

## Management of Finished Goods Inventory and the Performance of Soft-Drink Manufacturing Companies in North Central Nigeria

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### Abstract

Since the inception of Nigeria Bottling Company and Seven up company in 1951 and 1926 respectively in Nigeria, the issue of keeping finished goods inventory at reasonable levels has been a major challenge that has affected the company's profitability, sales volume, turnover as well as customers' patronage. This study examined the management of finished goods inventory and the performance of soft-drink manufacturing companies in North Central, Nigeria. The study examined how forecasting demand, product handling as well product planning and warehouse management influence on the performance (sales volume and customer satisfaction) of Soft-drink Manufacturing Companies in North-Central Nigeria. The study adopted a combination of survey, explanatory and exploratory research, which involved the use of primary data for analysis. The data collection exercise involved a focus group discussion (FGD) with different targeted group of customers. The total population of study was two hundred and forty nine (249) management staff of Nigeria Bottling Company Ltd and Seven-Up Bottling Company Plc in North Central, Nigeria and a sample size of one hundred and fifty-three (153) was drawn using Taro Yamane's sample size technique. The study covered a period of 10 years from 2009 to 2018. The hypotheses were formulated in null form in line with the objectives of the study and the ordinary Least Squares (O.L.S) method of regression was employed for the analysis of the data collected. Findings revealed that there is a positive significant relationship between management of finished goods inventory and the performance of soft-drink manufacturing companies in North Central, Nigeria. The study therefore recommends that the management of Nigeria Bottling Company Ltd and Seven Up Bottling Company PLC should continue to improve and update the methods of managing finished goods inventory since there is a positive significant relationship between the management of finished goods inventory and sales volume, which can be done by accurately forecasting demand in other to avoid over stocking or going out of stock.

**Keywords:** *Economic order quantity, Out of stock, Over stocking, Holding cost, Ordering cost*

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### **Background to the Study**

Survival of any business concern depends to a very great extent on the firm's ability to effectively manage and control its finished goods inventory. The inability to achieve this feat has caused the failure of many industries (Oliomogbe, 2012). Inventory therefore plays a central role in any business and it is the main reason for the continuous existence of any business organization mostly those in manufacturing sector. It consists of raw materials, work-in-progress, spare parts/consumables, and finished goods. However, finished goods inventory which are products that have completed the manufacturing process and ready for sale, just like other types of inventory needs efficient management as a substantial share of a firms' funds is invested in them. Also, managing finished goods inventory levels is important for companies to show whether sales efforts are effective or whether costs are being controlled.

### **Statement of the Problem**

Since the inception of Nigeria Bottling Company and Seven up company in 1951 and 1926 respectively in Nigeria, the issue of keeping finished goods inventory at reasonable levels has been a major challenge that has affected the company's profitability, sales volume, turnover as well as customers' patronage (Anichebe and Agu, 2013). The challenge involves having to balance the conflicting economics of not wanting to hold too much stock and not wanting to run out of stock, which is, balancing the supply of finished goods inventory with demand. Although, the Nigeria Bottling Company and Seven up company established the re-order level economic order quantity system, a scientific method of arriving at a general finished goods inventory policy and crucial inventory decisions far back as 2009 and 2011 respectively, yet the issue of keeping finished goods inventory at reasonable levels still persists. Moreso, the Seven up company also adopted the Just in Time (JIT) finished goods inventory management system in 2014 in other to keep finished goods inventory at reasonable levels yet the issue has persevered. The persistence of the issue was observed in the Seven- Up Company (SBC) plant in Kwara state that serves the entire north central zone, which in other to avoid overstocking of some its finished goods inventory the company observed that it did not have in store some of its finished goods such as Mountain Dew and Mirinda for several periods lasting up to a year as at 2017. This in turn affected not only the customers' patronage but also the turnover rate, sales volume and net profit of the company as well (Seven- Up Company PLC audited records, 2017). Likewise, the Nigerian Bottling Company (NBC) manufacturing plant in Abuja ran out of stock of Coca Cola and Schwepps for several periods lasting up to five months as at 2017. Also, in 2018 the Nigerian Bottling Company (NBC) manufacturing plant in Plateau state also in a bid to avoid running out of stock of some its finished goods inventory recorded excess Fanta and Coca Cola in its warehouse which led to low inventory turnover, reduction in sales volume, fluctuating profit, as well as higher holding cost of finished goods inventories and locking of capital in its stock inventory (NBC Bulletin, 2018).

