

Inventory Management Practices and Organizational Resilience of Manufacturing Firms in South-South, Nigeria

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Abstract: *This study examined the relationship between inventory management practices and organizational resilience of manufacturing firms in South-South, Nigeria. The cross-sectional survey was used and a population of 495 managers and supervisors of twenty four (24) manufacturing firms were covered. A sample size of 221 respondents were drawn from the population and the simple random sampling technique was used. Data were collected from the respondents using copies of questionnaire. Inventory management practices was operationalized using inventory planning and control, lean inventory, strategic supplier partnership and capacity utilization and organizational resilience was measured using adaptive capability, agility and robustness. Structural Equation Modelling (SEM) was used to analyse the data and determine the association between organisational resilience metrics and inventory management practice aspects. The moderating effect of organisational flexibility on the link between inventory management techniques and organisational resilience was also ascertained through the use of structural equation modelling, or SEM. The analysis's findings showed that the organisational resilience metrics and the characteristics of inventory management procedures had a substantial correlation. It was concluded that inventory management practices in terms of inventory planning and control, and lean inventory help in enhancing the resilience ability of manufacturing firms in the industry. It was recommended that the manufacturing firms should invest in advanced inventory tracking systems that provide real-time visibility into stock levels, order status, and usage patterns to effectively monitor and control inventory, facilitating a more adaptive response to changing market conditions and unforeseen disruptions.*

Keywords: *Inventory management, inventory planning, lean inventory, adaptive capacity, agility.*

Introduction

The constant dynamism of the business world, coupled with the environmental turbulence within the Nigeria manufacturing sector have made the issue of resilience more vital than before. No organization irrespective of their philosophy, ideology, mission and orientation, do operate in a perfect environment that is free from unexpected eventualities or challenges. Hence, for organization to maintain their continuity concept, such organization must be able to strive, adapt and remain agile even within a crisis situation. Letam (2020) opined that organizational resilience enhances firm's robustness and also help in sustaining their operations during challenging or difficult period. In accordance with the aforementioned claim, Akhigbe and Onuoha (2019) argued that organizations that survive the most turbulent moment are not those that are fittest in terms of financial performance, but organizations that have high resilience ability to withstand the impoundable nature of the business environment. Every organization has the concept of

continuity, and such concept of continuity may never be achieved except the organization possess the resilient ability. Hepfer and Lawrence (2022) sees organizational resilience as a company's capacity to foresee, react to adversity, recover from and learn from the crisis situation. Hillman and Guenther (2020) remarked that resilience is a systematic process of the various ways on how firms deal with adversity so as to attain resilient and positive outcome. It is worthy to note that an organization that is resilient is able to maintain an acceptable state despite various disruption or adversity.

Furthermore, Umoh, Amah and Wokocha (2014) posited that building firms resilience enable organization to eliminate environmental threats by ensuring self-protective measures in order to overcome the odds and disruptive occurrences from the business environment. The measures of organizational resilience include adaptive capacity, agility and robustness (Amareui, Bettistella & Nonino, 2020). The production companies are often involved in production activities and this require them to frequently deal with inventory on a daily basis. Hence, a proper or efficient procedures for managing inventories may be helpful in enhancing the fortune of the manufacturing firms. Inventory management practices is very significant since it goes a long way to determine the success or downfall of a business (Gitau, 2016). Agu, Ozioma and Nnata (2016) argued that inventory management practices play a key role in the survival and growth of a firm because the inability of the company to properly control their stock levels will result in loses of customers which will thus negatively affect the total performance of the organization. The authors further remarked that efficient inventory control procedures in the production company will help smoothen the process of production and thus enhance the operational efficiency of the organization in the industry.

In conformity with the aforesaid claim, Ogbadu (2009) contended that prudent inventory management do reduce depreciation and wastes. Enhancing operational effectiveness in the production companies can be influenced by inventory management practices because it enables the organization to reduce the cost associates with holding stock by procuring or keeping the appropriate amount of inventory in the correct quantity at the appropriate time in the appropriate place. Koin, Cheruiyor and Mwangangi (2014) noted that inability of organizations to ensure proper inventory management will result in low cash flow, low effectiveness, poor efficiency and distorted functionality.

The need to enhance corporate resilience among organizations have attracted several scholarly works over the years. Achebelema and Achebelema (2021) did a study on how collaborative management. Jaja and Amah (2014) examined how mentoring in organization relate with the resilience of manufacturing firms. Evenseth, Sydnnes and Gausdal (2022) also observed that the ability of organizations to enhance the organizational learning, will help in boosting their resilience in the industry. The ability of organization to apply relevant strategies is helpful in boosting the firm's resilience. There is a dearth of scholarly works on how inventory management practices relate with organizational resilience. Therefore, this research aims to fill these observed knowledge gap.

