

**THE RELATIONSHIP BETWEEN COMPONENTS OF WORKING CAPITAL  
AND FINANCIAL PERFORMANCE OF AGRICULTURAL FIRMS QUOTED  
AT THE NAIROBI SECURITIES EXCHANGE**

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## DECLARATION

I, Gassim M. Kamara, declared that this research project is my original work and has never been submitted for a degree in any other university or higher institution of learning.

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This research project has been submitted for examination with my approval as the University supervisor.

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The University of Nairobi is an internationally recognized institution that provides high quality education and makes its student very much competitive at the highest standard. I want to thank you for the quality education and bringing out the best in me.

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## LIST OF ABBREVIATIONS

ACP	Average Collection Period
APP	Accounts Payable Period
ANOVA	Analysis of Variances
BAT	Baumol-Allais-Tobin
BVA	Book Value of Assets
CCC	Cash Conversion Cycle
CDP	Credit Deferred Period
COGS	Cost of Goods Sold
DSE	Dhaka Stock Exchange
DW	Durbin Watson
FMCG	Fast Moving Consumer Goods
GDP	Gross Domestic Product
GOP	Gross Operating Profit
ISE	Istanbul Stock Exchange
ITO	Inventory Turnover
KCC	Kenya Co-operative Creameries
KSE	Karachi Stock Exchange
L	Lower Limit
Ln	Natural Logarithm
LSE	London Stock Exchange
NOP	Net Operating Profit
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Square
PAT	Profit After Tax
ROA	Return on Assets
ROE	Return on Equity
U	Upper Limit
VIF	Variance Inflation Factor
SPSS	Statistical Package for Social Sciences
WC	Working Capital
WCM	Working Capital Management



## ABSTRACT

Working capital management is a key issue in financial decision making since its overall goal is to ensure that a firm is able to continue its operations and that it has sufficient ability to satisfy both maturing short-term debt and upcoming operational expenses which directly affects the liquidity and eventual profitability of the company. This research project studies the relationship between components of working capital and financial performance of agricultural firms listed at the Nairobi Securities Exchange. The study employed descriptive research design using quantitative method approach and based on panel data set from a sample of 7 firms for the period 2009-2013. Secondary data from all the firms was collected. The different variables of working capital management studied included: the accounts collection period, inventory turnover, accounts payable period, cash conversion cycle and current ratio, leverage, firm size and sales growth on the profitability of these firms. The study used multiple linear regression and correlation analysis to show the relationship between the variables. The findings from correlation analysis show that accounts collection period, accounts payable period, inventory turnover period in days and cash conversion cycle have significant ( $p < .001$ ) negative influence on financial performance. Regression analysis results shows that increase in accounts payable period ( $2.02E-04$ ;  $p = .019$ ), cash conversion cycle ( $-5.834E-06$ ;  $p = .017$ ) and accounts collectible period ( $-6.64E-04$ ;  $p = .017$ ) lead to a decrease in financial performance while inventory turnover period ( $1.88E-04$ ;  $p = .041$ ) would increase the same. The study concludes that optimizing the time span during which working capital is tied up in the company (higher cash conversion cycle) can be a way to improve profitability. It recommends that agricultural firms should endeavour to enhance their liquidity for higher financial performance by ensuring higher inventory turnover, collecting money from receivables faster and paying creditors last.

# **CHAPTER ONE:**

## **INTRODUCTION**

### **1.1 Background of the Study**

Most financial literature traditionally focused on the study of long term financial decisions, particularly investments, capital structure, company valuation, etc. However, current assets and liabilities are also important in the management decision making process of a corporate entity. Working capital mainly constitutes the current assets used in the day-to-day operations of a corporate firm. The efficient management of working capital enhances a firm's profitability and strengthens its liquidity position. This research project examined the relationship between components of working capital and financial performance of agricultural firms quoted on the Nairobi Securities Exchange (NSE), so as to determine how efficiently those firms are managing their working capital in order to maximize their value (Afza and Nazir 2009; Brigham and Houston, 2004).

#### **1.1.1 Working Capital Management**

Working Capital Management (WCM) is an important component of many firms financial management. It involves management of firms' current assets- cash, accounts receivable and inventories, and current liabilities- accounts payable. Firms must have an optimal level of working capital in order to maximize their value. Large inventories and generous trade credit policy may lead to higher sales. Firms with larger inventories tend to reduce the risk of stock-out, and also a good trade credit policy may stimulate sales because it allows customers to assess products quality before paying (Deloof, 2003).

Firms' existence significantly depends on the efficient management of their working capital (WC). WCM involves the process of converting investment in inventories and

accounts receivable into cash in order for firms to efficiently and effectively carry out their day-to-day operations. Accounts payable is another component of WC. Accounts payable, which is a current liability, must be managed in a reasonable manner in terms of delaying payment to suppliers. Therefore, the way in which WC is managed may have a significant impact on firms' profitability (Barine, 2012 and Deloof, 2003).

WCM also has a downside; for instance, flexible trade credit policy and keeping very large inventories can cause finance to get locked up in WC. Such a situation can cause firms to have trouble with managing short term financing, reduce the profitability of the firms and also affect the liquidity position of the firms. Implementing best practices and policies in WC, firms can strengthen strong cash flow levels, improve profitability, budgeting and forecasting process. Firms which are better at managing WC are found to have competitive advantage. They also are better at generating funds internally and face lesser problems while seeking external sources of financing (Quayyum, 2011).

### **1.1.2 Financial Performance**

Firms are mostly concerned with their profitability, as profitability serves as the primary goal of all business ventures. Without profitability the business will not survive in the long run. Most firms measure financial performance of their entity with a commonly used financial measures- return on equity (ROE), return on assets (ROA) and net margin on sales. Financial performance measures serve as a basis for evaluating the performance of a corporate entity. The use of equity and debt impact the common performance measures in different ways. A given firm with relatively high use of debt will have higher interest expense and therefore lower net margin. On the other hand, a relatively lower use of equity would result in a proportionately higher return on equity. Therefore, if a corporate

entity were to use relatively less debt and more equity, the opposite would be true (Liebrand, 2007).

