

WORKING CAPITAL MANAGEMENT AND FINANCIAL PERFORMANCE OF LISTED MANUFACTURING COMPANIES IN NIGERIA

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Abstract

The study examined the relationship between working capital management and financial performance of listed manufacturing companies in Nigeria. It retrieved secondary data from the annual reports of the ten listed manufacturing companies, for a period of five years (2016-2020) and analyzed them using ordinary least square multiple regressions. It used debtors collection period and creditors payment period as the dimensions of working capital management as the independent variables, with return on assets and return on equity as the proxies for company's financial performance. The results showed that creditors payment period and debtors collection period have no significant relationship with both return on assets and return on equity. The study recommends that the managers of the sampled manufacturing companies should review their working capital management strategies and future studies should be based on a combination of secondary data and primary data.

Keywords: Working capital management, financial performance, manufacturing firms

JEL Code Classification: L25, L60, M41

1. Introduction

One of the primary objectives of firms is to maximize the wealth of shareholders. This requires that managers ensure efficient management of assets of firms. Working capital constitutes a significant portion of total assets of firms (Aregbeyen, 2013; Rahman & Nasr, 2007). Working capital consists of current assets minus current

abilities and therefor managers have to devise strategies to ensure efficient management of working capital. Indeed, working capital management is an important aspect of financial management practices in all firms.

As manufacturing companies face serious challenges in managing working capital especially balancing the objectives of profitability and liquidity, several studies have investigated the impact of working capital management (WCM) on several measures of firm performance such as corporate liquidity (Kim *et al.*, 1998; Opler *et al.*, 1999), profitability (Shin & Soenen, 1998; Deloof, 2003; Lazaridis & Tryfonidis, 2006; Ukaegbu, 2014), and solvency (Peel and Wilson, 1994). The studies found conflicting results. While some studies found that WCM has beneficial effect on financial performance, others found the opposite effect. Yet others failed to any significant effect. This has continued to prompt researches not to cease attention on the effect of WCM on financial performance of firms. Furthermore, firms are continually confronted by the dynamic macro-economic environments and therefore have to continually revisit their strategies for efficient working capital management. For instance, Braun and Larrain (2005), Chiou *et al.* (2006) and Enqvist (2014) have respectively show that changes in business cycle influence WCM practices and ultimately moderate the WCM- financial performance relationship.

The objective of this study therefore is to assess the effect of working capital management on financial performance of Nigeria listed manufacturing firms using recent data. The specific objectives of the study are to:

1. Ascertain the relationship between creditors' payment period and return on assets of listed manufacturing companies in Nigeria.
2. Ascertain the relationship between debtors collected period and returns on assets of listed manufacturing companies in Nigeria.
3. Evaluate the relationship between creditors payment period and returns on equity of listed manufacturing companies in Nigeria.
4. Evaluate the relationship between debtors collection period and Returns on Equity of listed manufacturing companies in Nigeria.

In line with the specific objectives, the study proposed the following research hypotheses:

Ho₁: There is no significant relationship between creditors payment period and return on assets of listed manufacturing companies in Nigeria.

Ho₂: There is no significant relationship between debtors collection period and return on equity of listed manufacturing companies in Nigeria.

Ho₃: There is no significant relationship between creditors payment period and return on assets of listed manufacturing companies in Nigeria.

Ho₄: There is no significant relationship between debtors collection period and return on equity of listed manufacturing companies in Nigeria.

In addition to section 1 above, the of this study is structured thus: Section 2 is concerned with review of related literature; Section 3 sets out the methodology. In section 4 is found the test of hypotheses, results, and discussion of findings while Section 5 presents the conclusion and suggestions for further studies.