Statement of the Problem

The manufacturing firms in Nigeria have witnessed the problem of poor organizational resilience over the years due to the high rate of dynamism of the Nigeria business environment. This problem of organizational resilience has intensified in recent time as a result of the outbreak of the Corona Virus Disease (COVID-19) which have forced some

of the firms into liquidation based on inability to cope with the pandemic. The manufacturing sector in Nigeria was one of the booming sector in Nigeria which contributed hugely to the economic wellbeing of Nigeria before the thriving of the oil sector. However, over the years, the manufacturing firm's contribution to the Nigeria economy has fallen far below expectation when compared with the other countries of the world. In alignment with the above assertion, Umoh, Amah and Wokocha (2014) noted that the manufacturing firms in Singapore, Malaysia, Indonesia and South Korea do contribute up to sixty (60%) the Gross Domestic Product (GDP) of the country. Their study further noted that the manufacturing firms in China do contribute up to eighty (80%) to the GDP of the nations while the manufacturing firms in Nigeria contributed just here (3%) to the GDP of the country.

The inability of the manufacturing firms to remain resilient in the midst of the crisis and challenges have made them to witness dwindling growth over the decades (Omhonria & Needorn, 2022). Achebelema and Achebelema (2021) noted that the issue of resilience affects the survival of organization. This implies that low resilience ability of the manufacturing firms will affect the survival of the organization and thus result in liquidation. In line with the above argument, Abolo (2017) noted that more than nine hundred manufacturing firms in Nigeria liquidated between the year 2000 and 2016. It is worthy to note that the manufacturing sector is very volatile and other firms operating in other countries import their products to Nigeria even at a cheaper price and this act have further threatened the survival and competitiveness of the manufacturing firms that operates within Nigeria. It is an undeniable fact that the manufacturing firms spend huge budget in inventory and thus the degree of their ability to manage this inventory will influence their operations and surviving during emergencies (Otchere, Adzimah & Aiken, 2016; Hannah *et al*; 2020). The capacity of the production enterprises to ensure effective inventory management will enable them withstand crisis situations. However, considering the key element of inventory management practices in enhancing firm's operation, it is believed that when manufacturing firms adopt effective inventory management, it will enhance the survival of such firm in times of turbulence. It is on this note that this study examined how inventory management can help address the problem of organizational resilience of manufacturing firms in South-South, Nigeria.

Objectives of the Study

The objectives are to examine the relationship between:

- i. inventory planning and control and adaptive capacity.
- ii. inventory planning and control and agility
- iii. lean inventory and adaptive capacity
- iv. lean inventory and agility

Research Hypotheses

Ho₁: There is no significant relationship between inventory planning and control and adaptive capacity of manufacturing firms in South-South, Nigeria.

Ho₂: There is no significant relationship between inventory planning and control and agility of manufacturing firms in South-South, Nigeria.

Ho₃: There is no significant relationship between lean inventory and adaptive capacity of manufacturing firms in South-South, Nigeria.

Ho₄: There is no significant relationship between lean inventory and agility of manufacturing firms in South-South, Nigeria.

Conceptual Framework

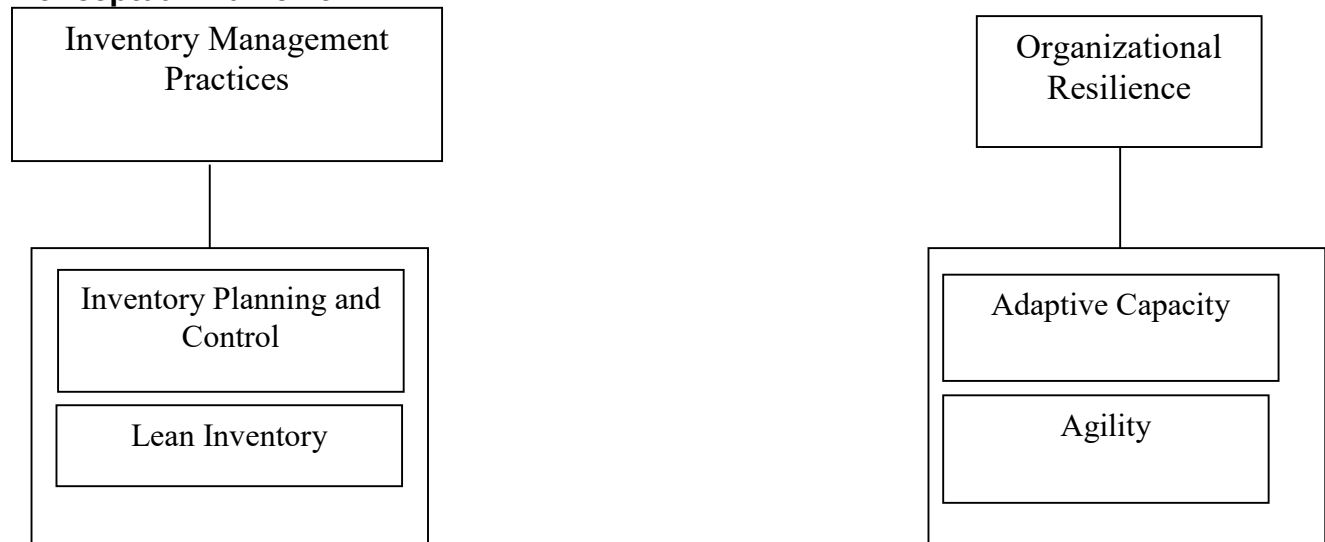


Figure 1: A conceptual framework of Inventory management practices and organizational resilience of Manufacturing firms in South South, Nigeria.

