ISSN: 3065-0534

Journal of Financial Economics and Management

Research Article

OPTIMIZING INVENTORY MANAGEMENT FOR INCREASED PROFITABILITY AMONG SMES IN DELTA STATE, NIGERIA

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Abstract

This study examines the impact of inventory management on small and medium-scale enterprises profitability with a focus on supermarkets and bottled/sachet water producers in Nigeria. The specific objective of the study aimed at investigating the impact of inventory turnover, inventory ordering frequency, and inventory level on SMEs profitability in Nigeria. The population of the study consists of all supermarkets and bottled/sachet water producers operating in Delta State. Data were collected via a self-designed structured questionnaire administered to ninety respondents from the selected sampled SMEs used for the study. Data gathered for the study were analyzed using the multiple regression model technique via the IBM statistical package for social sciences (SPSS) version 23. The findings of the study revealed that inventory turnover has a positive and significant relationship with SMEs profitability. The study also revealed that both inventory ordering frequency, and inventory level have positive relationships with SMEs profitability, however, these positive relationships were not statistically significant. The study concludes that there is a relationship between inventory management and SMEs profitability. On the strength of the above findings, the study recommends that managers of SMEs endeavor to keep an adequate level of inventory, taking into consideration the business turnover rate coupled with the delivery lead time of their various suppliers, and knowing full well that inventory management directly impacts its profitability.

Keywords: inventory management, inventory turnover, inventory ordering frequency, inventory level, profitability.

Introduction

Business entity considers as one of the main sources by which revenues or cash inflows are generated for the business entity (Olaide & Omodero 2023). Hence, the importance of inventory cannot be overstated because inventory could be viewed as the health of a manufacturing firm or businesses that deal in physical goods or products. It is the livewire of any business that deals with tangible products, and not keeping the right inventory

to meet a sudden increase in customer demand can result in the reduction in profit margin, low returns on equity, wastage of materials, and pilferage (Duru, Okpe, and Udeji 2014). While inventory might be important for business enterprises, the management of these inventories is equally important. Inventory management is the process and activity of overseeing all aspects of a company's inventory, starting from raw materials to finished products. Inventory management is further seen as the process of coordinating, procuring, and utilizing available materials that are to be used in the production process, whether the inventory includes raw materials, work-in-progress, or finished goods (Ajeyi, Obafemi, & Araoye 2021). However, the importance of inventory management to any business can never be overemphasized, and it represents a major asset and constitutes a critical portion of total current assets of business enterprises. Inventory management is used by organizations to arrange, store, and replenish stock so as to maintain the required level of goods while aiming to reduce other costs that are associated with under-stocking or over-stocking. Inventory management has been a major challenge for many small and medium enterprises, especially with the logistical problem posed by the Nigerian business environment. However, SMEs, which are the core for enhancing economic development of any nation, coupled with their scarce resources, are poised to engage in efficient inventory management, as it forms one of the most vital aspects in inventory management (Ekubiat, 2022). . Effective inventory management would provide a well-thought-out strategy for acquiring and keeping the materials to avoid stock-outs and guarantee that the company maintains the appropriate quantity of inventory. A company's growth and long-term survival depend on its capacity to manage its inventory effectively, as incompetent inventory management can lead to a decline in cash inflow or revenue and the loss of potential and existing customers (Sonko & Akinlabi, 2020). It therefore follows that the main objective of inventory management is to guarantee that there are adequate stockpiles to satisfy customer demand without experiencing stock-outs or excessive holding costs. Therefore, the purpose of this study is to contribute to existing literature by seeking to empirically investigate the impact of inventory management on profitability with an emphasis on selected small and medium-scale enterprises in Delta State, Nigeria.

1.2. Objectives of the Study

The main objective of the study is to examine the impact of inventory management on small and medium enterprises profitability, in line with the specific objectives stated below:

i. Determine the relationship between inventory turnover and SMEs profitability.

ii. Ascertain the relationship between inventory ordering frequency and SMEs profitability. iii. Examine the relationship between inventory level and SMEs profitability.

1.3. Research Questions

This study seeks to answer the following questions:

i. Does inventory turnover have any relationship with SMEs profitability?

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ii. What is the relationship between inventory ordering frequency and SMEs profitability? iii. What impact does inventory level have on SMEs profitability?

1.4. Research Hypotheses

The following null hypotheses were formulated to guide the research.

