

Working Capital Management and Firm Profitability: Evidence from Nigerian Quoted Companies

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Abstract

This study examines the relationship between working capital management and firms' profitability of twenty-five Nigerian quoted companies for the seven-year period 2005-2011. Data used in the study were sourced from audited financial statements of the companies. Multiple Regression analysis was used to analyze the data and results showed a negative relationship between working capital management (Cash Conversion Cycle) and firm profitability (ROA). This finding is consistent with prior empirical studies and provides evidence in support of aggressive policy of working capital management.

Keywords: Working Capital Management, Cash Conversion Cycle, ROA, Nigeria.

1. Introduction

Working capital is basically the portion of asset required by a business in current operations. In its gross form, it is the investment in current assets. However, it can also be described in its net form as the difference between current assets and current liabilities. In most organizations, current assets occupy a significant portion of the total asset structure. This invariably requires efficient management of it.

Working capital management is concerned with managing the different components of current assets (inventories, debtors/receivables, cash/bank, short-term investments, prepaid expenses) and current liabilities (creditors/payables, provision for tax, other provisions against the liabilities payable within a period of 1 year). For a firm to be efficient, it must keep its working capital at optimum level. It must neither have excess nor shortage.

Working capital affects both the liquidity and profitability (Shin & Soenen, 1998 and Raheman & Nasr 2007) and the risk (Eljelly 2004) of the firm. Thus, maintaining adequate working capital at the satisfactory level is crucial for adding value to the business, through reduction in risk and improving performance.

Working capital management involves planning and controlling of current assets and current liabilities. Two working capital policies- aggressive and conservative are well known and documented in financial management literature. Firms pursuing aggressive policy invest on low level of current assets as percentage of total assets. In the same manner, the portion of current liabilities out of the total liabilities will be high. On the other hand, a conservative policy is the one that will make the firm to invest more on current assets and less on current liabilities. Each of these methods has its financial cost implications. The bottom line is for the organization to operate at an optimum level that will maximize the value of the firm.

In empirical literature the most widely use method of measuring working capital management is cash conversion cycle (CCC). This is defined as the sum of days of sales outstanding (average collection period) and days of sales in inventory less days of payable outstanding. The longer the time lag in CCC, the larger the amount of investment in working capital and vice-versa. A longer CCC may increase financial performance through increase in sales. At the same time, a longer CCC may lead to reduction in performance because capital is unnecessarily tied up to working capital and this will generate little or no profit for the business.

The purpose of this paper is to examine the relationship between working capital management and organizational performance using 25 non-financial firms in Nigeria as a case study. The motivation for this study stems from the fact that only limited empirical studies in this area have so far been carried out in most emerging countries, particularly in Africa. By conducting research of this nature using the Nigerian environment will reduce the knowledge gap to the barest level.

The rest of the paper is organized as follows: sections 2 deals with literature review, 3 with methodology and 4 with results. Section 5 concludes the study.

2. Literature Review

The empirical literature is rich with studies in working capital management, although most of them were carried out in the developed countries. We take a look at some of the recent ones on the relationship between working capital management and firm performance.

Jose, Lancaster and Stevens (1996) examined the relationship between aggressive working capital management and profitability using data from the United States companies. The result showed a significant negative relationship between cash conversion cycle and firm performance. The outcome of the study validated the earlier findings of Soenen (1993), which posited that aggressive policy (low CCC) is associated with high financial performance.

Deloof (2003) investigated the relationship between working capital management and corporate profitability of 1,009 large Belgian non-financial firms for the 1992-1996 periods. The outcome of the study indicated a negative relationship between profitability (gross operating income) and cash conversion cycle (and its two components- Accounts Receivables and Inventories, in number of days).

Lazaridis and Tryfonidis (2006) used data from 131 listed Greek companies for period of 2001- 2004 to found out the relationship between working capital management and firm performance. The findings showed a statistical significance between profitability (gross operating profit) and the cash conversion cycle.

