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WORKING CAPITAL MANAGEMENT AND THE FINANCIAL PERFORMANCE OF LISTED OIL AND GAS COMPANIES IN NIGERIA

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Abstract

Working capital is required for steering the day to day operations of an organization and hence its importance. This study examines the impact of working capital management on the financial performance of listed oil and gas firms in Nigeria. The study used secondary data only covering a period of 8 years (2011-2018). Correlational research design was used on a sample of 11 oil and gas firms. The study also employed the Robust Generalized Least Squares (GLS) multiple regression technique for data analysis, it concluded that cash conversion circle, and average period of debt settlement are negatively and strongly influencing return on asset of listed oil and gas firms in Nigeria, while average collection periods is positively influencing the return on asset of listed oil and gas firms in Nigeria. But average period of inventory retention has no statistical significant positive impact on the return on asset of listed oil and gas firms in Nigeria. The study therefore recommended that the management of oil and gas firms in Nigeria among others should consider reducing the cash conversion circle so as to increase their firm profitability. In addition, managers' of oil and gas firms should encourage larger sales turnover and volume by allowing their customers' shorter periods of account collections through granting of prompt sales cash discounts. The policy implication from the finding is that, management of listed oil and gas firms in Nigeria must embrace a more flexible trade credit policy from suppliers with elongated time to make payments for the profitability of their firms to improve.

Keywords: *Working Capital Management, Return on Asset, Oil and Gas Firms*

1. Introduction

Working capital connotes the funds lock up in materials, work in progress, finished goods, receivables, and cash. Working capital means the amount by which total current assets exceed current liabilities and is affected by current

assets such as cash, stock, bank balance, and prepayments as well as current liabilities, including creditors and accruals. Therefore, working capital is one of the most important measurements of the financial position. This necessitates the need for the careful management of working capital in every business organization with the value maximization objective in mind. This is because, the main objective of any given firm is to maximize shareholder's wealth and this can be achieved by maximizing the profit of a firm (Owolabi & Alu, 2012).

Rehn (2012) asserts that working capital usually refers to net working capital, the difference between current assets and current liabilities. Thus, it involves minimizing the timing of collecting receivables, deferring the period of payables, and keeping the minimal inventory. Moreover, working capital management includes cash management, that is, how to invest idle cash without compromising liquidity. Working capital management is considered a very sensitive area in the field of financial management; because it involves the decision of the amount and composition of current assets and the financing of these assets. However, most firms do not hold the correct amount of working capital and this has been a major obstacle to their overall performance (Stephen, 2012).

Therefore, a firm is required to strike a balance between profitability and liquidity while steering its day to day operations (Hoang, 2015). However, optimum liquidity position is usually accomplished through the management of cash conversion cycle, average period of debt settlement, average period of collection of receivables and inventory retention as a whole.

Cash conversion cycle is used in measuring cash management, and it denotes the interface between the various links of liquidity and the movement of cash within a company (Wang, 2002). Similarly, it can also be used to determine the amount of cash needed for any sales level; it is therefore a period of time between the outflow of cash on raw materials and the inflow of cash from the sale of finished goods.

Average period of collection of receivables management involves achieving an ideal average time taken by credit customers to make good their accounts (Van Horne, 1995). Moreover, since the purpose of extending credit is to increase profitability, the costs of debt collection should not be allowed to surpass the amounts recovered. On the other hand, average period of debt settlement

management emphasizes on the average time taken by an enterprise to settle its trade payables; it is short term liabilities and all obligations, which mature within a year such as income tax liability, creditors, accrued expenses, bills payable, short-term bank loans, and bank overdraft, all of which quickly mature in the current year (Uyar, 2009). And lastly, Falope and Ajilore (2009) stated that Inventory retention management for purchasing, production and marketing of stock should reduce the total costs of carrying, handling and funding inventory.

The way in which inventory is managed affects the levels of raw materials, work in progress and finished goods required to sustain efficient operations and sales. This directly impact on liquidity if management introduces change to alter the absolute levels of inventory held (Stephen, 2012).

