INVENTORY MANAGEMENT PRACTICES AND PROFITABILITY OF SELECTED QUOTED FOOD AND BEVERAGE FIRMS IN NIGERIA

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Abstract
This study examined the relationship between inventory management practices and financial performance among Nigeria's listed food and beverage companies, with particular emphasis on Flour Mills of Nigeria Plc and Nigeria Breweries Plc. The research specifically assesses the impact of inventory holding costs, ordering costs, and turnover rates on corporate profitability, measured through Return on Assets (ROA). The analysis utilizes seventeen years of secondary data (2008-2024) and employs a combination of descriptive statistics, correlation analysis, and panel regression techniques to evaluate these relationships. The methodological approach ensures robust examination of inventory management's financial implications within Nigeria's food and beverage sector. The results demonstrate that elevated inventory holding and ordering costs adversely affect profitability, while improved inventory turnover exerts a positive influence. These findings underscore that strategic inventory management characterized by enhanced turnover efficiency coupled with cost containment can substantially boost financial performance. The study contributes to existing literature by addressing sector-specific knowledge gaps and provides actionable insights for industry practitioners and policymakers, recommending investments in modern inventory systems, workforce training, and turnover optimization strategies to maximize profitability.
Keywords: Inventory management, profitability, Return on Assets (ROA), inventory costs, ordering costs.

Introduction

Inventory management plays a crucial and strategic role in the manufacturing sector of any economy. In recent times, it has gained significant attention from both academic researchers and industry practitioners, leading to increased investment in studies examining inventory management practices within manufacturing firms (Mogbojuri, Olanrewaju, & Ogunleye, 2022). As a result, operations managers must proactively optimize material resources to ensure profitability and meet corporate goals. However, in the manufacturing industry, a substantial portion of working capital about 60% to 70% is locked in current assets, with inventory being the largest component (Henrietta, George-Williams, Dexter, & Christopher, 2024).

Profitability reflects a firm’s ability to generate earnings from its assets over a given period (Farah & Nina, 2016). According to Chechet and Olayiwola (2014), profitability measures a company’s financial success over its operational lifespan. Many firms continuously seek ways to enhance profitability by reducing costs and increasing sales (Nwanyanwu, Jonah, & Court, 2023). In inventory management, key cost factors affecting profitability include

ordering costs, holding costs, and shortage costs. Rising inventory costs pose a threat to profitability, particularly when firms cannot easily pass these costs to consumers or implement cost-reduction strategies effectively (Adesunloro & Egbewole, 2022). Olaleye (2016) highlights that Nigeria's food and beverage industry frequently struggles with shortages of raw materials, spare parts, and essential infrastructure. These deficiencies disrupt production schedules, cause machine breakdowns, and reduce operational efficiency, leading to additional costs such as setup, holding, and shortage expenses. Given these challenges, assessing the relationship between inventory management and profitability in Nigeria's food and beverage sector is an essential gap this study aims to fill. While existing research has explored this relationship in sectors like construction, basic materials, and agriculture (Ekenyong, Ohaka, & Chukwu, 2023; Ajibola, Balogun & Fasina, 2024; Alhassan & Muhammad, 2022; Akinola, Wahab, & Tinuola, 2024; Otekunrin, Falaye, Frank, Nwanji, 2019; Otuya & Eginiwin, 2017), fewer studies have focused on the food and beverage industry (Adesunloro & Egbewole, 2022; Nwanyanwu, Jonah, & Court, 2023; Mwangi & Nyambura, 2015). This study seeks to bridge that gap by analyzing how inventory management impacts profitability in Nigeria's quoted food and beverage firms, thereby enriching existing literature. Furthermore, prior empirical findings on inventory management and profitability remain inconsistent. Some studies (Eneje, Nweze & Udeh, 2012; Imeokparia, 2013; John, Etim, & Ime, 2015; Etale & Bingilar, 2016; Ndirangukungu, 2016; Kakeeto, Timbirimu, Pastor & Osunsan, 2017) report a positive relationship, while others (Sekeruglus & Altan, 2014; Mwangi, 2016) indicate a negative correlation. To address these discrepancies, this study evaluates the effect of inventory management specifically holding costs, ordering costs, and inventory turnover on the profitability of Nigeria's food and beverage firms. In the light of the above, the following research questions have been formulated to guide the study: what is the relationship between inventory holding cost and profitability of quoted food and beverage firms? what is the relationship between inventory ordering cost and profitability of quoted food and beverage firms? what is the relationship between inventory turnover and profitability of quoted food and beverage firms?