Ganeson (2007) examined the relationship between working capital management and firm performance. A sample 349 telecommunication firms in the United States of America for a 7-year period (2001-2007) was used. Regression analysis was used to analyse the data and result showed a negative relationship between working capital efficiency and profitability.

Raheman & Nasr (2007) utilized sample of 94 listed Pakistani companies from different sectors for the period 1999-2004. The result showed a negative relationship between cash conversion cycle (CCC), a measure of working capital management and profitability.

Falope & Ajilore (2009), using data from a sample of 50 Nigerian manufacturing companies found a negative relationship between cash conversion cycle and net operating profit.

Sen & Oruc (2009) used data from 49 firms from Turkey to analyze the relationship between working capital management and firm performance. The study confirmed a negative relationship between cash conversion cycle and working capital both at firm and industry level.

Dong & Su (2010) investigated the relationship existing between profitability, the cash conversion cycle and its components (Accounts Receivable, Accounts Payable and Inventory, in number of days) for listed firms in Vietnam. Findings showed a strong negative relationship between profitability, measured through gross operating profit and cash conversion cycle. It is further suggested that managers can create a positive value for the shareholders by handling the adequate cash conversion cycle and keeping each different component to an optimum level.

Hayajneh & Yassine (2011) explored the relationship between working capital efficiency and profitability of 53 listed Jordanian manufacturing firms for the period 2000-2006. Using both OLS and 2SLS regression estimation techniques, results showed a negative and significant relationship between profitability and working capital management proxies (average receivable collection period, average conversion inventory period, average payment period and cash conversion cycle). It further suggested that a firm must manage its working capital efficiently to achieve the optimal profitability.

Nwaobia, Kajola & Adedeji (2012) examined the impact of working capital management on firms' financial performance of 30 Nigerian listed manufacturing firms for a period of 7 years (2004-2010). The results revealed a negative relationship between working capital management (cash conversion cycle) and firm's financial performance (ROA).

On the other hand, limited studies confirmed a positive relationship between working capital management and firm performance, suggesting that the more investment in working capital, the higher the profitability. This theoretically confirmed the prediction of conservative working capital policy. In their study, Gill, Biger and Mathur (2010) investigated the relationship between working capital management and firm performance of 88 American listed firms for the period 2005-2007 and found a positive relationship between the two variables (cash conversion cycle and corporate profitability). In similar studies, Blinder and Maccini (1991) confirmed positive relationship between working capital management and firm performance.

3. Methodology

Sample and data source

As at the beginning of 2005 the total number of non-financial firms listed on the floor of Nigerian Stock Exchange was 125 covering 18 industrial sectors. The study makes use of 25 companies, purposively selected and with the belief that it will be adequate to carry out a study of this nature. It is also to be noted that the firms selected have complete data for the duration of the study period (2005-2011).

Required data for this study were sourced primarily from the annual financial statements of the firms and periodical of the Nigerian Stock Exchange.

Variables

Dependent variable: Return on Asset (ROA) is used to proxy financial performance. It is computed by finding the ratio of profit before interest and tax to total assets.

Independent variable: Cash conversion cycle is the most widely use proxy for measuring working capital management. It is computed by adding the number of days of average collection period to the inventory turnover period and subtracting average payment period. CCC can either be positively related (conservative policy) or negatively related (aggressive policy) to profitability.

Controlled variables: Certain factors, if not controlled, may have some influence on profitability. In line with the study of Nwaobia et al (2012) and with modification, we utilize the following as controlled variables: size, leverage and current ratio.

Size of a firm is computed by finding the natural logarithm of sales. In principle, a larger sized firm is expected to have a larger amount invested in working capital, which will increase profitability through increase in sales. Hence, we expect a positive relationship between ROA and size.

Leverage: This is measured by the ratio of total debt to total assets. Following the prediction of Pecking order theory, a negative relationship between ROA and leverage is expected.

Current ratio: This is a measure of liquidity and is expected to have a negative relationship with ROA.