The financial performance of a firm is generally evaluated in three main aspects. The first one is the productivity of the firm, or in other words, conversion of the inputs to outputs in an efficient manner. Secondly, the profitability, a stage, or the level of earnings that reaches the company from its daily activities to be greater than the costs of these activities. Stephen, (2012) argued the last aspect of evaluating the company's performance is the market premium and it could be said that it is the level at which a firm's book value is lower than its market value.

However, it could be debated what financial performance is, a firm's financial performance can be measured by many formulas and ratios (Rezazade, 2014).

Therefore, this study focuses on Oil and Gas firms in Nigeria; oil and gas firms employs a significant number of Nigerians, while at the same time attracting the largest volume of foreign direct investment into Nigeria. Oil and gas companies were selected as a domain of this study because, in the last decades, there have been several cases of business failure in developed and developing economies around the world. Some believe that such failure is due to mismanagement of working capital efficiency, while others are of the view that it was due to the failure of managers to identify factors that are responsible for eliminating and improving the efficiency of working capital items. Examples of such mismanagement of working capital lead to Oando Nigeria Plc management 'cooking' its books as reported recently by two of its shareholders (Reuters, 2018). Again, the delisting of two oil and gas firms from the Nigerian stock exchange in the last 10 years which falls within the period of study was also due

inadequate working capital management that gave the two delisted firms negative impact on their performance (Oluboyede 2007). Thus, prompting the present research in the oil and gas sector of the Nigerian economy.

This study is equally designed to apply a more robust methodology (GLS) and provide a more reliable finding in the oil and gas firms in Nigeria. The study will therefore utilize tests such as shapiro-wilk test for data normality, VIF for multicollinearity, and heteroscedasticity test for hettest problem in order to improve the robustness of the statistical result. Finally, a period gap and domain gap exists for the most of the studies that were conducted on working capital management in Nigeria as many of them were conducted using data not extended to 2018 and none conducted on the oil and gas domain in Nigeria to the best of the researcher's knowledge except in Pakistan (Shah & Sana, 2006). Their findings might not be in tune with the present day reality on as so many changes in the business environment and political cycle took place in Nigeria which significantly affected prices as well as lending. These changes include; changes in rate of inflation, scarcity of foreign currencies for importation of raw materials and machineries, change of the Nigerian government and also, the recent hike in foreign exchange rate to naira for all the major currencies in the world making it difficult for managers of firms in Nigeria to manage their liquidity. The central question is whether different working capital management components used by other researchers from other countries and developed economy will influence the profitability of oil and gas firms in Nigeria? Therefore, this provided a gap for this study to fill.

The main objective of the study is to examine the impact of working capital management on the net operating profitability of listed oil and gas firms in Nigeria. The specific objectives of the study are to investigate the impact of cash conversion circle, average period of debt settlement, average period of collection of receivables and inventory retention on the profitability of listed oil and gas firms in Nigeria.

The following null hypotheses were formulated in line with the specific objectives of the study to test the influence of working capital management on return on asset of listed oil and gas firms in Nigeria; cash conversion circle, average period of debt settlement, average period of collection of receivables and inventory retention all have no significant impact on the profitability of the listed oil and gas firms in Nigeria.

This study could add to existing literature considering six liquidity management proxies used; Cash Conversion Circle, average period of debt settlement, average period of collection of receivables Inventory retention. Findings of this study can have some far reaching implications for users of financial statements such as shareholders, potential investors, policy makers, the regulatory bodies and also students.

The study investigates the impact of working capital management on return on asset of the listed oil and gas firms in Nigeria. Therefore, the study covers all the oil and gas companies listed on the floor of the Nigerian Stock Market (NSE) as at 31st December, 2018. The study covers a period of eight years (2011-2018). This period was selected due to the recent financial meltdown that engulfed the Nigerian economy since the year 2014 when oil price started to nose dive and also, the recent hike in foreign exchange rate to the naira for all the major currencies in the world making it difficult for managers of firms in this subsector in Nigeria to manage their working capital during the selected period.

