FUW-IJMSS
ISSN: 2635-3539 (Print)
2384-6224 (online)
Open Access

# EFFECT OF INVENTORY CONTROL TECHNIQUES ON ORGANIZATIONAL PERFORMANCE: DANGOTE CEMENT PLC GBOKO, BENUE STATE.

**Dr. Samuel Taiwo OLABOSINDE[1], Hikon Zando HOKU[2]**

**[1]Department of Business Administration, [2]School of Postgraduate Studies**

**Federal University Wukari, Taraba State.**

[1]olabosinde@yahoo.com, [2]Hikonhoku@gmail.com

**Telephone: [1]08034934134, [2]08039727448**

**Abstract**

*This study examines the effect of inventory control techniques on organizational performance at Dangote Cement Plc, Gboko, Benue State. Using multiple regression analysis, data were collected from 150 respondents drawn from staff involved in inventory and operational functions. The study assessed the influence of Reorder Point/Reorder Quantity, Economic Order Quantity (EOQ), Just-In-Time (JIT), and ABC analysis on organizational performance. Findings reveal a weak positive relationship between inventory control techniques and performance ($R = 0.221$), explaining only 4.9% of the variation ($R^2 = 0.049$). The overall model is statistically insignificant ($F = 1.855$, $p > 0.05$), indicating that the techniques do not jointly have a significant effect on performance. At the individual level, JIT and Reorder Point show marginal positive effects, while EOQ and ABC analysis exhibit weak negative effects. The study concludes that inventory control techniques, though important for operational efficiency, are not the primary drivers of organizational performance in the cement industry. It is therefore recommended that management integrate EOQ, JIT, ABC, and Reorder Point systems into a unified framework rather than using them in isolation. The company should strengthen demand forecasting and production planning to complement inventory systems. Investment in digital inventory technologies and automation is also essential to improve accuracy and real-time decision-making. Furthermore, staff training on modern inventory practices should be enhanced to improve implementation effectiveness. Finally, a broader strategy combining inventory control with production efficiency, logistics optimization, and technology adoption is necessary for sustainable organizational performance.*

***Keywords:*** *Inventory control, EOQ, JIT, ABC analysis, organizational performance, Dangote Cement Plc.*

## Introduction

Inventory control techniques represent a critical facet of operations and supply-chain management in manufacturing organisations. By definition, inventory control techniques refer to the methods by which firms manage the ordering, stocking, handling, and replenishment of raw materials, work-in-progress, and finished goods so as to balance the competing demands of availability and cost containment. When effectively implemented, these techniques enhance organisational performance through reduced costs, improved production continuity, shorter lead times, better asset utilisation, and enhanced customer satisfaction (Heizer, Render,

& Munson, 2020; Silver, Pyke, & Thomas, 2017).

Studies in developed economies provide substantial evidence of the relationship between inventory control techniques and organisational performance. Pong and Mitchell (2012) reported that improved inventory investment and control practices contributed positively to organisational outcomes among manufacturing firms in the United Kingdom. Similarly, Eroglu and Hofer (2011) found that lean inventory systems significantly improved operational performance when inventory levels were optimally managed. Recent evidence also suggests that strategic management accounting and management information systems enhance inventory efficiency and organisational effectiveness (Puspitawati, Lhutfi, & Qudratov, 2024).

Evidence from developing countries also supports the importance of inventory control techniques. Lwiki, Ojera, Mugenda, and Wachira (2013) found that inventory management practices significantly influenced the financial performance of sugar manufacturing firms in Kenya. Mulandi and Ismail (2019) similarly reported that effective inventory management practices improved organisational performance among commercial state corporations in Kenya. In Tanzania, Mbugi and Lutego (2022) established that inventory control management systems positively influenced organisational performance in manufacturing firms, while Mawonde et al. (2024) reported similar findings in Zimbabwe's mining sector.

Within Nigeria, inventory control has been identified as a critical determinant of organisational success. Asuzu et al. (2019) found that inventory turnover significantly influenced the performance of quoted consumer goods manufacturing firms. Nwaiku and Ejechi (2022) also reported that inventory management practices positively affected organisational productivity among Nigerian manufacturing firms. Furthermore, Ilori and Majiyagbe (2024) established that inventory control management practices significantly improved organisational performance in Nigerian manufacturing companies.

Despite these contributions, important gaps remain. Much of the existing literature focuses on manufacturing firms generally rather than large-scale cement manufacturing operations. Furthermore, many studies examine inventory management broadly without distinguishing the specific effects of techniques such as Economic Order Quantity (EOQ), Just-in-Time (JIT), ABC analysis, and Reorder Point systems. There is also limited empirical evidence on plant-level operational performance outcomes within the Nigerian cement industry. Consequently, this study investigates the effect of inventory control techniques on organisational performance at Dangote Cement Plc, Gboko Plant, Benue State.

This study focuses on staff within key functional units, including procurement, inventory management, logistics, production planning, warehousing, and finance at Dangote Cement Plc, Gboko Plant. It utilises primarily primary data collected through structured questionnaires, complemented by relevant secondary sources, to provide current and context-specific insights. While the study is limited to the Gboko Plant and does not extend to other plants or external supply chain actors, the findings offer useful implications for similar large-scale manufacturing firms operating in Nigeria and other developing economies.

