

Research Article

An Analysis of Working Capital Cycles Across Agricultural/Agro-Allied Quoted Firms

¹E. Chuke Nwude and ²K. Chikezie Anyalechi

¹Department of Banking and Finance, Faculty of Business Administration,
University of Nigeria Enugu Campus
chukwunekenwude@yahoo.com; chuke.nwude@unn.edu.ng;
chukenwude@gmail.com

²Department of Banking and Finance, Faculty of Business Administration,
University of Nigeria Enugu Campus

[Received-05/09/2016, Accepted-12/09/2016, Published-27/09/2016]

ABSTRACT

This study aimed to reveal the working capital cycle of quoted agricultural/agro-allied sector firms in the Nigerian Stock Exchange (NSE) from 2000-2014. Quantitative approaches were used to find the working capital cycles of the firms. The findings of the study show that while FTN cocoa processors on average had the longest cash conversion cycle (CCC) of 272 days from 2008-2014, Okomu oil palm had second longest CCC of 145 days, Presco had 131 days and Livestock feeds producers had a negative CCC of -30 days. It was discovered also that Livestock feeds with negative CCC in many of the years under study receive cash on its sales before it pays its suppliers. This effectively makes the company's suppliers a source of financing and can be relevant in competitive interactions. On the average it took 137, 27, 164 and 97 days to convert inventory to finished goods, collect credit sales, convert raw materials and sales to cash, pay creditors and invest net cash in working capital items respectively in the agricultural/agro-allied sector of the Nigerian Stock Exchange (NSE) between 2000 and 2014.

Keywords: Working Capital, Working Capital cycle, inventory period, receivables period, payables period, cash conversion cycle.

1. INTRODUCTION

Working capital is a financial metric which represents the operating liquidity available to a business. Working capital management is a very important component of corporate finance because it directly affects the liquidity and profitability of the company. It involves planning and controlling of current assets and current liabilities in a manner that eliminates the risk of inability to meet due short-term obligations on one hand and avoid excessive investment in these assets on the other hand. It takes a combination of policies and

techniques for the management of a company's working capital. A popular measure for evaluating working capital management is cash conversion cycle which tells us how cash is moving through a company in terms of duration. Management of working capital involves management of working capital cycle. Working capital cycle is the length of time it takes a firm, from the time it paid cash for the raw material purchases and other different forms of current asset items to the time the firm collect cash from its sales. It is the time lag

between the cash investment in purchase of raw materials and the recovery of cash by the way of sales of goods. The longer the cycle is, the longer a business is tying up capital in its working capital without earning a return on it. It is worthy of note that as cash is paid out for the operation of the firm the current assets are being gradually converted into different forms till cash recovery from sales. Those forms include inventory period, receivable period, and payable period. Firms are looking for new ways to stimulate growth, improve financial performance and reduce risk in today's challenging economic climate. Funds tied up in working capital can be seen as hidden reserves that can be used to fund growth strategies; such as capital expansion. Cash flows locked in stocks and receivables can be freed up by understanding the determinants of working capital. Many firms that have earned profits over the years have shown that the efficient management of working capital is essential for short-run corporate solvency or the survival of any organization. Especially, efficient working capital management will lead a firm to react quickly and appropriately to unanticipated changes in market variables such as interest rates and raw material prices, and gain competitive advantages over its rivals. Too often, however, this is an area that many organizations have ignored. The way of managing working capital efficiently varies from firm to firm since it depends on industry, the nature of the business, business policy, strategy etc. Thus, it is very important for organizations to understand and manage their working capital cycles efficiently.

As there is need to continually assess the effectiveness of firms' working capital management there is also the need to establish the working capital cycles (WCC) of the firms concerned. As a result this study seeks to critically investigate the working capital cycles (WCC) of Nigerian firms with particular interest in agricultural/agro-allied industries. However the specific objectives of this study are to find out the inventory conversion period(ICP), debtors' or

accounts collection or receivable period(ARP), creditors or accounts payment period(APP), working capital cycle(WCC) and cash conversion cycle(CCC) of the subject firms. Specifically in order to elicit information this study is geared to answer the question: How long does it take the agricultural/agro-allied firms to convert their raw materials into finished product and their sales into cash? How long is cash tied down in raw materials and sales? To what extent do payables reduce the working capital cycle?

2. LITERATURE REVIEW

2.1 Theoretical Concepts

Some scholars had made useful comments on the usefulness of working capital cycles in managing working capital. Walker and Petty (1978) and Deakins et al (2001) state that managing cash flow and cash conversion cycle is a critical component of overall financial management for all firms especially those who are capital constrained and more reliant on short term sources of finance. Vural, Sokmen & Cetenak (2012) state that the most popular measurement of working capital management is cash conversion cycle (CCC) which is the time lag between purchase of raw materials or render of services and the collection of cash from the sale of goods or services rendered. Pauraghajan, Reabdarkolaei & Shafie, (2013) state that one of the criteria for evaluating working capital is cash conversion cycle which they defined as the time between the purchase of raw materials and collecting the proceeds from the sale of the made goods. 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. In the mean time, cash conversion cycle begins when the company pays cash to supplier for the materials purchased and ends when the cash is collected from the customers for credit sales. Huynh (2012) submits that cash conversion cycle tells us how cash is moving through a company in

terms of duration. The cycle start with a cash outflow by which the company pays back to suppliers for obtaining raw materials then end with a cash inflow when receiving money back from its customers for selling its goods or services. Nzioki et al (2013) state that corporate liquidity is influenced by the cash cycle because cash cycle measures the average amount of time that cash is tied up in operations process. The firm with a short term cash cycle is expected to have high level of cash and marketable securities, all things being equal.

