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# Automated Credit Management Systems and Financial Performance of Listed Manufacturing Firms in Nigeria

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**ABSTRACT**
Automated credit management system and financial performance are the nuclei to the survival of the listed manufacturing firms. Despite this, the level of dependency of the latter on the former remained unresolved by the past studies. As a result, this study examined the impact of automated credit management systems on the financial performance of listed manufacturing firms in Nigeria. The study employed an *ex post facto* research design. A sample size of ten(10) listed manufacturing firms was selected from the population of 55 firms using judgemental sampling technique. The data which were collected through the secondary source were analyzed descriptively and inferentially. In addition, this study conducted some post-estimation tests for the validity and reliability of data. The findings revealed that receivable collection period had a significant negative effect on ROA and EPS, while payable payment period negatively affected ROA and EPS. Inventory turnover rate exerted a significant positive influence on EPS but showed no significant effect on ROA. The joint effects of the explanatory variables on all financial performance measures were statistically significant, leading to the rejection of the null hypothesis.
The study concluded that automated credit management system significantly influenced the financial performance of listed manufacturing firms in Nigeria, with the efficient contributions of receivables management and higher inventory turnover. In view of this, the study recommends greater investment in integrated automated inventory and receivables management systems by the management.
**Keywords:** Automation, Credit management, Financial performance, Inventory turnover rate, Receivable collection period, Return on assets.
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## 1.0 INTRODUCTION

The manufacturing sector plays a pivotal role in the economic development of nations by driving industrialization, employment creation, and foreign exchange earnings. In Nigeria, the sector contributes significantly to Gross Domestic Product (GDP), although its performance has been inconsistent due to numerous structural and operational challenges (Olufemi, 2025; Adegbie et al., 2020). Manufacturing firms are expected to achieve efficiency in production and maintain profitability to ensure sustainability in a competitive business environment. However, the reality is that many listed manufacturing firms in Nigeria struggle with declining profitability, liquidity challenges, and weak returns to shareholders Among these operational bottlenecks, credit management has been widely recognized as one of the most critical factors influencing financial outcomes, as inefficiencies in credit rating directly affect asset productivity and shareholder value (Ismail & Muhammad, 2022; Ngbomowa, et al., 2023; Okafor & Nwosu, 2023).
Credit management constitutes a major component of working capital and directly affects both liquidity and profitability. When credit system is poorly managed, firms experience either customers loss, which disrupt production and sales, or liquidity decline, which leads to insolvency. In Nigeria, these inefficiencies are compounded by infrastructural deficiencies such as unreliable electricity supply, high transportation costs, and heavy dependence on imported raw materials (Adegbie et al., 2020; Joseph et al., 2023).
Further more, reliance on traditional manual credit systems continues to limit efficiency and profitability. Poor record tracking create unnecessary disagreements and increase in bad debts. Globally, firms have increasingly embraced automated credit management (ACM) systems to address these challenges and strengthen financial performance. Developed economies such as the United States, Germany, and Japan have adopted technologies including Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID), Internet of Things (IoT), and blockchain for real-time credit tracking, demand forecasting, and cost optimization (Mondol, 2021; Panigrahi et al., 2022). These technologies have reduced human error, minimized arguments, improved sales turnover efficiency, and enhanced profitability (Ugbebor et al., 2024; Filani et al., 2024). For instance, studies have shown that blockchain-enabled systems improve supply chain transparency, while RFID

 

and IoT integration ensure accuracy in credit levels and reduce bad debts (Maheshwari et al., 2021; Skórnóg & Kmiecik, 2023). Consequently, firms in developed economies enjoy stronger financial indicators such as ROA and EPS reflecting both operational efficiency and value creation (Panigrahi et al., 2022; Ugbebor et al., 2024).
Automated credit management has become a vital tool for enhancing financial performance by addressing inefficiencies in traditional systems. Through the adoption of Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID), and Internet of Things (IoT) technologies, firms can achieve real-time visibility, reduce bad debts, and optimize turnover efficiency. Ugbebor et al. (2024) found that automation improved accuracy, reduced bad debts, and minimized altercations, directly enhancing return on investment (ROI). Likewise, Akinlabi (2021) showed that automated systems significantly improved operational outcomes by reducing cash leakages and improving record accuracy, which indirectly supports financial metrics such as ROA and EPS. Evidence from Nigerian studies confirms that credit management significantly affects firm performance, but the emphasis has been on traditional practices rather than automation. Therefore, the central problem this study addresses is the lack of comprehensive empirical evidence on how automated credit management, measured by payable days, inventory turnover ratio, and receivable days, influences the financial performance (ROA and EPS of listed manufacturing firms in Nigeria. To bridge these conceptual, methodological, and contextual gaps, the study seeks to provide robust insights into the effect of automated credit management systems on the financial performance of listed manufacturing firms in Nigeria.