The rest of the paper is divided into four sections covering discussion on the literature review and theoretical framework, the research method and model specification, result and discussions and conclusion and recommendation.

2. Review of Empirical Studies

Cash Conversion Cycle and Profitability

Raheman and Nasr (2007) conducted a study on working capital management and profitability of Pakistani Firms. Using secondary data, extracted from the financial statements of the sampled firms, Pearson's correlation and regression analysis models were employed to analyze the panel data. Their study revealed that cash conversion cycle has negative significant effect on profitability. Still on CCC impact on profitability, Usama (2012) extended the work of Raheman and Nasr (2007) on liquidity management and its effect on profitability of Pakistani firms, using a sample of 18 food companies listed on Karachi Stock Exchange for a period of 5 years (2006-2010). Pooled least square regression and common effect model were used to analyzed the extracts from the firms' financial statements. The results indicated a significant positive relationship between cash

conversion cycle which was used as a measure of working capital management and firm's profitability.

Average Period of Debt Settlement and Profitability

Rafiu and John (2014) found a significant positive association exists between account payment periods and performance of manufacturing firms in Nigeria for the period of 9 years (2000-2009). The panel data method was adopted and the data were analyzed using descriptive and inferential statistics for sixty listed firms out of 237 from Nigerian stock exchange. The study concluded that effective management of working capital leads to a significant effect on performance of manufacturing firm in Nigeria. In a related development, Adeleke and Mukolu (2013) on examination of the relationship between working capital management and profitability of manufacturing firms listed in Nigerian using secondary data of 120 firm-year observations of ten years (2002 and 2011). The data were analyzed using Descriptive Statistics, Correlation Analysis and Multiple Regression Analysis. The study revealed Account payment period have insignificant negative relationship with Net operating profit of food and beverages and manufacturing companies in Nigeria.

Average Collection Period and Profitability

Zainab et al (2020) examined the assessment of working capital management on profitability of listed manufacturing firms in Nigeria. Accounts receivable, accounts payable, and Cash Conversion Cycle was used as a proxy for working capital and serve as independent variables, while return on assets serves as the dependent variable and was proxy for profitability. The study population comprised all manufacturing firms listed in Nigeria as at 31st December, 2017.

The study found that accounts receivable has a negative insignificant impact on the profitability of manufacturing firms listed in Nigeria. The accounts payable was found to be positive and significant in influencing profitability of manufacturing firms listed in Nigeria. Also, cash conversion cycle is positive but insignificant at influencing profitability of manufacturing firms listed in Nigeria.

In the same vain, Chemis (2015) examined the effect of working capital management variables including the Average collection period, Inventory turnover in days, Average payment period, Cash Conversion Cycle. The study used secondary data collected from 8 Sugar Manufacturing firms in Kenya

covering the period from 2008-2013. Using Pearson's correlation and regression analysis, the study finds a significantly negative relationship between variables of the working capital management such as Average Collection period and profitability of Sugar Manufacturing firms in Kenya.

Average Period of Inventory Retention and Profitability

Abdul, Talat and Mahmood (2010), used 204 samples and examined the impact of working capital management of firm's performance in Pakistan for the period 1998 to 2007. They used balanced Panel data of manufacturing firms listed on Karachi Stock Exchange. The dependent variable is net operating profit while the independent variable is working capital management proxies by inventory turnover. The result shows that inventory turnover in days are significantly affecting the performance of the firms. In addition, Raheman and Nasr (2007) analyzed the effect of several variables on Net Operating Profit which includes inventory turnover (ITO) in days using sample of 94 Pakistani listed companies for 6 years from 1999-2004 had been taken and concluded that managers can maximize shareholder value by efficiently managing components of Cash Conversion Cycle (CCC) and inventory retention. The finding shows that there exists a strong negative relation between firm's profitability and measures of working capital management (WCM).