Source: The dimensions of inventory management practices were adapted from Khan and Siddiqui (2019), Lwiki, Ojera, Mugenda and Wachira (2013), while the measures of organizational resilience were adapted from Annareui, Battistella and Nonino (2020).

Literature Review

Inventory Management Practices

Inventory management is the art and science of maintaining stock levels of a given group of items at the lowest possible cost while also meeting or exceeding other relevant targets and objectives established by the organization (Jessop, 1999). In an effort to satisfy the consumer needs while keeping inventory costs to a bare minimum, it is critical for managers of organizations that deal with inventory to keep this goal in mind. Drury (2004) states that costs associated with inventories involve holding fees, ordering costs, and shortage costs, all of which are included in inventory costs. The expenses incurred in holding are those related to keeping physical items on hand. Insurance, obsolescence, and opportunity costs are each connected to possessing money that could be used elsewhere but are instead being used to maintain inventory levels. Ordering costs are the expenses incurred during the ordering and receiving of inventory. Costs associated with these include determining how much is required, creating invoices, transportation costs, and the cost associated with inspecting goods. Shortage costs occur when the demand for a product exceeds the supply of inventory available. Among the expenses are the opportunity costs of making a sale, the loss of customer goodwill, late fees, and other similar expenses.

Inventory management can be defined as the "management of materials in motion and at rest" in its most basic definition (Coyle, Bardi, Langley, 2003). Inventory management encompasses the following activities, according to Wikipedia (Wikipedia, 2022): control of lead times, inventory carrying costs, inventory valuation, inventory visibility, asset management, inventory forecasting, physical inventory, physical space that can be used for inventory, quality control, replenishment, returns and defective goods, and demand

forecasts. Inventory management, as per Kotler (2000) is the term used to describe all of the processes involved in creating and maintaining the levels of inventory for raw materials, semi-finished materials (work-in-progress), and final products in order to ensure sufficient supplies are accessible and minimise the expenses associated with overstocking and understocking. The task of inventory management is to oversee the movement of commodities from the point of initial purchase via internal processes to the service point via distribution (Smaros, Smaros, Lehtonen, Appelquist and Holmstrom, 2003). Inventory management is primarily concerned with two primary objectives (Reid & Sanders, 2007). First and foremost, having an efficient inventory management system is accountable for ensuring that goods are always available. Maintaining operations requires that all necessary materials are present in the proper quantities, of high quality, and at the appropriate time in order to provide a specific level of service to the customer base. The second goal is to provide this level of service while keeping costs as low as possible. For example, not all items can be kept in stock at all times at all costs, so decisions must be made about which ones to keep on hand.

Inventory Planning and Control

Inventory control and planning are two functions that are associated with inventory management. Inventory management is extremely important to business owners because it typically represents the second largest expense in their operations. Inventory planning entails developing forecasts in order to determine how much inventory should be kept on hand to satisfy consumer requirements (Morden, 2004). Inventory control refers to the process by which managers count and maintain inventory items in a company's warehouse (Morden, 2004). Inventory control can be defined as a policy designed to obtain the appropriate quantity and quality of raw materials at the appropriate locations. Another definition is a system used in a company to control the amount of money the company invests in stock. Recording and monitoring stock levels, forecasting future demand, and determining when and how many units to order are all part of the job description.

Inventory control, according to Nweze (2004), is the procedure for making sure that the actual flow of inventory in an organization corresponds to the plan. Inventory control refers to the techniques used by store managers to ensure that materials are available when they are needed in the quantity, quality, and price that is required without the risk of running out of stock or overstocking the shelves. It is necessary to have a plan in place for inventory control to be effective; this plan should include the development of organizational objectives, as well as the preparation of various budgets, in order to achieve these objectives. An organization's inventory management strategy is critical to its success. A company should be able to determine the level of inventory investment that is the most effective for them. Only when the company ensures that its inventories are sufficient to meet the needs of production and sales will this situation be possible. Additionally, the company must avoid stocking excess inventories that are unnecessary because doing so increases the risk of obsolescence. However, a company cannot afford to lose sales due to insufficient inventories, and it is also prohibitively expensive to keep more inventories on hand than is absolutely necessary in the current market conditions.

Lean Inventory

Womack et al (1990) were the first to apply the lean manufacturing principle, the application of this principle was associated with lower inventories. The argument is that

as inventory is reduced, profits will improve as a result of interest savings, as well as a reduction in storage fees, handling fees, and waste. The literature has estimated that these savings will be in the range of 20-30 percent in the long run (Brigham & Gapenski, 1993). When operating in today's highly competitive environment, Lean Management is becoming increasingly popular. The proponents of the Lean Inventory system argue that having too much inventory will have a negative impact on a company's net cash flows. Using a Lean inventory management system, a distributor can meet or exceed customers' expectations for product availability while maintaining an inventory of each item in an amount that will maximize the distributor's net profit margin. Inventory is regarded as a symptom of a sick factory that is in desperate need of some form of medical intervention in a Lean system of operation. Inventory should be kept as close to zero as possible in order to achieve the best results for a company. Using effective inventory management, distributors are able to meet or exceed their customers' expectations regarding product availability while simultaneously increasing their profits.

