



WORKING CAPITAL MANAGEMENT AND THE OPERATING PROFIT OF LISTED CEMENT MANUFACTURING COMPANIES IN NIGERIA

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Abstract

Financial managers tend to prioritise other long-term financial decisions (investment and capital structure) and neglect their working capital. Thus, this study explores the impact of working capital management on the operating profits of selected cement firms' in Nigeria. The analysis is performed for the 2010 to 2019 period using Pooled Least Square (PLS), fixed- and random-effect model together with a panel data of 3 cement manufacturing companies listed on the Nigerian Stock Exchange (NSE). The results of the fixed-effect model analysis showed that the cash conversion period and two other indicators of working capital management (account receivable days and inventory days) had a negative and significant effect at 5% level on the operating profits of the sampled cement firms. In contrast, the account payable days had a positive and significant effect on the operating profits of the sampled cement firms. Based on these findings, the finance managers should improve on managing the account receivable days and inventory days in their working capital management properly. The paper recommended that emphases should be put on shortening the cash conversion period, reducing accounts receivable days and inventory days, and extend their payable days.

Keywords: Working capital management, Operating profit; Firm profitability, Panel data; Nigeria



INTRODUCTION

In today's global world of relentless rivalry, almost all companies have no other viable option but to reduce operating costs to remain competitive and financially secure. Consequently, effective working capital management is an essential component of the overall corporate strategy to build shareholder value (Garg & Gumbochuma, 2015). Traditionally, corporate finance literature provides findings on long-term financial decisions, including capital structure, acquisitions, dividends, and valuations (García-Teruel & Martínez-Solano, 2007). However, as a source of finance, most companies have significant sums of cash invested in working capital and small quantities of short-term payables (Deloof, 2003). This tends to have a direct effect on liquidity and profitability (Appuhami, 2008). The lack of attention to the liquidity management mechanism may trigger serious difficulties and losses even for a firm with favourable long-run prospects due to adverse short-run developments. Many factors, both internal and external, may influence corporate managers' decisions about the level optimal for current assets and liabilities. Overall, working capital management can be motivated by an aggressive policy, with high levels of non-current assets and little investment in current assets, especially with low cash balances, low inventory levels, and very minimal credit grant to the customers to produce more income. Working Capital Management (WCM) is an essential element in a firm's financial management due to its apparent effect on a firm's profitability (Knauer & Wöhrman, 2013). Working capital is an operational liquidity measure that determines a company's short-term condition, and inadequate management of working capital will deteriorate the entity's strength.

Alternatively, excessive working capital could force the firm into spending heavily on fixed assets and ultimately leading to a situation of over-capitalisation that its revenues could not compensate. Too much operational capital can tempt the firm to excessively overtrade or accumulate inventory, which could adversely affect profitability. On the other hand, a lack of working capital can hamper the firm in executing its operations and, consequently, achieving its goals. So it is desired to keep working capital healthy. Improved working capital increases a firm's liquidity market ranking, thus accelerating shareholder value growth (Singhania & Mehta, 2017).

Effective management of working capital requires managing and monitoring current assets and liabilities in a manner that achieves for a company the desired combination of the risk of failing to fulfill short-term financial obligations as at when due and preventing any unnecessary costs incurred by maintaining undue investment in those assets (Ramachandran & Jamakiraman, 2009). Overall, working capital management includes the

short-term financial decision-making roles that Chief Financial Officers conduct every day. Therefore, in a commercial sense, the essence of working capital management is to help companies achieve a reasonable and sustainable profit level and maximum liquidity (Amalendu & Uddin, 2011; Mathuva, 2010).

Given the potentially significant impact of WCM on profitability and liquidity, WCM lacks major theoretical advances relative to long-term investment and financial decision-making. This indicates less attention has been given to short-term financing and, in particular, to controlling working capital (Amalendu & Uddin, 2011). These factors prompted this study. In pursuit of a firm's day-to-day running of a company, according to Madhou (2011), chief executive officers and managing directors neglect to pay attention to working capital management. As such, most working capital decisions are assigned to the company's junior employees and are rarely factored when the CEOs make big decisions. Besides, significant past company failures have been attributed to the financial manager's inability to prepare and monitor their respective firms' working capital (Owolabi & Alu, 2012). A stringent working capital management strategy can lead to a liquidity crisis, while a relaxed one can lead to reduced profitability. A generous credit policy may increase profits, but as a result, bad debts may also rise; a stringent credit policy may adversely affect a firm's sales.