Current asset to total asset ratio: It represents investment in current assets in relation with the total assets. It is expected to have a positive relationship with ROA.

Current liability to total asset ratio: Padachi (2006) posited that this ratio measures the degree of aggressive financing policy and it is expected that it will have a negative relationship with ROA.

Model

The study utilizes panel data for the period 2005-2011 and simple OLS as estimation technique. This will assist in getting the coefficients of the explanatory variables and meaningful inferences can be made.

The model for this study is as follows:

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 CR_{it} + \beta_5 CATAR_{it} + \beta_6 CLTAR_{it} + e_{it} \text{ ----- (3.1)}$$

4. Results

Table 1 presents the descriptive statistics of the study's variables.

Table 1: Descriptive statistics

	Mean	Minimum	Maximum	Standard deviation
ROA	0.073	-0.192	0.372	0.077
CCC	132.265	-174.010	603.530	131.970
SIZE	9.960	8.290	11.378	0.849
LEV	0.262	0.000	0.864	0.253
CR	1.428	0.304	3.409	0.553
CATAR	0.629	0.149	0.994	0.209
CLTAR	0.481	0.122	0.913	0.189

The average profitability (ROA) is 7.3% and that of cash conversion cycle (CCC) is 132 days. The minimum cash cycle is -174 days. This may sound illogical, but in practice this is possible as in the case of the sampled firms. This is because the average payment period is greater than the combined days for the average inventory period and average receivable period. The natural log of sales (Size) shows a minimum value of 8.29 and maximum value of 11.378 in a year. The average log of sales is 9.96. The mean leverage is 26.2%. It shows that the sample firms utilized small amount of debt to total assets during the period of study, although some of the firms did not make use of debt while others showed high leverage, with maximum of 86.4%. The mean standard deviation of leverage is 0.253. The mean current ratio is 1.428 (this is less than the acceptable value of 2:1). The mean current asset to total assets ratio (CATAR) is 0.629, with maximum value of 0.994. It indicates that the firms were highly liquid. Lastly, the mean current liabilities to total assets ratio (CLTAR) is 0.481, with standard deviation of 0.189.

Table 2 presents the Pearson correlation coefficients of the study's variables.

Table 2: Correlation

	ROA	CCC	SIZE	LEV	CR	CATAR	CLTAR
ROA	1						
CCC	-0.239***	1					
SIZE	0.234***	-0.606***	1				
LEV	-0.537***	-0.053	0.121*	1			
CR	0.320***	0.485***	-0.351***	-0.511***	1		
CATAR	0.027	0.239***	-0.275***	-0.024	0.354***	1	
CLTAR	-0.331***	-0.180**	0.106*	0.472***	-0.579***	0.483***	1

*, **, *** indicate significant at 10%, 5% and 1% levels, respectively.

The table reveals that the cash conversion cycle (CCC) is negative and significantly associated with Profitability (ROA) at 1% level. It indicates that for a firm to maximize its profitability, it must reduce its CCC

to an optimum level. Size of the firm is positively related with ROA at 1% level. It implies that the higher the size of a firm, the higher will be profitability, which will come from sales. In support of the Pecking order theory, there is a negative and significant association between ROA and leverage at 1%. As expected, the current ratio has a positive association with ROA at 1% level and CLTAR has a negative correlation with ROA at 1% level.

The correlation matrix's inability to show the strength of relationship between variables renders it inappropriate to be used when unbiased inferences are to be made. To correct this limitation of correlation, we produce regression results of the model using pooled Ordinary Least Squares (OLS) as estimation technique. We utilized the SPSS version 15 for this exercise.

Table 3 presents the regression results.

Table 3: Regression results

	ROA
Constant	-1.422 (0.157)
CCC	-2.823*** (0.005)
SIZE	3.419*** (0.001)
LEV	-5.405*** (0.000)
CR	-0.228 (0.820)
CATAR	2.359** (0.020)
CLTAR	-2.331** (0.021)
Adjusted R square	0.446
F-stat	21.903*** (0.000)
DW	1.108
Number of observations	175

p- values are shown in parentheses.

