

# JUST-IN-TIME INVENTORY MANAGEMENT AND MARKETING PERFORMANCE OF QUOTED FIRMS IN THE NIGERIAN MANUFACTURING INDUSTRY

NWULU, CHINYERE STELLA

DEPARTMENT OF MARKETING, FACULTY OF MANAGEMENT SCIENCES

RIVERS STATE UNIVERSITY

&

OPARA, BRIGHT C.

DEPARTMENT OF MARKETING, FACULTY OF MANAGEMENT SCIENCES

RIVERS STATE UNIVERSITY

## Abstract

This study investigated the relationship between just-in-time inventory management and market performance of manufacturing firms in Nigeria. The objectives of the paper were to ascertain the extent to which just-in-time inventory management impacts on marketing performance measures such as sales growth, and profitability. The study adopted a cross-sectional survey design and data is generated from 15 quoted manufacturing firms in Nigeria. The Spearman's rank order correlation coefficient was adopted in ascertaining the relationship between just-in-time inventory management and marketing performance measures sales growth, and profitability; all hypotheses were rejected based on the evidence of significant associations between the variables. The findings showed that just-in-time inventory management significantly impacts on both sales' growth and profitability; hence in conclusion the study asserted that the evidence of just-in-time inventory management facilitates improved marketing performance for manufacturing firms in Nigeria.

**Keywords:** Just-in-time inventory management, marketing performance, profitability, sales growth.

## Introduction

The role Food and beverages manufacturers' play in the Nigerian economy include the expansion of economic opportunities for individuals and organisations. This is due to the ever-increasing importance of food and beverages to human health and life. Organisations achieve this role through the physical distribution (logistics) of goods and services while ensuring that products are available for businesses and consumers. The flow of food and beverages products from points of origin to their destination is embedded in the concept logistics and involves the timely delivery of company's finished products to customers. Scholars had suggested that logistics, a part and parcel of marketing is otherwise referred to as physical distribution (Kotler & Armstrong, 2013; Okwandu & Ekerete, 2001). Mentzer, Flint, and Kent (2004) suggest that firms who desire successes are often associated with well

managed logistics activities which comprise of viable strategies such as just-in-time inventory management.

Studies aimed at understanding just-in-time inventory management and marketing performance have been conducted by scholars (Anne, Nicholas, Gicuru, & Bula, 2016; Mwangangi, 2016). However, most of these studies offer little help to manufacturing firms in Nigeria. Reasons being that, while a few of them (Mwangangi, 2016) have considered various forms of logistics management such as order processing, inventory management and transport management, and their impact on marketing performance with little reference to just-in-time management. Furthermore, the dimensions of logistics management as studied by Rosenzweig (2009) are product quality, production cost, on time delivery, inventory level of stock and logistical

performance of manufacturing firms in the United States.

Although, the results of these studies were positive owing to the fact that, both logistics capability, logistics management and performance which were used as predictor variables had a direct influence on the financial performance, growth of the firm. The studies did not examine just-in-time inventory management alone as a single predictor variable and its relationship with firms' competitiveness in its industry of operation, in lieu of the fact that effective management of inventory enhances business competitiveness (Tseng, Yue, & Taylor, 2005). It is also important to note that very few of these studies have been conducted in Nigeria and of the few conducted not many of them focused on measures such as

profitability and sales growth as measures of marketing performance.

With a view to complementing the body of knowledge on just-in-time inventory management and marketing performance, it is the intention of the current study is to examine the relationship between just-in-time inventory management and marketing performance, using Sales growth, and profitability as measures of marketing performance. It is the position of this study that a study of this nature is sorely needed especially in view of the current recession and harsh economic condition in Nigeria; which has underscored the need for organizations to build and maintain viable relationship with their customers in order to benefit from the increased and continuous patronage behaviour of customers that will enhance market share and consequent desired profit levels