In measuring financial performance, agricultural firms listed on the NSE take into consideration the incomes generated from operations. Their incomes are generated through sales of their produce. Owners of agricultural companies also calculate key financial ratios in order to reveal trends and patterns in their performance. Current performance can be compared to budgeted performance to identify how and why operations differed from what was expected. Another way to measure financial performance is to compare a company's current performance to the industry, to determine status in the market and potential areas for improvement. Investors will consider firms in the agricultural industry for potential investment based on the analysis of financial performance measures.

### **1.1.3 Relationship between Working Capital and Financial Performance**

Working capital management is the administration of current assets and current liabilities, and directly affects the liquidity and profitability of the company. Firms' managers should accurately control the trade-off between profit maximization and liquidity in order to reach optimal WCM. Optimal WCM is expected to contribute positively to the creation of firm's value (Abudho, et al, 2013). However, working capital has always been ignored in the financial decision-making because it involves investment and financing in short-term period and also acts as a restraint in financial performance. Nevertheless, managers must ensure that firms are running in an efficient and profitable manner and also there are high possibilities of mismatch of current assets and current liabilities during these

processes. This can affect the firm's growth and profitability, which will further enhance financial distress and finally, firms could go bankrupt (Bagchi & Khamrui, 2012).

From a theoretical perspective, investment in current assets has a bearing on firms' profitability. Excessive investment in working capital may have a negative impact on the financial performance of a firm and positive impact on liquidity. Efficient working capital management involves planning and controlling current assets and current liabilities in an efficient manner that eliminates risk of inability to meet short term obligation (Waithaka, 2012). The theoretical importance of the working capital over the profitability is that the lesser the time a firm needs to realize cash from its customers relative to the time it requires to pay off its creditors; the better it is for its liquidity position and thus reduce the risk of dependency on external and more expensive sources of capital. The management of WC plays an important role in maintaining the financial health of the firm during the normal course of operations. A firm is required to maintain balance between liquidity and profitability while conducting its day to day operations. Liquidity is the precondition to ensure that firms are able to meet their short-term obligations and their continued flow can be guaranteed for a profitability venture (Quayyum, 2011).

Various studies have analyzed the relationship of working capital management (WCM) and firm profitability in various markets. The results are quite mixed, but a majority of studies concluded a negative relationship between WCM and firm financial performance. Therefore the theoretically expected relationship between working capital management and firms' financial performance is that there is either a negative or positive relationship between the measures of WCM and firm's financial performance. This study sought to

determine whether a negative or positive relationship exists in the case of agriculture firms listed on the NSE.

#### **1.1.4 Agricultural Firms Quoted at the Nairobi Securities Exchange**

The Nairobi Securities Exchange, formally called Nairobi Stock Exchange, was established in 1954. The establishment of NSE was mainly geared towards the sale of shares of public companies that are listed on the NSE and other private companies that intend to go public. Since the establishment of the NSE it has become the major securities exchange market in East Africa with about sixty (60) companies listed, grouped into eleven (11) industries. Inclusive of the industries is the agricultural sector, which is currently comprised of seven (7) agricultural companies.

The seven (7) agricultural companies listed on the NSE include Eaagard Ltd, Kapchorua Tea Company Ltd, Kakuzi Ltd, Limuru Tea Company Ltd, Rea Vipingo Plantations Ltd, Sasini Ltd, and Williamson Tea Kenya Ltd. These agricultural companies contribute immensely to the economy of Kenya through food productions and creation of employment ([www.nse.co.ke](http://www.nse.co.ke)). The agricultural sector is the backbone of Kenya's economy; it contributes 26 percent of the GDP and another 25 percent indirectly. The agricultural sector also accounts for 65 percent of Kenya's total exports, it employs over 40 percent of the total population, and over 70 percent of the rural population depends on agriculture for their livelihood. Although agriculture is critical to the economy, levels of production and productivity are very low. Some of the factors contributing to poor returns include low application of modern technologies and gender inequalities that constrain resource access (Government of Kenya, 2011).

## **1.2 Research Problem**

Working capital management deals with the administration of all components of working capital such as cash, marketable securities, debtors and stock receivables. The importance of WCM function of the firms is crucial because it involves time, investment as well as growth prospects of the firm. Financial managers place much premium on its proper management though much emphasis has been placed in corporate finance literature on the study of long term financial decisions, particularly investments, capital structure, dividends and company value decisions (Ibe et al, 2012). Efficient management of working capital is vital for the success and survival of the agricultural sector which needs to be embraced to enhance performance and contribution to economic growth and also improves the liquidity position of the firm and increases its profitability (Abudho et al, 2013 and Waithaka, 2012).

Agriculture remains critical to Kenya economic growth and development. This sector continues to remain the largest platform upon which economic growth is based, which makes the economy largely agro-based. Therefore agriculture must grow at a high rate in order to maintain sustainable economic growth. Agriculture which is the mainstay of Kenya's economy, contributed 26 percent of gross domestic product (GDP), and another 25 percent indirectly. This sector contributes 65 percent of Kenya's total export and employs over 40 over percent of the total population (Government of Kenya, 2011).

Studies have been conducted both internationally and locally to examine the impact of working capital management on firms' profitability. Unni (2011) examined the relationship between working capital management policy and profitability of manufacturing firms in Kenya. She found that there was no significant relationship

between working capital and profitability. For his part, Apuoyo (2010) studied the relationship between working capital management policies and profitability of companies quoted at the NSE and found that working capital needs of firms change over time as does its internal cash generation rate. He concluded that financial and investment sector has been able to achieve high scores on the various components of working capital and this has a positive impact on its profitability. Quayyum (2011) analyzed five companies of the cement industry listed on the Dhaka Stock Exchange (DSE) and found a negative relationship between cash conversion cycle (CCC) and profitability of the firms.

Several studies have been conducted on the relationship between working capital management and financial performance; however, there are few that are specifically related to agricultural firms quoted on the NSE. This research project sought to analyze and measure the relationship between components of working capital and financial performance of agricultural firms quoted on the NSE, with a view of closing the knowledge gap on the impact of components of WC on financial performance. The question that this study sought to answer is: what is the relationship between components of working capital and financial performance of agriculture firms in Kenya?

