

## **Supply Chain Management and Productivity in Nigeria**

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### **Abstract**

Globalization and managing across cultures and borders make the business sense of efficient supply chain management more challenging than ever before. The demand and supply chain can now be as long or as short as the distance between suppliers and consumers who have critical influence on the value chain. This is important because the demand and supply chain processes often have profound effect on productivity levels of the organization. The exploratory research design was deployed for the investigation to gauge the effect of supply chain management on productivity. Through regression analysis it was found that for a 1 percent increase in supply chain management productivity increases by 1.88 percent.

**Keywords:** Logistics, Productivity, Value chain, Supply chain, Network, E-commerce.

### **1. INTRODUCTION**

Organizations around the globe are getting increasingly concerned about the process with which their goods and services reach the ultimate consumer or customer. It is believed that an effective and efficient supply chain management is the corner stone

for customer satisfaction, and to this extent, supply chain management is an important topic in business and management today. According to Chase, et al (2001) the critical idea of supply chain management is to apply a total system approach to managing the entire flow of information, materials and services from raw materials suppliers, through factories and warehouses to the end customer. They posit that the idea of supply chain management comes from a picture of how organizations are linked together as a particular company. Such linkage is typically between suppliers that provide inputs, manufacturing and service support operations that transform the inputs into products and services, and the distribution and local service providers that localize the products. They argue that localization can involve just the delivery of the products or some other processes that tailors the products or services to the needs of the local markets and customers. Enterprises have come to realize that achieving significant competitive advantage depends to a great extent on the way they configure and manage their supply chain operations. Stevenson (2002) states that a supply chain is a sequence of organizations – their facilities, functions, and activities that are involved in producing and delivering a product or service. According to him, the sequence begins with basic suppliers of raw materials and extends all the way to the final customer. Basic facilities in supply chain management include warehouses, factories, processing centres, distribution centres, retail outlets, and offices. On the other hand, the major activities in supply chain management include forecasting, purchasing, scheduling, production, distribution, delivery, and customer service (Copacino, 1997, Marshall, 1997, Handfield, et al, 1999). Stevenson (2002) elaborates that supply chains are sometimes referred to as value chains; a term that reflects the concept that value is added as goods and services progress through the chain supply or value chains are typically comprised of separate business organizations, rather than just a single organization. Also, the supply or value chain has two components for each organization: a supply component and a demand component. He posits that the supply component starts at the beginning of the chain and ends with the internal operations of the organization. The demand component of the chain starts at the point where the organization's output is delivered to its immediate customer and ends with the final customer in the chain. The demand chain is the sales and distribution portion of the value chain. The length of each component depends on where a particular organization is in the chain; the closer the organization is to the final customer, the shorter its demand component and the longer its supply component. All organizations, regardless of where they are in the chain, must deal with supply and demand issues. Overall, the goal of supply chain management is to link all components of the supply chain so that market demand is met as efficiently as possible across the entire chain (Metz, 1998). These supply and demand supply chain processes, usually have profound effect on productivity levels of an organization. According to Chase, et al

(2001) productivity is a common measure of how well a country, industry, or business unit is using its resources or factors of production. According to them, productivity comparisons can be made in two ways: first a company can compare itself with similar operations within its industry, or it can use industry data when such data are available. A second approach is to measure productivity over time within the same operation, by comparing the productivity in one time period with that of the next. Stevenson (2002) believes that one of the primary responsibilities of a manager is to achieve productive use of an organization's resources. According to him, the term productivity is used to describe this, accordingly, productivity is an index that measures output, goods and services; relative to the input, goods and materials energy, and other resources, used to produce them. Productivity is usually expressed as the ratio of output to input, and a productivity ratio can be computed for a single operation, a department, an organization, or an entire country. Stevenson (2002) insists that productivity has important implications for business organizations and for the entire nation. According to him, productivity growth is the increase in productivity from one period to the next relative to the productivity in the preceding period (Roach, 1998, Mark, 2000).