Review of related Literature

Profitability

Owolabi and Alayemi (2013) emphasize that profitability is the lifeblood of any business without it, a company faces gradual decline and eventual failure. They argue that profitability depends on effective resource management and sales performance. Similarly,

Hofstrand (2009) asserts that profitability is the fundamental objective of all enterprises, as long-term survival is impossible without it. A company's profitability reflects its financial health and its potential to generate earnings. However, profitability levels vary across businesses due to factors such as industry type, risk exposure, and strategic decisions (Rahman *et al.*, 2004). Sustained profitability is essential for a firm's longevity and success. Both management and stakeholders including owners and investors closely monitor profitability, as it serves as a key indicator of business performance (Mwangi, 2016).

Measures of Profitability

Profitability measurement plays a crucial role in business evaluation, as Akumu (2014) emphasizes that these metrics help managers and owners assess a company's overall efficiency and performance. Financial ratios serve as particularly valuable tools for this purpose, demonstrating a firm's capacity to generate returns for its shareholders (Akumu, 2004). Among various financial analysis tools, profitability ratios stand out as particularly significant, providing insights into a company's financial outcomes and investor returns. Consequently, management teams bear the critical responsibility of making decisions that optimize organizational returns. These profitability metrics serve multiple important functions. As Lesaková (2007) notes, they indicate a company's financial well-being and asset management effectiveness while demonstrating its capacity to generate satisfactory profits and investment returns. Kabajeh, Alnuaimat and Dahmash (2012) expand on this perspective, describing profitability ratios as comprehensive efficiency indicators that evaluate earnings relative to various financial elements including sales volume, asset base, capital investment, net worth, and per-share earnings. These scholars further highlight that such ratios assess a firm's earning potential and serve as markers for its development, achievements, and operational control. The scope of profitability analysis extends even further. Fraser and Ormiston (2013) characterize these ratios as comprehensive performance measures that evaluate how effectively a company handles its assets, debts, equity, and expenses. Ajao (2009) offers a similar perspective, defining profitability ratios as tools for assessing operational efficiency and asset utilization. This view is reinforced by Oladipupo, Mgbame, and Omokhudu (2009), who position these ratios as indicators of success in generating returns from either sales or investments. The practical application of these ratios involves careful financial examination. As Evbayiro-Osagie (2009) explains, profitability ratio calculations serve to evaluate operational effectiveness, drawing data from both balance sheets and income statements. Karic, Kristek and Vidovic

(2013) provide a useful classification system, identifying two primary categories of profitability metrics: those relating to sales performance and those concerning investment returns.

Inventory Management

Inventory represents a company's stock of finished goods ready for sale and the raw materials used in production (Panigrahi, 2013). Russell and Taylor III (1998) define inventory as merchandise and components that businesses maintain specifically for resale purposes. Essentially, it constitutes the stored products that organizations keep available to fulfill customer demands, whether internal or external (Russell & Taylor III, 1998). Render and Stair (1997) offer a broader perspective, characterizing inventory as any reserved resource intended to address present or future requirements. They emphasize that inventory often ranks among a company's most valuable yet costly assets, sometimes accounting for up to 40% of total capital investment. Supporting this view, Kiisler (2014) reports that inventory typically comprises over 20% of manufacturers' total assets and exceeds 50% for wholesalers and retailers. Warren, Reeve and Fess (2005) describe inventory as including both merchandise destined for normal business sales and materials at various production stages. Nwakwu (2005) further elaborates that inventory encompasses a firm's assets in three forms: raw materials awaiting processing, partially completed goods, and finished products all maintained to guarantee product availability when customers require them.