**Objectives of the Study**
The specific objectives of the study are to::
i. examine the effect of automated credit management systems on return on Assets (ROA) of listed manufacturing firms in Nigeria; and
ii. evaluate the effect of automated credit management systems on earnings per Share (EPS) of listed manufacturing firms in Nigeria

**Research Hypotheses**
In line with the stated objectives, the research hypotheses are:
$H_0$1: Automated credit management systems has no significant effect on return on asset (ROA) of listed manufacturing firms in Nigeria; and
$H_0$2: Automated credit management systems has no significant influence on earnings per share (EPS) of listed manufacturing firms in Nigeria.

## 2. 0 LITERATURE REVIEW

**Conceptual Review**
**Financial Performance**
Financial performance remains one of the most critical constructs in corporate finance, reflecting how effectively a firm utilizes its resources to generate profits, create value, and sustain long-term growth. It provides a comprehensive view of a firm's financial health, operational efficiency, and value-creation capacity, thereby influencing strategic decisions, investor perception, and market competitiveness (Egbunike et al., 2020). financial performance measures the extent to which an organization achieves its financial objectives through efficient resource allocation. Similarly, Brigham and Ehrhardt (2021) assert that financial performance indicates a firm's ability to meet obligations, manage risks, and maximize shareholder wealth, making it a primary indicator of corporate success.
Financial performance can be assessed using several quantitative indicators that capture profitability, efficiency, and value creation. These measures help stakeholders evaluate how well the firm transforms its assets and operations into sustainable financial outcomes (Ross et al., 2020). In line with the objective of this study, financial performance is measured using two key indicators: Return on Assets (ROA) and Earnings per Share (EPS)

**Return on Assets**
Return on Assets (ROA) measures the efficiency with which a firm uses its total assets to generate net income. High ROA values signify effective asset utilization and strong operational performance, while low values may indicate inefficiencies or underutilization of productive resources (Oseni, 2023). Return on Equity (ROE), on the other hand, evaluates profitability from the perspective of shareholders by measuring the return generated on owners' invested capital. A higher ROE reflects stronger managerial efficiency in generating earnings from equity financing (Adebayo & Salawu, 2020). Return on Assets (ROA) is a fundamental profitability indicator that measures how efficiently a firm utilizes its total asset base to generate net income. It is computed as the ratio of net profit to total assets, reflecting management's effectiveness in employing both current and non-current

 

assets to create value (Brigham & Ehrhardt, 2021). According to Gitman and Zutter (2019), ROA is one of the most comprehensive measures of operational efficiency because it links earnings performance directly to the scale of resources invested in production and operations. In asset-intensive industries such as manufacturing, ROA provides critical insights into how well firms convert machinery, equipment, inventory, and other physical assets into sustainable profits.

**Earnings per share**

Earnings per Share (EPS) is a widely used indicator of shareholder value and market performance. It represents the proportion of net profit attributable to each outstanding share, making it a crucial metric for assessing firm profitability, investor confidence, and potential stock market performance (Gitman & Zutter, 2019). Earnings per Share (EPS) is one of the most widely used indicators of a firm's profitability and shareholder value. It measures the portion of a company's net income attributable to each outstanding ordinary share and is calculated by dividing net profit after tax by the number of issued shares (Gitman & Zutter, 2019). According to Brigham and Ehrhardt (2021), EPS serves as a crucial gauge of a firm's financial health because it reflects the direct earnings generated for equity investors, thereby influencing investment decisions, market valuation, and stock price movements. Higher EPS values typically signal strong profitability, efficient resource utilization, and enhanced shareholder wealth.

**Automated Credit Management System**

Automated credit management systems refer to technology-driven processes used to monitor, track, and control credit levels with minimal human intervention. These systems employ digital tools such as barcoding, Radio Frequency Identification (RFID), Enterprise Resource Planning (ERP) software, and real-time data analytics to optimize credit arrangements (Frazelle, 2002). According to Kumar and Suresh (2021), automation enhances the speed, accuracy, and reliability of inventory-related decisions by integrating data across procurement, production, and distribution functions. Automated systems reduce the dependence on manual procedures and help firms maintain optimal credit sales levels that support uninterrupted production and efficient customer fulfillment. The adoption of automated credit management systems is particularly critical in manufacturing firms, where credit sales constitutes a substantial proportion of working capital and directly influences operational efficiency. Stevenson (2020) notes that automation minimizes cash receipt discrepancies, improves demand forecasting accuracy, reduces bad debts, and enhances responsiveness to fluctuating market requirements. By providing real-time visibility into credit sales levels, automated systems help manufacturers avoid challenges such as over discounting, customers loss, and bad debt recovery problems that commonly arise from manual or poorly integrated credit sales processes (Wild, 2017)

**Receivable Collection Period (RCP)**

Receivable collection period, also known as Days Sales Outstanding (DSO), measures the average number of days a firm takes to collect cash from customers after making credit sales. It is a key component of working capital management and reflects the efficiency of a firm's credit policy, liquidity position, and cash flow cycle. It is typically computed as accounts receivable divided by net credit sales, multiplied by the number of days in the period.

