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## WORKING CAPITAL MANAGEMENT AND FINANCIAL PERFORMANCE OF QUOTED NON-FINANCIAL FIRMS IN NIGERIA

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### **Abstract**

*Despite huge literature in the area of working capital management (WCM) in past studies, many firms had crashed out of business because of their inability to optimally manage their working capital. This study examined the effect of working capital management on financial performance (ROA) of quoted non-financial firms (QNFFs) in Nigeria. Descriptive ex post facto research design was adopted with the use of purposive and cluster sampling techniques to select 95 out of 111 quoted non-financial firms listed on Nigerian Stock Exchange. Data were obtained from the annual reports of the firms and NSE fact book for the year 2020. Three (3) Panel Regression models, viz, Ordinary Least Square, Fixed Effect and Random Effect techniques, were used to analyse the data. The result revealed that all the explanatory variables (ACP, APP, INV, CCC, CATAR, GWCR, CLTAR, SIZE, LEV and SGROW) had a significant joint effect on return on assets of QNFFs ( $R^2 = 0.1462$ ;  $F=24.37$ ;  $P=0.0008$ ). The study concluded that; for the quoted non-financial firms in Nigeria to survive and maintain stability on performance (ROA) they should manage their ACP, APP, CCC, CTAR, GWCR and SIZE that is, Assets optimally.*

**Keywords:** *Financial Management, Working Capital Management, Non-Financial Firms, Return on Asset.*

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### **INTRODUCTION**

An enduring observation of long lingering failures of large number of firms in the past was linked to the inability of the business managers to effectively plan

and control the working capital components of the firms as asserted by Ali (2016). These observed inadequacies among the financial managers seem to be in practice these days in firms in Nigeria in the form of high profile of bad debt; as a result of not managing the accounts receivable properly, high inventory cost; as a result of bad inventory management policy and illiquidity due to their inability to understand the cash conversion cycle. These inadequacies in the management and neglect of working capital cycle led the firms to having longer number of days that the accounts receivable are outstanding, the number of days the inventory are held in warehouse, and shorter number of days it takes the firms to settle account payable.

Working Capital Management (WCM) therefore deals with the management of current assets and current liabilities, has been recognized as an important area of financial management. Working capital refers to the firm's short-term assets. Working capital (WC) is a measure of both firm's efficiency and its short-term financial health. WC is calculated as current assets minus current liability. The Working capital ratio (Current assets/Current liabilities) indicates whether a firm has enough short-term assets to cover its short-term debt. Anything below 1 indicates negative working capital while anything above 2 means the business is not investing excess assets and the most acceptable ratio has been sufficient is between 1:2 and 2:0 as asserted by Mbella and Ngongang (2018). WCM plays a vital role in the success of any firm because of its effect on liquidity and profitability. Capital is what makes or breaks business operations of firm and no business or firm can run successfully without enough capital to cover both short and long-term needs.

There has been a growing number of studies that examined the relationship between working capital and profitability in the recent time as well looked into various methods or approaches to solving the mirage of problems facing the subject of phenomenon, the authors include Zaxim et al, (2020); Raji et al, (2017); Faith & Ela (2016) cited in Daniya et al (2018) and Jinadu (2010). It is regrettable to note that in spite of these huge literature in this area, many firms had crashed, most especially those in the manufacturing sector of the Nigeria economy in which application of working capital is pronounced (Jinadu, 2010). Therefore, this study provides a leverage on the study of Ajayi, Abogun and Odediran, 2017.

Based on this, the research questions raised for the enhancement of the study include the extent of the relationship between working capital management

(WCM) and the performance of quoted non-financial firms in Nigeria as well as to what extent of the effects of working capital management (WCM) on return on assets (ROA) of quoted non-financial firms in Nigeria?

While the main objective we considered for the study is to determine the effect of Working Capital Management on performance of quoted non-financial firms in Nigeria over a period of nine (9) years from 2012 to 2020. The specifics are to establish the relationship between working capital management and financial performance and to also examine the effect of working capital management (WCM) on return on assets (ROA) of quoted non-financial firms on sectorial basis.