### **1.1 Statement of the Problem**

Major elements of the supply chain management have always tended to reflect supplier, storage, manufacturing, distributor, retailer, and customer, etc, without the other important elements like, logistics or traffic management, and quality control. Overseeing the transportation of incoming supplies or purchases and outgoing goods is important in effective supply chain management. This traffic management function handles schedules and decisions on movement methods and times taking into account costs of various alternatives, government regulations, the needs of the organization relative to quantities and timing, and external factors such as potential movement delays. Often, poor logistics arrangements have posed serious problems for effective supply chain management in Nigeria. Logistics refer to the movement of materials and information within a facility and to incoming and outgoing movements of goods and materials. Full attention to logistics is needed for a holistic supply or value chain management. Another important challenge to supply chain management is quality control. Because goals are involved, controls are imperative in supply chain management. Quality controls are necessary to ensure that the system conforms to standards of efficiency, and effectiveness. According to Akanwa and Agu (2005) quality standard is a measure of quality of a product. They state that quality is the degree to which a product conforms to the requirements and satisfaction of customers. Thus, the omission of logistics and quality controls from the primary elements of a supply chain management is a serious gap that must be satisfied (Walker, et al, 1999).

This study attempts to fill this gap as a contribution to knowledge in the specific areas of supply chain management and productivity (Crum and Arango, 1996, Lambert, 1994, Sterling, 1994).

### **1.2 Objective of the study**

The study was designed to explore the effect of supply chain management on productivity.

### **1.3 Delimitation of the study**

The study was delimited to the South-East geopolitical zone of Nigeria, composed of five out of the 36 states in Nigeria and the Federal Capital Territory, Abuja.

### **1.4 Significance of the study**

The result of the study will enable students, researchers, academics, policy makers, manufacturers, and others interested in operations and production management have an insight on the power of a holistic supply chain management on productivity.

### **1.5 Limitations of the study**

The study was constrained by lack of current literature in the areas of interest and the limited financial resources to extend the scope of the study. But these limitations did not impair the quality of the study.

### **1.6 Hypotheses**

To achieve the objective of the study; two hypotheses were formulated and tested at 0.05 level of significance.

H<sub>1</sub>: Supply chain management has no effect on productivity.

H<sub>2</sub>: Supply chain management has significant effect on productivity.

## **2. LITERATURE REVIEW**

Supply chain management creates value through changes in time, location, quantity and quality, and has the potential for huge competitive advantage for the organization. Optimizing the supply chain management idea means maximizing shareholder and customer value. This can be achieved by fully integrating all members of the supply chain, collaboratively balancing resources of chain members, and optimizing the flow of goods and services, and information from source to end user. According to Stevenson (2002) creating an effective supply chain requires linking the market, distribution channel, processing and suppliers. In which case, the design or model of a supply chain should enable all participants in the chain to achieve significant gains. Stevenson (2002) posits that the growing need for supply chain management has

arisen so as to improve operations in organizations. It enhances the chances to improve quality, stakeholder's gains, as well as cost minimization. Cost minimization would result from careful transportation arrangements within the supply value chain. Also competitive pressures arising from parallel new products, globalization, the importance of e-commerce, complexity in the marketplace are among the dimensions that lie at the heart of supply chain management. Controlling the quality of supplies and inventories plays a major role in the success or failure of a supply chain, therefore, it is important to ascertain the quality of supplies and coordinate inventory levels throughout a supply chain. This would be to reap the full benefit of effective supply chain management, by way of lower inventories and higher productivity (Chopra, et al, 2001).

### **2.1 Steps for Effective Supply Chain Management**

The creation of an effective supply chain is crucial for higher organizational productivity. A supply chain that embraces the elements of suppliers, logistics and customers would seem necessary in the creation of an effective supply chain. Other steps would involve the development of strategic objectives and tactics to guide the process, as well as the integration and co-ordination of activities in the internal portion of the chain. According to Stevenson (2002) coordinating activities of suppliers and customers, and addressing supply and demand issues as quickly as possible enhances the efficacy of a supply chain. He believes that co-ordination, planning and executive of policies across the supply chain requires a system for transferring data across the supply chain and allowing access to data to those who engage in operations to which it will be useful. Effective supply chain management needs to take cognizance of the benefits of strategic partnerships. Stevenson (2002) states that strategic partnership occurs when two or more business organizations that have complementary products or services that would strategically benefit the others agree to join so that each may realize a strategic benefit. According to him, this occurs when a supplier agrees to hold inventory for a customer, thereby reducing the customers costs; cost of holding the inventory, in exchange for the customer agreeing to a long-term commitment, thereby relieving the supplier of the costs that would be needed to find new customers, negotiate prices and services, among other challenges (Lee and Billington, 1992).

