

## EFFECT OF INVENTORY TURNOVER ON THE PERFORMANCE OF LISTED FOOD AND BEVERAGE FIRMS IN NIGERIA

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### Abstract

The study examined the effect of inventory turnover on the performance of listed Food and Beverage firms in Nigeria. The study used ex-post facto research design and the population comprises of food and beverages companies listed in Nigeria. There are 19 food and beverages companies listed on the Nigerian stock exchange during the period of study. The study used Census sampling technique to select the sample size. However, the study used 19 food and beverage firms since the population is small. The study used secondary data and collected data from different financial statement of account of these companies. The statistical tool adopted was panel regression with the software package of E-view 9.00 and the finding shows that inventory turnover (IT) has positive and insignificant effect on return on asset of listed food and beverage companies in Nigeria. The study recommended that listed food and beverages firms in Nigeria should try to know their inventory items' position in their product life cycle, improve demand forecasting accuracy, Prioritize their inventories, reorder smarter, use-up excess inventory by redistributing stock and use automation to improve insights.

**Keywords:** Inventory, Inventory Turnover, Performance and Return on Asset

### Introduction

Inventories are important assets of a company's production process. In order to avoid losses resulting from stock shortfalls and excesses, control of such inventories is useful. Falls in the level of inventories is positively related to the financial performance of a firm. Lower inventory to sales ratio and lower the days taken to convert inventory to sales is called higher inventory turnover and it has positive effects on the financial performance of a firm (Shah et al, 2019). There is an impact of inventory management on the firm's financial performance and inventory turnover ratio and it is used to measure inventory management is linked to the net profits of steel Food and Beverage companies in India (Nabi, 2018). The inventory turnover ratio and the profitability of a firm have a positive relationship whereas there is a negative relationship between the inventory conversion period and the profitability of a firm (Sunday &

Joseph, 2017). Poor inventory management has an uncertain influence on the financial performance of firm and financial ratios are not comprehensively influenced by poor inventory management (Rodrigo, 2020). A firm's financial performance depends upon the balance between inventory acquiring costs and the inventory holding period (Muchaendepi et al., 2019). Some firm keeps products as inventory to guarantee uninterrupted sales, whereas inattention decreases profits and affects firms' competitive position (Gołaś, 2020b).

According to Abdillah (2020), the higher the inventory turnover, the higher the cost that may be contained, increasing a company's profitability. Conversely, a slower inventory turnover leads to a reduced increase in profits. Achieving a high inventory turnover rate is a challenging endeavor, as it necessitates meticulous consideration of multiple operational factors by the company. Effective and consistent inventory management, augmentation of product quality, and the fulfillment of customer demands stand among these crucial factors. Moreover, the optimal duration for inventory turnover that yields the highest return on assets remains unspecified for Food and Beverage companies. While previous investigations have addressed this issue, none have focused on Nigerian food and beverage corporations. Moreover, this study extends the research duration to a decade, spanning from 2013 to 2022.

The primary aim of this research is to assess the impact of inventory turnover on the performance of Food and Beverage companies listed in Nigeria. The specific objective is to ascertain the influence of inventory turnover on the return on assets for these listed Food and Beverage enterprises within Nigeria.

**The following null hypothesis is stated**

H<sub>01</sub>: Inventory turnover has no significant effect on return on asset of listed Food and Beverage firms in Nigeria

**Concept of Inventory Turnover**

Inventory turnover is a widely recognized measure of how efficiently a company operates (Jin, 2019). The inventory conversion period signifies the time it takes for the total inventory to transform into cash. A longer conversion period indicates that a larger portion of working capital is tied up in inventory, detrimentally impacting the company's operations, and vice versa. Conversely, a shorter duration implies less capital is immobilized in inventory. Therefore, comprehending inventory's influence on a company's profitability is crucial (Elsa, 2019). Additionally, inventory turnover represents how many times the inventory is sold and converted to cash within a specified timeframe. Inventories constitute the operational working capital that can be fine-tuned based on a firm's activities. Within diversified businesses, inventory consistently stands as a valuable asset. Hence, effective inventory control remains indispensable for managing working capital (Van, 2019). Notably, the inventory turnover period equates to Average Inventory divided by Cost of Sales, multiplied by 365 days (Sunusi et al., 2020).

The inventory turnover ratio is a pivotal gauge for assessing the efficiency of inventory management and its contribution to sales generation. This ratio is calculated by dividing the

cost of goods by the average inventory. Generally, a higher ratio is favorable as it signifies more sales achieved with a given inventory amount. Alternatively, for a specific sales amount, utilizing fewer inventories enhances the ratio. Nevertheless, an excessively high ratio might lead to missed sales opportunities due to insufficient inventory meeting demand (Caroline, 2017).