Therefore, the Nigerian cement industry faces several problems, including increasing environmental pressure and severe overcapacity, which over-bloated their overhead cost. The cement industry has a long history of environmental issues specific to overproduction in capacity, unreasonable industrial structure, low bulk-loading ration, and relatively unstable market situation.

It is on this background that this study looked into the effect of working capital management on operating profit of listed cement companies in Nigeria.

The rest of the paper is structured as follows: Section two explains the literature review, and section three deals with the methodology. Section four analyses data and discuss the findings, while section five presents the conclusion, and recommendations.

LITERATURE REVIEW

Many studies were published to create relationships between working capital management and profitability. Most of them have found a negative relationship between the profitability and the cash conversion period, which describes the length of time between the purchase of raw materials and other inputs and the inflow of cash from the selling of products and reflects the decisions on the amount invested in the inventory, the loans to consumers and the credit

received from suppliers. The positive relationship between the current ratio and gross and net operating profit suggests that liquidity and profitability strengthen each other rather than the trade-off predicted by the conventional working capital management theory (Adekola, Samy, & Knight, 2017). Afrifa and Padachi (2016) examined the relationship and profitability of SMEs for a sample of 160 Alternative Investment Market (AIM)-listed SMEs in the United Kingdom from 2005 to 2010. Empirical findings from the Panel Data Regression Analysis (Fixed-effect model) indicated that there is a concave relationship between working capital level and business profitability and that there is an optimum working capital level that maximises the profitability of firms. Moreover, the analysis regarding whether or not deviations from the optimum working capital level decrease firm profitability suggests that deviations above or below the optimum decrease profitability.

Silva (2011) and Gomes (2013) noticed the presence of a non-monotonic (concave) relationship between working capital and firm profitability, suggesting that businesses have an optimum working capital amount that maximises their profitability, see also Baños-Caballero, García-Truel, and Martínez-Solano (2012) for proof on Spanish SMEs. Pais and Gama (2015) found that companies in Portugal may experience an increase in profitability if the time used to settle commercial debts and collect pending payments is reduced. Gorondutse, Ali, Abubakar & Maahtah (2017), in Malaysian research on WCM's impact on SME profitability, concluded that the cash conversion cycle had a positive effect on net operating profit. Bhatia and Srivastava (2016) studied the relationship between working capital management and firms performance in an emerging market. The study used Ordinary Least Square, Fixed and Random effect and generalized method of moment and found a negative relationship between Cash Conversion Cycle and firm performance.

Jahfer (2015) investigated the effects of working capital management on the profitability of manufacturing companies in Sri Lanka from 2008 to 2013. Applying pooled ordinary least squared and fixed-effect model, the study showed a significant negative relationship between accounts payable and profitability, which is consistent with the view that less profitable firms wait longer to pay their bills. There is no evidence to prove the existence of a significant relationship between cash conversion cycle and profitability, but there is a negative association. Tuffour and Boateng (2017) studied the effect of working capital management on the performance of manufacturing firms in Ghana for the period 2008 to 2014. Adopting correlation and regression analyses, the study showed that the current ratio, average collection period, and the accounts payable period positively affect profitability. However, only the current ratio has statistical significance. Also, while the inventory conversion period and the cash conversion cycle, have a negative effect on performance. Ng, Ye, Ong, and Teh (2017) examined the

relationship between working capital management and the firm's profitability of Malaysian listed manufacturing firms for the period from 2007 to 2012. The regression results showed that gross operating income is negatively related to the degree of aggressiveness of investment policies but positively related to the degree of aggressiveness of financing policies. Furthermore, the inventory conversion period is positively related to firms' profitability, while account receivables collection is negatively related to profitability.