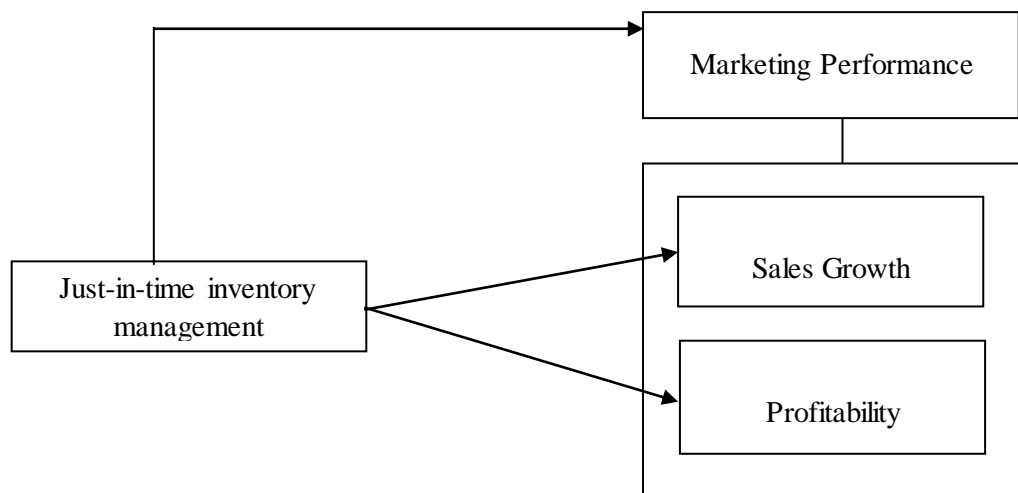


Fig. 1: Conceptual framework of the Relationship between just-in-time inventory management and marketing performance.

## Literature Review

### Just-in-Time (JIT) Inventory Management

Owing to expanding global competition, emerging new technologies used in businesses, and the increasing costs incurred in handling inventory, a growing manufacturing or retail firm faces the risk of managing its inventory due to

the large amount of resources that has been invested in it (Adegbeniga, 2016).

Lai and Cheng (2009) suggested that effective and efficient management of inventory is key to the success of business firms; they suggested

the need to emphasize on waste reduction, lower inventories, high velocity manufacturing and service improvements. Again, the stock of materials (inventories) requires that it be maintained so as to take care of company needs between the time they are needed and the time of supply.

The Just-in-time (JIT) inventory management strategy serves as a suitable practice to satisfy this objective. It emphasizes cost reduction and waste elimination in order to achieve firms' objective (Lai & Cheng, 2009). Just-in-time inventory management strategy is a strategy organisations adopt to outperform their competitors and attain sustainable growth. Lall (2001) asserts that competitiveness of a firm is defined as its ability to do better than other competing firms in sales, market shares, or profitability. Thus, the adoption of JIT strategy enhances organizational competitiveness by allowing organizations to develop an optimal process for managing the logistics of their products/services by reducing inventory costs and wastes without negatively impacting customer supply and thus achieve customer satisfaction (Slack, Chambers, & Johnston, 2007).

There are three main objectives of JIT, which are universal or homogenous in nature, thus it can be applied and adapted to a diversity of organizations within industries that differ from one another. These objectives are: (1) Increasing the organization's ability to compete with rival firms and stay competitive over the long run, (2) Increasing the degree of efficiency within the logistics process as efficiency will concern itself with achieving higher levels of productivity while minimizing the associated costs for performing the logistics activities and (3) Reducing the level of wasted materials, time and effort involved in the logistics activities, thus elimination of waste can significantly reduce the costs of production.

The theoretical justification of just-in-time inventory management practice reflected in the existence some traditional systems on inventory management which includes; Economic order quantity (Benton, 2007), vendor managed inventory (Kerin *et al*, 2003), collaborative planning, forecasting and replenishment, automatic replenishment, and material requirement planning (Coyle *et al*, 2003) etc. Similarly, logistics have relied on such operations and research techniques that enable it examine issues bothering on the number and location of warehouses needed to cut down costs in transportation or the suitable economic order quantity (EOQ) also needed to minimize the problem of out of stock situations and inventory stockholding cost. Hence, Stern & Weitz (n.d) suggests that the focus in logistics decision has shifted to a broader level that is concerned with costs throughout the whole value chain where programmes such as continuous replenishment, Just-in-time, quick response and efficient consumer response are adopted to replace traditional systems of inventory management.