## **LITERATURE REVIEW**

### **Conceptual Clarifications**

Working Capital can be described as a company's entire investment in current assets and current liabilities. Ali (2016) explained that working capital is part of company's total capital which is employed in the short term operators. Onaolapo and Kajola (2015) classified working capital into gross working capital and net working capital. They opined that gross working capital is regarded as the amount invested in a firm's current assets while net working capital is the excess of current asset over current liabilities.

Francis (2015) opined that current liabilities are one of the flexible financial resources of firms, while Steve (2012) saw current liability as liability that is expected to be settled in the company's normal operating cycle that is the time between the acquisition of assets for processing and the realization of these assets into cash or cash equivalent. The definition differentiates liabilities that are current from non-current liabilities that is liability that fall due after more than 12 months of reporting date. Kazi (2015) declared that working capital management involves the decision of using the current assets and current liabilities which are significant part in the day to day operating activities of that particular organization. To Khan and Jain (2007) as cited in Soyemi and Olawale (2014) there are two concepts of working capitals; gross and net. The term gross capital also referred to as working capital means total current assets of a business. The term net working capital is being argued and defined in two ways (i) net working capital (NWC) is the difference between current assets and current liabilities (ii) that portion of current assets which is financed with long-term funds.

## **Financial Performance**

Performance of a firm according to Solomon (2014), rests on the activities and investment decisions of organizations. Faredenik and Cynthis (2003) posit that profitability ratios, growth rates and margins are the conduits that harbored firm performance. High financial performance suggests effective and efficient management in making use of company's resources (Naser and Mokhtar, 2004). Four useful measures of profitability are the rate of return on assets (ROA), the rate of return on equity (ROE), operating profit margin and net income (Hansein and Mowen, 2005).

According to ISA-1, performance can be defined as financial or monetary performance means measuring the outcome of a company's overall policies and operations in term of money. Ali (2016) asserted that performance may be defined as a general measure of a company's overall financial health over a given period of time, and can be used to compare similar companies across the same industry or to compare industries or sectors in aggregation. Financial performance is an important construct in financial management research because it portrays the management's efficiency in resources utilization to profits.

Kurawa (2011) cited in Ali (2016) explained that, turnover in working capital components result to profit. The faster the turnover, the more the profit will grow. He further asserted that profitability can best be measured in terms of return on assets, return on equity as well as return on capital employed. Return on assets indicates how much a firm generates profits and effectiveness with given resources. It is also known as return on investment. According to Olaoye et al (2019) return on equity is the ratio of net income after taxes divided by total equity capital. It indicates the rate of return earned on the funds invested in the organization by its shareholders.

## **Empirical Review**

The desire to understand the systematic relationship between working capital management and firm performance had resulted in acute volume of empirical studies which has taken different dimensions of policy relevance in the literature.

Sorin and Anca (2021) investigate the relationship between working capital and firm profitability for a sample of 719 Polish listed firms over the period of 2007–2016. The study used a quantitative approach using different panel data

techniques (Ordinary least squares, fixed effects, and panel-corrected standard errors models). The results revealed an inverted U-shape relationship of working capital level and firm profitability, working capital has a positive effect on the profitability of Polish firms to a break-even point (optimum level).

Olaniyan, Olufemi and Dominic (2020) examined the impact of working capital management on profitability in manufacturing firms in Nigeria between the period of 1988 and 2019. The study made use of auto-regressive distributed lag (ARDL) technique to analysis the data. The result revealed that; there was presence of co-integration (long-run relationship) among the dependent and all the explanatory variables consequently the study estimated the ARDLECM. The result further showed that Cash and Bank Balances (CBB), Trade Payables (TAP) and Trade Receivables (TAR) had a positive and significant impact on profitability of manufacturing firms in Nigeria which is a clear indication that working capital management has positive and significant impact on company profitability in Nigeria both in short and long run. The findings of this study is in tandem with Keynesian Liquidity preference theory. This study recommend that financial managers increase their working capital and ensure that it is properly managed in order to enhance sales revenue, thus strengthening firm profitability. Furthermore, the study suggests that financial managers should increase investment in working capital to accelerate their productivity so that they can also improve the profitability of the firms.

Mitans & Masanja (2018) carried a research study on the impact of Working Capital Management on financial performance of supermarket in Arusha city – Tanzania. The study employed a correlational research design where data was collected by using the questionnaire from ten (10) supermarkets which were in operation during the time of carrying out the study from January to October 2018. The collected data were analysed using descriptive and inferential statistics. T-test, correlation and regression techniques were employed to examine the relationship between working capital management and financial performance.

