

## The Impact of Working Capital Management on Firms' Profitability: Evidence from Nigeria

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**Abstract:** The purpose of this paper is to investigate the impact of working capital management on firms' profitability in Nigeria. This research has been performed using a sample of 100 companies listed on the Nigeria Stock Exchange (NSE) from 2005 to 2015. The relationship between working capital management and firms' profitability was observed. The results of the weighted least square (WLS) regression analysis were statistically significant at 0.05 levels. The research evidence revealed that there is a significant positive relationship between working capital management and firms' profitability, measured by gross operating profit. The findings of the study confirmed that working capital management enhances firms' profitability in Nigeria. The empirical study contributes to the existing literatures on the relationship between working capital management and profitability.

**Keywords:** Working Capital, Leverage, Profitability, Nigeria Stock Exchange

### INTRODUCTION

It is important for every business to maintain sufficient liquid resources so as to maintain a daily cash flow [1]. This is not only essential in the short run but it is much necessary to keep a business on going concern basis [2]. Working capital is the capital available for day to day running of a business. It is the excess of current assets over current liabilities.

The main objective of a firm is to increase its market value [3]. Working capital management affects profitability of a firm, its risk and its value [4]. In other words, efficient working capital is a key component of the general strategy aiming at increasing the market value [5-7].

The effective working capital management is very important because it influences the performance and liquidity of a firm [8]. The main objective of working capital management is to reach optimal balance between working capital management components [9]. The efficient working capital management is the fundamental part of the overall corporate strategy to create shareholder's value [7].

Thus, companies tend to keep an optimal level of working capital that maximizes their value [6]. Most popular measurement of working capital is cash conversion cycle (CCC). Cash conversion cycle is the time lag between purchase of raw materials or rendering of services and the collection of cash from the sale of goods or services rendered.

Before the wake of the global recession in 2008, working capital management has been an important consideration in ensuring the stability and survival of a firm and after the recession, it became much more important [1, 10]. It was found that as a result of the last economic recession that hit the global economy, companies around the world especially the North America, Europe and Asia have tried to improve on their efficiencies and one of the strategies adopted is the management of their working capital [11]. Researchers have approached working capital management in numerous ways [9].

While some researchers investigated the impact of proper or optimal inventory management, others studied the management of accounts receivable as a component of working capital management in enhancing profit maximization.

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 asset and minimizes payments for its liabilities [12]. The aim of this research is to investigate the impact of working capital management on firm's profitability in Nigeria.

### LITERATURE REVIEW

The management of working capital is the management of all aspects of current assets and current liabilities. Working capital management helps a company to create values for shareholders. Working

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capital management was found to have a significant impact on both profitability and liquidity.

Abbas Ali [13] examined the impact of working capital management on profitability of companies listed on Tehran Stock Exchange from 2006 to 2010. The result of their findings revealed that there is a significant positive relationship between the effective working capital management and profitability of companies. The evidence of the findings also showed that management can enhance profitability through minimizing cash conversion cycle and the total debts to total assets ratio.

Kulkanya [14] also investigated the impact of working capital management on profitability. He tested the effects of working capital management on profitability using a sample of 225 companies listed on the Thailand Stock Exchange from 2007 to 2009. The result shows that there is an inverse relationship between the operating profits and inventory conversion period and the receivables collection period.

Sharma and kumar [15] investigated the effect of working capital management on profitability of Indian firms. They obtained data on a sample of 263 non- financial and 500 financial firms listed on Bombay Stock Exchange (BSE) from 2000 to 2008 using multiple regression models. The result of the study revealed that working capital management is positively related to firms' profitability in Indian.

Shin and Soenen [16] examined the relationship between working capital management and firms' profitability in US from 1975 1994 using net trade cycle (NTC). The evidence of their findings found a strong negative correlation between net trade cycle and corporate profitability.

Lazaridis and Tryfonidis [17] investigated a sample of 131 companies listed on the Athens Stock Exchange (ASE) from 2001 to 2004. The empirical evidence finds a significant negative relationship between cash conversion cycle and gross operating profit

Owolabi and Alayemi [10] measured working capital and profitability of manufacturing firms in Nigeria. The result of their findings revealed that there is a strong negative relationship between working capital and profitability of Nigerian manufacturing firms.

