



## Research Article

Volume-02|Issue-02|2022

## A Panel Study of Working Capital Management and Financial Performance of Nigeria's Manufacturing Sector

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## Article History

Received: 10.03.2022

Accepted: 15.04.2022

Published: 30.04.2022

## Citation

Ogunlade, O., Oseni, M., & Adeyemi, M. A. (2022). A Panel Study of Working Capital Management and Financial Performance of Nigeria's Manufacturing Sector. *Indiana Journal of Economics and Business Management*, 2(2), 14-19

**Abstract:** The pivotal role of the manufacturing sector in the sustainable growth and development across the globe through employment generation and poverty alleviation. However, the sector has been abated financially due to the poor management of working capital. This study, therefore, seeks to examine the effect of working capital management on financial performance with particular reference to Lafarge Africa-Cement Plc. The secondary data was used from the audited financial statements of Lafarge Africa Plc- Cement, for the period of the year 2011 – 2020. The method of analysis used as mean standard deviation and ordinary least square method of estimation. The study establishes that working capital management parameters jointly contribute to financial performance. It was further revealed that inventory conversion period (ICP) and cash conversion cycle (CCC) has a positive impact on financial performance but insignificant, while debtor conversion period (DCP) has a negative but insignificant relationship with financial performance, and Creditors' Conversion Period (CCP) has no relationship with financial performance. Subsequently, the study recommends that the inventory conversion period should be reduced while the accounts payable period should be elongated. This will go a long way to enhance financial performance and maximize returns to shareholders.

**Keywords:** Working Capital, Cash Conversion, Debtor Conversion, Inventory Conversion, Manufacturing.

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## INTRODUCTION

The pivotal role of the manufacturing sector in sustainable growth and development across the globe cannot be underestimated. According to Oyedele *et al.* (2017), the manufacturing sector contributes significantly to economic growth and sustainable development through employment generation and poverty alleviation globally. However, the sector has been abated financially due to the poor management of working capital coupled with COVID-19's plague. Eya (2016) evident that over one thousand companies across the globe lose about \$2 billion per year due to poor working capital management. In the same perception, Aifuwa *et al.* (2020) reveals that over 60% of business organizations have experienced financial crunch due to ineffective working capital management coupled with the effect of COVID-19. As a result of this unpalatable scenario, many manufacturing companies in Nigeria have moribund, some have left the country to other Africa countries for their survival while surviving ones in the country are still thinking of mergers and acquisitions due to liquidity problem syndrome (Oyedele *et al.*, 2017).

Working capital management has been well researched and conceptualized in different ways in both developed and merging economies and its contributions

to a firm's growth have been documented in the financial management literature. Working capital management plays a vital role as it affects directly the profitability and liquidity of the firm. Harris, A. (2005) is of opinion that excess of current assets in a firm reduces the profitability whereas shortage of current assets enhances the probability of insolvency. The study of Eljelly (2004) argues that an organization can make the best possible investment in current assets and pay off its obligations timely if working capital management is effectively managed. Eya (2016) views working capital as the capital locked up in materials, work in progress, finished goods, receivables, and cash and cash equivalent. Abuzayed (2012) also sees working capital management as a planning process for the acquisition and usage of short term assets and liabilities. Working capital, therefore, is the flow of readily available funds necessary required for continuous operations of an enterprise to maintain its liquidity, solvency, and profitability.

Prior studies such as Yakubu *et al.* (2020); Oladimeji & Aladejebi (2020); Oko *et al.* (2020); Mabandla (2018); Oseifuah (2018); Oyedele *et al.* (2017); & Kiptoo *et al.* (2017) have established the extent to which working capital management influenced organizational profitability in Small and Medium Enterprises and selected manufacturing companies in Nigeria. However, to the best knowledge of researchers,

no study has been carried out to examine the extent to which working capital management influences organizational performance in Nigeria's Cement industry. Academically, there is a gap in looking at working capital management and organizational performance at the Cement industry level. This study justifies the need to address this contemporary gap in the literature and to grant pointers on how to enhance the financial performance of Cement industry SMEs via effective working capital management.