Ross et al (2008) stated that the operating cycle is composed of the inventory period and the accounts receivable period. The inventory period is the average amount of time the inventory is held, whereas the receivables period is the average number of days it takes from the sale of the goods until the cash receipt from the customer. The accounts payable period, in turn, is the average time span between the purchase of the raw materials and the cash outflow to the supplier. The difference between the operating cycle and the accounts payable period is called the cash cycle. It is the time period it takes on average from the cash outlay by the firm to the suppliers to the cash inflow from the customer. In other words, it shows the financing needs of a company regarding the operating activities, since part of the inventory and accounts receivable have to be financed by either borrowing money or holding a liquidity reserve as suggested by Farris and Hutchison (2003). Boer (1999) posits that the amount of this additional financing depends on the length of the cash cycle and the longer the cash cycle is, the higher are the capital requirements and vice versa. This is due to the fact that the longer a firm has to wait after the cash outflow to the supplier to the cash inflow from the customer, the longer it has to finance the operations through other sources.

The length of the operating cycle determines the actual inventory and accounts receivables levels and hence considerably affects the amount of current assets which is held by the company. On the other hand, the length of the accounts payable

period has a substantial impact on the level of a firm's current liabilities, namely the amount of accounts payable. The capital needs, with respect to the operating activities are finally determined by taking the difference between the sum of the accounts receivable and the inventories minus the accounts payable. This difference is called the net working capital and corresponds to a company's short run financing needs according to Wagner and Locker (2008). In measuring the working capital various ratios can be used in order to evaluate a company's short term assets and liabilities.

According to Huynh (2012), when the cash conversion cycle shorten, cash becomes free for other usages such as investing on equipment and infrastructure or innovating manufacturing and selling process or lowering the total investment in current assets and company profitability increases as a result. In contrast, when the cash conversion cycle lengthens cash is tied up in firm's operation activities, leaving little chance for other investments and company profitability decreases as a result. In those cases cash conversion cycle is said to have a negative relationship with company profitability. On the other hand, cash conversion cycle can also have positive influence on company profitability. It could be interpreted through a chain of positive impact of inventory periods and account receivable period with a negative impact of accounts payable period on the company profitability. The longer the inventory, the lower the cost involved in procrastinating of goods and/or service supplied. The longer the account receivable period, the higher credit sales earned. And the lower the accounts payable period, the higher the reputation earned for borrowing opportunities. Converge the three effects into one place, we can explain for an increase in company profitability due to the long cash conversion cycle. In contrast, shortening the cash conversion cycle could harm the company profitability. The company could face inventory shortages as reducing inventory conversion period, lose good credit customers as reducing account receivable

period, and hamper its credit reputation as lengthening the account payable period. In those cases, cash conversion cycle is said to have a positive relationship with company profitability.

Losbichler and Rothböck (2008) stated that the current and the quick ratio are well-known examples of liquidity ratios. These ratios focus on a firm's short-term solvency, since they provide an indication of how well the short-term liabilities are covered by short-term assets. In other words, they indicate whether a company is able to meet its currently maturing financial obligations by its currently maturing short-term assets, and hence examine a firm's liquidity. Losbichler and Rothböck (2008) also indicated working capital ratios and the cash cycle as more popular measures of liquidity as they incorporate the dynamic nature of a firm's business. The cash conversion cycle or cash-to-cash cycle expresses the cash cycle in terms of days, and is calculated as shown below. According to Brealey and Myers (2005) the receivables period measures how many days it takes on average from the sale of the goods until the customers pay their bills. A high account receivables period (ARP) leads to a longer cash cycle, and hence also to higher working capital levels.

Submissions from various researchers give the road map for the determination of working capital cycles. Collections from Nwude (2004 and 2010) show that the length of time it takes a firm to convert its raw materials into finished product is called inventory conversion period (ICP) or inventory period (IP); the length of time it takes a firm to collect cash from its credit sales is known as accounts receivable or accounts collection period (ARP or ACP) or receivables period (RP); the length of time it takes a firm to recover cash tied down in both raw materials and sales is termed working capital cycle (WCC); the length of time it takes a firm to pay off cash for its short term credit purchases is known as accounts payable period (APP) or creditors period (CP); while the length of time a firm tied down its cash in working capital items reduced by the length of

