



Cash Management Strategies and Operating Performance of Listed Manufacturing Firms in Nigeria

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Abstract

This study investigates the influence of cash management strategies on the operating performance of listed manufacturing firms in Nigeria. Specifically, it assesses the extent of adoption of cash management strategies, examines their effect on both financial and non-financial performance and explores the dynamic link between cash management practices and operational outcomes. Adopting an ex-post facto research design, the study utilized secondary data obtained from the annual reports of 30 purposively selected manufacturing firms listed on the Nigerian Exchange Group (NGX) between 2012 and 2022. Descriptive and inferential statistical analyses were employed to evaluate the relationships among the study variables. The findings revealed that firms adopt varying degrees of cash management strategies: conservative (40%), moderate (33%), and aggressive (27%). Results further indicated that cash management strategies—proxied by cash and bank balances (CBB: $\beta = 0.267$, $p < 0.01$), cash conversion cycle (CCC: $\beta = -0.189$, $p < 0.05$), and cash turnover (CT: $\beta = 0.234$, $p < 0.01$)—significantly affect firms' operational performance. The study concludes that efficient cash management enhances liquidity and profitability, reinforcing the importance of effective cash policies for sustaining firm performance. It recommends that manufacturing firms adopt cash management policies and strengthen their treasury and liquidity planning systems to optimize liquidity while maintaining operational efficiency.

Keywords: Cash conversion cycle, cash management strategy, liquidity, operating performance and profitability.

1. Introduction

Cash management remains a crucial aspect of corporate financial strategy, influencing firms' liquidity, profitability, and long-term competitiveness (Nwarogu & Iormbagah, 2023). In the wake of global economic uncertainties and the COVID-19 pandemic, effective cash management has gained renewed attention as firms strive to maintain stability amid financial disruptions (Shen et al., 2022). It encompasses the planning, monitoring, and control of cash inflows and outflows across operating, investing, and financing activities to ensure solvency and efficiency (Zengin & Ada, 2010; Oseifuah & Gyekye, 2022). Consequently, cash management serves as a barometer of financial health and operational sustainability (Pearce & Robinson, 2011).

Although cash management practices vary across industries, their importance in promoting liquidity and profitability is universal. In financial institutions, cash management often focuses on optimizing returns through instruments such as treasury bills and

certificates of deposit (Ajibola, Okere, & Oyediji, 2018). Similarly, in non-financial firms, especially in the manufacturing sector, cash management plays a pivotal role in cost containment, cost avoidance, and cost reduction—key dimensions of financial sustainability (Faleke, Adekanbi, & Oluwadare, 2019). Zengin and Ada (2010) emphasized that effective cash management strategies drive profitability and sustainable growth, while Kumar and Sharma (2022) highlighted the growing relevance of advanced analytics and artificial intelligence in optimizing these processes.

Recent trends indicate that manufacturing firms increasingly adopt digital and data-driven cash management systems to improve liquidity, streamline supply chains, and enhance operational decision-making (Kumar & Sharma, 2022; Jiang et al., 2023). Empirical evidence from Nigerian firms such as Lafarge Africa Plc and PZ Cussons shows that efficient cash and investment management contributed to better operational outcomes during 2019–2021 despite macroeconomic instability (Lafarge Annual Report, 2020; Anyalewechi, 2021). However, post-pandemic challenges—ranging from inflation and exchange rate volatility to energy shortages and supply chain disruptions—have constrained cash flow and production efficiency in Nigeria's manufacturing sector

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(MAN, 2023; CBN, 2023). The sector's capacity utilization fell from 64.4% in 2022 to 57.5% in 2023, further underscoring the need for more dynamic, technology-driven cash management frameworks (MAN, 2023).

Despite the acknowledged importance of cash management, empirical research within the Nigerian manufacturing sector remains limited. Most prior studies have concentrated on working capital or liquidity management without exploring how cash management strategies affect cost efficiency and operational performance (Faleke et al., 2019; Faque, 2020). The effectiveness of traditional cash management methods has also been questioned amid economic volatility and financial market instability (Idamoyibo et al., 2021). For example, Dangote Cement's (2023) report showed that despite a 17% increase in revenue, profit after tax declined by 16.3% due to escalating production costs and exchange rate depreciation, highlighting the vulnerability of static cash management systems.

Furthermore, few studies have examined the integration of emerging technologies—such as artificial intelligence, blockchain, and analytics—in enhancing cash flow efficiency or incorporating sustainability and ESG considerations into cash management frameworks (Kumar & Sharma, 2022; Muthomi & Muturi, 2022). Consequently, this study investigates the relationship between cash management strategies and the operational performance of listed manufacturing firms in Nigeria. It aims to determine the extent of adoption of cash management practices and evaluate their impact on both financial and non-financial performance. The study contributes to the literature by providing new empirical insights from an emerging economy perspective, emphasizing technology-driven and sustainable cash management practices as strategic tools for improving competitiveness and operational resilience in Nigeria's manufacturing sector.

1.1 Objectives of the Study

Broadly, this study seeks to evaluate the overall influence of cash management strategies on the operational performance of listed manufacturing firms in Nigeria. To achieve this overarching goal, the study pursues the following specific objectives:

1. To analyze the extent to which cash management strategies are adopted by listed manufacturing companies in Nigeria.
2. To investigate the effect of cash management strategies on the non-financial performance of listed manufacturing firms in Nigeria.
3. To examine the relationship between cash management strategies and the financial performance of listed manufacturing firms in Nigeria.
4. To explore the dynamic interaction between cash management strategies and the overall

operating performance of listed manufacturing firms in Nigeria.