Conceptually, receivable days represent how efficiently a firm converts credit sales into cash inflows. A lower number of receivable days indicates faster cash collection, improved liquidity, and stronger working capital efficiency, while higher receivable days suggest delays in cash inflows, increased financing pressure, and potential liquidity constraints. Studies on working capital management consistently emphasize that efficient receivables collection improves firm liquidity and reduces dependence on external financing, thereby enhancing financial stability (Ojo & Fasina, 2024; Edomobi et al., 2023).

In manufacturing firms, receivable days are closely linked to sales policies and customer credit management. Firms often extend credit to boost sales, but this creates a time lag between revenue generation and cash receipt. Empirical evidence from Nigerian manufacturing firms shows that the receivable collection period significantly influences firm performance, as inefficient collection increases working capital requirements and reduces profitability (Ngbomowa et al, 2023)

**Payable Payment Period (PPP)**

Payable payment period, also known as Days Payable Outstanding (DPO), is a key component of working capital management that measures the average number of days a firm takes to settle its obligations to suppliers after receiving goods or services on credit. It reflects the efficiency of a firm's short-term liquidity and cash flow management and is an important element of the cash conversion cycle framework.

 

Conceptually, payable days represent the extent to which firms use trade credit as a short-term financing source. According to Brealey et al., (2020), firms often rely on accounts payable as an interest-free source of financing to support operations, particularly in inventory-intensive industries such as manufacturing. This means that payable days are directly linked to inventory acquisition decisions, since inventory is often purchased on credit and paid for later.

Recent empirical studies continue to emphasize the importance of payable days in working capital management. For instance, Akpadaka, et al., (2024) find that Days Payable Outstanding significantly influences firm value in Nigerian manufacturing and industrial firms, showing that supplier credit policies affect financial outcomes. Similarly, Olufemi and Amibor (2024) report that payable management is a key driver of liquidity and profitability in Nigerian firms, particularly when linked with inventory and receivables cycles. These findings suggest that how long firms delay payment to suppliers has direct implications for both operational efficiency and financial performance.

**Inventory Turnover Ratio**

Inventory Turnover Ratio refers to the rate at which a firm sells and replaces its inventory within a given accounting period, reflecting the effectiveness of inventory management practices in supporting operational performance. It is commonly measured as the ratio of cost of goods sold (COGS) to average inventory, indicating how frequently inventory is sold and replenished (Weygandt et al., 2019). A higher inventory turnover ratio signifies efficient inventory utilization, lower holding costs, and stronger alignment between production and market demand, whereas a lower ratio may indicate overstocking, obsolete inventory, or weak sales performance (Wild, 2017).

Inventory Turnover Ratio is particularly important in manufacturing firms where inventory constitutes a significant portion of working capital and directly influences production continuity and operational efficiency. According to Stevenson (2020), an efficient inventory turnover ratio enhances productivity by reducing storage costs, minimizing capital tied up in inventory, and ensuring smoother production processes. Manufacturing firms with high inventory turnover generally experience lower risks of spoilage, deterioration, and inventory obsolescence, which contributes positively to profitability and efficient resource utilization (Heizer et al., 2020).

**Theoretical Framework**

This study is anchored on two theories: the Resource-Based View (RBV) and the Technology Acceptance Model (TAM), which jointly provide a foundation for understanding how automated inventory management systems influence the financial performance of listed manufacturing firms in Nigeria. These theories explain both the strategic value of technological resources and the human factors affecting technology adoption, thereby linking automation to operational efficiency and financial outcomes.

The Resource-Based View (RBV), initially proposed by Wernerfelt (1984) and further developed by Barney (1991), provides the strategic basis for this study. RBV assumes that firms achieve competitive advantage by acquiring and effectively managing valuable, rare, inimitable, and non-substitutable resources. Automated inventory management systems represent such strategic resources capable of enhancing operational capabilities, reducing costs, and improving responsiveness to market demand. Within the Nigerian manufacturing context, firms that successfully leverage automation technologies are more likely to achieve superior financial performance indicators such as Return on Assets (ROA) and Economic Value Added (EVA). RBV thus provides an economic rationale for investing in automation as a key driver of sustainable competitive advantage and profitability.

While RBV focuses on the strategic value of technology, the Technology Acceptance Model (TAM), developed by Davis (1989), complements this by addressing user adoption of technological innovations. TAM posits that perceived usefulness and perceived ease of use determine users' acceptance and effective utilization of new systems. In manufacturing firms, the success of automated inventory management depends not only on the availability of technology but also on employees' willingness to embrace and use it efficiently. TAM explains how individual attitudes toward automation influence its operational effectiveness, which in turn impacts overall firm performance. Empirical studies affirm that positive user perceptions foster higher system utilization and better organizational outcomes.