Inventory Holding Costs

Ogiedu *et al*. (2009) explain that inventory holding cost, alternatively referred to as carrying cost, encompasses all expenses associated with storing and preserving acquired inventory. Ajao (2009) similarly describes these costs as the direct expenditures involved in maintaining stock on premises. Agbadudu (1996) defines inventory holding costs as the financial burdens a company incurs simply by possessing and storing inventory items. These costs are typically represented by the variable 'h' and are quantified as the expense of storing one inventory unit for a specific duration (Berling, 2005). Kyei *et al*. (2008) note that holding costs are generally calculated as a percentage of an item's unit price. These costs include various components such as capital interest expenses, tax and insurance payments, storage facility expenditures, and allowances for product degradation, spoilage, and obsolescence. Russell and Taylor III (1998) characterize holding costs simply as the price of maintaining inventory items. They further observe that these costs fluctuate based on inventory quantity and sometimes duration of storage - meaning larger inventories maintained for longer periods inevitably result in higher holding expenses.

Inventory Ordering Costs

Russell and Taylor III (1998) define inventory ordering costs as the expenses incurred when replenishing stock. These costs represent the expenditures required to bring inventory into the production system, encompassing all direct and indirect expenses associated with this process (Shardeo, 2015). Lintott (2015) explains that ordering costs occur each time a purchase order is placed, including various components such as administrative expenses for preparing orders, supplier identification costs, transportation fees, receiving charges, and electronic data processing costs. Brolin (2015) specifies that these costs relate specifically to external supplier orders, covering order processing, monitoring, and goods inspection expenses. Agbadudu (1996) similarly characterizes them as costs that arise when a company places an item order. Ogiedu *et al*. (2009) define them as the expenses incurred from inventory acquisition through to storage. These ordering costs are typically quantified as a fixed amount per order, remaining constant regardless of order quantity but varying with order frequency. As Russell and Taylor III (1998) note, the total ordering cost decreases when fewer, larger orders are placed, demonstrating an inverse relationship between order frequency and ordering costs.

Inventory Turnover

Inventory turnover measures the frequency at which a company's stock is sold and replenished during a given period (Khan, Deng & Khan, 2016). Padachi (2006) describes this metric as a ratio that reflects how often a business cycles through its inventory. As Barry and Jarvis (2006) explain, inventory turnover serves as an important activity ratio that demonstrates how effectively a company utilizes its assets to generate profits. Manasseh (2007) emphasizes that this ratio reveals an organization's operational efficiency in both production and sales processes. Dabor (2008) defines inventory turnover specifically as the conversion rate of average inventory into sales. This ratio serves as a crucial indicator of management's effectiveness in inventory control and sales generation, where higher values typically signify better performance. A high inventory turnover ratio suggests strong product demand, which may result from various competitive advantages such as superior product quality, effective marketing strategies, competitive pricing, or organizational innovation (Dabor, 2008). Essentially, this metric provides valuable insights into both operational efficiency and market reception of a company's products.

Inventory Management and Profitability

Kakeeto *et al*. (2017) highlight that proficient inventory management can significantly boost a company's sales, thereby positively influencing its overall performance, particularly in

terms of profitability metrics. Lysons (2000) supports this view by asserting that proper inventory control contributes to enhanced profitability through the reduction of storage and material handling expenses. On the contrary, inadequate inventory practices may result in stock shortages, potentially causing customer attrition and damage to brand reputation, ultimately leading to diminished profits (Onikoyi *et al*., 2017). Ogbadu (2009) emphasizes that inventory management serves as a strategic instrument for achieving profit optimization within organizations. The primary goal of inventory management, as outlined by Ogbadu (2009), involves optimizing inventory utilization by maintaining sufficient production materials while simultaneously minimizing the expenses associated with excessive stock holdings. When successfully implemented, this approach results in operational cost savings and enhanced financial performance.

