Management of Working Capital in Entrepreneurship: Empirical Evidence from the Agricultural/Agro-Allied Industry

Comfort Amaka Nwude[1], Patricia Ukachi Allison[2] and E. Chuke Nwude[3]

[1]*Centre for Entrepreneurial Development and Research (CEDR), University of Nigeria, Enugu Campus, Enugu State, Nigeria*
[2]*Department of Management, Faculty of Management and Social Sciences, Godfrey Okoye University, Enugu, Enugu State, Nigeria*
[3]*Department of Banking and Finance, Faculty of Business Administration, University of Nigeria, Enugu Campus, Enugu State, Nigeria*

[3]*Corresponding Author: chukwunekenwude@yahoo.com*

ABSTRACT
The study used sample of 3 of the 4 agricultural/agro-allied firms from 2007 to 2018 to examine the relationship between working capital measures and financial performance. The correlation and regression analysis were used to examine the relationship between them. The result of the study shows that profitability of the firms operating in agricultural/agro-allied industry can be influenced positively but not significantly by extending the time the input materials (planted seedlings) stay on the production stage, the time granted to the customers for credit sales of goods and extending the time of paying the suppliers.

Keywords: entrepreneurial behavior, working capital cycle, return on assets, return on equity, agricultural/agro-allied industry

I. INTRODUCTION

The subject matter Entrepreneurship is the concept of having the capacity and willingness to design, develop, organize, launch and manage a business venture while taking several risks, with the aim of making profit or creating some benefits. Entrepreneurship as a discipline is the study of how new businesses are created as well as the actual process of starting and managing such businesses. The people who create these businesses are called entrepreneurs. Therefore, an Entrepreneur is an individual who finds and runs a business and assumes all the risk and reward. Such individuals should have disciplined dedication (passion), believe in themselves (confident and optimistic), willing to work hard and take risks (self-motivated), identify opportunities, assemble skilled manpower and resources, open to new ideas, have opinion and respect opinion, salesmen that know the critical difference between price and value, driven by speed of execution, creates time budgets, set deadlines, value time over money.

Entrepreneurs can be classified based on type of business, use of technology, ownership, gender, and size of plant and machinery among others. On type of business we have trading entrepreneurs, manufacturing entrepreneurs, and agricultural entrepreneurs. Trading entrepreneurs undertake trading activities by procuring finished products from the manufacturers and selling them either directly to end-users as retailers or as middlemen (wholesalers) between the manufacturers and customers. Manufacturing entrepreneurs identify the needs of people; explore the resources and technology to produce the items of need to satisfy people's needs (convert raw materials into finished products).Agricultural entrepreneurs engage activities in the agricultural chain such as irrigation, mechanization,cultivation, packaging, or marketing agricultural produce.Based on use of technology we have Technical entrepreneurs who engage in new and innovative methods in science and technology to power industries. Non-Technical entrepreneurs are those who do not engage science and technology but imitate.Based on ownership we have Private entrepreneurs, state entrepreneurs, and Joint entrepreneurs. Private entrepreneur is an individual who sets up a business as sole owner and bears the entire risks and rewards. State entrepreneur is the state or government who sets up a business as sole owner and bears the entire risks and rewards.Joint entrepreneur is a combination of private and public authority partnership that sets up a business on joint ownership and jointly run by both the private and the state for the purpose of creating some benefits to the stakeholders.Based on gender we have men entrepreneurs and women entrepreneurs. Man-entrepreneur is a man who owns, manages, and controlsa business while a woman-entrepreneur is a woman who owns, manages, and controls a business. Based on size of plant and machinery there are small-scale, medium-scale, and large-scale entrepreneurs.

Due to the declining mood of employable spaces in the labour market of some economies especially the developing nations it is inevitably exciting to chart one's own vision in pursuit of means of livelihood, be your own boss and create wealth. From this perspective many desire to be an entrepreneur. In the entrepreneur lectures we were made to learn the following lessons. That concept or product alone cannot assure success in entrepreneurship. The entrepreneurial success is directly proportional to qualities that define the entrepreneur. Entrepreneurs have eye to understand what is missing and where the gaps are, know how to reward, build team and have the attitude of gratitude, network with people effectively and navigate through obstacles efficiently, show brevity and clarity in communication and negotiations, do not overlook facts, problems and errors, values courtesy principles by giving the deserving respect to all and working hard to earn the respect, reputation and recognition, accessible to team, customer, investors and love to be in market than office, avid listener, enthusiastic, motivated and contagious personality. Entrepreneurs should have passion for planning, perseverance, and persistence. They should have empathy by putting themselves in the people's state of mind and understand how they think and feel about things, what they need, and how best to reach them. There is need for capacity for high sense of fairness to those they do business with, be it vendors, customers, and employees. Entrepreneurs need to have a solid vision of success and their end goals which can be seen from their plan regardless of what their goals and intentions are. Knowing your customers well and selling something that your customers actually want is a key in business. You need to promote your business and make people find out about it yourself. If you can personalize your business, you set yourself apart from the competition but do not make the mistake of thinking you can just put out a great product and leave it at that. There is need to project a positive business image. You may only have a single opportunity to convince your customers to try your product or service. Developing a solid brand for your business is a key to being successful. Successful entrepreneurs utilize the technology available to them. What technology is out there that can make running your business easier? Leveraging available technology to your advantage can make the difference between a run-of-the-mill small business, and one that can stand up to bigger competitors. Build a top-notch business team. You may not have all the skills necessary to run your business successfully. Find others who compliment your skills, and you'll be more successful. Become known as an expert and position yourself as an expert in your industry so that people view your business with more confidence. Get involved and become a fixture in your community, whether online or in your local community (or both). Make yourself a voice in your industry. Grab attention because you may have a chance to convince someone that your business is worth a second glance. You can establish a blog or get involved in local events in their respective fields, as industry thought leaders. To become an expert, you need to invest in yourself through time and energy into learning as much as you can about your industry, and become as skilled as possible. Master the art of negotiations because you will have to negotiate at some point in your business career.There is competition in all businesses.Find out what you do better than your competitors and create a competitive advantage with it to douse the effect of competition. Be accessible, make it easy for people to buy and use your product affordably. Make it easy for people to do business with you smoothly.Build a rock-solid reputation. To be a successful entrepreneur, your customers, investors, and those in your industry need to be able to trust you. Do not ever give them a reason not to. Remember you are selling what your product or service does better than anyone else. Therefore, what you are selling particularly are benefits.Design your workspace for success. You donot need to spring up a huge, impressive office space in your first month of business, that may be a bad idea,but, your workspace should be suitable for your own productivity, and give the right impression to clients or customers. Stay organized and analyze your market through strength, weakness, opportunity, and threat (SWOT) analysis. Use whatever tools that work for you to keep your business organized.Take time off once in awhile to unwind. Limit the number of hats you wear by determining what you do well, and what you would be better served if outsourced to someone else. There is need to follow up customers constantly in order to keep your product or service top on their minds because it helps you understand your market better.