2. Review of Related Literature

2.1 Conceptual Review

Working Capital Management

Working capital management refers to the managerial function and decision processes involved in the maintaining of optimal liquidity ratio that guarantees a firm staying above the problem of insolvency (Eljelly, 2004). While financing and investing decisions focus on acquisition and deployment of fixed assets respectively, working capital management or liquidity decision focuses on the acquisition and utilization of current assets, which are undoubtedly tied to short-term finances. Capital investment decisions and working capital management decisions are intricately linked because a firm, for instance, investing in fixed assets which involves huge financial outlay as required in capital projects, must not only consider the acquisition of the asset and the expected stream of inflow, but must also contemplate acquiring or incurring additional current assets or current liabilities respectively. Therefore, once a firm increases its production facility by acquiring additional machines, it means that the firm must also be willing to increase its stock of raw materials, work in progress, wage expenses etc. Working capital management is a broader concept that entails the management of cash and marketable securities, management of accounts receivables and stock management and control. Efficient management and control of the individual components is required to achieve the overall effect of maintaining optimum liquidity of the firm. Debtors collection period and creditors payment period are very important components of working capital management.

Debtors Collection Period

This represents the average number of days that it takes a company to receive payments from its customers (Lantz, 2008). There is a consensus among scholars that the shorter the debtors collection period, the better the financial performance of the firm. Consequently, many companies to adopt various strategies for reducing the debtors collection period in order to improve the company's level of liquidity as well as profitability (Boisjoly, 2009). A longer debtor collection period is likely to attract more credit sales but may also give rise to high bad debts if appropriate collection machineries are not in place. Debtors collection period is measured by the average account receivable divided by the net sales and then, multiply the outcome by the average number of days in the year, which is usually taken as 365 day (Adamu, 2016).

Creditors Payment Period

Creditors payment period (CPP) represents the average number of days it takes the company to pay its creditors/suppliers (Erik, 2012). While firms ordinarily, prefer to delay payment for credit purchases, suppliers prefer that debtors pay for credit purchase within the shortest period of time. Long creditor payment period Firms that grant excessive creditor payment period is likely to borrow fund from other sources at a cost exceeding that of using internal funds from short creditor payment period and therefore adversely impact financial performance (García-Teruel & Martinez-Solano, 2007; Samiloglo & Dermirgunes, 2008). They therefore offer cash discounts, amongst other strategies as inducement. Creditors payment period is computed as average number of days of accounts payable (Average account payable) divided by cost of goods sold and multiply by 356 days.

Financial Performance

Financial performance is a subjective view of how well a firm can use assets from its primary mode of business and generate revenues. It is also used as a general measure of a firm's overall financial health over a given period. Financial performance is assessed by various ratios comprising of return on assets, and return on equity, return on investment, gross profit/gross margin; net profit/net margin; operating cashflow; current ratio; quick ratio; debt-to-equity ratio; inventory turnover. Both internal and external users find financial performance indicators useful in determining companies' wellbeing and in evaluating potential investment

opportunities. This study focuses on return on assets, and return on equity as dimensions of financial performance.

Return on Assets (ROA)

ROA is an indicator of how profitable a business is relative to its total assets. ROA gives an idea of how efficient the management is using its assets to generate earnings/ profit (Penman, 2013). The assets of the company comprise noncurrent and current assets and financed both debt and equity. ROA is an indicator to the investors of how effectively the firm is converting the money invested into net income. It is calculated as total profits for the year divided by the total assets for an accounting period. The higher the ROA, the better the company is, in using its own recourses and vice versa.

Return on Equity (ROE)

Return on equity (ROE) signifies how good the company is in generating returns on the investment of the shareholders. It is considered a gauge of a corporation's profitability and how efficient it is in generating profits. It tells what percentage of profit the company makes for every monetary unit of equity invested in the company. It is computed as profit before tax divided by shareholders' fund. The higher the ROE, the more efficient a company's management is at generating income and growth from its equity financing.

The variables discussed are presented in Operational Conceptual Framework in Fig. 1