time it takes a firm to pay off its short term creditors is regarded as cash conversion cycle (CCC). That is, $CCC = WCC - APP$. Again a firm is termed a net credit extender in time if its ARP is higher than the APP. Conversely it is a net credit receiver firm if its APP is higher than the ARP. That is, $payable\ period - receivable\ period$ indicates whether the firm is net extender or net receiver of credit with respect to time period. If the difference is positive it shows that the firm is granted longer period to pay up its debts than it grants to its own debtors hence the firm is a net receiver of credit in time. If the difference is negative it shows that the firm grants longer period to its own debtors to pay up their debts than the time it is granted by its creditors hence the firm is a net extender of credit in time. This indicates liberal credit policy by the net extender of credit firm and conservative credit policy by the net receiver of credit in time. Payable amount less receivable amount measures the amount by which the firm is net extender or net receiver of credit on monetary value. If the difference is positive it shows that the firm is granted higher amount of credit than it grants to its own debtors hence the firm is a net receiver of credit. If the difference is negative it shows that the firm grants higher amount of credits to its own debtors than the amount granted to it by its creditors hence the firm is a net extender of credit. Again this indicates liberal credit policy by the net extender of credit firm and conservative credit policy by the net receiver of credit firm. The above views were also expressed by other researchers like Brealey et al (1995), ACCA (2003), Corman (1998), Deloof (2003), Farrgher et al (1999), Fink (2001), Greg et al (2005), Harris (2005), Howorth and Westhead (2003), Islam and Rahman (1994), Kennedy (1980), Myers (2000), Mohiuddin(1983), Md (2006), Van Horne (1977), Weinraub and Visscher (1998:39-46), Weisel, Harm and Bradley (2003), Pauraghajan, Rekabdarkolaei and Shafie (2013), Nzioki et al. (2013), Rehemana and Nasr (2007), Lazaridis and Tryfonidis (2006), Afza and Nazir (2007), Afza

and Nazir (2011), Deloof (2003), Hubbard(1991), Jafari, Salahinezhad and Jalili (2014) among others.

From Nwude (2004), the five keys dates in product cycle that influence the firm's investment in working capital are (1) Account Payable Period which starts when current asset items are obtained on deferred payment till the time the payment is made. (2) Inventory Period which starts from the moment current asset items are obtained to the time the finished goods are sold off. (3) Account Receivable Period which commences from the time the firm sold the finished goods to the time its customers pay their bills. (4) operating or working capital cycle 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 into cash. (5) cash conversion cycle 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, cash conversion cycle is the sum of the inventory period and account receivable period less the account payable period. From Alipour (2011), Nzioki et al (2013), Deloof (2003), Mamoun (2011), Vural, Sokmen and Cetenak (2012) and Nwude(2004), the computational methods of obtaining working capital cycles are Inventory period = Average Inventory/ Annual cost of goods sold *365/1; Account Receivable Period = Average Account Receivable/ Annual sales*365/1; Account Payable Period/Annual cost of goods sold*365/1; Operating or Working capital cycle = Inventory period + Receivable period. Cash Conversion Cycle = Inventory period + Receivable period – Payable period. Alternatively, Inventory Period can be obtained from the model, Inventory Period = Raw materials period + work-in-progress + finished good period. Raw Materials Period is the number of days raw materials are held in store before they are converted into work-in-progress. Work- In-Progress Period is the number of days the raw materials are in the process before conversion into

finished goods. Finished Good Period is the number of days the finished goods are held before they are sold. The sum of the ICP and ARP result to working capital or operating cycle. Therefore, an increase in these ratios leads also to an increase in the cash cycle. Since the cash cycle is the difference between the working or operating cycle and the payables period, an increase in the APP results in a shorter cash cycle. Hence, the later the cash outflows to the suppliers occur, the less capital is needed to finance the operating activities of a company. The working capital need or cash conversion cycle in days is calculated by adding inventory period to receivable period minus the payable period. The cash conversion cycle thus measures the average time span between the cash outflow for the purchase of inventories and the cash inflow from the collection of receivables. Studies by Jose et al (1996); Shin and Soenen (1998) show that a shorter cash conversion cycle (CCC) leads to higher profitability and rising share prices which finally enhances firm value. These studies really underlined the importance of an efficient working capital management.

Other subsidiary working capital cycles in form of turnover times include the following. Inventory turnover which measures the number of times average inventory is used up in the year and the higher the number of times the better. Receivables turnover measures the number of times average receivables is built up in the year and the lower the number of times the better. Payables turnover measures the number of times the firm paid up its average debts to its creditors in the year and the higher the number of times the better. Current ratio measures the coverage of current liabilities by current assets and the higher the better, with the standard set at 2:1. Quick ratio measures the coverage of current liabilities by current assets less stocks and the higher the ratio the better with the standard set at 1:1. Net working capital is the capital a company requires to run its day-to-day operations. It is defined as current assets minus non-interest-bearing current liabilities. Net working capital equals about one-quarter of assets

on average for companies in the U.S. The primary components of net working capital include inventory, accounts receivable, and accounts payable. Interest-bearing current liabilities, which include short-term debt and the current maturities of long-term debt, are a form of financing and are therefore not part of net working capital.