Theoretical background

The Theory of Working Capital Management

This theory emanated from Sagan (1955) and it provided the basis for working capital management research. This theory was emphatically on the need for management of working capital account and warns that it could easily affect the growth of the company. Sagan (1955) believed that the financial managers operations are mainly in the area of funds generated in the course of daily business transactions. In this case, the managers must be accustomed with happenings in the control of inventories, receivables and payables because, all these accounts affect cash positions. As a result of this, Sagan (1955) preached that the management of account receivable, payable, inventories and cash is important for the proper functioning of any firm's operation. Moreover, the theory of working capital management argues that the major work of a financial manager is to provide funds to invest temporarily surplus funds to meet its profitable investment in view of his particular requirement of safety, and meets its liquidity obligations as and when due (Ibrahim & Abdullah, 2016)

Fisher's Separation Theory

The concept of separation theorem in finance states that the investment decisions of a firm are independent from firm's owner's wishes. This was propounded in 1930 by neoclassical economist, Prof. Irving Fisher. He believed that, with perfect and complete financial market, the investment decision (Wealth maximization) without paying more attention to the individual's subjective preferences that comes into the consumption decisions (Ibrahim & Abdullah, 2016).

METHODOLOGY

The study adopted a descriptive research design.

Model specification

The model used in this study was adapted from the studies of (Banos-Caballero, García-Truel, & Martínez-Solano, 2010).

The model is listed below:

$$GOP_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (1)$$

$$GOP_{it} = \beta_0 + \beta_1 ARD_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (2)$$

$$GOP_{it} = \beta_0 + \beta_1 ID_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (3)$$

$$GOP_{it} = \beta_0 + \beta_1 APD_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad (4)$$

Where:

GOP is Gross Operating Income ACC is Cash Conversion Cycle
 ARD is Account Receivable in Days ID is Inventories Days
 APD is Account Payable in Days β_1 to β_4 are Co-efficient of Variables
 ε is Error term

While Size, Growth and Leverage are explanatory variables.

Operating profit is a measure of profitability since firms with mainly financial assets on their balance sheet will not receive most of their return on assets from operating activities. The main independent variables are the working capital measures, and ward off the firm differences, additional control variables have been added based on the inputs from Deloof (2003).

Estimation Technique

The study estimates the effect of working capital management on the operating profits of selected cement manufacturing firms using the Panel regression analysis. The sample for the study includes non-financial firms listed on the Nigerian Stock Exchange (NSE for 2010-2019). Five listed cement firms used to exist in Nigeria, however, only three cement firms currently operate in Nigeria's cement sector, three NSE-listed cement manufacturing firms are used, which includes the Northern cement Company, Dangote Cement plc, and Lafarge Wamco cement company plc. An F-test was conducted to compare standard OLS and fixed-effect approaches. In contrast, a Hausman test was used to assess the random and fixed-effect association between unique errors and regressors. The total population reflects the industrial goods market, but only cement manufacturing firms with reliable data are sampled over the reviewed period. This study targets the Nigerian cement industry because they have high working capital needs. It provides a more comprehensive, secondary data analysis of WCM issues.

The cash conversion cycle (CCC) is used as a working capital calculation used in previous studies (Banos-Caballero, García-Truel, & Martínez-Solano, 2010; Banos-Caballero, García-Truel, & Martínez-Solano, 2012; Tauringana & Afrifa, 2013). The regression models analyse the impact of working capital management interventions on the company's operating

profits at time t individually and monitor those variables that influence the sampled firms' profit capacity. The study used the cash conversion cycle (CCC) and associated components such as account receivables, account payable duration, and inventory turnover period to examine WCM's effect on profitability. ID is the number of days of inventories, AP the number of days of accounts payable, AR the number of days of accounts receivable, CCC the cash conversion cycle, SIZE the size of the company, GROWTH the sales growth, and LEV., the debt level. The two components of the error are η_i and π_{it} . The first tests the individual error component (a specific feature of each firm), and the other considers the idiosyncratic error (unobservable factors that vary over time and affect OPit).

Table 1. Variable definition

Variable	Label	Definition	Derivation	Hypothesised sign
Dependent variable				
Operating profit	GOP	Gross operating income measures the firm's operating profit and does not consider the financial assets	. EBITDA/operating asset	NA
Independent variables				
Cash conversion cycle	CCC	This is a comprehensive measure of working capital management; that is, the longer the cash conversion cycle indicates, the more time between the outlay of cash and cash recovery.	Receivable days + inventory days – payable days	Negative
Account receivable days	ARD	This variable represents the average number of days that the firm takes to collect debts of sales from customers.	Accounts receivable/ (sales/365)	Negative
Inventory days	ID	This variable reflects the average number of days of stock held by the firm	Inventory/(cost of goods sold/365)	Negative
Control variables				
Firm size	SIZE		Natural log of sales	Positive
Sales Growth	GROWTH	It reflects the development of the natural business	(Current year sales/ previous year sales) – 1	
Financial Leverage	LEV	It reflects the financial access of the firm	Debt/total assets	Negative

Source: Compiled by the author

ANALYSIS & DISCUSSION OF FINDINGS

The time series and cross-sectional data are not controlled for heterogeneity, and the results may be biased if it is not controlled. To control that, the study used the same data and analysed using panel data models with fixed- and random-effects models.

