Effective Supply Chain Management through Inventory Control Management in Nigeria's Downstream Petroleum Sector

Nwankwo Sinclair Izuakulom

Ph.D. Student in Logistics and Supply Chain Management, High Fliers University of America, 3422 Old Capitol Trail, Suite 78 Wilmington, DE 19808, Delaware, USA

Abstract: The role of supply chain management in the oil and gas sector globally cannot be overemphasized. This study discusses effective supply chain management through inventory control management in Nigeria's downstream petroleum sector. Resource - Based View Theory (RBV) forms the theoretical framework of the study. Research design is descriptive and narrative with quantitative and qualitative secondary data. The study among other things found out that the most fundamental role inventory plays in supply chain is that it facilitates and balances demand and supply. The finding of the paper shows that environmental uncertainty, information technology, supply chain relationships, and supply chain management performance are the broad challenges facing Nigeria's downstream petroleum sector in its supply chain management over the years. The central argument of this study is that the downstream operations cannot be effective and sustained in the petroleum industry without a well-coordinated and viable downstream operations and more importantly, without robust and vigorous supply chain master plan and industry good practices. One of the recommendations of the study is that oil and gas products marketing companies should strengthen their inventory management system for effective chain supply management through training and retraining of their staff on regular basis, responding to technological changes in inventory management and supply chain for effective and timely delivery of petroleum products to the general public.

Keywords: Supply Chain Management, Inventory Management, Downstream Petroleum Sector.

1. INTRODUCTION

Nigeria is among the major oil producing countries in the comity of nations under the auspices of Organization of the Petroleum Exporting Countries (OPEC). The oil industry is made of three different sectors namely the upstream, midstream, and downstream. Supply chain cuts across these three sectors (Aminu & Olawore, 2014; Nigerian National Petroleum Corporation (NNPC), 2016). The upstream includes exploration and exploitation. The last phase of upstream sector is production. The midstream sector involves refining and storage of crude oil. The storage is done in oil tank farms and depots. The downstream supply chain's activities involve marketing, distribution, and transportation of refined petroleum products from the refineries, tank farms, depots or import jetties to retail outlets to be dispensed to the general public (NNPC, 2016; Osuala, 2013).

Supply chain in the petroleum downstream sector is multifaceted because it involves the services of various service providers who depend on the network of infrastructure in order to carry out their operations (Fernandes et al., 2013). This is because supply chain is the key driver of these infrastructure in the downstream sector, which sometimes brings interruption in the system, and these must be carefully checked and controlled. Simba et al. (2019) are of the view that third party logistics (3PL) is one other major factor that disrupts effective supply chain system in the petroleum downstream sector globally. In a study by Amor and Ghorbel (2018), it explains the fact that Nigeria is among the countries OPEC system that uses outsourcing (third party logistics) to drive its supply chain management system. This according to them has snowballed into a vulnerable and disruptive risk situation. Further in this situation, other disruptive elements have affected supply chain, which include but not limited to internal operation and some external environmental issues (Olsen et al., 2005; Kim & Chavas, 2003). The objective of this study was to evaluate the role of inventory management system in Nigerian petroleum downstream sector from the standpoint of supply chain management.

The central argument of this paper was that the downstream operations cannot be effective and sustained in Nigerian petroleum industry without a well-coordinated and viable downstream operations and more importantly, without robust and vigorous supply chain master plan and industry good practices. This argument was anchored on the context that it is through the instrumentality of a sustainable supply chain system that the petroleum products can get to the consumers both in the private and corporate environments.

2. CONCEPTUAL REVIEW

2.9.1 Inventory

Inventory is the totality of raw materials, semi-finished and finished goods a firm holds, which may be used for further production, resale and repair of existing manufacturing infrastructure (Jaber, 2009). Inventory can also be used to refer to the quantity of raw materials, components, assemblies, consumables, work -in- progress and finished stock that are kept for use or for resale in any business, and which provide the organizational structure and the operating polices for maintaining and controlling goods to be

stocked (Lysons, 1996). Good inventory management benefits organizations in terms of easy distribution and acquiring of goods (Mageto, Chirchir & Ombati 2012).

Inventory has been characterized by Monks, as idle assets that have certain monetary value. Usually, it is an vital aspect of the speculation arrangement of any creation system. Keeping an inventory for future sales and using it whenever necessary is normal in business. For example, retail firms, wholesalers, manufacturing companies and blood donation centers generally have a stock on hand. Quite often, the demand rate is chosen by the amount of the stock level. The motivational effect on the general population is due to the nearness of stock at times. Large quantities of merchandise displayed in markets according to seasons, motivate the customers to purchase more. Either inadequate stock or stock in abundance, the two situations get misfortune to the manufacturer (Pandey, 2019).