2.2 Empirical Review

Seeger, Locker and Jergen (2011) conducted working capital survey of the Swiss chemical industry aimed to reveal the working capital performance of Swiss based chemical and pharmaceutical companies within the study period. They administered a questionnaire forwarded to all investigated companies in order to evaluate the awareness and relevance of an efficient working capital management for the firms and the responsible executives. With the year-end balance sheet figures, the ICP, ARP and APP of 18 listed companies chosen according to the Standard Industrial Classification system in Chemicals & Allied Products were computed but they used CCC as metric for measuring the overall working capital levels.

The cash conversion cycle (CCC) is the standard way to analyze working capital efficiency. For example, Cisco Systems, Inc.'s CCC in fiscal 2014 was 82 days while Apple's was -31 days. Some firms, including Apple, have a negative CCC, which means that the company receives cash on the sales before it pays its suppliers. This effectively makes the company's suppliers a source of financing and can be relevant in competitive interactions. For instance, Wal-Mart Stores Inc.'s CCC was 12 days in 2014 while Amazon.com's CCC was -23 days. With a CCC for each company in hand, you can compare the efficiency of working capital use from one company to the next.

From Jose et al (1996), Kieschnick et al(2013), Zhao and Wijewardana (2012) studies show a strong relationship between a lower CCC and a higher return on capital within, and across industries. In other words, good working capital

management is associated with high returns on invested capital.

The impact on total shareholder returns, however, is less clear. Research suggests that an amount invested in working capital is worth less than an amount either held in cash. Further, extending credit to customers through increasing receivables has a bigger effect on shareholder value than increasing inventory.

In summary the predominant measures and decision rules of working capital cycles are as follows. The shorter the inventory and receivable periods the better for the firm while the higher the payable period the better for the firm.

The shorter the working capital cycle the more liquid is the firm. Cash conversion cycle measures the length of time fund is tied down in current assets less the length of time allowed by creditors. If it is positive it shows that the working capital cycle is higher than the payable period which indicates that more fund is tied down in current assets longer than the credit period obtainable from creditors, and this may warrant call for more credit extension by creditors.

If it is negative it shows that creditors grant longer credit period than the working capital cycle and if care is not taken some funds may be left idle. Payable period less receivable period indicates whether the firm is net extender or net receiver of credit with respect to time period. If the difference is positive it shows that the firm is granted longer period to pay up its debts than it grants to its own debtors hence the firm is a net receiver of credit in time.

If the difference is negative it shows that the firm grants longer period to its own debtors to pay up their debts than the time it is granted by its creditors hence the firm is a net extender of credit in time. Payable amount less receivable amount measures the amount by which the firm is net extender or net receiver of credit. If the difference is positive it shows that the firm is granted higher amount of credit than it grants to its own debtors hence the firm is a net receiver of credit. If the difference is negative it shows that the firm grants

higher amount of credits to its own debtors than the amount granted to it by its creditors hence the firm is a net extender of credit.

3. METHODOLOGY

The starting data, namely the year-end figures of the inventories, accounts receivable, accounts payable, cost of sales and sales, were taken from the financial year-end annual reports and accounts of the subject firms from 2000-2014 as approved by the respective regulatory authorities in the country of study. The working capital performance metrics are thus calculated based on publicly available financial statements issued by the companies. The inventory conversion period (ICP), accounts receivable period (ARP) and the accounts payable period (APP) represent the metric for the assessment of inventories, accounts receivable and accounts payable, respectively. The working capital cycle represents the metric for measuring the raw materials are tied down in working capital items until it transformed to cash through receipts from sales. The cash conversion cycle is considered as measure of the overall examination of the collaborative working capital levels. Year-end balance sheet entries have been used for the calculations of all ratios. The sample consists of 4 companies that are listed at the NSE with active trading going on their stocks. They were chosen according to their constant

appearance on floor of exchange. Based on these requirements, the study includes the following firms: FTN Cocoa Processors, Livestock feeds, Okomu Oil Palm and Presco Oil Palm.

The most common approach to measurement of the effectiveness of working capital management is the comparison of present working capital ratios with the past working capital ratios, which is looking at the trend through the past years. For the purpose of this study only those ratios that have to do with the management of working capital such as the inventory period, account receivable Period, operating or working capital cycle, and cash conversion cycle will be considered. The computational methods of obtaining working capital cycles are Inventory period = Average Inventory/ Annual cost of goods sold *365/1; Account Receivable Period = Average Account Receivable/ Annual sales*365/1; Account Payable Period/Annual cost of goods sold*365/1; Operating or Working capital cycle = Inventory period + Receivable period. Cash Conversion Cycle = Inventory period + Receivable period – Payable period.

4. Data Presentation and Analysis

In this section, the results of the computations which were prepared from the financial statements of the subject-companies, are presented in the tables below and analyzed.