2. Literature Review

2.1 Conceptual Review

Cash Management

Cash management encompasses the planning, monitoring, and control of a company's cash inflows and outflows to maintain adequate liquidity and ensure profitability. According to Abiola-Adams et al. (2025), effective cash management involves developing and implementing strategies that optimize short-term liquidity while supporting long-term financial stability. It includes managing cash balances, forecasting cash needs, and determining appropriate investment of surplus funds. The central objective is to ensure that the firm has enough cash to meet its operational obligations and unexpected expenses without holding excessive idle funds that could otherwise be invested for returns. In practice, cash management forms the foundation of corporate financial health. Firms that effectively manage their cash can maintain smooth operations, meet financial commitments promptly, and capitalize on investment opportunities. Conversely, poor cash management can lead to liquidity shortages, missed payments, or insolvency (Van Horne, 2002). The importance of cash management has grown in the post-COVID-19 business environment, where disruptions to supply chains and market volatility have made liquidity preservation a strategic priority (The Hackett Group, 2025).

Cash Management Strategy

A sound cash management strategy integrates cash flow planning with credit, inventory, and receivables management. Firms must strike a balance between extending credit to stimulate sales and ensuring timely collections to sustain liquidity (Powell & Baker, 2010). An optimal strategy focuses on maintaining sufficient cash reserves, accelerating receivables collection, delaying payables within permissible limits, and investing idle funds efficiently. Abiola-Adams et al. (2025) emphasized that strategic liquidity management entails not only cash control but also aligning cash policies with broader corporate objectives. For instance, technology-driven treasury systems now allow real-time cash forecasting and automated reconciliation, helping firms reduce inefficiencies and liquidity risks. Furthermore, businesses use data analytics to anticipate cash shortfalls and identify trends in payment behavior, thereby enhancing working capital management.

Key Determinants of Cash Management Strategy

1. **Nature and Size of Business:** The structure and scale of a firm influence its cash flow dynamics. Manufacturing and trading companies generally require higher working capital compared to service-oriented firms because of their inventory and receivables cycles (Orlova & Sun, 2018).
2. **Production and Operating Cycle:** The longer the manufacturing and cash conversion cycle, the more funds are tied up in raw materials, work-in-

progress, and receivables. Efficient management of these cycles reduces liquidity pressure and enhances cash turnover.

3. **Demand Fluctuations and Seasonality:** Seasonal variations in demand affect cash inflows and outflows. Firms must plan for off-peak periods by maintaining adequate liquidity reserves or arranging short-term financing (Pandy, 2005).
4. **Credit Policy:** Extending credit to customers can stimulate sales but delays cash inflows. Effective credit evaluation and collection policies are therefore essential to mitigate bad debts and improve liquidity.
5. **Operating Efficiency:** Firms with efficient production and cost control mechanisms require less cash to maintain operations. Operating efficiency enhances profitability and strengthens the firm's liquidity position (Hutchison et al., 2007).
6. **Economic and Inflationary Trends:** Rising prices increase working capital requirements as costs of raw materials and services escalate. Firms must adjust their liquidity management policies to account for inflationary pressures (Orlova & Sun, 2018).

Measuring Cash Management Performance

Several financial indicators assess how effectively a firm manages its liquidity and working capital. These include the *Debtors Collection Period (DCP)*, *Creditors Payment Period (CPP)*, *Operating Cash Flow Ratio*, and the *Cash Conversion Cycle (CCC)*.

- **Debtors Collection Period (DCP):** $DCP = (\text{Trade Debtors} \div \text{Turnover}) \times 365 \text{ days}$. This metric measures the average time taken to collect payments from customers. A shorter DCP indicates faster cash inflows and stronger liquidity.
- **Creditors Payment Period (CPP):** $CPP = (\text{Average Trade Creditors} \div \text{Cost of Goods Sold}) \times 365 \text{ days}$. A longer CPP can improve liquidity by allowing firms to use available cash longer; however, excessive delays can harm supplier relationships.
- **Operating Cash Flow Ratio:** This ratio measures a company's ability to pay off current liabilities using cash generated from operations. It provides a more realistic view of liquidity than current or quick ratios because it reflects actual cash movements.
- **Cash Conversion Cycle (CCC):** $CCC = DCP + \text{Days Inventory Outstanding (DIO)} - \text{Days Payable Outstanding (DPO)}$. The CCC measures the number of days it takes for a company to convert resource inputs into cash flows. A shorter CCC indicates more efficient working capital management and stronger liquidity (Hutchison et al., 2007).

According to the Hackett Group (2024, 2025), global companies continue to improve their working capital performance post-pandemic, though trends vary by industry. In 2024, top-performing firms achieved an average CCC of 37 days, reflecting stronger receivables collection and inventory control. However, 2023 witnessed deterioration due to supply chain disruptions and inflationary cost pressures. The study further highlights that companies leveraging digital tools for cash forecasting and automated collections outperform their peers in liquidity management.

Liquidity Ratios

Liquidity ratios serve as vital indicators of a firm's short-term solvency and ability to meet immediate obligations. The main ratios include:

1. **Current Ratio:** $\text{Current Assets} \div \text{Current Liabilities}$. A higher current ratio suggests adequate liquidity but excessively high values may indicate idle resources.
2. **Quick Ratio (Acid-Test Ratio):** $(\text{Current Assets} - \text{Inventories}) \div \text{Current Liabilities}$. This ratio provides a stringent test of liquidity by excluding inventories that are not readily convertible to cash.
3. **Cash Ratio:** $(\text{Cash} + \text{Marketable Securities}) \div \text{Current Liabilities}$. This conservative measure focuses solely on the most liquid assets.

Liquidity ratios are essential for assessing a firm's ability to sustain operations without external financing. Firms that maintain optimal liquidity ratios often experience improved creditworthiness, lower borrowing costs, and greater operational flexibility (Abiola-Adams et al., 2025).

Operational Performance

Operational performance reflects a firm's efficiency in converting resources into outputs and achieving desired financial results. It is often measured using profitability and efficiency ratios that assess how well assets and equity are used to generate income.