2.9.2 Inventory Management
As per Miller (2010), inventory management includes all exercises set up to guarantee that clients have the required item or service. This includes procurement, assembling and distribution in order to protect marketing and attain the needs of the customers who mostly are the final consumers. Inventory management is principally required with indicating the size and position of loaded merchandise. According to Stevenson (2010), inventory management is defined as a framework employed in firms in controlling its interest in inventory. According to Stevenson (2010), inventory management can be defined as a frame work employed by firms in controlling its interest in inventory. This includes various activities such as recording and observing the level of stock in the warehouse, which invariably help to carryout stock estimation to attain to customers future demand. It also helps to determine when and how to make arrangement for respond to the customers' requests. The essential purpose of inventory management along these activities, is to have satisfactory amounts of brilliant things accessible to serve client needs, while additionally minimizing the expenses of conveying stock (Brigham & Ehrhard, 2005).

As indicated by Miller (2010), inventory management consist of operational activities put in place by a firm in order to meet up with the delivery of the items and services requested by customers. An essential aspect of inventory management deals with Just-in-Time (JIT), which looks at the inventory management from the perspective of managing income in-flow from retailers. An organization just purchases what they require from a merchant when they get and deal with the clients' requests.

2.9.3 Inventory Control
Inventory control includes the bringing together of materials, ease of access, controlling, consumption and acquisition of stocks. All processes involved in getting sufficient quantity of stocks where needed and on time by an establishment are known as inventory management (Joseph, Omodero & Okezie, 2019). Miller (2010) states that effective inventory control can determine the profit-making capacity of an establishment unswervingly or circuitously. Also, inventory management connotes a scientific technique of making sure that sufficient stock is maintained by a business to meet up subsequent demand (Coleman, 2000; Jay & Barry, 2006). From the foregoing, effective and efficient control of material in a firm makes it possible for materials needed to be available in the sufficient quantity and on time to ensure that storage cost is reduced to barest minimum as well as maintain continuity of operations.

2.9.4 Supply Chain
Supply chain as a sequence of (decision making and execution) processes and (material, information and money) flows that aim to meet final customer requirements and take place within and between different supply chain stages. The supply chain not only includes the manufacturer and its suppliers, but also (depending on the logistics flows) transporters, warehouses, retailers, and consumers themselves. It includes, but not limited to new product development, marketing, operations, distribution, finance, and customer service (Chopra & Meindl, 2001). Laudon and Laudon (2020) explain supply chain as the network of businesses and business processes involved in creation and sale of a product from suppliers that procure raw materials through retail outlets and customers. Britt (2021) discusses the upstream supply chain comprises of all activities that form the organization's suppliers: those parties that source raw material inputs to send to the manufacturer. The downstream supply chain refers to activities post-manufacturing, namely distributing the product to the final customer.

2.9.5 Supply Chain Management
Supply chain management has been "the delivery of enhanced customer and economic value through synchronised management of the flow of physical goods and associated information from sourcing to consumption" (LaLonde & Innis, 1994, p. 78). Supply- chain management (SCM) can be defined as the configuration, coordination and continuous improvement of a sequentially organized set of operations. "The goal of supply chain management is to provide maximum customer service at the lowest cost possible. A customer is anyone who uses the output of a process" (Chima, 2007, p. 29). According to Supply Chain Resources Cooperative (SCRC) (2017), supply chain management (SCM) is an efficient and effective management of supply chain activities to make the most use of customers for value and for competitive advantage for business sustainability. According to Christopher M. Chima

"supply chain management in a petroleum industry is the configuration, coordination and continuous improvement of sequentially organized operations involved in upstream, midstream and downstream" (Chima, 2007, p. 90).

2.9.6 Petroleum Downstream Supply Chain

Supply chain at the downstream begins with refining of the crude oil into various consumable products. It involves the process of forecasting demand of these various products, their production, and the delivering of these fined products to customers (Hussain, Assavapokee & Khumawala, 2006). The petroleum downstream supply chain can be characterized as a global supply driven structure with the main following participants: (1) Suppliers of crude oil: as a natural resource, crude oil is located in certain areas of the world that usually are far from the main consuming countries, mostly the Organization for Economic Co-operation and Development (OECD) members. An important part of the crude oil supply and reserves is concentrated in the hands of a cartel: Organization of Petroleum Exporting Countries (OPEC). (2) Refiners: they have plants located all over the world and closer to final consumers. The main reasons for this fact are the economies of scale of transporting crude oil in big supertankers versus transporting the final product in smaller lots, and the strategic value of the refining assets, which make governmentss prefer having some of the refinery operations in their territories (Manzano, 2005).

2.9.7 Petroleum Downstream

Downstream operations are the processes involved in converting oil and gas into finished products. These include refining crude oil into gasoline, natural gas liquids, diesel, and a variety of other energy sources. The closer an oil and gas company is to the process of providing consumers with petroleum products, the further downstream the company is said to be (Chen, 2021). According to Manzano (2005), the downstream portion of the industry includes all the key functions, which include crude oil acquisition and transportation, refining, supply and bulk distribution, and marketing (retailing, distribution, and terminals/wholesalers).

The sector involves in refining of crude oil into usable products through distillation, conversion and other special treatments to arrive at petroleum products and gas. It is also involved in distribution of products. The downstream sector in Nigeria has been constrained by unenviable state of the refineries, which have been producing at minimal capacities despite huge expenses incurred on turnaround maintenance of the crisis-ridden refineries (Aigbedion & Iyayi, 2007). "Petrochemical plants and fuel stations belong to this sector. The service sector provides technical and consultancy services to aid the upstream sector in drilling, exploration and production activities" (Abu, 2016, pp. 171-172). The downstream process is the one that provides the most products that are closely linked to consumers, and it is the sector of the oil and gas industry that people can relate to most regularly (Chen, 2021).