### Specific Objectives

The specific objectives are to:

- Examine the effect of Inventory Conversion Period (ICP) on financial performance.
- Determine the effect of Debtors' Conversion Period (DCP) on financial performance.
- Assess the effect of Creditors' Conversion Period (CCP) on financial performance.
- Examine the effect of Cash Conversion Cycle (CCC) on financial performance.

## LITERATURE REVIEW

### Working Capital Management

Working capital is popularly known as short-term or current assets used for daily operations by a firm. No organization can meet its financial obligation without effective working capital. Working capital is a measure of a firm's liquidity, operational efficiency, and short-term financial status. If a company has substantial positive working capital, then it should have the potential to invest and grow (Yakubu *et al.*, 2020). According to Nazir & Afza (2009), working capital is the items that are required for the day-to-day production of goods to be sold by a company. Eya (2016) views working capital as the funds locked up in materials, work in progress, finished goods, receivables, and cash and cash equivalent. Van Horne & Wachowicz (2004) state that cash, debtors, receivables, inventories, marketable securities, and redeemable futures are components of an organization's working capital. Similarly, Brealey & Myers (1996) is of opinion that the components of working capital consist of current assets and liabilities. Current assets constitute cash, marketable securities, accounts receivable, inventories, and other short-term assets. While current liabilities components are short term loans, accounts payable, accrued income taxes, current payments due on long term debt, and other short term liabilities (Sanusi, 2006).

According to Makori & Jagongo (2013), the concept of working capital management addresses companies' managing of their short-term capital and the goal of the management of working capital is to promote satisfying liquidity, profitability, and shareholders' value. Working capital management is the ability to control effectively and efficiently the current assets and current liabilities in a manner that provides the firm with maximum return on its assets and minimizes payments for its liabilities. Makori & Jagongo (2013) reaffirm that

the efficient management of working capital plays an important role in overall corporate strategy in order to create shareholder value.

### Empirical Review and Hypothesis Formulation

A plethora of studies have been carried out to examine the relationship between working capital management and financial performance in both developed and emerging economies but their results are conflicting and inconclusive. Some established a positive relationship, some reported a negative relationship while some confirmed that there is a relationship between the variables. For instance, Oko *et al.* (2020) carried out a study on the effect of working capital management policies and the performance of selected manufacturing firms for the periods 2015 – 2019. They find out that there is a significant effect of aggressive investment policy on firms' financial performance. Yakubu *et al.* (2020) also examine the impact of Working Capital Management on the Financial performance of 10 selected quoted firms in Nigeria for a period of seven (11) years from 2009 to 2019 based on purposeful sampling technique. The study reveals that Cash Conversion Cycle showed a positive significant impact on the financial performance of selected quoted firms in Nigeria while Debt Equity Ratio and Inventory Conversion Period have no significant impact on the financial performance of selected quoted firms in Nigeria.

In another study conducted by Oladimeji & Aladejebi (2020), they examine the impact of working capital management on the profitability of SMEs in Nigeria. The finding indicates that for the period 2014 – 2018, there is no relationship between WCM and SME's profitability. In the same direction, a study conducted in South Africa by Mabandla (2018) on the relationship between working capital management and the financial performance of listed food and beverage companies reveals that working capital management has a positive relationship with financial performance. The study of Oseifuah (2018) also confirms a significant negative relationship between working capital and profitability. A similar study conducted in Kenya by Kiptoo *et al.* (2017) on the effect of working capital management practices on the financial performance of the tea processing firms indicates that inventory management has a negative significant relationship with financial performance. Another study carried out in Nigerian Breweries by Oyedele *et al.* (2017) on the effect of working capital management on financial performance shows that the cash conversion cycle has a negative and significant relationship with financial performance. The study also confirms that there is a negative but insignificant relationship between inventory conversion period (ICP), debtor conversion period (DCP), creditor conversion period (CCP), and financial performance.