Most of literatures reviewed for working capital management variables in these studies shows that the number of years for period covered were mostly less than 10 years and this is considered as too small and not wide enough for generalization. Also, none of the studies in Nigeria was carried out on the oil and gas domain and failed to consider many years which would have made the result more robust

2.2 Theoretical Framework

The theory that underpins this study is the resource dependency theory and agency theory. From resource dependency theory perspective, it focuses on efficiency as regards to the time the firm realize cash from its customers to pay off its creditors in order to reduce the risk of dependency while from the agency theory perspective shows that working capital is a managerial activity that managers and shareholders of firms are expected to efficiently use to monitor and manage profitability and maximize the owners' value without the usual

principal- agent conflict of interest. These theories provide a framework and a logical linkage between the working capital management and financial performance.

3. Research Methodology and Model Specification

This study is designed to examine the impact of working capital management on the profitability of listed oil and gas companies in Nigeria. The study used correlational research design. This is consistent with the aim and objectives of the study. The data for this study were obtained mainly from secondary sources which were extracted from the annual report and account of listed oil and gas companies in Nigeria. The population of the study is all the 11 listed oil and gas firms operating in Nigeria as at 31st December, 2018 constituted the population of the study. To arrive at the sample size, the study used all the companies listed for the purpose of analysis. The justification for choosing oil and gas companies to the best of our knowledge is premised on the fact that, it is still an area with paucity of studies. This research work is descriptive and highly empirical as it embraces the use of regression analysis where ordinary Least Square Technique is employed. Multiple regressions were used for the analysis and STATA 11.2 was used to run the regression. Table 3.1 shows the variable measurement for the study.

The equation below represents the model specification of the study using balanced panel data of ordinary least square. This equation is represented as follows:

$$ROA_{it} = \alpha_0 + \beta_1 CCC_{it} + \beta_2 APDR_{it} + \beta_3 ACP_{it} + \beta_4 APIR_{it} + \beta_5 FSIZE_{it} + E_{it}$$

Where: CCC_{it} = Cash conversion circle; $APDR_{it}$ = Average period of debt settlement;

ACP_{it} = Average collection period; $APIR_{it}$ = Average period of inventory retention

$FSIZE_{it}$ = Firm size;

E_{it} = error term;

α_0 = is the intercept;

β_1 - β_6 = coefficient of independent

variables;

it = Firm i at time t

Table 3.1: Variable Measurement and Definition

Variable Acronym	Variable Name	Variable Measurement	Source(s)
ROA	Return on Assets	Profit after tax/ Total Assets	Rehman et.al. (2015)
CCC	Cash Conversion Cycle	ARD + ITD –APD	Gugong, Aitimon and Alibaba (2019)
APDR	Average period of Debt settlement	Trade debtors* 365/ credit sales	Usama (2012)
ACP	Average collection period	Average trade debtors*365/turnover	Rafiu and John (2014)
APIR	Average period of inventory retention	Inventory *365/ cost of sales	Lazaridis (2006)
FSIZE	Firm size	LN of total assets	Gugong, Alibaba and Aitimon (2019)

Source: computed by Author based on literature (2020)

Additionally, the study conducted robustness tests to ensure the validity and fitness of the results. Hence, various tests were conducted, such as multicollinearity test, normality test and heteroscedasticity test. The reason for adopting this technique is based on the fact that both the technique and tool are more informative as estimates are more efficient under it. This technique and tool of analysis gives information on the time-ordering of events, they also allow for control of individual unobserved heterogeneity in the data.

4. Result and Discussion

4.1 Descriptive Statistics

Table 4.1: Descriptive Statistics of the Variables

Variables	Obs	Mean	Std. Dev.	Minimum	Maximum	skewness	kurtosis
ROA	88	0.016	0.014	-0.03	0.05	-0.547	4.538
CCC	88	23.59	9.520	10	60	2.425	9.549
APDR	88	10.55	2.075	7	15.56	0.703	2.923
ACP	88	1.989	1.301	0.1	6.29	0.977	3.810
APIR	88	2.142	1.769	0.1	13.06	2.985	17.89
FS	88	16.65	3.430	11.7	21.21	0.150	1.215

Source: Extracted from Stata (Appendix A)