2. THEORETICAL UNDERSTANDING: RESOURCE-BASED VIEW (RBV) THEORY

Resource-Based View (RBV) theory was first used by Jay Barney in his article titled "Firm Resources and Sustained Competitive Advantage." The resource-based view (RBV) was popularized by Hamel and Prahalad (Hamel & Prahalad, 1996). According to RBV, resources can be broadly defined to include assets, organizational processes, firm attributes, information, or knowledge controlled by the firm which can be used to conceive of and implement their strategies (Learned, Christensen, Andrews, & Guth, 1969; Daft, 1983; Barney, 1991; Mata, Fuerst & Barney, 1995). Examples of resources are brand names, technological abilities, efficient procedures, among others (Wernerfelt, 1984; Olavarrieta & Ellinger, 1997; Spanos & Lioukas, 2001).

In the Resource Based View (RBV), only a few scholars have applied the theory in the area of supply chain management as a mean of gaining competitive advantage in their studies. Competitive advantages can be achieved through SCM based on RBV theory (Lewis, 2000; Carr & Pearson, 2002). The RBV deals with competitive advantages related to the firm's possession of heterogeneous resources which encompasses financial, physical, human, technological, organizational, and reputational capabilities (Halldorssor, Kotzab & Skjott-Larson, 2007). This theory sees organization as an assemblage of resources and competences that most times end to enhance organizational performance (Wernerfelt, 1984).

These resources are tangible (e.g., technology) or intangible (e.g., knowledge), and may be combined to create capabilities that determine how firms react to various internal and external threats and opportunities (Barney, 1991). The theory evaluates the influence of organization resources and competences to determine its competitive advantage that leads to overall organizational performance. According to Ray et al. (2004), the organization's resources and competences are not meant to sustain the operations and this makes its business processes to have negative performance.

Capacity and resource management is one of the SCM practices dimension studied in this framework. Capacity and resource management is defined as management capacity and resources of service that are organized effectively and operated efficiently at optimal level (Baltacioglu et al., 2007). The main contribution of the RBV as a theory that was developed in the strategy discipline is that it considers the involvement of other disciplines, such as economics, industrial organization, and organization science. This theory is important in this study because the RBV needs to coordinate all staff, materials and equipment to ensure that there is smooth flow of drugs right from the suppliers, through the organization and to the consumers. This will avoid shortages of drugs in the vaccination centres.

RBV in the words of (Barney, 1991), assists companies to develop agility, adaptability, and alignment regarding SCM (Dubey et al., 2018). The resources of various types and that cannot be copied are always independent and easy to be allocated because they have the unique capacities to increase business performance (Walker et al., 2015).

3.   METHODS

The method used in gathering and analysing data for this study was from secondary (indirect) sources. Hence, there was an extensive study of textbooks, newspapers, magazines, journals, periodicals, internet and any other documented materials that treat the subject matter of this study or/and other related topics. Adequate research, review and evaluation of literature relevant to and consistent with the topic and objective of this study were adopted to gather data. This was aimed at providing insight to the understanding of the operational terms/concepts and/or key words of the study, making out what has been done, and areas of attention about the study.

4.0 DISCUSSIONS

Managing customer-supplier relationship is of great importance in supply chain management. Most times, this relationship is essential once it is collaborative. Nevertheless, when this relationship is examined, especially the one that relates to flow of products either inflow or outflow), shows that inventory and storage is central. To manage this customer-supplier relationship, it entails purchase, transfer and inventory management. The explains that fact the inventory is critical in supply chain management (Esper & Waller, 2014). It is also important to note here that the most important inventory plays in supply chain management is to facilitate the harmonization between demand and supply in the process. Supply chain has forward and reverse flows, which must be managed effectively, and to do this, every organization has to deal with the exchange that takes place with the supply and the customer demands at the downstream end of the entire system. For an organization to achieve a balance that exists between the demands of the customers and to maintain adequate supply of raw materials and finished or semi-finished good, it must apply inventory system (P. 4).

For instance, according to Thomé, Sousa and Carmo (2013), in order to achieve this, the important to do is to implement sales and operations planning (S&OP). The reason for this is to bring for example, sales forecasting and marketing, which are the demand management functions of any organization, alongside manufacturing, supply chain, logistics and procurement, which are operations functions of the organization. However, to do this successfully and effectively, it encompasses three key issues namely: the firm's on-hand inventory, in-transit inventory, and work-in-process. The central purpose for this is to help the sales and marketing groups of the organization to make proper plan for the upcoming time, which also helps to gain an accurate idea of what the inventory level would be for sales. Further to this, the groups in charge of operations will be able to update it sales and have information for forecasting that will contribute to plan for the further in the area of inventory needs of the organization. This sometimes causes a shift while planning for manufacturing, or sometime too, alters procurement needs of the organization due to decision taken on some definite units of inventory is strategic (Williams & Waller, 2010). When the inventory is exhausted, the retailer and the supplier collaborate in determining at what point will reorder takes place. This is in order to replenish the exhausted inventory, mostly when the distributors are involved. In order to have a balance between supply and demand, information can be followed for the purpose to understand the best order for inventory replenishment to have the inventory in the warehouse. As a matter of fact, any decision on inventory is to determine at what time will supply inflows will occur to take care of demand outflows (Nachtmann, Waller & Rieske, 2010).