- **Return on Assets (ROA):** $ROA = (\text{Net Income} + \text{Interest Expense}) \div \text{Average Total Assets}$. ROA measures how efficiently a firm uses its assets to generate profit.
- **Return on Equity (ROE):** $ROE = \text{Net Income} \div \text{Shareholders' Equity}$. This ratio assesses how effectively equity capital is employed to generate returns for shareholders.
- **Return on Investment (ROI):** $ROI = \text{Profit After Tax} \div \text{Total Investment}$. ROI indicates the profitability of capital employed and serves as a performance benchmark.

Weidamann (2018) argues that operational

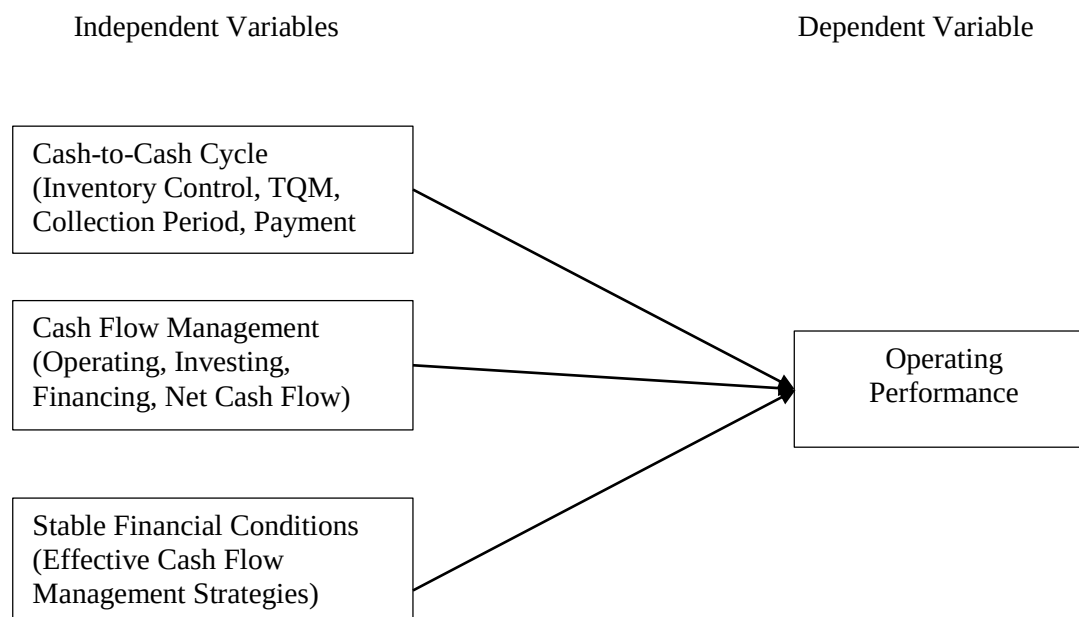


Figure 1: Schematic diagram that illustrates how cash management strategies connect with operating performance (Source: Author's Conceptualization, 2023)

performance stems from the firm's ability to optimize internal processes and resources, aligning with the Resource-Based View (RBV) of the firm. Efficient cash management strengthens this capability by ensuring that funds are available for investment in value-creating activities, thus improving profitability and competitive advantage.

Integration of Cash Management, Liquidity and Operational Performance

Effective cash management is closely linked to both liquidity and operational performance. Firms that efficiently manage cash flows are better positioned to fund operations, invest in innovation, and respond to market changes. A shorter cash conversion cycle improves liquidity, which in turn enhances profitability by reducing financing costs and improving asset utilization (Ferreira & Vilela, 2004). Conversely, liquidity shortages can disrupt operations, delay production, and erode profitability.

Recent studies confirm that strong cash management practices contribute to superior financial outcomes. For instance, Abiola-Adams et al. (2025) found that firms implementing strategic liquidity frameworks reported higher ROA and ROE than those without structured cash management systems. Similarly, The Hackett Group (2025) reported that top-quartile companies in working capital efficiency generated 32% higher operational cash flow and 22% higher returns on assets compared to lagging firms.

Thus, the integration of cash management strategies, efficient liquidity control, and strong operational

performance not only ensures financial stability but also enhances competitiveness and long-term sustainability.

2.2 Conceptual Framework

Figure 1 is showing the relationship between the strategies adopted in cash management and the resulting operating performance, an effective cash conversion cycle improves cash flow which shows signs of efficient resource management for operating performance. Also, elements like; TQM, cash flow management, and stable financial conditions is shown to collectively influence operating performance of a company.

2.3 Theoretical Framework

Agency Theory

Agency Theory, introduced by Jensen and Meckling (1976), explains the conflict that arises when the interests of shareholders (principals) differ from those of managers (agents) who control daily operations. Because managers have more information about the firm's activities, they may act in ways that benefit themselves at the expense of shareholders—a situation known as an agency problem (Eisenhardt, 1989). Such conflicts can manifest in decisions related to cash management, investment, and dividend policies, where managers may prefer retaining excess cash or pursuing projects that enhance personal gain rather than shareholder value (Bui et al., 2021).

To address these issues, firms employ corporate governance mechanisms such as performance-based incentives, shareholder monitoring, and regulatory oversight to align managerial objectives with those of

owners (Hafford et al., 2022). Agency costs, including monitoring and bonding expenses, arise in the process of ensuring managerial accountability. Recent studies also show that excessive cash holdings may increase inefficiencies and reduce firm value, reinforcing the importance of proper control systems (Abiola-Adams et al., 2025).

Overall, Agency Theory provides a useful framework for understanding managerial behavior, corporate governance, and the financial decisions that influence firm performance.

2.4 Empirical Review

Assessment of the Extent of the Adoption of Cash Management in Listed Manufacturing Firms in Nigeria

Cash management is a vital aspect of financial administration that directly influences liquidity, solvency, and operational stability in manufacturing firms. Studies show that the extent of adoption among Nigerian manufacturing firms varies based on firm size, technological capacity, and managerial efficiency. Larger firms often employ advanced tools such as cash flow forecasting and digital treasury systems, while smaller firms rely on informal or manual methods due to limited financial expertise (Ojo & Fagbemi, 2020; Igbalajobi, 2023). Effective cash management enhances profitability and ensures smooth operations, whereas weak planning and poor financial control lead to liquidity challenges (Ezeani & Ogbuabor, 2021).