Ahmed, Mahtab, Islam and Abdullah (2017) examined the impact of different components of working capital management on profitability of Bangladeshi textile companies. Eight (8) years data from the time period of 2007 – 2014 of 22 textile companies listed in Dhaka Stock Exchange (DSE) were used, logistic regression was employed to analysis the data. Findings of the study revealed that there is statistically significant relationship between working capital

management and profitability of the Bangladeshi textile companies. The study also found that current ratio and current liabilities to total asset had most significant impact on profitability of textile companies in Bangladesh.

Ali (2016) examined the impact of working capital management on the financial performance of listed agricultural firms in Nigeria for the period 2007 – 2016. Accounts payable ratio, account receivable ratio, inventory ratio and cash conversion cycle were used as working capital variables. Firm size and age were used as the control variables in the study. The study employed ex-factor research design and utilized multiple regression in the analysis based on random effect estimation. The study revealed that account payable ratio had significant influence on the agricultural firms' financial performance while account receivable ratio (ARR) had positive and significant influence on financial performance of the firms studied. Inventory ratio (IR) had positive but insignificant influence with the financial performance of the firms. It also revealed that firms cash conversion cycle (CCC) had negative but significant influence on the financial performance. The study recommended that management of agricultural firms in Nigeria should maintain shorter cash conversion cycle in order to improve their financial performance based on their ability to generate funds internally, which could reduce their reliance on external finance that often tends to be expensive.

## **METHODOLOGY**

The research design adopted for this study was the descriptive ex post facto research design being a suitable technique for time order assessment of variables which in this case measured the effect of independent variables (working capital, accounts receivables, accounts payable, inventory days, liquidity ratio) on a given dependent variable (Return on Assets) among quoted companies of non-financial sector over a period of seven (9) years from 2012 – 2020. Moreover, the suitability of the choice was based on the fact that panel data design allows researcher to establish the time sequence of the variables on the basis of logical considerations.

The population of this study consists of One hundred and eleven (111) companies of non-financial firms listed on Nigerian Stock Exchange under ten (10) sectors of the economy as recorded in the NSE fact book of 2020. A multistage sampling method consisting of Purposive sampling and cluster sampling techniques as one of the methods of probability sampling was

employed to select ninety-five (95) quoted Non-financial firms and this represents (86%) of the entire population for this study. The purposive sampling technique was adopted for the selection of only non-financial companies that consistently published their annual reports for the period of investigation covering naira (9) years between 2012 and 2020. While the cluster sampling was employed to sample the quoted firms from the naturally divided groups called sector, by randomly selecting firms that met the criteria already stated in the introduction above.

We made use of secondary data covering working capital management related data such as current assets, current liabilities, quick assets, inventories and financial performance of companies (return on assets) for 2012 to 2020 were sourced from the Annual reports and accounts of the sampled quoted non-financial firms and Nigeria Stock Exchange fact book for the study.

**Measurement of Variables**

Dependent variable used in this study is the firm performance of quoted non-financial companies’ proxied by return on assets.

**Independent Variable:** Working capital management was represented by cash conversation cycle, accounts payable, accounts receivable and inventory and current ratios.

**Control Variable**

This control variable was introduced because of the notion that firm performance may also be affected by other factors not captured in the independent variables in which firm size is one (Adeusi., Akeke., Aribaba, and Adebisi , 2013). The control variables for this study include: firm size, leverage and age of the firm.

**Table 1: Measurement of variables**

Dependent variables	Description	Acromion	Source (s)
<b>Return on assets</b>	Net profit after tax / Total assets	ROA	Afrifa and Padachi 2016
<b>Independent variables</b>			
<b>Average collection period</b>	Account receivable	ACP	Ajayi et. al, 2017
<b>Average payment period</b>	$\frac{\text{Account payable}}{365}$	APP	"