 

## Empirical Review

### Automated inventory management systems and Return on Assets (ROA)

Akinleye and Adesina (2023) explored the relationship between credit management and financial performance among listed manufacturing firms in Nigeria, recognizing the critical role that inventory practices play in manufacturing efficiency. The study particularly focused on two key metrics: inventory turnover and cash conversion period, to understand their impact on profitability. Employing panel regression analysis across multiple years and firms, the authors analyzed how fluctuations in these inventory indicators corresponded with changes in Return on Equity (ROE). Their empirical results revealed that higher inventory turnover rates strongly and positively influenced ROE, indicating that firms able to move inventory faster optimize capital use and reduce costs tied up in stock. Conversely, a longer inventory conversion period which reflects the duration inventory remains unsold was found to negatively impact profitability by increasing holding costs and reducing operational liquidity.

Olufemi (2025) investigated the joint influence of inventory turnover, free cash flow, and leverage on firm performance among Nigerian firms, highlighting the complex interplay between operational efficiency and financial structure. This study recognized that inventory management does not operate in isolation but is closely linked to a firm's liquidity and financing decisions. Utilizing panel regression techniques, Olufemi analyzed data over multiple time periods, focusing on key performance indicators including Return on Equity (ROE) and Tobin's Q, a market-based measure of firm value. The findings underscored that efficient inventory turnover, alongside enhanced free cash flow, significantly boosts firm profitability and market valuation, affirming that liquidity availability supports operational flexibility and growth. Moreover, the study revealed that leverage when combined with strong inventory and cash flow management can positively influence firm value by enabling productive investments. Olufemi's work underscores the importance of an integrated approach where inventory efficiency complements sound financial management to achieve superior firm performance.

Ugbebor et al. (2024) explored the impact of automated inventory management systems integrated with the Internet of Things (IoT) on the performance of small and medium enterprises (SMEs). Acknowledging that SMEs often face challenges with manual inventory tracking, inaccuracies, and stock mismanagement, the study employed a panel research survey combined with Ordinary Least Squares (OLS) regression analysis to quantify the effects of technological adoption. The findings revealed that IoT-enabled automation significantly improves inventory accuracy by providing real-time data on stock levels, thereby reducing errors and preventing stockouts. Additionally, the implementation of such systems led to notable reductions in carrying costs and optimized stock replenishment cycles. Importantly, the study showed that SMEs leveraging IoT experienced higher return on investment (ROI) due to cost savings and improved operational efficiency. This research underscores the transformative potential of digital technologies in enhancing inventory management capabilities, particularly for resource-constrained SMEs.

Filani et al. (2024) undertook a comprehensive Systematic Literature Review (SLR) to examine how artificial intelligence (AI) contributes to demand forecasting and inventory optimization across various industries. By synthesizing findings from multiple studies, the authors highlighted the significant role AI-driven forecasting models play in increasing accuracy and operational efficiency. Their review revealed that AI applications, such as machine learning algorithms and neural networks, enable firms to better predict demand fluctuations, which reduces overstocking and stockouts. This precision helps organizations lower wastage, optimize procurement, and align inventory levels with actual market needs. Furthermore, the authors discussed how AI technologies support firms in meeting sustainability objectives by reducing excess inventory and resource consumption. Filani et al.'s work emphasizes that AI is not merely a technological advancement but a strategic asset that fosters smarter inventory planning and contributes to long-term organizational resilience.

### Automated inventory management systems and Earnings per Share (EPS)

Zorić et al (2022) explored the theoretical foundations and practical considerations of intelligent inventory management systems within supply chains. The authors emphasized that intelligent systems facilitate the maximum protection and preservation of product value throughout physical distribution, storage, and sales. By enabling the timely exchange of critical information among supply chain participants, these systems uphold the essential principles of delivering the right product at the right time, place, quantity, quality, and price to the appropriate consumer. Although primarily theoretical, the study highlights that such systems improve operational reliability, reduce product loss, and minimize wastage, which can positively affect financial outcomes by increasing net profit margins. Enhanced profitability would, in turn, have a direct impact on Earnings Per Share (EPS), as higher net income translates to increased earnings available to shareholders.

 

Adegbie et al (2020) applied descriptive and inferential statistical methods to analyze inventory control and its influence on the financial performance of Nigerian listed conglomerate firms. The study revealed significant positive relationships between different dimensions of inventory control — including procurement control, security control, and usage control — and financial performance indicators. Specifically, procurement control exhibited a strong positive effect (β = 0.628), followed by security control (β = 0.535) and usage control (β = 0.531). These results suggest that firms optimizing their inventory controls experience enhanced profitability, likely reflected in improved Earnings Per Share (EPS) due to increased net income. Interestingly, inventory turnover period was found to have an insignificant positive effect, indicating that while turnover speed is beneficial, the overall quality of inventory control has a more pronounced impact on financial returns and shareholder wealth.