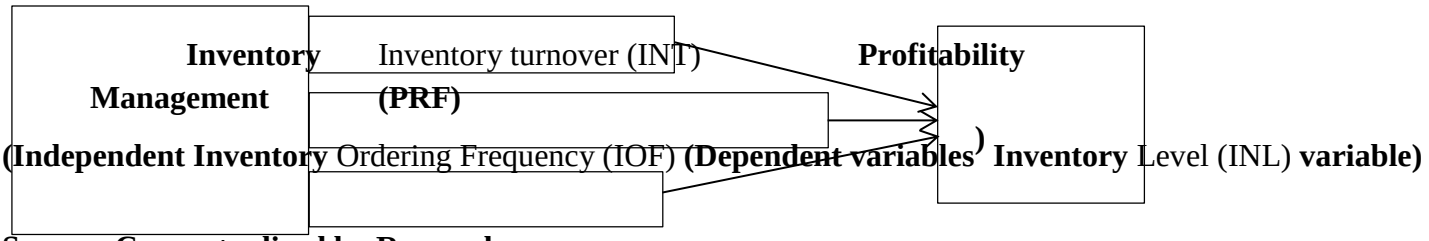
$H0_1$: There is no significant relationship between inventory turnover and SMEs profitability.

$H0_2$: There is no significant relationship between inventory ordering frequency and SMEs profitability.

$H0_3$: There is no significant relationship between inventory level and SMEs profitability.

2. REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework



Source: Conceptualized by Researchers

Inventory Management

Inventory is a necessary part of a systematic supply chain of a business, and it is utilized to balance the supply and demand of a certain product (Alam, Thakur, & Islam, 2024). It involves keeping track of and monitoring stock levels, projecting future needs, and determining the best time and method for arrangement. The main objective of inventory management is to make requisitions for the appropriate amount or quantity and quality of supplies at the appropriate time while minimizing the cost of stock holding in order to gain the full benefits of inventory management (Ajeyi et al., 2021; Atnafu & Balda, 2018).

Inventory Turnover

Inventory turnover measures and shows the frequency with which a business sells and replenishes its goods over time. It is a ratio showing quickly and how efficiently business enterprises utilize inventory to generate sales revenue. It has a positive impact on a business enterprise's profitability, and it is calculated as inventory turnover equal to cost of goods sold divided by average inventory (i.e., inventory turnover = cost of goods sold/average inventory). Inventory turnover refers to the liquidity and how efficiently the company holds and manages its inventory (Gitman, 2015, cited in Alnaim & Kouaib, 2023). It has a positive impact on business enterprise profitability and their overall performance.

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Inventory Level

Inventory level, also called stock level, refers to the amount of a specific product or products that a business has on hand at a given time. It is a key metric in inventory management and helps businesses ensure they have enough stock on hand to meet both potential and existing customers demand without overstocking and tying up valuable scarce resources. It is the amount of goods, products, or materials that a business currently has in stock as its inventory. It represents the actual quantity or amount of inventory available at a specific point in time or given moment. In inventory management, businesses are constantly faced with the dilemma of balancing two competing demands: either maintaining a minimum amount of inventory to reduce storage and other holding costs and increase profitability or maintaining a large amount of inventory for smooth and efficient production or sales operations (Pandey, 2008, as cited in NdiranguKung'u, 2016). The dangers of both overstocking and understocking inventory are not desirable for any business that wants to maximize its profit or performance. Hence, any company looking to increase its performance or profit should avoid the risks of both overstocking and understocking inventory by putting in place effective and efficient inventory management practices to help optimize their inventory level at any given time.

Inventory Ordering Frequency

Inventory ordering frequency is a critical decision for businesses, especially small and mediumscale enterprises (SMEs) with the challenge of a paucity of funds, as this directly impacts their operational efficiency, cash flow, and customer satisfaction. However, these SMEs can still employ one or a combination of various strategies, such as economic order quantity (EOQ), justin-time (JIT) inventory, safety stock level, inventory management software, and other strategies in optimizing their inventory ordering frequency. Not only do businesses have this wide range of options to manage their inventory, but they can order any quantity at any given interval. Hence, inventory ordering frequency is defined as the number of times an inventory item is ordered from the market or suppliers (Vaz, Tedjamulja, Tendulkar, & Rajagopal, 2020).

Profitability

Profitability measures how efficiently a company converts its expenses into profits for its owners. It is an important measure of a business's prosperity and financial health. It is a concept that explains the ability to make a profit from all the business activities of an organization. It reflects the level of efficiency of an organization in using the available resources to achieve the predetermined profit goal (Tella & Olatunji, 2023).

