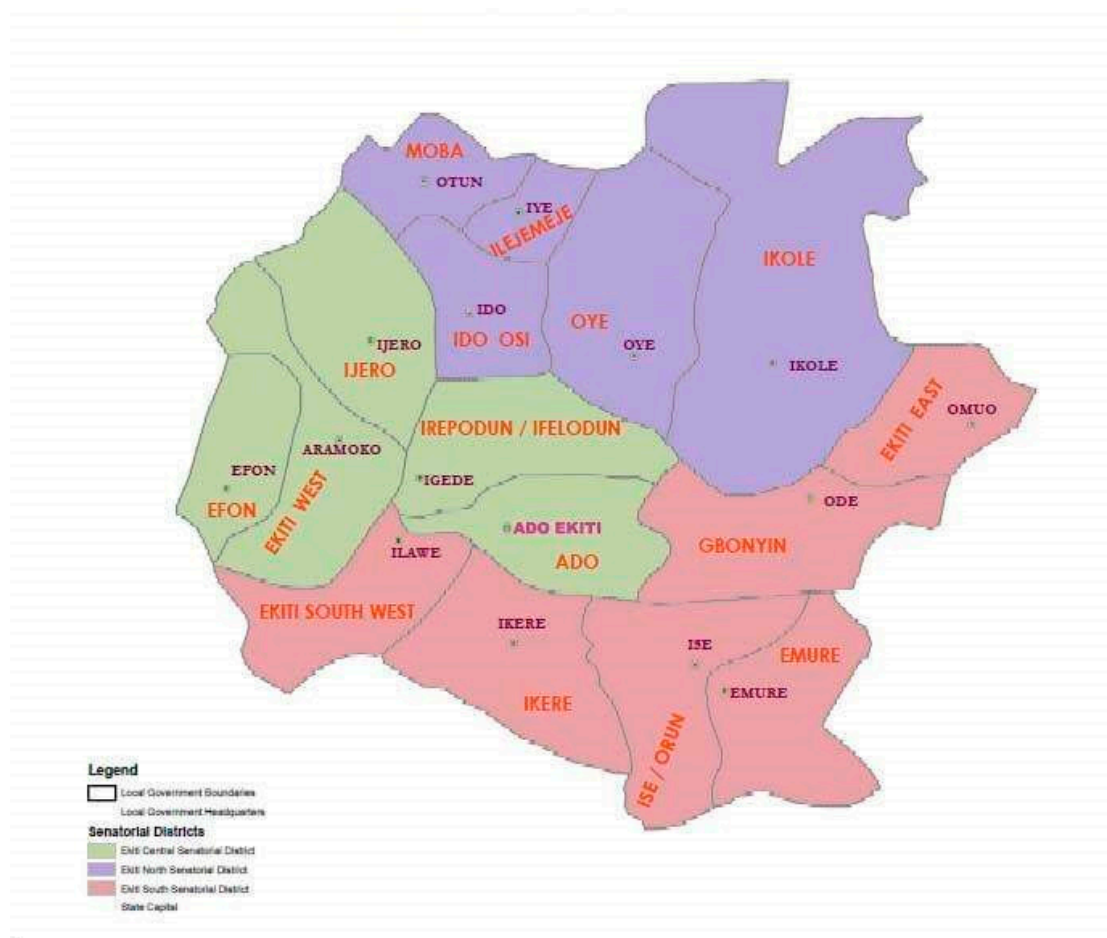
192 **Figure 2.** Proposed Research Model

193 **Source:** Adapted from [11]

## 194 3. Methodology

### 195 3.1. Study Area

196 This study was carried out in Ekiti State which is one of the States in Southwest, Nigeria. Ekiti  
 197 State was created on October 1, 1996 after it was carved out of the old Ondo State by the then  
 198 military administration of General Sanni Abacha. Upon creation, Ado Ekiti became the capital and  
 199 currently the economic hub of Ekiti State. According to the 2006 national census [35], the population  
 200 of the State stood at 2, 398,957. The State covers an expanse of land area measuring 6,353 square  
 201 kilometres hosting 16 local government areas in three senatorial districts. Common mineral  
 202 resources in Ekiti State include Kaolin, Clay, Granite, Feldspar and Syenite.



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204 **Figure 3.** Senatorial Districts in Ekiti State205 **Source:** [36]

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207 *3.2. Research Design*

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

212 The questionnaire and its scales were adapted from previous studies including [2,37–42] and  
 213 carefully reviewed then accordingly modified by experts in order to enhance content validity of the  
 214 scale. Only questions relevant to supply chain design, collaboration and degree of customers'  
 215 satisfaction were retained in the modified scales. The structured questionnaire consisted of questions  
 216 in four different sections. Section A covered respondents' demographic profile, section B was used to  
 217 elicit data on supply chain design, section C collated data on collaboration while section D fetched  
 218 data on level of customers' satisfaction derived by the respondents (retailers).

