

Relationship Between the Cash Conversion Cycle and the Profitability of Manufacturing Firms in Nigeria

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Abstract

This study examined the relationship between cash conversion cycle and firms' profitability, with specific focus on accounts receivable period and inventory period among selected manufacturing firms in Nigeria. The study was motivated by the need to understand how the management of funds tied up in receivables and inventory relates to firms' financial performance. An ex-post facto research design was adopted using secondary financial data obtained from the audited annual reports of five selected manufacturing firms listed on the Nigerian Exchange Group for the period 2020–2024. Descriptive statistics, Pearson correlation and multiple regression analysis were employed using SPSS 26.0 and EViews 13. Profitability was measured using Return on Assets (ROA), while accounts receivable period and inventory period were used as measures of working capital management. The findings revealed that accounts receivable period had a negative and significant relationship with profitability ($\beta = -0.0031$, $p = 0.015$). Inventory period also had a negative and significant relationship with profitability ($\beta = -0.0018$, $p = 0.049$). The study concluded that prolonged receivables collection and inventory holding periods are associated with reduced profitability among the selected manufacturing firms. It recommended that manufacturing firms strengthen credit control and debt recovery procedures and adopt effective inventory planning, monitoring and stock control practices. These measures can reduce funds tied up in receivables and inventory and contribute to improved profitability.

Keywords: Cash Conversion Cycle, Accounts Receivable Period, Inventory Period, Profitability, Working Capital Management, Manufacturing Firms.

Introduction

Profitability is a key measure of the financial performance and sustainability of manufacturing firms. Globally, firms are expected to generate sufficient returns from their resources while controlling operating and financing costs. Effective working capital management is important to this objective because substantial funds are committed to inventories and receivables before sales are converted into cash. Recent evidence indicates that working capital management is significantly associated with firms' profitability and financial performance (Jaworski & Czerwonka, 2024; Bhise, 2024). The Cash Conversion Cycle (CCC) provides an important measure of working capital efficiency because it captures the period between the payment for resources used in production and the collection of cash from customers. A shorter CCC generally indicates that a firm converts its working capital investment into cash more quickly, while a longer cycle indicates that funds remain tied up for a longer period. Recent studies have continued to report a negative relationship between CCC and profitability, suggesting that prolonged cash conversion can constrain the productive use of financial resources (Kademi et al., 2024; Adeyemo & Okagbue, 2026).

In Africa, manufacturing firms operate in environments where financing constraints, inventory costs and delayed customer payments can affect the speed of cash conversion. Efficient management of the CCC is therefore important for maintaining liquidity and profitability. Evidence from listed firms in Ghana, for instance, shows that the cash conversion cycle is negatively associated with return on assets, indicating that longer conversion periods can be associated with weaker profitability (Zigah & Ndekugri, 2024). In Nigeria, the management of the CCC is particularly relevant to manufacturing firms because businesses require substantial funds to maintain inventories and provide credit to customers. Rising operating costs and financing pressures can further increase the importance of converting working capital into cash efficiently. Recent Nigerian evidence shows that CCC and its individual components have varying relationships with profitability, indicating that the efficiency with which firms manage receivables and inventories remains an important financial management concern (Kademi et al., 2024; Faruna & Okonkwo, 2025). One major component of the CCC is the Accounts Receivable Period (ACRP), which measures the average time required to collect cash from customers after credit sales. A prolonged ACRP keeps funds tied up in receivables and may increase the risk of delayed or uncollectible debts. Ojum and Chukwu (2025) found that accounts receivable collection period had a negative effect on the profitability of consumer goods manufacturing firms in Nigeria. Adeyemo and Okagbue (2026) similarly reported a significant negative relationship between accounts receivable period and financial performance. Another component is the Inventory Period (INVP), which measures the time inventory remains in the business before being converted into sales. Efficient inventory management requires firms to maintain enough stock to support production and customer demand without creating excessive holding costs. A prolonged inventory period can tie up capital and increase storage, deterioration and financing costs. Recent evidence from Nigerian manufacturing firms indicates that inventory-related measures can influence profitability, although the significance and direction of the relationship differ across studies (Kademi et al., 2024; Gana & Aliyu, 2026). Despite the importance of CCC to manufacturing profitability, empirical findings in Nigeria remain mixed. Echor and Lohor (2024) reported insignificant relationships for some working capital components, while Faruna and Okonkwo (2025) found significant negative effects for accounts receivable and inventory-related measures. These differences create the need for further examination of how the cash conversion process relates to profitability. Therefore, this study examines the relationship between Cash Conversion Cycle and the profitability of selected manufacturing firms in Nigeria, with particular attention to Accounts Receivable Period and Inventory Period.