These systems functioned in their respective capacities to compete on price, quality, variety, after service, etc. Present The key competitive factor has now become speed of accomplishing logistics tasks, develop capabilities to attain cost and service advantages for the organizations, Hence, "the just-in-time (JIT) inventory system is introduced as a substitute for the traditional inventory systems" (Aradhye & Kallurkar, 2014).

Yeh, (2017) opines that the faster a business firm responds to the demands of its customers, the more profitable it is likely to become (Goldman *et al*, 1995; Rigby *et al.*, 2000; Waters, 2010). The shorter the lead-time (high velocity) with which a manufacturer meets up with the supply of its products to customers, the higher the likelihood that such a firm will survive. Thus, Just-In-Time also known as a high velocity manufacturing is a common goal for all

manufacturing businesses and service firms where inventories are stocked only for a very short time, and then moved to other locations only moments after being stocked. It is believed that JIT inventory management strategy will try to harmonize the flow of materials from the suppliers to the customers, and in so doing increasing the organization's efficiency in serving customers while achieving its competitive objectives. The objectives of any firm is to have the supplies a firm needs at the exact moment that they are needed in order to accomplish the goal it is constantly seeking to achieve.

### **Just-in-time Inventory Management Strategy and Marketing Performance**

In the study conducted by Matsui (2007) on the empirical analysis of just-in-time production in Japanese manufacturing companies discovered that JIT production systems contributed to improved competitive performance, they opined that efficient equipment layout has a strong impact on the competitive position of the manufacturing plant.

In literature, Lai and Cheng (2009) and Kinney and Wempe (2002) discovered that the Just-in-time strategy improves profitability due to its impact on the two interdependent components of the subject, (i) Return on Assets (ROA) and (ii) Return to sales. JIT is expected to improve ROA in a number of ways. First, asset turnover should increase as Just-in-time inventory purchases free up assets and capital. Hence, they opined that a firm with a small asset base is said to be increasing in ROA. Secondly, lower inventory levels reduce the asset base by improving asset turnover in the short term. Third, few buffer inventories necessitate the elimination of non-valuable activities (NVA) for example, this can be seen in a situation where the firm deals (eliminate) with defects and stock outs that have a negative impact on profit margins (Alles *et al.* 1995).

(ii) . The adoption of just-in-time inventory strategy helps companies to be more efficient and effective in their supply chains. An efficient supply chain will be able to achieve costs reduction throughout its manufacturing process, which is then passed to the customer who buys at a reduced cost. These lowered costs can make the company's products more affordable, and help the company gain a larger market share and stay ahead of its competitors. In Aberdeen, Pinder, and Dutta (2011) summarized the issue of inventory management and market share in that majority of companies under survey considered the management of inventory as a cost-related item and emphasized the need for greater percentage of firms to adopt cost leadership strategy to remain competitive, although the scholars discovered that only 27% of the companies think that inventory management is a way of gaining market share through superior service and product availability.

**Sales Growth:** Sales growth describes the rate at which a firm's sales revenue increases. It is a key metric that firms must monitor over succeeding accounting intervals in order to have a fair grasp of trends because it is an essential component of forecasting and is instrumental in decision-making. Sales growth as a metric of business wellness provides executives and sales directors with an assessment of the firm's performance (O'Sullivan & Abela, 2007). Sales growth also means the amount by which the average sales growth is often stated in financial terms, it is considered positive for the firm's survival and profitability. It results in increased dividends for shareholders, also results in higher stock prices.

In the work conducted by Odunlami and Ogunsiji (2011) examined whether sales promotion techniques adopted affects the company's sales volume and organizational performance. Their study adopted the survey

approach using the questionnaire. The chi-square method was used to test the hypotheses. It was discovered that majority of the respondents accepted that sales promotion affected organizational performance and the sales volume of the firm.