Table 1. Agricultural/Agro-Allied Sector Firms’ Data on inventory conversion period (ICP)

1. ICP	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Mean
1.FTN									196	168	184	192	296	299	223	223
2.LVF	94	39	38	35	42	40	43	44	51	88	98	74	78	121	184	71
3.OKO	151	186	209	157	169	118	136	199	189	177	165	92	158	223	241	171
4.PRES			142.7	136.8	154.2	149	148	122	118	150	114	121	116	185	199	143
MEAN	123	113	130	110	122	102	109	122	138	146	140	120	162	207	212	137

Source: Author’s computations from the companies’ financial statements 2000-2014

In table 1 above we have the inventory conversion periods (ICP) of the firms from 2000-2014. The firm FTN operates in the value chain of processing cocoa, Livestock feeds (LVF) produces animal feeds, Okomu oil palm(OKO) and Presco oil palm (PRE) operate in palm plantation and

processing of the products. It is surprising to notice that FTN had the highest inventory conversion periods almost throughout the study period with a mean of 223 days. This may be because of the long gestation period of cocoa. Livestock feeds had the lowest inventory

conversion periods throughout the period of study and this may be attributable to short processing period of animal feeds. On the average, LVF had 71 days inventory conversion period. Okomu oil palm competes with Presco, a firm in the same stage of production, in long inventory conversion periods. While Okomu on the average had 171 days inventory conversion periods Presco made it 143 days. Okomu exceeded the industry average in all the years except in 2011 and 2012 as can be seen in table 1 line 4. Presco towed the same line

as Okomu but played lower than the industry average in 2008, 2010, 2012-2014. FTN had high inventory conversion periods above the industry average in all the years while Livestock feeds had low inventory conversion periods below the industry average in all the years. The mean averages of the sector for the various years within the study period ranged between 102 and 212 days which provided a sector average of 137 days from 2000-2014

Table 2. Agricultural/Agro-Allied Sector Firms’ Data on accounts receivable period (ARP)

2.ARP	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Mean
1.FTN									31	68	111	134	253	119	119	119
2.LVF	13	13	3	1	1	2	6	9	8	16	23	20	9	1	2	8
3.OKO	15	23	31	32	47	36	36	25	7	15	12	5	5	6	5	20
4.PRES			17	8	7	8	13	15	17	27	17	16	15	22	22	16
MEAN	14	18	17	14	18	15	18	16	16	32	41	44	71	37	37	27

Source: Author’s computations from the companies’ financial statements 2000-2014

In table 2 above we have the accounts receivable periods (ARP) of the firms from 2000-2014. FTN had the highest accounts receivable periods throughout the study period with a mean of 119 days as a result of the long delay in collecting payments after sale of cocoa. Livestock feeds had the lowest accounts receivable periods except in 2008-2012 which unarguably attributable to cash and carry nature of receipts before delivery of animal feeds. Most times the customers were required to make advance payment for the production to start. This accounted for its low average accounts receivable period of 8days. Okomu oil palm still competes with Presco in long accounts receivable periods. Okomu had the highest accounts receivable periods in the sector

or industry from 2000-2007 while Presco took over the lead in the same direction from 2008-2014. While Okomu on the average had 20 days accounts receivable periods Presco had 16 days. Okomu exceeded the industry average from 2000-2007 FTN exceeded the industry average from 2008-2014. All the firms except FTN had accounts receivable periods below the industry average from 2008-2014. FTN had high accounts receivable periods above the industry average in all the years. The mean accounts receivable period averages of the sector for the various years within the study period ranged between 14 and 71 days which provided a sectoral average of 27 days from 2000-2014.

Table 3. Agricultural/Agro-Allied Sector Firms’ Data on working capital cycle (WCC)

3.WCC	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Mean
1.FTN									227	236	295	326	549	418	342	342
2.LVF	107	52	41	36	43	42	49	53	59	104	121	94	87	122	186	80
3.OKO	166	209	240	189	216	154	172	224	196	192	177	97	163	229	246	191
4.PRES			160	145	161	157	161	137	134	178	131	137	131	207	221	158
MEAN	137	131	147	123	140	118	127	138	154	177	181	163	233	244	249	164

Source: Author’s computations from the companies’ financial statements 2000-2014

Table 3 above presents the working capital cycles (WCC) of the firms from 2000-2014 which is the summation of ICP and ARP. The WCC shows

how long cash was tied down in inventory and debtors. It shows the length of time it takes the firms to recover the cash expended on purchase of

raw materials, later converted to finished goods which were sold presumably on credit and later received the cash. In this direction it took FTN on the average 342 days to recoup the cash expended on inventory and credit sales whereas it took Livestock feeds 80 days, Okomu 191 days and Presco 158 days giving a sector or industrial average of 164 days. Due to the high levels of ICP and ARP of the FTN it topped up all other firms in WCC including the industry averages in all the years under study. Livestock feeds still maintained its lead as the firm with the lowest WCC due equally to its low levels of its ICP and ARP in all the years. Livestock feeds had the lowest working capital cycles which unarguably attributable to cash and carry nature of receipts before delivery of animal feeds. Most times the customers were required to make advance payment for the

production to start. This accounted for its low average working capital cycles of 80days. Okomu oil palm had the highest working capital cycles throughout the study period with a mean of 191 days as a result of the long delay in selling and collecting payments after sale of its palm products. Presco oil palm still competes with Okomu in long working capital cycle as it had the highest working capital cycle in the sector or industry in 2011. While the industry average from 2008-2014 was 164 day FTN cocoa processors had high working capital cycle above the industry average in all the years. The mean working capital cycle averages of the sector for the various years within the study period ranged between 118 and 249 days which provided a sectoral average of 164 days from 2000-2014.