### **1.3 Research Objective**

The objective of the study was to establish the relationship between components of working capital and financial performance of agricultural firms quoted on the NSE.

### **1.4 Value of the Study**

The study is beneficial to a wide range of individuals and institutions, including management of agriculture firms, government, customers, shareholders, employees and academics. Surveys have shown that managers spend lots of times on day-to-day



problems involving working capital decisions. Efficient working capital management involves excessive planning and controlling. Therefore, managers must strike a balance between current assets and current liabilities in order to reduce the risk of inability to meet short term obligations and avoid excessive investment in these assets.

The study can benefit the government in that it can help government carve appropriate strategies and policies that enhance the profitability of the firms. This has, in turn, a positive impact on the economy. Also the study increases the body of knowledge to scholars of agricultural sector, especially on the maintenance of optimal working capital. It may also influence further research on other factors influencing working capital position of the agricultural firms and the material would serve as a reference by other scholars in the area on the impact of working capital policies on the financial performance of firms.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

Literature review covers key financial management theories that are related to working capital management. This chapter discussed those relevant financial theories with respect to their relationship with the research project being undertaken. Also other empirical studies are reviewed, to establish the relationship between working capital management and financial performance.

### **2.2 Theoretical Review**

There are several theories that establish relationships between working capital management and firms' financial performance. Few of those theories propounded by scholars are discussed, with their implications on firms' financial performance.

#### **2.2.1 The Baumol- Allais-Tobin Model**

The Baumol-Allais-Tobin (BAT) model analyzes cash management problem of firms. This model can be used to actually establish the target cash balances of firms. It is a straight forward model that describes cash management and the general current asset management. This model is a simple and stripped-down sensible model for determining the cash position of firms. This theory assumes that, in order for firms to determine optimum cash position, they must consider costs; opportunity cost, trading cost and total cost. Opportunity is the cost incur for holding cash. Interest is the opportunity forgone for the holding of cash. Trading cost is the cost incur when trading in marketable securities during the fiscal period. Total cost is the sum of the opportunity cost and the trading cost.

This theory, however, has a chief weakness, which is, it assumes a steady and certain cash outflows (Jordan et al, 2010).

### **2.2.2 The Miller-Orr Model**

This model describes a cash management system designed to deal with cash inflows and outflows that fluctuate randomly from day to day. This theory again concentrates on the cash balance, but in a different way to that of the BAT model. This model assumes that cash fluctuates up and down randomly and that the average cash is zero.

This model operates in terms of upper limits (U) and a lower limit (L) to the amount of cash, as well as a target cash balance. The model assumes that firms allow their cash balance to wander around between the lower and the upper limits. As long as the cash balance is between the upper limit and the lower limit, everything is fine. Whenever the cash balance reaches the upper limit, firms' managements buy marketable securities to bring cash balance back to its normal level. Also when cash balance reaches the lower limit, firms' managements sell marketable securities to bring the cash balance back to normal level (Jordan et al, 2010).

## **2.3 Components of Working Capital**

Working capital is comprised of current assets and current liabilities. Current assets include cash, accounts receivable and inventories while current liabilities include accruals and accounts payable. These line items are discussed below.

### **2.3.1 Cash**

Cash is said to be the most liquid asset, it is a medium of exchange use to purchase goods and services and to satisfy obligations more easily than other types of assets. Cash

includes Kenyan currency and coins, personal checks, money order, demand deposits, cashiers' checks, bank drafts, petty cash, change funds, and most savings deposits. Because cash has a high degree of liquidity, it also is most likely to be the object of fraud and theft.

Firms' management must therefore put in place measures and procedures for the protection of cash from theft and other misuse. Internal control procedures put in place apply to all assets; however, they are particularly important with respect to the management of cash. A properly designed internal control system encourages adherence to prescribed managerial policies. It also promotes operational efficiencies, protects the business assets, especially cash, from waste, fraud, and theft. The system ensures accurate and reliable accounting data (Larson, 1990 and Chasteen et al, 1992).

### **2.3.2 Accounts Receivable**

Accounts receivable arise from the sale of goods and services to customers on credit. Most firms expect that by selling on credit, they will achieve greater sales and profit. This expectation tends to strengthen the liquidity position of the firms. However, there are risks associated with the creation of receivables as management may not be able to collect some receivables. This makes the management of receivables a problem of balancing profitability and liquidity. A firm grants trade credit to protect its sales from competitors and to attract potential customers to buy its products at favorable terms (Pandey, 2010 and Waweru, 2011).

Managements of firms can affect the volume of credit sales and collection period through a sound and efficient credit policy. A sound credit policy should aim at maximizing

shareholders wealth through increase in sales leading to net improvement in profitability. A firm may allow either a lenient credit policy or a stringent credit policy. Firms, following lenient credit policy, tend to sell on credit to customers on verbal liberal terms and standards. In such case credits are granted for longer periods even to those customers whose creditworthiness are not fully known or whose financial positions are in doubt. On the other hand firms following stringent credit policy sell on credit on a highly selective basis, only to those customers who have proven creditworthiness and who are financially strong (Pandey, 2010).

### **2.3.3 Inventory**

Inventory is considered as merchandise held for sale by the business firm (Larson, 1990). Inventory constitutes large percentage of current assets in most firms. Because of the large size of inventories maintained by firms, a considerable amount of funds is required to be committed to them. It is therefore important to manage inventories efficiently and effectively, in order to avoid unnecessary investment. Firms that do not manage their inventories efficiently tend to endanger their long run profitability and liquidity position and end up failing.

The twin goal of inventory management are, to ensure that inventories needed to sustain operations are available and to hold the cost of ordering and carrying inventories to the lowest possible level. The reduction of excessive inventories carries a favorable impact on firms' profitability. Inventory is costly to store; therefore, there is always pressure to reduce inventory as part of firms' overall cost containment strategies (Brigham and Daves, 2010 and Pandey, 2010).