Oyetade et al (2024) investigated the relationship between inventory management practices and SME performance in Lagos State using multiple regression analysis. Their findings demonstrated that inventory control techniques, inventory storage systems, and tracking systems each significantly contributed to the performance of SMEs. Effective management in these areas reduces stock discrepancies, minimizes losses, and streamlines operations, collectively improving profitability. These financial benefits can contribute to stronger Earnings Per Share (EPS) for SMEs by raising net earnings attributable to owners, which is especially crucial for growth-focused small and medium enterprises.

Osungbemiro et al (2024) developed an automated logistics and inventory management system, employing an experimental design to evaluate its performance in Nigerian manufacturing industries. The system substantially reduced data recording time and improved efficiency in managing materials orders. These efficiency gains translate into lower operational costs and improved productivity, factors that contribute to higher profitability. Increased profitability, assuming stable share counts, would enhance Earnings Per Share (EPS), making such automation an important driver of financial performance and shareholder value creation.

## 3.0 METHODOLOGY

### Research Design

This study adopts an *ex-post facto* research design to appraise the impact of automated credit management on the financial performance of listed manufacturing firms in Nigeria. The choice of this design is appropriate because the study relies on historical data that already exist, and the researcher has no control over the variables under investigation.

### Population, Sampling Technique and Sample Size

The population of this study comprises all manufacturing firms listed on the Nigerian Exchange Group (NGX). This research employed the purposive sampling technique to select ten (10) manufacturing firms listed on the Nigerian Exchange Group out of the total population of 55 (fifty-five) firms.

### Method of Data Collection

The data for this study was collected from the secondary source, that is, annual published financial statements of the selected listed manufacturing firms in Nigeria and from publications of the Nigerian Exchange Group (NGX).

### Model Specification

FP = $f$(ACMS)…….(1)

FP = financial performance

ACMS = automated credit management system

FP = return on assets (ROA), earnings per share (EPS)

ACMS = receivable collection period (RCP), payable payment period (PPP),
inventory turnover ratio (ITR)

FP = $f$(RCP, PPP, ITR)…….(2)

### Model 1

$ROA_{it} = \beta_0+\beta_1 RCP_{it}+\beta_2 PPP_{it}+\beta_3 ITPF_{it}+ \mu_{it}$…….(3)

 

**Model 2**

$EPS_{it} = \beta_0+\beta_1 RCP_{it}+\beta_2 PPP_{it}+\beta_3 ITR_{it}+\mu_{it}$……(4)

Where:
$\beta_0$ = Intercept.
β1, β2, β3= Parameters to be estimated.
μ = Stochastic or error term.
i = each of the firms in the cross section
t = period of time
***A Priori*** **Expectation**

**Table 2**: ***A priori*** **Expectations**

| Dependent Variable Indicators | Expected Sign | Decision Rule |
|---|---|---|
| $ROA_{it} = \beta_0+\beta_1 PYD_{it}+\beta_2 ITR_{it}+\beta_3 RCD_{it}+\mu_{it}$ | $\beta_1 - \beta 3 > 0$ | If the ρ-value is greater than 5%, do not reject $H_0$ |
| $EPS_{it} = \beta_0+\beta_1 PYD_{it}+\beta_2 ITR_{it}+\beta_3 RCD_{it}+\mu_{it}$ | $\beta_1 - \beta 3 > 0$ | If the ρ-value is greater than 5%, do not reject $H_0$ |

**Source: Researcher's computation, 2026**

**Description and Measurement of Variables**

**Table 1: Measurement of Variables**

| Variables | Categories | Proxies | Acronys | Measurement | Authors |
|---|---|---|---|---|---|
| Automated Credit Management System | Independent | Payable payment period | PPP | Accounts Payable ÷ Cost of Goods Sold × 365 days | Ugbebor et al. (2024); |
| | | Inventory Turnover Ratio | ITR | Cost of Goods Sold ÷ Average Inventory | Mbugi & Lutego (2022) |
| | | Receivable collection period | RCP | Accounts Receivable ÷ Net Credit Sales × 365 days | Ugbebor et al. (2024) |
| Financial Performance | Dependent | Return on Assets | ROA | Net Income ÷ Total Assets | Panigrahi et al. (2022) |
| | | Earnings per Share | EPS | Net Income ÷ Number of Outstanding Shares | Adegbie et al. (2020); |

Source: Researcher's Compilation (2026)

**3.8. Method of Data Analysis**

This study employs panel data regression techniques to analyze the data. Panel data, which combines time series and cross-sectional data, offers richer information, greater variability, reduced collinearity among variables, increased degrees of freedom, and improved efficiency, as noted by Gujarati (2004). By leveraging observations

 

across multiple manufacturing firms over time, panel data is well-suited for capturing the dynamic changes and heterogeneity inherent within these firms. Such heterogeneity is explicitly accounted for by allowing individual-specific effects in the estimation process.

