



Empirical Investigation of Effective Management of Working Capital on Firm Performance: Evidence from the Nigerian Agricultural Sector

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Authors' contributions

This work was carried out in collaboration between both authors. Author JN wrote the first draft of the manuscript. Author AEP edit and made all the corrections. Both authors read and approved the final manuscript.

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ABSTRACT

The focus of this study is to find out the link between working capital management and firm performance in agriculture firms listed in the Nigerian stock exchange. The research used yearly data for Livestock Feeds Plc from 2002 to 2018 and Okomo oil company Plc from 2007 to 2018. The study employed cash conversion cycle, account payables, account receivables and inventory turnover as stimulus variables with earnings per share as outcome variable. The data was analyzed employing descriptive statistics, ADF unit root test and regression technique. The study revealed that, earnings per share and working capital management represented by account receivables is found to be positive and statistically significant for the both companies used for the study. The association between earnings per share and account payables is found to be negative and statistically insignificant for the both companies. The connection between cash conversion cycle and earnings per share is positive and statistically significant for the both firms. The relationship between inventory management and earnings per share in Livestock Feeds Plc is negative and not statistically significant but that of Okomo oil company Plc is positive but not statistically significant. The overall equation was statistically significant for both firms judging from their R² and F-statistics.

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Based on the findings, it is concluded that efficient management of working capital has influence on firm performance. Therefore, it is recommended for financial managers in agricultural firms to periodically review firm's accounts receivables and payables. Also Sales, purchases and inventory units must work as a team to ensure that an optimal inventory level is maintained.

Keywords: Cash conversion cycle; accounts receivables; accounts payables; inventory turnover and earnings per share.

1. INTRODUCTION

Shareholders wealth maximization has been a priority for managers in business organizations. To expand the wealth of the shareholders, key corporate finance decisions must be made. One of such vital corporate finance decisions is working capital management [1-3]. Working capital indicates organization's short period financial fitness and its capacity to meet day-to-day working expense [4]. Working capital is the organization's financial resources for the daily running of the organization or the financial assets that are liquid in character which are required by organizations to maintain steady cash flow [5]. It shows the totality of an organization's investment and management in short-tenure assets, namely cash, accounts receivables, inventory and marketable securities [6,7].

Working capital management is a vital part of corporate finance theory; it is concerned with the management of short tenure financing and investments decisions of the organization [8-17].

Efficient and effective management of working capital could affect the organization in an appealing way and could result to financial distress. Mismatch of current financial assets and current financial liabilities could occur in the management process if proper attention is not given. According to Sefideh and Asgari [18], organizations with too much cash working capital can be low risk and low financial performance equally; an organization with low liquidity can experience high efficiency and high risk. Financial managers in business organizations need to reflect on both sides so as to create a balance among risk and financial performance. If a room is given for mismatch between current financial assets and current financial liabilities by finance managers, it will lead to financial distress and organizations can go bankrupt as well [19,20].

Existing literature has made several empirical and theoretical additions to knowledge on the association between management of

working capital and performance of organizations [4,21-28].

Evidence from several studies does not only support the traditional belief that management of working capital affects firm's wealth positively and significantly. Meaning, several studies from the different parts of the globe have been carried out with mixed findings as to the link between management of working capital and financial performance. Some studies found evidences that support the traditional believe [29-33]. There are evidences of contrary results [34,35,26]. With this high perceived importance of working capital management, literature concerning the link between management of working capital and financial wealth in Nigeria is still lacking. The vibrancy of the companies in the agricultural sector to a large extent determines the growth and development of any economy including Nigeria [36]. From the length of our enquiry, no research has examined this effect in the agricultural industrial sector in Nigeria. Thus, this study intend to fill the existing gap by utilizing recent data to examine the link between the management of working capital and firm performance in the agricultural sub-sector in Nigeria.

1.1 Statement of the Problem

The efficiency of management of working capital is a key, specifically for agricultural firms, because the main part of the agricultural companies consists of company's current assets. The sector contributed 21.91% to real GDP and 5.1% of export earnings in the first quarter of 2019 in Nigeria. The sector is considered as the third largest sector of the economy of Nigeria. The agricultural sector plays a pivotal role and contributes about 70% of overall working labor force of Nigeria [37]. This sector is dominated by crop production, livestock, forestry and fishing.