<b>Inventory turnover</b>	$\frac{\text{Sales or Revenue}}{\text{Account payable}} \times 365$	INV	Olayinka Uchenn and Modee
<b>Cash conversion cycle</b>	$\frac{\text{Cost of sales}}{\text{Inventory}} \times 365$	CCC	"
<b>Gross working capital turnover ratio</b>	$\frac{\text{Cost of sales}}{\text{ACP} + \text{INV} - \text{APP}}$	GWCTR	"
<b>Current assets to total assets ratio</b>	$\frac{\text{Net annual sales}}{\text{Average working capital}}$	CATAR	Afrifa and Padachi 2016
<b>Current liabilities to total assets ratio</b>	$\frac{\text{Current asset}}{\text{Total assets}}$	CLTAR	"
<b>Control Variables</b>	$\frac{\text{Current liabilities}}{\text{Total assets}}$	SIZE	Olaoye et. al, (2020)
<b>Firms' size</b>	Log. of Total Assets	SGROW	""
<b>Sales Growth</b>	$\frac{\text{Sales}_1 - \text{sales}_0}{\text{Sales}_0} / 100$	LEV	
<b>Leverage</b>	Total debt / Total assets		

Source: Authors Conceptualization, 2021

### Model Specifications

The model is specified as follows:

$FP = f(Wcm, Sgrow, Debt, Size, \text{Net profit Margin}, \text{Return On Asset}, \text{Return On Equity})$ . The composition of WCM are ACP, APP, INT, CCC and FP represents financial performance. The empirical literature on working capital management for instance; Ajayi, Abogun and Odediran (2017), Yakubu, Alhassan and Fusani (2017) used Net profit margin, Return on asset and Return on Equity as the most common measures of firm performance. In this study, firm performance is measured by the return on asset. Independent variables for this study include: Inventory turnover, Average collection period (ACP), Average Payment period (APP), Cash conversion cycle (CCC) and Current ratio. Control variables for this study include: Size, sales growth and leverage. The relationship can be established in a linear form as stated below:

$$ROA_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_2 APP_{it} + \beta_3 INV_{it} + \beta_4 CCC + \beta_5 CATAR_{it} + \beta_6 CLTAR_{it} + \beta_7 GWCTR_{it} + \beta_8 SIZE_{it} + \beta_9 SGROW_{it} + \beta_{10} DEBT_{it} + \epsilon_{it} \dots \dots \dots 1$$

The  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}$

The regression revealed the degree of dependent variable caused by the independent variables.

A prior expectation was that  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}$

Coefficients of the independent variables measures the characteristics of each firm otherwise known as the observable heterogeneity,

$\epsilon_{it}$  = error term representing factors other than those specified in the model while

$i$  = 1 – 111 firms

$t$  = 2012 – 2020

**Method of Data Analysis**

To provide answer to research questions and achieve stated objectives information on all variables are analysed using descriptive and inferential statistics. The descriptive statistics include measures of central tendency such as mean, maximum, minimum and measures of variability such as standard deviation. The inferential statistics employed were Ordinary least square techniques, Pearson’s product correlation analysis and panel regression analysis. The Hausman test was however applied to select the best out of the three models adopted for the study.

**Pooled OLS Estimation**

In the pooled OLS model or constant coefficient model, all the observations are pooled together and a grand regression is estimated neglecting the cross sectional and time series nature of the data. Thus, the model takes the form stated below:

$$Y_{it} = \delta_0 + \sum_{m=1}^M \delta_m X_{it} + \mu_{it} \dots \dots \dots 2$$

For  $t = 1, \dots, T; i = 1, \dots, N; m = 1, \dots, M,$

Where, T is the number of observations over time, N number of cross-sectional units in the panel, and M number of regresses. Both the intercept and coefficient are constant across subject and over time.

**Least Square Dummy Variable Fixed Effect Estimation**

In this third approach known as the least squares dummy variable (LSDV) regression model, the unobserved effect is brought explicitly into the model. If we define a set of dummy variables  $D_i$ , where  $D_i$  is equal to 1 in the case of an observation relating to firm  $i$  and 0 otherwise, the model can be written

$$Y_{it} = \delta_0 + \sum_{i=2}^N \alpha_i D_i + \sum_{m=1}^M \delta_m X_{it} + \mu_{it} \dots \dots \dots 3$$

Formally, the unobserved effect is now being treated as the co-efficient of the individual specific dummy variable.