Hence, the researcher examined the management of finished goods inventory and the performance of soft-drink manufacturing companies in North Central Nigeria in other to come up with some decision rules or recommendations towards addressing the underlying issue(s).

### **Objectives of the Study**

The main objective of this study is to examine the management of finished goods inventory and the performance of soft-drink manufacturing companies in North-central Nigeria.

The specific objectives are to:

- i. Examine the management of finished goods inventory on the sales volume of soft-drink manufacturing companies in North-central Nigeria
- ii. Examine the management of finished goods inventory on customers' satisfaction of soft-drink manufacturing companies in North-central Nigeria

### **Review of Related Literature**

#### **Concept of Finished Goods Inventory Management**

Miller (2010), defined finished goods inventory as goods that have been completed by the manufacturing process, or purchased in a completed form, but which have not yet been sold to customers, while Ogbo, (2014) described it as the third group of inventory owned by a manufacturer and consist of products that are ready for sale. Smaros (2013), on the other hand views it as the number of manufactured products in stock that are available for customers to purchase. However, Ile (2012), defined the management of finished goods inventory as the activities put in place to ensure that customer gets the needed product or service as at when due. This according to him involves the efficient handling of the products after production and during distribution, effective product planning, forecasting demand accurately, as well as efficient warehouse management. Ozigbo (2010), describes the management of finished goods inventory as control systems involved with forecasting demand of goods accurately, specifying the size and placement of stocked goods in other to meet customers' orders. In the view of Agha (2010), management of finished goods inventory involves managing the warehouse efficiently, forecasting demand accurately and handling of products efficiently, as well as maintaining good distribution functions. Similar to the view of Agha (2010), Smaros (2013), views management of finished goods inventory as the science of organizing and maintaining step by step the proper planning of products or goods produced, the efficient handling of the products and the proper management of the warehouse.

#### **Concept of Performance**

Organizational performance remains a central theme in contemporary literature, scholars continue to ventilate on various factors that inform performance in diverse organizations. A company's performance can be measured based on the variables that are involved in the productivity, returns, growth or even customer satisfaction (Mihaela, 2012). Financial performance (reflected in profit maximisation, maximising return on assets and maximising shareholders return) is based on the firm's efficiency (Mihaela, 2012). The term performance is a controversial issue in finance largely because of its multidimensional meanings (Prahalthan, 2011 cited by Mihaela, 2012). It can be defined as outcome-based financial indicators that are assumed to reflect the fulfilment of the economic goals of the firm. It is the process of identifying the financial strengths and

weaknesses of the firm by properly establishing relationship between the items of the balance sheet and the profit and loss account and it relates to the motive of maximizing profit both to the shareholders and on assets while the operational performance concerns with growth and expansions in relations to sales and market value (Prahalthan, 2011).

According to Richard (2009), company's performance encompasses three specific areas of firm outcomes: financial performance (profits, return on assets, return on investment etc); product market performance (sales, market share) and shareholder return (total shareholder return, economic value added). Prahalthan (2011) argued that performance measures could include result-oriented behavior criterion-based and relative normative measures, education and training, concepts and instruments, including management development and leadership training, which were the necessary building skills and attitudes of performance management.

### **Theoretical Framework**

#### **Theory of Demand Forecasting and Management of Finished Goods Inventory**

The theory of demand forecasting and inventory management was propounded by Grabara, Grabara, Kot, Rozdz & Lapide (2008), and according to the theory, management of logistics chains plays a key role in the process of demand forecasting and that the whole supply chain is subject to flow of both materials and information. Owing to frequent uncertainties in the market development, fluctuating demand and changes in lead times, the management of finished goods inventory may be very complicated (Emmett, 2018). However, early demand forecasting allows for limitation of costs generated as a result of storage of excessive amount of unsold products (Brzozowska & Nowicka, 2017). It should be emphasized that the selected techniques of prediction are contained in the implemented advanced information technology (IT) systems used for warehouse management. The companies that do not use these systems or use them only for limited areas, incur considerably higher costs of building inventory, which would have been use to keep the firm profitable.

### **Empirical Review**

Anichebe and Agu (2013) examined the management of finished goods inventory and the performance of soft-drink manufacturing companies in Enugu State. The study considered sales volume and customers satisfaction as measures for the dependent variable. Descriptive (survey) and case study research design were employed in carrying out the study. The population of the study was six hundred and fifty-eight (658) and a sample size of two hundred and forty-eight (248) was derived using the Taro Yamane formula for sample size determination from a finite population. Data were generated using questionnaire and oral interviews. Data were presented in tables and analyzed using simple percentages. Pearson product moment correlation coefficient and linear regression were used in the hypotheses testing. Findings indicate that management of finished goods inventory has a significant positive effect on sales volume but a negative influence on customers' satisfaction. The study is limited to soft drink manufacturing companies in Enugu State. Also, the study did not clearly state how it arrived at selecting the soft drink manufacturing companies in Enugu state.

