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Supply Chain Efficiency and Manufactured Capital of Conglomerates in Nigeria

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Abstract- ***The aim of this study was to determine how efficient the conglomerate companies were in their supply chain for the period 2016 to 2025. The dependent variable was Manufactured Capital which encompasses the machinery, tools, infrastructure, and technology used in the production and distribution of goods while Supply Chain Efficiency was independent variable and were expressed with Inventory Turnover Ratio, Turnover Growth Ratio and Asset Turnover Ratio. Data for the work were accessed from published financial statements of the companies in Nigeria for the period 2016 to 2025 (10 years). Multiple linear regression technique was used to analyse the sourced data. Major findings of the study were that Inventory Turnover Ratio had negative relationship with Manufactured Capital of the firms; Turnover Growth Ratio had positive relationship while Asset Turnover Ratio also had negative relationship for the period 2016 to 2025. The study showed that only Turnover Growth Ratio had positive relationship with Manufactured Capital while the rest had negative relationships. It therefore recommended that Corporate Managers should work towards growing the turnover of their organizations since this ratio positively had relationship with Manufactured Capital.***

I. INTRODUCTION

In today's highly competitive and dynamic business environment, the efficiency of supply chains are critical determinants of organizational success. One significant factor that contributes to these aspects is manufactured capital which encompasses the machinery, tools, infrastructure, and technology used in the production and distribution of goods. Manufactured Capital serves as the backbone of modern supply chains, facilitating the seamless movement of products from raw material suppliers to final consumers. The integration of advanced manufacturing technologies, automation, and sophisticated logistics infrastructure has revolutionized supply chain operations, enabling companies to achieve higher levels of productivity and responsiveness. By investing in state-of-the-art machinery and equipment, firms can streamline their production processes, minimize downtime, and ensure consistent quality, thereby boosting overall efficiency. Moreover, the strategic deployment of manufactured capital can lead to significant cost savings, which directly enhances efficiency. Efficient manufacturing systems reduce waste, optimize resource utilization, and lower production costs. Additionally, advanced logistics and distribution networks enable faster delivery times and reduced transportation expenses, further contributing to the bottom line. In an era where consumer demands are constantly evolving, the ability to quickly adapt to market changes and deliver products efficiently provides a competitive edge.

This paper aims to explore the multifaceted impact of manufactured capital on supply chain efficiency. By examining industry data and theoretical frameworks, the study will uncover how investments in machinery, technology, and infrastructure drive operational improvements and financial gains. Understanding these dynamics is crucial for businesses seeking to enhance their supply chain performance and achieve sustainable growth in a rapidly changing economic landscape. The research delves into the role of manufactured capital in enhancing supply chain efficiency highlighting its impact on inventory turnover, turnover growth, and asset turnover of listed conglomerates in Nigeria.

Statement of the Problem

Despite the critical role of manufactured capital in modern supply chains, many organizations struggle to effectively leverage their investments in machinery, infrastructure, and technology to achieve optimal efficiency and profitability. There is a need to comprehensively understand how these elements of capital influence supply chain performance for maximization of returns to the companies. The problem is compounded by the rapidly evolving technological landscape and increasing market demands, which require continuous adaptation and improvement of supply chain operations. Without clear insights into these dynamics, companies risk underutilizing their manufactured capital leading to inefficiencies, higher operational costs, and reduced competitiveness.

Objective of the Study

The primary objective of this study was to investigate the effect of supply chain efficiency on manufactured capital of conglomerates in Nigeria from 2016 to 2025. Specifically, the study aims to:

1. Analyze the relationship between Inventory Turnover Ratio and manufactured capital of listed conglomerates in Nigeria from 2016 to 2025
2. Evaluate Turnover Growth Ratio and manufactured capital of listed conglomerates in Nigeria from 2016 to 2025
3. Analyze the relationship between Asset turnover ratio and manufactured capital of listed conglomerates in Nigeria from 2016 to 2025

Research Questions

1. What is the relationship between Inventory turnover ratio and manufactured capital of listed conglomerates in Nigeria from 2016 to 2025?
2. How is Turnover Growth ratio influenced by manufactured capital of listed conglomerates in Nigeria from 2016 to 2025?
3. What is the nexus between asset turnover ratio and manufactured capital of listed conglomerates in Nigeria from 2016 to 2025?

Null Hypothesis

The hypotheses are expressed in null form as follows:

Ho1: There is no significant relationship between Inventory turnover ratio and manufactured capital of listed conglomerates in Nigeria.

Ho2: Turnover Growth has no significant influence on manufactured capital of listed conglomerates in Nigeria.

Ho3: Asset turnover ratio has no significant relationship with manufactured capital of listed conglomerates in Nigeria.