However, macroeconomic instability, inflation, and exchange rate fluctuations hinder optimal cash management, creating uncertainty in liquidity planning (Okafor & Nwankwo, 2022). Firms that maintain structured cash budgeting and control mechanisms are better positioned to meet short-term obligations and sustain profitability. Recent studies also highlight that excessive cash holdings can reduce firm value by limiting investment opportunities (Amahalu, Okudo, & Eyide, 2023). Overall, while larger firms demonstrate stronger adoption levels, smaller firms lag behind due to infrastructural and resource constraints. Strengthening managerial capacity, digital integration, and regulatory support can improve cash management adoption across Nigeria's manufacturing sector (Patricia & Izuchukwu, 2022; Irom et al., 2023).

Impact of Cash Management Strategy on Non-Financial Performance

An effective cash management strategy extends beyond financial outcomes to influence various non-financial aspects of firm performance, such as operational efficiency, customer satisfaction, employee productivity, and overall organizational resilience. Sound cash management ensures timely payment to suppliers, efficient procurement processes, and uninterrupted production cycles, which enhance customer trust and operational reliability (Owolabi & Olayinka, 2021). Firms with structured cash flow planning are better able to manage resources efficiently,

reduce delays, and improve stakeholder relationships (Okeke, Irom, & Udeh, 2023).

Research indicates that adequate liquidity management supports employee morale and productivity, as firms can consistently meet wage obligations and fund capacity development initiatives (Olaoye & Alabi, 2022). Furthermore, firms with effective cash management systems tend to display stronger reputational capital, as prompt financial commitments enhance credibility with investors, creditors, and regulators (Nwokolo & Eze, 2021). Conversely, poor cash management can disrupt operations, strain supplier relationships, and lower customer confidence, ultimately undermining competitiveness (Abiola & Oladipo, 2023).

Empirical findings reveal that firms adopting digital cash management tools and predictive analytics experience improved decision-making, reduced administrative inefficiencies, and greater adaptability to market fluctuations (Ogunyemi & Adebayo, 2022). Thus, efficient cash management strategies serve as a catalyst for enhanced non-financial performance by fostering stability, innovation, and stakeholder satisfaction within Nigeria's manufacturing sector.

Impact of Cash Management Strategy on Organizational Sustainability

Effective cash management plays a pivotal role in ensuring the long-term sustainability of organizations. By maintaining optimal liquidity levels and aligning cash inflows and outflows, firms are better positioned to meet both short-term obligations and long-term strategic goals (Owolabi & Ogunyemi, 2022). Sustainable cash management practices promote financial resilience, enabling firms to navigate economic uncertainties, manage risks, and capitalize on investment opportunities that support growth and stability (Okeke, Udeh, & Alabi, 2023).

Cash management strategy also contributes to environmental and social sustainability. Companies that efficiently manage cash can allocate resources toward sustainable production processes, corporate social responsibility (CSR) initiatives, and innovations that reduce environmental impact (Olaoye & Adebayo, 2021). Furthermore, maintaining strong liquidity enables firms to uphold ethical business practices, enhance transparency, and strengthen governance structures—key elements of long-term sustainability (Eze & Nwokolo, 2023).

Empirical evidence reveals that firms with disciplined cash management frameworks exhibit superior adaptability to market shocks and are more likely to sustain operations during economic downturns (Abiola & Oladipo, 2023). Conversely, poor cash planning may lead to insolvency, loss of stakeholder confidence, and eventual business failure. Therefore, an effective cash management strategy serves as the backbone of organizational sustainability by ensuring financial

stability, fostering innovation, and enhancing corporate reputation within Nigeria's dynamic business environment.

Cash Management Strategy and Operating Performance of Listed Manufacturing Firms in Nigeria

Cash management strategy is a critical determinant of operational performance, particularly within Nigeria's manufacturing sector where firms often face liquidity constraints and volatile market conditions. Efficient cash management ensures that adequate funds are available for daily operations, procurement, and production, thereby minimizing downtime and enhancing operational continuity (Essien & Umo, 2023). Firms that maintain balanced cash conversion cycles and control receivables and payables effectively are more likely to achieve higher productivity and operational efficiency (Orshi, 2022).

Empirical evidence indicates that well-structured cash management practices contribute to improved asset utilization, reduced operational costs, and enhanced inventory turnover (Cyril, Lawretta, & Adakole, 2022). Moreover, studies reveal that cash flow stability enables manufacturing firms to respond promptly to fluctuations in input prices and customer demand, thus sustaining production efficiency (Nangih, Ofor, & Onuorah, 2020). Conversely, poor liquidity planning and weak monitoring mechanisms often result in production delays, excessive borrowing, and suboptimal performance.

Recent studies further highlight that manufacturing firms with proactive cash flow forecasting and liquidity controls demonstrate superior return on investment and competitive advantage (Okafor & Onoh, 2023). This underscores that effective cash management not only supports financial soundness but also strengthens operational capacity, positioning Nigerian manufacturing firms for sustainable growth in an unpredictable economic environment.

3. Methodology

This study adopts an ex-post facto research design, which examines the relationship between variables after events have occurred without manipulation. This design is suitable for analyzing historical financial data and assessing how cash management indicators—Cash Conversion Cycle (CCC), Cash Turnover (CT), and Cash and Bank Balances (CBB)—influence firms' financial performance, measured by Return on Equity (ROE), and non-financial performance metrics.

The population comprises 71 manufacturing firms listed on the Nigerian Exchange Group (NGX) as of October 2023. Using purposive sampling, 30 firms with consistent data from 2012–2022 were selected to ensure data completeness and reliability.