Having laid the background information, let us now look at the main gist of this paper, management of working capital in entrepreneurship with particular emphasis on the bedrock of most developing economies which is agriculture and agro-allied businesses. That many industries operate is a function of availability of raw material inputs. These inputs are provided through agricultural processes. This created many production value-chains in agricultural and agro-allied sector, which any discerning person with entrepreneurial spirit can tap into. The long run sustainability of entrepreneurship space remains dependable on the ability and success of financial management function as it is now a challenge for entrepreneurs to respond to the dynamics of financial markets. The survival of a firm not only depends on how an entrepreneur can efficiently and effectively pursues his financing and investing opportunities but also how to be managing the financial and operational affairs of the business. This long run survival can only be possible through efficient management of working capital cycle (wcc), a comprehensive measure of the efficiency of working capital management, made up of inventory conversion period, account collection period, and account payable period. The efficient use of funds along with efficient operations management is the critical area of financial affairs of a firm.

The wcc is the sum of time taken by the firm to convert its raw material into finished goods and time required for collection of its receivables less by the time taken by the firm to pay its current obligation (Deloof, 2003; Lazaridis & Tryfonidis, 2006). The sum of inventory conversion time and the time required to collect amount from customers define the firm's cash operating cycle (Uyar, 2009). The concept of operating cycle become deficient due to ignoring the time dimension

of current liability commitments which is useful for cash flow measurement and liquidity requirement of the firm (Richards & Laughlin, 1980), leaving working capital cycle (wcc) a comprehensive performance measure used for reviewing the ability of companies in managing their capital. WCC is a function of [days of inventory + days of accounts receivable – days of accounts payable] (Deloof, 2003; Lazaridis & Tryfonidis, 2006). The inventory conversion period is the time required for the conversion of raw material into finished goods and finally into sales. It is calculated as [(average inventory/cost of goods sold*365]. The receivable collection period measures the average number of days from the sale of goods on credit to collection from account receivables. It is calculated as [(average account receivables/sales) *365]. The account payable period is the average time needed to pay for the purchased goods on credit. It is calculated as [(average account payable/cost of goods sold) *365]. The length of wcc is used to measure the impact of inventories, accounts receivable, and payments to supplier on the firm's profitability. Firms that manage well their credit policy with increasing inventory levels will experience a shorter time span of wcc which enhances their profitability. Larger wcc damage the profitability as well as the future prosperity of any entrepreneurship (Shin & Soenen, 1998). Thus, the management of current assets especially inventories and account receivable requires reduction of unnecessary fund investment on them in order to reduce the cost of financing. In this study an attempt is made to look at the effect of the level of efficiency in the management of inventories, account receivable, and account payable on the financial performance of agricultural/agro-allied industry of Nigeria.

Agricultural/agro-allied industry of Nigeria has a very important role to play in the current drive by the government to encourage the spirit of entrepreneurship in her active productive population. There are many production value-chains in the agricultural and agro-allied sector which any discerning person with good entrepreneurial spirit can tap into. The development and growth of this sector is highly considered a good avenue to reduce the level of unemployment and facilitate economic growth. The sector can be promoted through proper utilization of available resources which will increase the growth rate as well as improve the availability of raw material inputs to many industrial set-ups. Investors put their resources in a business for getting some positive return which depends upon the efficient management policies. This current study aims to show the roadmap on how entrepreneurs in the agricultural and agro-allied sector can benefit from efficient and effective use its short term funds to improve profitability.

Therefore, the objective of this study is to reconfirm the extent of the relationship between the measures of working capital management (wcm) and the financial performance of firms with particular interest on listed performing agricultural and agro-allied firms in Nigeria, an emerging market economy in Africa. The apriori expectation is that positive and significant relationships exist between the two sides.

II.   LITERATURE REVIEW

The two main objectives of wcm are to increase profitability and liquidity of a business to the level that can ensure that short-term obligations are discharged smoothly as they fall due. It involves planning and controlling of current assets and current liabilities in a manner that fulfils these objectives. Majorly, it involves management of working capital cycle. Literature has shown there are five keys dates in product cycle that influence the firm's investment in working capital and these are (1) Account Payable Period (APP) which starts when current asset items are obtained on deferred payment till the time the payment is made. (2) Inventory Conversion Period (ICP) which starts from the moment current asset items are obtained to the time the finished goods are sold off. (3) Account Receivable or collection Period (ACP) which commences from the time the firm sold the finished goods to the time its customers pay their bills. (4) Cash operating or conversion cycle (CCC) which is the sum of the inventory period and account receivable period gives the length of time it takes the purchased raw materials to transform them into cash. (5) Working capital cycle (WCC) which is the length of time it takes from the inception of the production process to the time cash is realized less the time allowed by creditors for their payment to materialize. In other words, WCC is the sum of the inventory period and account receivable period less the account payable period.