*, **, *** indicate significant at 10%, 5% and 1% levels, respectively.

From the Table 3 we observe that the F-stat of the model is 21.903 and is significant at 1%. It shows that the model is fit. Also, the Durbin Watson (DW) value of 1.108 indicates that there is less autocorrelation between the variables.

The table indicates a negative and significant relationship between CCC and ROA at 1% level. This indicates that managers of firms need to be watchful of their cash conversion cycle in order to improve on their financial performance. They have to keep the CCC as low as possible in order to increase their profitability level. The outcome of this study is in support of the aggressive policy of working capital management.

The result is consistent with the findings of Shin & Soenen (1998), Raheman & Nasr (2006), Nazr & Afza (2008), Falope & Ajilore (2009), Nazir (2009), Uyar (2009), Rahema, Afza, Qayyum & Bodla (2010), Dong & Su (2010), Hayajneh & Yassine (2011) and Nwaobia et al (2012).

All the study's controlled variables (with the exception of current ratio, CR) have relationships with ROA that are in line with theoretical predictions. The firm size and current asset to total assets ratio showed positive relationship with ROA, while leverage and current liabilities to total asset ratio showed a significant negative relationship with ROA.

5. Conclusion and Recommendations

The study investigated the relationship between the working capital management and profitability of 25 Nigerian listed non-financial firms for 7-year period (2005-2011). The result of the study indicated a strong and negative relationship between the measure of working capital management (CCC) and profitability (ROA), significant at 1% level.

The implication of the outcome of the study is that for a firm to seek higher financial performance, it must be efficient in managing its working capital through keeping the cash conversion cycle as low as possible. To achieve this, it is recommended that decisions concerning the individual components of cash conversion cycle needs to be properly evaluated for efficient working capital management to be achieved. This is possible by accelerating the collection of receivables (reduce the time lag between sales and receipts of cash), reduce the length of time between the conversion of raw materials to finished goods and increase the length of time when

payments are to be made to suppliers of materials and other creditors. All these acts will eventually lead to optimal profitability.

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APPENDIX 1: VARIABLE DESCRIPTION

Variable	Abbreviation	Description
Return on Asset	ROA	$\frac{\text{Profit Before Tax}}{\text{Total Assets}}$
Cash Conversion Cycle	CCC	$\text{ICP} + \text{RCP} - \text{APP}$ Where, $\text{ICP} = \frac{\text{Average inventory}}{\text{Annual cost of goods sold}} \times 365$ $\text{RCP} = \frac{\text{Average accounts receivables}}{\text{Annual cost of goods sold}} \times 365$ $\text{APP} = \frac{\text{Average accounts payables}}{\text{Annual sales}} \times 365$
Size	SIZE	Log of Sales
Leverage	LEV	$\frac{\text{Total Debts}}{\text{Total Assets}}$
Current Ratio	CR	$\frac{\text{Current Asset}}{\text{Current Liabilities}}$
Current Asset to Total Asset Ratio	CATAR	$\frac{\text{Current Asset}}{\text{Total Assets}}$
Current Liability to Total Asset Ratio	CLTAR	$\frac{\text{Current Liabilities}}{\text{Total Assets}}$

APPENDIX 2: SECTORIAL CLASSIFICATION OF SAMPLE FIRMS USED IN THE STUDY

S/N	SECTOR	NUMBER OF FIRM
1	AUTOMOBILE AND TYRE	1
2	BREWERIES	2
3	HEALTHCARE	2
4	INDUSTRIAL AND DOMESTIC PRODUCT	3
5	BUILDING MATERIALS	2
6	CHEMICAL AND PAINTS	3
	CONGLOMERATES	1
7	CONSTRUCTION	2
8	PRINTING AND PUBLISHING	2
9	FOOD/BEVERAGES & TOBACCO	2
10	PACKAGING	3
11	PETROLEUM (MARKETING)	2
	TOTAL	25

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