Panel data analysis enhances empirical insights by detecting effects that pure cross-sectional or time series data might overlook. The estimation of panel data models typically involves choosing between the fixed effects model (FE) and the random effects model (RE), also referred to as error components models, depending on the nature of the data and assumptions about individual-specific variables.

## 4.0 RESULTS AND DISCUSSION

### 4.1 Desctriptive Statistics

**Table 3: Descriptive Analysis of Observed Variables**

| | ROA | EPS | PPP | ITR | RCP |
|---|---|---|---|---|---|
| **MEAN** | 0.082222 | 9.771376 | 171.3130 | 4.214544 | 47.25548 |
| **MEDIAN** | 0.064953 | 1.279690 | 160.9781 | 4.211735 | 30.99746 |
| **MAXIMUM** | 0.306788 | 207.6499 | 499.7295 | 8.967876 | 255.7550 |
| **MINIMUM** | 0.000260 | 0.000450 | 9.327238 | 0.779785 | 3.546136 |
| **STD. DEV.** | 0.067871 | 25.81005 | 84.75400 | 1.720787 | 46.91669 |
| **SKEWNESS** | 1.308504 | 5.295683 | 1.445300 | 0.250572 | 1.911421 |
| **KURTOSIS** | 4.430350 | 37.33976 | 6.398438 | 3.383262 | 6.804999 |
| **JARQUE-BERA** | 37.06095 | 5380.817 | 82.93730 | 1.658480 | 121.0746 |
| **PROBABILITY** | 0.000000 | 0.000000 | 0.000000 | 0.436300 | 0.000000 |

 

| | | | | | |
|---|---|---|---|---|---|
| | 00 | 00 | 00 | 81 | 00 |
| **SUM** | 8.222 13 | 97 7.137 6 | 171 31.30 | 42 1.454 4 | 47 25.54 8 |
| **SUM SQ. DEV.** | 0.4 560 46 | 65 94 9.73 | 711 140.9 | 29 3.149 5 | 21 79 16.4 |
| **OBSERVATIONS** | 10 0 | 10 0 | 100 | 10 0 | 10 0 |

*Source: Author's computation using E-views 9*

Return on asset (ROA) has a mean value of 0.082222 implying that, on the average, company's after-tax profit of all the listed companies is 8 percent. The median ROA of 0.064953 (6.49 percent) is lower than the mean by about 2 percent, indicating that the distribution is skewed as a result of some of the companies having lower ROA values. The maximum ROA of 0.306788 and the positive standard deviation of 0.067871 confirm the presence of outliers as seen in some of the companies having very high return on asset. The positive skewness of 1.308504 and kurtosis of 4.430350 indicate a right-skewed distribution. The mean Earning Per Share (EPS) is 9.771376 while the median EPS is lower at 1.279690, suggesting that the distribution is skewed by a few companies with high EPS. Hence, some companies' EPS is relatively low while some are high. The maximum is 207.6499 and the standard deviation of 25.81005 further confirm the presence of outliers or few companies with very high EPS. The positive skewness of 5.295683 and very high kurtosis of 37.33976 also indicate that the distribution is skewed to the right, with most companies having relatively low EPS and some while some are with high EPS.

The mean Payable Payment Period (PPP) of 171.3130 suggests that, on average, the companies are using 171 days as the interval between receiving goods and payment. The median PPP of 160.9781 is lower than the mean, indicating that the distribution is skewed by a few companies with higher PPP. The maximum PPP of 499.7295 and the standard deviation of 84.75400 confirm the presence of outliers or companies with very payable days as compared to others. The positive skewness of 1.445300 and high kurtosis of 6.398438 indicate a right-skewed distribution.

The mean of Inventory Turnover Rate (ITR) is 4.214544, indicating that on average, manufacturing companies are taking 4 days to turnover their inventory. Subsequently, the median ITR is slightly lower at 4.211735, suggesting that the distribution is slightly skewed by a few companies with relatively high ITR. The maximum ITR of 8.967876 and the positive standard deviation of 1.720787 further confirm the presence of outlier companies. Although these outliers were not high however the minimum value of 0.779785 shows that the minimum companies also have a very low inventory turnover rate. The positive skewness of 0.250572 and kurtosis of 3.383262 also indicate that the distribution is skewed to the right. The mean Receivable Collection Period (RCP) is 47.25548 while the median RCP is lower at 30.99746, suggesting that the distribution is skewed by a few companies with high RCP. Hence, some companies' RCP is relatively low while some are high. The maximum is 255.7550 and the standard deviation of 46.91669 further confirm the presence of outliers or companies with high RCP. The positive skewness of 1.911421 and kurtosis of 6.800499 also indicate that the distribution is skewed to the right.

**Correlation Analysis**

Results of the pairwise relationship of the observed variables and their interpretation were presented in Table 4.