Oliomogbe (2012), examined the management of finished goods inventory and sales volume, a study of Nigeria Bottling Company, Port Harcourt Rivers State. A sample size of 200 respondents all randomly selected from the staff and management of Nigeria Bottling Company were used. Both primary and secondary data were used in collecting data and analyzed using the Chi-square. Findings revealed that there is a positive significant relationship between the management of finished goods inventory and sales volume. The study made use of chi-square as the tool of analysis instead of a more appropriate tool like the ordinary least regression technique to analyze the data collected. The study is also limited to Nigeria Bottling Company, Port Harcourt Rivers State. Agu, Obi-Anike, & Eke (2016), conducted a study to ascertain the impact of management of finished goods inventory on customers satisfaction of soft drink manufacturing firms in Lagos State. The descriptive survey research design was adopted for the study. The hypotheses were tested using Pearson product moment correlation coefficient and simple linear regression statistical tools. The findings indicate that the management of finished goods inventory has a positive relationship with customers satisfaction of selected manufacturing firms ( $r = 0.849$ ;  $t = 27.726$ ;  $F = 768.754$ ;  $p < 0.05$ ). There is also a positive relationship between demand management and customer satisfaction of selected manufacturing firms ( $r = .799$ ,  $P < .05$ ). Just -in - time has a significant effects on growth of the selected manufacturing firms ( $r = .885$ ;  $t = 32.865$ ;  $F = 1080.094$ ;  $p < 0.05$ ).

The findings of the study is limited to manufacturing firms in Lagos State, further study could still be carried out in other firms outside the manufacturing firms in Lagos State.

### Methodology

The study combine the use of both qualitative and quantitative data; the qualitative data shall be the survey data used to measure customers satisfaction and employees view regarding finished goods inventory turnover while the quantitative data shall be the sales volume, inventory turnover ratio and profitability.

The study population consists of the soft drink manufacturing companies in north-central states (Abuja, Nasarawa, Plateau, Niger, Kogi, Benue, Kwara) of Nigeria, which are: Nigeria Bottling Company limited (NBC), Seven-Up bottling company PLC (SBC) and La Casera Company PLC (LCC).

**Table 1:** Target Population of Soft-Drink Manufacturing Companies

S/N	States	No. of Manufacturing Plants (NBC)	No. of Manufacturing Plants (SBC)	No. of Manufacturing Plants (LCC)
1.	Abuja	1	-	-
2.	Nasarawa	-	-	-
3.	Plateau	1	-	-
4.	Niger	-	-	-
5.	Kogi	-	-	-
6.	Benue	-	-	-
7.	Kwara	-	1	-

Source: Survey data, 2018.

**Table 2:** Target Population of the Management Staff of Soft-Drink Manufacturing Companies in North Central Nigeria

Departments/ Units	Abuja NBC Manufacturing Plant	Plateau State NBC Manufacturing Plant	Kwara State 7UP Manufacturing Plant	Total
Plant Manager	1	1	1	3
Sales	9	11	15	35
Production /Factory	8	9	8	25
Quality Control	4	4	6	14
Warehouse	34	21	24	69
Finance	10	11	8	29
Company Accountant	5	6	5	16
Transport	5	7	7	19
Marketing	10	13	16	39
Utility	4	5	-	9
Total	<b>80</b>	<b>88</b>	<b>81</b>	<b>249</b>

**Source:** Survey Data, 2018.

The stratified random sampling technique was used to obtain a representation of a sample from the population since the population was not drawn from a homogenous group. The researcher divided the entire population into different subgroups or strata, then applied the stratified sample formula to calculate the proportion of staff from each group to be randomly selected from the different strata. Ordinary Least Squares method of regression was used to test the relationship between management of finished goods inventory and the performance of Nigeria Bottling Company Plc and Seven-Up bottling company Ltd. The regression analysis was computed using Statistical Package for the Social Sciences (SPSS) version 23. Since the result of the Alpha is more than 0.7 based on the right target population identified; adequate representation of sample; appropriateness of sampling method; structured questionnaire using Likert-scales; administering the instrument without biasness, entering data with care using E-view package (version7), we therefore conclude that the measuring instrument of the variables is reliable and acceptable.