On the cost side, the most obvious are the costs of inventory holding, which include the capital costs (interest or opportunity) as well as the physical costs of maintaining inventory (storage, insurance and spoilage). Many systems have recently been established in the operations management industry to deal with the problem of excess inventory. These systems include: Management-oriented systems include Just-in-Time (JIT) delivery, material requirements planning (MRP), and enterprise resource planning (ERP), to name a few examples. Just-in-Time refers to a collection of practices that are designed to reduce waste and increase efficiency. These practices are implemented throughout the entire organization, including the supply chain. Its components include collaborative product design with suppliers and customers, a shift toward single sourcing from close suppliers, reduced machine set-up times, and total preventive maintenance. Reduced inventory and associated carrying costs are used in this inventory strategy to improve the return on investment of a business. In order to achieve JIT, the process must be equipped with signals that provide information about what is happening everywhere in the process. JIT can result in notable enhancements in a producing organization's ROI, product quality, and efficiency, among other things. It highlights the significance of producing items that are delivered at the time of need, rather than earlier or later.

Organizational Resilience

The term "resilience" is frequently used to refer to the ability to "bounce back" from adversity. Its origins can be traced back to the Latin term "resilience," which has the same meaning as "jumping back" (Klein, Nicholls, & Thomalla, 2003; Paton & Johnston, 2006). Despite the fact that the term has been in general use for decades, ecology was the first scientific discipline to use the term in the course of developing its theoretical framework. Holling (1973) was a pioneer in the application of the concept of resilience in the field of ecology. In the context of ecosystems, Holling (1973) defined resilience as an organism's ability to adapt to and survive changes in its environment. With Holling's initiative in 1973, the phrase has been broadened to include a range of different fields of study.

A resilient organization is one that is capable of adapting to, coping with, surviving, and prospering in the face of abrupt and sometimes hostile changes in the business environment (Ateke & Nadube, 2017). When it comes to organizational resilience, according to the British Society for Industrial Engineering (2015), resilient organizations are those that have the capacity to foresee, plan for, react to, and adjust to both

progressive and sudden shocks in the working environment. When environmental conditions change, a resilient organization adapts in order to remain fit for purpose over the long term (Ateke & Nadube, 2017). The experiences of others help resilient organizations learn from their own failures as well as from their own successes (Zhang & Liu, 2012). They are concentrating more on business improvement as a futuristic strategic enabler rather than on technology (Lengnick-Hall & Beck, 2005). Furthermore, resilient businesses are adaptable, proactive, anticipatory, and creative, and they take advantage of new opportunities by taking calculated risks (Ateke & Nadube, 2017). Organizational resilience, according to the British Standards Institution (2015), entails the adoption of best practices to deliver continuous business improvement while also integrating skill and talent into all units of an organization.

Among these branches is Organizational Resilience (OR), which focuses on how organizations can deal with unexpected environmental uncertainties when they arise. Along with the groundbreaking work of Weick (1993), organizational resilience (OR), which prospered despite the rising frequency of calamities in the business world, gained increased focus from academics as well as practitioners (Vogus & Sutcliffe, 2008; Hillmann & Guenther, 2020). The pandemic situation that arose as a result of the new COVID 19 virus, for example, forced us to reevaluate how resilient we are as a company.

Adaptive Capacity

It is the ability of a firm to quickly coordinate and reconfigure resources in order to respond to sudden environmental changes while maintaining performance that is referred to as adaptive capacity (Gibson & Birkinshaw, 2004). (Aggarwal, Posen, & Workiewicz, 2015). It has been argued that adaptive capacity enables a company to recognize and capitalize on new opportunities as they emerge in the market (Hofer, Niehoff, & Wuehrer, 2015). Firms with adaptive capacity learn more quickly (Akgün, Keskin, and Byrne, 2012), respond more quickly to changes in line with firm priorities (Wang & Ahmed, 2007), and integrate external information into the firm's knowledge base more quickly (Wang & Ahmed, 2007).

In business, adaptive capacity is defined as an organization's ability to maintain competitive advantage through the modification, reconfiguration, or interconnection of resources, capabilities, and competences, as well as the pursuit of increasing the number of options or available strategic reactions in order to respond quickly to determinism and environmental changes (Kaehler, 2014). Although the phrase "adaptive capacity" encompasses a broad variety of attributes and processes, there is still no general agreement among researchers in the literature about what these attributes and processes should be, according to the literature (Adger et al., 2004). According to Adger et al. (2004), the ability or capability of a system to alter its traits or behaviour in order to better withstand present or expected external shocks is known as adaptive capacity. When it comes to the resilience literature, definitions of adaptive capacity are typically focused on the consequences of the system's capacity to adapt to disruption (Carpenter et al., 2001), like the capacity to improve or preserve quality of life (Gallopín, 2006) or the capacity to effectively exit an unfavourable situation and reenter a preferable one (Walker et al., 2004)

