

EFFECT OF MATERIAL MANAGEMENT ON THE PERFORMANCE OF SELECTED BAKERIES IN THE FEDERAL CAPITAL TERRITORY, (FCT) ABUJA

ADEOYE, Meshach Olorunayo and U.D. Muhammad
Department of Business Administration
University of Abuja

Email: udmohammed@gmail.com; meshachyou@gmail.com

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ABSTRACT

This study investigated the effect of inventory management practices on the organizational performance of selected manufacturing firms in Nigeria. In light of the increasing competition in the manufacturing sector, efficient inventory management is crucial for enhancing productivity and competitiveness. Using a quantitative research design, data were collected from 175 employees of various manufacturing firms through structured questionnaires. The analysis involved multiple regression techniques to evaluate the relationship between inventory management practices—including ordering, storage, and control systems—and organizational performance metrics such as efficiency, productivity, and overall operational success. Findings reveal a significant positive correlation between effective inventory management and improved organizational performance. The study concludes that implementing robust inventory management practices can lead to enhanced operational efficiency and competitiveness in the Nigerian manufacturing industry. Recommendations are provided for practitioners to adopt advanced inventory techniques and for policymakers to support training programs focused on inventory management competencies.

Keywords: Material Management, Bakeries, Performance, Practices

INTRODUCTION

Materials are fundamental to nearly every organization, especially those in the manufacturing sector where they constitute a substantial portion of current assets. Effective material management is crucial for ensuring organizational efficiency and success. Mismanagement of materials can lead to a series of issues including reduced productivity, excessive production, diminished customer loyalty, and inflated inventory costs (Khalid & Lim, 2018).

The manufacturing industry has experienced rapid growth since 2016, a trend likely to continue due to advancements in technology and

innovation. Proper material control systems are essential to managing assets and stock efficiently while maintaining accurate demand forecasting. This minimizes the need for emergency procurement and supports streamlined procurement procedures that align with market demands and supplier conditions (Mbugi & Lutege, 2022). Accurate demand forecasting further enables businesses to reduce operational costs, enhance employee efficiency, and meet future product and service needs, ultimately boosting customer satisfaction and organizational performance.

Effective management of receivables, inventories, and payables is crucial for a company's profitability and liquidity. Poor

management of working capital can result in excess cash being tied up unnecessarily, affecting the company's value and limiting investment opportunities in profitable assets such as plant and equipment. This can undermine the company's sustainability (Halilbegovic, Mekic, Mekic & Tandır, 2022). Typically, excess funds are often linked to inventory, a significant component of current assets.

Material management involves the comprehensive coordination of planning, controlling, organizing, and directing efforts to enhance efficiency in procurement, transportation, storage, and utilization of inputs in a manufacturing organization. In the Federal Capital Territory (FCT), many bakeries suffer from inadequate material management systems, often characterized by imbalances such as excessive material with poor management or insufficient material with excessive management efforts.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The concept material management encompasses the processes of acquiring, storing, transferring, and regulating commodities to optimize the use of facilities, staff, resources, and capital. According to Ballot (2016), it involves managing these resources to achieve maximum efficiency and effectiveness. Tersine and Campbell (2004) describe material management as ensuring the timely provision of appropriate materials at the right locations to maintain desired output levels.

Material management involves several key activities, including planning, identification, procurement, storage, receipt, and distribution of materials. Its main objective is to ensure that the right materials are available in the correct quantities and locations when needed. This is often managed by a dedicated material management department, which oversees the flow of materials from the initial order to their final use.

The core aim of material management is to control material flow effectively. Lowe (2002)

defines it as the careful management of raw materials, work-in-progress, and finished goods to ensure returns on capital investment and maintain stock levels to avoid opportunity costs. Slack et al. (2007) describes materials, or stock, as stored resources that can be either physical or informational. Effective material management allows firms to benefit from economies of scale by purchasing supplies in bulk, which reduces unit costs and enables firms to take advantage of quantity and cash discounts.