Significance of the Study

This study's importance stems from its capacity to offer insightful analysis and useful suggestions for companies looking to improve the effectiveness of their supply chains by making calculated investments in manufactured capital. Businesses can find opportunities for improvement, resulting in more efficient and productive operations, by comprehending how manufactured capital affects supply chain efficiency. The study can assist organisations in identifying areas where investments in infrastructure, machinery, and technology can lower operating costs, cut waste, and enhance resource utilisation. The study's conclusions can help businesses make well-informed choices that increase profitability by streamlining their supply chain operations and cutting expenses. Businesses that successfully use manufactured capital can get a competitive advantage in the market by achieving quicker delivery times, improved customer satisfaction, and higher-quality products. By offering a framework for evaluating the return on investment (ROI) in manufactured capital and coordinating these investments with long-term business objectives, the results can support strategic planning. By examining the relationship between manufactured capital and supply chain performance and providing empirical data and theoretical insights that might guide future research, the study adds to the body of knowledge in academia.

Scope of the Study

This study will include companies from diverse geographical regions to capture a broad spectrum of practices and outcomes as well as consideration of

both short-term and long-term effects of investments in manufactured capital on supply chain performance.

Limitations of the Study

The study admits a number of limitations that could affect the results. These include data quality and accuracy from participating companies; differences in regional and industry-specific practices that could make the findings not generally applicable; rapid technological advancements that could eventually render some findings outdated or less relevant; and external factors like market dynamics, economic conditions, and regulatory changes that can affect supply chain performance and make it difficult to isolate the impact of manufactured capital. The study intends to offer solid and useful insights into the function of manufactured capital in improving supply chain efficiency by addressing these constraints and thoroughly evaluating the scope.

II. CONCEPTUAL REVIEW

Manufactured Capital

This refers to funds that a company sets aside for the purchase, renovation, or upkeep of tangible assets like buildings, land, machinery, plants, or technology. These expenses are typically incurred to support new products or enhance ongoing operations. Two examples of manufactured capital are purchasing new machinery or constructing a new facility to boost operational capacity or provide long-term financial rewards for the business. It is anticipated that a company's long-term asset investment will yield returns over several years. To be considered manufactured capital, an expense must either produce a new asset or raise the value or usefulness of an existing asset. By investing in capital assets, businesses can boost productivity, efficiency, and overall performance, opening the door to long-term, stable growth. In addition to assets made by the reporting organization and kept for its own use, these capitals are frequently produced by one or more other organisations that are not the reporting organization. Therefore, manufactured capital represents the assortment of tangible, technological, and material assets that a business can use to deliver services and achieve its goals. The tangible resources that a business owns, rents, or manages and uses to produce or provide services are referred to as material assets and infrastructure (Omare et al, 2025).

Inventory turnover

The rate at which inventory is sold, consumed, and replaced is known as inventory turnover. The cost of products is divided by the average inventory for the same time period to determine the inventory turnover ratio. The higher the rate, the better for the company since it indicates that it may recycle its inventory multiple times over the reporting period. Overstocking raw material inventory and poor conversion of raw materials to work-in-progress and finished products are the causes of high inventory holding, which would reduce earnings. High inventory holding is a sign of higher inventory levels, unsuitable working capital investments, and an unsatisfactory liquidity situation, which prevents corporate expansion. Decreased inventory holding reduces holding costs and increases profits (Babu and Satyanarayana 2019).

Asset turnover

It is a financial indicator of how well a business makes use of its resources to produce income from sales. Net sales (turnover) are divided by the average total assets to arrive at this figure. In this context, net sales (turnover) is the total proceeds from sales less any allowances or refunds. This ratio shows how well a business uses its resources, which is necessary for profitability. It aids investors in determining how profitably a business is using their investment. Among other things, businesses should work to increase operating efficiency in order to become more competitive and raise their stock values, which will benefit shareholders (Patin et al, 2020).

Turnover growth

This represents the percentage growth of a company's overall sales revenue over a given time frame, such as a quarter or a year. It is a crucial indicator of how quickly a business is growing and whether more people are interested in its offerings. One important statistic for assessing a company's growth in sales over a given time frame is revenue growth. It is a key sign of the company's capacity to make money and remain competitive. The financial benefits obtained from effective supply chain operations are referred to

as profitability in the context of supply chains. This entails lowering manufacturing, inventory, and transportation expenses as well as raising revenue through improved service levels. Revenue growth of the firms is very imperative to avoid their failures (Oladipupo and Azeez, 2022).