Suffice it to say that, the management of any organization ensures that its sales team works in a fast paced-performance driven environment. They need to on a continuous basis fine-tune their sales targets and performance to ensure that their company is achieving its desired revenue targets. An effective sales dashboard is used by sales leaders to keep track or abreast of their current performance. A sales dashboard is a software application that is used to track sales growth, and further displays them to the sales team. It involves the use of such tools as charts, gauges, and other visualizations. In line with the foregoing, this study hypothesizes as follows:

**Ho<sub>1</sub>:** *There is no significant relationship between Just-in-Time (JIT) inventory management and sales growth of firms in the food and beverages sector.*

Profitability: Liargovas and Skandalus (2015) quoting Buckley et al. (1988) opined that competitiveness is synonymous with a firm's long-run profit performance and its ability to compensate its employees and provide superior returns to its owners. The above assertion implies that a firm's competitiveness is measured by its financial performance. However, there are studies that identified factors or forces close to a company that affect its ability to serve its customers and make a profit (Porter, 2008).

Beredugo and Etuk (2014) evaluated the extent to which price harmonization affects firms' profitability level and to ascertain the difference between price harmonization and discrimination. A survey design was employed using

questionnaire to obtain data from respondents of the selected commercial banks in Calabar. It was discovered that price harmonization significantly affected firms' profitability level. Again, Okpara and Edwin (n.d) in a study investigating the relationship between self-awareness and organizational performance in the Nigerian banking sector employed a survey research design and used the questionnaire to elicit information from respondents. Organisational performance was proxied by net profit, market share and return on investment (ROI). The results revealed that self-awareness is positively related to net profit and return on investment but no strong relationship was found with market share. In line with the foregoing, this study hypothesizes as follows:

**Ho<sub>2</sub>:** *There is no significant relationship between Just-in-Time (JIT) Inventory management and Profitability of firms in the food and beverages sector.*

### **Methodology**

This research study adopts the quantitative research process also known as the pure nomothetic positivist approach. As a quantitative research, the cross-sectional survey design is adopted. The population frame represents a listing of all the elements in the population from which the sample is drawn; this comprised all the quoted food and beverages manufacturing firms in Nigeria. There are fifteen (15) companies listed in the facts book of the Nigerian Stock Exchange (NSE) 2014-2016 edition, and hence, they represent the target population of this study.

The sample size of this study consists of all the elements in the study population. Thus, the total number of ninety (90) top management personnel and heads of different units; were sampled; six (6) from each of the fifteen (15) firms. The study adopted the use of both primary which was collected through the use of the questionnaire, A total of 90 copies of the

questionnaire were administered whereas only 63 copies representing about 70% return rate were used for data analysis

**Table 1: Cronbach's alpha coefficients**

SN	Variables	Item	Alpha
1	Sales growth	5	0.75
2	Profitability	4	0.84
3	Just-in-time inventory management	10	0.85

The result of the Cronbach's Alpha ( $\alpha$ ) test as shown in the table 1 above established the reliability or the internal consistency of the instruments. The calculation was made easier using Statistical Package for social sciences (SPSS) version 21.0. The above result necessitated the use of the instruments for the study and agrees with the thoughts of Ahiauzu (2010) that a reliability coefficient is calculated in terms of the average inter-correlations among the items measuring the concept.

### Data Presentation and Analysis

Descriptive and inferential statistics are computed respectively on the survey data relating to the study variable in references to the 3 hypotheses of the study. Results on the analyses of the quantitative data are presented in this section.

**Demographic data:** The demographic data are presented in the following sub-section of the study and assess the sample for characteristics such as gender, marital status and position in their respective organizations

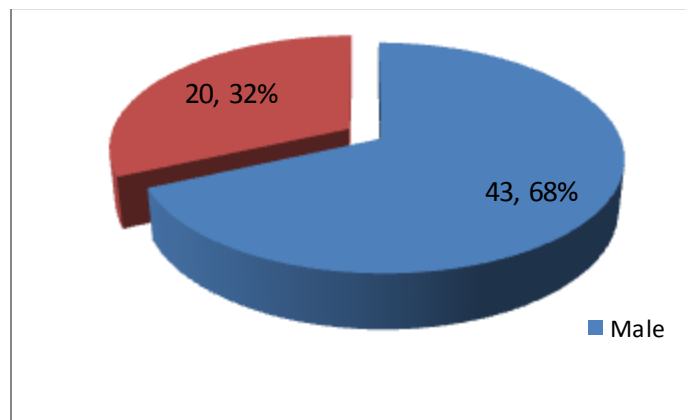


Fig 2. shows the distribution of sex of the respondents. It shows that there were 43(68.25%) males and 20(31.75%) female respondents; this means that there are more males working as employees of the food and beverage firms in Nigeria more than females.