Agility

In business, organizational agility refers to a set of processes that enable an organization to detect and respond quickly and effectively to changes in the internal and external

environment, learn from the experience and use it to improve the competencies of the organization. Organization agility is defined as the ability of an organization to sense changes in the internal and external environment, respond efficiently and effectively in a time- and cost-effective manner, as well as learn from the experience to improve the competencies of the organization (Seo & La Paz, 2008). Agility is defined by Worley, Williams, and Lawler (2014) as the ability to change an organization quickly, efficiently, and sustainably; it is also defined as a replicable organizational resource. According to Ganguly, Nichiani, and Farr (2009), agility is defined as the effective integration of response capabilities and knowledge management so that changes in both proactive and responsive business and consumer requirements and opportunities can be adapted quickly, efficiently, and accurately without compromising the cost or quality of the product and process. The variety of approaches that can be used to achieve success is referred to as agility.

According to Sambamurthy, Bharadwaj, and Grover (2003), agility is defined as a company's ability to recognize opportunities and threats, assemble the assets and skills necessary to launch an adequate response, assess its advantages and risks, and take competitively rapid action to address those opportunities and threats. Several authors, including Van Oosterhout, Waarts, and Van Hillegersberg (2006), assert that a company's agility allows it to change its businesses and business processes more quickly than the normal level of flexibility, allowing it to manage unforeseeable changes both internally and externally effectively. Setia, Sambamurthy, and Closs (2008) define agility as a company's ability to: 1) identify and exploit new competitive advantage opportunities; 2) capitalize on existing knowledge, assets, and connections; and 3) adapt when business conditions change suddenly and dramatically. Agility is essentially the process of managing risks through the cultivation of options (Holsapple & Li, 2008).

Theoretical Framework

Lean Theory

When Krafcik (1988) coined the term "Lean," he was attempting to draw attention to the ideas of cutting back on surplus labour and inventory, otherwise known as waste, as opposed to other auto manufacturers' "buffered approaches" (Staats et al., 2011). Toyota developed a variety of tools, techniques, as well as strategies to cut waste and enhance the leanness of manufacturing systems as part of its distinct culture of ongoing development. Toyota Manufacturing Systems (Monden, 1998).

Lean theory is an extension of the concepts of just-in-time delivery. Just-in-time (JIT) systems are pull-based systems that aim to coordinate business as well as production processes across the supply chain (Kros, Falasca, & Nadler, 2008). Green and Inman (2009) conducted a study to ascertain the influence of lean theory on the performance of an organization. They assert that you can utilise the idea to eliminate buffer stock and reduce waste in the manufacturing process. According to Eroglu and Hofer (2011), the leanness of a company's operations has a positive impact on its profitability. Their argument is that inventory leanness is the most effective inventory control tool available. In detail, the theory explains how manufacturers can gain greater freedom in their purchasing choices, lower the quantity of stock kept on site, and eliminate the need for inventory carrying costs. Overall, the adoption's timing and scale determine how empirically sound the lean explanation is, both of which are related to the timing. Conversely, inventory theoretically restricts a company's capacity to react to changes in

demand. Academic studies show that businesses that effectively optimise inventory using lean supply chain methods and procedures have increases in asset utilisation and customer happiness, which eventually results in improved organizational growth, profitability, and market share over time (Green & Inman, 2009).

Theory of Constraints (TOC)

A method for controlling variables, organisational decisions, manufacturing processes, and circumstances where there are restrictions in the present is called the Theory of Constraints, or TOC. The total order cost (TOC) is a business management tool that connects all manufacturing techniques. When applied scientifically, it allows for the connection of solutions to critical problems within an organization (regardless of its size), thereby ensuring that the organization's continuous improvement process continues unabated. The fundamental premise of TOC is that all businesses are constrained by at least one critical constraint that limits their ability to produce. The term "constraint" refers to any element that occurs in a system and prevents it from achieving its maximum performance.

Though most people associate the theory of constraints (TOC) with Goldratt (1990), TOC is actually a management philosophy whose objective is to identify and apply breakthrough improvement by concentrating on the constraint that keeps a system from performing at a higher level. There is a wide range of implementation scales for the theory of constraints; it can be applied in a variety of fields including manufacturing, logistics, supply chain management (including distribution), project management (including accounting), research and development (including sales and marketing), and so on. Every firm must have at least one constraint, according to the TOC paradigm, which is a generalization. The definition of a constraint given by Goldratt and Cox (1992) is any element or factor that prevents the system from accomplishing more of what it was intended to accomplish (i.e., achieving its goal). By applying the Theory of Constraints, management can regulate the product's contribution margin and unit production cycle with respect to its essential resources, also referred to as its constraints (bottlenecks), resulting in an increase in overall production capacity.