Many agricultural firms have failed within three years of startup. Scholars have attributed the failure to factors such as infrastructure, marketing, storage and processing, unstable

prices, agricultural labour, credit facilities, etc. The government of Nigeria has tried several means; has initiated many policies and programs that aimed at elevating the nation's agricultural sector to its desired level [38]. The various strategies, policies and programs that have been put in place to boost investment and diversification in the agricultural sector and to make the firms in the sector to be viable have not been able to bring the desired results.

The reason of low performance and failure could be as a result of inefficient and ineffective management of working capital. Scholars have researched the link between the management of working capital and deposit money banking sector, bottling companies, brewery firms, manufacturing companies that are quoted in the Nigerian stock exchange. But from the reviewed epistles and evidence from our investigation, no study has examined the association between the management of working capital and firm performance in the agriculture sector in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual Review

Efficient management of working capital could be indispensable to ensure that the firm's short and long term success is achieved and to achieve its desired goals which is owner's wealth maximization. An optimal level of working capital could be more desirable for the operations of companies. A well maintained working capital would ensure that there is successful operation of the business activities through the movement of the vital indicators of working capital. Thus, accounts receivable describes the length of time it takes for a firm to get back cash from credit sales; number of day's accounts receivable can be calculated by 365 multiplying (accounts receivables/sales during the year).

The duration inventory are held, which describes the average time needed for a firm's transform raw materials to finished produce and sell the goods; number of days of inventory can be calculated by 365 multiplying (inventories/purchase during the year).

Accounts payable describes the expected time taken by an organization to pay their creditors; it can be calculated by 365 multiplying (accounts payables/purchase during the year). Cash conversion cycle describes the expected time that cash is tied up in current assets; it can be

calculated as the number of days of account receivables and the days of inventory minus the number of days of accounts payable.

How working capital is managed will consistently determine the level of firm profitability [39]. Earnings per share express a link between the net income of a firm and the shareholder's equity for a given period. It could refer to the amount earned by each outstanding share of the firm. It is of great interest to investors because it is a measure of the firm's share performance. When the earning per share is increasing, the shareholder's wealth would be maximized [40]. Efficient working capital management would mean, maintaining an optimum level of working capital requirement and realizing maximum profit [41]. The efficient use of the firm's working capital has a linear link with the profitability of that firm, thus, efficient and effective management of working capital is well desired as it has significant effect on profitability and sustainability of companies [42].

2.2 Theoretical Review

Working Capital Management theory: This theory originated from [43]. Working Capital Management theory provided the foundation for the management of working capital study. Working Capital Management theory suggested the need for working capital management and opined that it could influence the health of the firm. Sagan [43] revealed that, the primary role of a finance manager is to properly manage the inflow and outflow in order to maximize profit. However, the finance manager must be common with inventory control measures, payments and receivables as all these could affect the cash position. He thus advocated that management of receivable, payable, cash and inventories is necessary for the efficient and effective running of the firm. The theory established that, there is a significant link between the management of working capital and firm performance.

2.3 Empirical Review

Scholars have examined efficient management of working capital on firm profitability all over the world. Akomeah and Frimpong [2] investigated the link between efficient management of working capital on firm performance of manufacturing firms listed in Ghana from 2005 to 2014 with the application of cross data regression method. The study exposed different results; a/c receivables and inventory conversion

had a statistical significant negative effect on firm performance, a/c payable had positive insignificant effect on firm performance while firm size, current ratio and cash conversion cycle had a significant positive effect on firm performance. Nandom, et al. [15] also examined the effect of working capital management on listed non-financial firms in Ghana between 2011 and 2015. Applying descriptive statistics, correlation analysis and regression method, it was revealed that, average payment period and current ratio had a positive association with return on asset, while average collection period, inventory turnover, cash conversion cycle and firm size had a negative relationship with return on asset.

Mweta and Kipronoh [44] carried out their study on construction and allied companies listed in the Nairobi stock exchange of Kenya from 2012 to 2016. The study utilized multiple regression method to measure the link between inventory conversion, receivable collection period, payable payout period, gross working capital, cash conversion cycle, ratio of current assets to total assets, return on asset and return on equity, ratio of current liabilities to total liabilities. A weak association was found between the variables. Murega, et al. [31] evaluated working capital management practices and SME wealth in Kenya. The research used NOP and inventory turnover as variables. Employing the multiple regression and descriptive statistics techniques, the study revealed that, effective management of inventory had a significant influence on the profitability of the SMEs. Muiruri and Wepukhulu [1] investigated the influence of financing decision on financial success of listed firms in the Nairobi stock exchange in Kenya between 2012 and 2016. After applying descriptive statistics and with regression methods, the research found a positive significant link between liquidity decision, return on equity and return on assets.