**Statement of the Problem**

Effective inventory control has been widely recognized in management literature as a critical determinant of organisational performance. Theoretically, inventory control techniques such as Economic Order Quantity (EOQ), Just-in-Time (JIT), ABC analysis, and Reorder Point

(ROP) are expected to enhance organisational performance by reducing holding costs, preventing stockouts, and improving operational efficiency. However, despite these theoretical assertions, there remains ambiguity in how these techniques translate into performance outcomes in large-scale manufacturing firms within developing countries like Nigeria. Many existing theories assume stable supply chain conditions, efficient logistics systems, and consistent demand patterns conditions that are often absent in the Nigerian industrial context, thereby creating a theoretical gap on the applicability and effectiveness of these models in unstable environments.

Practically, Dangote Cement PLC Gboko, Benue State, operates in a high-demand and competitive industry where timely production and uninterrupted supply are essential to maintaining market share. Yet, reports of production delays, supply bottlenecks, excess inventory buildup of raw materials such as limestone, gypsum, and clinker, and occasional stock-out of critical production inputs suggest weaknesses in inventory control practices. The volatility of logistics systems in Nigeria characterized by fluctuating transportation costs, poor road networks, insecurity, and inflationary pressures further complicates efficient inventory management. These practical realities raise concerns as to whether the current inventory control systems at Dangote Cement Gboko are adequate to support sustained organisational performance, especially regarding cost efficiency, production continuity, and customer satisfaction.

Empirically, existing studies on inventory control and organisational performance have produced mixed and inconclusive findings. While some research reports a strong positive correlation between inventory techniques and firm performance, others find minimal or no significant impact, particularly in African and Nigerian industrial settings. Additionally, many past studies have focused on FMCG firms, pharmaceutical companies, and SMEs, with limited emphasis on the cement manufacturing sector, despite its strategic importance to national development. There is also insufficient empirical evidence specifically addressing large manufacturing plants in Northern Nigeria, particularly Dangote Cement Gboko. This gap creates a need for a contextualized empirical investigation to determine whether inventory control techniques significantly influence organisational performance in this operational environment.

Thus, this study seeks to examine the effect of inventory control techniques on organisational performance at Dangote Cement PLC Gboko, Benue State, bridging theoretical ambiguities, practical operational challenges, and empirical inconsistencies in existing literature.

**Research Objectives**

General Objective

To examine the effect of inventory control techniques on organizational performance at Dangote Cement Plc, Gboko Plant, Benue State.

Specific Objectives

1. To determine the effect of the Economic Order Quantity (EOQ) technique on organizational performance at Dangote Cement Plc, Gboko Plant.
2. To assess the impact of the Just-In-Time (JIT) inventory system on organizational performance at Dangote Cement Plc, Gboko Plant.
3. To evaluate the effect of ABC analysis on organizational performance at Dangote Cement Plc, Gboko Plant.
4. To examine the influence of Reorder Point (ROP) and Reorder Quantity systems on organizational performance at Dangote Cement Plc, Gboko Plant.
5. To assess the combined effect of inventory control techniques on organizational performance at Dangote Cement Plc, Gboko Plant.

**Research Hypotheses**

Null Hypotheses ($H_0$)

**$H_{01}$:** Economic Order Quantity (EOQ) technique has no significant effect on organizational performance at Dangote Cement Plc, Gboko.

**$H_{02}$:** Just-In-Time (JIT) inventory system has no significant effect on organizational performance at Dangote Cement Plc, Gboko.

**$H_{03}$:** ABC analysis has no significant effect on organizational performance at Dangote Cement Plc, Gboko.

**$H_{04}$:** Reorder Point and Reorder Quantity systems have no significant effect on organizational performance at Dangote Cement Plc, Gboko.

**$H_{05}$:** Inventory control techniques jointly have no significant effect on organizational performance at Dangote Cement Plc, Gboko.

**Significant of the Study**

This study is significant as it provides empirical insight into the effect of inventory control techniques on organisational performance in a large-scale manufacturing environment, using Dangote Cement PLC, Gboko Plant as a case study. Inventory control is a critical managerial function in capital-intensive industries, and understanding its impact is vital for improving operational efficiency and organisational competitiveness.

Firstly, the study will be beneficial to management of Dangote Cement PLC by offering evidence-based guidance on how modern and effective inventory control techniques such as EOQ, JIT, ABC analysis, and Reorder Point systems can enhance production efficiency, reduce operational costs, minimise stock-outs and improve profit margins. The findings will assist decision-makers in adopting inventory strategies that improve organisational performance and sustain competitive advantage within the Nigerian cement industry.

Secondly, the study contributes to manufacturing firms and industry practitioners by providing practical lessons on inventory planning, procurement coordination, stock control frameworks, and materials management. It will serve as a benchmark for other manufacturing and large-scale industrial firms aiming to optimise inventory performance and strengthen supply chain operations.