Empirical Review

According to Shukor, Newaz, Rahman, and Taha (2021), environmental uncertainty and organizational ambidexterity have a negative impact on supply chain integration. They also investigated the relationship between supply chain agility and organizational flexibility in manufacturing firms. The information was gathered from 526 managers working in the services and manufacturing industries in Kuala Lumpur, Malaysia. The partial least square (SmartPLS 3.0) tool was used in conjunction with the structural equation modeling (SEM) technique to achieve the desired results. The findings demonstrated that the supply chain and environmental uncertainty have a substantial link integrations, which include customer, supplier, and internal integrations, among other things.

On the one hand, Jain (2021) investigated the effect of customer and supplier connections and strategic partnerships on supply chain responsiveness, and on the other hand, he looked into the impact of supply chain responsiveness on operational performance in the Indian manufacturing industry. Additionally, the study examined the moderating impacts of demand uncertainty on the link between supply chain responsiveness and strategic supplier partnerships, as well as one between customer relationship–supply chain

responsiveness. For the purpose of collecting data from manufacturing companies in India, a structured self-administered questionnaire was developed and tested. After ensuring the validity and reliability of the identified constructs, this study conducted structural equation modeling and moderated regression for the purpose of testing the hypotheses in question. Furthermore, the establishment of strategic partnerships with suppliers and customer relationships positively affects the responsiveness of the supply chain, which in turn improves operational performance.

Otchere, Adzimah, and Aikens (2016) investigated the inventory management practices and internal controls of a selected Ghanaian company in order to develop recommendations. To collect primary data from the company's employees, the researchers used an interview-administered questionnaire and observational methods. The researchers used a purposive sampling approach to identify fourteen employees who were directly involved in inventory management operations. The quantitative data was analyzed with the help of the Statistical Package for Social Sciences (SPSS) and Microsoft Excel 2007 Software, whereas the qualitative data was analyzed with the help of deductive and inductive reasoning. As per the study's conclusions, the organisation under investigation employs numerous inventory management protocols to guarantee that its stock is consistently accessible to fulfil consumer requirements. Inventory management practices, as well as internal control practices, are both of moderate quality in this organization.

Agu, Oni-Anike, and Eke (2016) investigated the correlation between demand management and customer satisfaction of a subset of manufacturing enterprises, the impact of inventory control on the productivity of those firms, and the effect of Just - in - time delivery on the growth of selected manufacturing firms in their research. The study had a total population of 996 participants, from which a sample size of 285 was calculated using Taro Yemini's formula with a 5 percent error tolerance and a 95 percent level of confidence in the results. The majority of the data was gathered through the use of questionnaires and interviews, respectively. From the total of 285 copies of the questionnaire that were distributed, 270 copies were returned, with only 15 copies not being returned. It was decided to use a descriptive survey research design for this investigation. The hypotheses were tested with the help of statistical tools such as the Pearson product moment correlation coefficient and simple linear regression. Inventory control has a significant impact on the productivity of selected manufacturing firms.

Kinyua and Nyang'au (2018) conducted a study to determine the impact of inventory management on the performance of organizations. With this research, it was hoped to achieve the following specific objectives: to evaluate the impact of inventory investment on organizational performance and to investigate the impact of inventory turnover on organizational performance. When investigating the impact of inventory management on organizational performance in Kenya's energy sector, we used a descriptive approach to find out more. Kenya Power's management staff was the intended audience for this study, which was conducted in Nairobi. A simple random sampling technique was used to determine the sample size for this study, and the primary data was collected directly from respondents using a questionnaire, which was developed by the researcher specifically for this study. The questionnaire was made up of both closed-ended and open-ended inquiries. In order to determine the relationship between inventory management and organizational performance, the researcher conducted a multiple regression analysis.

The intended audience consisted of 300 members of management. When selecting a sample size of 90 respondents, the researcher used stratified random sampling to select the participants. The quantitative data was gathered through the use of questionnaires, and the results were analyzed through the use of descriptive statistics in SPSS. The study found a relationship between the variables.

Methodology

The cross-sectional survey design was employed in this study. The cross-sectional survey can be seen as a snapshot of a population in a given period of time. The cross-sectional survey which is a form of quasi experimental design was used since the researcher did not have control over the variables under examination and the research's objective is to generate new facts without intentionally manipulating the variables. The study's target population were all the manufacturing firms in south-south Nigeria. The six states that comprised the south-south were Akwa Ibom, Bayelsa, Cross Rivers, Delta, Edo, and Rivers. Nevertheless, the study's accessible population consist of twenty-four (24) manufacturing enterprises. This accessible population was determined by choosing four firms from each state. The organizations were selected based on the fact that they have existed for over a decade, have standard facilities and they have above 100 staff strength. The number of managers and supervisors provided to the researcher by the human resource departments of these firms were four hundred and ninety five (495). Out of the population, a sample of 221 was gotten through the use of Taro Yamane's formula at 95% confidence level. Hence, the sample size of this study was 221 managers and supervisors of the selected firms. The simple random sampling technique which is a type of the probability sampling techniques was used in this study. The data for this research was gotten from primary. The primary data for this study were collected mainly through a structured questionnaire. The SmartPLS 3.3.3 was used to examine all individual items and their loadings to ensure all loadings meet the minimum cut-off recommended. For the bivariate and multivariate analysis, the Structural Equation Modelling (SEM) with the aid of Smart PLS 3.3.3, was used to examine the relationship between the dimensions of inventory management practice and the measures of organizational Resilience.