## Data Presentation and Analysis

**Table 3:** Descriptive Statistics for Customer Satisfaction Variables

Descriptive Statistics							
Variable	N	Range	Minimum	Maximum	Mean	Std. Deviation	Decision
Quality of Finished Goods Inventory	74	4.00	1.00	5.00	1.8559	1.13435	Satisfied
Price of Finished Goods Inventory	74	4.00	1.00	5.00	2.3983	1.20639	Satisfied
Promotion Distribution	74	4.00	1.00	5.00	2.6780	0.41350	Satisfied
Valid N (listwise)	74	4.00	1.00	5.00	2.1271	0.28467	Satisfied

**Source:** Computed by the author using SPSS (Version 23)

### Test of Hypothesis One

$H_{01}$ : Management of finished goods inventory has no significant influence on the sales volume of soft-drink manufacturing companies in North-central Nigeria

**Table 4:** OLS Result Using SPSS version 23

ANOVA <sup>a</sup>					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3463.985	4	865.996	439.830	.000 <sup>b</sup>
Residual	222.489	113	1.969		
Total	3686.475	117			

a. Dependent Variable: DSVscore

b. Predictors: (Constant), IWMscore, IPPscore, IDFScore, IPHscore

**Source:** Computed by the author using SPSS Version 23

**Table 5.**

Coefficients <sup>a</sup>					
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.726	.347		2.090	.039
IDFScore	1.896	.179	1.345	10.611	.000
IPHscore	-.085	.223	-.060	-.380	.705
IPPscore	.391	.121	.304	3.237	.002
IWMscore	-.948	.269	-.644	-3.529	.001

a. Dependent Variable: DSVscore

**Source:** Computed by the author using SPSS Version 23

From the result of hypothesis one above, it was found that there was a significant relationship between demand forecasting and sales volume at (B = 1.896, t = 10.6, Sig = .000, P <.05). This result indicates that the more accurate demand forecasting is, the higher the sales volume. For product handling, the result reveals that there was no significant relationship between product handling and sales volume at (B = -.085, t = -.380, Sig = .705, P <.05). This result shows that the more the product handling the lower the sales volume of the soft-drink manufacturing companies.

From the regression result, the regression model is stated as follows:

$$SV = .726 + 1.896DF - .85PH + .391PP - 0.948WM + .347..... (1)$$

A test of the regression model indicates that the personal variables as a set effectively influenced the yielded F = 439.830 and p-value of 0.039 is significant since p-value is less than 0.05 level of significance. This implies that the regression model, as shown in Equation 1, significantly explained the predictability of demand forecast (DF), Product Handling (PH), Product Planning (PP) and Warehouse Management (WM) on the performance of Soft drink manufacturing companies variable "Sales Volume".

Also, the coefficient of determination (R<sup>2</sup>) of 0.94 indicates that 94% of variation in sales volume (SV) in both Nigeria Bottling Company and 7UP Bottling Company can be explained by the management of finished goods inventory (demand forecast, Product Handling, Product Planning and Warehouse Management). The remaining 6% can be explained by other related factors not noted in the regression model. The F-statistic value of 439.830 is significant at p-value of 0.00. This implies that there is an evidence of linear relationship between the management of finished goods inventory (demand forecast, Product Handling, Product Planning and Warehouse Management) and sales volume in Nigeria Bottling Company and 7UP Bottling Company. Therefore, we accept the alternative hypothesis that management of finished goods inventory has significant influence on the sales volume of soft-drink manufacturing companies in North-central Nigeria.

**Table 6.**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.969 <sup>a</sup>	.940	.938	1.40319	2.291

a. Predictors: (Constant), IWMscore, IPPscore, IDFscore, IPHscore

b. Dependent Variable: DSVscore

**Source:** Computed by the author using SPSS Version 23

Relationship between the Management of Finished Goods Inventory and Customers' Satisfaction of soft drink Manufacturing Companies in North Central, Nigeria.



**Test of Hypothesis Two**

H<sub>02</sub>: Management of finished goods inventory has no significant influence on customers' satisfaction of soft-drink manufacturing companies in North-central Nigeria