Supply chain

The concept of supply chain appeared for the first time in the military field, its concept developed and expanded to reach economic organizations and institutions due to its success (Lilia and Yasmina 2024). Small and medium-sized businesses' supply chain managers must deal with cost inefficiencies when it comes to fulfilling their capital needs for people, equipment, and technology. Supply chain managers in small and medium-sized businesses run the danger of compromising profitability if they don't put cost-efficiency ideas into practice. An organization, people, technology, activities, information, and resources involved in transferring a good or service from supplier to consumer make up a supply chain. It is a network of suppliers, retailers, distributors, transporters, and storage facilities that take part in the manufacturing, shipping, and retailing of goods to customers. Along with the related information and financial flows, these activities are related to the movement and transformation of goods from the raw materials stage to the final consumer. Natural resources, components, and raw materials are transformed via supply chain operations into a final product that is shipped to the final consumer. A supply chain is, to put it simply, the connection between a company and its suppliers and clients. It consists of three main components: supply, which deals with how, when, and where raw materials are supplied to manufacturing; manufacturing, which is concerned with turning these raw materials into final products; and distribution, which is concerned with making sure that the products are delivered to customers via a well-organised network of distributors, warehouses, and retailers. In today's highly competitive market, organizations are increasingly recognizing the critical role that supply chain costs play in determining the final product cost and overall profitability. Fluctuations in these costs, driven by factors such as sourcing, transportation, and inventory management, necessitate a strategic focus on enhancing supply chain operational efficiency. This focus is essential not only for maintaining profitability but also for achieving sustainable revenue growth. (Agbonghae, 2024).

According to Panle and Okpara (2024) the fact that the strategic supply chain has a significant impact on the profitability and sustainability of manufacturing companies is the advantage of strategic supply chain management. In order to create a cohesive and high-performing commercial enterprise model, supply chain management combines capabilities with the primary duty of connecting critical commercial enterprise capabilities and processes both within and between organisations. Sales of goods and services to final customers less the total cost of the supply chain is known as supply chain profitability. One of the main problems is how the supply chain's participants divide up the profits, expenses, and risks. The allocation of revenues, costs, and risks among supply chain members is a major problem, even if boosting supply chain sales necessitates cooperation and information exchange among supply chain members. In order for a supply chain to thrive, it must be evaluated from a financial perspective. In particular, supply chain profits and profitability are important performance measures.

Supply Chain Efficiency

The optimization of the supply chain to save costs, increase speed, and guarantee seamless operations without sacrificing quality or service level is referred to as supply chain efficiency. It focuses on how well the supply chain uses resources like labour, capital, and time to meet consumer demand. Reducing production, shipping, warehousing, and procurement costs; reducing the time it takes for goods to move from the point of raw materials to the point of delivery; reducing excess inventory, handling, and delays that could lead to waste; maintaining the right amount of inventory to meet demand (neither too little nor too much); and preventing delays or bottlenecks through suppliers, manufacturers, and distributors working together smoothly are all essential characteristics of a productive supply chain. For businesses to be competitive, supply chain efficiency is essential because it allows them to offer better products at cheaper prices and with faster

service. In today's highly competitive and interconnected global market, supply chain efficiency has become a pivotal factor in determining a business's success. Companies now operate in an environment where agility, speed, and cost-effectiveness are vital to maintaining a competitive edge. A well-optimized supply chain not only ensures the timely delivery of products but also significantly reduces operational costs, enhances customer satisfaction, and increases profitability (Roumel 2024).

Increasing supply chain efficiency requires optimising several processes, reducing waste, and enhancing collaboration and communication throughout the whole supply chain. These can be accomplished by integrating Enterprise Resource Planning (ERP) systems, which help departments like production, inventory, and procurement better manage data flow and make better decisions; using software to track inventory levels in real time, project demand, and streamline logistics; automating repetitive tasks, such as order processing and warehouse management, to reduce costs, speed up operations, and minimise human error; and utilising blockchain technology for safe and transparent tracking of goods, lowering fraud, and enhancing traceability. It is preferable to implement demand efficiency strategies by minimising excess inventory and keeping a safety stock level to prevent stockouts; lowering holding costs and avoiding overstocking; and using Just-In-Time (JIT) guidelines to ensure that stock is refilled when needed. Software for route planning can save fuel use, expedite deliveries, and maximise transportation effectiveness. Key Performance Indicators (KPIs) such as inventory turnover, order correctness, and on-time delivery should be closely monitored in order to attain supply chain efficiency. The first and most crucial step in optimizing supply chain efficiency is embracing data-driven decision-making. Modern technologies such as big data, artificial intelligence (AI), and machine learning enable businesses to gather, process, and analyze vast amounts of data in real time (Roumel, 2024).

In this study, Supply Chain Efficiency will be measured with three variables. These are Inventory Turnover ratio (which is the Measurement of the number of times inventory is sold and replaced over a period, that is Cost of Goods Sold /Average Inventory); Turnover Growth ratio (current period turnover – previous period turnover/previous period turnover); as well as Asset turnover ratio (Net Turnover divided by average assets of the company). Statistical methods, including regression analysis and correlation analysis, were used to explore the relationships between manufactured capital and supply chain performance metrics.