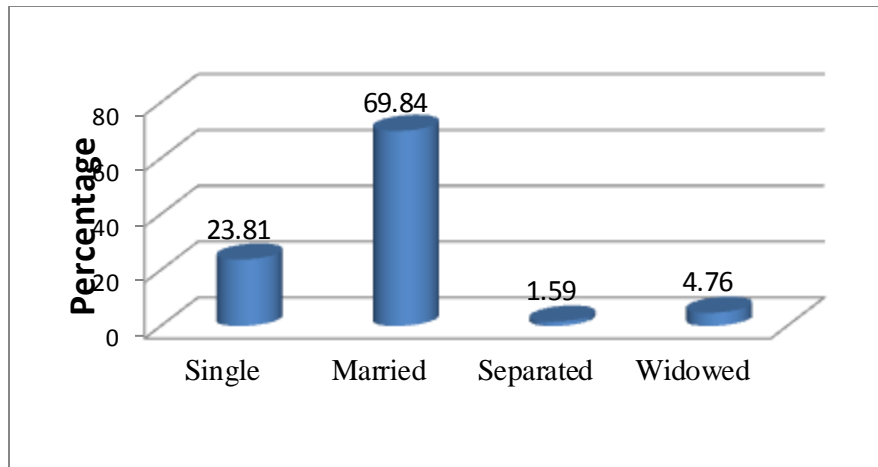


Fig 3. shows the distribution of the marital status of the respondents. It shows that a total of 44(69.84%) of the respondents were married whereas 15(23.81%) were single, 3(4.76%) were widowed and 1(1.59%) was separated. This means that a greater percentage of the respondents are married whereas little percentage were single and separated

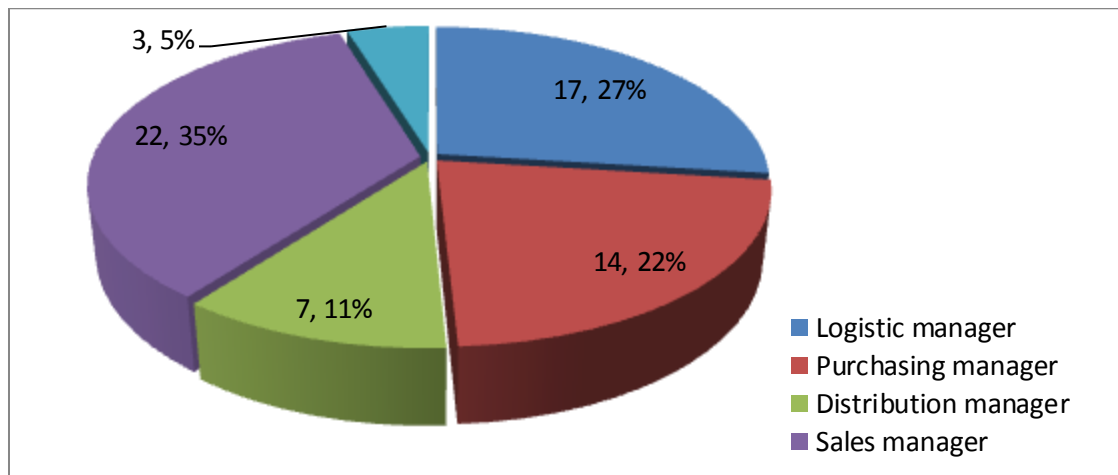


Fig 4. shows the distribution of the designation of the respondents. It shows that most of the respondents were marketing/sales managers, 20 (31.74%) this was followed by the logistic managers, 17(26.98%) and procurement/purchasing manager, 14(22.22%) among others.