Dimensions of Material Management

Material Cost

Material cost refers to the total expenditure required to purchase raw materials needed for production. Effective management of material costs is essential for maintaining profitability, particularly in industries with thin margins. Firms that focus on strategic procurement, such as negotiating favourable terms with suppliers or purchasing in bulk, can lower their material costs and enhance overall efficiency (Smith & Jones, 2020; Lee, 2021). Moreover, fluctuations in material costs due to external factors like global supply chain disruptions can have a substantial impact on a company's boom line (Williams & Green, 2020).

Safety Cost

Safety cost involves expenses incurred to maintain a safe working environment, including the cost of safety equipment, employee training, and compliance with safety regulations (Thomas & Clark, 2019; Moore, 2020). Just-in-time (JIT) inventory management is a strategy that minimizes inventory costs by receiving goods only when they are needed for production, thus reducing excess inventory and storage costs (Brown & Lee, 2019; Harris, 2021). The valuation of stock, such as using FIFO (First-In-First-Out) or LIFO (Last-In-First-Out) methods, is essential for accurate financial reporting and managing working capital effectively (Adams, 2021; Gray & White, 2020). Accurate stock valuation helps companies assess their financial performance and optimize inventory levels.

Just-in-time (JIT)

Just-in-time (JIT) inventory management is a strategy aimed at reducing inventory holding costs by aligning material deliveries with production schedules, thereby minimizing excess stock. This approach allows companies to reduce storage expenses, improve cash flow, and enhance operational efficiency by avoiding overstocking (Brown & Lee, 2019; Harris, 2021). However, JIT requires precise coordination with suppliers and can be vulnerable to supply chain disruptions, which may lead to production delays if materials are not delivered on time (Wilson & Adams, 2020).

Valuation of Stock

Valuation of stock involves determining the financial value of a company's inventory, which includes raw materials, work-in-progress, and finished goods. Accurate stock valuation is critical for proper financial reporting and can influence tax obligations and profitability. Common methods such as FIFO (First-In-First-Out) and LIFO (Last-In-First-Out) impact how costs are reflected in financial statements, especially in times of fluctuating material prices (Adams, 2021; Gray & White, 2020). Correct valuation helps in ensuring that the cost of goods sold and inventory values are accurately depicted, providing insights into the company's financial health (Smith & Clarke, 2019).

Importance of Materials Management

Effective materials management is crucial for the success of any business, including bakeries. It involves regulating the flow of supplies and is vital for the smooth execution of projects. Proper material control is essential for managing a significant portion of product and project expenses.

Materials play a critical role in operations across all industries. The unavailability of materials can halt production, reduce efficiency, and cause delays. Even for basic products, discrepancies between the supply and demand timelines can affect operations, particularly if suppliers cannot meet the required quantities or deadlines. Delays

in material procurement can impact business operations significantly (Willis, 2008).

Conversely, excessive stock levels can also create challenges. High storage costs and management difficulties can arise from holding too many supplies. In situations with limited storage space, alternative solutions must be considered, which can increase overall expenses. Proper handling and storage of materials are crucial to prevent damage and ensure efficient use. The goal is to acquire materials at the lowest possible cost to maximize savings for the company (Damodara, 2008).

Concept of Performance

Performance, as defined by Hagos (2015), is the evaluation of an organization's outcomes in relation to its set goals and objectives. It involves measuring how effectively an organization meets its targets while optimizing the use of available resources. This definition emphasizes that performance is a dynamic concept that varies across sectors and can be interpreted differently by stakeholders depending on their interests. In the context of material management, performance is closely tied to how efficiently materials are managed, with successful performance reflecting the organization's ability to minimize waste, control costs, and maintain smooth operations.