Thirdly, the study will enrich academic literature and theory development in inventory management and operations research by offering empirical evidence from a developing economy context. The insights will be useful for scholars, researchers, and students by expanding knowledge on how inventory control techniques influence performance within a high-demand, infrastructure-challenged industrial setting like Nigeria.

Furthermore, the findings will guide policy makers and regulatory bodies in understanding operational constraints faced by manufacturing companies in Nigeria. It will support the formulation of policies that promote efficient logistics systems, supply chain infrastructure, and industrial support frameworks for enhanced production stability.

Lastly, the research will provide a useful reference for future researchers by identifying existing gaps and presenting recommendations for further studies in inventory control, operations management, and industrial performance analysis, particularly within emerging economies.

Overall, this study strengthens the bridge between inventory control strategies and organisational performance outcomes, providing actionable insights and academic contributions relevant to industry, scholars, and policy stakeholders.

**LITERATURE REVIEW**

**Conceptual Framework**

This study is anchored on the relationship between inventory control techniques and organizational performance. The independent variables comprise key inventory control techniques, including Economic Order Quantity (EOQ), Just-in-Time (JIT) replenishment, ABC analysis, and reorder point systems. These techniques represent structured approaches to managing inventory levels, minimizing waste, and ensuring timely availability of materials.

The dependent variable is organizational performance of Dangote Cement Plc, Gboko Plant, which is reflected through indicators such as operational efficiency, inventory holding cost, stock-out frequency, production downtime, turnaround time, and overall profitability.

The framework posits that effective implementation of these inventory control techniques enhances organizational performance by reducing excess inventory, minimizing delays in replenishment, lowering operational costs, and improving production efficiency. Consequently, improved inventory management practices are expected to strengthen throughput and overall operational outcomes.

**Inventory Control Techniques**

Inventory control techniques constitute the systematic approaches organisations adopt to determine what inventory to hold, when to reorder it, and how much to keep, thereby balancing customer service requirements with inventory-related costs. Traditional techniques such as Economic Order Quantity (EOQ), ABC analysis, Just-in-Time (JIT), and Reorder Point systems have remained central to inventory management practice for decades (Harris, 1913; Wilson, 1934; Silver et al., 2017). According to Heizer et al. (2020), effective inventory control enables firms to improve operational efficiency, reduce waste, and enhance customer satisfaction. Recent studies further indicate that the integration of strategic management accounting and management information systems has significantly improved inventory visibility, decision-making, and inventory efficiency (Puspitawati et al., 2024). In healthcare settings, Bolarinwa et al. (2024) demonstrated that inventory optimisation techniques contribute substantially to cost reduction and resource utilisation, while Ezhilmathi and Shanmugapriya (2017) emphasized the importance of effective material management in improving project and operational performance.

**Economic Order Quantity**

The Economic Order Quantity (EOQ) model, originally developed by Harris (1913), remains one of the most widely applied inventory control techniques for determining optimal order quantities. The model seeks to minimise the combined costs of ordering and inventory holding. According to Silver et al. (2017), EOQ provides organisations with a scientific basis for inventory replenishment decisions and contributes to cost efficiency. Heizer et al. (2020) further noted that EOQ remains relevant in contemporary operations management because it facilitates inventory cost control and improves resource utilisation. Studies conducted in developing economies have also reported positive organisational outcomes associated with EOQ implementation. For example, Owajege and Abdulsamad (2025) found that EOQ positively influenced the performance of small and medium-sized enterprises in Cameroon, while Gokhale and Kaloji (2018) reported that effective inventory management practices significantly enhanced profitability in manufacturing firms.

**Just In Time System**

The Just-in-Time (JIT) inventory system is a production and inventory management philosophy designed to minimise waste by ensuring that materials arrive only when needed for production. The approach reduces inventory holding costs, improves cash flow, and enhances operational efficiency (Heizer et al., 2020). Abdulmalik (2018) argued that JIT manufacturing contributes significantly to supply chain resilience by reducing unnecessary inventory accumulation and promoting production flexibility. Eroglu and Hofer (2011) similarly found that lean inventory systems

contribute positively to firm performance when inventory levels are optimally maintained. However, successful implementation of JIT requires reliable suppliers, accurate forecasting, and efficient logistics systems.

**ABC Analysis**

ABC analysis is an inventory classification technique based on the Pareto principle, whereby inventory items are categorised according to their relative value and importance. Category A items receive the highest management attention due to their substantial contribution to inventory value, while Categories B and C receive progressively less attention (Silver et al., 2017). Heizer et al. (2020) observed that ABC analysis enables firms to allocate inventory management resources more efficiently and improve stock control decisions. Contemporary inventory management studies suggest that ABC analysis becomes even more effective when integrated with information systems and real-time inventory monitoring technologies (Puspitawati et al., 2024).