Deloof [6] tested the relationship between working capital management and corporate profitability using a sample of 1009 large Belgian non- financial firms from 1992 to 1996. He employed correlation and

regression analysis for the purpose of his analysis. The evidence of the findings found a significant negative relationship between gross operating income and the number of days accounts receivable, inventories and accounts payable of Belgian firms. The research evidence also reveals that corporate profitability can be improved by reducing the number of day's accounts receivables and inventories.

Ghosh and Majj [18] examined the efficiency of working capital management in Indian cements companies from the period of 1992 to 2002. They developed three indices: performance index, utilization index, and overall efficiency index to measure the efficiency of working capital management with the aid of regression analysis. The empirical evidence reveals that there is a significant positive relationship between working capital management and efficiency of Indian cement companies.

Garcia-Teruel and Martinez – Solano [19] tested the effects of working capital management on SME profitability using a panel data of 8872 small and medium sized enterprises (SMEs) in Spain from 1996 to 2002. The study reveals that managers could create value by reducing their inventories and the number of days accounts are outstanding. The reduction in cash conversion cycle also improves firms' profitability.

Falope and Ajilore [20] examined working capital management of 50 Nigerians quoted non-financial firms for the period of 1996 to 2005. They adopted the use of panel data econometrics in a pooled regression. Their research evidence found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period and cash conversion cycle.

Raheman and Nasr [21] measured the effect of different variables of working capital management including average collection period, inventory turnover in days, average payment period, cash conversion cycle and current ratio on the net operating profitability of 94 Pakistan firms listed on Karachi Stock Exchange for a period of 1999 to 2004. The empirical evidence found a strong negative relationship between variables of working capital management and profitability of the firms.

Oladipupo and Okafor [22] investigated the implications of working capital management practice on profitability and dividend payout ratio of 12 manufacturing companies quoted on the Nigeria Stock Exchange for the period of 2002 to 2006. They used Pearson Product Moment Correlation and Ordinary Least Square (OLS) regression. The evidence of the

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findings revealed that the impact of working capital management on corporate profitability was statistically insignificant at 5% confidence level. The research evidence also reveals that shorter net trade cycle and debt ratio promotes high corporate profitability.

Almazari [23] studied the relationship between working capital management and firms' profitability in 8 Saudi cement manufacturing companies listed on the Saudi Stock Exchange for the period of 2008 to 2012. He used Pearson Bivariate Correlation and Regression model to analyse his data. The result of the findings revealed that Saudi cement industry's current ratio was the most important liquidity measure which affected profitability. The study also found a significant positive relationship between profitability and size of a firm.

Akoto *et al.*; [24] analysed the relationship between working capital practices and profitability of manufacturing firms listed on Ghana Stock Exchange. The study utilized data from annual reports of 13 listed manufacturing companies in Ghana for the period of 2005 to 2009. Using panel data method and regression analysis, the empirical evidence found a significant negative relationship between profitability and accounts receivable days. However, the results of the findings also revealed a significant positive relationship between the measures of working capital (cash conversion cycle, current asset ratio, size and current asset turnover) and firms' profitability.

Omesa *et al.*; [25] investigated the relationship between working capital management and corporate performance of manufacturing companies listed on the Nairobi Securities Exchange using a sample of 20 companies from 2007 to 2011. Principal components analysis (CPA) and multiple regression method were used to analyse the data for the purpose of the study. The research evidence shows that working capital proxies (cash conversion cycle (CCC) and average collection period), and control variables (current liabilities, net working capital turnover ratio and fixed financial ratio) were statistically significant at 95% confidence level. Moreover, average collection period was found to be negatively related to return on equity.

Maradi *et al.*; [26] compared working capital management of two groups of companies listed on Tehran Stock Exchange (TSE), which comprised of 34 chemical companies and 30 medicine companies over a period of 10 years (2001-2010). The data were analysed using multiple regression. The results of the findings showed that debt ratio makes more impact on reduction in net liquidity in medicine industry than chemical industry.