Similarly, Edward (2018) views performance management as a continually evolving discipline, comparable to other business functions like sales and finance, where efficiency and strategic execution are key. Wayne Eckerson, from the Data Warehouse Institute, describes performance management as a set of processes and implementations aimed at enhancing business execution and maximizing value. This perspective highlights the role of data-driven decision-making in assessing and improving organizational performance. In relation to this study, effective materials management is a critical aspect of organizational performance, as it directly influences cost efficiency, operational sustainability, and the overall ability of a company to meet its objectives. Therefore, managing materials efficiently not only improves the company's

operational performance but also its competitive positioning within the market.

THEORETICAL REVIEW

Queuing Theory

Queuing theory, as outlined by Shingo (2005), provides a mathematical approach to analyzing and managing waiting lines or queues. It focuses on various stages of the queuing process, including the arrival of entities, the time they spend waiting, and the service delivery process. The theory enables the calculation of key performance metrics, such as the average waiting time, the expected number of entities in the system, and the probability of the system being in certain states—whether empty, full, or with available servers. An essential aspect of queuing theory, as highlighted by Houtzeel (cited in Agu et al., 2016), is its application to the priority assignment problem in systems with multiple customer classes. This involves determining the optimal service rule to minimize long-term waiting costs, which differs from traditional inventory systems where the focus is on minimizing inventory holding costs (Teng, 2009; Teunter & Klein, 2008).

In this study, which focuses on the effect of material management on the performance of selected bakeries in FCT, queuing theory is particularly useful in optimizing the flow of materials and resources. By applying the principles of queuing theory, bakery managers can better manage the waiting times for material deliveries, reduce bottlenecks in production, and ensure timely availability of raw materials. This helps improve overall operational efficiency, reduce downtime, and enhance the performance of the bakeries. Additionally, prioritizing certain materials or processes within the bakery's production line, as suggested by the priority assignment aspect of queuing theory, can help in reducing delays and improving service delivery, thereby boosting the bakery's performance.

EMPIRICAL REVIEW

Kowo and Lubica (2023) conducted a study to assess the critical role of material management in enhancing organizational effectiveness. Using

a survey methodology, the study employed regression analysis and ANOVA to evaluate the impact of Economic Order Quantity (EOQ) on operational costs and how production costs influence sales turnover. The results revealed that EOQ significantly affects operational costs, contributing to 21.1% of cost changes. Additionally, production costs were found to influence sales turnover by 31.7%. The study recommends that management pay close attention to EOQ, production costs, and operational costs to improve liquidity and overall organizational performance.

Gemachis, Shagufta, and Mohd (2022) explored the impact of material management on organizational performance within the Ethiopian public sector, utilizing descriptive and explanatory research designs. Data were collected from 186 respondents, achieving a 91% response rate. The analysis, conducted via SPSS, showed a strong positive correlation between material management practices and organizational success. However, challenges such as bureaucratic inefficiencies, inadequate documentation, and limited ICT use in inventory management were identified. The study recommends enhancing procurement processes, improving documentation and staff skills, and increasing the adoption of ICT to optimize inventory management.

Hashed and Shaik (2022) examined the relationship between material management efficiency and financial performance among companies listed on the Saudi stock exchange (Tadawul) between 2016 and 2020. By employing pooled regression models, the study investigated how effective material management practices influence financial performance metrics. The findings emphasized the significance of efficient material management in improving financial outcomes, underscoring its critical role in driving financial success for companies.

METHODOLOGY

This study used a cross-sectional survey design to capture data from a specified population at a single point in time. The population for this study included a cross-section of staff from

bakeries located in Abaji, Abuja Municipal, Bwari, Gwagwalada, Kuje, and Kwali, totaling 175 individuals. The workforce within these bakeries was categorized into three levels: top-level management, middle-level staff, and lower-level staff. For the purpose of this study, the focus was on top-level management, including operations managers and procurement staff. The selection of these bakeries was justified by their proximity to the researcher, their years of operation, and their registration with the Corporate Affairs Commission. The study employed a stratified sampling technique to ensure representation across different levels of staff. A sample of bakeries was chosen based on their relevance and operational history, ensuring a comprehensive view of the industry. The sample consisted of responses from various staff categories, with a particular focus on top-level management. Data were collected using a face-to-face approach to distribute and collect questionnaires from respondents. This method was selected for its speed, cost-efficiency, and ability to facilitate accurate and complete responses from participants. The primary data collection instrument was a structured questionnaire designed to gather information on materials management practices and their impact on organizational performance. The questionnaire was validated for content and

