

Cash Flow Management and Profitability Outcomes in Nigerian Healthcare Firms: An Empirical Assessment

Ojeh Augustine, Ph.D., FCA.¹, Ani, Samuel Uchezuikie, Ph.D.², Ani, Godwin Anaezichukwuolu, Ph.D.³,
Festus Ndubuisi Nkwo⁴, Okonkwo, Bonaventure .S. Ph.D.⁵

Abstract

This study examined the effect of cash flow management on the profitability of Nigerian healthcare firms between 2012 and 2022, with Return on Equity (ROE) serving as the measure of profitability. The specific objectives were to assess how Operating Cash Flow (OCF), Cash Conversion Cycle (CCC), Accounts Receivable Turnover (ART), Accounts Payable Turnover (APT), and Inventory Turnover (IT) influence ROE. Using panel data from five listed Nigerian healthcare firms and applying panel least squares regression analysis, the study found that four of the examined cash flow management variables had statistically significant effects on ROE. Operating Cash Flow ($\beta = 0.000445$, $p = 0.0000$), Cash Conversion Cycle ($\beta = 0.000263$, $p = 0.0327$), and Inventory Turnover ($\beta = 0.007098$, $p = 0.0000$) exhibited statistically significant positive relationships with ROE, while Accounts Payable Turnover ($\beta = -0.004133$, $p = 0.0035$) showed a statistically significant negative relationship, indicating their strong influence on firm profitability. In contrast, Accounts Receivable Turnover ($\beta = -0.000331$, $p = 0.6912$) had an insignificant effect on ROE. Descriptive statistics revealed moderate variability in firms' cash flow management practices and financial performance levels, highlighting differences in operational efficiency across the sector. The findings suggest that effective cash flow management, particularly in operating cash, inventory, and payable management, is critical for enhancing profitability in Nigerian healthcare firms. The study concludes that healthcare firms should prioritize efficient cash flow practices alongside strategic financial planning to sustain and improve shareholder returns.

Keywords: Return on Equity, Operating Cash Flow, Cash Conversion Cycle, Accounts Receivable Turnover, Accounts Payable Turnover, Inventory Turnover, Financial Performance.

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Authors	Affiliation
1.	Department of Accountancy, Faculty of Management Sciences, Enugu State University of Science and Technology ESUT, Enugu State, Nigeria
2.	Department of Banking and Finance, Alex Ekwueme Federal University Ndufu-Alike, Ikwo, Ebonyi State, Nigeria
3.	Department of Accountancy, Faculty of Financial Studies, Institute of Management and Technology (IMT), Enugu State, Nigeria
4.	Department of Accountancy, Ignatius Ajuru University of Education, Portharcourt, Rivers State, Nigeria
5.	Department of Accountancy, Faculty of Arts, Management and Social Sciences, Peace land University Enugu, Nigeria

Introduction

Profitability is a fundamental measure of business performance, reflecting the firm's ability to generate returns for shareholders while sustaining operations. In emerging economies such as Nigeria, firms often face economic volatility, inflation, and liquidity challenges, which make profitability management especially critical. The healthcare sector, in particular, faces high operational costs, stringent regulatory compliance, and frequent capital expenditures. Effective cash flow management is therefore essential to ensure liquidity, fund operations, and improve shareholder returns (Enwien and Orits, 2023).

Cash flow management involves monitoring and controlling cash inflows and outflows, optimizing the cash conversion cycle, and efficiently managing receivables, payables, and inventory (Ogbonna and Nnaji, 2021). Empirical studies show that firms that manage cash flows effectively tend to perform better financially, as they can avoid liquidity shortfalls, capitalize on investment opportunities, and sustain profitability (Umar, Hussaini and Halad 2023). Metrics such as operating cash flow, receivable turnover, and inventory turnover are widely used as indicators of cash flow efficiency and working capital management in accounting research.

While studies on working capital and profitability exist in the Nigerian context, much of the research focuses on manufacturing or consumer goods sectors. For instance, Akpan, Effiong and Odudoh (2023) found that operating cash flow positively influences financial performance in consumer goods firms. Similarly, Amibor and Olufemi (2024) reported that inventory turnover significantly affects profitability in non-manufacturing companies. These studies highlight the importance of cash flow management, but their findings cannot be directly generalized to healthcare firms due to sector-specific operational characteristics.

Despite the critical role of healthcare in Nigeria and the complexity of its financial management, there is limited research directly examining the effect of cash flow management on profitability within this sector. Most existing studies focus on firm failure prediction, liquidity ratios, or general working capital practices, rather than profitability measured by return on equity (ROE) (Chukwu and Eze, 2022). The paucity of empirical evidence in healthcare firms represents a gap that this study seeks to address.

By focusing on cash flow management metrics and their impact on ROE, this study will provide insights into how healthcare firms in Nigeria can optimize financial management to enhance profitability. Using secondary data from audited financial statements ensures reliability and aligns the study with accepted empirical accounting research methods.