Summary Statistics

The summary statistics of all variables in the model are reported in Table 2.

Table 2. Results of Summary Statistics (E-view 9)

Variable	OBS	MEAN	Std. Dev.	MIN.	MAX.
GOP	80	1.82578	0.58974	-0.3498	3.8357
CCC	80	16.9694	63.0821	-575.8897	1205.9018
ARD	80	34.0563	28.6857	1.5544	573.0466
ID	80	42.4573	61.7251	0.7238	793.8218
APD	80	58.0673	38.7342	-627.4197	1102.035
SIZE	80	5.5762	2.2750	1.1058	11.7241
GROWTH	80	0.1845	0.8427	-0.6429	20.1528
LEV	80	0.2364	0.5179	-0.5182	13.7507

Note: OBS, MEAN, Std. Dev., MIN., MAX., imply observation, mean value, standard deviation, minimum value, and maximum value.

The operating profit margin value ranges from – 34.98% to 3.84%, with an average of 1.83%. It seems pretty secure. The sampled firms averaged CCC at 16.97 days, thus implying that firms are able to convert their investments in inventory and other resources into cash flows from sales in less than 17 days. An average Nigerian firm collects payment after 34.06 days after credit sales and can clear inventory in 42 days. Companies pay their credit transactions on average in 58.07 days. Sampled Nigerian firms' medium sales growth rate is 5.58 percent, with a range from 1.11 percent to 11.72 percent, indicating a high variation in Nigerian firms' growth rate.

Table 3. Pooled Least Squares (E-view 9)

Dependent Variable: Gross Operating Profits

Regression Model	OLS							
	1		2		3		4	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Constant	0.1186	0.0004	0.1964	0.0028	0.1174	0.0002	0.3725	0.0021
CCC	-0.0001	0.0205	-	-	-	-	-	-
ARD	-	-	-0.0018	0.0362	-	-	-	-
ID	-	-	-	-	-0.0063	0.0484	-	-
APD	-	-	-	-	-	-	0.0003	0.0394

SIZE	0.1206	0.0002	0.0061	0.0004	0.0194	0.0023	0.0127	0.0004
Growth	0.0618	0.1284	0.0047	0.1572	0.0032	0.1894	0.0437	0.1942
LEV	-0.1403	0.0016	-0.2395	0.0125	-0.3693	0.0021	-0.2193	0.0005
Adj. R	0.2854		0.2812		0.2828		0.2869	

Pooled Least Square Method Results

Table 3 reports the pooled least square results. The results in model 1 from Table 3 suggests that the cash conversion cycle is negatively and significantly related to the operating profits of sampled firms. This shows firms can improve their profitability by lowering their CCC. The size of the firm and growth rate is positively and statistically significantly related to the operating profits of firms. However, the debt ratio is negatively and significantly related to the operating profits of firms.

The results for model. (2) and (3) are similar to the results of model (1) as show in Table 3. The coefficients of working capital measures (ARD) and ID are negatively and significantly related to the operating profits of sampled firms, implying that the firms can improve their profit margin by lowering the collection period from debtors and by reducing the inventories holding period. However, in model (4), the measure of working capital (APD) is positively and significantly related to the operating profits of sampled firms. This shows firms can improve their profitability by increasing the APD and by extending the credit periods from their vendors and supplier

Table 4. Fixed Effect/Random Effect (E-view 9)