The formula for calculating Inventory Turnover (Sutrisno, 2020) is:  $\text{Inventory turnover} = \text{net sales} / \text{average inventory}$ . Also,  $\text{the average inventory} = (\text{beginning of year inventory} + \text{end of year inventory}) / 2$ .

### **Concept of Performance**

Performance is in two forms which are financial performance and non-financial (Akyuz & Opusunju, 2019). Performance is a general structure that refers to the operations of the enterprise (Opusunju et al, 2019). Opusunju et al (2017) noted that performance is a reflection of the productivity of members of an enterprise measured in terms of revenue, profit, growth, development, and expansion of the organisation. Performance is defined as how an enterprise is doing in terms of an increase in profit, market share, product quality, and expansion about other enterprises in the same industry (Akyuz & Opusunju, 2019). Performance is measured using diverse parameters by different organisations some firms measure it through expansion, survival, number of employees, and capital employed (Akyuz & Opusunju, 2020). Performance indicators encompass metrics such as revenue, return on investment, profitability, and market share. Therefore, when these crucial indicators of performance demonstrate favorable conditions, it signifies operational efficiency (Lyndon & Timi, 2019). As per Osibanjo et al. (2019), performance denotes the accomplishment of tasks constituting one's role. It represents the results an individual achieves within a specific job and timeframe (Ladley et al., 2019). Performance pertains to the conduct and actions of employees, rather than the ultimate outcomes or outputs of their work. Moreover, the entirety of activities carried out by employees in their work environment can be defined as job performance (Fogaca et al., 2019).

Nguyen (2020) reports that the primary measures of financial performance include return on assets (ROA) and return on equity (ROE).

### **Return on Assets (ROA)**

Return on Asset (ROA) is an important financial performance ratio because it measures the efficiency with which the firm is managing its investment in assets and using them to generate profit (Obalemo et al., 2020). ROA serves as a fundamental gauge of a company's effectiveness in assigning and overseeing its resources. Return on assets establishes a correlation between post-tax profits and overall assets, revealing the efficacy in utilizing a business organization's complete resources (Ali & Faishal, 2020). ROA is widely recognized as a comprehensive profitability indicator. It offers insight into the company's profitability concerning its asset holdings. This metric is derived by comparing net income to total assets. A greater ratio signifies enhanced company profitability, indicating that the company generates heightened profits relative to its assets (Singhania & Mehta, 2017).

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### The Trade-off Theory

This theory was developed from two major cost trade-off models, including tax benefit-bankruptcy cost trade-off model by DeAngelo and Masulis (1980) and Agency theoretical models by Jensen and Meckling (1980), Jensen (1986), and Myers (1977). DeAngelo and Masulis (1980) stresses that, enterprises develop sustainable capital structure by controlling the balance of debts cost and the benefits. The cost involves expenses linked to financial difficulties, while the benefits encompass the advantage of tax shields. Conversely, according to agency theory models, businesses adopt a benefit-driven approach involving cash flow, shareholders, and management to counteract problems stemming from the costs associated with underinvestment and asset substitution. To model the adjustment process towards a target level of debt, the following general equation was devised by considering the difference between the desired debt level and the previous debt level:

$$Dt - Dt-1 = \alpha_0 + \alpha_1 (D^* - Dt-1) + \epsilon t$$

Here, D represents = total debts,

D\* stands for = optimal debt,  $\alpha_1$  symbolizes the = coefficient of adjustment rate, and  $\epsilon t$  denotes the = error term.

The trade-off theory elucidates the impact of liquidity levels on profitability. The theory implies that, high level of liquidity minimize problems associated with profitability (Jakpar et al, 2017).

### Empirical Studies

Jin's (2019) investigation delved into the utilization of inventory turnover (IT) as a performance metric in the Food and Beverage sector. The significance of this metric within the industry and its objectively accessible nature motivated the study. The research scrutinized data spanning 2010 to 2018 from 421 Food and Beverage companies in Korea, conducting an in-depth analysis to comprehend the determinants influencing IT across diverse segments and its interconnectedness with other financial ratios. The study also undertook a comparative analysis employing Altman's Z-score approach between the highest and lowest performing companies. The study's findings unveiled broader trends showcasing negative correlations between IT ratios and gross margin, as well as debt cost, while revealing a positive correlation with capital intensity. However, these trends exhibited variability across different segments. Remarkably, IT ratios demonstrated limited noteworthy correlations with various other categorized financial ratios, including growth, profitability, stability, productivity, and company value. Nevertheless, a novel metric, adjusted IT (AIT), emerged as a promising yardstick for gauging financial sustainability. The research also spotlighted that the upper echelon of companies consistently demonstrated higher AIT ratios compared to the lower echelon across the majority of Food and Beverage segments.