Council of Supply Chain Management Professionals (CSCMP) (2013) in its annual State of Logistics Report outlines some key logistics tendencies and data that offer the picture of emerging issues in the discipline, which can be used as a benchmark for supply chain operations of any organization. One of the primary aspects of the report was the discussion of inventory trends. The report further shows that inventories in the retail, wholesale, and manufacturing sectors all rose in 2012 (Autry & Griffis, 2018). On a good note, inventories in retail business during this period has an increase of 8.3%, which was double of inventories in wholesale business, and six times higher than inventories in manufacturing. On the part of costs in inventory increased by 4%. More interesting is these inventories were not moving as expected when there were substantial increases in the second part of 2012 (Esper & Waller, 2014).

In line with CSCMP report, the effective supply chain and logistics is hinged on the good inventory system. This is because efficient and excellent supply chain are what determined supply chain management strategic goals for many organizations over twenty years now. This has brought an increase in C-level executives who concentrate their efforts on inventory-based cost and measures. It is now common to see reduction initiatives that decrease inventory. This also has come with many supply chain and logistics professional, which is an indication that inventory-based efficiencies have formed the culture and mindset in any organization. Inventory reduction initiatives have become commonplace, with many supply chain and logistics professionals indicating that inventory-related efficiencies have become a culture and mindset within the organizations where they found themselves (Autry & Griffis, 2018).

4.1 The Role of Inventory in Supply Chain Management

Meng (2006) identifies five key functions of inventory to effective supply chain management. These include:

4.1.1 Meeting Various Product Demand
Most times the demand for various products buy customers are not certain. With the application inventory system, the demands of various customers for different products can be met. This can be achieved by maintaining buffer stock (Meng, 2006).

4.1.1 Maintenance of Business Operations
Inventory helps to maintain and have independence operations especially in the area of supply of raw materials. This allows reductions in the cost of new production set-ups. This is also required because manufacturing assembly lines or unites form workstations. It also contributes to identify the different operations that are identical. For this reason, it is expected that there is a cushion of various components that form the workstations for shorter performance, which can be used to prepare for extended performance times. This ensures that normal outputs are sustained (Meng, 2006).

4.1.3 Assist Flexibility in Production Scheduling
One common challenge that is in production system is the pressure. According to Meng (2006), this pressure can be taken care of use of a stock of inventory of the available products. When this done, smoother flow of production planning and also brings about lower cost of operations.

4.1.4 Provide a Safeguard for Variation in Raw Material Delivery time
One of the key challenges that are identified in production and inventory especially in raw material reordering is delay in the supply and delivery of these raw materials from suppliers. But with good inventory system, the challenge can be tackled (Meng, 2006).

4.1.5 Advantage of Economic Purchase Order Size
Some costs are involved in process of placing order for raw materials, finished or semi-finished products. The costs cover communication expenses, labour, tying of necessary documents, postage etc. When each order placed is larger, fewer orders are written. This is also applicable when shipment is large- it attracts few costs per unit item. This is only possible with a good inventory system in place (Meng, 2006).

4.2 Challenges in the Supply Chain Management in the Petroleum Downstream in Nigeria
There are some challenges that are encountered in the petroleum downstream sector especially from the standpoint of supply chain management. This is due to the multifaceted nature of the industry (Balasubramanian, 2010). Some of the broad challenges which have been identified and might affect SCM as found in the previous work by Quesada, Gazo, and Sanchez (2012). The broad challenges also have their sub-challenges as discussed here.

4.2.1 Environmental Uncertainty
Quesada et al. (2012, p.34) also qualify this as "the environmental issues in the product chain". These environmental issues include: unforeseen changes of supplier, competitors, technology, and customer (Ettlie & Reza, 1992). Adoption of modern business trends such as globalization, outsourcing internal functions and just-in-time philosophy to reduce buffer level in SC increase this risk factor (Behdani, Adhitya, Lukszo & Srinivasan, 2007). There are three sub-factors identified under these factors which include: company environment, government support, and uncertainty aspects from overseas suppliers.

   i. **Company Environment**: This relates, on one hand, to a company's relationship with its suppliers and their level of trust and commitment; while, on the other hand, it touches on the company's expectations, quality of products or services, delivery time, and competition in the sector of business (Quesada et al., 2012, p. 34). Illustrative of this is when an organization on the process of responding to the demands of their customers observe that it is better to import the products demanded by their customers than to produce locally, the uncertainty in importation notwithstanding (Wu, 2006 as cited in Quesada et al., 2102, p.34). Hence, companies should deploy appropriate strategies to address environmental uncertainties that may impact on their performance negatively.