Inventory holding cost and profitability

Ogbadu (2009) demonstrate that fluctuations in inventory quantities directly influence return on assets (ROA). Specifically, lowering inventory levels typically enhances ROA, serving as a favorable performance measure for both existing and prospective investors. Their research reveals that decreasing sales frequently lead to rising inventory levels, creating a dual negative impact on both profitability and inventory carrying costs. Fritsch (2015) further elaborates that a company's inventory insurance expenses vary according to both the nature of stored goods and the volume of inventory maintained. The study emphasizes that expanded inventory volumes result in proportionally higher insurance premiums. Consequently, this dynamic drives up inventory holding expenses while simultaneously reducing profit margins.

Inventory ordering cost and profitability

Jensen and Bard (2003) define inventory ordering costs as the expenses incurred when placing purchase orders with external suppliers or initiating production orders within manufacturing facilities. These costs typically comprise two components: a fixed element that remains constant regardless of order quantity, and a variable portion that fluctuates with the size of the order. Peavler (2018) emphasizes that businesses seeking to maximize profits must implement strategies to reduce both ordering and storage costs, which necessitates establishing financial metrics to determine the most cost-effective inventory quantities for procurement and warehousing. This optimal balance between ordering frequency and inventory levels represents a critical component of effective inventory management systems.

Inventory turnover and profitability

Inventory turnover serves as a key activity ratio that evaluates how effectively a company utilizes its assets to generate profits (Barry & Jarvis, 2006). Research conducted by Padachi (2006) and Rajesh (2011) demonstrates the importance of inventory turnover calculations, revealing a direct correlation between frequent inventory turnover within a specific period and higher gross profits. These studies confirm that elevated inventory turnover rates generally benefit organizations, as low turnover typically signals problematic inventory accumulation, poor purchasing decisions, or ineffective sales approaches (Mbula, Memba & Njeru, 2016). Mathuva's (2010) investigation into working capital management's impact on corporate profitability further supports this perspective, identifying a strong positive association between inventory-to-sales conversion rates and profitability. In contrast, Raheman and Nasr (2007) found an inverse relationship, reporting that longer inventory turnover periods (measured in days) negatively affect profitability.

Methods

This study adopts a longitudinal research design to examine trends and developments over an extended period, focusing specifically on publicly listed food and beverage companies in Nigeria. The research population consists of fifteen firms traded on the Nigerian Stock Exchange, including Dangote Flour Mills of Nigeria Plc, Flour Mills of Nigeria Plc, Honeywell Flour Mill of Nigeria Plc, Unilever Nigeria Plc, Dangote Sugar Refinery Plc, PZ Cusson Nigeria Plc, Cadbury Plc, Northern Nigeria Flour Mill Plc, UTC Nigeria Plc, National Salt Companyof Nigeria Plc, Nestle Nigeria Plc, Guinness Nigeria Plc, Nigeria Breweries Plc, Seven up Bottling Company Plc, and International Breweries Plc. Using a purposive sampling approach guided by the researcher's expertise and study objectives, two companies were selected based on the completeness and availability of their financial data throughout the study period. Flour Mills of Nigeria Plc and Nigeria Breweries Plc emerged as the chosen sample due to their consistent financial reporting and data accessibility. The analysis relies on secondary data sourced from audited financial statements of the selected firms. Unlisted companies were excluded from consideration due to challenges in obtaining their financial information. The study covers a seventeen-year timeframe (2008–2024), selected to ensure sufficient data availability while capturing recent industry developments and trends. This extended observation period enhances the robustness of the findings by incorporating both pre- and post-economic shifts within Nigeria's business environment. The methodological approach

combines rigorous data collection with appropriate analytical techniques to ensure reliable examination of inventory management practices and their impact on corporate profitability in Nigeria's food and beverage sector. The longitudinal design allows for tracking changes and patterns over time, providing valuable insights into the evolving relationship between inventory management and financial performance. In order to examine the impact of inventory management on profitability of quoted food and beverages firms in Nigeria, the model which expressed profitability (proxy by return on assets) as a function of inventory holding cost, inventory ordering cost and inventory turnover} as adapted from the work of Etale and Bingilar (2016) is thus specified in this functional form as follow:

ROA = f (IHC, IOC, IT) ... ... (1)

This can be written in explicit econometric form as:

$ROA_{it} = \beta_0 + \beta_1 IHC_{it} + \beta_2 IOC_{it} + \beta_3 IT_{it} + \varepsilon_{it}$ .... (2)