Madugba & Ogbonnaya (2016) also investigate the impact of working capital management on financial performance of manufacturing companies in Nigeria.

The results reveal that the Average Payment Period and Average Collection Period impacts both Earnings per share and Return on capital employed. The study of Ojeani (2014) investigates the impact of working capital management on the profitability of Pharmaceutical firms listed on the Nigerian Stock Exchange market. The results reveal that working capital management measured by account receivables collection management, accounts payables management, inventory management, cash conversion cycle management, and operating cash flow management have a significant impact on profitability. Another study conducted by Salawu & Alao (2014) on the relationship between working capital management and the financial performance of selected quoted manufacturing companies in Nigeria, reveals that the average collection

period, the average payment period, are positively and significantly related to profitability; inventory turnover in days, cash conversion cycle are also significant but negatively related to profitability.

Based on the above conflicting empirical results, the following hypotheses emerged:

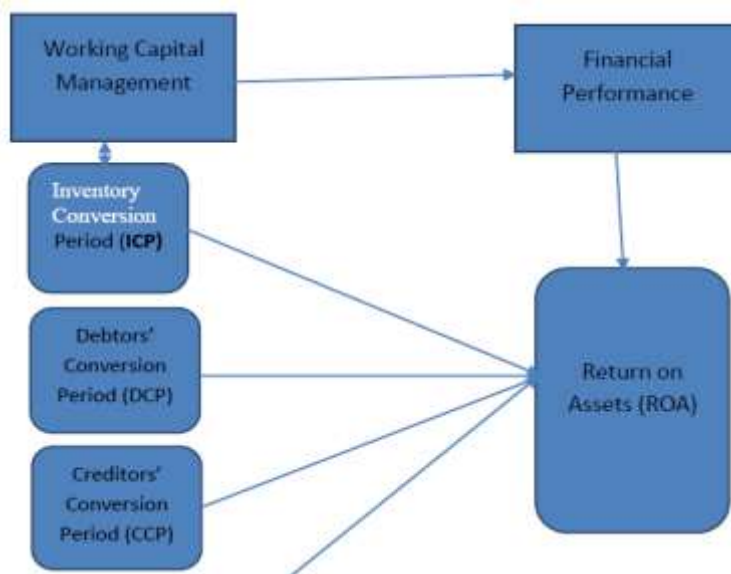
- H<sub>01</sub>:** Inventory Conversion Period (ICP) has no significant effect on financial performance.
- H<sub>02</sub>:** Debtors' Conversion Period (DCP) has no significant impact on financial performance.
- H<sub>03</sub>:** Creditors' Conversion Period (CCP) has no significant influence on financial performance.
- H<sub>04</sub>:** Cash Conversion Cycle (CCC) has no significant effect on financial performance.

**Table 1:** Measurement of Variables

| Variable                              | Definition  | Calculation  |
|---------------------------------------|---|--|
| Return on Assets (ROA)                | It is based on the relationship between the sales and total assets of a firm.                                     | $\frac{\text{Net Sales} \times 100}{\text{Total Assets}}$            |
| The Inventory Conversion Period (ICP) | ICP is the time required to convert inventory into cash.  | $\frac{\text{Average Stock Value} \times 365}{\text{Cost of Sales}}$ |
| Debtors' Conversion Period (DCP)      | DCP is the time required to collect the cash from debtors.  | $\frac{\text{Average Debtors} \times 365}{\text{Net Credit Sales}}$  |
| Creditors' Conversion Period (CCP)    | CCP is the length of time the firm is able to defer payments on various resource purchases                        | $\frac{\text{Average Creditors} \times 365}{\text{Cost of Sales}}$   |
| Cash Conversion Cycle (CCC)           | CCC is the length of time between a firm's purchase of inventory and the receipt of cash from accounts receivable | $\text{CCC} = \text{ICP} + \text{DCP} - \text{CCP}$                  |

