

## **Working Capital Management and Profitability of Industrial Goods Sector in Nigeria**

**Okphiabhele, Emmanuella<sup>1</sup> PhD, Ibitomi, Taiwo<sup>2</sup> PhD, Dada, Durotimi Amos<sup>3</sup> PhD & Micah, Elton Ezekiel Mike<sup>4</sup> PhD**

<sup>1,2, & 3</sup> Achievers University, Owo, Ondo State, Nigeria

Department of Business Administration

<sup>4</sup> Air Force Institute of Technology, Kaduna, Nigeria

Department of Accounting

---

Citation: Okphiabhele, Emmanuella, Ibitomi, Taiwo, Dada, Durotimi Amos & Micah, Elton Ezekiel Mike (2022) Working Capital Management and Profitability of Industrial Goods Sector in Nigeria, *European Journal of Accounting, Auditing and Finance Research*, Vol.10, No. 5, pp.74-90

---

**ABSTRACT:** *This study investigated the relationship between working capital management and profitability of industrial goods sector in Nigeria. Specifically, the variables of working capital management namely: Cash Conversion Cycle (CCC), Current Ratio (CR), Quick Ratio (QR) and Working Capital Turnover ratio (WCTR) and Return On Assets (ROA) were examined. Firms in the industrial goods sector were selected and their data sourced from the Nigerian Stock Exchange Factbook (2011-2020) and seventy (70) observations were obtained. The study revealed from the regression analysis carried out that a positive linear relationship exist between the variables of working capital management (CCC, CR, QR and WCTR) and ROA. CR was negatively and significantly related with ROA while, CCC and QR was positively but insignificantly related with ROA. WCTR shows a negative and insignificant relationship with ROA when tested at 0.05 level of significance. Based on the findings, it is recommended therefore, that listed industrial goods firms should adopt the management of their short term financial strength in boosting profitability.*

**KEYWORDS:** current ratio, industrial goods, profitability, working capital management

---

### **INTRODUCTION**

Working capital management is an aspect of finance that deals with decisions regarding the flow of required resources to continuously carry out operations, concerned with the management of current assets and liabilities of a business (Owolabi & Alu, 2012). Different views on corporate finance are mostly concerned about long-term financial decisions which comprises of firm's valuation, dividend policies capital structure and investment decision. Though the activities of the economic growth in Nigeria with its limited financial resources that are available to market operators no doubt has brought increase in credit transaction (Ifurueze, 2013). It is regarded as an important component of financial management in any firm on accounts of its contributions and relationship on profitability (Ani, 2014). Asian (2015) described the need and importance of profit as the main motive of every business organization and the desire of maximising wealth that cannot be achieved without profit which ensures the continuity of business. Also business is financed by both equity and borrowed funds. Financial ratios help investors and other users of the financial statement to better understand and gauge

the firm's performance. Though, it depends on skills and expertise with which firms uses in their credit sales, Nandom, Mubarik and Abdul (2017) described working capital management as one of the vital elements of financial management which has direct relation on the firm's financial performance. Therefore, it is considered to be an inseparable segment of overall financial management (Navena & Anthuvan, 2017).

In connecting working capital management and profitability concepts, Singh and Asres (2011), opined that a well-established and efficient working capital management has a significant impact on profitability and liquidity of a firm. Valipour and Moradi (2012) stated that by effective working capital management, firms can reduce depending on external source of funds thereby generating funds for investments internally. Also ineffective working capital management may lead to under-investment which will affect profitability of a firm by reducing it. Furthermore, Uremadu, Egbide and Enyi (2012) suggested that profitability and liquidity are the major concepts of working capital management. Thus, there is a trade-off between them which helps to understand the relationship that exists between profitability and liquidity. Ani (2014) described profitability and working capital management as factor which creates positive impact on profitability. Sabo (2016) stated that profitability and management of working capital are the main elements of a business survival. Though, profitability ensures firm's survival, some firms will agree that through improvement of working capital management, profitability can be increased. Therefore to avoid failure or weak management of working capital, the importance of working capital management and its impacts on profitability should be considered as suggested by (Mohammed & Adnan, 2016).

It is expected that working capital management can be controlled thereby giving a significant impact on profitability of firms. The review of pertinent literatures by researchers like Angahar and Agbo (2014), Junaidu and Sanusi (2014), Onyimba (2015) and Sabo (2016) stated likely variables or components of working capital management with regards profitability such as average collection period, average payment period, cash conversion cycle and inventory turnover among others in cement companies, building materials companies, chemical and paint companies in Nigeria but observed that: Apart from the above listed variables to the best of my knowledge none has dealt on the issue of current ratio, quick ratio and working capital turnover ratio as variables of working capital management that can affects profitability of industrial goods sector in Nigeria.

The specific objectives of this study is to ascertain cash conversion cycle, current ratio, quick ratio and working capital turnover and firm's profitability. The research questions and hypotheses were set out in line with the stated specific objectives. Also, the panel analyses used in the past studies covered individual quoted companies specifically in cement, building materials, chemical and paint companies, and have not really analyse industrial goods sector in Nigeria across board which significantly shows the trend of profitability index assessment to reflect the full sector. This study therefore presents useful insights on working capital management and profitability of industrial goods companies in Nigeria using panel data to establish relationships among the research variables.