Ali and Isak [25] analyzed the link between the practice of financial management and financial success of services firms in Somalia. Regression method and Descriptive statistics were used to measure the practice of working capital, investment decision and financing decision as independent variables while sales volume, asset growth and profit as dependent variables. The results show that practice of working capital and investment decisions are important determinants of financial success of the services firms in Somalia. Jama, et al. [35] examined the effect in retail firms in Garowe and Puntland of Somalia from 2012 to 2015. Descriptive statistics

measurement indicated that, the practice of working capital management had no influence on financial success.

Aleem and Usman [23] investigated textile companies in Pakistan. Regression method was employed to measure current ratio, inventory turnover, quick ratio, TDR and ROA. It was revealed that current ratio and inventory turnover are related significantly and had a positive association with return on asset, while trade debt ratio had no significant association with ROA. Chand, et al. [26] ascertain firms in Pakistan between 2013 and 2018 with regression technique. The research bring into being a negative link between management of working capital and firm success. Imran, et al. [3] evaluated the influence of wcm on value enhancing across manufacturing sector of Pakistan between 2010 and 2016. Panel data analysis technique, correlation and descriptive statistics were used to analyze the link between investment, stock performance, operating performance and excess return. The results indicated that wcm has a significant influence on firm's success as well as on stock performance. Siraj, et al. [8] investigated the relationship in Pakistan from 2000 to 2016. The results from the regression analysis showed a positive significant link among the variables.

Karim, et al. [29] examined the relationship of pharmaceutical firms of Bangladesh from 2006 to 2015. Return on asset, equity returns, receivables period, inventory turnover, account payment period and cycle of cash conversion were used as variables. The descriptive statistics and correlation analysis result indicated that, a significant link exist between variables. Another similar study from Sharif and Islam [32] also showed similar result in Bangladesh.

Le, et al. [4] investigated the condition in Vietnam. The research employed regression technique to examine the link. The results showed that, wcm positively influence the financial success of the organization. Agegneu [22] examined the effect on selected manufacturing and merchandizing firms in Hawasa city from 2009 to 2015. Regression method was used. The results indicated a statistical significant negative association between firm's success and wcm. Alehegne [24] ascertained the determinants of working capital requirement on manufacturing firms operating in Addis Ababa between 2011 and 2015. The regression results revealed a negative

connection between the requirement of working assets, real GDP, leverage, firm size, and inflation rate. Also a positive and significant link exists between the requirements of working capital and cash conversion cycle. Kademi, et al. [34] examined the association between wcm and organization's success in Malaysia during economic crisis (2008-2009) and after the economic crisis (2012-2013). The multiple regression results revealed that, negative connection exists between wcm and organizational success for the both periods. Nzitunga [16] investigated the influence of creditor, cash and debt management on firm's success in state owned enterprises in Namibia. The inquiry employed regression analysis. The study showed that firm's success is influenced by the three variables. Vartak and Hotchandani [39] investigated wcm and firm's success in firms listed in India from 2009 to 2018. It was revealed from the regression result that the expected collection duration is significant and negatively connected with return on asset. Inventory turnover, cash conversion cycle and return on asset are positive and significant but account payable and ROA are insignificantly related.

Abdulazeez, et al. [21] investigated the connection between wcm and performance of listed conglomerate firms in Nigeria from 2005 to 2014. Regression technique was employed to evaluate debt collection duration, credit payment duration, firm's size and cash conversion cycle as explanatory factors; ROA and return on investment as explained factors. The study show that debtor's collection duration, creditor's payment duration and firm size are inversely connected to return on investment while cash conversion cycle has insignificant positive associated with firm financial position. Akinleye and Roseline [5] measured expected collection duration, expected payment duration, earning per share and return on capital with the application of static data analysis. A negative insignificant relationship was found among the variables. Eya [27] found a positive significant link between ROA, current ratio and quick ratio from 2004 to 2013 with regression method. Godswill [28] examined wcm of 10 deposit money banks in Nigeria from 2010 to 2016 with regression method. The regression output revealed a significant positive connection between the variables. Uguru, et al. [13] investigated working capital in Nigerian brewery sector from 2006 to 2014 with regression technique and found a positive significant relationship. Madugba and Ogbonnaya [30] conducted a similar study with

Uguru, et al. [13] and found a positive significant relationship.