### **2.3.4 Accounts Payable**

Accounts payable arise when firms purchase goods and services or supplies on credit. Accounts payable is the largest single category of operating current liabilities. It arises from ordinary business transactions. An efficient account payable policy requires firms to defer payments of payables, which will enable firms to use those capitals to finance investment in current assets. The creditor deferred period (CDP) is the length of time firms are able to defer payments in various resource or supplies purchased (Pandey, 2010).

Most firms that sell on credit have credit policy that includes the terms of credit. A firm may indicate that; goods sold on credit, if payment is made within ten days, the customer benefits from a 2% discount; otherwise pay the full amount within thirty days. A good and efficient account payable policy must consider and analyze credit terms before engaging in the creation of account payable. Credit terms that are flexible and beneficial to the firm should be considered (Pandey, 2010).

### **2.4 Empirical Review**

Past scholarly works have reported that the management of working capital has significant effect on firms' profitability, which ultimately determines their long run competitive survival and going concerns. Findings of some of those studies are reviewed.

Waweru (2011) studied the relationship between WCM and profitability of insurance companies in Kenya. In his analysis of eighteen companies, over a period of five years, he noted that insurance companies have large amount of cash invested in WC. He noted a positive relationship between NOP and accounts receivable period and leverage for the insurance firms.

Baghchi and Khamrui (2012) conducted a study to investigate the relationship between working capital management and profitability of selected FMCG companies in India. The objectives of the study were to determine the nature and extent of the relationship between WCM and profitability and to explore the joint impact of different components of WCM on profitability. The study used a population of ten FMCG companies over a period of ten years from 2000-2001 to 2009-2010. Using multiple regression analysis they concluded that better utilization of firms' resources leads to value creation. They found that CCC and debt used by the firms are negatively associated with firms' profitability.

Cetenak, et al (2012) conducted an empirical study of the effects of working capital management on firms' performance in Turkey. The objective of the study was to empirically determine the effects of WCM on firms' performance in Turkey. Their study considered seventy-five manufacturing firms listed on the Istanbul Stock Exchange (ISE), for the period of nine years from 2002 to 2009. They used the regression analysis in concluding their findings of the study. They concluded that there are significant relations between working capital management and firms' performance. The result showed that ACP and CCC are negatively related with firms' profitability. Also the relationship between leverage and firms' profitability is negative while the relationship between firms' size and firms' profitability is positive.

Ibe, et al (2012) studied the impact of working capital management on profitability of Nigerian firms. This study sampled twenty- eight quoted firms from twenty- six industries on the Nigerian Stock Exchange from 2004 to 2008. The multiple regression technique was used in the analysis of the models. Findings from the study revealed a

positive impact of both aggressive investment and financing working capital policies on profitability of Nigerian firms. This indicates a positive relationship between WCM and firms' profitability; as more short term funds are committed, both for investment and financing decisions, the profitability of firms increase.

Muchiri (2012) conducted a study on the relationship between working capital management and profitability of the dairy industry in Kenya with specificity towards the New Kenya Co- operative Creameries Ltd. Her study covered a period of four years (4) years from 2008 to 2011. Using regression analysis to determine the relationship, she concluded that KCC Ltd management of WC had a positive relationship with profitability. She indicated that the company converted inventories into cash for an average period of 83.46 days, its accounts receivable 46.81 days and paid its creditors within an average of 67.01 days. This results to a CCC being an average of 63 days, which put the firm in a good cash position.

Abudho, et al (2013) conducted an empirical study on the management of working capital and its effect on profitability of manufacturing companies listed on the NSE. The study considered six manufacturing companies over a period of five years from 2006 to 2010. The study was carried out in order to analyze the relationship between WCM and company profitability. Using multiple regression and correlation analysis in the analysis of secondary data, they concluded that profitability of manufacturing firms depends on effective WCM. Gross operating profit (GOP) is positively related with average collection (ACP). It is therefore profitable to delay payables and invest the money in different gainful ventures.



Anjum and Rehman (2013) conducted an empirical study to determine the impact of working capital management on profitability of the cement sector in Pakistan. The objectives of their study were to evaluate the impact of WCM on profitability of Karachi Stock Exchange (KSE) listed companies; to establish the optimum level of WC, and to analyze the degree of variation of ROA with respect to working capital. This study considered ten listed KSE companies of the cement industry in Pakistan over a period of six years from 2003 to 2008. Using multiple regression analysis, they found a negative relationship between WCM and productivity. When working capital increases liquidity increases and profitability decreases.

## **2.5 Summary of Literature Review**

This chapter reviewed theoretical and empirical evidence on the relationship between components of working capital management and firms' financial performance. The empirical review reveals that many researchers have studied working capital from different views and in different environments.

Several studies, of working capital management in relation with firms' financial performance, have been carried out both locally and internationally. Muchiri (2012) studied working capital management in relation with profitability of the dairy industry, while Wareru (2011) studied the relationship between WCM and profitability of insurance companies in Kenya. Review of other empirical studies (Abudho et al, 2013, and Ibe et al, 2012) found a positive relationship between WCM and firms' financial performance. On the other hand Bagchi and Khamrui (2012) and Cetenak et al (2012) found a negative relationship between working capital management and profitability. While these studies are relevant to the current study, they acknowledged that there is a

need for further extensive and empirical research to be done. These studies do not provide clear-cut direction of the relationship between working capital and firm's profitability. Further examination of these studies reveals that there is little of empirical evidence on the working capital management and its impact on the firm profitability in case of the agricultural sector of Kenya. Therefore, the present study is an attempt to fill this gap and estimates the relationship between components of working capital and financial performance.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter addresses the methodology of the research. Research methodology focused on the research design, population size, data collection procedures and data analysis.

### **3.2 Research Design**

This study employed a descriptive study design. Cooper and Schindler (2014) defines descriptive studies as the study that attempts to describe or often create a profile of a group of problems, people or events, through the collection of data and the tabulation of the frequencies on research variables or their interaction. In this research, the research sought to assess the relationship between components of working capital and financial performance of agricultural firms listed on NSE.

### **3.3 Population**

Target population of the study comprised of all agricultural companies listed on the NSE, which constituted seven companies as at December 2013. Those listed companies were appropriate for the study since they are public entities operating under strict corporate governance regulations, making their financial and accounting disclosures largely reliable. The study was census for a period of five years, which considered data from 2009 to 2013.