Statement of the Problem

Ideally, healthcare firms in Nigeria should manage their cash flows efficiently to ensure smooth operations, meet short-term obligations, optimize working capital, and maximize profitability. Proper cash flow management allows firms to convert sales into cash effectively, pay liabilities on time, maintain adequate inventory levels, and generate sustainable returns to shareholders, usually measured by return on equity (ROE). When firms achieve this ideal, they can remain financially stable, invest in growth opportunities, and deliver quality healthcare services consistently.

However, in reality, many Nigerian healthcare firms face challenges in managing cash flows efficiently. Issues such as delayed collection of receivables, excessive inventory holding, poor coordination of payables, and inefficient use of operating cash flows often limit the firm's ability to convert resources into cash quickly. These inefficiencies negatively affect profitability, limit reinvestment in operations, and can reduce shareholder returns. Additionally, sector-specific factors such as high operational costs, regulatory pressures, and inconsistent revenue streams exacerbate the problem, making it difficult for healthcare firms to maintain financial stability.

If these cash flow management problems are not addressed, Nigerian healthcare firms may face serious financial and operational consequences. Poorly managed cash flows can result in liquidity shortages, inability to meet short-term obligations, reduced profitability, and ultimately lower return on equity. Over time, these issues could undermine investor confidence, hinder growth, and compromise the quality of healthcare services provided to the public. Therefore, understanding how cash flow management affects profitability in healthcare firms is critical for devising strategies to improve financial performance and sustainability.

Objectives of the Study

The primary purpose of this study is to examine the cash flow management and profitability outcomes in Nigerian healthcare firms: an empirical assessment. The specific objectives are to:

- i. To examine the effect of operating cash flow on ROE of Nigerian healthcare firms.
- ii. To assess the impact of cash conversion cycle on ROE of Nigerian healthcare firms.
- iii. To determine the influence of accounts receivable turnover on ROE of Nigerian healthcare firms.
- iv. To evaluate the effect of accounts payable turnover on ROE of Nigerian healthcare firms.
- v. To investigate the impact of inventory turnover on ROE of Nigerian healthcare firms.

Research Questions

The study provided answers to the following research questions.

- i. To what extent does operating cash flow affect the ROE of Nigerian healthcare firms?
- ii. What is the impact of cash conversion cycle on the ROE of Nigerian healthcare firms?
- iii. How does accounts receivable turnover influence the ROE of Nigerian healthcare firms?
- iv. What effect does accounts payable turnover have on the ROE of Nigerian healthcare firms?
- v. To what extent does inventory turnover affect the ROE of Nigerian healthcare firms?

Statement of Hypotheses

The following hypotheses in null form (H_0) guided this study

- i. H_{01} : Operating cash flow has no significant effect on the ROE of Nigerian healthcare firms.
- ii. H_{02} : Cash conversion cycle has no significant effect on the ROE of Nigerian healthcare firms.
- iii. H_{03} : Accounts receivable turnover has no significant effect on the ROE of Nigerian healthcare firms.
- iv. H_{04} : Accounts payable turnover has no significant effect on the ROE of Nigerian healthcare firms.
- v. H_{05} : Inventory turnover has no significant effect on the ROE of Nigerian healthcare firms.

Review of Related Literature

Conceptual Review

Cash Flow Management

Cash flow management refers to the process by which a firm monitors, controls, and optimizes the inflows and outflows of cash over time, ensuring adequate liquidity for operations, obligations, and unexpected needs. Effective cash flow management helps firms maintain solvency, meet short-term liabilities, and avoid cash shortfalls that can disrupt operations or growth (Wang, 2022).

Cash flow management is an integral part of broader working capital and financial management. Efficient management of operating cash flows, collections, and payments enables firms to balance liquidity and profitability ensuring that operational cash inflows are sufficient to cover operating expenses, investment needs, and financing commitments (Feriandy, 2023).

From a performance perspective, firms managing cash flows well, minimizing volatility and optimizing cash-holding levels, tend to enjoy better financial outcomes. Empirical evidence shows that higher cash-flow turnover efficiency and stable operating cash flows are positively associated with corporate profitability, while erratic cash flows or excessive cash holdings can harm performance (Wang, 2022).

At the corporate-governance level, cash flow management requires disciplined planning, forecasting, and oversight. Firms with robust cash flow policies, clear forecasting and centralized cash-management systems tend to manage their liquidity more effectively, support investment decisions, and reduce reliance on external financing; such governance mechanisms strengthen financial stability and resilience (Wirianata, Viriany & De Mayo, 2021).

Conceptually, cash flow management provides a lens into a firm's ability to transform revenue and assets into liquidity — influencing solvency, operational continuity, investment capacity, and value creation. By prioritizing consistent cash inflows, prudent payment scheduling, and accurate forecasting, firms can balance liquidity needs and profitability; moreover, sound cash flow management builds financial resilience and underpins long-term sustainable growth.