   ii. **Government Support through Subside:** This factor relates to government support to companies in a particular sector of business that import raw materials and finished products through policies, regulations etc. For instance, control of price of petroleum products in Nigeria is determined by the difference in price between the landing cost of imported products by the oil companies and the price of the same products by government (Quesada et al, 2012). This is the price difference which government takes care of on behalf of the petroleum products importers under the auspices of 'subside' to meet the demand of the petroleum products in Nigeria. This is a policy being implemented under the petroleum support fund (PSF) to encourage oil marketing companies to partake in petroleum products importation as a way to meet the country's demand for refined petroleum products which cannot be met by domestic refining (Tanimowo, 2014).

   iii. **Uncertainty Aspects from Overseas Suppliers:** The outsourcing of raw materials or products, including importation, from suppliers across the globe is susceptible to this type of uncertainty. Political uncertainties in other countries are

environmental issues that increase the risk for suppliers or influence business decisions. Technology in use in other countries and social uncertainties such as language, religion, culture and communication restrictions may also interfere with supply chain activities (Quesada et al., 2012).

4.2.2 Information Technology

Information and computer technology provide the means for all members in supply chains to communicate among one another thereby improving information flow and service delivery to the customers. Not only are companies looking for ways to cut cost and reduce lead time but also means to enhance inter-organisational relationships in order to improve service levels (Quesada et al., 2012). The use of ICT enables companies to achieve this by reducing paperwork and enhancing access to information and data interchange along the supply chain. There are mainly two sub-factors that are connected with information technology, namely: communication tools and planning tools.

   i. **Communication Tools:** These are tools that are normally used to facilitate communication and transfer of data among trading partners and may include: electronic data interchange (EDI), electronic fund transfer (EFT), internet, intranet, and extranet (Li as cited in Quesada et al., 2012). Communication tools are useful in aiding companies to perform in an efficient manner (Tanimowo, 2014).

   i. **Planning Tools:** Supply Chain Management planning tools are used for the integration of materials and information flows within an organisation and across organisations in the supply chain. Examples of planning tools are enterprise resource planning (ERP), distribution resource planning (DRP). Also included are materials requirement planning (MRP) and manufacturing resource planning (MRP2) (Bowersox, Closs & Cooper., 2007).

4.2.3 Supply Chain Management Performance

This is described as the operational excellence to deliver leading customer experience (Simchi-Levi, Kaminsky & Simchi-Levi, 2003). Effective performance can be evaluated using measurement systems which include: measurability (required data being measurable), inclusiveness (measurement of all pertinent aspects), and universality (provision for comparison under various operating condition, and consistency (measurement of consistency with organisational goals) (Tanimowo, 2014). Performance of SCM can also be measured using inventory levels, service level, supplier performance, cost, and throughput efficiency. Sub-factors identified to play crucial roles for successful SCM include: logistics, supplier markets, supplier performance and material sourcing.

   i. **Logistics**: Logistics supports some basic things namely procurement of raw materials, logistics of raw materials, and the storage of raw materials in the warehouse, finished products and other resources across geographical locations in an efficient and cost-effective manner. According to Somuyiwa (2010) logistics management is part and parcel of SCM. It also includes crossing geographical and organizational borders in order to satisfy customers.

   ii. **Supplier Markets**: According to Bolgar (2011, p. 24), "the supplier markets are categorized as: tactical, approved, preferred and strategic." These categorizations bring changes in the market in the firm-supplier relationship (Yushan & Cavusgil, 2006). Approved suppliers provide regular supplies through contracts and can thus be managed on the contract terms and price. Preferred suppliers are evaluated based on service levels, contract and price. So, what you get is what you pay for, and even more in term of quality, speed and other added value. Lastly, strategic suppliers are considered the most important category of suppliers.

   iii. **Supplier Performance**: Supplier performance has something to do with relationship quality. According to Gregoire and Fisher (2006, p.32), relationship quality is a concept used to capture "the psychological connection that customers have with a retailer or service provider". Relationship quality is a reflection of the customers' trust, satisfaction, commitment and identifications in a retailer or service provider, where trust is conceptualised to reflect the level to which customers are confident that an organisation is reliable to serve them well (Gregoire & Fisher, 2006, p. 33).

   iv. **Material Sourcing**: Manufacturing companies always require procuring raw materials for production at low costs, including labour. The customers, on the other hand, expect to buy products at the cheapest possible prices. These factors, amongst others, necessitate companies to source for raw materials from sources and suppliers across the globe. Suppliers also source for finished products globally to enable them maximize their returns. However, global sourcing of raw material or finished products exposes the supply chain to different risk issues like currency exchange fluctuations, quality issues, transportation delays and political instability (Lockamy & McCormack, 2010).