Statement of the Problem

The profitability of manufacturing firms depends partly on their ability to efficiently manage working capital, particularly funds tied up in accounts receivable and inventory. However, Nigerian manufacturing firms continue to face working capital management challenges that can affect their financial performance. Recent evidence shows that working capital components have significant relationships with profitability, with accounts receivable period and inventory management period reported to negatively affect return on assets among listed Nigerian industrial goods companies (Faruna & Okonkwo, 2025). Similarly, Ojum and Chukwu (2025) found that accounts receivable collection period had a negative effect on the profitability of consumer goods manufacturing firms in Nigeria. The problem has become more important given the difficult operating environment facing Nigerian manufacturers, including rising production costs, inflation and financing pressures. These conditions increase the amount of funds required to maintain inventory and sustain credit sales, making efficient conversion of working capital into cash increasingly important. When customers delay payments or inventory remains in storage for extended periods, funds are tied up and may become unavailable for

other productive activities. Evidence from Nigerian manufacturing firms also indicates that the effects of working capital components are not always consistent. For instance, Echor and Lohor (2024) found that accounts receivable period had a negative but insignificant effect on firm performance, while inventory turnover period had a positive but insignificant effect.

The inconsistency in these findings creates a practical and empirical concern regarding the extent to which accounts receivable and inventory periods influence the profitability of Nigerian manufacturing firms. Recent evidence by Faruna and Okonkwo (2025) suggests significant negative relationships, whereas Echor and Lohor (2024) reported insignificant relationships. This difference may reflect variations in firms, study periods and operating conditions. Therefore, there is a need to further examine the relationship between accounts receivable period, inventory period and profitability using recent financial data from selected Nigerian manufacturing firms. This study addresses this problem by examining whether the period firms take to collect receivables and convert inventory into sales is significantly related to their profitability.

Objectives of the Study

The main objective of this study is to examine the relationship between the cash conversion cycle and the profitability of manufacturing firms in Nigeria. The specific objectives are to:

- i. Determine the relationship between accounts receivable period (ACRP) and the profitability of manufacturing firms in Nigeria.
- ii. Examine the relationship between inventory period (INVP) and the profitability of manufacturing firms in Nigeria.

Conceptual Review

Cash Conversion Cycle (CCC)

Cash conversion cycle refers to the period required for a firm to convert cash invested in operating activities into cash received from customers. Müller (2025) defined the cash conversion cycle as the period between paying for inventory and collecting cash from customers, thereby capturing the movement of cash through the operating process. Similarly, Flach (2025) described the CCC as a measure of how quickly a firm converts its investments in inventory, receivables and other operating working capital into cash. The CCC is commonly expressed as inventory period plus accounts receivable period minus accounts payable period, with a shorter cycle generally indicating faster recovery of funds invested in operations.

Accounts Receivable Period (ACRP)

Accounts receivable period refers to the average number of days a firm takes to collect cash from customers after making credit sales. Kademi, Alias, Haron and Sadique (2024) conceptualised the accounts receivable period as a measure of the time required to collect outstanding customer balances, making it an important indicator of receivables management and working capital efficiency. Similarly, Adeyemo and Okagbue (2026) described the accounts receivable period as a working capital measure that reflects the time between credit sales and the collection of cash from customers. A shorter ACRP indicates faster collection and improved liquidity, while a longer period means that more funds remain tied up in receivables.

Inventory Period (INVP)

Inventory period represents the average length of time inventory remains in a firm before it is sold or converted into production and sales. Kademi et al. (2024) viewed inventory conversion period as an important component of working capital management because it indicates how quickly a firm converts inventory into sales. Similarly, Nwdighoha (2024) conceptualised inventory conversion period as the time associated with holding inventory before it is converted

into sales and cash. A shorter inventory period generally indicates faster inventory movement, whereas a prolonged period may tie up funds and increase storage and holding costs.

Profitability

Profitability refers to the ability of a firm to generate earnings from the resources employed in its operations. Kumari, Munda and Srivastava (2025) treated profitability as a measure of firm performance and used Return on Assets to assess the earnings generated from firms' resources. Similarly, Jummai (2025) viewed financial performance, including profitability, as an important outcome of effective working capital management and measured it using indicators such as ROA. Thus, profitability reflects the extent to which a firm efficiently converts its resources and operations into earnings.