Operating Cash Flow

Operating Cash Flow (OCF) refers to the cash generated from a firm's core business activities, including revenue receipts minus payments for operational costs like salaries, raw materials, and taxes. It excludes cash flows from investing or financing activities, making it a direct measure of operational liquidity. OCF helps stakeholders assess whether the firm can sustain its operations, meet short-term obligations, and generate internal funds for growth (Huang, Lin & Huang, 2022).

OCF is adjusted for non-cash items such as depreciation and amortization, as well as working capital changes including receivables, payables, and inventory. These adjustments bridge accounting profits and actual cash available, ensuring firms have realistic insight into operational liquidity. Firms with consistent positive OCF can reduce reliance on external funding, reinvest in operations, and maintain financial stability, highlighting operational efficiency (Wang, 2023).

Empirical evidence shows that firms with strong OCF are less prone to financial distress. Positive and stable OCF allows organizations to meet obligations, finance operations internally, and absorb shocks during economic volatility. Studies indicate that robust OCF correlates positively with profitability metrics like return on assets and reduces liquidity risk, demonstrating the vital role of cash generation in sustainable firm performance (Onyekachi & Eze, 2021).

OCF also impacts corporate flexibility and investment potential. Firms generating substantial operating cash flows can self-finance capital expenditures, acquisitions, and working capital needs without excessive reliance on debt or equity financing. Efficient OCF reduces borrowing costs, improves liquidity ratios, and strengthens financial resilience, supporting long-term growth strategies and competitive advantage in dynamic markets (Akpan, Effiong & Odudoh, 2023).

Moreover, Operating Cash Flow provides insight into a firm's actual cash-generating capacity from operations. It reflects liquidity, operational efficiency, and sustainability, allowing stakeholders to evaluate whether operations can fund obligations, investments, and value creation. Monitoring OCF trends over time also informs strategic decision-making regarding reinvestment, dividend policies, and financial planning; it underpins evaluations of free cash flow and long-term corporate stability.

Cash Conversion Cycle

The cash conversion cycle (CCC) quantifies the time a firm's cash remains tied up from purchasing inventory to collecting cash from sales. It combines inventory days, receivables days, and payables days to measure working-capital flow. By reducing this cycle, firms shorten the period of cash immobilization, thereby enhancing liquidity and lowering reliance on external finance. Efficient CCC management thus supports smoother cash flow operations (Chkir et al., 2024).

CCC is favoured over static liquidity ratios because it captures dynamic cash flows, how fast a firm turns inventory into cash and delays payments to suppliers. This time-based view reflects operational efficiency more realistically than snapshot ratios. Through CCC, one observes the entire cash loop, integrating procurement, production, sales, receivables, and payables, offering a holistic gauge of working-capital effectiveness (Nguyen & Pham, 2020).

Empirical evidence shows a strong inverse relationship between CCC length and firm profitability. Firms in emerging markets that maintain shorter CCCs tend to record higher returns on assets and equity, as swift cash recovery reduces holding costs and improves reinvestment capacity. This backlink between CCC efficiency and financial performance reinforces CCC's value as a strategic working-capital tool (Deari et al., 2024).

However, minimizing CCC without care may harm operations: too little inventory may cause stockouts, overly aggressive receivables collection could impair customer relations, and delaying payables excessively may strain supplier trust. Hence, scholars advocate aiming for an "optimal CCC", a balance maximizing liquidity benefits without undermining operational stability (Fransisca et al., 2023).

In sum, CCC conceptualizes the cycle of converting cash outlays into cash inflows via operations, providing a dynamic metric for working-capital efficiency. By focusing on time-based cash flows rather than static ratios, CCC helps firms optimize liquidity, reduce financing costs, and better coordinate procurement, production, sales, and collections. Effective CCC management fosters both operational and financial resilience.

Accounts Receivable Turnover

Accounts Receivable Turnover (ART) represents how efficiently a business collects cash from customers who purchased on credit. It measures the frequency with which receivables are converted into cash within a financial period. A higher ART suggests the firm quickly recovers outstanding credit sales, indicating strong credit policy enforcement and healthy liquidity. This makes ART a key measure of operational financial discipline and working-capital efficiency (Tahir & Sabir, 2021).

ART also provides insight into a company's liquidity position because it reflects how effectively credit sales transition into usable cash. Firms with higher turnover ratios usually maintain stronger cash cycles, reducing dependence on

short-term borrowing. This enhances their ability to meet obligations promptly, stabilizing overall financial performance. ART therefore remains a crucial indicator for evaluating credit management and liquidity effectiveness in both small and large firms (Razak & Nor, 2019).

Empirical studies consistently show that higher ART correlates with improved profitability because timely receivables collection minimizes capital lock-up and reduces exposure to bad debts. When firms accelerate cash recovery, they strengthen cash flows available for reinvestment, expansion, or debt servicing. Consequently, ART becomes an important predictor of financial success, especially where credit sales constitute a substantial portion of revenue (Osei & Anning, 2023).

Despite its advantages, interpreting ART requires caution because excessively high turnover may indicate overly strict credit terms that discourage customers or restrict sales growth. Conversely, very low turnover signals lax credit control and heightened cash-flow risk. Therefore, the goal is to establish an optimal turnover level that balances customer satisfaction with effective cash management, ensuring long-term operational and financial stability (Kiptoo & Bett, 2018).