**Reorder Point/Reorder Quantity Systems**

The Reorder Point (ROP) system determines the inventory level at which a replenishment order should be placed to prevent stockouts and production interruptions. Wilson (1934) provided one of the earliest scientific frameworks for stock control through reorder-based inventory systems. According to Silver et al. (2017), reorder point systems improve inventory availability and production continuity by ensuring timely replenishment. Heizer et al. (2020) further argued that modern reorder systems are increasingly supported by automated inventory monitoring technologies, which improve inventory accuracy and responsiveness. RFID-enabled inventory tracking technologies have also enhanced the effectiveness of reorder point systems by providing real-time inventory visibility and reducing stock discrepancies (Borda, Pitroda, & Rathod, 2019).

**Organizational Performance**

Organisational performance refers to the extent to which an organisation achieves its operational and strategic objectives effectively and efficiently. Performance encompasses both financial and non-financial indicators, including profitability, productivity, operational efficiency, customer satisfaction, and resource utilisation (Heizer et al., 2020). Formeloza (2023) found that effective inventory management practices significantly improved organisational efficiency in the automobile sector. Similarly, Puspitawati et al. (2024) demonstrated that inventory efficiency contributes positively to overall organisational effectiveness through improved decision-making and resource allocation.

**Theoretical Framework**

This study is anchored on the Economic Order Quantity (EOQ) theory developed by Ford W. Harris in 1913. The EOQ theory explains how firms determine the optimal order quantity that minimizes total inventory costs, including ordering and holding costs. It emphasizes efficient inventory management as a means of improving operational performance (Harris, 1913; Heizer et al., 2020). The theory provides a scientific basis for inventory decision-making by balancing the trade-off between inventory holding costs and ordering costs, thereby enabling organizations to achieve cost efficiency and operational effectiveness (Silver et al., 2017).

The relevance of this theory to the study lies in its ability to explain the relationship between inventory control techniques and organizational performance. Techniques such as EOQ, Just-In-Time (JIT), ABC analysis, and Reorder Point (ROP) systems are designed to ensure optimal inventory levels, reduce waste, and prevent

stock-outs. Effective application of these techniques enhances production continuity, reduces operational costs, improves inventory turnover, and strengthens overall organizational efficiency (Heizer et al., 2020; Silver et al., 2017).

In the context of Dangote Cement Plc, Gboko Plant, where operations are inventory-intensive and require continuous availability of raw materials and production inputs, the application of EOQ and related inventory control techniques is critical for maintaining smooth production processes, minimizing disruptions, and achieving organizational goals. The theory therefore provides a useful framework for understanding how inventory control decisions influence operational and organizational performance.

However, the traditional EOQ model assumes stable demand patterns, constant lead times, and predictable operating conditions, assumptions that may not fully reflect the realities of developing economies such as Nigeria, where supply chain disruptions, transportation challenges, inflationary pressures, and infrastructure constraints are common (Heizer et al., 2020). Consequently, organizations increasingly complement EOQ with other inventory control techniques such as JIT, ABC analysis, and Reorder Point systems to improve flexibility, responsiveness, and inventory visibility. The integration of these techniques extends the applicability of EOQ theory and makes it a suitable theoretical foundation for analysing the relationship between inventory control techniques and organizational performance at Dangote Cement Plc, Gboko Plant (Silver et al., 2017).

**Empirical Review**

Empirical evidence from developed economies generally supports the proposition that inventory control techniques improve organisational performance. Pong and Mitchell (2012) reported that inventory investment and control practices positively influenced organisational outcomes among manufacturing firms in the United Kingdom. Likewise, Eroglu and Hofer (2011) found that lean inventory systems enhanced operational performance when inventory levels were effectively managed.

In developing economies, several studies have reported similar findings. Lwiki et al. (2013) established that inventory management practices significantly improved the financial performance of sugar manufacturing firms in Kenya. Mulandi and Ismail (2019) also reported a positive relationship between inventory management practices and organisational performance among Kenyan state corporations. In Tanzania, Mbugi and Lutego (2022) found that inventory control management systems significantly improved organisational performance in manufacturing firms. Similarly, Mawonde and Demberere (2022) and Mawonde et al. (2024) reported that inventory control systems positively influenced organisational performance in Zimbabwe's mining sector.

Evidence from Central Africa further reinforces these findings. Owajege and Abdulsamad (2025) found that inventory control practices significantly enhanced the performance of small and medium-sized enterprises in Cameroon. The authors concluded that inventory optimisation improves operational efficiency and profitability.

Within Nigeria, Asuzu et al. (2019) reported that inventory turnover significantly influenced the performance of quoted consumer goods manufacturing firms. Nwaiku and Ejechi (2022) similarly found that inventory management practices positively affected organisational productivity among Nigerian manufacturing firms. Ilori and Majiyagbe (2024) further established that inventory control management practices significantly enhanced organisational performance in Nigerian manufacturing companies. These findings collectively suggest

that inventory control remains an important determinant of organisational success, although contextual and industry-specific factors may moderate its effectiveness.

**Methodology**

This study employed a quantitative explanatory research design to examine the effect of inventory control techniques on organizational performance at Dangote Cement Plc, Gboko, Benue State. The design was appropriate as it enables the establishment of causal relationships between variables through statistical analysis. Data were collected using a structured questionnaire and analysed using multiple regression techniques.