## LITERATURE REVIEW

### **The Concept of Profitability**

Sharaf and Haddad (2015) defined profitability as the position of providing monetary gain which is the main goal of any firm. Thus without it, businesses will be discontinued thereby regarding increase of profitability as an important task. Therefore, the measurement of previous year's profits and foretelling profits are important. There are varieties of profitability ratios used in monitoring the financial health of a business (Muhammad & Imran, 2015). Sharaf and Haddad (2015) defined profitability as the position of providing monetary gain which is the main goal of any firm. Thus without it, businesses will be discontinued thereby regarding increase of profitability as an important task. Therefore, the measurement of previous year's profits and foretelling profits are important. There are varieties of profitability ratios used in monitoring the financial health of a business (Muhammad & Imran, 2015). In a supporting view, Manoppo and Arie (2016) profitability is measures how well a firm can produce profits from prepared processes that have been executed to ensure continuity of the firm in future. And its usually seen as a significant factor for a firm survival and achievement of long term goals (Zeeshan, Zahid, Farrukh, Muhammad & Assad, 2016). Profitability shapes the value of a firm, giving it positive attitude or results from investors who can increase the stock prices as regards market value which eventually increases the value of the firm (Yanti & Darmayanti 2019). Elements of this ratio shows the combined result of liquidity and management of assets and debt such as cash return on capital invested, gross profit margin, net profit margin, return on asset, return on capital employed, return on equity, return on investment and return on sales.

### **Return On Asset (ROA)**

The Return on Asset (ROA) analyse the return to a firm's assets and it is often used as a general index of profitability. Thus, the more profitable a firm, the higher the value and as a profitability ratio, it measures the general competency of a firm in producing profits with available resources, which is equal to return on investment (ROI), though it is most suitable in measuring operating effectiveness of a firm which is operating profit divided by total assets (Sharaf & Haddad, 2015;). Return on Asset states the net income gross of a firm as percentage of the total assets obtainable for use by a particular firm or organization. Return on Asset suggests that firms with high amounts of assets should be able to gain high levels of income and it analyse management's capacity to gain a return on the firm's assets (Akindele & Odusina, 2015). In addition, it is used for measuring firm's performance as regards the shareholder's usage of funds compared to the firm's assets obtained (Konak & Guner, 2016).

### **Concept of Working Capital Management**

The concept of working capital management deals with choices describing the financing of short-term and the relationship management between short-term assets and liabilities of a firm (Naveed, Malik, Muhammad & Naqvi, 2014; Kosgey & Njiru, 2016). Also it is a major feature of every firm's activities since it has to do with maximising of profits and good running of firm. Sabo (2016) viewed working capital management as a vital tool which is considered as part of the main aspects of any business management. It is the action which aimed at managing a firm's working capital levels which deals with the problems of short-term financing (Qian, 2016). A well organised management of working capital is important in achieving profitability

while an unorganised management ties up funds and thereby reduces the firm's profitability (Suganya, 2016).

The aim of working capital management is to create a successful continuity process such as activities of the firm and sufficient accessibility of cash-flow to suit the growth of short-term debt and other expenses (Sabo, 2016; Dwommor, 2017). The components of working capital should not only be managed individually, but as a whole to improve investment and financing decisions. Four components have been selected in measuring profitability which are cash conversion cycle, current ratio, quick ratio and working capital turnover ratio.

### **Cash Conversion Cycle (CCC)**

Cash conversion cycle was suggested and developed by Richards and Laughlin (1980). Duru (2014) stated that it is an alternative for the efficiency of working capital management which rates the process of cash flows in a firm. Furthermore, it was identified as a time gap between cash payout that comes at the time of production output and cash inflows that is from the sales and collection of receivables (Angahar & Agbo, 2014). Naveed et. al. (2014) opined that it is the span of time that a firm takes to convert its resource inputs to cash-flows also putting into consideration, the time of selling inventory and collection of receivables (Akindele & Odusina, 2015). Cash conversion cycle is calculated as the addition of both days of sales outstanding and days of inventory outstanding minus days of payable outstanding (Azeez, 2015).

### **Current Ratio (CR)**

Current ratio is defined as the measurement of a firm's ability to generate cash to meet its short-term financial debt. Avo (2013) asserted that current ratio is an indicator for a tough financial situation which means that the firm has adequate resources to operate business. Hina (2014) described it as the ratio of a firm's current assets to its liabilities and if below one (1) indicates liquidity issues which it faces because it explains that the firm's total amount of its liabilities are more compared to the total amount of its assets in which the firm will not be able to pay its short-term debts. Also in relating with the above definitions, Onyimba (2015) contributed that current ratio is the common measure of liquidity and it is measured by current asset to current liabilities, which is suggested to be ratio two to one (2:1) which indicates that the firm can convert its assets to cash because working capital is a major key of attaining profits for the firm. The capability of the firm to convert its assets to cash means the firm's ability to manage working capital which is of a normal level to avoid insolvency.

### **Quick Ratio (QR)**

Quick ratio is a measurement of liquidity which is use in determining the response of a firm in paying its liabilities and the ideal level is 1:1 (Barine, 2012). It gives an insight of the capability of a firm in meeting its maturing current responsibilities and paying off its debts (Maisiba, Muturi & Atambo, 2017). Also, it measures the firm's capability in settling its short-term debts by using assets which are already converted to cash and that exclude inventories (Sathyamoorthi, Mogotsinyana & Popo, 2018).

### **Working Capital Turnover Ratio (WCTR)**

Lina (2013) defined working capital turnover ratio as one of the suitable method of examining the competency of a firm in controlling its assets. And it gives information about the operation

of its working capital. Working capital turnover ratio gives information needed as to how successfully a firm is making use of its working capital to generate sales. It is a widely used ratio for evaluating liquidity when establishing a relationship between current assets and liabilities. Furthermore, it measures the ability of paying a short-term debt (Diddimani & Ishwara, 2014).