4.2.4 Relationships in Supply Chain

These relate to the coordination and integration of activities among the players in the SC. It involves relationship management of suppliers and the customers and its main components are: strategic supplier partnerships and customer relationships (Quesada et al., 2012). The related sub-factors are: suppliers' relationship and customers' relationship.

i. **Relationships with Suppliers:** In recent time, most organisations in the manufacturing and service sectors employ supply chain strategies such as JIT, global sourcing or outsourcing (Behdani et al., 2007, p. 3). The SC is thus confronted with risks, largely as a result of the drive to cut costs and deliver cheaper products and services to the customers; and this creates an adversarial relationship with the suppliers (Bolgar, 2011, p.15). To achieve organisational goals and meet customers' expectations, organization must develop partnerships and alliances that will benefit both partners (Quesada et al., 2012).

ii. **Relationships with Customers:** Customers will always want to acquire products at competitive prices. In order to meet the expectations of the customers as well as provide them with varieties of products at relatively cheap prices, companies compete on price, quality and other strategies such as loyalty programmes to win customers to their side; thereby establishing relationships with customers (Quesada et al., 2012, p. 37).

4.2.5 Supply Chain Management Performance: The concept of customer satisfaction is vital in every area of business. Kotler (1996) as cited in Wang and Shieh (2006, p.196) define customer satisfaction as: "the level of a person's felt state resulting from comparing a product's perceived performance or outcome in violation to his/her own expectations". Thus, customer satisfaction can be conceived as a value the customer places on products he/she buys from a retailer or service provider. Customer service is identified as a related sub-factor to customer satisfaction.

i. **Customer Service:** Customer service is a "series of activities designed to enhance the level of customer satisfaction - that is, the feeling that a product or service has met the customer expectation", according to Demetriou (2008, para 1). Therefore, customer service improves the benefit that a customer derives from a product or service before, during and after a purchase is made or order is taken.

5. CONCLUSION

In view of the paper discoveries, it is presumed that a critical correlation occurs between inventory management methods and SCM in the marketing functions of oil firms in Nigeria. Powerful inventory control management is considered as one of the zones an organization of any association should secure ability. The limit of any relationship to progress reasonable stock control organization structure will depend on how much it sees the preferences it stands to get from such program. All around the revelations that rose up out of this paper have demonstrated that oil marketing firms stay to get an awesome arrangement from intense stock control organization system.

Some of this favorable position consolidate perfect use of benefits, cost diminishment, improved productivity, upgraded bargains reasonability, reduction of waste, straightforwardness and obligation, basic stockpiling and recuperation of stock, high stock use among others. An effective management of inventory is a critical operation in various firms specializing in the production of goods and services. Sound administration offers a firm a competitive edge in the market.

Oil marketing firms accomplish huge investment funds from powerful materials administration, which adds up to between half and 60% of aggregate costs. Oil firms in Nigeria are portrayed by lengthened or overextended chains of retailers (purchasers/operators) which, therefore, insinuate long chains of exchanges between chain individuals and customers. Inventory management is critical for supply chain management in light of the fact that their prosperity and cost decrease of the association's consumption require enhanced Operational Performance and learning to the representatives.

4. RECOMMENDATIONS

i. Government should prepare to tackle the labour problems, which may arise due to deregulation and privatization. A proactive programme of education of labour unions should be pursued. More so, safeguards against job losses should be embarked upon (Abu, 2016).

ii. oil and gas products marketing companies should strengthen their inventory management system for effective chain supply management through training and retraining of their staff on regular basis, responding to technological changes in inventory management and SC for effective and timely delivery of petroleum products to consumers.

iii. The study further recommends that oil firms in the downstream sub-sector should embrace the stock keeping strategy that best suits their operation. Here, seller oversaw stock could be deliberated on as an alternate approach since it was successful in upholding the correct level of stock as well as anticipated stock-outs.

References

Abu, N. I (2016). The Influence of Deregulation and Privatisation of the Upstream and Downstream Oil and Gas Industry Promote National Sustainable Development in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)* 7(3):170- 174

Adeyemi, S. L., & Salami, L. O. (2010). Inventory management: A tool for optimizing resources in a manufacturing industry. *Journal of Social Science*, 23(2); 135-142.

Aigbedion, I., & Iyayi, S. E. (2007). Diversifying Nigeria's Petroleum Industry. Nigerian Economic Summit Group (NESG) *Economic Indicators,* Vol.13 No.4; pp.41-50

Aminu, S. A., & Olawore, O. P. (2014). Empirical investigation of challenges of distribution of premium motor spirit (PMS) in federal capital territory (FCT), Abuja and environs, Nigeria. *International Journal of Management Sciences and Humanities,* 2(2); 11-38.

Amor, R. B., & Ghorbel, A. (2018). The risk in Petroleum Supply Chain: A review and typology. *International Journal of Scientific & Engineering Research*, 9(2); 141- 165.

Autry, C. W., & Griffis, S. E. (2018). Supply Chain Capital: The Impact of Structural and Relational Linkages on Firm Execution and Innovation. *Journal of Business Logistics* 29.1: 157-173.

Balasubramanian, K. (2010). Supply chain management in oil downstream distribution business: a perspective on IT alternatives and issues. Available at http://www.infosys.com/supply-chain/white-papers/Documents/SCM-oil- downstream- distribution.pdf

Baltacioglu, T., Ada, E., Kaplan, M. D., Yurt, O., & Kaplan, Y. C. (2007). A new framework for service supply chains. *The Service Industries Journal, 27(2)*, 105-124.