Results and Discussion

The researcher distributed a total of 221 questionnaires to selected manufacturing firms in South-South, Nigeria. The filled copies of the questionnaires were collected after being submitted to key collaborators at the firms and in different states. Out of the two hundred and twenty one questionnaires administered, two hundred and six were retrieved out of which 6 were not properly filled, and hence it was not used. Therefore, for the purpose of this study 200 questionnaires were used for the analysis. To evaluate the relationships between variables in the structural equation model (SEM), the study employed the bootstrap method. Path coefficients (β values) ranging from .10 to 0.29 were considered weak correlations, .30 to .49 indicated moderate correlations, and .50 to 1.0 represented strong correlations. Hypotheses with p-values below 0.05 were accepted, signifying statistical significance, while those above 0.05 were rejected. Additionally, the coefficients of determination (R^2 or predictive accuracy) were determined. R^2 values for endogenous variables were interpreted as follows: 0.00 to 0.25 (weak), 0.26 to 0.50 (moderate), and ≥ 0.75 (substantial).

Inventory Planning and Control and Measures of Organizational Resilience

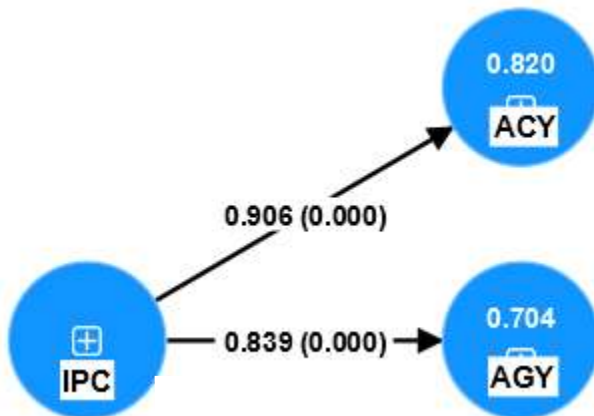


Figure 2: Hypotheses 1 and 2

Source: SmartPLS 4.0 output on Research Data, 2023

Ho₁: There is no significant relationship between Inventory Planning and Control and Adaptive Capacity of manufacturing firms in South-South, Nigeria.

The analysis in Figure 2 indicates a significant relationship ($p < 0.05$) between Inventory Planning and Control and Adaptive Capacity. The path coefficient (β) is 0.906, and the coefficient of determination (R^2) is 0.820, suggesting a strong positive relationship between Inventory Planning and Control and Adaptive Capacity. This implies that an increase in Inventory Planning and Control corresponds to an increase in Adaptive Capacity within manufacturing firms in South-South, Nigeria. The study thus rejects the null hypothesis, affirming a significant relationship between Inventory Planning and Control and Adaptive Capacity.

Ho₂: There is no significant relationship between Inventory Planning and Control and Agility of manufacturing firms in South-South, Nigeria.

Similarly, the analysis in Figure 2 demonstrates a significant relationship ($p < 0.05$) between Inventory Planning and Control and Agility. The path coefficient (β) is 0.839, and the coefficient of determination (R^2) is 0.704, indicating a strong positive relationship between Inventory Planning and Control and Agility. This implies that an increase in Inventory Planning and Control leads to a corresponding increase in Agility within manufacturing firms in South-South, Nigeria. The study rejects the null hypothesis, confirming the significant relationship between Inventory Planning and Control and Agility.

Lean Inventory and Measure of Organizational Resilience

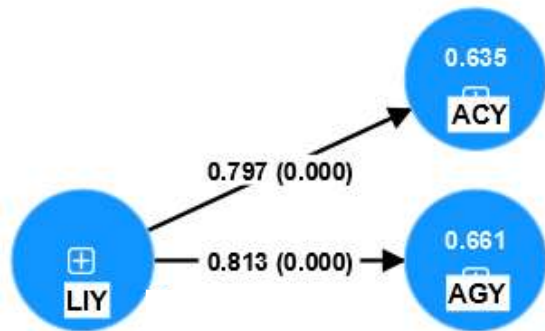


Figure 3: Hypotheses 3 and 4

Source: SmartPLS 4.0 output on Research Data, 2023

Ho₃: There is no significant relationship between Lean Inventory and Adaptive Capacity of manufacturing firms in South-South, Nigeria.

The analysis in Figure 3 indicates a significant relationship ($p < 0.05$) between Lean Inventory and Adaptive Capacity. The path coefficient (β) is 0.797, and the coefficient of determination (R^2) is 0.635, suggesting a positive relationship between Lean Inventory and Adaptive Capacity. This implies that an increase in Lean Inventory corresponds to an increase in Adaptive Capacity within manufacturing firms in South-South, Nigeria. The study rejects the null hypothesis, confirming the significant relationship between Lean Inventory and Adaptive Capacity.