The population comprised staff directly involved in inventory-related functions, including procurement, logistics, warehousing, production planning, and inventory control. Following a careful reassessment, the accessible population was defined based on these functional units. A sample of 150 respondents was selected using stratified random sampling to ensure adequate representation across departments. The sample size was considered sufficient for regression analysis based on established statistical guidelines.

The research instrument consisted of structured items measured on a five-point Likert scale. Inventory control techniques Economic Order Quantity (EOQ), Just-In-Time (JIT), ABC analysis, and Reorder Point systems were measured as independent variables, while organizational performance was measured as a single composite dependent variable.

The validity and reliability of the instrument were ensured through expert review and statistical testing. Experts in supply chain management and industry practitioners assessed the instrument for content and face validity. Construct validity was examined using Exploratory Factor Analysis (EFA), with acceptable factor loadings above 0.50. Reliability was assessed using Cronbach's Alpha, with coefficients exceeding 0.70, indicating satisfactory internal consistency.

Data collected were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Multiple regression analysis was employed to determine the effect of inventory control techniques on organizational performance.

The model was specified as follows:

$$Y = \beta_0 + \beta_1(EOQ) + \beta_2(ABC) + \beta_3(ROP) + \beta_4(JIT) + \varepsilon$$

Where Y denotes organizational performance, and EOQ, ABC, ROP, and JIT represent the inventory control techniques. The overall model significance was tested using the F-statistic, while individual coefficients were assessed using the t-statistic at a 5% level of significance ($p < 0.05$). The coefficient of determination ($R^2$) was used to assess the proportion of variance in organizational performance explained by the predictors. Diagnostic tests were performed to verify the assumptions of linearity, normality, homoscedasticity, independence of errors, and multicollinearity.

This methodological approach ensured reliability, validity, and empirical robustness in assessing the effect of inventory control techniques on organizational performance in Dangote Cement Plc, Gboko, Benue State.

**Results and Discussion**

**Multiple Regression Analysis**

This section presents the results of the multiple regression analysis conducted to examine the effect of inventory control techniques Economic Order Quantity (EOQ), Just-In-Time (JIT), ABC analysis, and Reorder Point systems on organizational performance at Dangote Cement Plc, Gboko Plant. The analysis was performed using SPSS, and the results are presented in Tables 1-

4.

**Table 1: Model Summary on Effect of Inventory Control Techniques on Organizational Performance: Dangote Cement Plc Gboko, Benue State.**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .221[a] | .049 | .022 | 1.13005 | .049 | 1.855 | 4 | 145 | .122 | 1.767 |

a. Predictors: (Constant), Reorder point/Reorder quantity, Economic Order Quantity, Just In Time Inventory System, ABC Analysis Technique

b. Dependent Variable: Organizational Performance

**Source: Field Work, 2025**

The regression results indicate that inventory control techniques such as Reorder Point/Reorder Quantity, Economic Order Quantity (EOQ), Just-In-Time (JIT), and ABC analysis have a weak and statistically insignificant effect on organizational performance at Dangote Cement Plc, Gboko. Although the predictors show a positive relationship (R = 0.221), the model explains only 4.9% of the variation in performance ($R^2$ = 0.049). The overall model is not statistically significant (Sig. F = 0.122 > 0.05), indicating no meaningful joint influence.

This suggests that while inventory control contributes to operational efficiency, it is not a primary driver of performance. Other factors such as production capacity, managerial efficiency, technology, and market conditions may play more significant roles. A holistic performance strategy is therefore recommended.

**Table 2: ANOVA on Effect of Inventory Control Techniques on Organizational Performance: Dangote Cement Plc Gboko, Benue State.**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 9.474 | 4 | 2.369 | 1.855 | .122[b] |
| | Residual | 185.166 | 145 | 1.277 | | |
| | Total | 194.640 | 149 | | | |

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Reorder point/Reorder quantity, Economic Order Quantity, Just In Time Inventory System, ABC Analysis Technique

**Source: Field Work, 2025**

The ANOVA result shows that the regression model assessing the effect of inventory control techniques on organizational performance is not statistically significant. The F-value of 1.855 with a significance level of 0.122 ($p > 0.05$) indicates that Reorder Point/Reorder Quantity, Economic Order Quantity (EOQ), Just-In-Time (JIT), and ABC analysis do not jointly exert a significant influence on performance at Dangote Cement Plc, Gboko. This implies that variations in performance are not adequately explained by these techniques alone.

The result suggests that while inventory control contributes to efficiency, other factors such as managerial effectiveness, production capacity, technology, and market conditions play more dominant roles. A comprehensive, integrated performance strategy is therefore recommended.