Obim, et al. [12] employed comparative and disaggregate analysis to ascertain the management of working capital on manufacturing firm's growth in Nigeria. Regression technique was utilized to measure AR, AP, inventories, cash and return on equity in Nestle Plc and Cadbury Plc. The research indicated that, negative connection exists among the variables for the both manufacturing firms used in the research. Olaoye, et al. [7] investigated the administration of working capital and firm's success in selected quoted firms in the Nigerian SE from 2008 to 2017. Regression method was used in measuring the connection between current ratio, cash payment duration, cash collection period, inventory and return on asset. It was revealed that, cash payment and cash collection period exerted a negative influence on return on asset while inventory and current ratio exerted a positive influence on the return on asset.

3. METHODOLOGY

The prime intend of this study is to explore the effect of trade payables, trade receivables, cash conversion cycle and inventory management on agriculture sector performance in Nigeria. The target population comprised the two agriculture firms listed in the Nigerian stock exchange (Okomu Oil Company Plc and Livestock Feeds PLC). The sample of the two agriculture firm (Livestock Feeds Plc and Okomo Oil Company Plc) quoted at the Nigerian Securities Exchange were elected for the research. The above firms were preferred because they are the only listed agriculture firms in the Nigerian stock exchange and availability of published secondary data. The study explores secondary data from the agriculture company's audited and published financial statements. The data covered duration of 12 years for Okomo Oil Company Plc from 2007 to 2018; 17 years for Livestock Feeds Plc from 2002 to 2018. The data set as transformed via log. Log transformation could lower the variability of data particularly in a set of data that involves far-flung observations [45]. The collected data was analyzed using descriptive statistics and regression method.

3.1 Research Design

The research utilized an ex-post facto study design; which is a type of descriptive study in

which researcher begins with the observation of the explanatory variable then observes the explained variable in retrospect for possible link and effects on the explanatory variable [46].

3.2 Models Specification

The study shall employ five independent variables (Account receivables (AR), Accounts payables (AP), Cash conversion cycle (CC), and Inventory (IP)). The independent variables shall be regressed against Earnings Per Share (EPS) which is the dependent variable in the study. In order to reduce variability of the data set, the research employed log to transform the data. Where; Ln stands for log in all the variables. The following regression equations were utilized to obtain the estimates:

$$EPS = f(AR, AP, CC, IP) \quad (1)$$

This equation can be transformed into a linear function thus:

$$EPS = Y_0 + Y_1AR + Y_2AP + Y_3CC + Y_4IP + \varepsilon \quad (2)$$

Where;

- EPS = Earnings Per Share
- AR = Accounts Receivable
- AP = Accounts Payable
- CC = Cash conversion Cycle
- IP = Inventory Management
- Y₀ = the constant
- Y₁-Y₄ = the coefficients of the independent variables
- ε = Error term

3.3 Estimation Methods

3.3.1 Descriptive statistics

The descriptive statistics on Table 1 shows that Earnings Per Share (EPS) has a mean value of 9.137059, Accounts Payables (AP) has a mean value of 0.705294, Accounts receivables (AR) has a mean value of 2.247647, Inventory Management (IP) has a mean value of 1.101176 and Cash conversion cycle (CC) has a mean value of 2.643529. The Jarque-Bera statistic indicated that all the variables are normally distributed; EPS with P. value of 0.449946; AP with P. value of 0.482042; AR with P. value of 0.157425; IP with P. value of 0.653575 and CC with P. value of 0.193272.

The descriptive statistics on Table 2 shows that Earnings Per Share (EPS) has a mean value of 4.414167, Accounts Payables (AP) has a mean value of 126.9375, Accounts receivables (AR) has a mean value of 118.8517, Inventory Management (IP) has a mean value of 321.6517 and Cash conversion cycle (CC) has a mean value of 313.5658. The Jarque-Bera statistic indicated that all the variables are normally distributed; EPS with P. value of 0.535943; AP with P. value of 0.768022; AR with P. value of 0.612479; IP with P. value of 0.0.585996 and CC with P. value of 0.470095.

3.3.2 ADF unit root test summary

From the stationarity test results in Table 4, all the variables in the both companies were not stationary at levels but were all stationary at first difference.