 

**Table 4 : Correlation Matrix**

| | ROA | EPS | PPP | ITR | RCP |
|---|---|---|---|---|---|
| **ROA** | 1.0000 | | | | |
| **EPS** | 0.4629 | 1.0000 | | | |
| **PPP** | 0.1007 | 0.0057 | 1.0000 | | |
| **ITR** | 0.0455 | 0.1013 | -0.1388 | 1.0000 | |
| **RCP** | -0.0121 | -0.1397 | 0.3278 | -0.4045 | 1.0000 |

*Source: Author's computation, 2026*

ROA has a positive correlation with EPS (0.4629). There was also a positive correlation with PPP (0.1007), even though it was not strong. ROA has a positive correlation with ITR (0.0455), and a negative correlation with RCP (-0.0121). EPS has a weak positive correlation with the PPP (0.0057), ITR (0.1013) and a weak negative correlation with RCP (-0.1397). PPP was negatively related with ITR and positively correlated with RCP. ITR had a negative relationship with RCP. In a nut shell, there was no existence of colinearity between one variable or the other.

**4.5 Regression Analysis**

The estimated regression results to achieve the two specific objectives of the study were presented:

**Return on Asset and Automated Credit Management System**

In the following regression analysis, the effect of credit management system was regressed on return on assets.

**Table 5: Hausman Test Result**

| Test Summary | Chi-Sq Statistic | Chi-Sq d.f | Prob |
|---|---|---|---|
| **Cross-section random** | 1.892189 | 3 | 0.5951 |

*Source: Author's computation, 2026*

In Table 5, the Hausman test result provides statistical evidences validating the adoption of the choice regression model in the study. The p-value of 0.5951 which is beyond the 5% threshold is reported; therefore, a random effect model is fitted to achieve the objective. The result of the regression is presented as follows:

**Table 6: Random Effect Regression of ROA and Automated Credit Management System**

| Variables | Random Effects |
|---|---|
| C | 0.072890 |
| | (0.0173)** |
| RCP | -1.17E-05 |
| | (0.0139)** |
| PPP | -2.40E-05 |
| | (0.0399)** |
| ITR | 0.003319 |
| | (0.4941) |
| R-Squared | 0.4164 |
| Adjusted R-squared | 0.3847 |
| Durbin-Watson stat | 1.3866 |
| F-Statistic | 3.2058 |
| Prob.F-stat | 0.0022*** |

**** 1% level of sig; ** 5% level of sig; * 10% level of sig*

*Source: Author's computation, 2026*

From the random effect model result, the coefficient of payable payment period is negative and has a probability of 0.0399 which is significant at 5 percent. An increase in payable day will therefore cause return on asset (ROA)

 

to reduce significantly. Inventory turnover ratio (ITR) has an estimated coefficient of 0.003319 with an insignificant probability value. This implies that an increase in turnover ratio will cause an insignificant increase in companies return on asset. The estimated coefficient of receivable collection period is -1.17E-05 and has a probability value of 0.0139, which is significant. As receivable collection period increase, return on assets significantly reduces. The constant value of 0.072890 indicates that if payable payment period, inventory turnover ratio and receivable collection period were to be zero, return on asset would be as much as 0.072890. The joint effect of automated credit management system on return on assets of listed manufacturing companies in Nigeria is significant given the F statistic value of 3.205790 and Prob-(F) statistic of 0.002165, which are statistically significant.

The R-square value of the regression is 0.416390, indicating that about 41.6 percent of the changes or variation in of return on asset of listed manufacturing companies in Nigeria is explained by payable days, inventory turnover ratio and receivable days.

**EPS and Automated Credit Management System**

In the following regression analysis, the effect of credit management system was regressed on earnings per share of listed manufacturing companies in Nigeria.

**Table 7: Hausman Test**

| Test Summary | Chi-Sq Statistic | Chi-Sq d.f | Prob |
|---|---|---|---|
| **Cross-section random** | 1.107979 | 3 | 0.7751 |

*Source: Author's computation, 2026*

In Table 7, the Hausman test result to determine the model to be estimated to analyse the effect of automated credit management system on earnings per share was presented. The Hausman test has a probability value of 0.7751 which was above the threshold. This suggested that a random effect model should be estimated to achieve the objective.