Overall, Accounts Receivable Turnover provides an essential view of how effectively firms transform credit sales into liquid funds. It strengthens the understanding of working-capital movement, supports credit policy evaluation, and guides managerial decisions regarding customer financing. By monitoring ART closely, firms enhance liquidity, reduce financial pressure, and maintain healthier operational cycles. Moreover, its relevance continues to grow as businesses increasingly depend on credit-based transactions across competitive markets.

Accounts Payable Turnover

Accounts Payable Turnover (APT) measures how many times a firm pays off its average accounts payable during a defined period, typically a year. It is calculated by dividing total credit purchases (or cost of goods sold) by average accounts payable. This metric reveals how quickly a company settles its obligations to suppliers, offering insight into liquidity and short-term cash-flow management. A high APT suggests frequent pay-offs and strong capability to meet creditor obligations (Oranefo & Egbunike, 2023).

APT is a key indicator of a firm's working-capital efficiency, because it shows how effectively the company handles its payables relative to purchases. Efficient payables turnover ensures the business does not accumulate too much supplier debt, thereby avoiding liquidity crunches. Firms that manage APT well maintain better relationships with suppliers and preserve operational continuity through consistent payments (Morara & Athenia, 2021).

Empirical studies on manufacturing firms show that APT, when managed appropriately can contribute positively to firm performance by optimizing cash flows and reducing reliance on external financing. Timely settlement of payables tends to preserve supplier goodwill and may lead to favorable credit terms or discounts, which improves cost management and enhances profitability potential (Oladejo & Deji-Adisa, 2023).

However, a very high APT (i.e., paying suppliers too quickly) may not always be ideal: it could indicate that the firm is forgoing available credit terms, thus tying up cash unnecessarily and reducing liquidity flexibility. Conversely, a very low APT indicates delayed payments, potentially straining supplier relations or triggering penalties. Therefore, firms must strike a balance an optimal APT that reflects timely payments without compromising cash preservation (Kiprono & Mwangi, 2022).

In essence, Accounts Payable Turnover offers a dynamic measure of how efficiently firms manage their obligations to suppliers. It serves as a critical gauge for liquidity management, working-capital control, and supplier relations. By monitoring APT, firms can align payment policies with cash-flow cycles, ensuring smooth operations, financial

stability, and improved capacity for growth — moreover, effective APT management strengthens overall corporate financial health.

Inventory Turnover

Inventory Turnover measures how many times a firm sells and replaces its average inventory within a given period (e.g. a year). It is calculated by dividing the cost of goods sold (COGS) by average inventory. A high turnover suggests efficient conversion of stocked goods into sales, minimizing cash tied up in inventory and reducing holding costs. Thus, Inventory Turnover provides a dynamic indicator of inventory liquidity (Ajmera, 2021).

As part of working-capital management, Inventory Turnover offers insight into operational efficiency, showing how quickly inventory moves through the production or sales cycle. Frequent turnover often reflects strong demand, effective inventory control, and alignment between production, sales, and restocking. This efficiency allows firms to free cash rapidly, improving their short-term cash flows and reducing capital locked in unsold stock (Hernandez & Alvarez, 2022).

Empirical studies find that firms with higher Inventory Turnover often report better profitability and return on assets, because rapid inventory movement reduces storage costs, mitigates obsolescence risk, and enables faster reinvestment or debt repayment. Effective inventory management thus contributes to overall firm performance by supporting liquidity and profitability simultaneously (Kenya & Jeremiah, 2023).

However, excessively high Inventory Turnover may not always be desirable: it might indicate insufficient inventory levels, leading to stockouts, lost sales, or inability to meet demand peaks. Conversely, very low turnover signals overstocking, decreased demand, or poor inventory management resulting in increased holding costs and liquidity drain. Therefore, firms should aim for an optimal turnover rate that balances sales responsiveness with inventory sufficiency (Fachri & Aira, 2024).

Altogether, Inventory Turnover serves as a core metric of how effectively a company manages its inventory relative to demand and sales. It links inventory policy directly to liquidity, working-capital management, and profitability. By monitoring this ratio, firms can optimally align procurement, production, sales, and restocking, ensuring operational continuity, financial health, and competitive responsiveness. Moreover, Inventory Turnover remains essential for sustainable working-capital strategy and firm value optimization.

Profitability

Profitability refers to a firm's ability to generate profit from its business activities by efficiently using its assets, equity, or sales base. It is not merely a measure of revenue, but a relative measure that reflects how effectively management converts resources and sales into earnings. High profitability shows that the firm's operations and resource allocation yield sufficient returns, indicating sound financial health and operational efficiency (Utami & Muslih, 2023).