Theoretical Review

Supply Chain Management Theory

It blends concepts from logistics, marketing, and systems engineering. Several key theorists defined the modern academic foundation of Supply Chain Management (SCM). Forrester, J. (1958) proposed early models showing how information, material, and capital flows link business activities across a channel. Mentzer, J. T. et al, defined SCM as the systemic, strategic coordination of traditional business functions within a particular company and across businesses. Lambert, D. M. and Cooper, M. C. (2000) established the framework (2000) for integrating business processes across the supply network. van der Vorst, G. A. J. (2004) developed theories focusing on supply chain redesign and reducing the "bullwhip effect" (unplanned order fluctuations). Supply Chain Management (SCM) evolved over several decades, with the 1980s marking the coinage of the term and the 1990s cementing the blend of logistics, marketing, and systems engineering. This cross-disciplinary approach allows businesses to coordinate operations globally, optimize resources, and efficiently meet consumer demands.

Transaction Cost Economics (TCE)

This theory was propounded by the economist Williamson, O. (1970). He formalized and expanded the theory into an operational framework in his 1975 book, Markets and Hierarchies: Analysis and Antitrust Implications, and further solidified it in his landmark 1979 article, "Transaction Cost Economics: The Governance of Contractual Relations." The emergence of transaction cost economics (TCE) in the early 1970s with Oliver Williamson's successful reconciliation of the so-called neoclassical approach

with Herbert Simon's organizational theory can be considered an important part of the first cognitive turn in economics. The development of TCE until the late 1980s was particularly marked by treating the firm as an avoider of negative frictions, that is, of transaction costs. However, since the 1990s TCE has been enriched by various approaches stressing the role of the firm in creating positive value, example is the literature on modularity. Hence, a second cognitive turn has taken place as the firm is no longer only seen as an avoider of negative costs but also as a creator of positive knowledge.

This research holds on to the Supply Chain Management Theory which directly links to the topic of this paper.

Empirical review

Omare et al, (2025) wrote on the effect of manufactured capital reporting on the firm value of listed companies in Kenya. They assessed that many organisations' firm values have decreased as a result of a lack of accountability and transparency brought on by the inability to give both financial and nonfinancial information. The majority of successful businesses in today's business environment are aware that using integrated reporting to create firm value for clients, staff, and investors is the main objective of any corporation. Since many organisations are still having financial difficulties after implementing integrated reporting, more research is required. The goal of the study was to ascertain how manufactured capital reporting affected listed businesses' firm values. Trade-off theory served as the basis for the investigation. The positivist research philosophy served as the study's compass. A correlational study design was employed. The research population consisted of twenty-three integrated reporting companies that were listed on the Nairobi Securities Exchange. The selection of the listed firms was justified since the Nairobi Securities Exchange was the only stock market in Kenya that was required by law to prepare integrated reports under the company laws CAP 486. They used a census survey. For eight years, from 2015 to 2022, secondary data was gathered via the Nairobi Securities Exchange website. The collected data was analysed using panel data regressions and panel summary statistics. Overall averages, standard deviations, minimum and maximum ratios, between-firm standard deviations, and within-firm standard deviations were among the elements of descriptive statistics. Serial correlation tests, stationarity tests, Hausman tests, Breusch-Pagan Lagrange multiplier (LM) tests, and testparm tests were among the panel data regressions. For each variable modelling, appropriate models between random effects (RE) and fixed effects (FE) were chosen using the Hausman test. The STATA analysis's findings indicate that listed companies' firm value is positively and significantly impacted by manufactured capital reporting, and that increasing financial capital reporting increases the firm's total worth. Firm value, however, is somewhat affected by undetected firm-specific characteristics but does not vary much over time. Furthermore, implementing reporting standards only yields long-term benefits. This result supports previous studies by demonstrating that, with the right model, it is possible to pinpoint the precise variation in company value that unobserved firm-specific factors contribute to the idiosyncratic mistake.

Okeke et al, (2025) researched on Financial and Manufactured Capital Reporting and Firm Value of Listed Consumer and Industrial Goods Firms in Nigeria: A Comparative Analysis. They contend that Nigeria's consumer and industrial goods industries are essential to the country's economic growth and job creation. The performance of these industries has been uneven and disappointing for over ten years, as recent events have shown. This study looked at how Nigerian consumer and industrial goods companies' firm values were affected by financial and manufactured capital reporting. The study employed an ex post facto research design, and secondary data for the twelve-year period from 2013 to 2024 came from the annual financial reports of the chosen consumer and industrial goods companies in Nigeria. The Price to Book ratio (P/B Ratio) serves as a proxy for firm value, since financial and manufactured capital reporting are independent variables. Regression studies of the direct effect of pertinent factors were performed using STATA 16, and both financial-based and disclosure level-based measures were examined. According to the study, the firm value of listed consumer and industrial products