### **3.4 Data Collection**

For purposes of this study, secondary data was the main source of data collection. The use of the secondary data ensured the collection of reliable information from the target population. Data on the profitability of the company as well as on the total number of

current assets, inventory levels, and debt was sourced from the company's audited financial statements for the years 2009 to 2013.

### **3.5 Data Analysis**

The data collected was analyzed using multiple regression analysis and correlation analysis to establish the relation between the independent variables and the dependent variable. Regression analysis is concerned with the study of how one or more variables affect changes in another variable (Abudho *et al.*, 2013).

#### **3.5.1 Variables and Variable Measurement**

The data analysis procedures was achieved by developing similar model used by Abudho, *et al.* (2013), Arunkumah and Ramanan (2013), and Anjum and Rehman (2013). Data used to come up with the required variables include: operating sales for each year, trade receivables, trade payables, inventories, current assets, non-current assets, total assets, current liabilities, long term liabilities, profit after taxes and total equity. These include dependent, independent and control variables.

ROA was calculated by dividing profit after tax (PAT) with book value of assets (BVA); it was used as the dependent variable. The impact of working capital management on profitability was analyzed through accounting measures of profitability. The independent variables constituted average collection period, inventory conversion period, average payment period and cash conversion cycle. Also the control variables included sales growth, firm leverage, current ratio and firm size.

### 3.5.2 Quantitative Analysis

Two methods of quantitative analysis were used in this study. Pearson correlation to measure the degree of association between variables under consideration was used. Also the multiple regression analysis was used to estimate the causal relationships between ROA and other chosen variables. A multivariate regression was used to analyze the relationship between the components of WCM level of the firm and the performance of the firm. This similar to Abudho, *et al.* (2013), Arunkumah and Ramanan (2013), and Anjum and Rehman (2013), who applied the same model in coming up with the required variables include: operating sales for each year, trade receivables, trade payables, inventories, total assets, leverage, current ratio, profit after taxes and total equity.

$ROA = f(\text{ACP, ICP, APP, CCC, Growth, Leverage, CR, Size})$

$$ROA = \beta_0 + \beta_1 ACP_t + \beta_2 ICP_t + \beta_3 APP_t + \beta_4 CCC_t + \varepsilon_t$$

Where:

ROA: Return on assets of a firm at time t

ACP: Average Collection Period calculated as:  $\text{Receivables/Sales} * 365$

ICP: Inventory Conversion Period calculated as:  $\text{inventory/cost of sales} * 365$

APP: Average Payment Period calculated as:  $\text{Payables/Purchases} * 365$

CCC: Cash Conversion Period calculated as:  $\text{average collection period} + \text{inventory turnover in day} - \text{average payment period}$

t: Time = 1, 2, ....., 5 years

$\varepsilon_t$ : The error term

$\beta_0$ : Beta of the firms at t

$\beta_1, \beta_2, \beta_3$  and  $\beta_4$ : regression model coefficients measuring the change in ROA with each unit change in the independent variables. To test the impact of the cash conversion cycle and its components on profitability, the cash conversion cycle, the receivables collection period, the inventory conversion period, and the payables deferral period were regressed

against gross operating profit. The general preposition was that the coefficients,  $\beta_1$ ,  $\beta_2$  and  $\beta_4$ , would be negative while  $\beta_3$  would be positive.

Correlation analysis was employed to examine the relationships between the variables used in this research. To analyze the impact of components of working capital on firms' profitability, the gross operating profit (GROSS) was used as the dependent variable. This variable was derived by subtracting the cost of goods sold (COGS) from total sales and dividing the result by total assets minus financial assets (Napompech, 2012).

## **CHAPTER FOUR**

### **DATA ANALYSIS, PRESENTATION AND INTERPRETATION**

#### **4.1 Introduction**

The main objective of the study was to investigate the impact of the components of working capital on profitability. The data was obtained from 7 listed companies in the agriculture sector. The study used descriptive and inferential analytical techniques to analyze the data obtained. The study used Ordinary Least Squares (OLS) regression models. However, before running the regressions, descriptive statistics and correlation analysis were calculated. Correlation analysis shows the relationships between the different variables considered in the study. The correlation matrix presented simple bivariate correlations not taking into account other variables that may influence the results.

#### **4.2 Descriptive Analysis**

Table 4.1 presents the descriptive statistics and the distribution of the variables considered in this research: net operating income, natural logarithms of sales, sales growth, current ratio, debt ratio, accounts collection period (ACP), accounts payable period (APP), inventory turnover in days (ITO) and cash conversion cycle (CCC). The descriptive statistic considered were minimum, maximum, mean, standard deviation, skewness and kurtosis. Mean was used to establish the average value of the data, standard deviation gave the dispersion in the data, whereas skewness measured negative or positive symmetry of the distribution around its mean (left or right skewed), and kurtosis is the peakedness of the distribution.

Table 4.1 shows that net operating income had a mean of 0.225. That is, net operating income is, on average, 22.5% of the agricultural firms' (total assets – financial assets). However, the value went as high as 73% and as low as 1% bringing about huge dispersion in profitability as indicated by the standard deviation. Accounts collection period was on average 106.7. That is, it took 107 days to collect account receivables while in some companies it took as long as 378.7 days and as short as 21.9 days. This further depicts high disparity in the duration it took to collect debts.

Mean value of accounts payable period was 248.4. This denotes that, it averagely took the agricultural firms 248 days to pay up their financial obligations. However, it took some companies as short as 78 days or as long as more than one year (472 days) to honor their financial obligations to other entities. On inventory turnover in days, the agricultural firms took, on average, 144 days to sell their inventory but to some firms, the duration was as short as 28 days while others experience longer periods in excess of one year (435 days).