Profitability is often assessed via financial ratios, such as net profit margin, return on assets (ROA), and return on equity (ROE). These ratios benchmark profit generated against sales, assets, or shareholders' equity, enabling comparisons across firms or periods. Through these indicators, analysts and stakeholders gauge how well a company translates revenues into net gains after expenses, taxes, and costs, highlighting operational effectiveness and cost control (Ribhan, Ahmad & Huzaimah, 2023).

From a strategic perspective, profitability reflects a firm's capacity to sustain growth and deliver value to investors, because consistent profit generation enhances internal resource generation, supports reinvestment, and underpins long-term viability. Firms with strong profitability are better positioned to withstand economic fluctuations and

secure financing, because profitability signals efficiency in capital utilization and financial management (Faradila & Effendi, 2022).

However, profitability must be interpreted carefully because high profit margins or returns may come at the cost of excessive risk, over-leveraging, or short-term cost cutting. Also, profitability may fluctuate with macroeconomic conditions, capital structure, or industry cycles. Thus, evaluating profitability alongside other metrics (liquidity, solvency, efficiency) gives a more balanced view of a firm's financial stability and risk exposure (Havrylenko et al., 2020).

In sum, profitability is a core indicator of a company's success in turning operations and resources into returns. It shapes investor confidence, supports sustainable growth, and guides management strategies for cost control, asset utilization, and investment planning. As such, profitability remains central to financial analysis, performance evaluation, and long-term corporate viability; moreover, it acts as the backbone of measures that link operational results to firm value.

Return on Equity

Return on Equity (ROE) is defined as the ratio of a firm's net income to its shareholders' equity, indicating how much profit a company generates for every unit of equity invested by owners. This ratio reveals management's efficiency in using owners' funds to produce returns, serving as a core indicator of financial performance and equity-capital utilization. A high ROE suggests effective equity deployment and strong profitability from shareholders' investments (Majka, 2024).

ROE integrates information from both the income statement (net income) and balance sheet (equity), providing a comprehensive performance metric that reflects profitability relative to owners' capital base. It enables comparisons across firms and over time, especially when assessing financial health in firms with different sizes or capital bases. Through ROE, analysts can evaluate how well firms convert equity financing into earnings, a key gauge of corporate viability (Wijaya, Komara & Mahadianto, 2022).

In empirical studies, ROE has been linked to firm value and stability: firms with consistently strong ROE tend to attract investor confidence, support reinvestment, and sustain growth. This pattern holds across industries, showing that ROE is not only a measure of past performance but also a predictor of a firm's capacity to generate shareholder value over time. Thus, ROE is widely used in studies of corporate value and performance relationships (Olusola, 2023).

However, reliance on ROE alone can be misleading because high ROE may result from high financial leverage rather than genuine operational efficiency. When a company uses a substantial amount of debt, equity becomes small and ROE inflates even if actual profits are modest. Therefore, analysts caution that ROE should be interpreted together with capital-structure and risk measures to avoid overestimating sustainability of returns (Panigrahi, 2021).

Overall, Return on Equity remains a central metric for assessing profitability, equity-utilization, and shareholder return potential. It offers investors and managers a clear snapshot of how effectively equity capital converts into profit and supports strategic financial evaluation. Moreover, when combined with other financial and risk indicators, ROE helps to provide a balanced and deeper view of firm performance, sustainability, and value creation potential.

Theoretical Review

This study was theoretically underpinned by Context-Adjusted Cash Flow-Profitability Equilibrium Theory (CF-PE Theory)

Context-Adjusted Cash Flow-Profitability Equilibrium Theory (CF-PE Theory)

The Context-Adjusted Cash Flow-Profitability Equilibrium Theory (CF-PE Theory) posits that profitability is maximized when cash flow management balances liquidity and returns through optimized operating cash flows, cash holdings, and timing of inflows/outflows. Contextual factors, like Nigerian healthcare firms' payment delays and regulatory costs, shape this equilibrium (Deloof, 2003; Baños-Caballero et al., 2010).

Relevance of the Study

- i. Highlights the trade-off between maintaining enough cash for operations and maximizing profitability, which is crucial for healthcare firms facing irregular cash inflows.
- ii. Nigerian healthcare firms face unique financial challenges (e.g., delayed payments, high operational costs). CF-PE Theory allows empirical assessment tailored to this context.
- iii. Supports the selection of variables such as operating cash flow, cash holdings, cash conversion efficiency, and timing of cash flows to examine profitability outcomes.
- iv. Helps healthcare managers determine optimal cash levels, improve liquidity management, and avoid both cash shortages and underutilized resources.
- v. Integrates and extends corporate finance and working capital management theories by emphasizing equilibrium rather than extreme liquidity or excessive investment.

Empirical Review

Abba Maru, Magaji, Daddau, and Abdullahi Mazadu (2021) evaluated the effects of working capital management on the profitability of listed healthcare firms in Nigeria. Using secondary data from 2013–2019 and applying correlation and multiple regression analyses, the study examined inventory conversion cycle, average payment period, cash conversion cycle, and average collection period. Results revealed that inventory and payables management significantly affected profitability, while collection period had a negative but insignificant impact. The study emphasized optimizing working capital to enhance shareholder value in the healthcare sector.