Source: Oyedele *et al.* 2017

**Conceptual Model**



**Figure 1.** Conceptual Model

**Mathematical Model for the research variables**

$ROA = f( ICP, DCP, CCP, CCC )$   
 $ROA = \beta_0 + \beta_1( ICP) + \beta_2( DCP) + \beta_3( CCP) + \beta_4( CCC) + \mu_i$   
 Where:  
 ROA = Return on Assets  
 $\beta_0$  = Constant of the model

$\beta_1 - \beta_4$  = Coefficients of the model  
 ICP = Inventory Conversion Period  
 DCP = Debtors' Conversion Period  
 CCP = Creditors' Conversion Period  
 CCC = Cash Conversion Cycle  
 $\mu_i$  = error term

## METHODOLOGY

Secondary data was used for this study. It was adopted from the audited financial statements of Lafarge Africa Plc- Cement, for the period of the year 2011 – 2020. Most of the yearly reports that were inaccessible in the NSE fact book were obtained from the corporate office of Lafarge Africa Plc- Cement and also downloaded from its corporate website. Panel data was used since it incorporates time series and cross-sectional data. The method of analysis used as mean standard deviation and ordinary least square method of estimation.

The choice of these techniques was because of their ability to account for several predictive variables accurately (Oyedele *et al.*, 2017).

### Heteroskedasticity Test

To ascertain the reliability of the data used, the heteroskedasticity test was employed as a post-test tool. This test is basically on the variance of the error term. It helps to ascertain whether the variance of the error term is constant or not. Table 2 below shows the result of the test:

**Table 2:** Result of Heteroskedasticity Test

| Model      | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|------------|-----------------------------|------------|---------------------------|-------|------|
|            | B                           | Std. Error |                           |       |      |
| (Constant) | -.006                       | .015       |                           | -.394 | .761 |
| 1 ICP      | 5.960E-005                  | .000       | .142                      | .535  | .687 |
| DCP        | .000                        | .000       | .767                      | 4.236 | .148 |
| CCC        | 8.142E-005                  | .000       | .741                      | 3.049 | .202 |

a. Dependent Variable: AbsUt

From Table 2 above, p-values of ICP, DCP and CCC are 0.687, 0.148, and 0.202 respectively. The p-value for ICP, DCP and CCC is greater than 0.05. This indicates that there is no heteroskedasticity problem in the model (Astivia & Zumbo, 2019).

### Multicollinearity Test

A multicollinearity test was used to check if there is any inter-association among the working capital management dimensions (see Table 3). To analyze Multi-co linearity, two types of measurements can be used: Variation Inflation Factor (VIF) and Tolerance. The VIF measures the extent to which the variance of the

estimated regression coefficients are inflated as a result of being related to the other independent variables, and Tolerance is the amount of variability of the selected independent variables not explained by other independent variables. High degrees of Multi-co linearity can result in both regression coefficients being inaccurately estimated, and difficulties in separating the influence of the individual variables on the dependent variables. Any variables with a VIF value above (10) or with a value below (0.10) of Tolerance would have a correlation of more than 0.90 with other variables, indicative of the Multi-co linearity problem (Astivia & Zumbo, 2019).

**Table 3:** Result Of Multicollinearity Test

| Model      | Collinearity Statistics |       |
|------------|-------------------------|-------|
|            | Tolerance               | VIF   |
| (Constant) |                         |       |
| 1 ICP      | .329                    | 3.042 |
| DCP        | .706                    | 1.416 |
| CCC        | .393                    | 2.545 |

a. Dependent Variable: ROA

From Table 3, the VIF values for ICP, DCP and CCC are 3.042, 1.416, and 2.545 respectively. The VIF value for each variable is greater than 1 but less than 10.

This means there is no multicollinearity among the independent variables in the model.