2.2 Empirical Reviews

There have been many empirical studies on the impact of inventory management on profitability. These studies give diverse findings in their report. For instance, Duramany-Lakkoh and Daboh (2023) examined the impact of inventory management on the profitability of a manufacturing company. They employed data that cannot be

manipulated, data collected in a secondary form from the financial statement of their sampled firms covering a period of 2015-2020, and used a multiple regression model. The findings of their study revealed that raw material cost and storage cost have a negative and insignificant relationship with the profitability of a manufacturing company, and that inventory conversion period has a positive and significant relationship with returns on assets. Anisere-Hameed and Bodunde (2021) examine the effect of inventory management on the profitability of the manufacturing industry. The objectives of the study are to examine the effect of inventory management on return on assets, investment, net operating margin, and net income of manufacturing firms in Nigeria using manufacturing companies in food and beverages operating in Nigeria. The study employed the ex post facto research design and covered a period of 5 years from 2015 to 2019, and both descriptive and inferential methods of data analysis were employed. The study reveals that inventory management has a significant effect on return on asset, investment, net operating margin, and net income of manufacturing firms in Nigeria. Atnafu & Balda (2018) investigate the impact of inventory management practice on firms' competitiveness and organizational performance. one hundred and eighty-eight (188) micro and small enterprises (MSEs) operating in the manufacturing sub-sector was their focus, and their findings indicated that higher levels of inventory management practice can lead to an enhanced competitive advantage, as well as improved organizational performance. Their results also revealed that competitive advantage has a direct and positive impact on organizational performance. Mamoor and Raana (2020) examine the effect of inventory management on the profitability of small businesses in Bangladesh with data covering a period of 10 years. They adopted a multiple regression analysis technique, and their results indicated a positive and significant relationship between the inventory management of small businesses and the profitability of small businesses. Garba, Mourad, & Chamo (2020) investigated the effect of inventory turnover period on the profitability of listed conglomerate companies in Nigeria, with data collection covering a period from 2007 to 2016. Feasible generalized least square (FGLS) regression was adopted for analysis. The findings of the study establish that inventory turnover management inversely affects the profitability of conglomerate companies' in Nigeria. Alam, Thakur, & Islam (2024) examine the inventory management practices of small and medium enterprises (SMEs) in Bangladesh. Their study applied a qualitative case study design. Data were collected from ten SME owners in Bangladesh. The study employed a purposive sampling technique to collect data. This study used semi-structured interviews to generate data. Their findings show that most SME business owners collect raw materials from the local market. Along with the local sources, they collect raw materials from international markets.

3. Methodology

The research design adopted the survey research design using a validated structured questionnaire with a quantitative approach specifically tailored to extract the relevant information on the subject matters of inventory

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management and SMEs profitability in Nigeria. The population of the study is heterogeneous in nature, and it consists of all supermarkets and bottled/sachet water producers in Delta State, Nigeria. Stratified sampling was used, and a total of thirty (30) SMEs were selected with equal representatives from each of the strata across the three senatorial districts in Delta State. Furthermore, three (3) respondents from each of the thirty (30) selected SMEs, consisting of the managers, accountants, and storekeepers, were chosen to form the sample size of ninety (90) respondents. Data collected for the study were analyzed using the multiple regression statistical technique with the aid of the IBM Statistical Package for the Social Sciences {SPSS} software.

3.3 Specification of Model for the Study

The model for the study is expressed in mathematical and econometric forms.

PRF = f(INV, IOF, INL) ----------(i)

$PRF = \beta_o + \beta_1 INV + \beta_2 IOF + \beta_{3INL} + U1$ ---------- (ii)

Where: PRF = Profitability; INV = Inventory Volume; IOF = Inventory Ordering Frequency and Inventory Level. β0 = intercept coefficient; β1 = coefficient for each of the independent variables; and U = error term.

Measurement and Explanations of Variables

Variables	Types	Measurement	Expected sign
Profitability (PRF)	Dependent variable	This is measured by the overall operational performance of the business.	
Inventory Turnover (INT)	Independent Variable	Measures the rate at which a company is able to turn its inventory into sales. Inventory turnover = cost of goods sold/average inventory	+
Inventory Ordering Frequency (IOF)	Independent Variable	This is measured by the number of times the business order new stock per year	+
Inventory Level (INL)	Independent Variable	This is measured by the number of goods the business have in store and warehouse	+

Source: Compiled by Researchers (2024)

DATA ANALYSIS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics displayed the fundamental characteristics of the data from the SMEs that were chosen for the study.

Table 4.1: Descriptive Statistics

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Variables	Observations	Mean	Standard deviation
PRF	90	24.6200	3.45166
INT	90	18.0504 5.3556	3.89176
IOF	90	74.2444	2.43251
INL	90		6.08426

Source: Extracted from the analyzed result with SPSS version 23.

KEYS: PRF = Profitability; INL = Inventory Level; IOF = Inventory Ordering Frequency; INV = Inventory Volume

Table 4.1 above revealed that PRF has a mean of 24.62 percent and a standard deviation of 3.45166. It further revealed that inventory turnover (INT) across the selected SMEs for the study has an average of 18.0504 percent and a standard deviation of 3.89176. Inventory Ordering Frequency (IOF) has a mean of 5.3556 and a standard deviation of 2.43251. Finally, the descriptive statistic revealed a mean value of 74.2444 and a standard deviation of 6.08426 for Inventor Level across the number of SMEs used for the study.