Scholars have made useful comments on the usefulness of working capital cycles in managing working capital. Vishnani and Shah (2007) indicate that a company's inventory management policy, debtors' management policy and creditors' management policy play an important role in its profitability performance and that concerned managers should give due attention towards policy formulation in these regards. Boer (1999) posits that the amount of additional financing required depends on the length of the cash conversion cycle (CCC) and the longer the CCC is, the higher will be the capital requirements and vice versa. Ross, Westerfield, Jordan (2008) submits that CCC is the sum of the inventory period (inventory management policy) and the accounts receivable period (debtors' management policy). The difference between the CCC and the accounts payable period (creditors' management policy) shows the working capital financing gap called the working capital cycle (WCC). The CCC shows the financing needs of a company regarding the operating activities. The longer a firm has to wait for its cash outflow to the supplier to be returned through cash inflow from its customers, the longer it has to finance its operations through other sources. The length of the CCC determines the actual inventory and receivables levels and this affects considerably the amount of current assets which should be held by the business. On the other hand, accounts payable period

has a substantial impact on the level of a firm's current liabilities. At any point in time the capital needs with respect to the operating activities are finally determined by the difference between the sum of the inventories and the accounts receivable minus the accounts payable. This difference is called the net working capital or the WCC and this corresponds to a business' short run financing needs according to Wagner and Locker (2008).

Deloof (2003), Raheman and Nasr (2007), García-Teruel and Solano (2007), Losbichler and Rothböck (2008), Vural, Sokmen&Cetenak (2012), Pouraghajan, Rekabdarkolaei & Shafie (2013) and Nwude (2010) state that CCC is the number of inventories days plus number of accounts receivable days less the number of accounts payable days, and it is the most popular measure of WCM. They also agree that if the time lag is longer, it means greater investment to working capital components and this causes greater financing needs. But if the time lag shortens, it means lower investment to working capital components as well and this will result to a lower financing need. Huynh (2012) submits that CCC tells us how cash is moving through a company in terms of duration. Nzioki, Kimeli and Abudho (2013) stated that corporate liquidity is influenced by the CCC. Reducing CCC to a reasonable minimum, generally, leads to improved profitability (Karaduman, Akbas, Caliskan, and Durer, 2011; Jose, Lancaster, and Stevens, 1996). The firm with a short term CCC is expected to have high level of cash and marketable securities, all things being equal.

Researchers have studied account receivable and found to have a significant impact on profitability (Madishelli and Kibona, 2013). Deloof (2003) studied the relationship between average collection period (ACP) and corporate profitability with the use of a sample of 1,009 large Belgian non–financial firms for the period 1992- 1996 and found a significant and negative relationship between ACP and gross operating income. He opined that managers can increase firm profitability by reducing their ACP. Garcia-Teruel and Martinez – Solano (2007) used panel data of 8,872 small to medium size enterprises (SMEs) in Spain from 1996-2002 to test the effect of ACP on SME profitability and found that managers could create value by reducing their ACP. Other researchers who explored the impact of receivable management on profitability and established negative relationship between the two variables include Lazardis and Tryfonidis (2006) with 131 companies listed in the Athens stock exchange (ASE) Greece for the period of 2001–2004, Gill et al (2010) with 88 American firms listed on New York Stock Exchange for the period 2005 – 2007, Demirgunes and Samilogu (2008) with Istanbul Stock Exchange (ISE) listed manufacturing firms for the period of 1998-2007 for Turkey and Mathuva (2010) with 30 firms listed on the Nairobi Stock Exchange (NSE) Kenya for the period 1993 to 2008. Barine (2012) established negative and significant impact of ACP on profitability with 37 large firms in the Netherlands during the non-crises period of 2004-2006 and during the financial crisis of 2008 and 2009. On the other hand, Sharma and Kumar (2011) found a positive relation between ACP and return on assets on 263 non-financial BSE 500 firms listed at the Bombay Stock (BSE) from 2000 to 2008. Barine (2012) found that slow collection of accounts receivables is correlated with low profitability. Managers can improve profitability by reducing the credit period granted to their customers.

Madishetti and Kibona(2013) and Mathuva(2010) reported a highly significant and positive relationship between average payment period and firm profitability while Deloof(2003), Raheman and Nasr(2007), and Padachi(2006) recorded negative correlation between profitability and accounts payable period (APP). Deloof (2003) defends the result of negative relationship between average payables period and profitability by arguing that it is consistent with the view that less profitable entities wait longer to pay their invoices and that it was the inability of firms in distress to generate enough cash to pay their payables that resulted in lengthening the payable days. Gill et al. (2010) and Karaduman et al. (2011) argued that if a firm maintains its accounts receivable, accounts payable and inventories optimally, it will generate maximum profit.

Shin and Soenen (1998) with American firms, Deloof (2003) with Belgian firms, Lazaridis and Tryfonidis (2006) with Greece firms, Zariyawati et al (2009) with Malaysian firms, Dong and Su(2010) with Vietnam stocks found a strong negative relationship between CCC and corporate profitability (gross operating profit) and suggest that firms can create value for their shareholders by reducing ICP and ACP to a reasonable minimum. Garcia-Teruel and Martinez-Solano(2007) established negative relationship between CCC and ROA for 8,872 Spanish SMEs and affirmed that managers can improve profitability by shortening the cash conversion cycle through inventory reduction and reduction in the outstanding number of days receivables. Wang (2002) study on Japanese and Taiwanese firms reported that a shorter CCC impacts positively on firm performance. Ganesan (2007) found that the working capital management efficiency is negatively associated to the profitability and liquidity. On the other hand, Raheman and Nasr(2007) with Pakistani and Nobenee and Alhajjar(2009) with Japanese firms, established a positive relationship between components of WCM (ICP, ACP, APP, CCC) and profitability.

Shin and Soenen(1998), Deloof(2003), Lazaridis and Tryfonidis (2006), Zariyawati et al (2009), Dong and Su(2010) proxied corporate profitability by gross operating profit and WCM by Cash Conversion Cycle. Van-Horne and Wachowicz (2005), Garcia-Teruel and Martinez-Solano(2007), Afza and Nazir (2011) proxied corporate profitability by ROA as they viewed ROA as a measure of the overall effectiveness of the firm in generating profit with the available assets while WCM efficiency was measured by CCC. Shin and Soenen (1998) and Sharma and Kumar (2011) adopted current ratio and quick ratio as measures of a firm's short-term solvency.