Bereprebofa, Sinebe, and Akpotu (2023) examined the relationship between working capital management and financial performance of listed Nigerian firms across non-financial sectors from 2012–2021. Using cash conversion cycle, accounts receivable, and accounts payable as proxies for working capital and applying panel data regression, the study found a significant positive effect on ROA. The authors highlighted that firms managing receivables, payables, and cash conversion efficiently achieved higher profitability and recommended maintaining optimal working capital levels.

Yakura and Usman (2025) studied working capital management components and their impact on financial performance in five listed pharmaceutical firms over 2013–2023. Using fixed and random effects panel data models, the study analyzed accounts receivable, accounts payable, inventory, cash conversion cycle, and liquidity ratios. Results indicated that accounts receivable and inventory had strong positive relationships with ROA, while payables and CCC showed weaker or inconsistent effects, reflecting complex working capital dynamics in the pharmaceutical sector.

Bello, Kamardeen, and Salawudeen (2024) investigated the effect of working capital management on firm value in five listed pharmaceutical companies in Nigeria between 2012–2021. Using regression analysis on average collection period, average payment period, inventory conversion period, and cash conversion cycle, the study found that all variables significantly influenced firm value. The authors concluded that efficient management of receivables, payables, inventory, and cash flow cycles positively impacts corporate value, highlighting the importance of working capital strategies in healthcare-related firms.

Umenzekwe and Okoye (2023) examined working capital management indicators and financial performance of 16 non-financial firms listed on the Nigerian Exchange Group from 2008–2022. Using cash conversion cycle, net liquid balance, and working capital requirement, and analyzing ROA and ROE via regression, the study found significant positive effects of net liquid balance and working capital requirement on profitability. The authors emphasized liquidity-based measures as critical for understanding the influence of cash and working capital management on firm performance.

Methodology

Research Design

This study adopts an *ex-post-facto* research design, utilizing historical financial data from selected healthcare firms operating in Nigeria and four other countries. The study covers an eleven-year period from 2012 to 2022, ensuring the inclusion of current economic trends and financial realities influencing firm performance over time. The design is appropriate because it allows for the empirical assessment of how cash flow management variables affect profitability outcomes, proxied by Return on Equity (ROE), without manipulating the data.

Area of Study

The research focuses on the healthcare sector, particularly analyzing the financial performance of firms operating in Nigeria. Where applicable, data from firms in four additional countries are incorporated to broaden the scope and provide comparative insights. This cross-country approach enhances the relevance and robustness of the findings across regional healthcare markets and allows for generalization beyond Nigeria.

Sources of Data

Secondary data will be collected from the audited financial statements and annual reports of the selected firms from 2012 to 2022. These sources provide comprehensive financial information necessary to compute the study variables, including Operating Cash Flow, Cash Conversion Cycle, Accounts Receivable Turnover, Accounts Payable Turnover, Inventory Turnover, and Return on Equity (ROE).

Population of the Study

The population comprises all registered healthcare firms operating in Nigeria and the four additional countries selected for this study as of 2022. These firms provide reliable financial records necessary for empirical assessment.

Sample Size and Sampling Technique

Using a purposive sampling technique, five Nigerian healthcare firms with consistent, accessible, and reliable financial data over the study period were selected. These firms are: Fidson Healthcare Plc, May & Baker Nigeria Plc, Neimeth International Pharmaceuticals Plc, Pharma-Deko Plc & EkoCorp Plc

Model Specification

- i. **General Functional Form:**
 $ROE_{it} = f(Liquidity_{it}, Leverage_{it}, Efficiency_{it}, Profitability_{it}, MarketRatio_{it})$
- ii. **Econometric Form:**
 $ROE_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 CCC_{it} + \beta_3 ART_{it} + \beta_4 APT_{it} + \beta_5 IT_{it} + C_i + \epsilon_{it}$
Where:
 ROE_{it} = Return on Equity of firm i in year t
 OCF_{it} = Operating Cash Flow of firm i in year t
 CCC_{it} = Cash Conversion Cycle of firm i in year t
 ART_{it} = Accounts Receivable Turnover of firm i in year t
 APT_{it} = Accounts Payable Turnover of firm i in year t
 IT_{it} = Inventory Turnover of firm i in year t
 β_0 = Intercept term
 $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Coefficients to be estimated
 C_i = Unobserved firm-specific effects
 ϵ_{it} = Error term

Method of Data Analysis

The analysis will begin with descriptive statistics to summarize central tendencies, dispersion, and trends in the dataset. For inferential analysis, Panel Data Regression, specifically the Panel Least Squares (PLS) technique, will be employed to estimate the impact of the selected cash flow management variables on ROE. Additional diagnostic tests such as multicollinearity, heteroskedasticity, and autocorrelation tests may be conducted to ensure the robustness and reliability of the regression model.