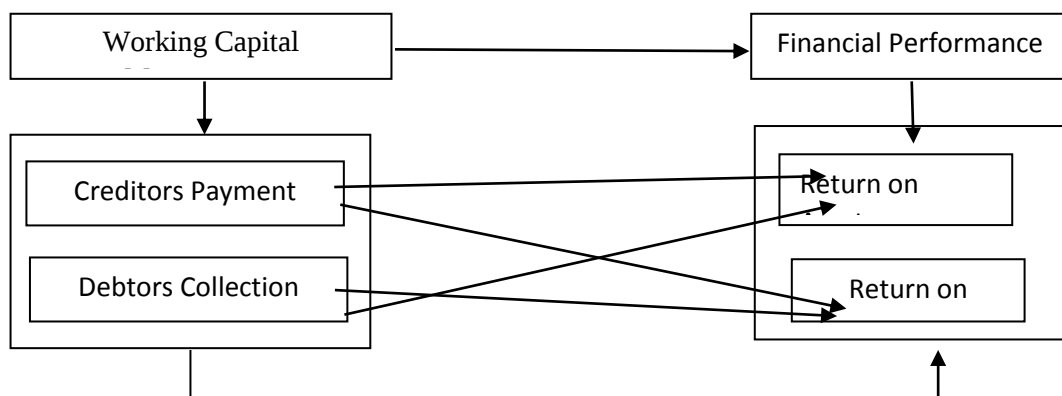


Fig. 1 Operational Conceptual Framework

Source: Okoror *et al.*, (2022)

2.2 Theoretical Review

Cash Conversion Theory

The cash conversion theory evaluates how effectively a firm is managing its working capital. It tells about the time it takes a company to convert its resource inputs into cash. In other words, it quantifies the number of days it takes a company to convert cash outflows and, therefore, the number of days of funding required to pay current obligations and stay in business. The theory was propounded by Blinder and Maccini in 2001 (Salend, 2009).

Working Capital Theory

The prescriptive theory of working capital assumes that if working capital is managed to the optimum then, it would be expected that business would invest in working capital and monitor factors that would influence it. This entails firms analyzing and measuring the influence of cash management, accounts receivables, inventory, accounts payables and cash conversion cycle to ensure that assets are utilized effectively and efficiently for overall attainment of efficiency, profitability, and shareholders wealth maximization (Okoror *et al.*, 2022). This prescriptive theory of working capital was propounded by Ans Mcinnes in 1937 (Diallo & Obotto, 2003; cited by Okoror *et al.*, 2022).

2.3 Empirical Review

Oyedele *et al.* (2017) investigated the impact of working capital management on Nigeria Breweries PLC's financial performance. The working capital policy variables investigated were Cash conversion cycle (CCC), Inventory conversion period (ICP), and Debtor conversion period (DCP), with ROA serving as the dependent variable. Multiple regression analysis was used in the study, and the results revealed that CCC, ICP, and DCP were all negatively related to ROA. Only CCC was statistically significant.

Edem (2017) studied working capital management and financial performance of selected listed agricultural firms for the period from 2004 to 2014 in Nigeria. The study which adopted ex-post facto research design used secondary data extracted from the audited financial statements of the sample. and analyzed, using a. The results from the estimation of pooled OLS model indicated that there was a positive

significant relationship between liquidity and both ROA and ROE respectively. However, there was a positive and insignificant relationship with EPS.

Fekadu (2021) used a total of 164 Ethiopian exporters to explore the fundamental impact of working capital management on the success of export firms. The results showed that working capital management, as measured by account receivables period, cash conversion cycle, and accounts payable period, has a statistically significant and positive correlation with the performance of Ethiopian exporting firms, as measured by both return on assets and return on investment. However, whereas inventory conversion period has a statistically significant and favorable influence on return on investment, it has no effect on return on assets.

In an investigation of the impact of working capital turnover on Indian Pharma companies' profitability from 2011 to 2017, Chakraborty (2018) used return on capital employed, return on equity, return on total assets, earning per share, and price/earnings ratio as measures of profitability. Current assets and current liabilities serving as independent variables were the measures of working capital. The results from ANOVA revealed that there was no relationship between working capital turnover and profitability measures.

Abdulazeez *et al.* (2018) examined the impact of working capital management on the financial performance of listed conglomerate companies in Nigeria for a period of ten (10) years (2005-2014). The study obtained data from the annual reports and accounts of the studied companies and used Ordinary Least Square Regression to analyze the data. Findings showed that debtors collection period, creditors payment period and firm size were negatively related to return on investment while cash conversion cycle has positive but insignificant relationship with the financial performance of the studied companies.