### **Relationship between selected variables and profitability (ROA)**

#### **Cash conversion cycle and ROA**

Angahar and Agbo (2014); Junaidu and Sanusi (2014) stated that CCC proved positive and significant relationship to profitability. Yusoff, Kamilah, Ong and Shafie (2018); Ting, Nan, Hongyan, Youzhi and Yijun (2019) stated that CCC shows a negative and significant relationship to profitability. While Azeez (2015); Akindele and Odusina (2015); Pham, Nguyen, and Nguyen (2020) in their results proved that CCC was negatively and insignificantly related to ROA. But Muhammed (2015) result stated that there was no significant relationship with ROA.

#### **Current ratio and ROA**

Ani, Okwo and Ugwunta (2013); Akoto, Awunyo and Angm (2013); revealed in their work that current ratio significantly influenced firm's profitability. Also, Kajola, Nwaobia and Adedeji (2014) stated that current ratio as a variable of measuring working capital management was significantly related to profitability (Pham, Nguyen, & Nguyen, 2020). In their research, where they investigated WCM on ROA, it stated that current ratio has a positive influenced on ROA (Sabo, Rabi, Usman, Fatima & Tijani, 2015). While Rizwan (2016) revealed in his work that current ratio has a great impact on ROA.

#### **Quick ratio and ROA**

Sayed (2015) stated in his work that there was a significant inverse U-shape relationship of quick ratio with ROA. While Maisiba et al (2017) identified in their conclusion that quick ratio has a significant positive effect on profitability. Also Sathyamoorthi et al (2018) revealed in their work that quick ratio was insignificant to profitability.

#### **Working capital turnover ratio and ROA**

A study carried out in a Pakistan cement companies identified working capital turnover ratio as a significant variable that affects profitability (Ashraf, 2012). Furthermore, studies carried out by Mobeen and Naveed (2013); Lina (2013) confirmed that it also creates positive value to productivity, while Diddimani and Ishwara (2014) stated that there is a positive impact of WCTR on ROA.

## **THEORETICAL REVIEW**

### **The Operating Cycle Theory**

Yusuf and Nasruddin (2015) stated that this theory is one of the most important theories when managing working capital. It is regarded as an element that measures efficiency which takes note of the inventories and receivables relating to working capital management. Consequently, its practice starts from the receipt of raw materials to collection from debtors' receivables of the stock sales. Dabo Andow and Shekina (2018) in their support of operating cycle, states that

managing liquidity can be carried out by way of undertaking the balance sheet and income statement evaluation especially in corporate inventory turnover and accounts receivable where it analyses it to an operating cycle theory which gives suitable way of controlling assets or securities instead of depending on acid test ratio and current ratio as signs of solvency.

### **Trade off Theory**

Onyimba (2015) stated that trade off theory is between the hedging and conservative theories which gives an acceptable financing strategy because the hedging theory is related to higher profits while conservative is related to higher risks and neither serves a good purpose of competent management of working capital. Furthermore, the trade-off theory gives a financing decisions which lies between these two theories. The precise trade-off between profitability and risk differs from each issue and it depends on the perception of decision makers. A possible trade-off assumes to equal most monthly needs of finances in a given manageable time and the level in requirement of such needs may be funded through long term source and any additional support needs short-term financing.

### **Theoretical Framework**

This study is based on the theory of operating cycle. The importance of this theory is that it decides the amount of liquidity a firm needs. An operating cycle is having the liquidity requirements of business, and if the turnover periods of account receivables and inventories are long or the payment period is short, the operating cycle will grow longer and investment will boost (Yanchao, Yu, Xu & Chunlei, 2014). Yusuf and Nasruddin (2015) stated that in this theory in which firms ranks moderate credit term, there is tendency of having a higher but eventually less investment known as inventory turnover which shows the period of time firms converts their stock, working progress and finally finished goods to product sales.

In relating this theory to working capital management, the operating cycle defined the number of days a firm will take to change buying of inventory to cash receipts, which can be referred to as cash operating cycle. Trailing the records of this operating cycle of firms by comparing it to other firms alike, it provides investors the quality of the firm's assets. Therefore, it is advisable for firms to operate short operating cycle as it achieves its profit rapidly which allows firms to acquire more cash speedily to use for investment.

### **Research Model**

Based on the review of extant literature, we proposed a model as depicted in figure 1. Specifically, we are interested in examining if working capital management measured by cash conversion cycle, current ratio, quick ratio and working capital turnover ratio if properly managed, will yield good profits. The schematic representation of their relationship is shown below.

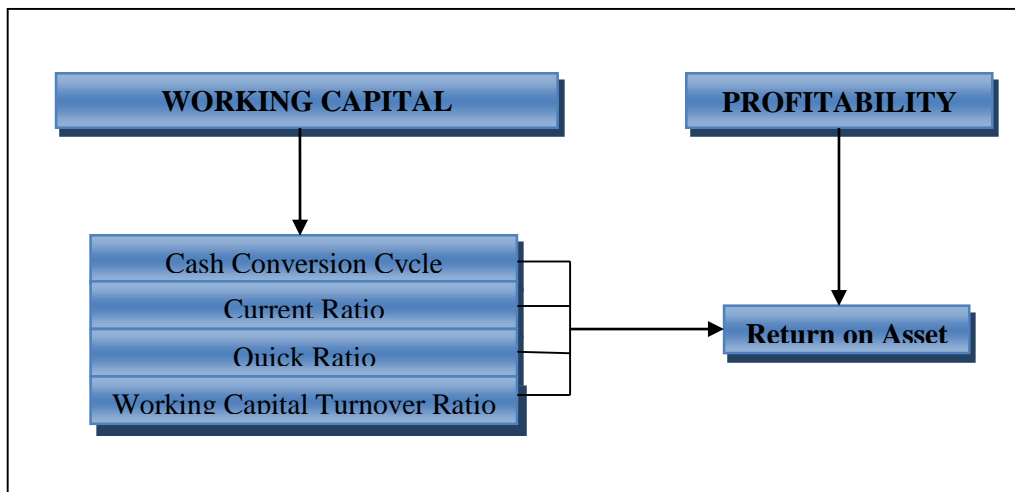


Figure 1: Conceptual paradigm

*Source:* Researcher's conceptualization (2021)