In Abdillah's (2020) study, an examination was carried out on the influence of inventory turnover on the profitability of automotive companies listed on the Indonesia Stock Exchange between 2015 and 2017. The study measured profitability using Return on Assets (ROA). The research adopted a quantitative approach, validating classical assumptions and conducting simple linear regression analysis. The sample companies' financial statements were sourced

from the Indonesia Capital Market Directory (ICMD). The sampling technique applied was purposive, with inventory turnover (X) and Return on Assets (Y) forming the variables, encompassing an annual sample of 18 companies. The outcomes demonstrated that inventory turnover did not yield a positive impact on Return on Assets.

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Nor (2020) explored the intricate relationship connecting inventory turnover and the financial performance of retail supermarkets in Malaysia. The study factored in four independent variables: days in accounts receivable, days in accounts payable, inventory turnover in days, and cash conversion cycle. The dependent variable was Return on Assets. Data from 40 listed companies on the Bursa Malaysia exchange spanning 2015 to 2019 constituted the research corpus. Four hypotheses were devised to scrutinize the interplay among these variables. The findings underscored the absence of significant correlations between accounts receivable and firm profitability, a significant correlation between accounts payable and firm profitability, no discernible association between inventory turnover and return on assets, and a significant correlation between the cash conversion cycle and firm profitability.

Sunusi et al (2020) conducted an analysis probing the nexus between inventory turnover management and the profitability of conglomerate firms in Nigeria. Historical panel data analysis was employed utilizing annual accounts from listed firms between 2007 and 2016. The study concentrated on a study population consisting of six conglomerate firms registered on the Nigerian Stock Exchange. The analysis was executed using feasible generalized least squares (FGLS) regression. The findings illuminated a reverse link between inventory turnover management and the profitability of Nigerian conglomerate firms listed on the stock exchange.

### **Methodology**

The research employed an ex-post facto research design, selected for its suitability in investigating causal relationships among variables. The research context consisted of companies within the food and beverages sector listed on the Nigerian stock exchange. Specifically, the study encompassed the 19 food and beverages companies that were listed during the defined study period. This demographic was identified as the population, a fact substantiated by Appendix C, sourced from the Nigerian Exchange Group in 2023. The study employed a Census sampling technique, a choice motivated by the population's limited size. This decision was underpinned by the distinction between a census, which aims to collect information from every population member, and sampling, which gathers data from a subset to infer characteristics of the whole. Given the relatively small population, 19 food and beverage firms were selected as the sample. This approach resonates with Opusunju et al's (2022) assertion that a small population can be treated as such, with the methodology termed as census sampling technique. Notably, the study harnessed secondary data due to the quantitative nature of the variables under investigation. Data were sourced from diverse financial statements of these companies.

The study used Panel regression technique and Panel data is the subject of one of the most active and innovative bodies of literature in econometrics, partly because panel data provide such a rich environment for the development of estimation techniques and theoretical results

(Greene, 2003). In panel data, cross-sectional unit is surveyed over time. The selection of variables for the estimated model was guided by Verbeek (2004) who sets out the framework for panel study as:

$$y_{it} = \alpha + x_{it}\beta_{it} + \varepsilon_{it} \dots \dots \dots 3.1$$

There are several advantages of working with panel data. Awunyo-Vitor and Badu (2012) observe that panel data facilitate identification of effects that cannot be detected using purely cross-section or time series data. According to Greene (2003), however, the fundamental advantage of a panel data set is that, it allows the researcher greater flexibility in modelling differences in behavior across individuals.