Table 4.1 shows that the measure of return on asset (ROA) of the listed oil and gas firms in Nigeria has a mean value of 0.016 with standard deviation of 0.014, and minimum and maximum values of -0.03 and 0.05 respectively. This implies that the average return on asset of the listed oil and gas firms in Nigeria is between 0.016 and it ranges from a loss of -0.03 to a profit of 0.05, and the deviation from both sides of the mean is 0.014. The peak of the data is indicated by the kurtosis value of 4.538 (greater than 3). The coefficient of Skewness of -0.547 implies that, the data is negatively skewed (that is, most of the data are on the left side of the normal curve. The Table also indicates that Cash Conversion Cycle (CCC) has a mean value of 23.59 with standard deviation of 9.520 and the minimum and maximum values of 10 and 60 respectively. The standard deviation value of 9.520 signifies that there is a mild dispersion or variability of cash conversion circle among firms because the standard deviation of 9.520 is lower than the mean of 23.59. The skewness value of 2.425 implies that, the data is positively skewed, while the kurtosis, 9.549 (greater than 3) is an indication that majority of the data are higher than the mean.

Table 4.1 shows that the minimum and maximum values of the Average period of debt settlement are 7 days and 16 days respectively, with the mean value of 10.553 and standard deviation of 2.075. This shows that the sample firms have an average of about 11% Average period for debt settlement, and the standard deviation value implies that there is mildly dispersion from the mean value by 2 days in the sample firms. The minimum values signify that some of the sampled firm's quickness in the realization of account debt settlement is just 7days, while some firms accounts settlement period extends to 16 days. The coefficient of Skewness 0.703 implies that the data is positively skewed, and thus, the data meets the symmetrical distribution assumption because the data are centered on the zero region of the distribution. On the other hand, the kurtosis value of 2.923

also shows that most of the values are not higher than the mean as they are mostly within the benchmark of ± 3 , and thus the data met the Gaussian distribution assumption.

Again, table 4.1 also indicates that, average collection period has a minimum and maximum value of 1 and 6 days respectively. On average, the average collection period in the sample oil and gas firms is 1.989 days with standard deviation of 1.301 days. That is, the deviation from the mean is 1.301 days; the minimum and the maximum values are indicators that the time taken by some firms to settle their trade creditors is one day, while some firms' average collection period extends to 6 days. The coefficient of skewness 0.977 shows that, the data is positively skewed, and meet the symmetrical distribution assumption because it is distributed within the zero (0) region, while the kurtosis value of 3.810 suggests that majority of the data are higher than the mean and did not meet the assumptions of the normal distribution. In the same vain the average period of inventory retention in days has a mean of 2.142 with standard deviation of 1.769, implying that the deviation from the mean is not too wide as the standard deviation is close to the mean of the sample firms. The minimum and maximum values of days in inventory are 1 day and 13 days respectively. The standard deviation of 1.769 is an indication that the values are centered round the mean value, that is, there is not much dispersion away from the mean. The skewness value of 2.985 implies that the data is skewed to the right, and thus said to positively skewed, Also, the data did not meet the symmetrical distribution assumption because it did not fall within the zero (0) region of the curve, while the kurtosis 17.891 is an indication that majority of the data are higher than the mean, as such did not also meet the normal distribution criterion (i.e. that the data are far above the ± 3 benchmark of a normal distribution assumption).

Lastly, the table also indicates that firm size (natural log of total assets) has a mean of 16.656, while the minimum and maximum are 11.7 and 21.21 respectively. The standard deviation of 3.430 shows that the values are centered on the mean value, which implies that there is not much dispersion away from the mean. This attests to the fact that the size of the oil and gas firms in terms of total assets are similar in size. The skewness value of 0.1509 implies that the data is positively skewed. While the kurtosis 1.215 is an indication that majority of the data are lower than the mean value, as such meet the normal distribution criterion

(i.e. that the data are below the ± 3 benchmark of a normal distribution assumption).