**Table 3: Coefficients on Effect of Inventory Control Techniques on Organizational Performance: Dangote Cement Plc Gboko, Benue State.**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| 1 | (Constant) | 1.614 | 1.342 | | 1.202 | .231 | -1.039 | 4.266 | | | | | |
| | Economic Order Quantity | -.043 | .197 | -.019 | -.220 | .826 | -.433 | .346 | -.010 | -.018 | -.018 | .914 | 1.094 |
| | Just In Time Inventory System | .405 | .230 | .168 | 1.757 | .081 | -.051 | .860 | .144 | .144 | .142 | .715 | 1.398 |
| | ABC Analysis Technique | -.257 | .224 | -.111 | -1.148 | .253 | -.699 | .185 | -.002 | -.095 | -.093 | .708 | 1.412 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reorder point/Reorder quantity | .338 | .195 | .145 | 1.731 | .086 | -.048 | .724 | .165 | .142 | .140 | .931 | 1.075 |

a. Dependent Variable: Organizational Performance

**Source: Field Work, 2025**

The coefficient analysis shows that Just-In-Time (JIT) and Reorder Point/Reorder Quantity systems have positive but weak effects on organizational performance, while Economic Order Quantity (EOQ) and ABC analysis exhibit negative and insignificant effects. None of the variables are statistically significant at the 5% level, although JIT and Reorder Point show marginal significance at the 10% level at Dangote Cement Plc, Gboko.

This suggests that inventory control techniques have limited influence on performance in this context. Organizational performance appears to be driven more by broader factors such as managerial capability, production efficiency, technology, and market conditions. Therefore, management should adopt a holistic strategy that integrates inventory management with other operational and strategic initiatives to achieve sustained performance improvement.

**Table 4: Coefficient Correlations on Effect of Inventory Control Techniques on Organizational Performance: Dangote Cement Plc Gboko, Benue State.**

| Model | | | Reorder point/Reorder quantity | Economic Order Quantity | Just In Time Inventory System | ABC Analysis Technique |
|---|---|---|---|---|---|---|
| 1 | Correlations | Reorder point/Reorder quantity | 1.000 | .044 | -.179 | -.090 |
| | | Economic Order Quantity | .044 | 1.000 | -.093 | -.205 |
| | | Just In Time Inventory System | -.179 | -.093 | 1.000 | -.450 |
| | | ABC Analysis Technique | -.090 | -.205 | -.450 | 1.000 |
| | Covariances | Reorder point/Reorder quantity | .038 | .002 | -.008 | -.004 |
| | | Economic Order Quantity | .002 | .039 | -.004 | -.009 |

| | | | | | |
|---|---|---|---|---|---|
| | Just In Time Inventory System | -.008 | -.004 | .053 | -.023 |
| | ABC Analysis Technique | -.004 | -.009 | -.023 | .050 |

a. Dependent Variable: Organizational Performance

**Source: Field Work, 2025**

The correlation matrix shows generally weak relationships among Reorder Point/Reorder Quantity, Economic Order Quantity (EOQ), Just-In-Time (JIT), and ABC analysis as predictors of organizational performance at Dangote Cement Plc, Gboko. Most coefficients are low, indicating minimal linear association and limited interdependence among the techniques. The strongest relationship is a moderate negative correlation between JIT and ABC analysis (r = –0.450), suggesting differing operational approaches.

Overall, the weak correlations and small covariance values indicate no serious multicollinearity problem, meaning each variable contributes unique information to the model. However, the results suggest that these techniques are applied independently rather than strategically integrated. A more coordinated inventory management approach is therefore recommended to improve efficiency and performance.

**Discussion of Findings**

The findings of this study reveal that inventory control techniques such as Economic Order Quantity (EOQ), Just-In-Time (JIT), ABC analysis, and Reorder Point/Reorder Quantity systems exerted a weak and statistically insignificant effect on organizational performance at Dangote Cement Plc, Gboko Plant. The regression model exhibited low explanatory power ($R^2 = 0.049$), indicating that only 4.9% of the variation in organizational performance was explained by the inventory control variables. Although Just-In-Time (JIT) and Reorder Point systems showed positive coefficients, none of the inventory control techniques achieved statistical significance at the 5% level. This suggests that inventory control practices alone may not be sufficient to drive organizational performance in a capital-intensive manufacturing environment such as cement production, where other operational and strategic factors play substantial roles.

The findings differ from several previous studies that reported significant positive relationships between inventory management practices and organizational performance. For example, Nwaiku and Ejechi (2022) found that inventory management practices significantly enhanced productivity in Nigerian manufacturing firms. Similarly, Asuzu et al. (2019) reported that effective inventory turnover positively influenced the performance of consumer goods manufacturing firms in Nigeria. Ilori and Majiyagbe (2024) also established that inventory control management practices contributed significantly to organizational performance among Nigerian manufacturing companies. The disparity between these findings and the present study may be attributed to industry-specific differences, as the cement manufacturing sector is characterized by high capital intensity, complex logistics requirements, energy dependence, and substantial infrastructural constraints that may weaken the direct influence of inventory control techniques on overall performance.

The insignificant effect of EOQ observed in this study contrasts with the theoretical expectations of the EOQ model proposed by Harris (1913) and later elaborated by Silver et al. (2017) and Heizer et al. (2020), who argued that optimal order quantities reduce total inventory costs and improve operational efficiency. The result suggests that the assumptions underlying EOQ,

including stable demand, predictable lead times, and consistent ordering costs, may not fully apply within the operational realities of the Nigerian manufacturing environment. Frequent supply chain disruptions, transportation challenges, and economic volatility may limit the effectiveness of EOQ-based inventory decisions.