A high ACP and ACP lead to a longer CCC and by extension leads to higher working capital needs. APP shortens the CCC. When the CCC shortens, cash becomes free for other usages which can increase profitability. In contrast, when the CCC lengthens cash is tied up in firm's operation activities, leaving little chance for other investments which can decrease profitability. As a result, CCC is said to have a negative relationship with company profitability. In contrast, shortening the CCC could harm the company profitability in that the company could face inventory shortages by reducing inventory conversion period, lose good credit customers by reducing account receivable period, and hamper its credit reputation by lengthening the account payable period. In these cases, CCC is said to have a positive relationship with company profitability. This study sets out to find the true position of these WCM variables on the financial performance proxy by ROA and ROE of the agricultural and agro-allied firms listed in the NSE.

III.   DATA AND METHODS

The population of this study was based on agricultural/agro-allied industry operating in Nigeria. The data was analyzed for the period of twelve years from 2007 to 2018. The data was collected from the annual financial statements of the subject-firms as approve by the SEC and NSE, two firms Ellah Lake and FTN Cocoa Processors with missing data were excluded to obtain a sample of three firms (Livestock feeds, Okomu oil palm, and Presco oil palm). For the purpose of the study data was obtained from the income statements and balance sheets, which include cost of goods sold, sales, receivables, inventory, payables, total assets, earnings before interest and tax, shareholders funds and net profit. These data are used to calculate the inventory conversion period, the receivable collection period, the payable period, return on assets, and the return on equity.

As already discussed in the literature WCC for a manufacturing firms can be calculated as a function of [days of accounts receivable + days of inventory – days of accounts payable] (Deloof. 2003; Lazaridis & Tryfonidis, 2006). In this study we hypothesize that shorter period of WCC improves the financial performance of the firms. In order to find out the relationship between working capital cycle (WCC) and firm's performance the current study examines the impact of different component variables of working capital cycle (WCC) which includes inventory conversion period (ICP), account receivables collection period (ACP), and account payables period (APP). Researches on working capital management are replete with use of control variables along with the main variables of working capital in order to have a balanced analysis on the effect of working capital management on the performance of firms. Some cases on point include Smith and Begemann (1997), Deloof (2003), Eljelly (2004), Garcia-Teruel and Solano (2007), Lazaridis and Tryfonidis (2006) among others. On the same basis of analysis following the footsteps of Nazir and Afza (2009), this study has taken into consideration some control variables relating to firms like the liquidity (LIQ), gross working capital to total asset ratio(WCR), Financial liabilities ratio (FLR), sales growth rate(SGR), size of the firm (FSZ), gross working capital to turnover ratio (WCT) and its financial leverage (FDR). Therefore, to investigate the relationship between the working capital cycles and firms profitability we use the following regressions.

$$ROA_{it}=\beta_o+\beta_1 ICP_{it}+\beta_2 ACP_{it}+\beta_3 APP_{it}+\beta_4 LIQ_{it}+\beta_5 WCR_{it}+\beta_6 FLR_{it}+\beta_7 SGR_{it}+\beta_8 FSZ_{it}+\beta_9 WCT_{it}+\beta_{10} FDR_{it} + u_{it} \quad \text{--------(1)}$$

$$ROE_{it}=\beta_o+\beta_1 ICP_{it}+\beta_2 ACP_{it}+\beta_3 APP_{it}+\beta_4 LIQ_{it}+\beta_5 WCR_{it}+\beta_6 FLR_{it}+\beta_7 SGR_{it}+\beta_8 FSZ_{it}+\beta_9 WCT_{it}+\beta_{10} FDR_{it} + u_{it} \quad \text{----------(2)}$$

Return on assets (ROA) and return on equity (ROE) are dependent variables used as two profitability performance proxies. ICP, ACP, APP were independent variables. The correlation and regression analysis are used to examine the relationship between inventory, receivable, and payable periods and the firms' performance proxy by return on assets (ROA) and return on equity (ROE).

In summarized format the calculation of each of the variables is shown below.

Table 1: Variables definitions and measurement of working capital items

	Variables	Definitions	Measurement	Abbreviation
1	ROA	Return on asset	EBIT/Total asset	EBIT/TA
2	ROE	Return on equity	Profit after tax/Shareholders' funds	PAT/SHF
3	ICP	Inventory conversion period	[Average inventory/Cost of Goods Sold]*365	AI*365/COGS
4	ACP	Accounts Collection period	[Average Trade debtors/Sales]*365	AD*365/Sales
5	APP	Accounts Payable period	[Average Trade payable/ Purchases]*365	AP*365/COGS
6	LIQ	Liquidity = Current ratio	Current asset/Current liabilities	CA/CL
7	WCR	Working capital ratio	Current asset/Total asset	CA/TA
8	FLR	Financial liabilities ratio	Current liabilities/Total Assets	CL/TA

9	SGR	Sales Growth rate	(Succeeding sales - Preceding sales)/ Preceding sales	$(S_t–S_{t-1})*100/S_{t-1}$
10	FSZ	Firm size	Natural logarithm of total asset	LnTA
11	WCT	GWC turnover ratio	Current Assets/ Sales	CA/S
12	FDR	Financial debt ratio	Total Financial debt/Total Assets	TD/TA
	GWC	Gross working capital		

For the purposes of data analysis three statistical procedures were used, descriptive statistics, correlation coefficients and multiple regressions. Descriptive statistics are used to determine mean and standard deviation for each variable. In this study correlation coefficients are used to determine the strength of association between two variables.