Table 4. Agricultural/Agro-Allied Sector Firms’ Data on accounts payable period (APP)

4.APP	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Mean
1.FTN									57	30	39	49	91	151	70	70
2.LVF	91	161	151	160	322	340	216	21	23	39	35	26	23	14	29	110
3.OKO	38	43	58	52	43	19	24	58	50	42	40	16	34	69	105	46
4.PRES			.98	.25	.27	4	6	16	62	133	75	12	11	17	18	27
MEAN	65	102	70	71	122	121	82	32	48	61	47	26	40	63	55	67

Source: Author’s computations from the companies’ financial statements 2000-2014

Recall that the length of time it takes a firm to pay off its creditors is termed the accounts payable period (APP). Table 4 presents the APP from 2000-2014. As many of the firms such as FTN Cocoa processors, Okomu and Presco oil palms they hasten to pay their creditors much earlier. A firm like FTN had an average of 119 but was in the habit of paying off its creditors on the average in 70 days time. With this it extended net time credit liberally. Again the Livestock feeds that maintained the lowest ARP of 8 days owed its creditors on the average for 110 days thereby

receiving net time credit conservatively. Okomu and Presco had 20 and 16 days ARP respectively but owed their creditors on the average for 46 and 27 days respectively under the sector average of 67 days. The sector or industrial average ranged between 26 and 121 accounts payable period days. Livestock Feeds was the longest debtor followed by FTN, Okomu and Presco in the order of magnitude. The various accounts payable periods for the respective years can be depicted from table 4 above.

Table 5. Agricultural/Agro-Allied Sector Firms’ Data on cash conversion cycle (CCC)

5.CCC	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Mean
1.FTN									170	206	256	277	458	267	272	272
2.LVF	16	-109	-110	-124	-279	-298	-167	32	36	65	86	68	64	108	157	-30
3.OKO	128	166	182	137	173	135	148	166	146	150	137	81	129	160	141	145
4.PRES			159	144	161	153	155	120	73	45	56	125	120	190	202	131
MEAN	72	29	77	52	18	-3	45	106	106	117	134	138	193	181	193	97

Source: Author’s computations from the companies’ financial statements 2000-2014

Finally table 5 provides the most useful metric of working capital management which is the cash

conversion cycles of the firms from 2000-2014. Cash conversion cycle the balance that needs to be

funded by owner funds and/or by further short term borrowing. Excluding the APP from the operating cycle FTN had extra 272 days to be covered by further funding, Livestock feeds had surplus of 3 days, that is excess of APP over the operating cycle, Okomu had 145 days and Presco had 131 days under an industry average of 97 days. The CCC of FTN ranged between 170 and 272 days, which of Livestock Feeds ranged between -298 and 108 days, Okomu between 81 and 182 days and Presco between 45 and 202 days. The mean CCC for the sector for the study period was 97 days while the respective industry averages for the various years are shown in table 5 line 6.

4.2 DISCUSSION OF RESULTS

The length of the operating or working capital cycle determines the actual inventory and accounts receivables levels and hence considerably affects the amount of current assets which is held by the company. The quoted agricultural/agro-allied firms on the average tied up cash in inventory and sales for an average period of 164 days. On individual firm level, FTN invested cash in inventory and sales between 227 and 549 days from 2008-2014 with an average of 342 days against the industry yearly averages that ranged between 118 and 249 days with an average of 164 days. Livestock feeds invested cash in inventory and sales between 36 and 186 days from 2000-2014 with an average of 80 days against the industry yearly averages that ranged between 118 and 249 days with an average of 164 days. Okomu invested cash in inventory and sales between 97 and 246 days from 2000-2014 with an average of 191 days against the industry yearly averages that ranged between 118 and 249 days with an average of 164 days. Presco invested cash in inventory and sales between 131 and 221 days from 2002-2014 with an average of 158 days against the industry yearly averages that ranged between 118 and 249 days with an average of 164 days. All these show that Livestock feeds which beats the industry

average in all years had the best WCC in the sector from 2000-2014.

Boer (1999) and other scholars posit that the amount of this additional financing depends on the length of the cash cycle and the longer the cash cycle is, the higher are the capital requirements and vice versa. He attributes this to the fact that the longer a firm has to wait after the cash outflow to the supplier to the cash inflow from the customer, the longer it has to finance the operations through other sources. Therefore because the CCC of FTN, Okomu, and Presco were all positive there was need for additional financing on the average for 272, 145, and 131 days for FTN, Okomu and Presco respectively from 2000-2014 as the case may be. Likewise in the respective years from 2000-2014 where there was positive CCC. A firm like Livestock feeds had excess funds for up to 30 days so it should have employed it profitably somewhere or reduced its short term obligations in order to restore itself to balance working capital investment and financing. Again Livestock feeds remained the best in CCC. Livestock feeds with negative CCC in some years means that the company receives cash on the sales before it pays its suppliers. This effectively makes the company's suppliers a source of financing and can be relevant in competitive interactions.