companies in Nigeria is not statistically significantly impacted by Financial Capital Reporting or Manufactured Capital Reporting as determined by financial and disclosure level-based indicators. However, a positive but negligible coefficient for the level of produced capital disclosures points to a possible new informational value. By matching strategic narratives on financing, asset use, risk, and long-term performance with important indicators like debt, reserves, grants, and physical assets, firms can enhance the value relevance of financial and manufactured capital disclosures. Regulators should support this through sector-specific templates and standards to ensure clarity, comparability, and a stronger link to value creation.

Simon-Ilogho (2025) wrote on Inventory turnover ratio and firm profitability: A study of listed agricultural firms in Nigeria. The researcher found that the turnover rate of a manufacturing company has an impact on revenue, which in turn has an impact on the profitability of the company. A key factor in determining profitability is efficient inventory management. This study looks at how inventory turnover affects Nigerian agricultural companies' profitability. Using secondary data from these companies' financial records, the study examined listed agricultural companies on the Nigerian Exchange Group for 24 quarters between 2018 and 2023. The data analysis technique used was ordinary least squares regression. According to the findings, inventory turnover ratios have no bearing on profitability as determined by return on assets (ROA). The findings indicated that the impact of inventory turnover on return on equity (ROE) is negative, while its effect on return on sales (ROS) is positive. The study recommends that more efforts be directed toward improving inventory management efficiency in agricultural firms. However, it is essential to consider and monitor the outcomes on ROE to determine if the costs associated with enhancing inventory management outweigh the benefits, given its negative impact on ROE.

Erawati et al, (2025) wrote on the Importance of Assets Turnover and Profitability the Sustainable Growth Rate of Company in Achieving Sustainable Development Goals (SDGs). They claimed that studying Sustainable Growth Rate (SGR) is crucial because businesses must prioritise sustainable and responsible growth in a world that is becoming more competitive and dynamic. Stakeholder theory was used in the study. The study demonstrated how sustainable growth can serve the Sustainable Development Goals (SDGs) while conforming to stakeholder expectations and needs. The financial statements of businesses listed between 2019 and 2023 on the Indonesia Stock Exchange (IDX) served as the data sample. Purposive sampling was the method employed in this investigation, which collected 1650 data points. The findings demonstrated that while IOS had no discernible impact on SGR, the ATO and Profitability variables had a favourable impact. Furthermore, Company Size acted as a moderator between Profitability and SGR but did not modify the link between IOS and SGR or ATO and SGR. The results made clear that businesses must prioritise operational efficiency (ATO) and profitability while coordinating strategies with stakeholder expectations. This linkage helps achieve the SDGs and promotes sustainable growth. The results of this study were expected to contribute significantly by providing a knowledge base for decision makers in the company, such as top management and investors, in formulating a sustainable growth strategy with the main objective of increasing revenue and becoming the basis for implementing business performance.

Oladipupo and Azeez (2022) researched on the effect of Sales Revenue Growth on the Corporate Performance of Nigerian Listed Foods and Beverages Manufacturing Firms. The study investigated the effect of sales revenue growth on the corporate performance of listed Nigerian foods and beverages manufacturing firms. The study used secondary source of data to collect panel data from the financial statements of the selected firms between 2011 and 2020. The population of the study is made up of the eight (8) listed foods and beverages companies listed on the Group Stock Exchange Nigerian Limited. The sample four (4) of the firms were obtained using a purposive sampling technique. The study employed the correlation analysis and the ordinary least square technique for data estimation. The research work found that the co-efficient of the sales revenue on the

return on assets is positively and significantly signed (0.17548, P-value of 0.02 < 0.05) with the correlation result of 0.8965. The study therefore concluded that sales revenue growth has a positive effect on the corporate performance of listed foods and beverages manufacturing firms in Nigeria with a strong positive correlation between the turnover and the firms' performance. Therefore, the research work recommended that the directors of the foods and beverages firms should strategize on how to improve on their advert coverage to increase their markets share that will improve the level of their firms' turnover in Nigeria.

Yin and Tian (2022) researched on Supply Chain Efficiency and Effectiveness Management: Decision Support Systems. They stated that optimal productivity model plays a significant role in various supply chain management (SCM) decision support systems. Therefore, the precision of the optimal productivity model is necessary to improve SCM's effectiveness. A factor often ignored is that transactions of certain goods are assembled within an enterprise as dynamic structures of various distribution ratios. Regardless of such structure, optimal model productivity is often produced; however, the productivity model's optimal precision can be enhanced by taking it into account. This focusses on strategic thinking and planning, where various process improvement mechanisms are developed. Therefore, in this study, data envelopment analysis (DEA) has been utilized to enhance supply chain efficiency and effectiveness management. The paper explored an optimal productivity model that evaluates the supply chain efficiency and effectiveness management. It discussed the policy preparation demands of the decision support systems and developed a framework that organisations can use to control the implementation process.