**Random Effect Model Estimation**

The random effect model is specified on the notion that heterogeneity effect across cross sectional units and over time cannot be tracked in the fixed sense; rather it's a random effect that can only become a subset of the error term of the model.

$$Y_{it} = \delta_0 + \sum_{m=1}^M \delta_m X_{it} + e_{it} + v_{it} \dots \dots \dots 4$$

Where:

$Y_{it}$  = measure of operational efficiency and the firm's growth rate

$X_{ijt}$  = measures of credit risk management

$$\mu_{it} = e_{it} + v_{it}$$

**Post-Estimation Tests**

Post estimation test conducted in the study included the restricted f-test of heterogeneity, Cross-Section independence test and autocorrelation test, with heteroscedasticity Wald test.

**RESULT OF FINDINGS**

Presented in Table 2 is the summary of the description of the variables of the study. The discovery above indicates that the Return on Assets (ROA) of the sampled firm for the period covered have an average value of 0.0553462% ranged from a negative return of -0.1965952% to a maximum of 0.6304504%. The inference is that for every one naira invested, the industry had made a loss of N0.2 and had made a maximum gain of N0.6. Equally, the average value of

ROA reported to be 0.0553462 indicates that the sampled firm could make an average of 0.06% on the net investment with a higher degree of risk as the returns varied at both sides of the scale by a large margin of 0.127%. Also, the sampled firms collect the money back from their debtors in 36 days and pay their creditors in 30 days on the average. Whereas their debtors could remain outstanding for a minimum of 12 days, the firms were not paying their bills earlier than 90 days. The credit conversion cycles the companies granted their clients averaged 110 days while it took an average of 117 days to convert inventories into sales. To check the size of the firms and its relationship with profitability, natural logarithm of sales is used as a control variable.

The mean value of log of sales is 0.5645499 while the standard deviation is 4.447547. The maximum value of log of sales for across the sampled firms for the period covered is 0.9231292 and a great loss of 44.39093. Furthermore, it was revealed that the average value for Current Assets to Total Asset Ratio (CATAR) is 0.5313962, with a minimum and maximum values of 0.0040755 and 6.896293 respectively. The standard deviation of 0.7956189 shows that the risk is higher, as it is relatively closer to its mean figure. In the same result, the mean value of Gross Working Capital Ratio (GWCR) is at 2.542906, with a minimum and maximum values of -92.20247 and 109.5937 respectively and a standard deviation of 22.84624 which shows that the risk is higher, as it is relatively greater than its mean figure. Also, the mean value of Current Liabilities to Total Asset Ratio (CLTAR) is at 0.6864924 with a minimum and maximum values of -0.4535974 and 12.81374. The average value of the debt ratio given to be 13% indicates that the sampled firms have more debt than asset.

**Table 2: Descriptive Statistics of Variables**

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	609	0.0553462	0.1274448	-0.1965952	0.6304504
ACP	609	36.20671	26.62551	-12.64274	97.0383
APP	609	-30.25697	31.57599	-90.57741	80.94926
INV	609	-177.2028	1215.221	-7901.626	6345.275
CCC	609	-110.7391	1205.122	-7792.337	6320.704
CATAR	609	0.5313962	0.7956189	0.0040755	6.896293
GWCR	609	2.542906	22.84624	-92.20247	109.5937
CLTAR	609	0.6864924	1.465887	-0.4535974	12.81374

<b>SIZE</b>	609	7.359582	0.6573713	5.682478	8.472961
<b>LEV</b>	609	0.1346319	0.3777224	-0.4633567	3.660278
<b>SGROW</b>	609	-0.5645499	4.447547	-44.39093	0.9231292

**Source: Data Analysis (2021).**

### Regression Analysis

The regression analysis revealed the effect of working capital management on financial performance of quoted non-financial firms in Nigeria. There are three models based on the specific objectives and the analysis covered pooled OLS estimation, fixed effect estimation and random effect alongside post-estimation tests. For the fixed effect estimation, the study jointly incorporated firms' heterogeneity effect and period effect into the model using a dummy approach in which each firm and year was assigned an intercept term.

### Pooled OLS Model

Analysis of the Effect of working capital management (average collection period, average payment period, inventory turnover, cash conversion cycle, current asset to total assets ratio, gross working capital ratio and current liabilities to total asset ratio) on the Return on Asset (ROA) of quoted non-financial firms in Nigeria.