### Empirical Review

Angahar and Agbo (2014) examined the impact of working capital on the profitability of the Nigerian Cement industry. Data from a sample of four (4) out of five (5) cement companies quoted on the Nigerian Stock Exchange from 2002-2009 were analysed using descriptive statistics and multiple regression analysis. The result showed that there was an insignificant negative relationship between profitability and the number of days accounts receivable are outstanding (DAR) and a significant negative relationship in the number of days inventory (DINV) but was significantly positive in relationship to profitability and cash conversion cycle (CCC). It was concluded that profitability of these companies was inclined by DINV and CCC. It was therefore recommended that, management of these companies should efficiently handle their working capital by reducing the number of days inventory and should improve in the cash flow by reducing the cash conversion cycle.

Junaidu and Sanusi (2014) investigated the impact of working capital management on the profitability of quoted Nigerian cement companies using panel data analysis. A model was derived (GLS regression model), using descriptive statistics, correlation and simple graph as analytical tools. It was discovered that working capital components of inventory turnover, debtors collection period, average payment period and cash conversion cycle were significantly affected profitability. Therefore, these companies need to raise their investment level and concentrate more on investment in current asset.

Onyimba (2015) examined working capital management and profitability in chemical and paint sector in Nigeria. Secondary data were obtained from annual reports of five (5) chemical and paint firms listed in NSE during the period of 2000-2013. Hypotheses were tested using ordinary least square. From the result, the regression model showed that account collection period and cash conversion cycle proved positive while inventory conversion period and average payment period proved negative significant on profitability of the selected chemical and paints sector in the country.

Sabo (2016) investigated working capital management and profitability of listed Nigerian building material companies. Where secondary data was utilized collected from the annual reports and accounts of the companies for 2007-2014 were utilized. A panel data regression technique, descriptive statistics, correlation matrix of each variable, regression result on management of liquidity and ROA were used for analysis. The study observed that negative and insignificant effect between debt collection period, inventory conversion period and ROA. Meanwhile there was a negative significant effect between credit payment period, size and ROA. Though, there was negative and insignificant effect of ICP, DCP on ROA, the overall P value was 0.0002 and F value was 6.82 which suggests that working capital management has significant effect on profitability. In conclusion, WCM and profitability are the major factors of business survival.

Yusoff *et al.*, (2018) investigated the link between WCM and firm performance of 100 selected manufacturing firms in Malaysia. From their findings, CCC, ACP, ICP were negatively and significantly linked with profitability. Thus, firms performance is urged to be improved through proper WCM practices.

Ting *et al.*, (2019) examined the relationship between WCM and performance of firms of the Chinese economy context. Their study applied the two-way fixed effect regression models to a sample of Chinese listed manufacturing firms between the period of 2010-2017. From their result, CCC shows a negative but significant effect to performance. Thus, the result offers a key implication in assisting the Chinese government in creating better IEs and to improve their practices of WCM.

Pharm *et al.*, (2020) examined the influence of WCM and ROA of Steel Companies listed on the Stock Exchange of Vietnam. Secondary data was used for the period of 2010-2019. From the result, it revealed that CCC was negatively insignificant to ROA while CR shows a positive and significant relationship with ROA. It was concluded that the studies was in contrast to many published researched studies due to specific industries also with different stages of economic development linked with the policies of the State. Thus, it is recommended that managers can increase profitability by putting in place effective sales, debt and credit management strategies in order to achieve profitability and thereby maximising their shareholders wealth and reputation of their companies.

Findings from these studies revealed that common variables of measuring working capital management are average collection period, average payment period, cash conversion cycle and inventory turnover. Most part of these studies used regular method of analysis such as regression method which measures mostly the impact of firm's management of working capital on profitability.



## METHODOLOGY

A panel data analysis was used for this study. This design was chosen because it captures both time series and cross sectional effects. The research had a sample size of seventy (70) observations comprising seven (7) firms selected from the industrial goods sector listed in the Nigerian Stock Exchange for the period of ten (10) years (2011-2020); which reflects the entire quoted industrial goods firms in the Nigeria Stock Exchange as at 31<sup>st</sup> December, 2020. These firms include: Berger Paints Nigeria, Beta Glass Company, Cement Company of Northern Nigeria, Chemical and Allied Products, First Aluminium Nigeria, Greif Nigeria and Lafarge Cement Wapco Nigeria. The selection of these firms was based on the availability of data and the objects of selection are the industrial goods firms whose stocks are actively traded during observation period.