219 *3.3. Reliability and Validity of Questionnaire*

220 The reliability and internal consistency of the research instrument as performed on the relevant  
 221 variables was determined or measured by Cronbach alpha which is most commonly used in

222 reliability tests. Under this measure, Cronbach alpha with value greater than or equal to 0.7 was  
 223 found adequate in the measurement of internal consistency of an instrument [43].

224 **Table 1.** Reliability of Variables

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			

225 **Source:** SPSS Reliability Analysis Output, 2018

226 Table 1 described the output of reliability test on the scale used in this study. The 19-item scale,  
 227 comprising of 4 constructs (variables) has an overall alpha value ( $\alpha$ ) of 0.808 which surpassed the  
 228 standard threshold of 0.7 establishing adequacy of the instrument in achieving desired objectives  
 229 [43]. In the course of testing the scales, some items were dropped due to relatively low item-total  
 230 correlation. From the results, supply chain design returned highest reliability coefficient of 0.800  
 231 while 5-item-scale collaboration recorded the lowest reliability coefficient of 0.753.

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

### 238 3.4. Data Collection and Sampling Technique

239 Population of this study was taken as the retailers at the lower end of the supply chain network  
 240 who buy directly from the noodles manufacturer(s) or through designated middlemen. The retailers  
 241 were targeted as respondents to this study because they are the major supply chain stakeholders  
 242 who take title to the goods and are most affected by manufacturers' production and supply policies  
 243 as well as practices in the entire supply chain network.

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

248 **Table 2.** Study Population by Senatorial Districts

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

249 **Source:** Ekiti State Ministry of Commerce, Industry and Cooperatives (2018)

250 A total sample of 381 respondents generated from the total population with the aid of Yamane  
 251 [44] formula was chosen for this study using purposive sampling method. This formula was  
 252 adopted because of its reputation for presenting an unbiased sample from a large population.

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

#### 263 4. Results and Discussion

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

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

##### 276 4.1. Testing of Hypotheses

277 The general regression equation for the inferential analysis is given as  $Y = \beta_0 +$   
 278  $\beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n + e$  where Y is the dependent variable; X independent  
 279 variable and e is the error term.

##### 280 4.1.1. Regression Analysis of Supply Chain Design and Customers' Satisfaction

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

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

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

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tol	VIF
	(Constant)	2.113	0.176				11.982
Supply Chain Design	0.463	0.040	0.518	11.586	0.000	1.000	1.000
<b>Model Summary:</b>							
	R				0.518		
	R Square (R <sup>2</sup> )				0.268		
	Adjusted R <sup>2</sup>				0.266		
	F				134.234		
	Durbin-Watson				1.352		

<sup>a</sup>Independent Variable: Supply Chain Design<sup>b</sup>Dependent Variable: Customer Satisfaction

Source: Author's Regression Output, 2018

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289 From the model summary of regression output presented in Table 3, the computed value of R =  
 290 0.518 indicated a moderate positive relationship between the outcome and predictor variables. Also  
 291 it could be observed that supply chain design was responsible for 26.8% (R<sup>2</sup> = 0.268) of variance in  
 292 customers' satisfaction. Variance inflation factor of 1.000 under collinearity statistics indicated that  
 293 there was no multicollinearity in the regression model [45]. The alternative hypothesis was therefore  
 294 accepted as supply chain design was found to be statistically significant (B = 0.463; t = 11.586; p <  
 295 0.05). The model function could be written as: CS = 2.113 + 0.463\*SCD + e; meaning that for every 1%  
 296 increase in supply chain design, there exist 46.3% increase in customers' satisfaction.

297 4.1.2. Regression Analysis of Collaboration and Customers' Satisfaction

298 **Ho2:** Collaboration does not significantly affect customers' satisfaction of instant noodles in Ekiti  
 299 State.

300 **Ha2:** Collaboration significantly affects customers' satisfaction of instant noodles in Ekiti State.

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

Coefficients	
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Model	Unstandardised 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		

<sup>a</sup>Independent Variable: Collaboration

<sup>b</sup>Dependent Variable: Customer Satisfaction

Source: Author's Regression Output, 2018

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303 Regression output of collaboration as predictor against customers' satisfaction as outcome  
 304 variables presented in Table 4 indicated a fairly strong positive relationship between the outcome  
 305 and predictor variables with  $R = 0.564$ . The model summary further revealed that collaboration  
 306 explained 31.8% ( $R^2 = 0.318$ ) of variance in customers' satisfaction. 68.2% of variation in the outcome  
 307 variable was thus accounted for by other extraneous factors outside the coverage of this model.  
 308 Variance inflation factor of 1.000 indicated that there was no multicollinearity problem in the  
 309 regression model [45]. The alternative hypothesis was supported and accepted as collaboration was  
 310 found statistically significant ( $B = 0.516$ ;  $t = 13.091$ ;  $p < 0.05$ ). The regression function could be written  
 311 as:  $CS = 2.080 + 0.516 \cdot CAC + e$ ; indicating that customers' satisfaction increase by 51.6% for every 1%  
 312 increase in collaboration among supply chain partners.