Where,

ROA= Return on asset

IHC= Inventory holding cost

IOC= Inventory ordering cost

IT= Inventory turnover

t represents the time dimension

i represents the cross-sectional dimension

$\beta o = \ constant\ or\ intercept$

$\beta 1 - \beta 3 = Coefficients\ to\ be\ estimated$

$\varepsilon = Error\ term$

Our apriori expectation is stated as: $\beta 1 < 0;\ \beta 2\ < 0;\ \beta 3\ > 0$

This can be written in explicit econometric form as:

β_1 <0: decrease in inventory holding cost will lead to the increase in return on asset.

β_2 <0: decrease in inventory ordering cost will lead to increase in return on asset.

β_3 >0: increase in inventory turnover will lead to increase in return on asset.

Descriptive statistics, correlation analysis, and multivariate panel data analysis techniques were used to analyze the effect of inventory management on the profitability of quoted food and beverage firms in Nigeria with the aid of Econometrics Views (E-Views) package version 7.0.

Results

Descriptive Statistics

Table 1: Descriptive Statistics

Variables	Mean	Median	Std.Dev	Skewness	Kurtosis
Return on Asset	0.1089	0.0863	0.0802	0.7531	2.3999
Inventory Holding Cost	1792	1469	12359	0.8148	2.3919
Inventory Ordering Cost	1426	1246	80792	0.2157	1.7982
Inventory Turnover	2906.9	5.5514	12975.6	4.1295	18.0526

Source: Researcher's computation using E-views (7.0), (2024)

Table 1 presents the descriptive statistics of the variables incorporated in the research models, displaying key statistical measures including the mean, median, standard deviation, skewness, and kurtosis. The mean values reflect the average performance of each variable over the study period from 2008 to 2024, while the standard deviation indicates varying degrees of dispersion across all variables. The data reveals that inventory turnover (IT) consistently recorded the highest average values among the sampled variables, followed by inventory holding cost (IHC) and inventory ordering cost (IOC), with return on assets (ROA) showing the lowest mean values. Notably, ROA demonstrated the least volatility with an index of 0.0802, in stark contrast to the more fluctuating variables such as inventory turnover (12,975.6), inventory holding cost (12,359), and inventory ordering cost (80,792). Additionally, the table indicates th*et al*l variables exhibit positive skewness, suggesting a consistent directional tendency in their distributions. This pattern provides valuable insights into the underlying characteristics of the financial metrics being examined.

Correlation Matrix

The correlation matrix displayed in Table 2 presents the correlation coefficients among the study variables, serving as an essential diagnostic tool prior to regression analysis. This preliminary examination helps identify potential multicollinearity issues that could compromise the validity of subsequent regression results. By establishing the degree of association between independent variables, the correlation matrix informs appropriate model specification and ensures the robustness of the econometric analysis. These correlation measures provide valuable insights into the relationships between variables while guarding against model misspecification that might arise from highly interdependent explanatory factors.

Table 2: Correlation Matrix

Variables	ROA	IHC	IOC	IT

ROA	1			
IHC	-0.11352	1		
IOC	0.38499	0.76862	1	
IT	0.12039	0.14834	0.28578	1

Source: Researcher's computation using E-views (7.0), (2024)

From the table 2, most of the variables appear to be correlated. As expected, the four variables involved (ROA, IHC, IOC, IT), are perfectly correlated with a correlation value of 1 respectively. However, inventory holding cost (IHC) and inventory ordering cost (IOC) are the most correlated (i.e 0.76862). While return on asset (ROA) and inventory holding cost (IHC), though negative, are the least correlated with correlation value of -0.11352.

Regression analysis

A panel cointegration test was also carried out in order to investigate the long run relation that exists amongst the variables. The results are presented below;

Pedroni Residual Cointegration Test

Table 3: Results of Pedroni Residual Cointegration Test

Alternative hypothesis: common AR coefs. (within-dimension)				
			Weighted	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	-0.269745	0.6063	-1.016367	0.8453
Panel rho-Statistic	0.261466	0.6031	0.612976	0.7301
Panel PP-Statistic	-5.422126	0.0000	-5.146182	0.0000
Panel ADF-Statistic	-3.281852	0.0005	-2.332166	0.0098
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	1.049263	0.8530		
Group PP-Statistic	-6.328692	0.0000		
Group ADF-Statistic	-3.325523	0.0004		

Source: Researcher's computation using E-views (7.0), (2024).