**Table 4.1: Descriptive Statistics**

	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
					Statistic	Std. Error	Statistic	Std. Error
ROA	.01	.73	.2250	.15750	.900	.289	.787	.570
Ln(Size)	16.45	23.48	21.3024	1.60114	-1.492	.289	2.105	.570
Growth	-.38	1.97	.1597	.36099	2.520	.304	10.109	.599
Current Ratio	.27	3.85	1.2707	.65285	1.451	.289	3.779	.570
Debt Ratio	.17	2.41	1.0456	.55042	.366	.289	-.565	.570
ACP	21.88	378.68	106.73	58.68438	1.529	.289	5.615	.570
APP	78.01	472.39	248.43	102.59900	-.183	.289	-1.022	.570
ITO	28.13	435.08	144.39	98.99683	1.378	.289	1.755	.570
CCC	- 240.82	390.94	2.6915	121.56113	1.060	.289	1.627	.570

### 4.3 Correlation Analysis

The study sought to establish the relationship between the components of working capital, its moderating factors and agricultural firms' profitability. Pearson Correlation analysis was used to achieve this end at 99%, 95% and 90% confidence levels. The correlation analysis enabled the testing of study's hypothesis that working capital has a significant effect on agricultural firms' profitability. Table 4.2 shows significant, negative but low linear relationships between firms' performance and: accounts collection period ( $R = -0.298$ ,  $p = .013$ ); accounts payable period ( $R = -0.261$ ,  $p = .030$ ); inventory turnover period in days ( $R = -0.301$ ,  $p = .012$ ); and, cash conversion cycle ( $R = -0.169$ ,  $p = .016$ ).

The first hypothesis stated that inefficient accounts collection period has a negative impact on agricultural firm's profitability. The study's established negative coefficient between accounts collection period and profitability ( $p = 0.013$ ) points at rejection of the

null hypothesis of insignificant relationship. This depicts that agricultural firms that are not efficient in collecting debts from sales are less profitable.

The second hypothesis stated that there is no relationship between accounts payable period and firm's profitability. The study established a significant negative coefficient ( $p = 0.030$ ) between accounts payable period and profitability. Thus, the null hypothesis is rejected and alternative hypothesis of significant relationship accepted. This depicts that less profitable companies wait longer to pay their bills.

The third hypothesis tested the relationship between cash conversion cycle and profitability. The study established a negative coefficient significant at  $\alpha=5\%$ . Thus, the null hypothesis is also rejected as cash conversion cycle has a negative linear relationship with profitability. This implies that if the agricultural firms are able to decrease their cash conversion cycle (sale of finished goods, collection of debts and deferred payment of financial obligations), it can improve its profitability.

The fourth hypothesis stated that firm's profitability is insignificantly negatively influenced by the inventory turnover days. The study established a negative coefficient between inventory turnover period in days and profitability. The null hypothesis is, thus, rejected and alternative hypothesis of significant relationship accepted. Thus, agricultural firms that hold much inventory are less profitable. That is, when the time span during which inventories remain within the agricultural firms increases, profitability decreases. Thus, all measures for working capital management (ACP, APP, ITO and CCC) present negative and significant coefficients.

**Table 4.2: Correlation Matrix**

Variables			ROA	Size	G	CR	DR	ACP	APP	ITO
1	Size	Correlation	.593***	1						
		Sig.	.000							
2	Growth	Correlation	.023	-.235*	1					
		Sig.	.861	.066						
3	Current Ratio	Correlation	.100	.007	.384***	1				
		Sig.	.413	.953	.002					
4	Debt Ratio	Correlation	-.119	-.404***	.121	-.322***	1			
		Sig.	.332	.001	.350	.007				
5	A/C Collection Period	Correlation	-.298**	-.013	-.380***	-.349***	-.068	1		
		Sig.	.013	.917	.002	.003	.577			
6	A/C Payable Period	Correlation	-.261**	-.283**	.048	-.352***	.117	.345***	1	
		Sig.	.030	.019	.713	.003	.339	.004		
7	Inventory Turnover	Correlation	-.301**	-.500***	-.137	-.200*	.243**	.432***	.486***	1
		Sig.	.012	.000	.287	.099	.045	.000	.000	
8	Cash Conversion Cycle	Correlation	-.169**	-.175	-.343***	-.035	.066	.544***	-.282**	.613***
		Sig.	.016	.150	.006	.778	.590	.000	.019	.000

\*\*. Correlation is significant at the 0.01 level (2-tailed); \*. Correlation is significant at the 0.05 level (2-tailed).

#### **4.4 Regression Analysis**

Regression analysis was used to measure the relationship between individual independent variables (accounts collection period, accounts payable period, inventory turnover in days and cash conversion cycle, debt ratio, sales growth, sales and current ratio) and dependent variable (profitability). The regression analysis was of the form:

$$ROA = \beta_0 + \beta_1 (\ln(S)) + \beta_2 (SG) + \beta_3 (CR) + \beta_4 (DR) + \beta_5 (ACP/ITO/APP/CCC) + \epsilon_i$$

Whereby ROA is Return on assets,  $\ln(S)$  is natural logarithm of size, G is growth, CR is current ratio, DR is debt ratio,  $\beta_0$  is regression constant,  $\beta_0$  to  $\beta_5$  is regression coefficients and  $\epsilon_i$  is model's error term.

##### **4.4.1 Accounts Collectible, Payable and Inventory Turnover**

The study sought to determine the goodness of fit of the regression equation using the coefficient of determination between the independent variables and financial performance. Coefficient of determination established the strength of the relationship.

Table 4.3 illustrates the strength of the relationship between financial performance and independent variables. From the determination coefficients, it can be noted that there is a strong relationship between dependent and independent variables given an R values of 0.640 and R-square values of 0.409. This shows that the independent variables (account collectible period, account payable period and inventory turnover) accounts for 40.9% of the variations in profitability as measured by ROA.

The study also used Durbin Watson (DW) test to check that the residuals of the models were not autocorrelated since independence of the residuals is one of the basic hypotheses of regression analysis. Being that the DW statistic were close to the

prescribed value of 2.0 (2.444) for residual independence, it can be concluded that there was no autocorrelation.