Wajo (2021) researched on the effect of Cash Turnover, Receivable Turnover, Inventory Turnover and Growth Opportunity on Profitability. The purpose of this study was to analyze cash flow, accounts receivable turnover, inventory turnover, and growth opportunity for the profitability of manufacturing companies listed on the Indonesia Stock Exchange. This research was conducted at manufacturing companies listed on the Indonesia Stock Exchange. This study's population were manufacturing companies listed on the Indonesia Stock Exchange in 2013-2016, totaling 137 companies. The number of samples used in this study was 16 companies using the purposive sampling method. The data was collected using the documentation method. The type of data used is quantitative, while the data source used is secondary data. This study indicates that cash turnover has a positive and significant effect on profitability, accounts receivable turnover has a positive and significant impact on profitability, has a positive and significant impact on profitability. and growth opportunity has a positive and insignificant effect on profitability.

Patin et al, (2020) studied on the Impact of Total Asset Turnover Ratios on Equity Returns: Dynamic Panel Data Analyses. This paper is an empirical exploration of the impact of total asset turnover ratios on stock returns of 1961 US public firms in different types of industries from 2001 to 2015. Stock prices are significantly influenced by operating performance of a company in efficiently utilizing its assets. For that matter, operating efficiency (as measured by total asset turnover ratio) plays a role in portfolio investment decisions. Pedroni's heterogeneous panel co-integration procedures, associated bivariate error-correction model (ECM), dynamic ordinary least squares (DOLS) and generalized method of moments (GMM) were applied. Both stock returns and total asset turnover ratios in levels were non-stationary with one behaviour. Subsequently, both variables were found co-integrated. The panel ECM estimates suggested convergence of variables toward long-run equilibrium at moderate pace with short-run interactive positive feedback effects. Again, both DOLS and GMM estimates revealed short-run contemporaneous positive effects of total asset turnover ratios on stock returns in levels. In view of the findings of this study, the researcher recommended that firms should strive to improve operating efficiency, among others.

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Kwak (2019) researched on the Analysis of Inventory Turnover as a Performance Measure in Manufacturing Industry. According to the researcher, using an appropriate measure to assess firms' performance is essential. They analyzed inventory turnover (IT) as a performance measure in manufacturing processes because IT ratios are critical in the manufacturing industry and publicly available objective measures. Using the data of 421 manufacturing companies in Korea from 2010 to 2018, we conducted an extensive analysis of the factors affecting IT by segment and its correlation with other financial ratios. Then, we compare performances between the top and bottom companies determined by Altman's Z score approach. We found that, for the overall manufacturing industry, IT ratios were negatively correlated with gross margin and debt cost, but positively correlated with capital intensity, although the results varied by segment. Moreover, IT ratios did not show significant correlations with other financial ratios categorized for growth, profitability, stability, productivity, and value of companies. However, adjusted IT (AIT) can be a good indicator of firms' performance in terms of financial sustainability. Results also revealed that the top 10% companies showed higher AIT ratios than the bottom 10% in most segments of the manufacturing industry. The analysis of this study can be a starting point to search for a composite index to evaluate manufacturing processes comprehensively.

Raoa and Rao (2009) studied on Inventory Turnover Ratio as a Supply Chain Performance Measure. The researchers viewed Inventory management as vital in supply chain performance of a firm. The inventory turnover ratio measures the number of times a company sells its inventory during the year. A high inventory turnover ratio indicated how best the firm is operating economically in selling its products. Inventory turnover is a measure of management's ability to use resources effectively and efficiently. Precise control and safeguarding of inventory is an essential task for a successful and well organized

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company. Business requires timely and accurate information on inventory location, movement and valuation. ERP systems provide data pertaining to receipt of goods, movement within and between locations, the sale, removal or disposition of goods, lot and serial tracking, precise valuation and status of goods remaining in inventory at any point of time. As a part of its continuous improvement program (CIP), firms can focus on inventory turn ratio as a means of improving its supply chain performance. In this context, present research is aimed to measure effect of inventory turnover ratio on supply chain performance in a leading battery manufacturing organization in India.

III. METHODOLOGY

3.1 Research Design

Ex-post facto research design was adopted in this study because past data was used. Ten (10) listed conglomerate companies in the Nigerian Exchange Group were used. These were UAC, John Holt, Chellarams, Dangote Cement, Unilever, Honeywell, Seplat, Transnational Corporation, Presco and Guinness.