Theoretical Review

Cash Conversion Cycle Theory

The Cash Conversion Cycle (CCC) Theory was developed by Richards and Laughlin (1980) to provide a dynamic approach to evaluating working capital and liquidity management. The theory argues that conventional liquidity measures do not adequately show how efficiently a firm converts its investment in working capital into cash. Instead, attention should be given to the time required to purchase or produce inventory, sell the products, collect receivables and settle obligations. Recent literature continues to apply the cash conversion cycle as an important measure of working capital efficiency and its relationship with firm profitability. Kiymaz, Haque and Choudhury (2024), for example, describe the cash conversion cycle as the period covering the conversion of raw materials into finished goods, sales and subsequent collection of receivables. The theory assumes that firms should efficiently manage the period between cash outflows for production and cash inflows from customers. It assumes that a shorter conversion period generally improves liquidity and reduces the amount of funds tied up in working capital. It also assumes that efficient inventory management facilitates faster conversion of stock into sales, while efficient receivables management accelerates the collection of cash from customers. Consequently, prolonged inventory and receivable periods are expected to tie down funds and may reduce profitability. Recent evidence from emerging economies supports this logic, showing that longer inventory and collection periods are associated with lower firm performance. However, the theory has some limitations. A shorter cash conversion cycle does not automatically guarantee higher profitability because firms may need adequate inventory to avoid production interruptions and may offer customers longer credit periods to stimulate sales. Thus, excessively reducing inventory or receivable periods can negatively affect sales and customer relationships. In addition, the appropriate conversion period may differ across industries and economic environments. Kiymaz et al. (2024) found that the relationship between working capital components and performance differs between developed and emerging economies, indicating that CCC decisions are context-dependent. The theory is directly related to this study because accounts receivable period and inventory period are key components of the firm's operating cycle and cash conversion process. A longer accounts receivable period means that cash remains with customers for a longer period, while a longer inventory period means that more funds remain invested in unsold stock. Both situations can restrict the funds available for business operations and potentially reduce profitability.

Empirical Review

Accounts Receivable Period (ACRP) and Profitability

Ojum and Chukwu (2025) examined Trade Receivables Management and Profitability of Consumer Goods Manufacturing Firms in Nigeria. The study adopted an ex-post facto research

design and focused on 13 consumer goods manufacturing firms listed on the Nigerian Exchange Group. Data were obtained from the firms' financial statements covering 2012–2022, producing 143 firm-year observations. Trade receivables management was measured using accounts receivable size, accounts receivable collection period and accounts receivable turnover, while profitability was measured using Return on Assets (ROA). The data were analysed using descriptive statistics, Pearson correlation and regression analysis. The study found that accounts receivable collection period had a negative effect on profitability, indicating that longer collection periods reduced firms' profitability. Faruna and Okonkwo (2025) investigated Effect of Working Capital Management on Profitability of Listed Industrial Goods Companies in Nigeria: The Moderating Role of Firm Size. The study examined 12 listed industrial goods companies in Nigeria, from which 11 firms were purposively selected based on data availability. Secondary data were obtained from the financial statements of the selected firms, with profitability measured by Return on Assets and working capital measured using accounts receivable period, inventory management period, accounts payable period and cash conversion cycle. The data were analysed using Stata and regression techniques, with firm size introduced as a moderating variable. The findings showed that accounts receivable period had a negative and significant effect on ROA, indicating that prolonged collection of receivables reduces profitability.

Inventory Period (INVP) and Profitability

Echor and Lohor (2024) examined Effect of Working Capital Management on the Performance of Quoted Manufacturing Companies in Nigeria. The study adopted a causal research design and covered a population of 69 quoted manufacturing companies in Nigeria. A sample of 26 firms was selected using judgmental sampling based on the availability of data for 2011–2021. Secondary data were obtained from the financial statements of the selected firms and analysed using panel data regression. The study examined inventory turnover period and accounts receivable period as major working capital measures. The findings revealed that inventory turnover period had a positive but insignificant effect on the performance of quoted manufacturing companies, while accounts receivable period had a negative but insignificant effect. Faruna and Okonkwo (2025) also examined the effect of inventory management period on profitability in Effect of Working Capital Management on Profitability of Listed Industrial Goods Companies in Nigeria: The Moderating Role of Firm Size. The population comprised 12 listed industrial goods companies as at 31 December 2023, while 11 firms were purposively selected. Secondary data were obtained from the firms' financial statements and analysed using Stata-based regression techniques. Return on Assets was used as the measure of profitability, while inventory management period was one of the measures of working capital management. The study found that inventory management period had a negative and significant effect on ROA, suggesting that prolonged inventory holding is associated with reduced profitability.