Univariate Analysis: The descriptive analysis on the variables is presented in this section

**Table 2: Dimension-based descriptive statistics on market performance**

Statistic	Sales growth	Profitability	Just in time Inventory management
Mean	3.8921	3.8651	4.0333
Std. Error of Mean	.08620	.08870	.07304
Median	4.0000	4.0000	4.0000
Mode	4.40	4.00	4.40
Std. Deviation	.68422	.70400	.57977
Variance	.468	.496	.336
Skewness	-.415	-.051	-.243
Std. Error of Skewness	.302	.302	.302
Kurtosis	-.744	-.790	-.709
Std. Error of Kurtosis	.595	.595	.595
Range	2.60	2.50	2.30
Minimum	2.40	2.50	2.70
Maximum	5.00	5.00	5.00
Sum	245.20	243.50	254.10

**Source: Research Data**

Table 2 shows the dimension-based descriptive statistics on market performance. It shows that the mean rating of the respondents over sales growth was 3.89, SD=0.68, whereas their mean rating on profitability was 3.86, SD=0.70. The mean ( $\bar{x}$ ) rating of the just-in-time management of 4.03, and standard deviation, SD= 0.58, implies that respondents strongly

agreed that having an effective management of customer service activities is a viable strategy to increase sales.

**Bivariate Analysis:** The results for the test on the hypothetical statements are presented in this section

**Table 3: Just-in-Time management and the measures of marketing performance**

		JITM	Sales	Profitability	
Spearman's rho	JITM	Correlation Coefficient	1.000	.660**	.597**
		Sig. (2-tailed)		.000	.000
		N	63	63	63
	Sales	Correlation Coefficient	.660**	1.000	.662**
		Sig. (2-tailed)	.000		.000
		N	63	63	63
	Profit	Correlation Coefficient	.597**	.662**	1.000
		Sig. (2-tailed)	.000	.000	
		N	63	63	63

Source: Research data, 2018



The evidence as illustrated on table 3 illustrates the relationship between just-in-time management and the measures of marketing performance.

### **Test of Hypothesis 1**

$H_{01}$ : There is no significant relationship between just in time and sales growth of firms in the food and beverages sector.

From table 3, the associated  $p$ -value of the relationship between just-in-time management and sales growth is observed to be significant (where  $p = 0.000$ ) which is less than 0.05. The result from the analysis corresponds with the high correlation coefficient ( $\rho = .660$ ) revealing that just-in-time management to a high extent impacts on the sales growth of firms in the food and beverages sector. Therefore, we reject the first null hypothesis, implying that the relationship between just-in-time management and sales growth of the selected companies is significant.

### **Test of Hypothesis 2**

$H_{02}$ : There is no significant relationship between just in time and profitability of firms in the food and beverages sector.

From table 3, the associated  $p$ -value of the relationship between just-in-time management and profitability is observed to be significant (where  $p = 0.000$ ) which is less than 0.05. The result from the analysis corresponds with the moderate correlation coefficient ( $\rho = .597$ ) indicating that just-in-time management can be considered to moderately enhance the profitability of firms in the food and beverages sector. Therefore, we reject the second null hypothesis, implying that the relationship between just-in-time management and profitability of the selected companies is significant.

### **Discussion and Conclusion**

From table 3, the effect of just-in-time inventory management and the measures of marketing performance (sales growth and profitability) are

observed to all be significant. Therefore, we strongly reject both null hypotheses, implying that the relationship between just in time and sales growth as well as profitability of the selected companies is highly significant. Consistent with the present findings, an earlier study conducted by Matsui (2007) on the empirical analysis of just-in-time production in Japanese manufacturing companies discovered that JIT production systems contributed to improved competitive performance; they opined that efficient equipment layout has a strong impact on the competitive position of the manufacturing plant.

This finding supports the claim by Anichebe and Agu (2013) that the absence of the JIT strategy would usher in problems of inventory inadequacy from time to time which would also affect production and lead to the scarcity of one brand of their products or the other. Thus, the absence of just in time inventory management strategy would reduce sales growth, profitability and market share. In line with our expectation *a priori*, just in time inventory management is consistently found to exhibit positive relationship with sales growth, profitability and market share. Implying that just in time inventory management strategy enhances market performance.

Thus, just in time inventory management, which is directly aimed at reducing time, waste and costs through focused factory, uniform plant loading, work and plant standardization, group technology, reduced set up times, mixed model scheduling, just in time purchasing and multi-skilled workforce (Lai & Cheng, 2009), is also a strong factor for improving sales, and profitability. Hence, we adduce that most managers of food and beverage firms perceive just in time management as a good strategy to increase sales growth, and profitability.