Data for the work covered a ten year period of 2016-2025 and were derived from the published accounts of each of the companies. Variables used were Inventory Turnover Ratio (ITR), Turnover Growth Ratio (TGR), and Asset Turnover Ratio (ATR).

3.2 Model Specification

The following specification was formulated to ascertain the contributions of the independent variables to the dependent variable and was expressed in regression models. The linear regression model was therefore expressed in the form:

$$MFC = \beta_0 + \beta_1 X + \epsilon \quad \text{Model 3.1}$$

Where:

- β_0 = intercept
- β_1 = coefficient of the independent variable
- X = independent variable (e.g., ITR)
- ϵ (epsilon) = error term

This was expressed in regression models as follows:

$$MFC = \beta 0 + \beta 1\ ITR + \epsilon \quad \text{Equation 3.1}$$
$$MFC = \beta 0 + \beta 2\ TGR + \epsilon \quad \text{Equation 3.2}$$
$$MFC = \beta 0 + \beta 3\ ATR + \epsilon \quad \text{Equation 3.3}$$

where

MFC = Manufacturing Capital
ITR = Inventory Turnover Ratio
TGR = Turnover Growth Ratio
ATR = Asset Turnover Ratio

3.3. Method of Data Analysis

In this study descriptive and inferential analysis which include mean (averages), minimum, maximum, standard deviation skewness kurtosis, were carried out. The decision statistics are t-values, f-values, R, R2, Adjusted R2. The hypotheses were tested at 5% level of significance.

IV. DATA PRESENTATION, ANALYSIS AND FINDINGS

4.1 Data Presentation

The study was made up of Operating cashflow, as Dependent Variable while Accounts Receivable Period, Inventory Holding Period, Accounts Payable Period, Cash Conversion Cycle, and Liquidity Ratio were Independent Variables.

4.2 Presentation and analysis of empirical results

The data was analysed using descriptive statistics, t-statistic, f-statistic and table as presented below.

Table 4.1: Descriptive Statistics

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Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
CAPEX N	100	848000	404980.0	29801.219	69836.34	3.380	.241	12.263	.478
Inventory Turnover	100	.000	23.380	4.48975	4.153019	2.057	.241	6.551	.478
Turnover Growth ratio	100	-170.25	200.00	21.2952	50.25554	.287	.241	2.798	.478
Asset Turnover ratio	100	3.00	2111.00	109.0350	218.1204	8.075	.241	73.357	.478
Valid N (listwise)	100								

From Table 4.1, Inventory Turnover Ratio (ITR) had a mean of 4.48975 which means that the average data was above zero. It means that most data points were positive. The minimum value of 0.000 indicated that the lowest value of the dataset was positive. The maximum value of 23.38 means that the highest value of the dataset was positive. Standard Deviation which measures how spread out the values are, was positive at 4.153019. It deviated from the mean at that value. Skewness statistic indicating asymmetry in the data distribution had long right tail at 2.057 indicating that the distribution was left-skewed, that is, more values were concentrated on the right, with a longer tail on the left. Kurtosis which measures whether data has heavy or light tails compared to a normal distribution showed 6.551 (meaning that it had more extreme values (outliers) than a normal distribution).

From the same Table 4.1 Turnover Growth Ratio (TGR) had a mean of 21.2952 indicating that the average data was positive. The minimum value of -170.25 showed that the lowest value was negative while the maximum value of 200.00 showed that it had a positive dataset. Standard deviation of 50.25554 showed a positive spread; skewness of 0.287 indicated that more values concentrated on the right, with a longer tail on the left; while kurtosis of 2.798 showed that it had heavy tails compared to a normal distribution.

Looking at the Asset Turnover Ratio (ATR) from the same Table 4.1, it had a positive mean of 109.035 indicating that the average data was not positive. It had a minimum value of 3.00 indicating that the lowest value of the dataset was positive. The maximum value of 2111.00 showed that the highest value was positive. Standard deviation was 218.1204 indicated a positive spread. Skewness of 8.075 indicated that the distribution was right-skewed, that is, more values were concentrated on the left, with a longer tail on the right. Kurtosis of 73.357 showed that it had more extreme values than a normal distribution.

4.2 Test of hypotheses

The hypotheses were tested in line with the model specifications. The equations used for this study were not logged, but expressed in their normal forms in order to observe their behaviours as follows:

$$MFC = \beta 0 + \beta 1\ ITR + \epsilon \quad \text{Equation 3.1}$$
$$MFC = \beta 0 + \beta 2\ TGR + \epsilon \quad \text{Equation 3.2}$$
$$MFC = \beta 0 + \beta 3\ ATR + \epsilon \quad \text{Equation 3.3}$$

where

MFC = Manufacturing Capital
ITR = Inventory Turnover Ratio
TGR = Turnover Growth Ratio
ATR = Asset Turnover Ratio

4.2.1. Test of Hypothesis One

The null hypothesis (Ho1) stated that there was no significant relationship between

Inventory turnover ratio and manufactured capital of listed conglomerates in Nigeria.