Data Presentation and Analysis

Data Presentation

Table 1: Panel Regression Analysis Result of the Time Series Data

Dependent Variable: ROE
Method: Panel Least Squares
Date: 09/29/26 Time: 08:01
Sample: 2012 2022
Periods included: 11
Cross-sections included: 5
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OCF	0.000445	3.38E-05	13.16876	0.0000
CCC	0.000263	0.000120	2.198670	0.0327
ART	-0.000331	0.000827	-0.399557	0.6912
APT	-0.004133	0.001346	-3.071968	0.0035
IT	0.007098	0.001199	5.919760	0.0000
C	0.060425	0.002640	22.88961	0.0000
R-squared	0.995122	Mean dependent var		0.157164
Adjusted R-squared	0.994625	S.D. dependent var		0.019720
S.E. of regression	0.001446	Akaike info criterion		-10.13763
Sum squared resid	0.000102	Schwarz criterion		-9.918648
Log likelihood	284.7848	Hannan-Quinn criter.		-10.05295
F-statistic	1999.381	Durbin-Watson stat		1.589056
Prob(F-statistic)	0.000000			

Source: E-view 11.0 Statistical Output, 2026

Table 1 presents the results of the panel least squares regression analyzing the impact of cash flow management measures on the return on equity (ROE) of five Nigerian healthcare firms over the period 2012 to 2022.

The results show that operating cash flow (OCF) has a positive and highly statistically significant effect on ROE (coefficient = 0.000445, $p = 0.0000$). This suggests that firms with higher cash generated from operations tend to achieve higher returns on equity, highlighting the importance of efficient core business operations in enhancing shareholder value. Similarly, the cash conversion cycle (CCC) exhibits a positive and statistically significant relationship with ROE (coefficient = 0.000263, $p = 0.0327$), implying that an efficient management of the time between cash outflows and inflows positively contributes to profitability.

In contrast, accounts receivable turnover (ART) shows a negative but statistically insignificant effect on ROE (coefficient = -0.000331, $p = 0.6912$), suggesting that variations in receivables collection do not have a strong or meaningful impact on the firms' profitability in this sample. Accounts payable turnover (APT) has a negative and statistically significant effect on ROE (coefficient = -0.004133, $p = 0.0035$), indicating that firms taking longer to settle payables may reduce profitability, possibly due to missed opportunities for discounts or strained supplier relationships. Inventory turnover (IT) is positively and highly significantly associated with ROE (coefficient = 0.007098, $p = 0.0000$), showing that efficient management of inventory enhances profitability by ensuring optimal stock levels and reducing holding costs. The constant term (C) is positive and highly significant (coefficient = 0.060425, $p = 0.0000$), suggesting that in the absence of the explanatory variables, the baseline ROE would be about 6%, providing a reference level for expected shareholder returns.

The model demonstrates extremely strong explanatory power, with an R-squared of 0.9951 and an adjusted R-squared of 0.9946, indicating that over 99% of the variation in ROE is explained by the included cash flow management variables. The F-statistic of 1999.38 ($p = 0.0000$) confirms that the overall model is statistically significant, showing that the variables collectively have a strong predictive effect on profitability. The Durbin-Watson statistic of 1.589 suggests slight positive autocorrelation in the residuals, but it is not severe enough to undermine the validity of the regression results.

Test of Hypotheses

Test of Hypothesis One

Restatement of the Hypothesis in Null and Alternate forms:

H_{01} : Operating cash flow (OCF) has no significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

H_{a1} : Operating cash flow (OCF) has a significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

From the regression result, the coefficient of OCF is 0.000445 with a t-statistic of 13.16876 and a p-value of 0.0000, which is less than 0.05.

Therefore, H_{01} is rejected, and the alternate hypothesis is accepted. This implies that operating cash flow has a significant positive effect on the ROE of Nigerian healthcare firms during the study period.

Test of Hypothesis Two

Restatement of the Hypothesis in Null and Alternate forms:

H_{02} : Cash conversion cycle (CCC) has no significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

H_{a2} : Cash conversion cycle (CCC) has a significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

The coefficient of CCC is 0.000263 with a t-statistic of 2.198670 and a p-value of 0.0327, which is less than 0.05.

Hence, H_{02} is rejected, and the alternate hypothesis is accepted. This indicates that the cash conversion cycle has a significant positive effect on the ROE of Nigerian healthcare firms.

Test of Hypothesis Three

Restatement of the Hypothesis in Null and Alternate forms:

H_{03} : Accounts receivable turnover (ART) has no significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

H_{a3} : Accounts receivable turnover (ART) has a significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

The coefficient of ART is -0.000331 with a t-statistic of -0.399557 and a p-value of 0.6912, which is greater than 0.05.

Therefore, H_{03} is accepted, and the alternate hypothesis is rejected. This implies that accounts receivable turnover does not have a significant effect on the ROE of Nigerian healthcare firms during the study period.

Test of Hypothesis Four

Restatement of the Hypothesis in Null and Alternate forms:

H_{04} : Accounts payable turnover (APT) has no significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

H_{a4} : Accounts payable turnover (APT) has a significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

The coefficient of APT is -0.004133 with a t-statistic of -3.071968 and a p-value of 0.0035, which is less than 0.05.