Regression Model	1		2		3		4	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	0.1527	0.1283	0.0404	0.0147	0.0792	0.0594	0.0742	0.1371
CCC	-0.0007	0.0926	-	-	-	-	-	-
ARD	-	-	-0.0046	0.0005	-	-	-	-
ID	-	-	-	-	-0.0008	0.0002	-	-
APD	-	-	-	-	-	-	0.0021	0.0682
SIZE	0.0406	0.0015	0.0571	0.0021	0.0462	0.0004	0.0854	0.0034
Growth	-0.0121	0.0063	-0.0264	0.0009	-0.0083	0.0023	-0.0073	0.0018
LEV	-0.5916	0.0023	-0.5236	0.0023	-0.3361	0.0097	-0.3752	0.0005
Adjusted R2	0.6437		0.6421		0.6403		0.6479	
Hausman Estimation	84.0272	0.0000	55.7304	0.0000	64.6218	0.0000	73.9252	0.0000
	FE		FE		FE		FE	

Table 4 indicates that firms' operating profits improve if a firm improves its working capital management. The data are further analysed for the relationship between working capital and

operating profits using panel data analysis. The test results of the Hausman test support the fixed-effect model, as the hypothesis of the random-effect model was rejected.

Fixed-effect Model

As shown by the results presented in Table 4, the estimates of model (1) suggest that size of the firm is positively and statistically significantly affect its working capital management. However, the explanatory power of the fixed model is better than OLS models, and the same is reflected in adjusted R-square values. In the case of OLS, the adjusted R-square values were around 0.28; however, in the fixed-effect model, the value of adjusted related to the operating profits of the firms. Firm growth and the debt ratio are negatively and significantly related to the operating profits of the firms. Working capital measure (cash conversion cycle) is negatively and significantly associated with operating profits of the firms. This shows firms can improve their profitability by lowering their CCC.

Furthermore, Table 4 reveals that the results for models (2) and (3) are similar to the results of the model (1). The coefficients of ARD and ID are negatively and significantly related to the operating profits of the sampled firms. The firms can thus improve their profitability by lowering the collection period from debtors and by reducing the inventories holding period. In model (4) from Table 4, the coefficient of APD is positively and significantly related to the operating profits of the sampled firms, implying that profitability can be increased by getting extended credit periods from the vendors and suppliers. The results in both Tables 3&4 indicate that similar to OLS outputs panel data through the fixed-effect model, firm performance improves if a firm improves R-square was around 0.64.

CONCLUSION & RECOMMENDATIONS

This study showed that working capital management could increase a firm's overall performance, thereby affecting its operating profits and competitiveness. The fixed-effect model is the basis for debate. Four working capital management steps are used: CCC, ARD, ID, and APD. Study findings indicate that CCC has a significant effect on Nigerian cement firms' operations. The CCC-financial success relationship is negative. This aligns with Pirttilä, Virolainen, Lind, and Kärri (2019) and Tuffour and Boateng (2017); however, vary from Abuzayed (2012) and Afrifa and Padachi (2016). This shows a firm can boost its financial results by shortening the CCC. A potential reason for this negative association between CCC and firm financial results is that shorter CCC means shorter average collection time, better inventory turnover, and extended supplier credit period, resulting in lower volumes of funds being blocked in working capital channels, thus decreasing the need for working capital finance.

The reduced use of working capital funding, results in less cash outflow in financing costs. As a result, the cost of working capital maintenance is also reduced; resulting in more substantial margins; increased margins and process profitability increase its value. It is also critical that managers of companies improve their companies' value by shortening CCC, reducing ARD and ID, and extending payable days. By so doing, it will enable the financial manager to have more funds to run the daily activities of the organization. These results are consistent with Sharma and Kumar (2011) and Enqvist, Graham, and Nikkinen (2014); Ukaegbu (2014); Wuryani (2015); Yazdanfar and Öhman (2014).

The control variable company size is also significantly linked to firm performance. Results indicate that larger businesses with sufficient working capital management are likely to have higher operating income and financial output. This study's findings are consistent with Deloof (2003), Lazaridis and Tryfonidis (2006), Garcia-Teruel and Martinez-Solano (2007), Mathuva (2010) and Ebben and Johnson (2011). This paper led to understanding how WCM impacts the operating income of companies. These results have implications for finance managers, entrepreneurs, business advisors, and financial institutions. This will lead to increase in their operating income and financial performance by enhancing highlighted working capital quality if adequate working capital management is sort after as one of the organization's priorities. Further analysis will validate and improve the robustness of our findings, for example, by examining the relationship between WCM and profitability for particular industries more closely and even using listed companies as samples.

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