IV. RESULTS AND DISCUSSION

Table 2, 3, and 4 shows the results of inventory conversion period, account collection period, account payable period, return on assets, return on equity, and other control variables for agric/agro-allied firms of Nigeria. For the purpose of data analysis three statistical procedures are used in the study, including descriptive statistics, Pearson correlation coefficients and multiple regressions. Descriptive statistics check variables for normality distribution and also use to find out the mean and standard deviation of each variable. The Pearson correlation helps us to determine the association between dependent and independent variables. A multiple regression analysis includes independent variable and measures the single variable result in order to determine the effect of individual independent variable on model.

Table 2: Descriptive statistics

	ROA	ROE	ICP	ACP	APP	CACL	CATA	CLTA	SG	LOGTA	CASALES	TDTA
Mean	14.37732	15.64493	184.5648	11.47970	42.52678	1.410758	0.379656	0.335678	28.53142	6.980008	0.438833	0.512475
Median	11.58970	12.93240	167.7659	10.37200	29.89885	1.259550	0.248450	0.208700	12.89125	6.896800	0.386350	0.526050
Maximum	38.37230	44.40520	591.7045	27.48580	167.8643	3.234800	0.864100	1.699700	307.1407	7.992700	0.992900	1.867000
Minimum	-9.649800	-42.39300	43.89420	1.253500	10.81460	0.267400	0.076200	0.064600	-24.58670	5.587100	0.218900	0.177900
Std. Dev.	10.48325	18.04869	113.2135	7.493335	35.70761	0.701315	0.268533	0.319624	56.01223	0.593907	0.176185	0.278080
Skewness	0.454898	-1.222835	1.955892	0.362004	1.797286	1.007225	0.660878	2.274402	3.528566	-0.349475	1.550592	3.160661
Kurtosis	3.517302	5.515872	7.379305	1.980596	6.181177	3.465531	1.804841	10.07238	18.15533	2.496863	5.158338	16.79175
Jarque-Bera	1.642997	18.46638	51.72053	2.345062	34.56127	6.412094	4.763164	106.0653	419.2305	1.112519	21.41364	345.2571
Probability	0.439772	0.000098	0.000000	0.309582	0.000000	0.040516	0.092404	0.000000	0.000000	0.573350	0.000022	0.000000
Sum	517.5834	563.2176	6644.332	413.2691	1530.964	50.78730	13.66760	12.08440	1027.131	251.2803	15.79800	18.44910
Sum Sq. Dev.	3846.451	11401.44	448605.2	1965.252	44626.16	17.21450	2.523858	3.575578	109807.9	12.34541	1.086446	2.706488
Observations	36	36	36	36	36	36	36	36	36	36	36	36

The descriptive statistics for collective variables are presented in table 2. According to the descriptive statistics it takes the firms an average period of 185days to convert the inventory into sales (maximum value 592). The firms' average period of credit granted to the customers is 11 days (maximum value 27) while the firms take an average period of 43 days to pay the creditors (maximum value 168). The average value of return on assets is 14.38% having a maximum value 38.37% and minimum value -9.65% which is due to the net loss of some of the selected firms used for the study. The average value of return on equity is 15.64% having a maximum value 44.41% and minimum value -42.39% which is due to the net loss of some of the selected firms used for the study.

Table 3: Correlation matrix

	ROA	ROE	ICP	ACP	APP	LIQ	WCR	FLR	SGR	FSZ	WCT	FDR
ROA	1.000000	0.846910	0.221365	-0.061607	0.077779	0.622870	-0.268325	-0.490569	0.267655	0.370130	0.145794	-0.483177
ROE	0.846910	1.000000	0.233371	0.036272	0.159483	0.525842	-0.416544	-0.476570	0.306634	0.392839	0.202438	-0.418358
ICP	0.221365	0.233371	1.000000	0.005741	0.142705	0.162800	-0.386647	-0.418378	-0.186331	0.741461	0.763169	-0.387501
ACP	-0.061607	0.036272	0.005741	1.000000	0.005123	-0.225304	-0.344733	-0.174106	-0.094506	-0.003143	0.060256	0.071584
APP	0.077779	0.159483	0.142705	0.005123	1.000000	0.009117	-0.348232	-0.297626	-0.139256	0.193922	-0.055333	-0.202781
LIQ	0.622870	0.525842	0.162800	-0.225304	0.009117	1.000000	-0.050258	-0.430921	0.096709	0.258197	0.270464	-0.487321
WCR	-0.268325	-0.416544	-0.386647	-0.344733	-0.348232	-0.050258	1.000000	0.669365	0.168699	-0.675858	-0.072468	0.405276
FLR	-0.490569	-0.476570	-0.418378	-0.174106	-0.297626	-0.430921	0.669365	1.000000	0.063184	-0.759316	-0.185235	0.915134
SGR	0.267655	0.306634	-0.186331	-0.094506	-0.139256	0.096709	0.168699	0.063184	1.000000	-0.239642	-0.119869	0.011565
FSZ	0.370130	0.392839	0.741461	-0.003143	0.193922	0.258197	-0.675858	-0.759316	-0.239642	1.000000	0.524842	-0.685420
WCT	0.145794	0.202438	0.763169	0.060256	-0.055333	0.270464	-0.072468	-0.185235	-0.119869	0.524842	1.000000	-0.184247
FDR	-0.483177	-0.418358	-0.387501	0.071584	-0.202781	-0.487321	0.405276	0.915134	0.011565	-0.685420	-0.184247	1.000000

The relationship between firm's profitability of the industry and the component variables of WCC was investigated using Pearson correlation coefficient. The correlation coefficient 0.221, 0.078, 0.623, 0.268, 0.370, and 0.146 show positive relations between return on assets and inventory conversion period, account payable period, liquidity, sales growth rate, firm size and working capital turnover ratio respectively. Account collection period, working capital ratio, current financial liabilities ratio and total debt ratio show negative relation with return on assets. All except working capital ratio, current financial liabilities ratio and total debt ratio show positive relation with return on equity. The positive relation means that any positive change in the independent variables causes a positive change in the concerned dependent variables (ROA or ROE) and vice versa. The negative relation means that any negative change in the independent variables causes a positive change in the

concerned dependent variables (ROA or ROE) and vice versa. The findings show that the higher the inventory conversion period, account payable period, liquidity ratio, sales growth rate, firm size and working capital tournover ratio the higher will be the rate of return on assets and vice versa. The higher the account collection period, working capital ratio, current financial liabilities ratio and total debt ratio the lower will be the rate of return on assets and vice versa. With respect to return on equity, the higher the working capital ratio, current financial liabilities ratio and total debt ratio the lower will be the rate of return on equity and vice versa while the higher the values of all other independent variables the higher will be the rate of return on equity.