Gill *et al.*; [27] measured the relationship between working capital management and profitability of 88 American firms listed on New York Stock Exchange from 2005 to 2007. The data were analysed by the use of Pearson Bivariate Correlation Analysis and Weighted Least Squares (WLS) Regression Technique.

The empirical evidence found a significant positive relationship between cash conversion cycle and profitability, measured by gross operating profit. The study also revealed that managers can create profits for their companies by handling correctly the cash conversion cycle and by keeping accounts receivable at an optimal level.

Sen and Oruc [3] examined the relationship between efficient level of working capital management and return on total assets of 49 manufacturing companies listed on Instabul Stock Exchange from 1993 to 2007. They used multiple regression model and unit root test to analyse their data. The empirical evidence revealed that there is a significant negative relationship between cash conversion cycle, net working capital level, current ratio, accounts receivable period, inventory period and return on total assets.

Vural *et al.*; [28] investigated the effects of working capital management on firms' performance in Turkey. The empirical study is based on secondary data obtained from 75 manufacturing companies listed on Instabul Stock Exchange for the period of 2002 to 2009 using Dynamic Panel Data Analysis.

The results of the study revealed that firms can increase profitability by shortening accounts receivable collection period and cash collection cycle. Ikpefan and Owolabi [1] examined working capital management and profitability of 2 manufacturing firms in Nigeria (Nestle Plc and Cadbury Plc). The study employed correlation and regression model to analyse the data.

The empirical evidence found a negative relationship between liquidity, efficiency ratios and return on equity of Nestle Plc while a positive relationship was found between liquidity, efficiency ratios and return on equity of Cadbury Plc.

## RESEARCH METHODOLOGY

The objective of this study is to investigate the impact of working capital management on firms' profitability in Nigeria. The data used for the purpose of the study were obtained from the annual reports of 100 companies quoted on Nigeria Stock Exchange (NSE). A period of 10 years was considered.

The models used for the purpose of the study are:

$$P = \beta_0 + \beta_1ARD + \beta_2LnS + \beta_3DR + \beta_4FFAR \quad (1)$$

$$P = \beta_0 + \beta_1APD + \beta_2LnS + \beta_3DR + \beta_4FFAR \quad (2)$$

$$P = \beta_0 + \beta_1IT + \beta_2LnS + \beta_3DR + \beta_4FFAR \quad (3)$$

$$P = \beta_0 + \beta_1CC + \beta_2LnS + \beta_3DR + \beta_4FFAR \quad (4)$$

Where  $\beta$  = Intercept  
ARD = Accounts Receivable

Days

APD = Accounts Payable Days

DR = Debt Ratio

P = Profitability

In line with previous studies, measures relating to working capital management and profitability were taken from Lazaridis and Tryfonidis [17] study, and Gill *et al.*; [26]. The employed the use of cross-sectional yearly data and measured the variables as follows:

$$\text{Accounts Receivable Days} = (\text{Accounts Receivable}) * 365 \text{ Days}$$

Sales

$$\text{Accounts Payable Days} = (\text{Accounts Payable}) * 365 \text{ Days}$$

Cost of Sales

$$\text{Inventory Turnover (Days)} = \frac{(\text{Inventory}) * 365 \text{ Days}}{\text{Cost of Sales}}$$

$$\text{Cash Conversion Cycle} = (\text{No of Days Accounts} + \text{No of Days}) - \text{No of Days}$$

Receivable

$$\text{Inventory} = \frac{\text{Accounts Received}}{\text{Accounts Received}}$$

Firms' Size = Natural Logarithm of Sales

Debt Ratio =  $\frac{\text{Total Liabilities}}{\text{Total assets}}$

Gross Operating Profit =  $\frac{(\text{Sales} - \text{Cost of Sales})}{(\text{Total assets} - \text{Financial assets})}$

Firms' size, financial debt ratio and fixed financial asset ratio were used as control variables. Gross operating profit was taken as a dependent variable.

Gross operating profit was used instead of earnings before interest, tax, depreciation and amortization (EBITDA) in order to relate operating success or failure within an operating ratio to other operating variables such as cash conversion cycle. Furthermore, there is need to exclude the participation of any financial activity from operating activity that may affect the overall profitability of firms.