**Table 7:** OLS Result Using SPSS version 23

**ANOVA<sup>a</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	3240.986	4	810.247	2799.195	.000 <sup>b</sup>
Residual	32.709	113	.289		
Total	3273.695	117			

a. Dependent Variable: DCSscore

b. Predictors: (Constant), IWMscore, IPPscore, IDFScore, IPHscore

**Source:** Computed by the author using SPSS Version 23

**Table 8.**

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-.011	.133		-.083	.934
IDFScore	.243	.069	.183	3.551	.001
IPHscore	.142	.086	.106	1.660	.100
IPPscore	.461	.046	.380	9.952	.000
IWMscore	.471	.103	.340	4.576	.000

a. Dependent Variable: DCSscore

**Source:** Computed by the author using SPSS Version 23

From the result of hypothesis two above, it was found that there was a significant relationship between demand forecasting and customer satisfaction at (B = 0.243, t = 3.551, Sig = .001, P <.05). This result indicates that the more accurate demand forecasting is, the higher the satisfaction of customers. For product handling, the result reveals that there was also a significant relationship between product handling and customer satisfaction at (B = .142, t = 1.660, Sig = .100, P <.05). This result shows that the better the product is handled, the higher the satisfaction of customers of soft-drink manufacturing companies.

From the regression result, the regression model is stated as follows:

$$CS = -0.11 + .243DF + .142PH + .461PP + 0.471WM + .133..... (2)$$

A test of the regression model indicates that the personal variables as a set effectively influenced the yielded  $F = 2799.195$  and  $p$ -value of  $0.000$  is significant since  $p$ -value is less than  $0.05$  level of significance. This implies that the regression model, as shown in Equation 2, significantly explained the predictability of demand forecast (DF), Product Handling (PH), Product Planning (PP) and Warehouse Management (WM) on the performance of Soft drink manufacturing company's variable "Customer Satisfaction".

Also, the coefficient of determination ( $R^2$ ) of  $0.99$  indicates that  $99\%$  of variation in customer satisfaction (CS) in both Nigeria Bottling Company and 7UP Bottling Company can be explained by the management of finished goods inventory (demand forecast, Product Handling, Product Planning and Warehouse Management). The remaining  $1\%$  can be explained by other related factors not noted in the regression model. The  $F$ -statistic value of  $2799.195$  is significant at  $p$ -value of  $0.000$ . This implies that there is an evidence of linear relationship between the management of finished goods inventory (demand forecast, Product Handling, Product Planning and Warehouse Management) and customer satisfaction in Nigeria Bottling Company and 7UP Bottling Company. Therefore, we accept the alternative hypothesis that management of finished goods inventory has significant influence on customers' satisfaction of soft-drink manufacturing companies in North-central Nigeria.

**Table 9.**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.995 <sup>a</sup>	.990	.990	.53801	2.585

a. Predictors: (Constant), IWMscore, IPPscore, IDFScore, IPHscore

b. Dependent Variable: DCSscore

**Source:** Computed by the author using SPSS Version 23

### Summary

This study examines the management of finished goods inventory and the performance of soft drink manufacturing companies (Nigeria Bottling Company Ltd and Seven-up Bottling Company Plc) in North Central zone of Nigeria. The study has two objectives: to examine the management of finished goods inventory on the sales volume of soft-drink manufacturing companies in North-central Nigeria and to examine the management of finished goods inventory on customers' satisfaction of soft-drink manufacturing companies in North-central Nigeria. The ordinary least square (O.L.S) method of regression was used to analyze the data obtained using a software option of SPSS statistical package version 23. The findings revealed that management of finished goods inventory (demand forecast, product handling, product planning and warehouse management) leads to increase in sales volume of soft-drink manufacturing companies in North-central Nigeria

## Conclusion

The following conclusions were raised from the result analyzed:

1. There is a significant relationship between management of finished goods inventory (demand forecast, product planning and warehouse management) and sales volume. This indicates that the techniques of managing finished goods inventory such as accurate forecast of demand, proper product planning and effective warehouse management statistically contributes to increasing the sales volume of the soft drink manufacturing companies.
2. There is a significant relationship between management of finished goods inventory (demand forecast, product handling, product planning and warehouse management) and customer satisfaction.

## Recommendations

The study recommended the following based on the findings and in line with the objectives of the study on how Nigeria Bottling Company Ltd and Seven Up Bottling Company PLC could improve in the management of finished goods inventory in other to impact positively on their performance:

1. The management of Nigeria Bottling Company Ltd and Seven Up Bottling Company PLC should continue to improve and update the methods of managing finished goods inventory since there is a positive significant relationship between the management of finished goods inventory and sales volume, which can be done by accurately forecasting demand in other to avoid over stocking or going out of stock and to effectively optimize finished goods inventory.
2. Since there is a positive significant relationship between the management of finished goods inventory and customer satisfaction, the management of Nigeria Bottling Company Ltd and Seven Up Bottling Company PLC should continuously review the strategies it adopts in the management of finished goods inventory, so as to meet the changing taste and demands of its customers.

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