Thus, H_{04} is rejected, and the alternate hypothesis is accepted. This suggests that accounts payable turnover has a significant negative effect on the ROE of Nigerian healthcare firms.

Test of Hypothesis Five

Restatement of the Hypothesis in Null and Alternate forms:

H_{05} : Inventory turnover (IT) has no significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

H_{a5} : Inventory turnover (IT) has a significant effect on the Return on Equity (ROE) of Nigerian healthcare firms.

Statement of Decision Rule:

Reject the null hypothesis (H_0) if the p-value of the t-statistic is less than 0.05. Otherwise, accept the null hypothesis and reject the alternate hypothesis.

Decision:

The coefficient of IT is 0.007098 with a t-statistic of 5.919760 and a p-value of 0.0000, which is less than 0.05.

Therefore, H_{05} is rejected, and the alternate hypothesis is accepted. This indicates that inventory turnover has a significant positive effect on the ROE of Nigerian healthcare firms during the study period.

Summary of Findings, Conclusion and Recommendations

Summary of Findings

The key findings of the study are elucidated below:

- i. Operating cash flow demonstrated a positive and statistically significant effect on ROE, with a coefficient of 0.000445 ($t = 13.16876$, $p = 0.0000$). This indicates that Nigerian healthcare firms with higher cash inflows from core operations tend to generate higher returns for shareholders. The result highlights the critical role of effective cash flow planning and monitoring in ensuring that the firm can meet its obligations and invest in profitable opportunities.
- ii. The cash conversion cycle had a positive and statistically significant impact on ROE, with a coefficient of 0.000263 ($t = 2.198670$, $p = 0.0327$). This suggests that firms that efficiently manage the timing of their receivables, payables, and inventory can enhance profitability. A shorter and well-optimized CCC improves liquidity and operational efficiency, allowing firms to reinvest cash in revenue-generating activities more quickly.
- iii. Accounts receivable turnover exhibited a negative and statistically insignificant effect on ROE, with a coefficient of -0.000331 ($t = -0.399557$, $p = 0.6912$). This implies that, in this sample of healthcare firms, the efficiency of collecting receivables does not significantly determine profitability. It may indicate that

other factors, such as cash management and inventory efficiency, play a more dominant role in driving returns.

- iv. Accounts payable turnover showed a negative and statistically significant effect on ROE, with a coefficient of -0.004133 ($t = -3.071968$, $p = 0.0035$). This finding suggests that while timely settlement of payables is necessary to maintain supplier relationships, overly fast repayment may reduce cash availability, thereby adversely affecting firm profitability. Firms need to strategically manage payables to balance supplier trust with liquidity maintenance.
- v. Inventory turnover had a positive and statistically significant effect on ROE, with a coefficient of 0.007098 ($t = 5.919760$, $p = 0.0000$). This demonstrates that healthcare firms that efficiently manage their stock levels, avoid overstocking, and ensure timely availability of products can significantly enhance profitability. Effective inventory management reduces holding costs, minimizes wastage, and supports continuous revenue generation.

Conclusion

The study found that operating cash flow, cash conversion cycle, and inventory turnover positively and significantly influence the Return on Equity (ROE) of Nigerian healthcare firms, emphasizing the importance of efficient working capital and cash management practices. In contrast, accounts receivable turnover does not significantly affect profitability, while accounts payable turnover has a significant negative impact.

These findings reinforce the notion that profitability in healthcare firms is strongly linked to effective cash flow management, timely inventory control, and strategic coordination of receivables and payables. However, not all financial efficiency measures uniformly contribute to performance, suggesting that firms must consider sector-specific operational dynamics and broader economic conditions when designing financial strategies.

The results imply that while financial metrics are useful indicators of performance, they alone cannot fully explain profitability outcomes. Firms need a holistic approach that integrates operational efficiency, strategic financial management, and contextual considerations to achieve sustainable profitability.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

- i. Healthcare firms should strengthen cash flow planning, monitoring, and forecasting to ensure sufficient liquidity for daily operations, debt servicing, and strategic investments. Implementing real-time cash tracking tools can improve financial responsiveness.
- ii. Firms should actively manage the timing of cash inflows and outflows to shorten the CCC. This includes prompt collection of receivables, efficient payment scheduling, and aligning inventory turnover with demand patterns to improve profitability.
- iii. Although accounts receivable turnover was not statistically significant, firms should still implement credit control measures such as clear credit policies, prompt invoicing, and automated follow-ups to reduce the risk of bad debts and improve cash availability.
- iv. The negative effect of accounts payable turnover suggests the need for balanced management of payables. Firms should negotiate favorable credit terms with suppliers, avoid premature payments, and maintain sufficient liquidity to optimize profitability while sustaining supplier relationships.

- v. Efficient inventory control was found to positively influence ROE. Healthcare firms should adopt demand forecasting, just-in-time inventory practices, and regular stock audits to minimize holding costs and prevent stockouts, thereby supporting operational efficiency and profitability.

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