Ho₄: There is no significant relationship between Lean Inventory and Agility of manufacturing firms in South-South, Nigeria.

Similarly, the analysis shows a significant relationship ($p < 0.05$) between Lean Inventory and Agility (Figure 3). The path coefficient (β) is 0.813, and the coefficient of determination (R^2) is 0.661, indicating a positive relationship between Lean Inventory and Agility. This means that an increase in Lean Inventory leads to a corresponding increase in Agility within manufacturing firms in South-South, Nigeria. The study rejects the null hypothesis, affirming the significant relationship between Lean Inventory and Agility.

Discussion of Findings

Inventory Planning and Control and Adaptive Capacity

The analysis on Inventory Planning and Control and Adaptive Capacity yielded a path coefficient (β) of 0.906 with a p-value of 0.000, indicating a positive and significant relationship between the two variables. The coefficient of determination (R^2) value of 0.820 signifies that 82.0% of the total variation in Adaptive Capacity can be explained by changes in Inventory Planning and Control. This finding highlights the crucial role of Inventory Planning and Control in organizations, as it significantly contributes to increasing Adaptive Capacity. This result aligns with previous research conducted by Lwiki, Ojera, Mugenda, and Wachira (2013), which also demonstrated a relationship between inventory management practices and organizational resilience.

Inventory Planning and Control and Agility

The analysis of Inventory Planning and Control and Agility revealed a path coefficient (β) of 0.839 with a p-value of 0.000, indicating a significant and positive relationship between these variables. The coefficient of determination (R^2) value of 0.704 suggests that 70.4% of the total variation in Agility can be explained by changes in Inventory Planning and Control. This result highlights the crucial role of Inventory Planning and Control in organizations, significantly contributing to the enhancement of Agility. This finding is consistent with the research conducted by Munyao, Omulo, Mwithiga, and Chepkulei (2015), who discovered that manufacturing companies utilized various inventory management techniques, such as just-in-time delivery, economic order quantity, and material requirement planning, leading to improvements in their resilience and agility.

Lean Inventory and Adaptive Capacity

The analysis of Lean Inventory and Adaptive Capacity revealed a path coefficient (β) of 0.797 with a p-value of 0.000, indicating a positive, moderate, and significant relationship between these variables. The coefficient of determination (R^2) value of 0.635 suggests that 63.5% of the total variation in Adaptive Capacity can be explained by changes in Lean Inventory. This finding highlights the crucial role of Lean Inventory practices in organizations, significantly contributing to the enhancement of Adaptive Capacity. These results align with previous research conducted by Anichebe and Agu (2013), who emphasized the significant impact of effective inventory management on an organization's adaptability and resilience. Additionally, Nnadi and Ndu Oko (2021) found that lean inventory strategies account for a substantial portion of the variance in firm productivity and delivery performance, further underscoring the importance of such practices in organizational success.

Lean Inventory and Agility

The analysis of Lean Inventory and Agility revealed a path coefficient (β) of 0.813 with a p-value of 0.000, indicating a positive, moderate, and significant relationship between these variables. The coefficient of determination (R^2) value of 0.661 suggests that 66.1% of the total variation in Agility can be explained by changes in Lean Inventory. This finding underscores the critical role of Lean Inventory practices in enhancing an organization's Agility, enabling it to respond effectively to changes in the business environment. This result is consistent with the findings of Kinyua and Nyang'au (2018), who emphasized the necessity of lean inventory management for firms to remain agile and adaptable in the face of environmental changes.

Conclusions

This study has provided valuable insights into the critical relationship between inventory management practices and organizational resilience in manufacturing firms. By examining dimensions such as inventory planning and control and lean inventory, the study identified key areas that significantly influence a firm's ability to respond effectively to disruptions and challenges. The findings underscore the importance of a holistic approach to inventory management, emphasizing the need for firms to adopt efficient planning strategies, implement lean inventory systems, foster strategic supplier

partnerships, and optimize capacity utilization. These practices collectively contribute to enhanced operational efficiency and flexibility, thereby bolstering the overall resilience of the organization. In practical terms, our findings suggest that manufacturing firms should invest in comprehensive inventory management practices while simultaneously fostering a culture of flexibility within the organization. This dual focus will not only enhance day-to-day operations but also fortify the firm's ability to withstand and overcome unforeseen disruptions.

Recommendations

Based on the implication of the study outcomes, the following recommendations are made:

1. Manufacturing firms should invest in advanced inventory tracking systems that provide real-time visibility into stock levels, order status, and usage patterns to effectively monitor and control inventory, facilitating a more adaptive response to changing market conditions and unforeseen disruptions
2. Manufacturing firms should adopt agile manufacturing practices that prioritize flexibility, responsiveness, and quick decision-making.
3. Manufacturing firms should integrate Lean Six Sigma principles into their operations to eliminate waste, optimize processes, and improve overall efficiency to enhances adaptive capacity by creating a leaner, more agile operation that can quickly adapt to changes in demand and market conditions
4. Manufacturing firms should cultivate a culture of continuous improvement, where employees are encouraged to identify and implement changes that enhance efficiency and responsiveness.

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