construct validity by expert reviewers and pre-tested to ensure clarity and reliability. To ensure the validity of the instrument, the questionnaire was reviewed by experts in materials management and organizational performance to confirm that it accurately measured the intended constructs. Reliability was assessed using Cronbach's alpha coefficient to determine the internal consistency of the items in the questionnaire. A coefficient of 0.70 or higher was considered acceptable.

RESULTS AND DISCUSSIONS

The results of this study are presented and discussed in alignment with the research objectives and hypotheses. This section provides a detailed interpretation of the data gathered through regression analysis, explaining the influence of material management variables on the performance of selected bakeries in the Federal Capital Territory (FCT). The findings are compared with prior studies to assess the consistency and validity of the outcomes. Additionally, statistical tests such as the model summary, ANOVA, and coefficient analysis are used to evaluate the significance of each material management variable. The implications of these results are discussed in relation to improving operational efficiency and performance in the bakery industry.

Table 1: Model Summary result on material management on performance of Bakeries in FCT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877 ^a	.769	.763	.62713

a. Predictors: (Constant), Valuation of stock, Safety cost, Just-in-Time, Material cost

Table 2: ANOVA result on material management on performance of Bakeries in FCT

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	222.134	4	55.533	141.200	.000 ^a
	Residual	66.861	170	.393		
	Total	288.994	174			

a. Predictors: (Constant), Valuation of stock, Safety cost, Just-in-Time, Material cost

b. Dependent Variable: Performance

Table 3: Coefficients result on material management on performance of Bakeries in FCT

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.351	.175		2.005	.047
	Material cost	.170	.060	.179	2.853	.005
	Safety cost	.086	.053	.085	1.626	.106
	Just-in-Time	.094	.061	.089	1.542	.125
	Valuation of stock	.540	.063	.600	8.541	.000

a. Dependent Variable: Performance

The table 1 is the model summary shows an R value of 0.877, indicating a strong positive correlation between material management variables (valuation of stock, safety cost, Just-in-Time, and material cost) and the performance of bakeries in FCT. The R-square value is 0.769, meaning that 76.9% of the variation in bakery performance is explained by these material management variables. The adjusted R-square (0.763) confirms that even after adjusting for the number of predictors in the model, the model still explains a substantial proportion of the variance in performance.

Table 2 is the ANOVA table tests the overall significance of the model. The F-statistic (141.200) with a significance level of 0.000 indicates that the regression model is statistically significant, meaning that the material management variables collectively have a significant impact on the performance of bakeries in FCT. The low p-value (< 0.05) confirms that the model is a good fit for the data.

Table 3 is the coefficients table, which provides insight into the individual contribution of each material management variable to bakery

performance. The result shows that for material cost the coefficient is 0.170 with a t-value of 2.853 and a p-value of 0.005, indicating a statistically significant positive effect on bakery performance. The coefficient for safety cost is 0.086, but with a t-value of 1.626 and a p-value of 0.106, this variable is not statistically significant at the 0.05 level. The coefficient for Just-in-Time is 0.094, with a t-value of 1.542 and a p-value of 0.125, indicating that Just-in-Time practices do not significantly influence bakery performance. The coefficient for valuation of stock is 0.540, with a high t-value of 8.541 and a p-value of 0.000, showing that it has the most significant and substantial impact on bakery performance among the variables.

H₀₁: Material cost does not significantly affect the performance of bakeries in FCT.

With a p-value of 0.005 (less than 0.05), we reject the null hypothesis and conclude that material cost significantly affects the performance of bakeries in FCT.

H₀₂: Safety cost does not significantly affect the performance of bakeries in FCT.