Table 1. Descriptive statistics for livestock feeds Plc

	EPS	AP	AR	IP	CC
Mean	9.137059	0.705294	2.247647	1.101176	2.643529
Median	8.890000	0.570000	0.590000	1.090000	1.540000
Maximum	12.71000	1.600000	8.480000	1.580000	8.050000
Minimum	6.710000	0.110000	0.110000	0.370000	0.010000
Std. Dev.	1.978758	0.478515	3.043502	0.390974	2.769740
Skewness	0.472934	0.524546	1.110872	-0.388466	1.036232
Kurtosis	1.833688	2.020305	2.467062	2.227202	2.417614
Jarque-Bera	1.597257	1.459447	3.697618	0.850595	3.282613
Probability	0.449946	0.482042	0.157425	0.653575	0.193272
Sum	155.3300	11.99000	38.21000	18.72000	44.94000
Sum Sq. Dev.	62.64775	3.663624	148.2065	2.445776	122.7434
Observations	17	17	17	17	17

Table 2. Descriptive statistics for Okomo oil company Plc

	EPS	AP	AR	CC	IP
Mean	4.414167	126.9375	118.8517	313.5658	321.6517
Median	3.105000	123.3100	119.5700	353.3850	308.9150
Maximum	9.760000	169.3700	253.2100	447.2900	483.0900
Minimum	0.290000	78.36000	34.67000	146.5400	181.9100
Std. Dev.	3.307904	29.48904	63.62587	125.2698	101.7417
Skewness	0.432221	-0.016949	0.699161	-0.360703	0.153547
Kurtosis	1.678014	1.973063	2.924792	1.419222	1.570503
Jarque-Bera	1.247454	0.527874	0.980482	1.509642	1.068884
Probability	0.535943	0.768022	0.612479	0.470095	0.585996
Sum	52.97000	1523.250	1426.220	3762.790	3859.820
Sum Sq. Dev.	120.3645	9565.636	44530.77	172617.6	113865.1
Observations	12	12	12	12	12

Table 3. Livestock feeds Plc ADF unit root test summary

Variables	Signif. levels	ADF @ level			ADF @ 1 st diff		
		ADF test value	Critical value	P. value	ADF test value	Critical value	P. value
AP	1%	-3.301799	-4.667883	0.1014	-4.731213	-4.728363	0.0100
	5%		-3.733200			-3.759743	
	10%		-3.310349			-3.324976	
AR	1%	-0.725931	-4.667883	0.9519	-3.862110	-4.886426	0.0476
	5%		-3.733200			-3.828975	
	10%		-3.310349			-3.362984	
CC	1%	-3.311793	-4.886426	0.1080	-4.377266	-4.886426	0.0217
	5%		-3.828975			-3.828975	
	10%		-3.362984			-3.362984	
IP	1%	-2.810957	-4.667883	0.2136	-4.630519	-4.800080	0.0131
	5%		-3.733200			-3.791172	
	10%		-3.310349			-3.342253	
EPS	1%	-2.576240	-4.057910	0.1221	-3.057316	-2.771926	0.0056
	5%		-3.119910			-1.974028	
	10%		-2.701103			-1.602922	

Source: Eviews 10 software output, 2019

Table 4. Okomo oil company Plc ADF unit root test summary

Variables	Signif. levels	ADF @ level			ADF @ 1 st diff		
		ADF test value	Critical value	P. value	ADF test value	Critical value	P. value
AP	1%	-3.869448	-5.124875	0.0548	-4.957496	-5.295384	0.0152
	5%		-3.933364			-4.008157	
	10%		-3.420030			-3.460791	
AR	1%	-1.295892	-5.124875	0.8310	-4.131994	-5.295384	0.0531
	5%		-3.933364			-4.008157	
	10%		-3.420030			-3.460791	
CC	1%	-3.434708	-5.521860	0.1114	-4.911238	-5.295384	0.0421
	5%		-4.107833			-4.008157	
	10%		-3.515047			-3.460791	
EPS	1%	-1.780389	-5.521860	0.6351	-6.399560	-5.521860	0.0043
	5%		-4.107833			-4.107833	
	10%		-3.515047			-3.515047	
IP	1%	-3.521893	-5.521860	0.0997	-4.703187	-5.295384	0.0517
	5%		-4.107833			-4.008157	
	10%		-3.515047			-3.460791	