The positive but insignificant effect of Just-In-Time inventory systems is noteworthy. While JIT is widely recognized as an effective strategy for reducing inventory holding costs and improving operational efficiency (Abdulmalik, 2018), its successful implementation depends heavily on reliable suppliers, efficient transportation systems, and synchronized production processes. In the context of Dangote Cement Plc, supply chain uncertainties and infrastructural challenges may constrain the full realization of JIT benefits. This observation supports the argument that JIT effectiveness is contingent upon broader supply chain integration and environmental stability.

Similarly, the negative and insignificant coefficient associated with ABC analysis suggests that inventory classification alone may not guarantee improved organizational performance. Although ABC analysis enables organizations to prioritize high-value inventory items and allocate resources more effectively, its benefits are often enhanced when integrated with information systems and strategic inventory planning (Puspitawati et al., 2024). The finding implies that the classification of inventory items may not automatically translate into measurable performance gains unless supported by complementary operational capabilities.

The positive coefficient associated with Reorder Point/Reorder Quantity systems indicates that timely replenishment decisions may contribute to operational continuity, although the effect was not statistically significant. This finding partially aligns with the arguments of Wilson (1934) and Mulandi and Ismail (2019), who emphasized the importance of systematic stock replenishment in reducing stock-out risks and maintaining smooth production operations. However, the weak influence observed in this study suggests that replenishment systems alone may be insufficient to overcome broader operational constraints affecting organizational performance.

Overall, the findings indicate that inventory control techniques remain important operational tools, but their isolated application does not significantly determine organizational performance at Dangote Cement Plc, Gboko Plant. This result is consistent with studies emphasizing that performance outcomes are influenced by a broader combination of factors, including technology adoption, supply chain integration, production efficiency, managerial effectiveness, and strategic resource allocation (Eroglu & Hofer, 2011; Mawonde et al., 2024; Owajege & Abdulsamad, 2025). Consequently, organizations should view inventory control as one component of a wider operational excellence framework rather than as a standalone determinant of performance.

**Contribution to Knowledge**

This study contributes to operations and supply chain management by providing empirical evidence on the effect of inventory control techniques on organizational performance in Nigeria's manufacturing sector. It shows that the combined application of EOQ, JIT, ABC analysis, and Reorder Point systems can enhance operational efficiency when effectively integrated.

The study also reinforces operations management principles that emphasize resource optimization for improved performance. Methodologically, it offers a framework for analysing the joint influence of multiple inventory techniques on performance outcomes, which can guide future studies in developing economies.

Practically, the research provides context-specific insights for managers at Dangote Cement Plc and similar firms, emphasizing the

need to integrate inventory strategies to improve efficiency, cost control, and competitiveness in dynamic industrial environments.

**Managerial Implications**

The findings highlight that inventory control techniques such as EOQ, JIT, ABC analysis, and Reorder systems should be treated as strategic tools rather than routine operations. Their application enables data-driven decisions, efficient resource allocation, and improved coordination across procurement, production, and logistics.

Overall, adopting an integrated inventory management approach can help managers at Dangote Cement Plc and similar firms enhance efficiency, reduce waste, and improve profitability.

**Limitations of the Study**

This study is limited by its focus on a single firm Dangote Cement Plc, Gboko which may restrict generalization to other contexts. The use of a cross-sectional design limits causal inference, while reliance on self-reported questionnaire data introduces potential response bias.

Additionally, the study measured organizational performance as a single construct, excluding other dimensions such as agility and customer outcomes, and did not control for external factors like market conditions and supply chain disruptions.

Despite these limitations, the study provides valuable context-specific insights and a foundation for future research on inventory management and performance.

**Conclusion and Recommendations**

This study examined the effect of inventory control techniques on organizational performance at Dangote Cement Plc, Gboko Plant, focusing on EOQ, JIT, ABC analysis, and Reorder Point systems. Findings show that although these techniques have weak positive relationships with performance, their overall effect is statistically insignificant. The model has low explanatory power ($R^2 = 0.049$), indicating that they explain only a small portion of performance variation. The F-statistic was also not significant ($p > 0.05$), meaning the techniques do not jointly influence performance. Individually, JIT and Reorder Point show slight positive effects, while EOQ and ABC analysis are insignificant. The study concludes that organizational performance is driven more by broader operational and strategic factors, suggesting that inventory control should be integrated with other management systems for better results.

**Recommendations**

In line with the tested hypotheses and research findings, the study makes the following recommendations:

1. Management should integrate inventory control techniques (EOQ, JIT, ABC, and Reorder Point) into a unified and coordinated system rather than applying them in isolation to improve operational coherence.
2. The company should strengthen demand forecasting and production planning systems to complement inventory techniques, since inventory control alone was found to have limited impact on performance.
3. Greater investment should be made in digital inventory management tools and automation to improve accuracy, speed, and real-time decision-making in stock control processes.
4. Management should enhance staff training on modern inventory practices to improve effective implementation and reduce inefficiencies in application.
5. The firm should adopt a broader performance improvement strategy that

combines inventory control with production efficiency, logistics optimization, and technology adoption to drive sustainable organizational performance.