Data were obtained from firms audited annual reports, the NGX database, and verified financial platforms such

as Yahoo Finance and Google Finance. Descriptive statistics summarized data patterns, while diagnostic tests ensured model validity. Panel regression models (Fixed and Random Effects) were estimated, with the Hausman test determining the preferred model. To address endogeneity and dynamic interactions, Generalized Method of Moments (GMM) and Panel Vector Autoregression (PVAR) techniques were applied. All analyses were conducted using Stata 17, ensuring robust, precise, and policy-relevant results.

Model Specification

To empirically analyze the impact of cash management strategies on firm performance, the study employs both static and dynamic panel data models. The general model is specified as:

$$Y_{it} = \alpha_{it} + \psi X_{it} + \beta \vartheta_{it} + \varepsilon_{it} \quad (1)$$

where X represents the vector of the independent variables and ϑ is the vector of the control variables, α is the intercept and ε is the white noise error term. Y_{it} represents the dependent variable which is the corporate financial performance, and it is proxy by Return on Earnings.

Hence, specifying this model in explicit terms we have:

$$\ln(ROE_{it}) = \ln(\alpha_{it}) + \ln\beta_1(CBB_{it}) + \ln\beta_2(CCC_{it}) + \ln\beta_3(CT) + \ln\beta_4(Z_{it}) \quad (2)$$

where: ROE = Return on Equity,
CBB= Cash and bank balances
CCC = Cash Conversion Cycle
CT= Cash Turnover.

Also, in order to bring in the control variables for this study, $\ln(Z_{it})$ will also be decomposed into four (4) components. Decomposing $\ln(Z_{it})$, we obtain:

$$\ln(Z_{it}) = \ln(CG) + \ln(Lev_{it}) + \ln(INF_{it}) + \ln(EXR_{it}) \quad (3)$$

where: CG= Corporate Governance
Lev= Leverage
INF= Inflation
EXR= Exchange Rate

By substituting also equation (3) into equation (2) it then becomes:

$$\ln(ROE_{it}) = \ln(\alpha_{it}) + \ln\beta_1(CBB_{it}) + \ln\beta_2(CCC_{it}) + \ln\beta_3(CT_{it}) + \ln\beta_4(INF_t) + \ln\beta_5(EXR_t) + \ln\beta_6(LEV_{it}) + \ln\beta_7(CG_{it}) \quad (4)$$

Therefore, to mitigate the issue of endogeneity in the field of corporate finance, scholars such as Apanisile and Olayiwola (2019), Olayiwola and Okoro (2021) have advocated for the utilisation of a dynamic model. The proposed model is therefore outlined as follows:

$$\ln(ROE_{it}) = \ln(ROE - 1_{it}) + \ln\beta_1(CBB_{it}) + \ln$$

$$\beta_2(CCC_{it}) + \ln \beta_3(CT_{it}) + \ln \beta_4(INF_t) + \ln \beta_5(EXR_t) + \ln \beta_6(LEV_{it}) + \ln \beta_7(CG_{it}) + (\varepsilon_{it}) \quad (5)$$

where ROE-1 = the lagged value of the dependent variable and ε = stochastic error

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Taking a clue from the model estimated in equation 5

$$\ln(EFF_{it}) = \ln(EFF - 1_{it}) + \ln \beta_1(CBB_{it}) + \ln \beta_2(CCC_{it}) + \ln \beta_3(CT_{it}) + \ln \beta_4(INF_t) + \ln \beta_5(EXR_t) + \ln \beta_6(LEV_{it}) + \ln \beta_7(CG_{it}) + (\varepsilon_{it}) \quad (6)$$

where EFF= the efficiency of listed manufacturing companies in Nigeria.

Dynamic Relationship between Cash Management Techniques and performance.

$$ROE_{it} = \alpha_{ij} + \sum_{j=1}^n \alpha_{11ij} \Delta ROE_{it-j} + \sum_{j=1}^n \alpha_{12ij} CST_{it-j} + u_{it} \quad (7)$$

$$CST_{it} = \phi_{ij} + \sum_{j=1}^n \phi_{11ij} \Delta CST_{it-j} + \sum_{j=1}^n \phi_{12ij} ROE_{it-j} + u_{it} \quad (8)$$

The acronym ROE represents the measure of financial performance, while CST represents the cash strategy employed by an organisation.

Nevertheless, given the characteristics of the variables under investigation and the necessity to demonstrate the interplay between return on equity and cash management approach, the specified model was estimated utilising the Panel Vector Auto-regression (VAR) technique. The stability test will be conducted in order to verify the suitability of the model for policy development and execution by Nigerian publicly traded companies and the government. In the event that the variables exhibit co-integration, the estimation of the model would be conducted using the Vector Error Correction Model (VECM), which is a derivative of the VAR model.

Hence, equations (7) and (8) will undergo transformation and re-specification, resulting in equation (9).

In the given model, α_0 and Φ_0 are constant terms, while α_1 - α_3 and Φ_1 - Φ_3 are coefficients that will be estimated. The symbol Δ denotes the operator for calculating the initial difference. The stochastic error terms U_{1it} and U_{3it} are mutually uncorrelated, possessing a finite covariance matrix and a mean of zero. The variable t represents the time period, spanning from 1 to 15 years. The variable i represents the cross-sectional units, specifically firms numbered 1 to 50. Lastly, the variable j denotes the lag duration.

$$\begin{bmatrix} \Delta ROE_{it} \\ \Delta CST_{it} \end{bmatrix} = \begin{bmatrix} \alpha_{it} \\ \Phi_{it} \end{bmatrix} + \sum_{i=0}^n \begin{bmatrix} \alpha_{1i} & \alpha_{2i} & \dots & \alpha_{5i} \\ \phi_{1i} & \phi_{2i} & \dots & \phi_{5i} \end{bmatrix} \begin{bmatrix} \Delta ROE_{it-j} \\ \Delta CST_{it-j} \end{bmatrix} + \varepsilon_{it} \quad (9)$$

Measurement of Variables

Financial performance is proxied by Return on Equity (ROE), while non-financial performance is measured through efficiency (EFF). Independent variables include:

- Cash and Bank Balances (CBB): Ratio of cash to current liabilities (Major & Azali, 2021).
 - Cash Conversion Cycle (CCC): Inventory period + receivables period – payables period (Emmanuel, 2015).
 - Cash Turnover (CT): Interest income divided by cash and cash equivalents (Ando et al., 2019).
- Control variables—Leverage (LEV), Inflation (INF), Exchange Rate (EXR), and Corporate Governance (CG)—are included to account for firm and macroeconomic factors affecting performance.