- i. As Food and beverage firms in Nigeria employ, just in time practices, sales growth is enhanced significantly.

- ii. As Food and beverage firms in Nigeria adopt just in time inventory strategies, profitability significantly improves.

### References

- Adegbenga, A.A (2016). The practice implementation of just in time inventory (jit) management system in Procter and Gamble Ltd. Nigeria: the problems and challenges. Retrieved May 2017 From <https://businessays.net/the-practice-implementation-of-just-in-time-inventory-jitmanagement-system/>.
- Ahiauзу, A. (2010). Advanced Social Research Methods, Seminar held at CIMRAT, Portharcourt, 2010. 1-35.
- Alles, M., Amershi A., Data, S. & Sarkar, R. (2000). Information and incentive effects of inventory in JIT production, *Management Science*, 46 (12), 1528–1544.
- Anne, M., Nicholas, L., Gicuru, I, & Bula, O. (2016). Reverse logistics practices and their effect on competitiveness of food manufacturing firms in Kenya. *International Journal of Economics, Finance and Management Sciences*, 3, 678-684.
- Beredugo, S. B., & Etuk, A. J. (2014). The effect of price harmonization on profitability of selected banks in Cross River State, Nigeria. *European Journal of Accounting Auditing and Finance Research*, 2(4), 23-32.
- Coyle, J., Bardi, E. & Langley, C. (2003). The management of business logistics: A supply chain perspective. 7<sup>th</sup> Edition. Cincinnati, Ohio: Thomson Learning.
- Goldman, S.L., Nagel, R.N. & Preiss, K. (1995.) *Agile competitors and virtual organisations: Strategies for enriching the customer*. New York: Van Nostrand Reinhold.
- Kerin, R. A., Berkowitz, E. N., Hartley, S. W., & Rudelius, W. (2003). *Marketing*. 7<sup>th</sup> Edition. New York: McGraw Hills Irwin.
- Kinney, M. R. & Wempe, W. F. (2002). Further evidence on the extent and origins of JIT's profitability effects. *The Accounting Review*, 77 (1), 203–225.
- Kotler, P., & Armstrong, G. (2013). *Principles of marketing*, United Kingdom: Pearson Education Limited.
- Lai, K. H., & Cheng, T. E. (2009). *Just-in-time logistics*, Burlington: Gower Publishing Ltd
- Lall, S. (2001). *Competitiveness, technology and skills*. Cheltenham, UK: Edward.
- Matsui, Y. (2007). An empirical analysis of just-in-time production in Japanese manufacturing companies, *International Journal of Production Economics*, 108(1–2), 153–164.
- Mwangangi, P. W. (2016). Influence of logistics management on performance of manufacturing firms in Kenya. *Ph.D Thesis Submitted to the Jomo Kenyatta University of Agriculture and Technology, Kenya*, 1-195.
- Odunlami, I. B & Ogunsiji, A. (2011). Effect of sales promotion as a tool on organizational performance: A case study of sunshine plastic company. *Journal of Emerging Trends in Economics and Management Sciences*, 2(1), 9-13.
- Okwandu, G. A. & Ekerete, P.P. (2001). *Elements of marketing*, Nigeria: Springfield Publishers Ltd.

- Pinder, A., & Dutta, S. (2011). Warranty and Contract Management: Intersection of revenue creation and customer service, *The Aberdeen Group, A Horte Honks Company*, 1-26.
- Rigby C., Day, M., Forrester P., & Burnett, J. (2000). Agile Supply: Rethinking Systems Thinking Systems Practice. *International Journal of Agile Management Systems*, 2(3), 178- 186.
- Slack, N., Chambers, S. & Johnston, R.(2007). *Operations management*, 5<sup>th</sup> Edition, London: Pitman Publishing.
- Waters, D. (2010). *Global logistics: New directions in supply chain management*. New Delhi: Replika Press PVT Ltd.
- Zakaria, H., Zailani, S. & Fernando, Y (2010). Moderating role of logistics information technology on the logistics relationships and logistics service quality. *Operations and Supply Chain Management*, 3 (3), 134-147.