Therefore, inventory conversion period (ICP), account payable period (APP), liquidity (LIQ), sales growth rate (SGR), firm size (FSZ) and working capital turnover ratio (WCT) have positive impact on return on assets (ROA) while account collection period (ACP), working capital ratio (WCR), current financial liabilities ratio (FLR) and total debt ratio (FDR) have negative impact on return on assets (ROA). Working capital ratio (WCR), current financial liabilities ratio (FLR) and total debt ratio (FDR) have negative impact on return on equity (ROE) while inventory conversion period (ICP), account collection period (ACP), account payable period (APP), liquidity (LIQ), sales growth rate (SGR), firm size (FSZ) and working capital turnover ratio (WCT) have positive impact on return on equity (ROE).

These results are consistent with the previous studies that support the fact that ICP and APP have positive but no significant impact on ROA and ACP has negative but no significant impact on ROA. These results also support the findings of all previous scholars that confirm that ICP, ACP, and APP have positive but no significant impact on ROE. Firms operating efficiency is largely positively impacted by increasing the working capital cycle in the agricultural/agro-allied industry.

Table 4: OLS Regression results (Dependent variables =ROA&ROE)

ROA	Variable	Coefficient	Std. Error	t-Statistic	Prob.	ROE	Variable	Coefficient	Std. Error	t-Statistic	Prob.
	C	-54.50604	57.35175	-0.950381	0.3510		C	-52.80693	96.96343	-0.544607	0.5908
	ICP	0.012397	0.025890	0.478828	0.6362		ICP	-0.019970	0.043772	-0.456222	0.6522
	ACP	0.232489	0.306081	0.759565	0.4546		ACP	0.359727	0.517486	0.695144	0.4934
	APP	0.011460	0.045571	0.251470	0.8035		APP	0.057735	0.077046	0.749353	0.4606
	LIQ	9.372124	2.851390	3.286862	0.0030		LIQ	13.04505	4.820786	2.706001	0.0121
	WCR	0.904080	12.83170	0.070457	0.9444		WCR	-33.05306	21.69430	-1.523583	0.1402
	FLR	5.197332	23.65205	0.219741	0.8279		FLR	35.01499	39.98804	0.875637	0.3896
	SGR	0.058048	0.027341	2.123129	0.0438		SGR	0.123372	0.046224	2.668969	0.0132
	FSZ	7.912047	7.467397	1.059546	0.2995		FSZ	7.728331	12.62498	0.612146	0.5460
	WCT	-18.30898	17.141049	-1.068172	0.2956		WCT	7.970250	28.97907	0.275035	0.7855
	FDR	-1.401767	21.34926	-0.065659	0.9482		FDR	-25.40031	36.09476	-0.703712	0.4881

Table 4b: Model summary

Model	R^2	R Adjusted	Std. Error of the Estimate	F-stat	Prob(F-statistic)	Mean dependent var	S.D dependent var	Durbin-Watson
ROA	0.663365	0.487730	7.503185	3.776942	0.003025	14.37732	10.48325	1.455076
ROE	0.567055	0.393877	14.05162	3.274403	0.007790	15.64493	18.04869	1.181002

Regression model was used to test the hypotheses i.e. inventory conversion period (ICP), account collection period (ACP), account payable period (APP) of agric/agro-allied industry of Nigeria have negative relations with firms profitability which is measured by return on assets (ROA) and return on equity (ROE). In the regression model ICP, ACP, APP and the control variables were used as independent variables and ROA and ROE as dependent variables respectively. R and R^2 given in the above model summary table are coefficient of correlation and coefficient of determination respectively. The value of R shown in the ROA model summary table reveals that 0.81447 or 81.45% correlation exists between dependent (return on asset) variable and independent (constant, inventory conversion period (ICP), account collection period (ACP), account payable period (APP), liquidity (LIQ), working capital ratio (WCR), current financial liabilities ratio (FLR), sales growth rate (SGR), firm size (FSZ), working capital turnover ratio (WCT), and total debt ratio (FDR)) variables. The value of R^2 is 0.663365 or 66.34% which shows that 66.34% variation in return on assets is cause by the constant, inventory conversion period (ICP), account collection period (ACP), account payable period (APP), liquidity (LIQ), working capital ratio (WCR), current financial liabilities ratio (FLR), sales growth rate (SGR), firm size (FSZ), working capital turnover ratio(WCT), and total debt ratio (FDR). That is, R^2 shows that the independent variables have 66.34% explanatory power on the variation in the dependent variable (ROA).

R value in the ROE model summary table is coefficient of determination which reveals that 0.7530 or 75.30% correlation exists between dependent (return on equity) variable and independent (constant, ICP, ACP, APP, LIQ, WCR, FLR, SGR, FSZ, WCT, and FDR) variables and the value of R^2 is 0.5671 or 56.71% which shows that 56.71% variation in return on equity is caused by the constant, ICP, ACP, APP, LIQ, WCR, FLR, SGR, FSZ, WCT, and FDR. That is, R^2 shows that the independent variables have 56.71% explanatory power on the variation in the dependent variable (ROE). The value of adjusted R-square which is 0.4877 or 48.77% and 0.3939 or 39.39% also shows the explanatory power of these variables in determining the return on assets and return on equity respectively after taking residual and error term. The value of Durban Watson is used to find out the autocorrelation between the independent variables used in the model. There exists no autocorrelation in the regression as the value of Durban Watson in both ROA and ROE are 1.455 and 1.181. As the Durban Watson computed < Durban Watson 2.00 or above there exists no autocorrelation. The models are very appropriate for the analysis based on the p-value of the F-statistic in both the models, which are below the 5% significance level.