Pooled estimation result presented in table 3 revealed that when heterogeneity effect across firms sampled in the study is no given consideration, CCC, CATAR and CLTAR exert insignificant and negative effect on return on asset of quoted non-financial firms in Nigeria, with coefficient estimate of -0.0006859 ( $p=0.145 > 0.05$ ), -0.0183452 ( $p=0.266 > 0.05$ ) and -0.0060934 ( $p=0.474 > 0.05$ ) respectively. ACP and APP on the other hand exerts negative but significant effect on return on asset of quoted non-financial firms in Nigeria, with coefficient estimate of -0.0006888 ( $p=0.007 < 0.05$ ) and -0.0008656 ( $p=0.004 < 0.05$ ) respectively. Result also revealed that INV, GWCR, SIZE, LEV and SGROW exert a positive effect on return on asset of quoted non-financial firms in Nigeria. However, the positive effect is only significant for LEV against the insignificant effect of INV, GWCR, SIZE and SGROW with the coefficient and probability values of 0.1194817 ( $p=0.001 < 0.05$ ), 0.0007065 ( $p=1.52 > 0.05$ ), 0.0001504 ( $p=0.772 > 0.05$ ), 0.017396 ( $p=0.394 > 0.05$ ) and 0.0009976 ( $p=0.714 > 0.05$ ) respectively. Adjusted r-square statistics reported in table 3 showed that about 31% of the systematic variation in return

on asset can be jointly explained by ACP, APP, INV, CCC, CATAR, GWCR, CLTAR, SIZE, LEV and SGROW while the remaining 69% could be accounted for by other variables not covered by this study. The F-statistics of 7.45 along the probability value of 0.0047 revealed that the model is fit.

**Table 3: Pooled OLS Estimation Result**

Variable	Coefficient	Std. Error	T-Test	Probability
C	-0.0516127	0.1558004	0.33	0.741
ACP	-0.0006888	0.0002442	2.33	0.007
APP	-0.0008656	0.0002732	2.51	0.004
INV	0.0007065	0.0004651	1.52	1.52
CCC	-0.0006859	0.0004663	1.47	0.145
CATAR	-0.0183452	0.0164018	1.12	0.266
GWCR	0.0001504	0.0005171	0.29	0.772
CLTAR	-0.0060934	0.0084685	0.72	0.474
SIZE	0.017396	0.0202985	0.86	0.394
LEV	0.1194817	0.0333457	3.58	0.001
SGROW	0.0009976	0.0027161	0.37	0.714

R-square=0.3886, Adjusted R-square=-0.3118, F-statistics=7.45, Prob(F-stat)=0.0047 (\*) connotes significance at 5% level of significance.

**Source: Data Analysis (2021).**

### Fixed Effect Model (FEM)

Table 4 presented the fixed effect estimation results. The results indicated that when the diversity of the operational activities and managerial skills across firms and the time covered by this study are put into consideration, APP, INV and SGROW have a positive but insignificant effect on return on asset of the sampled quoted non-financial firms in Nigeria to the tune of 0.0002155 ( $p=0.584 > 0.05$ ),  $8.97e-06$  ( $p=0.379 > 0.05$ ) and 0.002922 ( $p=0.207 > 0.05$ ) respectively. Also, LEV exert a positive significant effect on return on asset across sampled quoted non-financial firms in Nigeria to the tunes of 0.0734615 ( $p=0.024 < 0.05$ ). On the contrary, ACP, CCC, GWCR and CLTAR were found to have negative insignificant effect on return on asset to the tune of -0.0006639 ( $p=0.187 > 0.05$ ), -0.0239811 ( $p=0.335 > 0.05$ ), -0.0001927 ( $p=0.668 > 0.05$ ) and -0.0145646 ( $p=0.063 > 0.05$ ) respectively. Also, it was

revealed that CATAR and SIZE exert a negative but significant effect on return on asset with the coefficient and probability values of -0.0708667 ( $p=0.001 < 0.05$ ) and -0.1877631 ( $p=0.006 < 0.05$ ) respectively. The adjusted R-square of 0.5117 revealed that about 51% of the systematic variation in return on assets can be explained by all the predictor variables while the remaining 49% could be accounted for by other variables not covered by this study. The F-statistics of 26.73 along the probability value of 0.0006 revealed that the model is fit.