4. Results and Discussion

The descriptive statistics indicate moderate variability among the variables from 2012 to 2022. The mean Return on Equity (ROE) of 0.156 suggests fair profitability, though the negative minimum value indicates losses in some years. Efficiency (EFF) averaged 0.723, showing generally strong operational performance. Cash management variables display notable dispersion—Cash Balance to Liabilities (CBB) and Cash Conversion Cycle (CCC) show high standard deviations and positive skewness, implying uneven liquidity across firms. Control variables such as board size (CG) and leverage (LEV) remain stable, while inflation (INF) and exchange rate (EXR) exhibit moderate volatility, reflecting Nigeria's fluctuating macroeconomic environment.

Table 2 reveals fluctuating cash holdings from 2012 to 2022. The ratio peaked at 0.223 in 2020, likely due to firms increasing liquidity during the COVID-19 crisis. Declines in 2021 and 2022 indicate normalization as firms resumed investments. Overall, cash holdings reflected macroeconomic and financial stability shifts.

Table 3 shows that Average Cash Conversion Cycle (CCC) varies across sectors, with healthcare firms recording the longest cycle (99.8 days), indicating slower cash recovery. Conglomerates have the shortest cycle (65.6 days), reflecting efficient cash management. Overall, the average CCC of 80 days suggests moderate efficiency in working capital utilization across industries.

Table 1: Descriptive Statistics of Variables (2012-2022)

Variable	Mean	Median	Std. Dev.	Min	Max	Skewness	Kurtosis
ROE	0.156	0.142	0.089	-0.234	0.456	0.876	3.234
EFF	0.723	0.698	0.156	0.234	1.456	0.543	2.987
CBB	0.345	0.312	0.187	0.045	0.987	1.234	4.567
CCC	87.45	82.34	32.67	15.23	198.45	0.987	3.456
CT	12.34	11.87	4.56	3.45	28.90	0.765	2.987
CG	9.45	9.00	2.34	5.00	15.00	0.432	2.567
LEV	0.587	0.543	0.234	0.123	0.987	0.876	3.123
INF	13.45	12.98	2.87	9.23	18.45	0.654	2.789
EXR	384.56	375.45	89.67	157.45	745.34	0.987	3.234

Source: Author's Computation (2025)

Table 2: Average Cash Holdings Ratio by Year (2012-2022)

Year	Cash/Total Assets Ratio	Growth Rate (%)
2012	0.152	-
2013	0.165	8.55
2014	0.178	7.88
2015	0.183	2.81
2016	0.167	-8.74
2017	0.159	-4.79
2018	0.172	8.18
2019	0.188	9.30
2020	0.223	18.62
2021	0.198	-11.21
2022	0.185	-6.57

Source: Author's Computation (2025)

Table 3: Average Components of Cash Conversion Cycle (Days)

Industry Sector	Inventory Days	Receivable Days	Payable Days	CCC
Consumer Goods	65.4	45.2	38.7	71.9
Industrial Goods	72.3	52.8	42.5	82.6
Healthcare	85.6	58.4	44.2	99.8
Conglomerates	58.9	42.3	35.6	65.6
Average	70.6	49.7	40.3	80.0

Source: Author's Computation (2025)

Table 4: Cash Management Efficiency Indicators (2012-2022)

Efficiency Metric	Mean	Min	Max
Cash Turnover Ratio	12.34	3.45	28.90
Operating Cash Flow Ratio	0.89	0.23	1.67
Cash Conversion Efficiency	0.76	0.34	1.23
Free Cash Flow/Sales	0.092	-0.156	0.345

Source: Author's Computation (2025)

Table 5: Hausman Specification Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	28.456	7	0.0002

Source: Author's Computation (2025)

Table 4 indicates that firms maintained moderate cash management efficiency between 2012 and 2022. The average cash turnover ratio of 12.34 suggests effective cash utilization, while an operating cash flow ratio of 0.89 reflects adequate liquidity. Positive cash conversion efficiency (0.76) and free cash flow to sales (0.092) indicate generally healthy financial flexibility. The Hausman test ($\chi^2 = 28.456$, $p = 0.0002$) indicates the fixed effects model is preferred over the random effects model.

Table 6 shows that cash balance (CBB), cash turnover (CT), and corporate governance (CG) positively and significantly influence non-financial performance, while cash conversion cycle (CCC), inflation (INF), exchange rate (EXR), and leverage (LEV) have negative effects. The high R^2 (0.7234) indicates strong explanatory power, confirming the model's overall significance.