The study was based on secondary data. The financial data of individual firms in the industrial goods sector were sourced from the annual reports and accounts listed in the Nigerian Stock Exchange (NSE) Factbook. Data obtained includes cash conversion cycle, current ratio, quick ratio, working capital turnover ratio and return on assets. To examine the relationship between working capital management and profitability of industrial goods sector in Nigeria, a constant coefficient model was generated from the form:

$$\text{Model: } ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 QR_{it} + \beta_4 WCTR_{it} + e_{it}$$

Where:

ROA = Return on assets

CCC<sub>it</sub> = Cash conversion cycle

CR<sub>it</sub> = Current ratio

QR<sub>it</sub> = Quick ratio

WCTR<sub>it</sub> = Working Capital Turnover Ratio

B<sub>0</sub> = intercept

β<sub>1</sub> – β<sub>4</sub> > 0 = Coefficient of CCC, CR, QR, and WCTR

e<sub>it</sub> = Error term

Descriptive statistics of data collected from selected firms in the industrial goods sector of the Nigerian stock exchange list were presented. Data were tested for co-linearity using the ordinary correlation test and further expressed using the coefficient of determination. In studying the relationship of working capital management with the profitability of selected firms over the period of time, the econometric technique used was the Panel Least Square Regression, which gives the advantages of analyzing cross-sectional data over time series and reducing issues concerning Degree Of Freedom (D.O.F) to produce better results. With the use of a panel regression, problem of multi-co-linearity, aggregation bias and endogeneity problems are avoided while capturing the individual cross-sectional (or firm-specific) influence on dependent variable in the model. Analysis was conducted at 0.05 level of significance using E-View 9.0 software.

**DATA ANALYSIS AND RESULTS****Descriptive Statistics of Selected Industrial Goods Firms****Table 1: Descriptive Statistics of the Measured Variables**

```
. tabstat roa ccc cr qr wctr, statistics( mean max min median sd range sum coun
> t )
```

stats	roa	ccc	cr	qr	wctr
mean	10.37286	3.067143	.3157143	1.005714	39.08571
max	53.9	109.5	3.5	4.3	186.6
min	-11.3	-79.6	-.9	.1	-173.4
p50	6.8	1.5	.2	.85	32.1
sd	12.6786	18.27703	.6462009	.8184265	73.76242
range	65.2	189.1	4.4	4.2	360
sum	726.1	214.7	22.1	70.4	2736
N	70	70	70	70	70

*Source: 2010 – 2020 NSE data analyzed using STATA 14*

Descriptive statistics presented in Table 1 showed the number of observations of all variables, their average values, variance and standard deviations. It is seen that return on asset has a mean value of 10.37 with a standard deviation of 12.67, Current ratio (liquidity ratio) at 0.32 indicates the ability of selected firms in offsetting short term and long term obligations and the mean values of the working capital turnover ratio and cash conversion cycle reveals the firm's effectiveness in using their working capital and overall management respectively. The table also shows the minimum and maximum values attained on the measured variables of the five (7) firms in the industrial sector over a period of nine (10) years which gave the 70 panel data set used as observations for this study.

**Correlation Test****Table 2: Correlation Matrix of Dependent and Independent Variables**

. pwcorr roa ccc cr qr wctr, star (0.05) sig

	roa	ccc	cr	qr	wctr
roa	1.0000				
ccc	0.0181 0.8817	1.0000			
cr	-0.0919 0.4491	0.4066* 0.0005	1.0000		
qr	0.1226 0.3120	0.1095 0.3669	0.4862* 0.0000	1.0000	
wctr	-0.1835 0.1283	-0.0183 0.8804	0.0286 0.8140	0.3037* 0.0106	1.0000

**Source: Researchers' Computation (2021)**

The correlation matrix of the relationship between working capital management variables (cash conversion cycle, current ratio, quick ratio and working capital turnover ratio) and the profitability (return on assets) of the listed industrial goods firms in Nigeria is shown below in Table 2. It was found from the result that CCC is positively and weakly associated with ROA at 0.0181 representing 2% level of association. CR is negatively and weakly associated with ROA at -0.0919 representing 9% level of associated. QR is positively and weakly associated with ROA at 0.1226 representing 12% level of association. While WCTR is negatively and weakly associated with ROA at -0.1835 representing 18% level of association. Thus, the result shows that variables tested were not statistically significant at a level of 0.05 using pear wise correlation analysis (which implies the likelihood of working capital management having a direct significant impact on Profitability of these firms).

**Regression Analysis and Model Estimation**

This part presents the regression analysis results and model estimation for the study. Table 3 below showed that cash conversion cycle (CCC) is positively and insignificantly related to profitability (ROA) with P value of 0.023 and coefficient value of 0.064, this implies that there was no proper management of these firms by managers controlling these firms which may leads to overall ill-health of these firms. Current ratio (CR) shows a significant but negative relationship with profitability (ROA) with a P value of 0.004 and a coefficient value of -5.570 this shows that the firms are able to generate cash to meet up their short-term financial contract. Quick ratio (QR) was not significant but positively related to profitability (ROA) with a P value of 0.021 and coefficient value of 5.176 this means that the firms were unable to access cash quickly in other to meet up with their immediate demands. Working capital turnover ratio (WCTR) shows a negative and insignificant relationship on profitability (ROA) with a P value of 0.007 and a coefficient value of -0.047 this implies that the firms are not using their working capital efficiently. The value of  $\beta_0$  at 8.578 with a P value of 0.0001 means that the variables

considered has an immense impact on profitability which indicates the relevance of the study to the financial growth of the industrial goods sector in Nigeria.