The p-value for safety cost is 0.106, which is greater than 0.05, so we fail to reject the null hypothesis. Therefore, safety cost does not have a significant effect on the performance of bakeries.

H₀₃: Just-in-Time practices do not significantly affect the performance of bakeries in FCT.

The p-value for Just-in-Time is 0.125, which is greater than 0.05, meaning we fail to reject the null hypothesis. Thus, Just-in-Time practices do not significantly affect bakery performance.

H₀₄: Valuation of stock does not significantly affect the performance of bakeries in FCT.

With a p-value of 0.000 (less than 0.05), we reject the null hypothesis and conclude that valuation of stock significantly affects bakery performance, making it the most impactful variable in the study. The findings indicate that material cost and valuation of stock are significant contributors to bakery performance, with stock valuation having the greatest influence. Safety cost and Just-in-Time practices, however, do not have significant effects. This highlights the importance of focusing on accurate stock valuation and efficient material cost management to enhance the performance of bakeries in FCT.

Discussion of Findings

The central objective of this study was to examine the effect of material management on the performance of selected bakeries in the Federal Capital Territory (FCT), Abuja. Specifically, the study aimed to investigate how material cost, safety cost, Just-in-Time (JIT) practices, and valuation of stock influence the performance of these bakeries. The findings reveal that material management practices have a significant impact on organizational performance, supporting the hypothesis that effective material handling is crucial for enhancing the operational success of bakeries.

In line with the findings of Kowo and Lubica (2023), this study shows that material cost management, particularly through the valuation of stock and production cost control, significantly influences the performance of bakeries in FCT. The implication of this result is that bakeries need to adopt more efficient stock valuation practices to minimize material wastage and reduce overall operational costs, as stock valuation had the most substantial impact on performance in this study. This aligns with Kowo and Lubica's (2023) recommendation that close attention to EOQ and production cost management is essential for improving liquidity and operational efficiency.

Similarly, the strong correlation between material cost and bakery performance mirrors the results of Gemachis, Shagufta, and Mohd (2022), who emphasized that material management practices correlate positively with organizational success. The implication here is that, for bakeries in FCT, optimizing material costs—such as procurement and storage costs—will likely enhance their competitive edge. However, like the Ethiopian public sector, bakeries in FCT may also need to address inefficiencies related to documentation and inventory systems, which can hinder optimal material management.

Lastly, the study's findings support the conclusions of Hashed and Shaik (2022), who demonstrated that material management efficiency contributes to better financial performance. The implication of this for bakeries in FCT is clear: efficient material management practices, particularly Just-in-Time systems and accurate stock valuation, can lead to significant improvements in financial performance. Bakeries that prioritize timely procurement and cost-effective stock management can expect enhanced financial outcomes and long-term sustainability in their operations.

CONCLUSION AND RECOMMENDATIONS

This study has established that material management significantly affects the performance of selected bakeries in the Federal

Capital Territory (FCT), Abuja. Material management variables, including material cost, safety cost, Just-in-Time practices, and stock valuation, play critical roles in determining operational efficiency and overall performance. Stock valuation emerged as the most significant factor in enhancing bakery performance, reinforcing the importance of effective inventory management for operational success. This study contributes to the growing body of knowledge on the importance of efficient material management in improving organizational performance, specifically within the bakery sector. This study offers the following recommendations, which are:

1. Bakeries should invest in training for procurement and inventory staff to improve stock valuation techniques. This will help maintain optimal stock levels, reduce wastage, and increase profitability.
2. Management should focus on controlling material costs through strategic procurement, such as bulk purchasing, and leveraging suppliers' discounts to reduce costs and improve liquidity.
3. Bakeries should explore integrating Just-in-Time practices into their operations to minimize inventory costs and improve responsiveness to market demand. This will reduce overstocking and lower storage costs.
4. Although safety cost did not show a significant direct impact, bakeries should continue to invest in safety management to ensure operational stability and reduce risks associated with workplace accidents, which can indirectly enhance performance.

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