The model is stated below:

$$ROA_{it} = \alpha + \beta_1 IT_{it} + \varepsilon_{it} \dots \dots \dots 3.2$$

Where  $ROA_{it}$  is return on asset i at time

$IT_t$  is the inventory turnover i at time t“

## Data Analysis

1. TABLE 1: DESCRIPTIVE STATISTICS OF THE VARIABLES

	ROA	TQ	IT
Mean	1.011007	2.61E+08	219.7440
Median	0.370896	1.26E+08	158.3050
Maximum	8.159826	9.92E+08	3756.360
Minimum	0.000861	4508000.	-203.3400
Std. Dev.	1.208644	2.72E+08	312.6377
Skewness	2.019697	1.291462	7.957537
Kurtosis	10.39844	3.085565	87.78112
Jarque-Bera	562.5080	52.87398	58908.93
Probability	0.000000	0.000000	0.000000
Sum	192.0913	4.96E+10	41751.35
Sum Sq. Dev.	276.0950	1.40E+19	18473301
Observations	190	190	190

Source: Researcher's Computation Using E-Views 9.0, 2023

The calculated mean and median values of Return on Assets (ROA) are 0.16 and 0.07, respectively. This discrepancy between the minimum and maximum values indicates the likely existence of an outlier. An outlier is characterized as an observation situated at an unusually substantial distance from the rest of the values within a random sample extracted from a given population. Similarly, for Total Quality (TQ), the mean and median values stand at 2.6 and 1.26, respectively, implying the probable presence of an outlier. The presence of an outlier can be inferred from the disparity between the minimum and maximum values. Again, it is important to note that an outlier denotes an observation that diverges significantly from the typical distribution of values within a random sample derived from a specific population. In the case of Inventory Turnover (IT), the mean and median values are computed as 219.75 and

158.30, respectively, further suggesting the potential existence of an outlier. These findings underscore the noticeable contrast between the minimum and maximum values.

**Table 2: The correlation matrix of the variables (Inventory Turnover and Return on Assets (ROA)).**

	ROA	IT
ROA	1.000000	-0.003099
IT	-0.003099	1.000000

**Source:** E-view, version 9.00

Table 4.3 Suggests that there exists an adverse negative connection (correlation) among the variables under examination. This signifies a mild adverse connection between the inventory turnover and return on assets within the cataloged Nigerian food and beverage enterprises.

**Table 3: Hausman Test**

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	55.090871	1	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
IT	0.000163	0.000160	0.000000	0.9290

**Source:** E-Views 9.0, 2023”

The outcomes of the Hausman test suggest that the fixed effect model is statistically more suitable than the random effect model, as evidenced by a probability value below 0.05. Consequently, the null hypothesis, which posits the superiority of the fixed effect model, is supported and accepted. “

**Table 4: Panel Regression result for Inventory Turnover and ROA of food and beverage companies in Nigeria**

Dependent Variable: ROA

Method: Panel Least Squares

Date: 04/20/23 Time: 05:04

Sample: 2013 2022

Periods included: 10

Cross-sections included: 19

Total panel (balanced) observations: 190

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.817844	0.096920	8.438337	0.0000
IT	0.007669	0.001472	5.209832	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
R-squared	0.739135	Mean dependent var	1.011007	
Adjusted R-squared	0.683952	S.D. dependent var	1.208644	
S.E. of regression	0.679477	Akaike info criterion	2.225741	
Sum squared resid	72.02357	Schwarz criterion	2.806788	
Log likelihood	-177.4454	Hannan-Quinn criter.	2.461115	
F-statistic	13.39425	Durbin-Watson stat	1.339163	
Prob(F-statistic)	0.000000			

**Source:** E-view, version 9.00

Decision rule: 5%

The findings of the regression analysis highlight the suitability of the model for this investigation, as evidenced by the significant F-statistic observed at a 5% significance level. Moreover, the outcomes reveal a pronounced and constructive impact of inventory turnover (IT) on the return on assets of the listed food and beverage corporations in Nigeria.

To elaborate, the equation  $ROA = 0.81 + 0.007IT$  encapsulates the dynamic between Return on Assets (ROA) and Inventory Turnover (IT). This formula indicates that with each 1% surge in inventory turnover, the return on assets of the listed food and beverage firms within Nigeria is anticipated to escalate by an appreciable 7%. Significantly, the remarkably low p-value of 0.00, considerably beneath the t-statistic value of 5.20, coupled with an exceedingly minor standard error of 0.00 compared to the t-statistic, offers compelling substantiation for the positive and substantial influence of inventory turnover on the return on assets among the aforementioned Nigerian companies.

The coefficient of determination (R-squared), quantified at 0.73 (i.e.  $R^2 = 0.73$ ), signifies that roughly 73% of the variability associated with inventory turnover can be employed to elucidate the fluctuations observed in the return on assets for the listed food and beverage enterprises in Nigeria. However, the residual 27% of variability is attributable to unaccounted aspects, encompassed by the regression model's error term, which are integral to understanding this relationship.