**Table 4: Fixed Effects Estimation Results**

Variables	Coefficient	Std Error	T-Test	Probability
C	1.509258	0.498695	3.03	0.003
ACP	-0.0006639	0.0004992	1.33	0.187
APP	0.0002155	0.0003921	0.55	0.584
INV	8.97e-06	0.0000101	0.88	0.379
CCC	-0.0239811	0.0221190	0.47	0.335
CATAR	-0.0708667	0.0198342	3.57	0.001
GWCR	-0.0001927	0.0004479	0.43	0.668
CLTAR	-0.0145646	0.0077155	1.89	0.063
SIZE	-0.1877631	0.0660494	2.84	0.006
LEV	0.0734615	0.0319164	2.30	0.024
SGROW	0.002922	0.0022992	1.27	0.207

R-square=0.5117, F-statistics=26.73, Prob(F-stat) =0.0006 (\*) connotes significance at 5% level of significance

Source: Author’s Computation (2021).

**Random Effect Model (REM)**

Table 5 revealed that when the error term absorbed the heterogeneity effect across quoted non-financial firms in Nigeria and over time, APC, APP, CCC, CATAR, GWCR, CLTAR and SIZE have a negative effect on return on assets with their respective coefficient values of -0.0006199, -0.0000604, -0.0449023, -0.0380584, -0.0000545, -0.0120383 and -0.0204613. However, the negative effect was only significant for ACP, CCC and CATAR with the probability values of 0.003, 0.008 and 0.026 respectively as against the insignificant probability value of APP, GWCR, CLTAR and SIZE given to be 0.875, 0.905, 0.120 and 0.511 respectively. On the contrary, INV and SGROW have a

positive but insignificant effect on return on asset across the sampled quoted non-financial firms in Nigeria to the tune of 0.0000126 ( $p=0.203 > 0.05$ ) for INV and 0.0028926 ( $p=0.220 > 0.05$ ) for SGROW. Also, it was revealed that LEV exerts a positive significant effect on return on asset across the sampled quoted non-financial firms in Nigeria with the coefficient and probability values of 0.1057663 and 0.000 respectively. The adjusted R-square of 0.1462 revealed that about 14% of the systematic variation in return on assets can be jointly explained by all the explanatory variables while the remaining 86% could be accounted for by other variables not covered by this study. The Wald Chi of 24.37 along the probability value of 0.0008 revealed that the model is fit.

**Table 5: Random Effect Estimation**

Variable	Coefficient	Std Error	T-Test	Probability
C	0.2448106	0.2367553	1.03	0.301
ACP	-0.0006199	0.0002746	2.31	0.003
APP	-0.0000604	0.0003838	0.16	0.875
INV	0.0000126	9.93e-06	1.27	0.203
CCC	-0.0449023	0.0155671	2.57	0.008
CATAR	-0.0380584	0.017078	2.23	0.026
GWCR	-0.0000545	0.0004584	0.12	0.905
CLTAR	-0.0120383	0.0077399	1.56	0.120
SIZE	-0.0204613	0.0311422	0.66	0.511
LEV	0.1057663	0.0303838	3.48	0.000
SGROW	0.0028926	0.0023577	1.23	0.220

R-square=0.1462, Wald chi2(5)=24.37, Prob> chi2 =0.0008 (\*) connotes significance at 5% level of significance

**Source: Author’s Computation (2021).**

### Hausman Test

Table 6 reported Chi-square statistic of 11.46 and a probability value of 0.1768. The result revealed that there is no enough evidence to reject the null hypothesis that differences in coefficients of fixed effect estimation and random effect estimation is not significant. Hence, the difference in the coefficient is not systematic. Therefore, the most consistent and efficient estimation is given by the random effect estimation as presented in Table 5. The results showed that

APC, APP, CCC, CATAR, GWCR, CLTAR and SIZE have a negative effect on return on assets with their respective coefficient values of -0.0006199, -0.0000604, -0.0449023, -0.0380584, -0.0000545, -0.0120383 and -0.0204613. However, the negative effect was only significant for ACP, CCC and CATAR with the probability values of 0.003, 0.008 and 0.026 respectively as against the insignificant probability value of APP, GWCR, CLTAR and SIZE given to be 0.875, 0.905, 0.120 and 0.511 respectively. On the contrary, INV and SGROW have a positive but insignificant effect on return on asset across the sampled quoted non-financial firms in Nigeria to the tune of 0.0000126 ( $p=0.203 > 0.05$ ) for INV and 0.0028926 ( $p=0.220 > 0.05$ ) for SGROW. Also, it was revealed that LEV exerts a positive significant effect on return on asset across the sampled quoted non-financial firms in Nigeria with the coefficient and probability values of 0.1057663 and 0.000 respectively.