#### 313 4.2. Discussions and Managerial Implications

##### 314 4.2.1. Role of Supply Chain Design

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

321 Supply chain design as predictor variable showed moderate positive correlation with  
 322 customers' satisfaction as observed in the model summary ( $R^2 = 26.8\%$ ). The findings of this study  
 323 were in consonance with that of previous researchers. Ibrahim [14] reported that of all the control  
 324 variables of supply chain flexibility (Competitive Environment Evaluation, Supply Chain Diagnostic  
 325 Review and Supply Chain Development) tested against customer satisfaction and retention, supply  
 326 chain development recorded the highest effect on customer satisfaction. The author posited that the

327 design and development of dynamic supply chain holds more benefits to the firm than any other  
328 distribution flexibility criteria. It promotes loyalty, boosts firm's reputation and enables easy  
329 resource sharing among supply chain partners. This assertion was in tandem with the postulation of  
330 the system thinking theory that operational proximity and position of the supply chain partners  
331 would determine the level of interaction and resource sharing which in turn enhances value creation  
332 and customers' satisfaction. Following the statistical values of the relationship ( $B=.463$ ,  $t=11.586$ ,  
333  $p<0.05$ ) the alternative hypothesis ( $H_{a1}$ ) was accepted while the null hypothesis ( $H_{o1}$ ) was rejected.  
334 The implication of this is that management must take the design of both upstream and  
335 downstream supply chain as a priority and strategically done with the involvement of other  
336 partners. Structure decentralisation and dynamism are important for better product performance.  
337 This creates trust with the middlemen in the supply chain and loyalty with consumers of the goods  
338 on the far end of the chain.

#### 339 4.2.2. Role of Collaboration

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

344 As observed from the regression output, collaboration exerted positive moderate effects on  
345 customers' satisfaction ( $B=.516$ ,  $t=13.091$ ,  $p=0.000$ ). The coefficient of determination of the model ( $R^2 =$   
346  $0.318$ ) also implies that collaboration exerts higher effects on customers' satisfaction when compared  
347 to supply chain design. This implies that firms must, as matter of priority, enable the survival of  
348 collaboration within their supply chain network in order to operate optimally. These results  
349 conclusively led to the acceptance of the alternative hypothesis ( $H_{a2}$ ) while null hypothesis ( $H_{o2}$ )  
350 was rejected.

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

357 Furthermore, the findings of this study were in direct harmony with the stance of social capital  
358 theory which states that players in the social network get direct optimised access [19] to embedded  
359 social capital resources or benefits when there is trust and bilateral collaboration among the  
360 participants [21]. Collaboration positions the entire chain as a single firm in operation. The  
361 implication of this for the management of an organisation is that collaboration should not be limited  
362 to the internal organs of the firm but extended effectively to all parts of the supply chain in order to  
363 attain organisational effectiveness through improved customers' satisfaction.

## 364 5. Conclusions and Recommendations

### 365 5.1. Conclusion

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

371 Conclusion could therefore be drawn from the statement above that there exists positive  
372 significant relationship between the level of customers' satisfaction and the two factors of supply

373 chain management: supply chain design and collaboration. This implies that these two practices of  
374 supply chain management are highly important criteria any manufacturing firm especially in the  
375 noodles industry must pay close attention to in order to satisfy her consumers and win big in terms  
376 of market share.

## 377 5.2. Recommendations

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

379 (i) Having observed from the research findings that collaboration among supply chain players  
380 yielded greater influence on customers' satisfaction than the supply chain design, it is  
381 recommended that supply chain decision makers pay more attention to policies that will  
382 enhance both vertical and horizontal integration with the organisation and among the  
383 supply chain partners in order to seamlessly harmonise production and distribution  
384 processes.

385 (ii) Also, based on the finding that supply chain design is an important predictor of customers'  
386 satisfaction in the noodles industry, management of organisations should pay critical  
387 attention to the structure of their distribution networks and ensure flexibility in the delivery  
388 process with less bottleneck in the relationship between the partners in order to get timely  
389 and accurate information of the chain performance and expectations of the final consumers  
390 who are closest to the retailers.

391

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

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399

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