Barney, Jay 1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*. 17 (1): 99–120. doi:10.1177/014920639101700108

Barney, J. B. (1986). Strategic factor markets: Expectations, luck, and business strategy. *Management Science*, 32(10), pp. 1231-1242.

Behdani, B., Adhitya, A., Lukszo, Z., & Srinivasan, R. (2007). How to handle disruptions in supply chains - an integrated framework and a review of literature. Available at https://www.academia.edu/1389703/How_to_Handle_Disruptions_in_Suppl y_Chains_-An_Integrated_Framework_and_a_review_of_Literature

Bolgar, C. (2011). Avoiding the pitfalls of supply chain disruptions. *Insights: supply chain risk*. Available at http://www.zurich.com/internet/main/SiteCollectionDocuments/products- and-services/SCI_Risk_Insight_WSI_articles.pdf

Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2007). Supply Chain Logistics Management. New York: McGraw-Hill/Irwin.

Brigham, E. F., & Ehrhardt, M. C. (2005). Financial management theory and practice. 11th ed. Mason, OH: Thomson/South-Western.

Britt, H. (2021). What Is "Upstream" and "Downstream" in Supply Chain Management? Available at https://www.thomasnet.com/insights/what-is-upstream-downstream-supply-chain- management/

Carr, A., & Pearson, J. (2002). The Impact of Purchasing and Supplier Involvement on Strategic Purchasing and its Impact on a Firm's Performance. *International Journal of Operations & Production Management*, 22(9/10):32-53

Chen, J. (2021). Downstream. Available at https://www.investopedia.com/terms/d/downstream.asp

Chima, C. M (2007). Supply-Chain Management Issues in the Oil and Gas Industry. *Journal of Business & Economics Research* 5(6), 90-91.

Coleman, B. (2000). Determining the Correct Service Level Target. *Production and Inventory Management Journal,* 41(1):169-176.

Council of Supply Chain Management Professionals (CSCMP). (2013). Career Patterns of Women in Logistics. UNESCAP Regional Forum of Freight Forwarders, Multimodal Transport Operations and Logistics Service Providers.

Daft, R. (1983), Organizational Theory and Design. New York: West.

Demetriou, C. (2008). Arguments against applying a customer service paradigm. Available at http://www.dus.psu.edu/mentor/old/article/08093cd.htm

Dubey, R., Altay, N., Gunasekaran, A., Blome, C., Papadopoulos, T., & Childe, S. J. (2018). Supply chain agility, adaptability and alignment: empirical evidence from the Indian auto components industry. *International Journal of Operations & Production Management*, 38(1), 129-148. http://dx.doi.org/10.1108/IJOPM-04-2016-0173

Esper, T. L., & Waller, M. A. (2014). Introduction to Inventory Management: Principles and Strategies for the Efficient Flow of Inventory across the Supply Chain.

Ettlie, J. E., & Reza, E. M. (1992). Organizational Integration and Process Innovation. *Academy of Management Journal*, 35:795.

Fernandes, L. J., Relvas, S., & Barbosa-Póvoa, A. P. (2013). Strategic network design of downstream petroleum supply chains: Single versus multi-entity participation.*Chemical engineering research and design*, 9 (1); 1557–1587.

Gregoire, Y., & Fisher, R.J. (2006). The effect of relationship quality on customer retaliation. Available at http://www.researchgate.net/publication/225137261_The_effects_of_relatio nshipquality_on_customer_retaliation/file/3deec5176aaf7e82a1.pdf

Halldorssor, A., Kotzab, J., & Skjott–Larsen, T. (2007). Compliment Theory of Supply Chain Management. *International Journal of Supply Chain Management*, 12(4):284-296.

Hamel, G., & Prahalad, C. (1996). Competing for the Future, Harvard Business School Press, Paperback edition, Boston (Massachusetts).

Hussain, R., Assavapokee, T., & Khumawala, B. (2006). Supply Chain Management in the Petroleum Industry: Challenges and Opportunities‖. International Journal *of Global Logistics & Supply Chain Management*, Vol. 1, No. 2, 1 November, 90 – 97.

Jaber, M. Y. (2009). Inventory Management: Non-Classical Views. Available at https://doi.org/10.1201/9781420079982

Jay, H., & Barry, R. (2006). Principles of Operations Management. 6th Edition. New Jersey; Pearson Prentice Hall, Eduation Inc.

Joseph, F. I., Omodero, C. O., & Okezie, U. C. (2019). Inventory Control Management and Revenue Generating Capabilities of Oil and Gas Drilling Firms in Nigeria. Annals of Spiru Haret University.

Kenton, W. (2021). Supply Chain. Available at https://www.investopedia.com/terms/s/supplychain.asp

Kim, K., & Chavas, J. P. (2003). Technological change and risk management: an application to the economics of corn production. *Agricultural Economics* 29(2); 125-142.

Kotler, P., & Amstrong, G. (2000). Principles of Marketing. New Jersey. Prentice Hall Inc.