Following the presentation and interpretation of the descriptive statistics of the data collected for the variables of the study which to a large extent suggested that the data is not normally distributed; the correlation matrix is presented and discussed in the following section.

4.2 Correlation Results

Table 4.2 Correlation Matrix of the Dependent and Independent Variables

VARIABLES	ROA	CCC	APDR	ACP	APIR	FS
ROA	1					
CCC	-0.6677* (0.0000)	1				
APDR	-0.4032* (0.0001)	-0.1569 (0.1443)	1			
ACP	0.3542* (0.0007)	-0.0853 (0.4292)	0.2431* (0.0225)	1		
APIR	-0.0068 (0.9498)	0.3977* (0.0001)	-0.3141* (0.0029)	0.1497 (0.1638)	1	
FS	0.0499 (0.6441)	-0.0770 (0.4760)	0.0076 (0.9441)	0.0237 (0.8267)	-0.0736 (0.4958)	1

Source: Stata Output (Appendix A) (P-Values in Parentheses)

Table 4.3, show that the relationship between cash conversion circle and return on asset of listed oil and gas firms in Nigeria is negative and significant at 1% level as indicated by the correlation coefficient of -0.6677 with a significant p-value of 0.0000. This shows that there is a strong and negative relationship between CCC and return on asset of the sampled firms. Also from Table 4.3, it can be seen that the degree of association between average period of debt settlement and return on asset is -0.4032. This shows that there is a strong significant negative association between average period of debt settlement and return on asset at 1% level of significance as attested from the probability value of 0.0001. The correlation coefficient indicates that, there is a negative relationship between the two.

Additionally, the degree of association between average collection period and return on asset is 0.3542. This shows that there is a significant positive association between average collection period and performance at 1% level as attested from the probability value of 0.0007. The correlation coefficient indicates that, there is a direct relationship between the two. Furthermore, average period of inventory retention (APIR) has an insignificant negative association with return on asset of listed oil and gas firms in Nigeria. This is because the correlation coefficient is -0.0068 and not significant at all level (PV = 0.9498).

Firm size (FS) and return on asset are positively correlated as can be seen from a coefficient value of 0.0499 and it is not significant at all level of significance. The correlation coefficient of firm size is 0.0499 with a probability value of 0.6441, shows that firm size (FS) has also a weak insignificant association with return on asset at no level of significance.

4.3 Robustness Test for Independent and Dependent Variables

Table 4.3: Robustness Test Results

Variables	VIF	Tolerance Values
CCC	1.16	0.860782
APDR	1.09	0.934269
ACP	1.30	0.771628
APIR	1.01	0.991310
FS	1.19	0.838003
Mean VIF	1.15	
Hetttest Chi2		2.36
Hetttest Sig		0.1245
Hausman Chi2		17.15
Hauman Sig		0.0088

Source: Stata Output (Appendix A)

Multicollinearity test:

The results from Table 4.3 proved the absence of perfect multicollinearity among the independent variables, because the smallest tolerance value (TV) is 0.771628, corresponding with the highest variance inflation factor (VIF) of 1.30. The Table indicates that all the VIF were consistently less than 10 and tolerance values were also consistently less than 1.0 but greater than 0.01. The rule of thumb for the

Tolerance Value is that any value of 1.0 and above implies the presence of perfect multicollinearity in the estimators, while for the Variance Inflation Factor a value of 10 and above is an indication of perfect multicollinearity.

Heteroscedasticity:

The evidence from Breusch Pagan/Cook-Weisberg coefficient of 2.36 with the probability value of the Chi Square is statistically not significant at all level (p-value > chi² of 0.1245) confirms the absence of the effects of heteroskedasticity, that is, there is constant variance in the residuals (indicating that the data are homoscedastic). Moreover, Breusch Pagan/Cook-Weisberg test is conducted to check whether the variability of error terms is constant or not. The absence of heteroscedasticity indicates that the variation of the error term is constant which would not affect the best linear unbiased estimators (BLUE) of the study (Gujarati, 1995). This suggests that the original OLS regression model is chosen and used in the analysis and hypotheses testing.