R	f. Cal	f. Crit	t. Cal	t. Crit
0.033	0.104	4.0012	0.322	1.671

The correlation coefficient (R) in Table 4.2 describes the relationship between the dependent variable Manufactured Capital and the independent variable (Inventory Turnover Ratio). The 0.033 being 3.3% shows a very weak positive relationship between the variables. The R2 of 0.001 (1%) is the coefficient of determination showing the extent of variation or changes in the dependent variable (Manufactured Capital) brought about by the independent variable (Inventory Turnover Ratio). This result shows that 1% of the changes in Manufactured Capital was caused by Inventory Turnover Ratio while 99% was accounted for by error term. From the table 4.3, the f critical value is 4.0012 greater than the f calculated 0.104 at 0.05 level of significance. In the same vein, t critical value is 1.671 greater than the t calculated

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(0.322) at the same level of significance hence the null hypothesis was accepted and the alternate rejected. This means that there is no significant relationship between Inventory Turnover Ratio and Manufactured Capital of the conglomerate companies in Nigeria between 2016 and 2025.

4.3.2 Hypothesis 2: This was stated in the null form that Turnover Growth has no significant influence on manufactured capital of listed conglomerates in Nigeria.

R	f. Cal	f. Crit	t. Cal	t. Crit
0.277	8.126	4.0012	2.851	1.671

The correlation coefficient (R) in Table 4.3 describes the relationship between the dependent variable Manufactured Capital and the independent variable (Turnover Growth Ratio). The 0.277 being 2.77% shows a very weak positive relationship between the variables. The R2 of 0.077 (7.7%) is the coefficient of determination showing the extent of variation or changes in the dependent variable (Manufactured Capital) brought about by the independent variable (Turnover Growth Ratio). This result shows that 7.7% of the changes in Manufactured Capital was caused by Turnover Growth Ratio while 92.3% was accounted for by error term.

From the table 4.3, the f critical value is 4.0012 less than the f calculated 8.126 at 0.05 level of significance. In the same vein, t critical value is 1.671 less than the t calculated (2.851) at the same level of significance hence the null hypothesis was rejected and the alternate accepted. This means that there is significant relationship between Turnover Growth Ratio and Manufactured Capital of the conglomerate companies in Nigeria between 2016 and 2025.

4.3.3 Hypothesis 3: This was stated in the null form that Asset Turnover Ratio has no significant relationship with manufactured capital of listed conglomerates in Nigeria.

R	f. Cal	f. Crit	t. Cal	t. Crit
0.033	0.106	4.0012	(0.326)	1.671

The correlation coefficient (R) in Table 4.4 describes the relationship between the dependent variable Manufactured Capital and the independent variable (Asset Turnover Ratio). The 0.033 being 3.3% shows a very weak positive relationship between the variables. The R2 of 0.001 (1%) is the coefficient of determination showing the extent of variation or changes in the dependent variable (Manufactured Capital) brought about by the independent variable (Asset Turnover Ratio). This result shows that 1% of the changes in Manufactured Capital was caused by Asset Turnover Ratio while 99% was accounted for by error term.

From the table 4.4, the f critical value is 4.0012 greater than the f calculated 0.106 at 0.05 level of significance. In the same vein, t critical value is 1.671 greater than the t calculated (0.326) at the same level of significance hence the null hypothesis was accepted and the alternate rejected. This means that there is no significant relationship between Asset Turnover Ratio and Manufactured Capital of conglomerate companies in Nigeria between 2016 and 2025.

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The aim of this study was to determine how efficient the conglomerate companies were in their supply chain for the period 2016 to 2025. The dependent variable was Manufactured Capital which encompasses the machinery, tools, infrastructure, and technology used in the production and distribution of goods while Supply Chain Efficiency was independent variable and were expressed with Inventory Turnover Ratio, Turnover Growth Ratio and Asset Turnover Ratio. Data for the work were accessed from published financial statements of the companies in Nigeria for the period 2016 to 2025 (10 years). Multiple linear regression technique was used to analyse the sourced data.

Major findings of the study were that Inventory Turnover Ratio had negative relationship with Manufactured Capital of the firms; Turnover Growth Ratio had positive relationship while Asset Turnover Ratio also had negative relationship for the period 2016 to 2025.

5.2. Conclusion

The study showed that only Turnover Growth Ratio had positive relationship with Manufactured Capital while the rest had negative relationships.

Recommendations

It is therefore recommended that Corporate Managers should work towards growing the turnover of their organizations since this ratio positively has relationship with Manufactured Capital.

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