Amponsah-Kwatiah, K., & Asiamah, M. (2021) investigated the effect of working capital management on profitability of Ghanaian listed manufacturing firms from 2015 to 2019. The population for this study was 20c listed manufacturing firms on the Ghana Stock Exchange. The study employed panel data methodology in analyzing the data. From the results of fixed and random effects regressions, the study found a strong positive and significant relationship between inventory management, account

receivables, account payables, cash conversion cycle, current assets, current ratio, firm size and that of ROA and ROE.

In their study of working capital management and profitability of listed companies in Nigeria from 2006 to 2010, Owolabi and Alu (2012) used purposive sampling technique to select 5 manufacturing companies. The data was analyzed using regression methods. The working capital management studied comprised of inventory conversion period, cash conversion period, debtors collection period, and creditors payment period. The results indicated that each working capital component affected the company's level of profitability at varying rates.

Okoror *et al.* (2022) investigated the impact of working capital policy on firm profitability using data from the annual reports of 31 publicly traded manufacturing/industrial firms in Nigeria for the fiscal years 2010-2019. The working capital variables were creditors payment period (CPP), Debt Collection Period (DCP) and cash conversion cycle (CCC). Profit margin was the measure of finance performance. The study employed Arellano and Bond (1991) dynamic panel estimator alongside random effects (RE) and fixed effects (FE) estimators in analyzing the data obtained. The results showed that CCC and CPP have positive and significant impacts on financial performance, while the Debtors collection period (DCP) has negative and significant impact on financial performance.

Prempeh and Peprah-Amankona (2018) conducted an empirical study on the impact of assets management on firm's profitability using a balanced panel consisting of eleven (11) manufacturing firms listed on the Ghana Stock Exchange covering the period of 2011-2017. The study analyzed the data employing dynamic panel regression (Arellano-Bond Estimation) technique. The study revealed that there is a significant positive linear relationship between working capital management and firms' profitability.

3. Methodology

This study adopted the ex-post facto research design and research philosophy based on positivism. A sample of 10 listed manufacturing companies on the Nigerian Exchange Group (NGX) was used in the study. The study obtained secondary data covering 2016 to 2020 from the annual reports of the sampled companies. It tested the hypotheses formulated in Section 1 by estimating ordinary least square (OLS)

model with the aid of SPSS 25.0. The model specification of the study in functional form is as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 CPP_{i,t} + \beta_2 DCP_{i,t} + \beta_3 BSIZE_{i,t} + \epsilon_{i,t} \dots\dots\dots [1]$$

$$ROE_{i,t} = \alpha_0 + \alpha_1 CPP_{i,t} + \alpha_2 DCP_{i,t} + \alpha_3 BSIZE_{i,t} + \epsilon_{i,t} \dots\dots\dots [2]$$

Where for company i in year t,

- ROA: Return on assets, computed as profit before tax divided by total assets.
- ROE : Return on equity = profit before tax divided by shareholders' fund.
- CPP: Creditors payment period, computed as accounts payable divided by cost of goods sold, multiplied by 365 days.
- DCP: Debtors collection period, computed as accounts receivables divided by turnover, multiplied by 365 days.
- BSIZE: Board size, measured as total number of directors.
- $\beta_1, \beta_2, \beta_3$ Intercepts of Model 1 and Model 2 respectively.
- $\alpha_1, \alpha_2, \alpha_3$ Coefficients of CPP, DCP, BSIZE respectively in Model 1
- $\beta_0 \text{ \& } \alpha_0$ Coefficients of CPP, DCP, BSIZE respectively in Model 2

The Models include board size as a control variable. This is in line with past studies which show that board size influence board effectiveness and ultimately impacts financial performance (Lipton & Lorsch, 1992; Yarmack, 1996). Firms with large boards are likely to have resources for effective monitoring and controlling proposals on working capital management put forward by management. However, it is argued that large boards may face difficulties in reaching decisions timely and such decisions may be founded on compromise thereby extenuating board effectiveness (Lipto & Lorsch, 1992, Yarmack, 1996). Jamalinesari and Soheili (2015) provide evidence that board size has a significant negative effect on accounts payable management of a sample of 115 companies in Iran.