**Table 3: Summary of Ordinary Least Square and Robust Regression Results**

`. estimates table OLS ROLS, stats(df N aic bic) se t p style(online)`

Variable	OLS	ROLS
ccc	.06376103	.06376103
	.08893043	.0274237
	0.72	2.33
	0.4760	0.0232
cr	-5.5702319	-5.5702319
	2.886586	1.8798109
	-1.93	-2.96
	0.0580	0.0043
qr	5.1764495	5.1764495
	2.1998533	2.1927059
	2.35	2.36
	0.0217	0.0212
wctr	-.04729958	-.04729958
	.02121815	.01710377
	-2.23	-2.77
	0.0293	0.0074
_cons	8.5786034	8.5786034
	2.3528943	2.1046304
	3.65	4.08
	0.0005	0.0001
df		
N	70	70
aic	554.34502	554.34502
bic	565.5875	565.5875

legend: b/se/t/p

**Source: Researchers' Computation (2021)**

Model:  $ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 QR_{it} + \beta_4 WCTR_{it} + e_{it}$

Estimation Equation:

=====  
 $ROA = C(1)*CCC + C(2)*CR + C(3)*QR + C(4)*WCTR + C(5)$

Substituted Coefficients:

=====  
 $ROA = -0.06376103*CCC - 5.5702319*CR + 5.1764495*QR - 0.04729958*WCTR + 8.5786034$

**DISCUSSION OF FINDINGS**

The practicing of working capital management for firm profitability increase at higher rates, it is imperative that principal interest is focused on the working capital turnover ratio and current ratios more than the firm's cash conversion cycle and quick ratio. Based on the data available, pursuing an increase in the negatively significant variable could be of less benefit and possibly reduce the profitability index of the industrial goods sector in Nigeria. From the findings of

this study, cash conversion cycle is positively insignificant with profitability which is in agreement with the result of Muhammed (2015) stating that there was no significant relationship with ROA. But it contradicts with the results of Azeez (2015); Akindele and Odusina (2015); Pham, Nguyen, and Nguyen (2020) whose results proved that CCC was negatively and insignificantly related to profitability. While the results from Angahar and Agbo (2014); Junaidu and Sanusi (2014) stated that CCC proved significantly positively in relation to profitability but Yusoff, Kamilah, Ong and Shafie (2018); Ting, Nan, Hongyan, Youzhi and Yijun (2019) proved that CCC shows a negative and significant relationship to profitability. Current ratio was significantly but negatively related to profitability this contradicts Sabo, Rabi, Usman, Fatima and Tijani, 2015; Rizwan (2016) results which stated that CR is positively and significantly related to profitability. The evaluation of quick ratio was insignificantly but positively related with profitability which was in agreement with the study of Sathymoorthi et al (2018) but was contrary with the work of Sayed (2015); Maisiba et al (2017) whose work stated that it was positively and significantly related with profitability. Working capital turnover ratio shows a negative and insignificant relationship with profitability which was not in agreement with the studies of Ashraf (2012); Mobeen and Naveed (2013); Lina (2013); Diddimani and Ishwara (2014) respectively whose results indicated positive and significant relationship with profitability.

## CONCLUSION AND RECOMMENDATIONS

This study provided further empirical evidence about the relationship of working capital management and profitability for a panel made up of a sample of industrial goods sectors in Nigeria for the period 2011-2020. The study found significant relationship between firm profitability with current ratio. While, cash conversion cycle and quick ratio and working capital turnover ratio were insignificantly related with firm's profitability. Thus, proper investment in current asset without stock will help to cover its current liabilities which will prevent liquid problem, and hence strengthen firm profitability performance. If firms properly manage short term investments and short term liability recovery, it will ultimately boost their profitability. It is therefore concluded that effective management of working capital contributes significantly to firm profitability.

## References

- Abdul-Khadir, M. I., Abdul, A., & Aliyu, S. (2020). Effect of working capital management on financial performance of quoted conglomerate in Nigeria. *Journal of Accounting Business and Finance*, 4(6), 1-14. <https://www.researchgate.net/publication/341237718>
- Afza, T., & Nazir, M. S. (2009). Impact of aggressive working capital management policy on firms' profitability. *The IUP Journal of Applied Finance*, 15(8), 20-30.
- Ahmed, M. (2016). Impact of working capital management on profitability of manufacturing share companies in Ethiopia. (Unpublished MSc Thesis), Addis Ababa University, Ethiopia.
- Akindele, J. A., & Odusina, A. O. (2015). Working capital management and firm profitability: Evidence from Nigerian quoted companies. *Research Journal of Finance and Accounting*, 6(7), 148-153. [www.iiste.org](http://www.iiste.org)
- Angahar, P. A., & Agbo, A. (2014). Impact of working capital on the profitability of the Nigerian cement industry. *European Journal of Accounting Auditing and Finance Research*, 2(7), 17-30.