**Table 4.3: Model Summary**

<b>R</b>	<b>R Square</b>	<b>Adjusted Square</b>	<b>R Std. Error of the Estimate</b>	<b>Durbin-Watson</b>
.640 <sup>a</sup>	.409	.261	.14467	2.444

a. Predictors: (Constant), ACP, APP, ITO

b. Dependent Variable: ROA

Analysis of Variance (ANOVA) was used to make simultaneous comparisons between two or more means; thus, testing whether a significant relation exists between variables (dependent and independent variables). This helps in bringing out the significance of the regression model. The ANOVA results presented in Table 4.4 shows that the regression model has a margin of error of  $p = .047$ . This indicates that the model has a probability of 4.7% of giving false prediction; this points to the significance of the model.

**Table 4.4: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	0.29	5	0.058	2.77	.047
Residual	0.419	20	0.021		
Total	0.708	25			

a. Dependent Variable: ROA

b. Predictors: (Constant), ACP, APP, ITO

Table 4.5 shows that the regression coefficients of independent variables categorizing the linear relationship between working capital management with regards to accounts collectible, inventory turnover and accounts payables, and profitability. The following regression model was established:

$$\text{ROA} = 0.325 - 6.64\text{E-}04 \cdot \text{ACP} - 2.02\text{E-}04 \cdot \text{APP} + 1.88\text{E-}04 \cdot \text{ITO}$$

From the equation, the study found that holding accounts collectible, inventory turnover and accounts payables at zero profitability ratio (ROA) will be 0.325. Additionally, when inventory turnover and accounts payables are constant, a unit increase in accounts collectible would lead to a 6.64E-04 decrease in financial performance.

When accounts collectible and inventory turnover are constant, a unit increase in accounts payables would lead to a 2.02E-04 decrease in financial performance. Holding accounts collectible and accounts payables constant, a unit increase in inventory turnover would lead to a 1.88E-04 increase in firms' financial performance.

The study conducted a multicollinearity tests to determine if two or more predictor (independent) variables in the multiple regression model are highly correlated. The study used tolerance and variance inflation factor (VIF) values for the predictors as a check for multicollinearity. Tolerance indicates the percent of variance in the independent variable that cannot be accounted for by the other independent variable while VIF is the inverse of tolerance. Table 4.5 shows that tolerance values were 0.756, 0.768 and 0.628 with corresponding variance inflation factor values of 1.323, 1.302 and 1.592. Since tolerance values were above 0.1 and VIF below 10, there was no multicollinearity in the model.

**Table 4.5: Regression Model Coefficients**

	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	.325	.077		4.232	.000		
ACP	-6.64E-04	4.80E-04	-.274	-3.385	.017	.756	1.323
APP	-2.02E-04	3.09E-04	-.128	-2.652	.019	.768	1.302
ITO	1.88E-04	3.72E-04	.110	1.504	.041	.628	1.592

b. Dependent Variable: ROA

#### 4.4.1.1 Account Collectible Period

Table 4.6 presents the strength of the relationship between financial performance and accounts collectible period. The study established correlation coefficient value of 0.679 and R-square values of 0.460. This depicts that account collectible period accounts for 46% of the variations in financial performance as measured by ROA

**Table 4.6: Model Summary**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>	<b>Durbin-Watson</b>
.679 <sup>a</sup>	.460	.412	.12288	1.792

a. Predictors: (Constant), Debt Ratio, Growth, Accounts Collection Period, Current Ratio, Ln(Size)

b. Dependent Variable: ROA

ANOVA statistics presented in Table 4.7 shows that the regression model has a margin of error of  $p < .001$ . This indicates that the model has a probability of less than 0.1% of giving false prediction which points to the significance of the model.

**Table 4.7: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	0.722	5	0.144	9.558	.000b
Residual	0.846	56	0.015		
Total	1.567	61			

a. Predictors: (Constant), Debt Ratio, Growth, Accounts Collection Period, Current Ratio, Ln(Size)

b. Dependent Variable: ROA

From Table 4.8, the following regression model was established:

$$\text{ROA} = -1.234 - 7.4\text{E-}04 * \text{ACP} + 0.069 * \text{Size} + 0.022 * \text{Growth} + 0.005 * \text{CR} + 0.041 * \text{DR}$$

Thus, the study established that when accounts collectible period, size, growth, current ratio and debt ratio are zero ROA will be -1.234; signifying loss. When size, growth, current ratio and debt ratio are constant, a unit increase in accounts collectible period would lead to a 7.4E-04 (p = .017) increase in financial performance as measured by ROA.

Moreover, holding other factors constant, unit increase in the moderating variables would have positive effect on ROA: size (0.069), growth (0.022), current ratio (0.005) and debt ratio (0.041). However, only size would have a significant increase in financial performance given a margin of error of p<.001.

**Table 4.8: Regression Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.234	0.275		-4.484	.000
ACP	-7.4E-04	2.99E-04	-0.277	-2.472	.017
Ln(Size)	0.069	0.011	0.674	6.08	.000
Growth	0.022	0.051	0.051	0.437	.664
Current Ratio	0.005	0.029	0.021	0.17	.865
Debt Ratio	0.041	0.034	0.142	1.191	.239

a. Dependent Variable: ROA



#### 4.4.1.2 Inventory Turnover in Days

The model summary statistics shown in Table 4.9 presents the linear relationship between inventory turnover and financial performance. The study established correlation coefficient value of 0.636 and R-square values of 0.404. This depicts that inventory turnover would accounts for 40.4% of the variations in financial performance as measured by ROA

**Table 4.9: Model Summary**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>	<b>the Durbin-Watson</b>
.636 <sup>a</sup>	.404	.351	.12914	1.960

a. Predictors: (Constant), Debt Ratio, Growth, Inventory Turnover, Current Ratio, Ln(Size)

b. Dependent Variable: ROA

ANOVA statistics presented in Table 4.10 shows that the regression model has a margin of error of  $p < .001$ . This indicates that the model has a probability of less than 0.1% of giving false prediction which point to the significance of the model.

**Table 4.10: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	0.633	5	0.127	7.593	.000b
Residual	0.934	56	0.017		
Total	1.567	61			

a. Predictors: (Constant), Debt Ratio, Growth, Inventory Turnover, Current Ratio, Ln(Size)

b. Dependent Variable: ROA

From Table 4.11, the following regression model was established:

$$\text{ROA} = -1.484 + 9.61\text{E-}05 \cdot \text{ITO} + 0.074 \cdot \text{Size} + 0.057 \cdot \text{Growth} + 0.03 \cdot \text{CR} + 0.057 \cdot \text{DR}$$

From the equation, the study established that when inventory turnover, size, growth, current ratio and debt ratio are zero ROA will be -1.484. Thus, the firm would make a loss. When size, growth, current ratio and debt ratio are constant, a unit increase in inventory turnover would lead to a 9.61E-05 ( $p = .034$ ) increase in financial performance as measured by ROA.