**Table 8: Random Effect of EPS and Automated Credit Management System**

| Variables | Random Effects |
|---|---|
| C | 23.00470 |
| | (0.0417)** |
| RCP | -0.084778 |
| | (0.0071)** |
| PPP | -0.006078 |
| | (0.0207)** |
| ITR | 1.942282 |
| | (0.0186)*** |
| R-Squared | 0.3376 |
| Adjusted R-squared | 0.3075 |
| Durbin-Watson stat | 0.6136 |
| F-Statistic | 3.2506 |
| Prob.F-stat | 0.0058*** |

**** 1% level of sig; ** 5% level of sig; * 10% level of sig*

*Source: Author's computation, 2026*

From Table 8 the coefficient of payable payment period (PPP) is -0.006078 and has a probability value of 0.0207 which is significant at 5 percent. This implies that an increase in payable day by a day will cause earnings per share of listed companies to significantly reduce by 0.006078. Inventory turnover ratio (ITR) has an estimated coefficient of 1.942282 with a significant probability value of 0.0186. This implies that an increase in turnover ratio will cause companies earnings per share to significantly increase by 1.942282. The estimated coefficient of receivable collection period (RCP) is -0.084778 and has a probability value of 0.0071, which is significant. As receivable period increases, earnings per share significantly reduces. The constant value of 23.00470 indicates that if payable payment period, inventory turnover ratio and receivable collection period were to be zero, earnings per share would be as much as 23.00470. The joint effect of automated credit management system on earnings per share of listed manufacturing companies in Nigeria is significant given the F statistic value of 3.250634 and Prob-(F) statistic of 0.005799, which are statistically significant.

 

The R-square value of the regression is 0.337612, indicating that about 33.8 percent of the changes or variation in of earnings per share of listed manufacturing companies in Nigeria is explained by payable payment period, inventory turnover ratio and receivable collection period.

**Discussion of Findings**

It was found that PPP negatively but significantly affected ROA and EPS. This gives a direct reflection of the negative effect estimate for payable payment period (PPP) on return on assets (ROA) and earnings per share(EPS). The prolonged payables strain supplier relationships and inflate input costs during inflationary periods. This ends up disrupting production continuity, as widely experienced and reported among Nigerian manufacturers operating under these uncertainties. Further, the regression output demonstrated that automated credit management system, as proxied by payable days (PPP), inventory turnover ratio (ITR), and receivable collection days (RCP), exerts statistically significant joint effects on the financial performance of listed manufacturing firms in Nigeria across the two analysed performance metrics (ROA and EPS).

The significant negative impact of receivable collection days on both return on assets (ROA) and eranings per share (EPS) closely aligns with operational realities in Nigeria. Delays in collection often experienced from customers prolong cash-flow shortages, causing firms to resort to expensive short-term borrowing amid elevated interest rates. The insignificant positive coefficient of inventory turnover ratio (ITR) on return on assets (ROA) with its significant positive effect on earnings per share (EPS), reflecting a mixed efficiency gain. Theoretically, faster turnover is expected to free working capital and improve firms' value creation capacity.

The study findings partly aligned with prior prominent researches in Nigeria. Madugba and Ogbonnaya (2016) in their work, documented positive effects of longer average payment periods on equity per share (EPS) and return on assets (ROA). This disagrees with the negative payable day (PPP)/return on asset (ROA) relationship discovered in this study. This divergence in position may strongly stem from the period under observation (2015 through 2024) where recessionary pressures are pronounced causing extended payables to signal distress. On the contrary, the positive relationshipt of inventory turnover ratio (ITR) with return on asset (ROA) corroborates the study by Alhassan and Muhammad (2022), where it was found that inventory turnover significantly enhances ROA of listed manufacturers. The insignificant coefficient of collection-period, in their secondary analysis, also support the limited stand alone role of certain proxies when automation is imperfectly implemented. The consistent negative effect of receivable days (RCP) on financial performance of listed manufacturing firms in Nigeria across the estimated models strongly align with Madugba and Ogbonnaya (2016), where it was reported that extended collection periods had significant adverse impacts on performance metrics. This agreement in findings underscores the importance of efficient receivables management in Nigeria's capital-constrained manufacturing sector.

The significant positive inventory turnover ratio (ITR) effect on equity per share (EPS) reinforces literature by emphasizing turnover's shareholder-value relevance. This directly boosts investors per-share earnings despite macroeconomic headwinds. It is noteworthy to mention that the negative payable day findings are thought-provoking and challenging where it is believed that longer payables breed free financing. This thus highlight Nigeria-specific risks such as supplier retaliation, supply interruptions, and reputational damage. This calls for nuanced automated strategies that will balance terms of payment with supplier partnerships.

## CONCLUSION AND RECOMMENDATIONS

**Conclusion**

The empirical evidence derived from this research has substantiated that automated credit management systems exert a statistically significant joint effect on the financial performance of listed manufacturing firms in Nigeria. The consistent negative coefficients for receivable collection days across return on assets and earnings per share emphasized that delays in receivables collection have severe constraints on liquidity and profitability in an environment marked by high borrowing costs and credit risks.

**Recommendations**

The following recommendations were suggested:

i Investment in integrated automated systems by listed manufacturing firms should be done to prioritize receivables optimization such as automated invoicing, credit monitoring, and real-time collection tracking;

ii Matching of technology adoption with staff capacity building programs and infrastructure investments to mitigate turnover gain loss is required from the management; and

iii Firms should adopt integrated digital inventory and credit monitoring platforms capable of tracking customer payment behaviour, supplier obligations, and inventory movement in real time.

 

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