- Ani, M. A. (2014). *Working capital management and corporate profitability: analysis of Nigerian firms, 2007-2012*. (Unpublished MSc thesis), University of Nigeria, Nigeria.
- Aravindan, R., & Ramanathan, K. (2013). Working capital estimation and management: a financial modeling approach. *Advances in Management*, 6(9), 4-5.
- Ashraf, C. K. (2012). The relationship between working capital efficiency and profitability. *Journal of Accounting Management*. 2(3), 21-32.
- Asian, A. U. (2015). Assessing the impact of liquidity and profitability ratios on growth of profits in pharmaceutical firms in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 3(10), 97-114.
- Avo, S. (2013). Performance measurement and management with financial ratios: the BASF SE case. *Institute of Management Berlin*, 72(3), 1-26.
- Azeez, N. O. (2015). *Working capital management and firms performance: a study of manufacturing companies in Nigeria*. (Unpublished MSc thesis), University of Nigeria, Nigeria.
- Barine, M. N. (2012). Working capital management efficiency and corporate profitability: evidences from quoted firms in Nigeria. *Journal of Applied Finance and Banking*, 2(2), 215-237.
- Dabo, Z., Andow, H. A., & Shekari, T. N. (2018). Impact of working capital management on financial performance of listed manufacturing firms in Nigeria. *International Journal of New Technology and Research*, 4(3), 09-14.
- Diddimani, B., & Ishwara, P. (2014). Working capital management analysis: an empirical study of leading hotels in India. *International Journal of Commerce, Business and Management*, 3(6), 806-812.
- Dong, H.P., & Su, J. (2010). The relationship between working capital management and profitability: a Vietnam case. *International Research Journal of finance and Economics*, 49(3), 62-70.
- Duru, A. N. (2014). *Impact of working capital management on corporate profitability of Nigerian manufacturing firms: 2000 to 2011*. (Unpublished MSc thesis), University of Nigeria, Nigeria.
- Dusica, S.S. (2018). Liquidity and profitability analysis of non-financial entities listed on the Macedonian stock exchange. *Business and Management Horizons*, 6(2). 32-42.
- Dwommor, J. Y., & Nasiru, I. (2017). Do firms manage working capital for survival or for success: An empirical evidence from literature review? *The International Journal of Business & Management*, 5(4), 173-183.
- Ghosh, S. K., & Maji, S. G. (2004). Working capital management efficiency: a study on the Indian cement Industry. *Management Accountant*, 39(5), 363-373.
- Gibson, C. (2012). *Financial statement analysis* (13th ed.). India: Cengage Learning.
- Hina, A. (2014). Impact of working capital management on profitability. *European Scientific Journal*, 10(1), 374-381.
- Ifurueze, M. S. K. (2013). The impact of effective management of credit sales on profitability and liquidity of food and beverage industries in Nigeria. *Global Journal of Management and Business Research*, 13(2), 29-38.
- Junaidu, M. K., & Sunusi, G. (2014). Impact of working capital management on the profit ability of quoted Nigerian cement companies. *International Journal of Advanced Studies In Business Strategies and Management*, 2(1), 126-138.

- Kajola, S. O., Nwaobia, A., & Adedeji, S. B. (2014). Working capital management and firm performance: evidence from Nigerian listed firms. *The International Journal of Humanities & Social Studies*, 2(4), 121-129.
- Konak, F. ., & Güner, E. N. (2016). The impact of working capital management on firm performance: An Empirical Evidence from the BIST SME industrial index. *International Journal of Trade, Economics and Finance*, 7(2), 56-64.
- Kosgey, T. & Njiru, A. (2016). Influence of working capital management on the financial performance of small enterprises; A survey of Nakuru County. *Journal of Business and Management*, 81(4), pp. 41-47.
- Lamberson, M. (1995). Changes in working capital of small firms in relations to changes in economic activity. *Mid-American Journal of Business*, 10(2), 45-50.
- Leon, S. A. J. (2013). The impact of working capital management on profitability of the listed firms in Sri Lanka. *Global Journal of Commerce and Management Perspective*, 2(6), 98-102.
- Lina, W. (2013). The impact of working capital turnover on Jordanian chemical industries' profitability. *American Journal of Economics and Business Administration*, 5(3), 116-119.
- Maisiba, L. N., Muturi, W., & Atambo, W. (2017). Effects of working capital management on profitability of retail firms in Kisii county, Kenya. *International Journal of Social Sciences and Information Technology*, 3(2), 1640-1655.
- Maness, T. S. (1994). The cash-flow timeline and the credit manager. *Business Credit*, 96(7), 10-12.
- Meltita, C. S. (2010). The effect of working capital management on firm's profitability: empirical evidence from an emerging market. *Journal of Business and Economics Research – December*, 8(12), 24-35.
- Micheal, A. A., Segun, A., & Taiwo, H. O. (2017). Impact of working capital management on financial performance of quoted consumer goods manufacturing firms in Nigeria. *Covenant Journal of Business & Social Sciences*, 8(2), 1-22.
- Mobeen, U. R., & Naveed, A. (2013). Determination of the impact of working capital management on profitability: an empirical study from the cement sector in Pakistan. *Asian Economic and Financial Review*, 3(3), 319-332.
- Mohammed, I. O., & Adnan, J. (2016). The impact of working capital management on the profitability of construction equipment firms: evidence from listed construction equipment firms in Abu Dhabi stock exchange. *Journal of Accounting and Finance*, 16(8), 135-147.
- Mohammad, M. (2015). Working capital management and profitability: A study on textiles industry. *ASA University Review*, 5(1), 32-40.
- Muhammad, N. K., & Imran, K. (2015). The effect of selected financial ratios on profitability: an empirical analysis of listed firms of cement sector in Saudi Arabia. *Quarterly Journal of Econometrics Research*, 1(1), 1-12.
- Nandom, Y. I., Mubarik, A. M., & Abdul, A. F. (2017). The impact of working capital management on corporate performance: evidence from listed non-financial firms in Ghana. *European Journal of Accounting, Auditing and Finance Research*, 5(3), 68-75.