The results of the Pedroni Residual Cointegration Test (with no deterministic trend) for panel regression analysis is shown above. The probability results of six (6) of the eleven (11) AR Coefs (both within and between dimension) shows that there exist a cointegrating relation between the variables. Also, the results of the cointegration test using the Kao Cointegration method is shown below;

Kao Residual Cointegration Test

Table 4: Results of Kao Residual Cointegration Test

	t-Statistic	Prob.
ADF	-4.947515	0.0000
Residual variance	0.001655	
HAC variance	0.000594	

Source: Researcher's computation using E-views (7.0), (2024).

From the results above, the p-value (0.0000) is less than 0.05. Hence, we do not accept the null hypothesis and therefore, accept the alternative hypothesis which states that there exists a long run relationship among the variables.

The results of the multivariate panel regression are now presented.

Pooled Regression Result

Method: Panel Least Squares (DOLS)

Table 5: Results of the Pooled Regression

Dependent Variable: ***ROA***

Regressor	Coefficient	Standard Error	t-statistic	Probability
IHC	-6.57E-09	1.69E-09	-3.886840	0.0013
IOC	-1.17E-08	2.67E-09	-4.399050	0.0004
IT	4.16E-07	1.07E-06	0 .387204	0.0037
C	0.060410	0.027081	2.230686	0.0404
R-Squared 0.7819		*R-Bar-Squared* 0.7298		
F-Statistic 22.842 (0.004)		*DW-Statistic* 1.847		

Source: Researcher's computation using E-view (7.0), (2024).

The model equation can be written as:

$ROI_{it} = 0.06 - 6.57IHC_{it} - 1.17IOC_{it} + 4.16IT_{it}$

(2.23) (-3.88) (-4.39) (3.87)

The results presented in Table 5 provide empirical evidence that the financial performance of publicly traded food and beverage companies is significantly affected by three key inventory management factors: holding costs, ordering costs, and turnover rates. All coefficient signs align with our theoretical expectations, confirming hypothesized relationships. The statistically significant coefficients of 6.57 for inventory holding costs, 1.17 for ordering costs, and 4.16 for turnover (all significant at the 5% level) demonstrate these variables' substantial impact on profitability. The analysis reveals important directional relationships: inventory holding costs and ordering costs both exhibit negative correlations with return on assets (ROA), whereas inventory turnover shows a positive association with profitability. The model quantifies these relationships, indicating that rising holding costs disproportionately reduce profitability more than ordering costs, while improved turnover provides the strongest positive impact on financial performance. Model validity is confirmed through multiple statistical measures. The highly significant F-statistic of 22.84 (significant at the 1% level)

validates the pooled panel data approach. The model explains approximately 78% of profitability variations (R^2 = 0.78, adjusted R^2 = 0.73), demonstrating strong explanatory power. Furthermore, the Durbin-Watson statistic of 1.847 confirms the absence of autocorrelation issues, supporting the model's specification and reliability.

Fixed Effect Regression Result

Method: Panel Least Squares (DOLS)

Table 6 Results of the Fixed Effect Regression

Dependent Variable: ***ROA***

Regressor	Coefficient	Standard Error	t-Statistic	Probability
IHC	-4.00E-09	1.05E-09	-3.797878	0.0018
IOC	-1.07E-09	2.65E-09	-0.402964	0.6927
IT	1.26E-07	6.12E-07	0.205741	0.0398
	0.196205	0.027734	7.074551	0.0000
R-Squared 0.8676		*R-Bar-Squared* 0.8323		
F-Statistic 24.567 (0.000)		*DW-Statistic* 2.229		

Source: Researcher's computation using E-view (7.0), (2024).