**Table 6: Hausman Test**

	Chi-square stat	Probability
Difference in coefficient not systematic	11.46	0.1768

**Source: Data Analysis (2021)**

**Post-Estimation Tests**

Table 7 shows the three (3) posr-estimation test conducted on the study viz, cross sectional dependence, homoscedasticity and autocorrelation test. The cross sectional dependce revealed that there is no enough evidence to reject that there is no cross-sectional dependence across the quoted non-financial firms sampled for this study. Hence, it can be established that there is no cross-sectional dependence for the estimated panel model. Similarly, the homoscedasticity test revealed that there is no enough evidence to reject the assumptions of an equal variance of residual terms across the quoted non-financial firms sampled for this study, reflecting that the variance around the regression line is the same for the values of the predictor. While the autocorrelation test revealed that there is no enough evidence to reject the assumption that there is no serial correlation in the panel model across the quoted non-financial firms sampled for this study, reflecting that there is no presence of auto-correlation.

**Table 7: Post-Estimation Results**

S/N	Tests	Null Hypothesis	Chi-square stat	Probability
1	Pesaran Test of Cross-sectional Dependence	No cross-sectional dependence	0.268	0.7889
2	Modified Wald Test for Groupwise Heteroskedasticity	Static panel homoscedasticity	0.22	0.6507
3	Wooldridge Test of Panel Autocorrelation	No AR(1)panel autocorrelation	0.7160	0.8190

**Source: Data Analysis (2021)**

### Summary and Conclusion of Findings

The study examined the effect of working capital management (WCM) on performance of quoted non-financial firms (Return on Assets) in Nigeria. The essence of the study was to find out the extent of the relationship between the independent variables and dependent variables as well as to investigate the effect of independent variables on the dependent variables.

The descriptive ex-post facto research design was adopted for the study with a multistage sampling technique consisting of purposive sampling technique on one side and cluster sampling technique on another side were employed to select 95 out of the 111 quoted non-financial firms in Nigeria (representing 86% of the entire population). Published annual report of the 95 NFFs for seven years (2012-2020) were employed for data collection. The report was already published by the firms and Nigeria stock exchange; thus they are considered reliable for purpose of this research. Analysis of data was carried out through the use of mean, minimum, maximum and standard deviation. Inferential statistics of OLS Ordinary Least Square techniques, Pearson’s product correlation and panel regression analysis were used to test the research hypotheses.

Conclusively, the study revealed that there is a relationship between the independent variables. The independent variables (CATAR, GWCR, CLTAR, INV, LEV, ACP and APP) and financial performance of NFFs (ROA) but in different direction over the period covered by this study across the sampled firms. This study revealed that ACP, APP, CCC, CATAR, GWCR, CLTAR

and SIZE have a negative effect on return on assets with their respective coefficient values of -0.006199, -0.0000604, -0.044903, -0.0380584, -0.0000545, -0.0120383 and -0.0204613, but only significant for ACP, APP, CCC, CATAR, GWCR, CLTAR and SIZE. However, this study also revealed INV and SGROW have a positive but insignificant effect on return on asset across the sampled quoted NFFs in Nigeria.

### **Contributions to Knowledge**

Factors influencing firm's performance have generated series of arguments and researches to date. Apparently, efforts are still on at shedding more light on this multifaceted concept by scholars. This study contributes significantly to knowledge in the following areas: component of working capital management have significant influence on firm's performance. The study also affirmed that the availability of inventories and debt without effective management is worthless and of no value at enhancing firm's performance. The model adapted and modified for this study is also another contribution to knowledge because it is conceptualized by the researchers. It shows the relationship between working capital management and firm financial performance with control variables.

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