Hausman Specification Test:

The choice, for which result will best fit the study between fixed and random effect models, is achieved by conducting Hausman specification test for fixed and random effect to select the most appropriate model (Gujarati, 1995). It tests whether the unique errors (stochastic disturbance) are correlated with the independent variables. The result of the test reveals that they are highly correlated because the Chi-Square probability is insignificant at all level of significant (0.1614) which would have guided us to interpret the result of the random effect model if there was heteroskedasticity problem in our data.

Robust Linear Regression (OLS)

Due to the fact that some firm's specific attributes affect the outcome variable in the Ordinary Least Square regression model, the robust (Heteroscedasticity adjusted standard errors) Ordinary Least Squares was incorporated in the model to absorb the effect of the unobserved heterogeneity in the original OLS regression. This is contained in the results attached in the appendix A.

4.4 Presentation, Analysis and Discussion of Regression Results

Table 4.4 Regression Results (Robust OLS) Model:

Variable	Coefficient	T-value	P-Value
CCC	-0.0008798	-5.15	0.000

APDR	-0.0017611	-2.88	0.005
ACP	0.0021921	2.08	0.041
APIR	0.000059	0.08	0.939
FS	-0.0005879	-1.57	0.120
Constant	0.0606693	7.13	0.000
R²	0.5410		
F-Statistics	23.53		
F-Sig	0.0000		

Source: Stata Output (Appendix A)

The results from Table 4.4 indicate that the overall coefficient of multiple determination (R^2 0.5410) implied that the working capital management variables (Cash conversion circle, Average period of debt settlement, Average collection period, and Average period of inventory retention, Firm Size) explained 54.10% of the total variation in the dependent variable (financial performance) of the listed oil and gas firms in Nigeria. The Table also shows that the model is fit as evidenced by the F-Statistics of 23.53 which is significant at 1% level of significance (P-value 0.0000). This implies 99% confidence level that, the probability that the relationship among the variables occurred by chance is only 1%.

4.4.1 Cash Conversion Circle and Return on Asset

The regression result revealed that cash conversion circle (CCC) has a t-value of -5.15, coefficient value of -0.0008798 at 1% level of significance (p-value of 0.000). This signifies that cash conversion circle has a negative and statistically significant affect return on asset of listed oil and gas firms in Nigeria. This implies that for every additional one-day increase in the number of days in CCC, the return on asset of the sampled firms will decrease by .09%. This is not surprising and meets the study's expectation, considering the fact that in the real world, as firm's Cash Conversion Cycle increases, profitability is supposed to decline based on the argument that the shorter an investment is locked up in production before turning into cash, the healthier the profitability. Thus, this provides an evidence of rejecting the first hypothesis of the study at 90% confidence level. H_01 , is rejected. The finding is in line with those of Raheman and Nasr (2007), and Soheila and Torgheh (2008). However, the result of the study contradicts those of Usama (2012) and Sharma and Kumar (2011).

4.4.2 Average Period of Debt Settlement and Return on Asset

In addition, the result of average period of debt settlement (APDR) in determining the strength or weakness of the return on asset reveals a t-value of -2.88 and a beta value of -0.0017611 with a p-value of 0.005. This indicates that APDR has a strong and significant negative effect on the return on asset of listed oil and gas firms in Nigeria. This implies that for every one percent (1%) increase in the average period of debt settlement, the return on asset of the listed oil and gas firms in Nigeria will decrease by 0.17%. This is not surprising and met the study's expectation because the earlier it takes firms to receive cash from their customers the better opportunity they have to invest in other profitable ventures. This finding provides evidence to reject Hypothesis 2 at 99% confidence level, H_{02} is rejected. This supports the findings of Gill, et al. (2010) and Karaduman, Akbas, Caliskan, and Durer (2011). However, it is contradicting the findings of El-maude and Shuaib (2016) and Sharma and Kumar (2011).