### **2.2 Supply Chain Management and E-commerce**

As international trade barriers collapse, more organizations are expanding global activities. This, in presenting new opportunities obviously makes the supply chain to become longer. However, the challenges of supply chain management as the result of distance, transportation, among others, are being ameliorated by the Internet and e-

Commerce. According to Stevenson (2002) e-Commerce refers to the use of electronic technology to facilitate business transactions. E-Commerce involves the interaction of different business organizations as well as the interaction of individuals with business organizations through the Internet. Applications include Internet buying and selling, e-mail, order and shipment tracking, and electronic data interchange. Also, companies use e-commerce to promote their products or services, and to provide information about them (Ross, 1998). According to Salo and Karjeluoto (2006) supply chain management and information technology are two areas of research which have attracted a lot of attention in academic and practitioners camps over the last decades. They state that Internet-based technologies have changed the management of supply chains. According to them, supply chains come in different forms, lengths, and the management of the supply chain or supply chain network (SCN) is therefore a complex task. They insist that the concept of supply chain management has been applied by many people from different organizations and organizational levels to achieve economic success (Angels, 2000, Christopher, 1992, Mentzer, 2004, Dedrick, et al, 2003).

### **3. METHODOLOGY**

#### **3.1 Research Design**

The exploratory research design was used for the study. The method is historical in nature, and does not usually require a large sample or a structured questionnaire (Miles and Huberman, 1994).

#### **3.2 Sources of Data**

Primary and Secondary data were generated through primary and secondary sources such as interviews, observations, books, newspapers, magazines, periodicals, journals, etc.

#### **3.3 Treatment of Data**

Data were organized, distilled and coded in readiness for analysis

#### **3.4 Method of Data Analysis**

Data were analyzed using descriptive, and regression statistical methods. The SPSS was used in respect of the regression and the results were presented in tables. The regression equation used was:  $Y = a + bx$

Where Y = Productivity

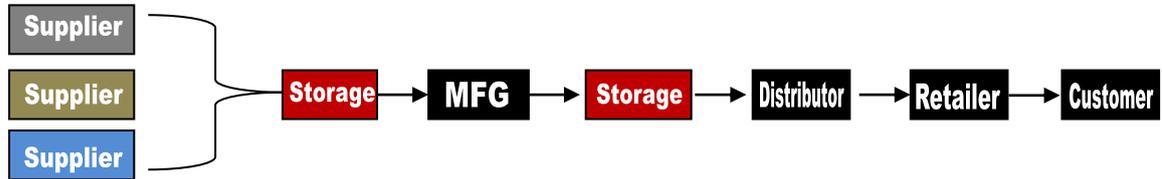
X = Supply chain management

a = A constant term

b = The regression slope coefficient

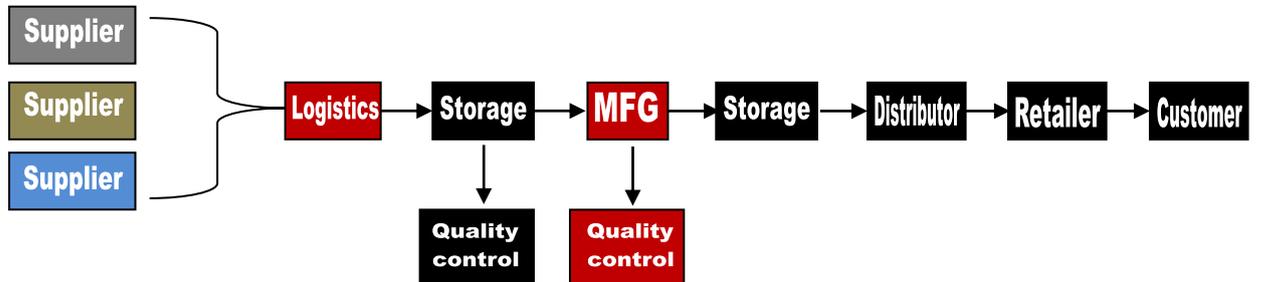
4. PRESENTATION OF RESULTS

Table 1: Typical Supply Chain



Source: Stevenson (2002)

Table 2: Modified Supply Chain Management Model



Source: Author; Ugoani (2016)

Table 3: Model Summary of Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.618 <sup>a</sup>	.382	.345	2.45781

- a. Predictors: (Constant) SCM Factor Score
- b. Dependent Variable Productivity
- c.

Table 4: Result of Anova of Regression Analysis

Model	Sum of Square	df	Mean Square	f	Sig
1. Regression	63.403	1	63.403	10.496	.005 <sup>a</sup>
Residual	102.694	17	6.041		
Total	166.097	18			

- a. Predictors: (Constant) SCM Factor score
- b. Dependent Variable Productivity

**Table 5: Regression Coefficients**

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. Error	Beta		
SCM Factor Score	4.926	.564	.618	8.737	.000
	1.877	.579		3.240	.005

a. Dependent Variable: Productivity

#### 4.1 Interpretation of Regression Results

In table 3,  $R^2 = 0.382$ , this value was adequate

In table 4, the regression was significant, in other words, supply chain management explains productivity

In table 5, the regression coefficients calculated using the equation stated was significant.