La-londe, B. J., & Innis, B. E. (1994). "Customer Service: The Key to Customer Satisfaction, Loyalty and Market Share", Journal of Business Logistics, VOL. 15 (1): 73-87.

Laudon, K. C., & Laudon, J. P. (2020). Management information systems: Managing the digital firm (16th ed).

Learned, E. P., Christensen, C. R., Andrews, K. R., & Guth, W. (1969), Business Policy. Homewood, IL: Irwin.

Lewis, M. (2000). Lean Production and Sustainable Competitive Advantage. *International Journal of Operations & Production Management*, 20(8):59-78.

Lockamy, A., & McCormack, K. (2010). Analysing risks in supply networks to facilitate outsourcing decisions. *International Journal of Production Research*, 48:593.

Lyson, K. (1996). Purchasing and Chartered Institute of Purchasing and Supply. London: Pitman Purchasing

Mageto, J., Chirchir, M., & Ombati, T. (2012). Fundamentals of Inventory Management: An introduction to inventory control models.

Manzano, F. S. (2005). Supply Chain Practices in the Petroleum Downstream. *Executive Summary*

Mata, F. J., Fuerst, W. L., & Barney, J. B. (1995). Information technology and sustained competitive advantage: A resource-based analysis. *MIS Quarterly*, December, pp. 487-505.

Miller, R. (2010). Inventors Control: Theory and Practice. New Jersey: Prentice Hall.

Nachtmann, H., Waller, M. A. & Rieske, D. W. (2010). The Impact of Point-of-Sale Data Inaccuracy and Inventory Record Data Errors. *Journal of Business Logistics 31.1: 149- 158.*

Nigerian National Petroleum Corporation (NNPC). (2016). Profile/products. Available at www.nnpcgroup.com

Okanda, S., Namusonge, G. S., & Waiganjo, E. (2016). Inventory Management Practice and the Performance of the Unit of Vaccines and Immunizations in the Minstry Health, Kenya. *International Journal of Academic Research in Business and Social Sciences, Vol. 6, No. 7*

Olavarrieta, S., & Ellinger, A. E. (1997). Resource-based theory and strategic logistics research. *International Journal of Physical Distribution & Logistics Management*, 27(9/10), pp. 559-587.

Olsen, B. E., Haugland, S. A., Karlsen, E. & Husoy, G. J. (2005). Government of Complex Procurements in the Oil and Gas Industry. *Journal of Purchasing and Supply Management*, 11(1); 1-13.

Pandey, D. K. (2019). Understanding the Concept of Different Stochastic Inventory Models. *Journal of Advances and Scholarly Researches in Allied Education*, Vol. 16, Issue No. 2, February, ISSN 2230-7540

Ray, G., Barney, J. B., & Muhanna, W. A. (2004). Capabilities, business processes, and competitive advantage: Choosing the dependent variable in empirical tests of the resource- based view. *Strategic Management Journal*, 25(1), pp. 23-37.

Quesada, H., Gazo, R., & Sanchez, S. (2012). Critical factors affecting supply chain management: a case study in the US pallet industry. Available at http://www.intechopen.com/download/pdf/32377

Simba, S., Niemann, W., Kotzé, T., & Agigi, A. (2017). Supply chain risk management rocesses for resilience: A study of South African grocery manufacturers. *Journal of Transport and Supply Chain Management* 11(0), 32-61.

Simchi-Levi, D., Kaminsky, P, & Simchi-Levi, E. (2033). Managing the Supply Chain. New York: McGraw Hill.

Somuyiwa, A. O. (2010). Problems and prospects of logistics in Nigeria: Explorative analysis. Available at http://www.lautechtransportmgt.net/PPLNEA_Somuyiwa.pdf

Spanos, Y. E., & Lioukas, S. (2001). An examination into the causal logic of rent generation: Contrasting Porter's competitive strategy framework and the resource-based perspective. *Strategic Management Journal,* 22, pp. 907-934.

Stevenson, B. (2010). Operations management (10th ed.). New York: McGrau Hill Publishing.

Tanimowo, O. (2014). An assessment of downstream petroleum supply chain effectiveness: a case of petroleum products supply and distribution in Nigeria. MSc dissertation, the University of Salford for the degree of MSc Procurement, Logistics and Supply Chain Management

Walker, H., Chicksand, D., Radnor, Z., & Watson, G. (2015). Theoretical perspectives in operations management: an analysis of the literature. *International Journal of Operations & Production Management*, 35(8), 1182-1206. http://dx.doi.org/10.1108/IJOPM-02-2014- 0089.

Wang, I. M., & Shieh, C. J. (2006). The relationship between service quality and customer satisfaction: the example of CJCU library. Retrieved from: http://www.tarupublications.com/journals/jios/full-text/jios-27-1-2006/jios- 134.pdf

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal,5*, pp. 171-180.

Williams, B. D., & Waller, M. A. (2010). Creating Order Forecasts: Point-of-Sale or Order History? *Journal of Business Logistics* 31.2: 231-251.

Yushan, Z., & Cavusgil, S. T. (2006). The effect of a supplier's market orientation on manufacturer's trust. *Industrial Marketing Management,* 35:405.