4. Result and Discussions of Findings

Descriptive Statistics

Table 1 shows the descriptive statistics of dependent, independent and control variables. Its shows that on average, creditors payment period of the sample is 183 days. The shortest period 36 days, and the maximum period is 594 days. Companies which have longer creditors payment period are considered more efficient. the

standard deviation value of 121.561212 indicates that there is little variation in creditors payment period of the sample companies. Table 1 also shows the mean of debtor's collection period is 663 days. This is quite high and may indicate that the sampled companies might be having problems with their logistic or communication with customers regarding their debts and expectations of payment. The maximum debtors collection period of 8504 days which implies that some trade debtors took as long as over two years to pay up their debts also points to problems with debt collection and inefficiency on the part of management. The standard deviation of 1480.37805 reveals a high variability among the samples. Table 1 reveals an average board size of 6 directors of 6. The smallest board has 5 directors while the largest board has 8 directors. The standard deviation of 0.45175395 is suggestive of a little variability across manufacturing companies sampled. Table 1 indicates that on average listed manufacturing companies in Nigeria earned a return of 6% on equity compared to 2% return on assets. With a range from -0.424 to 0.417 and a standard deviation of 0.1310348, ROE exhibits wide dispersion from the mean. The standard deviation of ROA also suggests wide dispersion from the mean. The values of skewness and kurtosis of the variables in Table 1 suggest that the data are approximately normally distributed.

Table 1: Descriptive Statistics

VARIABLES	CPP	DCP	ROA	ROE	BSIZE
Mean	182.88	662.72	0.02234	0.062086	6
Standard Deviation	121.56121	1480.3780	0.1430839	0.1310348	0.4517539
Kurtosis	3.0343954	15.990788	32.001317	5.1692849	8.9920213
Skewness	1.7264015	3.6238711	-5.0927868	-1.2717142	1.3834965
Minimum	36	4	-0.87	-0.424	5
Maximum	594	8504	0.261	0.417	8
Count	50	50	50	50	50

Source: Researcher's Computations, 2022

Correlation Analysis

Table 2 presents the correlation matrix containing correlation coefficients of pairs of the research variables.

Table 2. Correlation Matrix

Variables	CPP	DCP	ROA	ROE	BSIZE
CPP	1				
DCP	-0.01168	1			
ROA	0.082235	0.055815	1		
ROE	0.216234	-0.01226	0.631449	1	
BSIZE	0.275375	-0.035	0.09977	0.242951	1

Source: Researcher's Computation, 2022.

Table 2 shows that DCP has a positive correlation with ROA and a negative correlation with ROE and BSIZE. The correlation coefficients of CPP with all the variables are positive except with DCP which is negative. BSIZE also shows positive correlation with all the variables except with DCP. A positive correlation suggests a pair of variables moves in the same direction while a negative correlation implies that they move in opposite direction.

Hypotheses Testing

Table 3 Regression Results of Model 1 and Model 2

Variables	Model 1: ROA			Model 2: ROE		
	Coefficient	t-value	p-value	Coefficient	t-value	p-value
Constant	8.2075	4.77	0.000*	-3.0800	-0.57	0.569
CPP	-0.66	-0.337	0.738	-0.113	-0.499	0.620
DCP	-0.47	-0.755	0.454	0.082	0.124	0.165
BSIZE	-1.116	-2.106	0.041*	-1.720	-2.842	-0.383
R ²	0.95			0.935		
Fstat.	181.678			225.919		
P-value	0.000**			0.000*		

Source: Researcher's Computation, 2022.

* and ** indicate 1% and 10% level of significance respectively.

Hypothesis Ho₁: There is no significant relationship between creditors payment period and return on assets of listed manufacturing companies in Nigeria.

Table 3 presents the results of estimating Model 1 and Model 2. It shows that creditors payment period has negative and insignificant relationship with return on asset ($t = -0.377$; $p\text{-value} = 0.738$). Since the $p\text{-value}$ is greater than 0.05, the study fails to reject the null hypothesis and concludes that there is no significant relationship between creditors payment period and the return on asset in listed manufacturing companies in Nigeria.

Hypothesis Ho₂: There is no significant relationship between debtors collection period and return on assets of listed manufacturing companies in Nigeria.

Debtors collection period has a t value of -0.755 a $p\text{-value}$ of 0.454. Consequently, the study fails to reject the null hypothesis which states that, there is no significant relationship between debtors collection period and return on assets of listed manufacturing companies in Nigeria. Indeed, the study concludes that there is no significant relationship between debtors collection period and the return on assets in listed manufacturing companies in Nigeria.