Table 4.2: Correlation Analysis

	PRF	INT	IOF	INL
PRF	1.000			
INT	0.840	1.000		
IOF	0.054	0.043	1.000	
INL	0.056	0.055	0.563	1.000

Source: Extracted from the analyzed result with SPSS version 23.

KEYS: PRF = Profitability; INT = Inventory Turnover; IOF = Inventory Ordering Frequency; INL = Inventory Level

Table 4.2 above reveals the correlation analysis extracted from the analyzed result using SPSS. Correlation coefficients indicate that all of the variables examined contribute positively to profitability. The strength of the relationships amongst the variables examined varies as shown by their correlation coefficients in the table above. Inventory turnover (INT) has the highest correlation coefficient of 0.840 with profitability, while inventory level (INL) and inventory ordering frequency (IOF) have positive correlations of 0.055 and 0.043 with profitability, respectively.

4.2 Testing of Hypotheses

Table 4.3: Multiple Regression Analysis

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Coefficients[a]						Model Summary[b]	
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**R**	.840
						R- Square	.706
	B	**Std. Error**	**Beta**			**Adjusted R-Square**	.692
(Constant)	11.484	4.037		2.845	.006	**Std. Error of the Estimate**	1.91548
INT	.744	.052	.839	14.217	.000	**R- Square Change**	.706
IOF	.096	.515	.067	.186	.853	**Sig. F Change**	**.000**
INL	.000	.041	.000	-.003	.997	**Durbin Watson**	1.646

a. Dependent Variable: Profitability (PRF)
b.Observations: 90

The results of the multiple regression analysis presented above in Table 4.3 were based on profitability as the dependent variable and INT, IOF, and INL as the independent variables for the study. The results from the multiple regression analysis from the above table indicated that R^2 is 0.706 or approximately 71%. This implies that the data fit the regression model, and that the explanatory/independent variables INT, IOF, and INL in the model explain changes in profitability (PRF) to the extent of 71 percent, while the remaining 29 percent are explained by other variables outside the model. The results from the regression analysis further indicated that all of the explanatory variables— INT, IOF, and INL—have a positive relationship with SMEs profitability (PRF). The extents of these relationships were determined using the p-values for tests of statistical significance. The result of the p-values shows that the explanatory variable INT is positively and statistically related to the profitability of SMEs at a p-value less than 0.05 (i.e., 0.000 < 0.05). The implication of this revelation is that more inventory turnover means more profits for the SMEs, and that the increase in SMEs profits is dependent on inventory turnover. However, the positive relationship between IOF and INL with profitability (PRF) was not statistically significant at p-values greater than 0.05 (i.e., 0.853 and 0.997 > 0.05), respectively. The implications of these relationships are that both IOF and INL cannot be used to explain changes in profitability (PRF) of SMEs.

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Consequent on the above revelations, hypothesis one, which states that there is no significant relationship between INT and SMEs profitability, was rejected, while hypotheses two and three, which state that there is no relationship between IOF, INL, and SMEs profitability, respectively, were accepted.

5. Discussion of Findings

The study aim at investigating the impact inventory management on small and medium scale enterprises profitability in Nigeria with emphasis on selected supermarkets and bottled/sachet water producers in Delta state, Nigeria. The discussions of findings were centered on the three specific objectives of the study. Hence, objectives one of study is to determine the relationship between inventory turnover and SMEs profitability. The finding of the study equally revealed that inventory turnover has a positive and significant relationship with profitability with P-value < 0.05 (i.e. 0.000 < 0.05). Objectives two of the study is to ascertain the relationship between ordering frequency and SMEs profitability. Though, the finding of the study revealed a positive relationship between inventory ordering frequency and SMEs profitability. However, the relationship was not statistically significant to be relied upon at P > 0.05 (i.e. 0.853 > 0.05). Finally, Objectives three of the study is to examine the relationship between inventory level and SMEs profitability. The finding from the study also revealed that inventory level has positive relationship with SMEs profitability, but this relationship was equally not statistically significant to be relied upon at P > 0.05 (i.e. 0.997 > 0.05). The findings this study are in line with previous empirical findings (Mamoor, & Raana, 2020; Alnaim & Kouaib, 2023; Yunusa, 2021).

6. Conclusions and Recommendations

The study aims at examining the impact of inventory management on small and medium-scale enterprises profitability in Nigeria with an emphasis on selected supermarkets and bottled/sachet water producers in Delta State, Nigeria. Based on the findings of the study, the researchers conclude that inventory management has a relationship with SMEs profitability. Hence, SMEs are encouraged to engage in effective and efficient inventory management, which has a direct impact on profitability. Small and medium enterprises are equally advised to employ real-time, costeffective technology in managing their inventory to reduce the negative impact associated with the various costs of under-stocking or over-stocking.

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