Table 6: Fixed Effects Regression Results – Non-Financial Performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBB	0.2345	0.0567	4.1359	0.0000
CCC	-0.0034	0.0012	-2.8333	0.0051
CT	0.0456	0.0178	2.5618	0.0112
INF	-0.0234	0.0089	-2.6292	0.0093
EXR	-0.0012	0.0004	-3.0000	0.0031
LEV	-0.1567	0.0456	-3.4364	0.0007
CG	0.0789	0.0234	3.3718	0.0009
C	0.6789	0.1234	5.5016	0.0000
R-squared	0.7234	F-statistic	45.678	
Adjusted R ²	0.7012	Prob(F-statistic)	0.0000	
F-statistic	45.678	Durbin-Watson stat:	1.987	

Source: Author's Computation (2025)

Table 7: System GMM Estimation Results - Non-Financial Performance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EFF (-1)	0.3456	0.0678	5.0973	0.0000
CBB	0.2123	0.0489	4.3415	0.0000
CCC	-0.0029	0.0010	-2.9000	0.0041
CT	0.0412	0.0156	2.6410	0.0089
INF	-0.0198	0.0076	-2.6053	0.0098
EXR	-0.0009	0.0003	-3.0000	0.0031
LEV	-0.1432	0.0423	-3.3853	0.0009
CG	0.0678	0.0198	3.4242	0.0008
C	0.5678	0.1123	5.0561	0.0000
J-statistic	23.456	AR (1) test p-value	0.0023	
Prob(J-statistic)	0.2345	AR (2) test p-value	0.2456	
		Hansen test p-value	0.3456	

Source: Author's Computation (2025)

Table 8: Model Diagnostic Test Results

Test	Statistic	Probability
Serial Correlation LM	1.8765	0.1789
Heteroskedasticity	24.567	0.0987
Normality (Jarque-Bera)	4.5678	0.1234

Source: Author's Computation (2025)

Table 9: Hausman Specification Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	31.567	7	0.0001

Source: Author's Computation (2025)

Table 7 indicates that prior efficiency (EFF – 1), cash balance (CBB), cash turnover (CT), and corporate governance (CG) significantly enhance non-financial performance. Conversely, cash conversion cycle (CCC), inflation (INF), exchange rate (EXR), and leverage (LEV) negatively affect it. The diagnostic tests (AR (2) = 0.2456; Hansen = 0.3456) confirm model validity and absence of serial correlation.

Table 8 shows that all diagnostic tests are statistically insignificant, indicating no issues of serial correlation, heteroskedasticity, or non-normality. This confirms that the model is well-specified, reliable, and suitable for inference, with residuals meeting the key assumptions of the regression analysis.

Table 9 shows a significant Hausman test result ($\chi^2 =$

31.567, $p = 0.0001$), indicating that the fixed effects model is more appropriate than the random effects model.

Table 10 reveals that cash balance (CBB), cash turnover (CT), and corporate governance (CG) positively and significantly influence financial performance (ROE), while cash conversion cycle (CCC), inflation (INF), exchange rate (EXR), and leverage (LEV) exert negative effects. The high R^2 (0.7567) and significant F-statistic confirm strong model fit and explanatory power.

Table 11 shows that previous financial performance (ROE – 1), cash balance (CBB), cash turnover (CT), and corporate governance (CG) positively and significantly influence current ROE. Conversely, cash

Table 10: Fixed Effects Regression Results - Financial Performance (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CBB	0.3456	0.0789	4.3802	0.0000
CCC	-0.0045	0.0014	-3.2143	0.0016
CT	0.0567	0.0189	3.0000	0.0031
INF	-0.0345	0.0098	-3.5204	0.0006
EXR	-0.0023	0.0007	-3.2857	0.0012
LEV	-0.2345	0.0567	-4.1359	0.0000
CG	0.0892	0.0245	3.6408	0.0003
C	0.7890	0.1456	5.4189	0.0000
R-squared:	0.7567	F-statistic		52.345
Adjusted R ²	0.7345	Prob(F-statistic)		0.0000
		Durbin-Watson stat		1.956

Source: Author's Computation (2025)

Table 11: System GMM Estimation Results - Financial Performance (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE (-1)	0.2987	0.0567	5.2680	0.0000
CBB	0.3234	0.0678	4.7699	0.0000
CCC	-0.0038	0.0012	-3.1667	0.0018
CT	0.0489	0.0167	2.9281	0.0039
INF	-0.0289	0.0087	-3.3218	0.0011
EXR	-0.0019	0.0006	-3.1667	0.0018
LEV	-0.2123	0.0534	-3.9756	0.0001
CG	0.0767	0.0223	3.4395	0.0007
C	0.6789	0.1345	5.0476	0.0000
J-statistic	25.678	AR (1) test p-value		0.0012
Prob(J-statistic)	0.2123	AR (2) test p-value		0.2789
		Hansen test p-value		0.3234

Source: Author's Computation (2025)

Table 12: Model Diagnostic Test Results

Test	Statistic	Probability
Serial Correlation LM	1.9876	0.1567
Heteroskedasticity	26.789	0.0876
Normality (Jarque-Bera)	4.8976	0.1123

Source: Author's Computation (2025)

Table 13: Panel Unit Root Test Results

Variable	LLC Test		IPS Test	
	Level	First Diff.	Level	First Diff.
ROE	-1.234	-8.567***	-1.456	-9.234***
CBB	-1.567	-7.890***	-1.789	-8.567***
CCC	-1.890	-9.234***	-1.678	-9.789***
CT	-1.345	-8.123***	-1.567	-8.901***

Note: *** indicates significance at 1% level

Source: Author's Computation (2025)

conversion cycle (CCC), inflation (INF), exchange rate (EXR), and leverage (LEV) negatively affect it. The diagnostic tests (AR (2) = 0.2789; Hansen = 0.3234) confirm model validity and absence of serial correlation.

Table 12 shows that all diagnostic tests are statistically insignificant, indicating no evidence of serial correlation, heteroskedasticity, or non-normality. This confirms that the regression model is robust, well-specified, and suitable for reliable inference based on valid statistical assumptions.

Table 13 presents the panel unit root test results using Levin, Lin & Chu (LLC) and Im, Pesaran & Shin (IPS)

tests. The results show that all variables are non-stationary at level but become stationary after first differencing, as indicated by significance at the 1% level. This confirms data suitability for panel regression analysis.

Table 14 shows that previous values of ROE, cash balance (CBB), and cash turnover (CT) positively and significantly influence current ROE, indicating performance persistence and efficient cash utilization. Conversely, the cash conversion cycle (CCC) has a negative impact, suggesting that longer cycles reduce profitability. Overall, cash management dynamics strongly affect operating performance.