Hypothesis Ho₃: There is no significant relationship between creditors payment period and return on equity of listed manufacturing companies in Nigeria.

The result of Model 2 in Table 1 shows a negative and insignificant relationship of creditors payment period and return equity ($t = -0.499$; $p\text{-value} = 0.620$). Therefore, the study rejects the null hypothesis and concludes that creditors payment period is not significantly related with return on equity in listed manufacturing company in Nigeria.

Hypothesis Ho₄: There is no significant relationship between debtors' collection period and return on equity of listed manufacturing companies in Nigeria.

From the result in Model 2 in Table 3, it is shown that debtors collection period has positive and insignificant relationship on return on equity (t value = 0.124; $p\text{-value} = 0.165$). On this basis the study fails to reject the null hypothesis and draws conclusion that debtors collection period has no significant relationship on return on equity of listed manufacturing companies in Nigeria.

5. Discussion of Findings

The explanatory power of the models as measured by the R^2 , suggests that 95% and 94% of changes in the return on asset and return on equity respectively are accounted for by the joint impact of creditors payment period, debtors collection period and board size. Models have good fit for the data as suggested by the p-value of the F statistics. Findings shows that creditors payment period has a negative and insignificant relationship with return on asset. As creditor' payment period increases by 1 day, return on asset decreases by 66%, holding other variables constant. However, this inverse relationship is not significant. This finding is in line with Owolabi (2012). However, it is not in line with Michael *et al.* (2017) who found a positive and significant relationship between CCP and ROA. It is also not in line with Olaoye *et al.* (2019) who found a statistically significant negative relationship between CCP and ROA. Increase in creditors payment period might not improve return on assets if firm sourced for funds at high cost to continue to finance its current assets. Finding shows that as debtors collection period increases by 1 day, return on assets drops by 4.7%. However, this is not statistically significant. This could be because of a rise in bad debts and collection cost. The finding affirms the study of Owolabi (2012) but is not in agreement with Michael *et al.* (2017) and Olaoye *et al.* (2019). As creditors collection period lengthens by 1 day, return on equity falls by 11%. This is smaller than the 66% fall in return on assets. The fall could be due to the fact that longer creditors collection period tends to constrain firm's ability to undertake profitable investment opportunities. The fall, however, is not significant. The finding contradicts Amponsah-Kwatiah *et al.* (2021) and Prempeh and Peprah-Amankona (2018). It was observed that an increase in debtors collection period is associated with an increase in return on equity by 12%, other things being equal. This could be because an increase in debtors collection period enables firm remain liquid and maintain good payment reputation with suppliers which in turn leads to uninterrupted production. However, the effect of increasing debtors collection period is not statistically significant. This could be due increase in overhead expenses which eats deep into the profit of the firms. The finding agrees with Akey (2019) but differs from Amponsah-Kwatiah *et al.* (2021). With respect to the control variable, board size shows a negative influence on both return on assets and return on equity but is on significant in respect of return on assets. The result reflects the conflicting evidence in the literature concerning the effect of board size on board effectiveness and in particular, firm performance (El-Maude *et al.* (2018) and Yemack (1996).

5. Conclusion and Recommendations

The aim of the study is to examine the relationship of working capital management on financial performance using listed manufacturing companies in Nigeria. Specifically, the study examined the effect of the following indicators of working capital management: Creditors payment period and Debtors collection period, on return on assets and return on equity. The findings from ordinary least square multiple regressions reveal that Creditors payment Period (CPP) and Debtors collection period respectively have positive and negative on the measures of financial performance but the effect is not significant. The findings affirm the conflicting evidence in the literature. The lack of significant effect of working capital management on financial performance could be that the sampled companies were operating at an optimal level of working capital management that strikes a balance between cost and benefits hence, maximizing profit. It is possible that the secondary data did not capture the underlying dynamics of working capital management strategies. The study, therefore, recommends that managers should review the working capital management strategies and future studies should be based on a combination of secondary data and primary data.

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Competing Interest: The authors hereby declare that there is no competing interest in this manuscript.