Source: Eviews 10 software output, 2019

3.3.3 Estimation

Livestock Feeds Plc estimation

Dependent Variable: DLNEPS
 Method: Least Squares
 Date: 12/21/19 Time: 10:41
 Sample (adjusted): 3 17
 Included observations: 15 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	0.304252	0.041615	2.069013	0.0465
DLNAR	0.286203	0.138602	2.204255	0.0347
DLNAP	-0.119591	0.098229	-1.217469	0.2544
DLNCC	0.013812	0.006538	2.080839	0.0431
DLNIP	-0.155217	0.214494	-0.723643	0.4877
ECM(-1)	-0.661471	0.098603	-2.423420	0.0485
R-squared	0.782664	Mean dependent var		0.048653
Adjusted R-squared	0.671411	S.D. dependent var		0.403611
S.E. of regression	0.259586	Akaike info criterion		0.384095
Sum squared resid	1.214387	Schwarz criterion		0.917315
Log likelihood	6.119285	Hannan-Quinn criter.		0.541078
F-statistic	6.702278	Durbin-Watson stat		2.157566
Prob(F-statistic)	0.000720			

The result above shows that, AR has a coefficient of 0.286203 meaning that one percentage change in account receivables leads to 28.62 percent change in earnings per share in the positive direction and this is statistically significant at 5% level. AP has a coefficient of -0.119591 meaning that one percentage change in account payable leads to 11.96 percent change in earnings per share in the negative direction but is not statistically significant at 5% level. CC has a coefficient of 0.013812 meaning that one percentage change in cash conversion cycle leads to 1.38 percent change in earnings per share in the positive direction and this is statistically significant at 5% level. IP has a coefficient of -0.155217 meaning that one percentage change in inventory management leads to 15.52 percent change in earnings per share in the negative direction but this is not statistically significant at 5% level.

The results further revealed that r-squared is 0.782664 while adjusted r-squared is 0.671411 indicating that 67.14 percent of changes in earnings per share is attributable to the combined effect of accounts receivables, accounts payables, cash conversion cycle and inventory management.

Overall, the results revealed F-statistic of 6.702278 with a probability of 0.000720 indicating that the combined effect of the independent variables on the dependent variable is statistically significant.

In addition, the Error Correction Co-efficient is appropriately signed with a value of -0.661471 with a probability of 0.0485, which is statistically significant at 5% level of significance. The co-efficient indicates that the model has a 66.15 percent speed of adjustment from equilibrium position on the long run.

Okomo Oil Company Estimate Equation

Dependent Variable: DLNEPS
 Method: Least Squares
 Date: 12/21/19 Time: 11:29
 Sample (adjusted): 2 12
 Included observations: 11 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
C	0.018943	0.119035	0.503283	0.1931
DLNAR	0.014688	0.004034	3.217227	0.0036
DLNAP	-0.114082	0.013013	-1.160000	0.1791
DLNCC	0.594529	0.186453	2.261892	0.0239
DLNIP	0.115059	1.768288	0.630587	0.5560
ECM(-1)	-0.285925	0.208287	-6.173822	0.0016
R-squared	0.920327	Mean dependent var		0.311368
Adjusted R-squared	0.840653	S.D. dependent var		0.954655
S.E. of regression	0.381082	Akaike info criterion		1.210846
Sum squared resid	0.726117	Schwarz criterion		1.427880
Log likelihood	-0.659656	Hannan-Quinn criter.		1.074037
F-statistic	11.55124	Durbin-Watson stat		1.967506
Prob(F-statistic)	0.008916			

The result above shows that, AR has a coefficient of 0.014688 meaning that one percentage change in account receivables leads to 1.47 percent change in earnings per share in the positive direction and this is statistically significant at 5% level. AP has a coefficient of -0.114082 meaning that one percentage change in account payable leads to 11.41 percent change in earnings per share in the negative direction but is not statistically significant at 5% level. CC has a coefficient of 0.594529 meaning that one percentage change in cash conversion cycle leads to 59.45 percent change in earnings per share in the positive direction and this is statistically significant at 5% level. IP has a coefficient of 0.115059 meaning that one percentage change in inventory management leads to 11.51 percent change in earnings per share in the positive direction but this is not statistically significant at 5% level.

The results further revealed that r-squared is 0.920327 while adjusted r-squared is 0.840653 indicating that 84.07 percent changes in earnings per share is attributable to the combined effect of accounts receivables, accounts payables, cash conversion cycle and inventory management.