Based on the above analysis, the results of the firms operating in agricultural/agro-allied industry of Nigeria confirm positive relationship but insignificant impact of inventory conversion period, account collection period, account payable period on return on assets. However, while inventory conversion period showed negative relation and insignificant impact on return on equity, account collection period and account payable period indicated positive relationship and insignificant impact on return on equity. Only liquidity and sales growth rate show positive and significant impact on both the ROA and the ROE.

V.   CONCLUSION

The findings of this study reveal that inventory conversion period which measures the efficiency or how quickly the input materials are converted into saleable products, account collection period which indicates the efficiency or how quickly a firm converts their outstanding receivables into cash, account payable period which shows the efficiency or how quickly a firm pays off its outstanding debts, have positive but non-significant relationship with return on assets and return on equity (with the exception of inventory conversion period that has negative relation with ROE). These mean that firm's profitability can be increased by increasing the time the input materials stay on the production stage, the time granted to the customers for credit sales of goods and extending the time of paying the suppliers. It is concluded that if the firm is able to hold the inventory (planted seedlings) for longer period especially for seasonal products, extend the time the customers should pay for their purchases from the firm, and get the authority of the creditors to extend the time they should expect payment from the firm, the profitability of the agricultural/agro-allied firms can improve.

The originality value of the study stems from the fact that most of the notable studies on management of working capital are not only with reference to developed economy but fewer are with reference to developing economies like Nigeria that is currently wooing her teeming productive population to embrace any of the agricultural chains as a way to encourage

entrepreneurship. In this study we contribute to the literature by revalidating the respective impact of each of the working capital cycles on firm profitability of an emerging agrarian economy as well as validating the findings of previous studies.

The major research limitation of this study is that the sample of the study is based on agricultural/agro-allied industry of Nigeria, so the results of the current study cannot be generalized to the other manufacturing industries. The current study used disaggregated working capital cycle variables as working capital management measures and not the cash conversion cycle which is an aggregated comprehensive measure of working capital management.

VI.   POLICY IMPLICATIONS OF THE FINDINGS

It is essential that entrepreneurs understand the key concepts of working capital management (wcm). Any critical observer will discover that the amount invested in working capital is often very high in proportion to the total assets employed, so it is vital to ensure their effective utilization especially in entrepreneurship. Deloof (2003) indicated that current assets of a typical manufacturing firm, or even a distribution firm, accounts for more than half of the firm's total assets. In a bid to enhance the level of sales, firms offer trade credit to customers. Rajan and Zingales (1995) revealed that receivable constitute 18% of the total assets of US firms. Hill and Sartoris (2005) stated that one-sixth of the total assets of manufacturing firms are made up of accounts receivable and owing to its huge proportion in the total assets, accounts receivable could become a problem for a firm. The effective management of receivables is highly solicited. The failure to manage it well may result to long collection period and bad debts which can affect the profitability and liquidity of the business (Madishetti and Kibona, 2013). In as much as accounts receivable can raise profit by increasing sales, it is also possible that, because of high opportunity cost of invested money in accounts receivable and bad debts, the effect of this might be difficult to realize.

An efficient management of accounts receivables requires a proper analysis of credit and the establishment of veritable criteria for evaluating credit risk involved. An effective collection policy of credit sales should be put in place. In giving discount to customers in order to encourage early payment, the amount of the discount should be weighed against the likely benefits in the form of reduction in finance cost and bad debts. If the business is offered a discount it should take advantage of it to avoid the opportunity cost of trade discount if and only if the cost of capital in the market is greater than the opportunity cost of discount, otherwise the business can borrow and pay on time within the discount period to take the discount. An entrepreneur can improve liquidity by debt factoring and invoice discounting but the impact of each has to be weighted. Under factoring, factor takes over the sales ledger and goes for the debt collection. Under invoice discounting, a proportion of the debt is given to the seller being owed the debt. Collection polices should be formatted in such a way that the officers in-charge have to cultivate good relationship with key staff responsible for such payments, send reminder through order acknowledgements, invoices etc, issue invoices promptly to the customers, compute average settlement period for total debt and for each debtor, classifying the debts according to age (Length of time it is outstanding unpaid). Also prepare pattern of credit sales receipts as a control and compare budgeted to the control. There is need to act for the negative deviation. At any point in time, the level of working capital (WC) should be determined by the level of daily activities that involve relevant current assets; anticipated disappointment by debtors; anticipation of emerging profitable opportunities, nature of business; opportunity cost of funds involved, level of inflation in the economy; availability of near-liquid assets; availability of borrowing outlets; cost of borrowing; economic conditions in the economy whether boom, normal or recessive period; and relationship with suppliers (there should be a cash budget for prompt payment of creditors).

REFERENCES

1. Afza, T., & Nazir, M.S. (2011). Working capital management efficiency of cement sector of Pakistan. *Journal of Economics and Behavioral Studies*, *2*(5), 223-235.
2. Boer, G. (1999). Managing the cash gap. *Journal of Accountancy*, *188*(4), 27-32
3. Barine, M.N. (2012). Working capital management efficiency and corporate profitability: Evidences from quoted firms in Nigeria. *Journal of Applied Finance and Banking*, *2*(2), 215-237.
4. Deloof, M. (2003). Does Working Capital Management affect Profitability of Belgian firms?. *Journal of Business Finance and Accounting*, *30*(3 & 4), 573-588.
5. Demirgunes, R, & Samiloglu, F. (2008). The effect of working capital management of firm profitability: Evidence from Turkey. *The international Journal of Applied Economics and Finance, 2*(1), 44-50.
6. Dong, H. P., & Su, J.T. (2010). The relationship between working capital management and profitability; a Vietnam Case. *International Research Journal of Finance and Economics, 49*, 59-67.
7. Eljelly, A. M. A. (2004). Liquidity profitability trade off: an empirical investigation in an emerging market. *International Journal of Commerce and Management*, *14*(2), 48-61.