Therefore, there is need to deduct the financial assets from total assets. The researchers also applied correlation and non-experimental research design for the purpose of this study. The process of measurement is key to quantitative research because it provides a fundamental connection between empirical observation and the mathematical expression of quantitative relationships.

## RESULTS

### DESCRIPTIVE STATISTICS

**Table-1: Proxy Variables Definition and Expected Relationships**

PROXY VARIABLES	DEFINITIONS	EXPECTED SIGNS
ARD	Accounts Receivable Days	+/-
APD	Account Payable Days	+/-
IT	Inventory Turnover	+/-
CCC	Cash Conversion Cycle	+/-
LNS	Natural Logarithm of Sales, Lagged one year period	+/-
DR	Debt ratio	+/-
FFAR	Fixed Financial Assets Ratio	+/-

**Table-2: Descriptive Statistics of Independent, Dependent and Control Variables**

DESCRIPTIVE STATISTICS (N=100)				
	Minimum	Maximum	Mean	Standard
ARD	10.40	124.69	52.17	19.28
APD	7.22	240.56	48.43	31.02
IT	12.98	301.12	75.36	43.36
CCC	13.69	7.24	87.74	49.18
LNS	2.95	7.58	5.91	0.66
DR	0.03	0.69	0.30	0.15
FFAR	0.00	0.16	0.02	0.03
PROFIT	0.02	0.82	0.20	0.16

N= Number of Observations

Source: Author's Computation, 2016

**Table-3: Pearson's Bivariate Correlation Analysis**

	PROFIT	ARD	APD	IT	CCC	LnS	DR	FFAR
PROFIT	1	-0.206**	0.016	0.136	0.013	0.165	-0.126	-0.054
ARD		1	0.124	0.249**	0.463*	0.021	-0.121	-0.265
APD			1	0.231*	0.113	-0.005	-0.029	-0.136
IT				1	0.785*	0.026	-0.038	-0.087
CCC					1	0.031	-0.226	-0.214
LnS						1	-0.108	-0.143
DR							1	-0.128
FFAR								1

\*\*Correlation is significant at the 0.01 level (2 – tailed)

\*Correlation is significant at 0.05 levels (2-tailed)

Source: Author's Computation, 2016

**REGRESSION ANALYSIS**

The empirical findings on the relationship between working capital management and profitability of the manufacturing firms in Nigeria are presented in this section. The weighted least square model with cross section weight of four industries was used

(Manufacturing, Chemical Products, Oil and Gas and Food Production). The use of pooled data and cross sections may result to the problem of heteroskedascity. To overcome this problem, the general least square with cross section weights was used. The regression results were presented in the table below:

**Table-5: Weighted Least Square Regression Estimates on Factors Affecting Profitability**

$R^2 = 0.327, S.S.E = 0.085, F = 3.486$							
Regression Equation: Gross Operating Profit = 0.380 - 0.004ARD + 0.016LnS – 0.362DR -1.101FFAR							
	Unstandardized coefficient		Standardized coefficient	T	Sig	Collinearity Tolerance	Statistics VIF
	B	Std. Error	Beta				
(Constant)	0.380	0.201		1.786	0.049		
ARD	-0.004	0.002	-0.216	-2.293	0.018	0.570	1.381
LnS	0.016	0.016	0.124	0.581	0.329	0.547	1.297
DR	-0.362	0.129	-0.438	-2.163	0.002	0.408	1.508
FFAR	-1.101	0.478	-0.304	-1.749	0.048	0.468	1.329
(a) Dependent Variable = Gross Operating Profit							
(b) Independent Variable = ARD, LnS, DR & FFAR							

Source: Author's Computation, 2016

The results of the regression indicated that the coefficient of accounts receivable is negative, that is, a decrease in average collection period will increase the profitability of the firm significantly. The debt ratio

was used as a proxy for leverage. There is a significant negative relationship between leverage and gross operating profit, which implies that the higher the leverage, the lower the firms' profitability.