**References**


Abdulmalik, O. A. (2018). Just-in-time manufacturing for improving global supply chain resilience. *International Journal of Engineering Technology Research & Management, 2*(11), 58–75.

Asuzu, P. U., Echekoba, F. N., Ubesie, C. M., & Egbunike, F. C. (2019). Inventory turnover and firm performance of quoted consumer goods manufacturing firms in Nigeria. *Journal of Global Accounting, 6*(3), 97–123.

Bolarinwa, M., Bello, K., & Adeosun, P. (2024). Preemptive and non-preemptive goal programming approach to inventory optimization of the Central Sterile Supply Department, University College Hospital, Ibadan, Nigeria. *Journal of Engineering Studies and Research, 30*(1), 15–30. https://doi.org/10.29081/jesr.v30i1.002

Borda, N. N., Pitroda, J. R., & Rathod, J. M. (2019). Automated material management through RFID technology in construction industry: A review. *Journal of Emerging Technologies and Innovative Research, 6*(4), 886–890.

Eroglu, C., & Hofer, C. (2011). Lean, leaner, too lean? The inventory-performance link revisited. *Journal of Operations Management, 29*(4), 356–369. https://doi.org/10.1016/j.jom.2010.05.002

Ezhilmathi, P., & Shanmugapriya, T. (2017). Role of material management in apartment building. *International Journal of Scientific Research in Science and Technology, 3*(4), 95–100.

Formeloza, L. A. (2023). The inventory management practices and organizational efficiency of a car dealer in San Pablo City. *Journal of Third World Economics, 1*(2), 83–86. https://doi.org/10.26480/jtwe.02.2023.83.86

Gokhale, P. P., & Kaloji, M. B. (2018). A study on inventory management and its impact on profitability in foundry industry at Belagavi, Karnataka. *International Journal of Latest Technology in Engineering, Management & Applied Science, 7*(9), 29–31.

Harris, F. W. (1913). How many parts to make at once. *Factory, The Magazine of Management, 10*(2), 135–136, 152.

Heizer, J., Render, B., & Munson, C. (2020). *Operations management: Sustainability and supply chain management* (13th ed.). Pearson.

Ilori, F. O., & Majiyagbe, A. A. (2024). Impact of inventory control management practices on organizational performance in Nigerian manufacturing companies. *Indian-Pacific Journal of Accounting and Finance, 8*(2), 3–23. https://doi.org/10.52962/ipjaf.2024.8.2.155

Lwiki, T., Ojera, P. B., Mugenda, N., & Wachira, V. (2013). The impact of inventory management practices on financial performance of sugar manufacturing firms in Kenya. *International Journal of Business and Humanities, 3*(5), 75–85.

Mawonde, D., & Demberere, C. (2022). The effect of inventory control systems on organisational performance in the mining sector of Zimbabwe. *International Journal of Research and Innovation in Social Science, 6*(1), 273–285.

Mawonde, D., Nyoni, J., Mabwe, P., & Kamvumbi, L. (2024). An assessment of the effect of inventory control systems on organisational performance in the mining sector in Zimbabwe. *Cogent Business & Management, 11*(1), 1–18. https://doi.org/10.1080/23311975.2023.2298535

Mbugi, I. O., & Lutego, D. (2022). Effects of inventory control management systems on organization performance in Tanzania manufacturing industry. *International Journal of Engineering, Business and Management, 6*(2), 56–68. https://doi.org/10.22161/ijebm.6.2.5

Mulandi, C. M., & Ismail, N. (2019). Effect of inventory management practices on performance of commercial state corporations in Kenya. *International Academic Journal of Procurement and Supply Chain Management, 3*(1), 180–197.

Nwaiku, M. S., & Ejechi, J. (2022). Inventory management practices and organizational productivity in Nigerian manufacturing firms. *Journal of Entrepreneurship and Business, 10*(2), 1–16. https://doi.org/10.17687/jeb.v10i2.863

Owajege, G. A., & Saif, A. A. A. (2025). The effect of inventory control on the performance of small and medium-sized enterprises in Douala, Cameroon. *International Journal on Recent Trends in Business and Tourism, 9*(4), 34–45. https://doi.org/10.31674/ijrtbt.2025.v09i04.003

Pong, C. K. M., & Mitchell, F. (2012). Inventory investment and control: How have UK companies been doing? *The British Accounting Review, 44*(3), 173–188. https://doi.org/10.1016/j.bar.2012.07.008

Puspitawati, L., Lhutfi, I., & Qudratov, I. (2024). Enhancing inventory efficiency: The role of strategic management accounting and management information systems. *Cogent Business & Management, 11*(1), 1–17. https://doi.org/10.1080/23311975.2024.2429801

Silver, E. A., Pyke, D. F., & Thomas, D. J. (2017). *Inventory and production management in supply chains* (4th ed.). CRC Press.

Wilson, R. H. (1934). A scientific routine for stock control. *Harvard Business Review, 13*(1), 116–128.