8. Ganesan,V. (2007). An analysis of working capital management efficiency in telecommunication equipment industry. *Rivier Academic Journal*, *3*(2), 1-10.

9. Garcia-Teruel, P.J, & Martinez-Solano, P. (2007). Effects of working capital management on SME profitability. *International Journal of Managerial Finance, 3*(2), 164-177.

10. Gill, A, Biger, Nand, & Mathur, N. (2011). The relationship between working capital management and profitability: Evidence from the United States. *Business and Economics Journal*, 1, 1-9.

11. Hill,N.C, & Sartoris, W. (2005). *Short-term financial management text and cases*. New York: Macmillian International.

12. Jose, Manuel L, Carol Lancaster, & Jerry L. Stevens. (1996). Corporate returns and cash conversion cycles. *Journal of Economics and Finance*, *20*(1), 33-46.

13. Karaduman, H. A, Akbas, H. E, Caliskan, A. O, & Durer, S. (2011). The relationship between working capital management and profitability: evidence from emerging market. *International Journal of Finance and Economics, 62*(20), 61-67.

14. Karaduman, H.A., Akbas, H.E., Ozsozgun, A., & Durer, S. (2010). Effects of working capital management on profitability: the case for selected companies in the Istanbul stock exchange. *International Journal of Economics and Finance Studies*, *2*(2), 47-54.

15. Lazaridis, I., & Tryfonidis, D. (2006). The relationship between working capital management and profitability of listed companies in the athens stock exchange. *Journal of Financial Management and Analysis, 19*(1), 26-35.

16. Losbichler, H, & Rothböck, M. (2008). Der Cash-to-cash Cycle alsWerttreiber in SCM – ErgebnisseeinereuropäischenStudie. *Controlling & Management, 52*(1), 47-57.

17. Madishetti, S, & Kibona, D. (2013). Impact of receivables and payables management on the profitability of SMES in Tanzania. *Journal of Economics and Management, 2*(3).

18. Mathuva, D. (2010). The influence of working capital management components on corporate profitability: A survey on Kenyan listed firms. *Research Journal of Business Management*, *4*(1), 1-11.

19. Nazir, M. S, & Afza T. (2009). Impact of aggressive working capital management policy on firms profitability. *Journal of Applied Finance, 15*(8), 19-30.

20. Nazir, M.S., & Afza, T. (2009b). Working capital requirements and the determining factors in Pakistan, *IUP Journal of Applied Finance*, *15*(4), 28-38.

21. Nobanee, H, & Al Hajjar, M. (2009). *A note on working capital management and corporate profitability of Japanese firms*. Available at: SSRN 1433243.

22. Nwude, E.C. (2010). Working capital management in Nigerian agro-allied firms. *The Nigerian Stockbroker, G, 6*, 5-22.

23. Nzioki, P.M, Kimeli S.K, & Abudho, M. R. (2013). Management of working capital and its effect on profitability of manufacturing companies listed on Nairobi securities exchange Kenya. *International Journal of Business and Finance Management Research, 1*, 35-42

24. Padachi, K. (2006). Trends in working capital management and its impact on firms' performance- An analysis of Mauritanian small manufacturing firms. *International Review of Business Research Papers, 2*(2), 45-58.

25. Pauraghajan, A, Rekabdarkolaei, E. A., & Shafie, M. (2013). Investigation the effects of working capital management and capital structure on profitability and return on assets: A selection from the automotive companies in Iran. *Journal Basic Applied Science Research, 3*(4), 847-854.

26. Raheman, Aand, & Nasr, M. (2007). Working capital management and profitability- Case of Pakistani firms. *International Review of Business Research Papers*, *3*(1), 279-300.

27. Rajan, R, & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *Journal of Finance, 50,* 1421-1460.

28. Richards, V, & Laughlin, E. (1980). A cash conversion cycle approach to liquidity analysis. *Financial Management, 9*, 32-38.

29. Ross, S, Westerfield, R, & Jordan, B. (2008). *Fundamentals of corporate finance*. (8th ed.). McGraw-Hill/Irwin.

30. Sharma, A. K, & Kumar, S. (2011). Effect of working capital management on firm probability: Empirical evidence from India. *Global Business Review, 12*(1), 159-173.

31. Shin, H. H, & Soenen, L. (1998). Efficiency of working capital and corporate probability. *Financial Practice and Education, 8*(2), 37-45.

32. Smith, M., & Begemann, E. (1997). Measuring associations between working capital and return on investment. *South African Journal of Business Management*, *28*(1), 1-4.

33. Uyar, A. (2009). The relationship of cash conversion cycle with firm size and profitability an empirical investigation in Turkey. *International Research Journal of Finance and Economics, 24*(1), 186-193.

34. Van-Horne, J.C, & Wachowicz, J. M. (2005). *Fundamentals of financial management*. (12th ed.). New York: Prentice Hall.
35. Vishnani, S, & Shah, B.K. (2007). Impact of working capital management policies on corporate performance-an empirical study, *Global Business Review*, *8*(2), 267-281.
36. Vural, G, Sokmen, A.G, & Çetenak, E.H. (2012). Affects of working capital management on firm's performance: evidence from Turkey. *International Journal of Economics andFinancial Issues*, *2*(4), 488-495.
37. Wagner, S., & Locker, A. (2008), Working capital reduzierendurch. *Supply Chain Management, Beschaffungs Management, 9*, 6-8.
38. Wang, Y.J. (2002). Liquidity management, operating performance, and corporate value: Evidence from Japan and Taiwan. *Journal of Multinational Financial Management, 12*(2), 159-169.
39. Zariyawati, M.A, Annuar, M.N, Taufiq, H, & Rahim, A.S.A. (2009). Working capital management and corporate performance: Case of Malaysia. *Journal of Modern Accounting and Auditing*, *5*(11), 47-54.