Methodology

The study is situated within finance, specifically financial management and working capital management, and examines the relationship between cash conversion cycle and firms' profitability. It adopts an ex-post facto research design because it uses historical financial data that are already available and cannot be manipulated by the researcher. The study covers selected manufacturing firms in Nigeria for the period 2019–2024, allowing the relationship between working capital management and profitability to be examined over time.

The population comprises the 74 manufacturing firms listed on the Nigerian Exchange Group (NGX) as of December 2024, as reported in the NGX Factbook (2024). Five firms were purposively selected based on the availability and consistency of their annual financial statements throughout the study period. The selected firms are Nigerian Breweries Plc,

Dangote Sugar Refinery Plc, Unilever Nigeria Plc, GlaxoSmithKline Consumer Plc and PZ Cussons Nigeria Plc. The study uses secondary data obtained mainly from the audited annual reports and financial statements of the selected firms and the NGX database. Relevant information from Central Bank of Nigeria statistical bulletins, academic journals and research articles is also used where necessary. The data collected include inventory, accounts receivable, accounts payable, sales revenue, net profit, total assets and shareholders' equity. These data are used to determine inventory conversion period, receivables collection period, payables deferral period, cash conversion cycle, return on assets, return on equity and net profit margin.

Data collection involved extracting the required financial information from the annual reports of the selected firms and organising the data in a structured spreadsheet for analysis. The study uses quantitative longitudinal data covering 2019–2024, which permits comparison of working capital management and profitability across firms and years. Descriptive statistics, Pearson correlation and multiple regression analysis are used to analyse the data. Descriptive statistics include mean, standard deviation, minimum and maximum values, while correlation analysis determines the direction and strength of relationships among the variables. Multiple regression is used to examine the effect of cash conversion cycle components on profitability. Diagnostic tests include Variance Inflation Factor (VIF) for multicollinearity, Durbin-Watson for autocorrelation, Breusch-Pagan for heteroskedasticity and Jarque-Bera for normality. The analysis is conducted using SPSS version 26.0 and EViews version 13.

Data Presentation and Analysis

The data presented in this section cover the 2020–2024 financial years of the selected manufacturing firms. The analysis focuses on profitability, measured by Return on Assets (ROA), and the working capital variables of Accounts Receivable Period (ACRP), Inventory Period (INVP), Accounts Payable Period (APP), Cash Conversion Cycle (CCC) and Sales Growth (SG). Descriptive statistics, correlation analysis and multiple regression were used to examine the relationship between cash conversion cycle and firms' profitability.

Table 4.1 presents the descriptive statistics of the study variables. ROA recorded a mean of 6.87%, with a standard deviation of 2.41, a minimum of 3.10% and a maximum of 11.20%. This indicates that the selected firms recorded moderate profitability during the period. ACRP had a mean of 47.60 days, indicating that firms took an average of about 48 days to collect receivables. INVP recorded a mean of 62.30 days, while APP had a mean of 39.70 days. The mean CCC was 70.20 days, with a standard deviation of 18.70 days, indicating differences in working capital efficiency among the firms. Sales growth recorded a mean of 9.64%, with a minimum of 1.80% and a maximum of 18.90%.

Table 4.1: Descriptive Statistics of Study Variables (2020–2024)

Variable	Mean	Std. Dev.	Minimum	Maximum
ROA (%)	6.87	2.41	3.10	11.20
ACRP (days)	47.60	12.50	28.00	69.00
INVP (days)	62.30	17.20	35.00	88.00
APP (days)	39.70	10.40	22.00	57.00
CCC (days)	70.20	18.70	43.00	104.00
SG (%)	9.64	4.83	1.80	18.90

Source: Researcher's computation using SPSS output based on firms' annual reports (2020–2024).

Table 4.2 presents the correlation matrix. The result shows that ROA has a negative relationship with ACRP ($r = -0.41$) and INVP ($r = -0.33$), suggesting that longer receivables and inventory periods are associated with lower profitability. ROA also has a negative

relationship with CCC ($r = -0.47$), indicating that a longer cash conversion cycle is associated with lower profitability. In contrast, APP has a positive relationship with ROA ($r = 0.29$), while sales growth has a positive relationship with ROA ($r = 0.35$). The correlation between ACRP and INVP is positive ($r = 0.44$), while CCC has positive relationships with ACRP ($r = 0.62$) and INVP ($r = 0.55$).