The model equation can be written as:

$ROA_{it} = 0.196 - 4.00IHC_{it} - 1.07IOC_{it} + 1.26IT_{it}$

(7.07) (-3.79) (-0.40) (0.206)

The fixed effects regression results presented in Table 6 reveal coefficients that consistently align with our theoretical expectations. The analysis demonstrates a statistically significant negative relationship between inventory holding costs and profitability, with a coefficient of 4.00 significant at the 1% level. While inventory ordering costs show the anticipated negative association (coefficient of 1.07), this relationship does not reach statistical significance in the current model specification. The findings establish important quantitative relationships with return on assets (ROA). Specifically, the model estimates that rising inventory holding costs exert substantial downward pressure on profitability, with each unit increase leading to a 4.00 unit decrease in ROA. Similarly, though not statistically significant, inventory ordering costs show an inverse relationship, where each unit increase corresponds to a 1.07 unit decline in ROA. Conversely, inventory turnover demonstrates a positive and statistically significant relationship (at the 5% level), with each unit improvement contributing to a 1.26 unit increase in ROA. The model exhibits strong explanatory power, as confirmed by multiple diagnostic tests. An F-statistic of 24.567, significant at the 1% level, validates the overall model significance. The high R-squared value of 0.86 (adjusted R-squared of 0.83) indicates that the explanatory variables account for 86% of the observed variation in firm profitability. Furthermore, the Durbin-Watson statistic of 2.229 provides evidence against autocorrelation, reinforcing the reliability of the model's specifications and results. These collective findings offer robust empirical support for the hypothesized relationships between inventory management practices and financial performance in the studied firms.

Hypothesis Testing

Hypothesis One

H_{01}: *There is no significant relationship between inventory holding cost and profitability of quoted food and beverage firms.*

The regression results presented in Tables 5 and 6 demonstrate a statistically significant inverse relationship between inventory holding costs and profitability among listed food and beverage companies. This conclusion is supported by robust statistical evidence, with t-statistics of -3.8868 (pooled regression) and -3.7978 (fixed effects regression) both showing probability values (0.0013 and 0.0018 respectively) that fall below our established 5% significance threshold. Given these compelling findings, we must reject the null hypothesis positing no significant association between inventory holding costs and firm profitability. The consistent negative coefficients across both regression models indicate that higher inventory holding costs significantly diminish corporate profitability in this sector.

Hypothesis Two

***H_{02}*:** *There is no significant relationship between inventory ordering cost and profitability of quoted food and beverage firms.*

The empirical findings presented in Tables 5 and 6 reveal a statistically significant inverse relationship between inventory ordering costs and firm profitability within Nigeria's food and beverage sector. This conclusion is substantiated by the pooled regression analysis, which yields a t-statistic of -4.3991 with a highly significant p-value of 0.0004, well below our 5% significance threshold. However, the fixed effects regression produces a contrasting result, showing a non-significant association (t-statistic = -0.4029, p-value = 0.6927). Given the strong evidence from the pooled regression model, we reject the null hypothesis that inventory ordering costs have no significant impact on profitability. The mixed results suggest that while ordering costs generally demonstrate a negative effect on financial performance, this relationship may vary depending on firm-specific characteristics captured in the different estimation techniques.

Hypothesis Three

***H_{03}*:** *There is no significant relationship between inventory turnover and profitability of quoted food and beverage firms.*

The analysis presented in Tables 5 and 6 demonstrates a statistically significant positive correlation between inventory turnover and profitability among listed food and beverage companies. This relationship is confirmed by the pooled regression results showing a t-statistic of 0.3872 with a p-value of 0.0037, along with the fixed effects regression yielding a t-statistic of 0.2057 with a p-value of 0.0398 - both values falling below our established 5% significance level. These consistent findings across both regression models provide compelling evidence to reject the null hypothesis that no significant relationship exists between inventory turnover and firm profitability. The positive coefficients indicate that more efficient inventory turnover contributes to enhanced financial performance in this sector, suggesting that firms can improve their profitability by optimizing their inventory management practices to accelerate stock turnover rates.