4.4.3 Average Collection Period and Return on Asset

The regression results further reveal that average collection period (ACP) has positive and strong significant impact on return on asset of listed oil and gas firms at 5% significant level. This can also be observed from the statistical t-value of 2.08 with probability value of 0.041 and a beta coefficient value of 0.0021921. This shows that an increase in the average collection period (ACP) by 0.2% will significantly increases return on asset of listed oil and gas firms in Nigeria by at least 1%. This may not be possible at all times as some suppliers look at the credit worthiness as well as prompt payment of the company to encourage them to be supplying goods in time. However, this elongated settlement period will give companies the opportunity to free some current asset that can be invested in other business ventures; hence more profit can be generated. Thus, this provides an evidence of rejecting the fourth hypothesis of the study at 95% confidence level.

Thus, for Hypothesis 3, H_{03} is rejected. Studies such as Priya and Nimalathan (2013), and Mathuva (2010) findings supports positive influence of debt settlement period on profitability while, this finding contradicts the findings of El-maude and Shuaib (2016), Hoang (2015), Karaduman et al. (2011) and Sharma and Kumar (2011).

4.4.4 Average Period of Inventory Retention and Return on Asset

Also from table 4.4, the regression result revealed that average period of inventory retention (APIR has a t value of 0.08, coefficient value of 0.000059 and is not significant at all level of significance (p-value of 0.939). This signifies that average period of inventory retention has a non statistical positive impact on return on asset of listed oil and gas firms in Nigeria. This implies that for every one-day decrease in average period of inventory retention, the return on asset of the sampled firms will not increase by .0059%. The implication of this result is that average period of inventory retention should be kept short for profitability to increase because heavy stockpiling of goods will tied up money in inventory, increase spoilage of goods, goods obsolesce will be on the rise, theft or pilferage by the employees and increase cost of storage will all otherwise have negative impact on profitability. Based on this, the study fails to rejects the null hypothesis 4 (H04) which states that average period of inventory retention has no significant impact on the return on asset of listed oil and gas firms in Nigeria. The result supports the finding of Priya and Nimalathasan (2013), Qasim and Ramiz (2011) and Mathuva (2010). However, it is contrary to the findings of Soheila andTorgheh (2008) and Hoang (2015).

4.4.5 Firm Size and Return on Assets

Lastly, the firm size (FS) introduced as a control variable show that it has an insignificant negative impact on return on asset at no level of significance. This can be observed from the beta coefficient value of -0.0005879 a t-value of -1.57 with a P-value of 0.120. This indicates an inverse relationship exist between firm size and profitability but not statistically significant; that is the large firm size might not be affected the profitability of the sampled firms in Nigeria and vice versa which implies that every one percent (1%) increase in the firm size it will negatively impacted on the profitability of listed oil and gas firms in Nigeria, but it is not statistically significant at all levels.

5. Conclusion and Recommendations

In line with the tests conducted on the data collected and the findings of this research, the study concludes that: Cash conversion circles (CCC) and Average period of debt settlement (APDR) has significant negative impact on the profitability of listed oil and gas firms in Nigeria. While Average collection period (ACP) has a significant positive impact on return on asset of listed oil and

gas firms in Nigeria. But Average period of inventory retention (APIR) has no statistical significant positive impact on the return on asset of listed oil and gas firms in Nigeria.

Following the findings and conclusions from this study, the study makes the following recommendations:

- i. Managers of listed oil and gas firms in Nigeria can improve their firms' profitability ultimately and creating more value for its shareholders if they focus on shortening cash conversion circle. This is because of the negative influence of Cash Conversion Cycle on profitability. They should consider increasing those businesses within the firm that will maximizes profit if their Cash Conversion Cycle is reduced.
- ii. Managers should encourage larger sales turnover and volume by allowing their customers' shorter periods of account collections through granting of prompt sales cash discounts. This is because the shorter the collection period the higher the profitability of the listed oil and gas firms in Nigeria.
- iii. Lastly, based on the finding from the regression result, managers of listed oil and gas firms in Nigeria are encouraged to maintain short account collection periods to a reasonable level through prompt payments by debtors since making prompt payments by debtors will lead to increased profitability.

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