- Navena, N. K., & Anthuvan, M. V. L.(2017). A study on the impact of the working capital management on the profitability of the leading listed automobile companies in India. *International Journal of Scientific Research and Management*, 5(8), 6744-6757.
- Naveed, A., Malik, S. M., Muhammad, N., & Naqvi, H. (2014). Impact of working capital on corporate performance, a case study from cement, chemical and engineering sectors of Pakistan. *Arabian Journal of Business and Management Review*, 3(7), 12-22.
- Naveed, A., Nadeem, M., Hammad, N. (2014). Impact of working capital on corporate performance: A case study from cement, chemical and engineering sectors of Pakistan. *Arabian Journal of Business and Management Review*, 3(7), 12-22.
- Nguyen, A. T. H., & Nguyen, T.V. (2018). Working capital management and corporate profitability: Empirical evidence from Vietnam. *Foundations of Management*, 10, 195-206.
- Onyimba, R. C. (2015). *Working capital management and profitability in chemical and paint sector in Nigeria*. (Unpublished MSc thesis), University of Nigeria, Nigeria.
- Owolabi, S. A., & Obida, S. S. (2012). Liquidity management and corporate profitability: case study of selected manufacturing companies listed on the Nigerian Stock Exchange. *Business Management Dynamics*, 2(2), 10-25.
- Owolabi, S. A., & Alu, C. N. (2012). Effective working capital management and profitability: a study of selected quoted manufacturing companies in Nigeria. *Economics and Finance Review*, 2(6), 55- 67.
- Penman, S. H. (2013). *Financial statement analysis and security valuation* (5th ed.). Singapore: McGraw Hill.
- Pham, K. X., Nguyen, Q. N., & Nguyen, C.V. (2020). Effect of working capital management on the profitability of steel companies on Vietnam stock exchange. *Journal of Asian Finance Economics and Business*, 7, 741-750.
- Qian, L. (2016). *Working capital management and its effect on the profitability of Chinese listed firms*. (Unpublished MSc thesis), Instituto Universitario de Lisboa, Lisboa.
- Ren, T., Liu, N., Yang, H., Xiao, Y. & Hu, Y. (2019). Working capital management and firm performance in China. *Asian Review of Accounting*, 27(4), 546-562. <https://doi.org/10.1108/ARA-04-2018-0099>
- Richards V.D., & Laughlin E.J. (1980). A cash conversion cycle approach to liquidity analysis. *Financial Management*, 9(1), 32-38.
- Rizwan, I. (2016). Impact of the liquidity management on the performance of the 64 Pakistani non-financial companies constituting Karachi Stock Exchange (KSE). *International Journal of Innovation and Applied Studies*, 14(2), 304-314.
- Sabo, M., Rabi, U. S. J., Usman, S. K., Fatima, B. I., & Tjjani, H. A. (2015). The effect of working capital management on corporate profitability: evidence from Nigerian food product firms. *Applied Finance and Accounting*, 1(2), 55-63.
- Sabo, H. A. (2016). Working capital management and profitability of listed Nigerian building material companies. In *Proceedings of the ICAN International Academic Conference:18-20 May 2016, Department of Accounting, Bayero University, Kano* (858-876).
- Sathyamoorthi C. R., Mogotsinyana, M., & Popo, S. (2018). The impact of working capital management on profitability: evidence from the listed retail stores in Botswana. *Applied Finance and Accounting*, 4(1), 82-94.



- Seyed, R. S. F. (2015). Providing a new model for assessment of working capital management: evidence from Tehran stock exchange. *International Journal of Accounting and Financial Reporting*, 5(1), 108-122.
- Siddiqi, M. N. (1971). *Recent theories of profit*. Aligarh: Aligarh Muslim University Press.
- Singh, K., & Asress, F.C. (2011), Determining working capital solvency level and its effect on profitability in selected Indian manufacturing firms. *International Journal of Research in Commerce, Economics and Management*, 1(2), 52-57.
- Smith, K. (1987). Trade credit and informational asymmetry. *Journal of Finance*, 42, 863-872.
- Suganya, J. S. N. (2016). Working capital management and firms' profitability: the listed companies in Sri Lankan. *International Journal of Emerging Research in Management and Technology*, 5(7), 6-11.
- Stewart, G. (1995). Supply chain performance benchmarking Study reveals keys to supply chain Excellence. *Logistics Information Management*, 8(2), 38-45.
- Ukaegbu, B. (2014). The significance of working capital management in determining firm profitability: Evidence from developing economies in Africa. *Research in International Business and Finance* 31, 1-16.
- Uremadu, S. O., Egbide, B. C., & Enyi, P. E. (2012). Working capital management, liquidity and corporate profitability among quoted firms in Nigeria evidence from the productive sector. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 2(1), 80-92.
- Valipour, H. & Moradi, J. (2012). The impact of capital expenditure on working capital management: empirical evidences from Tehran stock exchange. *International Research Journal of Finance and Economics*, 85(4), 14-25.
- Vural, G., Sokmen, A. G., & Cetenak, E. H. (2012). Effects of working capital management on firm's performance: evidence from Turkey. *International Journal of Economics and Financial*, 2(4), 488-495.
- Yanchao, W., Yu, J., Xu, C., & Chunlei, S. (2014). Inflation, operating cycle, and cash holdings. *China Journal of Accounting Research*, 7(2), 263-276.
- Yusoff, H., Kamilah, A., Ong, Y. Q., & Shafie, M. Z. (2018). The relationship between working capital management and firm performance. *Advanced Science Letters*, 24, 3244-3248.
- Yusuf, A., & Nasruddin, Z. (2015). A review of anatomy of working capital management theories and the relevant linkages to working capital components: a theoretical building approach. *European Journal of Business and Management*, 7(2), 10-18
- Zeeshan, F., Zahid, A., Farrukh, S., Muhammad, I. N., Assad, U. (2016). Determinants of profitability: Evidence from power and energy sector. *Studia UBB Oeconomica*, 61(3), 59-78. DOI: 10.1515/subboec-2016-0005