**Table 4:** Descriptive Statistics

|     | N         | Minimum   | Maximum   | Mean      | Std. Deviation |
|-----|-----------|-----------|-----------|-----------|----------------|
|     | Statistic | Statistic | Statistic | Statistic | Statistic      |
| ROA | 10        | .16       | .28       | .2300     | .04690         |
| ICP | 10        | 88.60     | 140.90    | 114.6200  | 22.82383       |
| DCP | 10        | 28.55     | 89.00     | 67.6440   | 25.85487       |
| CCP | 10        | 117.00    | 395.00    | 227.3600  | 104.92020      |
| CCC | 10        | 58.00     | 105.00    | 45.0600   | 27.13058       |

Source: Authors' computation

Table 4 indicates that the average return on assets (ROA) is 23% with a maximum of 28% and a minimum of 16%. The standard deviation is 4.6%. This connotes that for every one Naira worth of net investment, the Larfage Africa – Cement had made a gain of 16 kobo and had at best earned a maximum of 28 kobo. The average time taken for the Larfage Africa – Cement to pay its suppliers or creditors is 227 days, with a maximum of 395 days, a minimum of 117 days, and a standard deviation of 105 days. Inventory Conversion Period (ICP) has an overall mean of 115 days with a

maximum of 141 days and a minimum of 89 days. This means that on average, Larfage Africa – Cement holds inventory up to 115 days. Debtors’ Conversion Period (DCP) has an overall mean of 68 days with a maximum of 89 days and a minimum of 29 days. This implies that the accounts collection period is up to 89 days. It also takes an average of 45 days for the Larfage Africa – Cement to convert its input resources (CCC) into cash. It could take as long as 105 days and a minimum of 58 days to achieve this.

**Table 5:** Result of Regression Analysis

| Variable          | Model (Financial Performance) |
|-------------------|-------------------------------|
| Constant          | 0.212                         |
| ICP               | .003<br>(1.608)               |
| DCP               | -0.07<br>(-0.134)             |
| CCC               | 1.034<br>(1.463)              |
| R                 | .0896                         |
| R Square          | 0.803                         |
| Adjusted R Square | 0.212                         |
| F-Statistics      | 1.359                         |

**Source:** Authors’ computation

Table 5 reveals that working capital management parameters jointly contribute 80.3% to the financial performance with an R2 value of 0.803. This connotes that working capital management is a predictor of financial performance. The study is consistent with theoretical and empirical findings that organizations can make the best possible investment in current assets and pay off their obligations timely if working capital management is effectively managed (Eljelly, 2004). Further, inventory conversion period (ICP) and cash conversion cycle (CCC) have a positive impact on financial performance but insignificant. The study is in line with the finding of Yakubu *et al.* (2020) that inventory conversion period (ICP) and Cash Conversion Cycle (CCC) have a positive impact on financial performance. However, the study is contrary to Oyedele *et al.* (2017) finding that inventory conversion period (ICP) and Cash Conversion Cycle (CCC) have a negative effect on financial performance. The study also reveals that the debtor conversion period (DCP) has a negative but insignificant relationship with financial performance, while the Creditors’ Conversion Period (CCP) has no relationship with financial performance.

Therefore, **H<sub>01</sub>**, and **H<sub>04</sub>** are partially accepted, while **H<sub>02</sub>** and **H<sub>03</sub>** are fully accepted.

## CONCLUSION AND RECOMMENDATIONS

The pivotal role of the manufacturing sector in the sustainable growth and development across the globe

through employment generation and poverty alleviation. However, the sector has been abated financially due to the poor management of working capital. This study, therefore, seeks to examine the effect of working capital management on financial performance with particular reference to Larfage Africa-Cement Plc. The study establishes that working capital management parameters jointly contribute to financial performance. It was further revealed that inventory conversion period (ICP) and cash conversion cycle (CCC) has a positive impact on financial performance but insignificant, while debtor conversion period (DCP) has a negative but insignificant relationship with financial performance, and Creditors’ Conversion Period (CCP) has no relationship with financial performance.

Subsequently, the study recommends that the inventory conversion period should be reduced while the accounts payable period should be elongated. This will go a long way to enhance financial performance and maximize returns to shareholders.

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