### Discussion of Findings

Through the process of conducting correlation analysis, it was ascertained that a tenuous and adverse linkage exists between inventory turnover and return on assets among the cataloged food and beverage enterprises within Nigeria. This suggests that the specific interplay between



inventory turnover and return on assets for the listed food and beverage companies in Nigeria is characterized by a unique negative correlation. Additionally, the investigation unveiled that the influence of inventory turnover (IT) on the return on assets of these registered food and beverage corporations in Nigeria is constructive, yet not statistically significant. The study is in line with the findings of Abdillah (2020) and Sunusi et al (2020) who found no significant effect of inventory turnover on return on asset. The study also disagreed with the findings of Jin (2019) who found a significant effect of inventory turnover and return on asset.

### **Conclusion and Recommendation**

The research concluded that there is weak negative association between inventory turnover and return on assets pertaining to the enumerated food and beverage enterprises in Nigeria. This suggests an exclusive negative relationship between inventory turnover and return on assets, specifically distinctive to the listed food and beverage corporations within Nigeria. Additionally, the study discerned that the impact of inventory turnover (IT) on the return on assets for these registered food and beverage companies in Nigeria is constructive but statistically insignificant.”

As a result of these findings, the study offers recommendations for the enhancement of performance among listed food and beverage entities in Nigeria. It is advised that these firms undertake a comprehensive evaluation of their inventory items' positions within the product life cycle, with an emphasis on refining the precision of demand forecasting. Moreover, a prudent prioritization of their inventory management is advocated, accompanied by an informed strategy for more efficient reordering. Addressing excess inventory through strategic redistribution and embracing automation to amplify insights also emerge as prudent measures for improving operational efficiency.

### **References**

- [1]. Abdillah, A. N. (2020). Effect of inventory turnover on the level of profitability. Conf. Series: Materials Science and Engineering725(2)
- [2]. Akyuz, M. & Opusunju, M. I. (2019). Effect of Internet Banking On the Performance of First Bank Nigeria Plc Abuja. The International Journal of Social Sciences and Humanities Invention, 6(8) 5559-5564
- [3]. Akyuz, M. &Opusunju, M. I. (2019). Effect of Globalisation on the Performance of Small and Medium Scale Enterprises in Nigeria, American Journal of Environmental and Resource Economics, 4(4) 125-131.
- [4]. Akyuz, M. & Opusunju, M. I. (2020). Infrastructural and performance of small and medium scale enterprises in federal capital territory (fct) Abuja, Nigeria. Journal of Global Economics and Business1 (3), 93-108.
- [5]. Akyuz, M. & Opusunju, M. I. (2019). Effect of Internet Banking On the Performance of First Bank Nigeria Plc Abuja. The International Journal of Social Sciences and Humanities Invention, 6(8) 5559-5564
- [6]. Myers, S.C. (1977), Determinants of corporate borrowing. Journal of Financial Economics, 5(2), 147-175

- [7]. Jensen, M. C.(1986). "Agency Costs of Free Cash Flow, Coporate Finance and Takeovers," American Economic Review 76, 323-339.
- [8]. Jensen, M.C. & Meckling, W.H. (1980). "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," Journal of Financial Economics 3, December 1976, pp. 305-360
- [9]. DeAngelo, H. & Masulis, R.W. (1980). Optimal Capital Structure under Corporate and Personal Taxation," Journal of Financial Economics 8, 3-29
- [10]. Kasmir, P.H. (2020). Tobin's Q Does Not Measure Firm Performance: Theory, Empirics, and Alternatives. Empirics, and Alternatives, March.
- [11]. Sunusi, G., Boudiab, M. & Muhammad, A. C. (2020). The Effect of Inventory Turnover Period on the Profitability of Listed Nigerian Conglomerate Companies. International Journal of Financial Research, 11(2)
- [12]. Nor, A. B. A. H., Suresh, R., Syed, M. A. H. G. (2021). The Impact of Working Capital Management on Firm Performance across Bumiputera and Non Bumiputera Food and Beverage Firms in Malaysia. Monografico, 3(2) 66-78
- [13]. Jin, K. K. (2019). Analysis of Inventory Turnover as a Performance Measure in Food and Beverage Industry. Processes 2019, 7, 760
- [14]. Opusunju, M. I., Akyuz, M & Abdullahi, I. A. (2019). Effect of Structure and Strategy on Organisational Performance: Case Study of Remou Oil Nig. Ltd, American Journal of Environmental and Resource Economics. 4(4) 139 –143
- [15]. Opusunju, M. I., Akyuz. M. & Jiya, N. S. (2017). Application of Simplex Method to Evaluate Advertising and Performance of Quoted Multinational Corporation in Nigeria. Nile Journal of Business and Economics, 7: 3-1