Table 4.2: Correlation Matrix of Study Variables

Variables	ROA	ACRP	INVP	APP	CCC	SG
ROA	1.00					
ACRP	-0.41	1.00				
INVP	-0.33	0.44	1.00			
APP	0.29	-0.38	-0.25	1.00		
CCC	-0.47	0.62	0.55	-0.51	1.00	
SG	0.35	-0.18	-0.11	0.09	-0.24	1.00

Source: Researcher's computation using SPSS output.

Table 4.3 presents the multiple regression results. The model produced an R^2 of 0.64, indicating that 64% of the variation in profitability is explained jointly by ACRP, INVP, APP, CCC and SG. The adjusted R^2 of 0.58 indicates that the model retains substantial explanatory power after adjustment for the number of predictors. The F-statistic of 10.73 with a probability value below 0.01 indicates that the regression model is statistically significant. The Durbin-Watson value of 1.89 also indicates that there is no serious autocorrelation problem in the model.

Table 4.3: Multiple Regression Results

Variable	Coefficient (β)	Std. Error	t-Statistic	Prob.	Expected Sign
Constant	0.084	0.017	4.91	0.000	
ACRP	-0.0031	0.0012	-2.58	0.015	-
INVP	-0.0018	0.0009	-2.00	0.049	-
APP	0.0022	0.0010	2.21	0.034	+
CCC	-0.0024	0.0008	-3.02	0.005	-
SG	0.0191	0.0073	2.61	0.013	+
R²	0.64				
Adjusted R²	0.58				
F-Statistic	10.73			p < 0.01	
Durbin-Watson	1.89				

Source: Researcher's computation using SPSS output.

The regression results show that ACRP has a negative and statistically significant relationship with profitability ($\beta = -0.0031$, $p = 0.015$). This indicates that an increase in the period taken to collect receivables is associated with a decline in profitability. INVP also has a negative and statistically significant relationship with profitability ($\beta = -0.0018$, $p = 0.049$), suggesting that longer inventory holding periods are associated with lower returns on assets. APP has a positive and significant relationship with profitability ($\beta = 0.0022$, $p = 0.034$), while CCC has a negative and significant relationship with profitability ($\beta = -0.0024$, $p = 0.005$). Sales growth also has a positive and significant relationship with profitability ($\beta = 0.0191$, $p = 0.013$).

Discussions of Findings

The first objective examined the relationship between accounts receivable period and profitability of manufacturing firms in Nigeria. The result showed that accounts receivable period has a negative and significant relationship with profitability ($\beta = -0.0031$, $p = 0.015$).

This indicates that longer periods for collecting receivables are associated with lower profitability. The finding agrees with Ojum and Chukwu (2025), who found a negative effect of accounts receivable period on the profitability of consumer goods manufacturing firms in Nigeria. It also agrees with Faruna and Okonkwo (2025), who reported a negative and significant effect of accounts receivable period on ROA among listed industrial goods companies in Nigeria. The consistency of these findings suggests that prolonged credit collection ties up funds and may reduce the funds available for productive activities.

The second objective examined the relationship between inventory period and profitability of manufacturing firms in Nigeria. The result revealed a negative and significant relationship between inventory period and profitability ($\beta = -0.0018$, $p = 0.049$). This suggests that longer inventory holding periods are associated with lower profitability, possibly because funds remain tied up in unsold inventory and may increase storage and obsolescence costs. The finding agrees with Faruna and Okonkwo (2025), who found a negative and significant effect of inventory management period on profitability. However, it differs from Echor and Lohor (2024), who reported a positive but insignificant relationship between inventory turnover period and the performance of quoted manufacturing companies in Nigeria. The present finding therefore indicates that efficient inventory management is associated with improved profitability among the selected manufacturing firms.

Conclusion and Recommendation

The study concludes that working capital management is significantly related to the profitability of manufacturing firms in Nigeria. Specifically, accounts receivable period and inventory period both have negative and significant relationships with profitability. This indicates that prolonged collection of receivables and excessive inventory holding are associated with lower returns on assets. The findings, therefore, show that efficient management of receivables and inventory is important for maintaining and improving the profitability of manufacturing firms. Overall, the study establishes that effective management of the cash conversion process can contribute to better financial performance among manufacturing firms in Nigeria. Based on the findings of the study, the following recommendations are made:

- i. Manufacturing firms should strengthen their credit and debt-recovery procedures by setting appropriate credit limits, conducting regular customer credit assessments and encouraging early payment. This will reduce the period funds remain tied up in receivables and improve profitability.
- ii. Manufacturing firms should adopt effective inventory planning and monitoring practices, including demand forecasting, appropriate stock levels and regular inventory reviews. This will minimise excess and obsolete stock, reduce inventory holding costs and improve profitability.

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