5. CONCLUSION

According to Wagner and Locker (2008) the difference between WCC and APP is called the net working capital and corresponds to a company's short run financing needs. All the firms indicated this short run financing needs in various years except Livestock feeds on the average for 2000-2014. According to Huynh (2012), when the cash conversion cycle shorten, cash becomes free for other usages such as investing on equipment and infrastructure or innovating manufacturing and selling process or lowering the total investment in current assets and company profitability increases as a result. In contrast, when the cash conversion cycle

lengthens cash is tied up in firm's operation activities, leaving little chance for other investments and company profitability decreases as a result. This scenario manifested in all the firms as results of the investigation revealed. Since the cash cycle is the difference between the working or operating cycle and the payables period and an increase in the APP results in a shorter cash cycle. It was also observed that the lower the accounts payable period, the higher the CCC. The higher the account receivables period (ARP) observed in the firms the longer the cash conversion cycle which consequently led to higher working capital levels. However the findings of this study on the average are at variance with Cisco Systems, Inc.'s CCC in fiscal 2014 of 82 days, Apple's CCC of -31 days, Wal-Mart Stores Inc.'s CCC of 12 days in 2014 and Amazon.com's CCC of -23 days. With a CCC for each company in hand, one can compare the efficiency of working capital use from one company to the next. To provide answers to the questions raised in this study: it took the agricultural/agro-allied firms 137 and 27 days to convert their raw materials into finished product and their sales into cash respectively. Cash was tied down in both raw materials and sales for a period of 164 days. Payables period of 67 days reduced the working capital cycle to 97 days which stands as the CCC for the agricultural/agro-allied sector of the NSE from 2000-2014.

REFERENCES

1. ACCA(2003), Study pack on "Financial Management and control paper 2.4.
2. Afza T, Nazir MS (2011). "Working Capital Management Efficiency of Cement Sector of Pakistan" J. Econ. Behav. Studies. 2(5): 223-235.
3. Afza, T. and Nazir, M.S. (2007). "Is it better to be aggressive or conservative in managing working capital?" Singapore Economic Review Conference (SERC) on August 02-04.
4. Alipour, M. (2011) "Working Capital Management and Corporate Profitability: Evidence from Iran," *World Applied Science Journal*, Vol.12, No. 7, pp. 1093-1099
5. Boer, G. (1999). Managing the Cash Gap. *Journal of Accountancy*, 188 (4), pp. 27-32
6. Brealey, R., Myers, S. (2005). Principles of Corporate Finance, 7. Edition, McGraw-Hill/Irwin
7. Brealey, R.A., Myers, S.C., Marcus, A.J. (1995). *Fundamentals of Corporate Finance*, International edition, McGraw-Hill.
8. Corman, L.,(1998), The 1998 Working Capital Survey: Cash Masters, *CFO Magazine* Vol.14(7), pp30-48.
9. Deakins, D., Logan, D. and Steele, L. (2001): "The Financial management of the small enterprise" *ACCA Research Report, No. 64*, pp. 21-25.
10. Deloof, M.(2003), Does Working Capital Management Affects Profitability of Belgian Firms?, *Journal of Business Finance and Accounting*, Vol. 30(3-4): 573-587.
11. Farragher, E., Kleiman, R., and Sahu, A., (1999), Current Capital Investment Practices, *Engineering Economist*, Vol.44(2), pp137-150.
12. Fink, R.(2001), The 2001 Working Capital Survey: Forget the float, *CFO Magazine* Vol.17(9), pp54-64.
13. Farris, T., Hutchison, P. (2003). Measuring Cash-to-Cash Performance. *The International Journal of Logistics Management*, 14 (2), pp. 83-91
14. Greg, Filbeck. and Thomas, M. K. (2005), An analysis of Working Capital Management Results Across Industries, *Schweser Study Program*, Vol.20(2). Pp20-35.
15. Harris, A. (2005). Working Capital Management: Difficult, but Rewarding. *Financial Executive*, 21(4): 52-53.
16. Howorth, C. and Westhead, P.(2003), The focus of Working Capital Management in UK Small Firms, *Management Accounting Research*, 14(2): 94-111.
17. Hubbard CM (1991). 'A General Working Capital Analysis of Accounts Receivable