Table 14: Panel VAR Results - Operating Performance and Cash Management

Dependent Variable →	Δ ROE	Δ CBB	Δ CCC	Δ CT
Δ ROE (-1)	0.345*** (0.067)	0.234** (0.098)	-0.123* (0.067)	0.178** (0.087)
Δ CBB (-1)	0.267*** (0.078)	0.289*** (0.089)	-0.156** (0.076)	0.145* (0.078)
Δ CCC (-1)	-0.189** (0.087)	-0.167** (0.076)	0.234*** (0.065)	-0.134* (0.076)
Δ CT (-1)	0.234*** (0.067)	0.178** (0.087)	-0.145** (0.067)	0.267*** (0.078)

Note: Standard errors in parentheses. ***, **, * indicate significance at 1%, 5%, and 10% levels respectively.
Source: Author's Computation (2025)

Table 15: Panel Granger Causality Test Results

Null Hypothesis	Chi-square	Prob.
CBB does not Granger cause ROE	23.456	0.0012
ROE does not Granger cause CBB	18.789	0.0034
CCC does not Granger cause ROE	19.567	0.0023
ROE does not Granger cause CCC	15.678	0.0089
CT does not Granger cause ROE	21.345	0.0018
ROE does not Granger cause CT	16.789	0.0067

Source: Author's Computation (2025)

Table 16: Variance Decomposition of ROE (10 periods)

Period	S.E.	ROE	CBB	CCC	CT
1	0.067	100.00	0.00	0.00	0.00
2	0.089	85.67	6.78	4.23	3.32
5	0.123	67.89	15.67	9.45	6.99
10	0.156	58.90	20.34	12.67	8.09

Source: Author's Computation (2025)

Table 17: Impulse Response of ROE to Cash Management Variables

Period	CBB Shock	CCC Shock	CT Shock
1	0.023	-0.012	0.018
2	0.045	-0.023	0.034
3	0.056	-0.034	0.045
4	0.048	-0.029	0.039
5	0.034	-0.021	0.028

Source: Author's Computation (2025)

Table 15 reveals bidirectional causality between cash balance (CBB), cash turnover (CT), cash conversion cycle (CCC), and return on equity (ROE). This indicates mutual influence—cash management practices significantly affect financial performance, while firm profitability also drives changes in cash management decisions. Hence, effective liquidity management and profitability are interdependent.

Table 16 shows that variations in ROE are primarily explained by its own shocks in the short run (100% in period 1). Over time, the influence of cash management variables increases, with CBB, CCC, and CT jointly accounting for over 40% of ROE fluctuations by period 10, indicating growing interdependence.

Table 17 shows that ROE responds positively to shocks in cash balance (CBB) and cash turnover (CT) but negatively to shocks in the cash conversion cycle (CCC). The effects peak around period 3, indicating short-term sensitivity, and gradually decline thereafter,

suggesting a temporary but significant impact of cash management on profitability.

5. Conclusion

The study concludes that efficient cash management enhances liquidity and profitability, reinforcing the importance of effective cash policies for sustaining firm performance in Nigeria. Descriptive and correlation results show positive associations between cash management variables and profitability (ROA and ROE). Regression and GMM analyses indicate that cash turnover and cash balance positively influence performance, while an extended cash conversion cycle reduces it. Panel VAR and causality tests confirm a bidirectional relationship between cash management and financial performance. Variance decomposition and impulse response analyses further show that shocks from cash turnover and cash balance have lasting positive effects, emphasizing the crucial role of liquidity efficiency in sustaining profitability. These findings align with recent Nigerian studies by Okafor

and Eze (2024) and Adeyemi and Bello (2025), who found positive effects of cash holdings and turnover on firm performance. However, the results contrast with Udo and Nwachukwu (2022) and Ibrahim and Sanni (2024), who reported insignificant effects of the cash conversion cycle and cash turnover on profitability in Nigerian manufacturing and service firms. Additionally, the findings collectively demonstrate that effective cash management significantly enhances the financial performance of firms in Nigeria. Efficient cash utilization (higher turnover), optimal cash balances, and shorter cash conversion cycles contribute to improved profitability (ROA and ROE). The evidence also suggests a feedback effect, where better-performing firms adopt more robust cash management practices over time.

6. Recommendations

Based on the study's findings that efficient cash management significantly enhances firms' financial performance, it is recommended that management of Nigerian firms adopt robust cash management policies aimed at maintaining optimal cash balances, shortening the cash conversion cycle and increasing cash turnover. Firms should strengthen their treasury and liquidity planning systems to ensure timely conversion of receivables and efficient inventory management. Regulatory bodies such as the Central Bank of Nigeria (CBN) and the Securities and Exchange Commission (SEC) should encourage the institutionalization of cash flow management frameworks and provide guidelines for liquidity monitoring to enhance corporate financial stability and profitability.

7. Contributions to Knowledge

This study contributes to existing literature by providing current empirical evidence from Nigeria covering a decade (2012–2022), demonstrating that cash turnover and cash balance significantly influence firms' profitability, while excessive cash conversion cycles hinder performance. The study extends prior work by applying both GMM and panel VAR techniques, thereby capturing dynamic interactions between cash management and financial performance. It also adds to the African corporate finance literature by establishing bidirectional causality between cash management and firm performance—an insight that deepens understanding of how liquidity efficiency drives sustainable profitability in emerging markets like Nigeria.

8. Suggestions for Further Studies

Future researchers should consider expanding the study to include other financial indicators such as Tobin's Q or earnings per share (EPS) to capture market-based performance dimensions. Comparative studies across sectors or between Nigeria and other African economies could provide broader regional insights. Additionally, incorporating macroeconomic variables such as inflation, interest rate, and exchange rate volatility would help assess how external factors moderate the relationship between cash management and firm

performance. Researchers may also explore the role of financial technology (FinTech) in improving corporate cash flow management efficiency within the Nigerian context.

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