Overall, the results revealed F-statistic of 11.55124 with a probability of 0.008916 indicating that the combined effect of the independent variables on the dependent variable is statistically significant.

In addition, the Error Correction Co-efficient is appropriately signed with a value of -0.285925 with a probability of 0.0016, which is statistically significant at 5% level of significance. The coefficient indicates that the model has a 28.59 percent speed of adjustment from equilibrium position on the long run.

4. DISCUSSION OF RESULTS

The link between firm performance represented by earnings per share and working capital management represented by account receivables is found to be positive and statistically significant for the both companies used for the study. The findings of this research concur with that of Sharif and Islam [32] that found a positive association between account receivables and return on assets for two leading pharmaceutical firms in Bangladesh. The association between earnings per share and account payables is found to be negative and statistically insignificant for the both companies. Our study findings concur with that of Obim, et al. [12] that found a negative relationship between account payables and return on equity of manufacturing firms in Nigeria. The relationship between cash conversion cycle and earnings per share is found to be positive and statistically significant for the both firms. Our research finding agree with that of Vartak and Hotchandani [39] that found a significant positive relationship between cash conversion cycle and return on asset for listed firms in India. The relationship between inventory management and earnings per share in Livestock Feeds Plc is negative and not statistically significant; that of Okomo oil company Plc is positive but not statistically significant. Our results here concur with the results of Nandom, et al. [15] that also found a negative association between inventory turnover and firm performance in Ghana but not in agreement with [44].

5. SUMMARY

The study investigated the effect of working capital management on firm performance in agriculture companies listed in the Nigeria stock

exchange. The following findings were inferred from the research:

That the earnings per share and working capital management represented by account receivables is found to be positive and statistically significant for the both companies used for the study.

The association between earnings per share and account payables is found to be negative and statistically insignificant for the both companies.

The relationship between cash conversion cycle and earnings per share is found to be positive and statistically significant for the both firms.

The relationship between inventory management and earnings per share in Livestock Feeds Plc is negative and not statistically significant; that of Okomo oil company Plc is positive but not statistically significant.

6. CONCLUSION

The focus of this research is to assess the effect of working capital management on firm performance in agriculture companies listed in the Nigerian stock exchange. The study used yearly data for Livestock Feeds Plc from 2002 to 2018 and Okomo oil company Plc from 2007 to 2018. The study employed account receivables, account payables, cash conversion cycle and inventory turnover as independent variables with earnings per share as dependent variable. The data was analyzed employing descriptive statistics, ADF unit root test and regression technique. The study revealed that, earnings per share and working capital management represented by account receivables is found to be positive and statistically significant for the both companies used for the study. The association between earnings per share and account payables is found to be negative and statistically insignificant for the both companies. The relationship between cash conversion cycle and earnings per share is found to be positive and statistically significant for the both firms. The relationship between inventory management and earnings per share in Livestock Feeds Plc is negative and not statistically significant but that of Okomo oil company Plc is positive but not statistically significant. The overall equation was statistically significant for the both companies judging from their R^2 and F-statistics. Based on the findings, it is concluded that effective management of working capital has influence on firm performance.

7. RECOMMENDATIONS

It is therefore recommended that:

Sales, purchases and inventory units must work as a team to ensure that an optimal inventory level is maintained.

The agricultural firms should frequently employed ratio analysis to improve undesirable ratios at least as to the point of industry's average.

Financial managers in agricultural firms should periodically review firm's accounts receivables and payables.

Government should assist agricultural companies in terms of training of qualified staff to ensure effective management of working capital.

8. SUGGESTIONS FOR FURTHER STUDIES

The study focused on the effective management of working capital on firm performance in agriculture companies listed in the Nigerian stock exchange. The study used secondary yearly data for Livestock Feeds Plc from 2002 to 2018 and Okomo oil company Plc from 2007 to 2018. The study employed account receivables, account payables, cash conversion cycle and inventory turnover as independent variables with earnings per share as dependent variable. The data was analyzed employing descriptive statistics, ADF unit root test and regression technique. Further studies could expand the time bound (scope) or utilize other variables as independent variables, or still, employ other statistical methods. This will enable comparison and boost reliance on and robustness of the results of this research. This will also attest to the strength of the study findings, since different independent variables, methods and time horizons could be applied. It will also widen the body of existing literature on the subject matter. Also, further study should be conducted on the effect of macroeconomic variables on agricultural sector performance.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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