- Policy', *J. Cash Manage.* 11(4): (Jul/Aug): 94-111
18. Huynh, N.T. (2012) "The Influence Of Working Capital Management On Profitability of listed Companies In The Netherlands," *Master Of Research In Business Administration*, pp.1-58
 19. Islam, H.C. and D.J, Rahman (1994): "Working capital trends of the selected enterprises in Bangladesh", *Journal of business finance*, Vol. 2(2), pp. 20-30.
 20. Jafari, I. I. Salahinezhad, M. and Jalili, A. (2014) "Effects of Working Capital Management on Firm's Bankruptcy Probability." *International SAMANM Journal of Finance and Accounting ISSN 2308-2356 January 2014*, 2(1): 55-70.
 21. Jose, M., Lancaster, C., Stevens, J. (1996). Corporate Returns and Cash Conversion Cycles. *Journal of Economics and Finance*, 20 (1), pp. 33-46
 22. Jose, Manuel L., Carol Lancaster, and Jerry L. Stevens (1996). Corporate Returns and Cash Conversion Cycles," *Journal of Economics and Finance*, Vol. 20, No. 1, Spring, 33-46.
 23. Kennedy, M. (1980), *Financial Management*, New Delhi, McGraw-Hill, pp 78-98.
 24. Kieschnick, Robert, Mark Laplante, and Rabih Moussawi (2013). Working Capital Management and Shareholders' Wealth, *Review of Finance*, Vol. 17, No. 5, September, 1827-1852.
 25. Lazaridis, I, and Tryfonidis, D. (2006): "Relationship between working capital management and profitability of listed companies in the Athens Stock Exchange, *Journal of financial management and Analysis*, 19(1):32-59.
 26. Losbichler, H., Rothböck, M. (2008). Der Cash-to-cash Cycle als Werttreiber im SCM – Ergebnisse einer europäischen Studie. *Controlling & Management*, 52 (1), pp. 47-57
 27. Mamoun, M. A. (2011) "Working Capital Management and Profitability: the Case of Industrial Firms in Jordan," *European Journal of Economic, Finance and Administrative Sciences*, Vol.36, 75-86.
 28. Md. Sayaduzzaman (2006), Working Capital Management: A case Study on British American Tobacco Bangladesh company Ltd, *The Journal of Nepalese Business Studies*, pp78-84.
 29. Mohiuddin, R.I. (1983): "The Role of cash budget in Working capital management: A study of some manufacturing firms in Bangladesh", *Journal of financial management and Analysis*, 20(2), pp.1-5.
 30. Mohiuddin, M. (1983), Cash Budget: An Effective Means to Solve Liquidity Problem, *The Cost and Management*, pp10-23.
 31. Myers, R. (2000), The 2000 Working Capital Survey: Cash Crop, *CFO Magazine* Vol.16(7), pp59-82.
 32. Nwude, E.C. (2010). Working Capital Management in Nigerian Agro-Allied Firms *The Nigerian Stockbroker*, Vol. G No 6, July-December, 5-22.
 33. Nwude, E.C. (2004). *Basic Principles of Financial Management- A First Course*, 2nd edition Enugu, Nwabude Publishers.
 34. 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*, Vol.1.pp.35-42
 35. Pauraghajan, A., Rekabdarkolaei, E. A. and 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*, Vol.3, No.4, pp. 847-854
 36. Raheman, A. and Nasr, V. (2007). Working Capital Management and Profitability: Case of Pakistani Firms. *International Review of Business Research papers*, 3 (2): 275–296.

37. Ross, S., Westerfield, R., Jordan, B. (2008): Fundamentals of Corporate Finance, 8. Edition, McGraw-Hill/Irwin.
38. Seeger, Stefan; Locker, Alwin and Jergen, Christian (2011). Working capital management in the Swiss chemical industry, *Journal of Business Chemistry* 8(2), 87-98.
39. Shin, H.-H., Soenen, L. (1998): Efficiency of Working Capital Management and Corporate Profitability. *Financial Practice & Education*, 8 (2), pp. 37-45
40. Van Horne, James C. (1977), *Fundamental of financial management*, 5th Edition, New York, Mc Graw Hill.
41. Vural, G., Sokmen, A. G. and Cetenak, E. H. (2012) "Effects OF Working Capital Management on firm's Performance: Evidence from Turkey," *International Journal of Economics and Financial Issues*, Vol.2, No.4 pp. 488-495.
42. Wagner, S., Locker, A. (2008), Working Capital reduzierend durch Supply Chain Management, *Beschaffungsmanagement*, (9), pp. 6-8
43. Walker, E. and Petty, W. (1978): "Financial differences between large and small firms", *Financial management Journal*, Winter, pp. 61-68.
44. Warrad, L. (2013) "The Impact of Working Capital Turnover on Jordian Chemical Industries Profitability," *American Journal of Economics and Business Administration*, 5(3), 116-119.
45. Weinraub, H. and Visscher, S. (1998) "Industrial Practice Related to Aggressive/ Conservative Working Capital Policies," *Journal of Financial and Strategic Decision*, Vol.11, No. 2, pp. 39-46
46. Weisel, J., N. Harm, and C. Bradley (2003): "The cash factor", *Strategic management journal* (Sept.), pp. 29-33.
47. Zhao and Wijewardana (2012). Working Capital Policy Practice: Evidence from Sri Lankan Companies. The 2012 International (Spring) Conference on Asia Pacific Business Innovation and Technology Management. *Procedia Social and Behavioral Sciences*, 40(2012), 695-700. Available online at www.sciencedirect.com