Table 6: **Regression Model**

$Y = 4.926 + 1.877x$
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All the coefficients were significant at 5% level. The value of  $b = 1.877$  meant that if supply chain management increased by 1%, then productivity will increase by 1.88%. So, it was accepted that SCM explains Productivity.

#### 4.2 Discussion

A sound supply chain as a management function starts with the identification of credible suppliers who are able to provide materials as economically as possible. This is critical because maintaining competitive advantage depends on the company's ability to satisfy customers' demands for products and services. To achieve this, management must proactively gather production and sales data and send them back to production planning system and from there to the suppliers so that they can adjust deliveries as exactly as required by the production system. Quality must be monitored before supplies are put into productivity because the twin elements of cost and efficiency are important for business growth, productivity and profitability, to this extent, the role of quality experts, does not need more emphasize. Quality control must involve pre and post production processes so as to ensure that what is put in store or warehouse for onward transfer to distributors meet with the required standards and expectation of the customers. There must be adequate storage facilities to ensure that manufactured products in excess of demand either due to competition or change in customers' preferences remain in good condition pending when there will

be effective demand. The purpose of organizations, both those who seek profit and those who do not, is to provide either goods or services to satisfy consumer demands. Therefore, a foundational idea of supply chain management is to accomplish the task in the most efficient and profitable manner. Supply chain management therefore, relates to the process an organization uses to obtain the materials or ideas for the product or services it provides, the process of transforming them into the product, and the process of providing the final product to the customer or consumer. According to Gomez-Mejia and Balkin (2002) an organization must have sufficient supplies of inputs to create its products. Inputs can include materials, energy, information, management, technology, facilities, and labour. They insist that management need to oversee not only the selection of inputs and suppliers, but also the availability of the needed quantity of inputs, the quality of the inputs, the ability of suppliers to meet delivery dates, and the reliability of the suppliers. Quality management is an important issue to many Nigerian organizations because it is a means of improving productive efficiency. Gomez-Mejia and Balkin (2002) suggest that a more efficient production process lowers production costs and ultimately, increases profitability for the organization, which can then decide to lower its prices and attract more customers. Because of competition, globalization, and profitability, it is a major objective of top management in most Nigerian organizations to make improvement in productivity a continuous exercise. Therefore, it is believed that effective supply chain management is required for higher productivity. From the analysis in table 6, it was found that if supply chain management improved by 1 percent, productivity improved by 1.9 percent. To this extent  $H_1$ : was rejected while  $H_2$  was accepted. This is the interest of the study. This result supports the previous findings of Stevenson (2002) and Gomez-Majia and Balkin (2002), among others, that supply chain management has positive relationship with productivity.

#### **4.2 Recommendations**

- i) For improved productivity, organizations must always select credible suppliers who can meet delivery dates.
- ii) Management at all levels must make quality control a continuous exercise, as a means of gaining necessary competitive advantage.
- iii) Inventories must be kept in good conditions to ensure their quality at any time of demand.
- iv) Organizations need to conduct regular customer surveys to establish the direction of their preferences. This may lead to the reduction of excess finished goods that is usually costly.
- v) The place of distributors and retailers is crucial in a typical supply chain management. Management must therefore appoint capable distributors who

can effectively mobilize retailers for the rapid sales of products. It must be borne in mind that business profitability depends highly on turnover levels.

### **4.3 Scope for further Study**

Further study could examine the relationship between operations management and profitability. This is important to unravel some of the reasons for business failures in Nigeria.

## **5 CONCLUSION**

Supply chain management is a process for the determination of the ways and methods of obtaining inputs and converting them into goods and services at the most efficient and profitable manner. It should naturally begin with the identification of credible suppliers who can meet delivery dates. Management must make efforts to ensure that quality control is a regular exercise so that what is put in the market meets the desired standards as well as customers' expectations. From the theoretical perspectives of the study it was made clear that supply chain management influences productivity. Statistically, it was found that with an increase of 1 percent in supply chain management, productivity increases by about 1.9%. The result supports previous findings by Stevenson (2002), Gomez-Mejia and Balkin (2002), among others, that supply chain management has positive effect on productivity. This is the objective of the study.

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