**Table-5: Weighted Least Square Regression Estimates on Factors Affecting Profitability**

$R^2 = 0.274, S.S.E = 0.062, F = 3.486$							
Regression Equation: Gross Operating Profit = 0.020 + 0.001APD + 0.036LnS - 0.192DR -0.251FFAR							
	Unstandardized coefficient		Standardized coefficient	T	Sig	Collinearity Tolerance	Statistics VIF
	B	Std. Error	Beta				
(Constant)	0.020	0.188		0.155	0.819		
APD	0.001	0.002	-0.010	-0.177	0.836	0.914	1.012
LnS	0.036	0.029	0.205	1.368	0.117	0.822	1.165
DR	-0.192	0.124	-0.217	1.634	0.048	0.707	1.138
FFAR	-0.251	0.483	-0.164	-0.558	0.323	0.739	1.116
(a) Dependent Variable = Gross Operating Profit							
(b) Independent Variables = APD, LnS, DR & FFAR							

Source: Author's Computation, 2016

The results of the regression indicated that the coefficient of accounts payable is positive, that is, an increase in accounts payable will increase the

profitability of the firm. Also, there is a significant negative relationship between leverage and firms' profitability.

**Table-6: Weighted Least Square Regression Estimates on Factors Affecting Profitability**

$R^2 = 0.493, SSE = 0.085, F = 3.486$							
Regression Equation: Gross Operating Profit = $-0.191 + 0.002IT + 0.049LnS + 0.026DR - 0.168FFAR$							
	Unstandardized coefficient		Standardized coefficient	T	Sig	Collinearity Tolerance	Statistics VIF
	B	Std. Error					
(Constant)	-0.191	0.182		-0.609	0.364		
IT	0.002	0.002	0.338	1.715	0.016	0.603	1.143
LnS	0.049	0.022	0.212	1.321	0.128	0.818	1.189
DR	0.026	0.144	0.046	0.180	0.628	0.563	1.216
FFAR	0.168	0.472	0.041	0.263	0.515	0.612	1.116
(a) Dependent Variable = Gross Operating Profit							
(b) Independent Variable = IT, LnS, DR & FFAR							

Source: Author's Computation, 2016

The results of the regression revealed that the coefficient of inventory turnover days is positive, that is, an increase in inventory turnover days increases the

profitability of the firm. Also, a significant negative relationship was observed between leverage and firms' profitability.

**Table-7: Weighted Least Square Regression Estimates on Factors Affecting Profitability**

$R^2 = 0.292, S.S.E = 0.168, F = 2.800$							
Regression Equation: Gross Operating Profit = $-0.199 + 0.002CCC + 0.038LnS + 0.025DR + 0.168FFAR$							
	Unstandardized coefficient		Standardized coefficient	T	Sig	Collinearity Tolerance	Statistics VIF
	B	Std. Error					
(Constant)	-0.199	0.188		-0.603	0.371		
CCC	0.002	0.002	0.311	2.217	0.015	0.648	1.228
LnS	0.038	0.021	0.247	1.359	0.126	0.750	1.130
DR	0.025	0.146	0.044	0.166	0.597	0.597	1.329
FFAR	0.168	0.482	0.039	0.304	0.565	0.716	1.216
(a) Dependent Variable = Gross Operating Profit							
(b) Independent Variable = CCC, LnS, DR & FA							

Source: Author's Computation, 2016

The Cash Conversion Cycle (CCC) was used as a proxy for working capital management. The coefficient of cash conversion cycle is positive and statistically significant. Therefore, the higher the cash conversion cycle, the higher the firms' profitability. Multicollinearity tests were performed for all the regressions and all the variance inflation factor (VIF) coefficients were less than 2 and their coefficients of tolerance were greater than 0.5.

## CONCLUSION

This paper investigates the impact of working capital management on firms' profitability in Nigeria. Working capital management is examined from the perspectives of accounts receivable days, accounts payable days, inventory turnover days and cash conversion cycle. The research evidence found a

significant negative relationship between accounts receivable and firms' profitability. The study finds a significant positive relationship between accounts payable and profitability.

Examining the relationship between inventory turnover days and profitability, a significant positive relationship was observed. We also found a significant positive relationship between cash conversion cycle and firms' profitability. Based on the findings of the study, it is recommended that firms should efficiently manage their working capital so as to improve profitability.

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