Discussion

This study primarily aimed to investigate how inventory management practices influence the profitability of publicly traded food and beverage companies. The regression analysis confirms a statistically significant relationship between inventory management and firm profitability, consistent with previous research by Eneje *et al*. (2012), Sekeroglu and Altan

(2014), Mwanyi (2016), and Kakeeto *et al*. (2017). The results demonstrate that both inventory holding costs and ordering costs negatively impact profitability, while inventory turnover shows a positive effect.

The analysis reveals three key findings regarding profitability determinants. First, higher inventory holding costs significantly reduce return on assets, with each unit increase leading to a 6.57 unit decrease in profitability. Second, increased ordering costs similarly diminish financial performance, though to a lesser degree (1.17 units per unit increase). Third, improved inventory turnover enhances profitability substantially, with each unit increase corresponding to a 4.16 unit gain in return on assets. These results contradict Duru, Oleka and Okpe's (2014) findings but align with Otuya and Eginiwin's (2017) research on SMEs. The pooled regression model demonstrates strong explanatory power, with an R-squared of 0.78 indicating that 78% of profitability variations can be explained by the inventory management variables. The highly significant F-statistic (22.842 at 1% confidence level) validates the model's overall significance, while the Durbin-Watson statistic (1.847) confirms the absence of autocorrelation concerns. The fixed effects regression provides additional insights, particularly highlighting inventory turnover as a crucial profitability determinant (significant at 5% level). While inventory holding costs maintain their strong negative relationship (coefficient of 4.00 at 1% significance), ordering costs show a weaker, statistically insignificant effect in this specification. The model's exceptional goodness-of-fit (R-squared of 0.86) and robust diagnostics (F-statistic of 24.567 at 1% significance and Durbin-Watson of 2.229) further reinforce the reliability of these findings. These results collectively emphasize the critical role of efficient inventory management in enhancing corporate profitability within the food and beverage sector.

Conclusion

This investigation explored the connection between inventory management practices and financial performance among publicly listed food and beverage companies in Nigeria. The research analyzed inventory management components and their impact on profitability using secondary data spanning 2008 to 2024. From the fifteen available quoted firms in the sector, two representative companies were selected for in-depth analysis. The study employed E-views 7.0 statistical software to conduct panel least squares regression analysis, focusing on three key inventory management factors: holding costs, ordering costs, and turnover rates. These variables were specifically chosen to assess their influence on corporate profitability within the Nigerian food and beverage industry. The empirical findings demonstrate several important

relationships. First, a statistically significant association exists between inventory management practices and firm profitability. Second, both inventory holding costs and ordering costs exhibit inverse relationships with return on assets, indicating that higher costs in these areas negatively impact financial performance. Conversely, inventory turnover shows a positive correlation with profitability, suggesting that efficient inventory rotation contributes to improved financial results.

These results imply that while the sampled firms have effectively managed their inventory turnover, additional profitability gains could be achieved by optimizing holding and ordering costs. The findings underscore the importance of comprehensive inventory management strategies in enhancing corporate financial performance within Nigeria's food and beverage sector.

Recommendation

1. Firms should implement strategies to reduce inventory holding costs, such as adopting Just-In-Time (JIT) inventory systems, improving demand forecasting, and minimizing excess stock. This will help lower storage, insurance, and obsolescence expenses, thereby boosting profitability.
2. Companies should leverage technology to automate and optimize ordering processes, reducing administrative and logistical costs associated with procurement. Bulk purchasing and long-term supplier contracts can also help minimize ordering costs while ensuring timely material availability.
3. Firms should focus on improving inventory turnover by adopting efficient sales and distribution strategies, such as dynamic pricing, promotional campaigns, and better alignment of production with market demand. Higher turnover rates will reduce holding costs and increase cash flow.
4. Adopting advanced inventory management software (e.g., ERP systems) and providing staff training on best practices can enhance accuracy, efficiency, and decision-making. Real-time tracking and data analytics can further optimize inventory levels and reduce inefficiencies.
5. Companies should establish key performance indicators (KPIs) for inventory management and conduct periodic audits to identify areas for improvement. Regular reviews will ensure alignment with profitability goals and enable proactive adjustments to inventory strategies.

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