As previously established, holding other factors constant, unit increase in the moderating variables would have positive effect on ROA: size (0.074), growth (0.057), current ratio (0.03) and debt ratio (0.057). Nevertheless, of the four variables, only size would have a significant increase in financial performance given a margin of error of  $p < .001$ .

**Table 4.11: Regression Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.484	0.324		-4.587	0.000
Inventory Turnover	9.61E-05	2.01E-04	0.058	3.479	0.034
Ln(Size)	0.074	0.013	0.722	5.569	0.000
Growth	0.057	0.053	0.128	1.06	0.294
Current Ratio	0.03	0.03	0.127	1.024	0.31
Debt Ratio	0.057	0.035	0.198	1.604	0.114

b. Dependent Variable: ROA

#### 4.4.1.3 Accounts Payable Period

Table 4.12 presents the linear relationship between accounts payable period and financial performance. The study established correlation coefficient value of 0.636 and R-square values of 0.405. This depicts that accounts payable period would account for 40.5% of the variations in financial performance as measured by ROA.

**Table 4.12: Model Summary**

<b>R</b>	<b>R Square</b>	<b>Adjusted Square</b>	<b>RStd. Error of Estimate</b>	<b>of theDurbin-Watson</b>
.636 <sup>a</sup>	.405	.352	.12906	1.915

a. Predictors: (Constant), Debt Ratio, Growth, Cash Conversion Cycle, Current Ratio, Ln(Size)

b. Dependent Variable: ROA

ANOVA statistics presented in Table 4.13 shows that the regression model has a margin of error of  $p < .001$ . This indicates that the model has a probability of less than 0.1% of giving false prediction which point to the significance of the model.

**Table 4.13: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	0.634	5	0.127	7.616	.000b
Residual	0.933	56	0.017		
Total	1.567	61			

a. Predictors: (Constant), Debt Ratio, Growth, Accounts Payable Period, Current Ratio, Ln(Size)

b. Dependent Variable: ROA

From Table 4.14, the following regression model was established:

$$\text{ROA} = -1.322 - 1.02\text{E-}04*\text{APP} + 0.069*\text{Size} + 0.057*\text{Growth} + 0.02*\text{CR} + 0.053*\text{DR}$$

From the equation, the study established that when accounts payable period, size, growth, current ratio and debt ratio are zero ROA will be -1.322. Thus, the firm would make a loss. When size, growth, current ratio and debt ratio are constant, a unit increase in accounts payable period would lead to a -1.02E-04 (p = .048) increase in financial performance as measured by ROA.

Holding other factors constant, unit increase in the moderating variables would have positive effect on ROA: size (0.069), growth (0.057), current ratio (0.02) and debt ratio (0.053). However, only size would have a significant increase in financial performance given a margin of error of  $p < .001$ .

**Table 4.14: Regression Coefficients**

	Unstandardized		Standardized	t	Sig.
	Coefficients				
	B	Std. Error	Beta		
(Constant)	-1.322	0.32		-4.137	.000
Accounts Payable Period	-1.02E-04	1.86E-04	-0.066	-2.546	.048
Ln(Size)	0.069	0.013	0.674	5.509	.000
Growth	0.057	0.053	0.129	1.075	.287
Current Ratio	0.02	0.033	0.084	0.619	.053
Debt Ratio	0.053	0.036	0.184	1.459	.150

a. Dependent Variable: ROA

#### 4.4.2 Working Capital Management and ROA

Using the regression models run, thus far, the study aggregated the effect of all the working capital variables on financial performance and moderating the relationship as previously shown. The regression model became:

$$ROA = \beta_0 + \beta_1 (ACP) + \beta_2 (APP) + \beta_3 (ITO) + \beta_4 (\ln(S)) + \beta_5 (SG) + \beta_6 (CR) + \beta_7 (DR) + \epsilon_i$$

Whereby ROA is Return on assets,  $\ln(S)$  is natural logarithm of size, G is growth, CR is current ratio, DR is debt ratio,  $\beta_0$  is regression constant,  $\beta_0$  to  $\beta_7$  is regression coefficients and  $\epsilon_i$  is model's error term.

The study sought to determine the goodness of fit of the regression equation using the coefficient of determination between the independent variables and financial performance as illustrated in Table 4.15. From the determination coefficients, it can be noted that there is a strong relationship between dependent and independent variables given an R values of 0.681 and R-square values of 0.464. This shows that the independent variables (account collectible period, account payable period, inventory turnover and the moderating variables) accounts for 46.4% of the variations in profitability as measured by ROA. Durbin Watson (DW) value of 1.998 shows that there was no autocorrelation in the model.

**Table 4.15: Model Summary**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>R Std. Error of the Estimate</b>	<b>Durbin-Watson</b>
.681 <sup>a</sup>	.464	.325	.14145	1.998

- a. Predictors: (Constant), Debt Ratio, APP, Growth, Ln (Size), CR , ITO, ACP  
 b. Dependent Variable: ROA

ANOVA used to measure the significance of the regression model produced an F value of 3.340 at  $p = .011$ . This indicates that the model has a probability of 1.1% of giving false prediction. This point to the significance of the model.

**Table 4.16: Analysis of Variance**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	.468	7	.067	3.340	.011b
Residual	.540	27	.020		
Total	1.008	34			

a. Predictors: (Constant), Debt Ratio, APP, Growth, Ln (Size), CR , ITO, ACP

b. Dependent Variable: ROA

Table 4.17 shows that the regression coefficients of independent variables categorizing the linear relationship between working capital management (accounts collectible, inventory turnover and accounts payables) and profitability with the moderating effect of size, sales growth, current ratio and debt ratio. The following regression model was established:

$$\text{ROA} = -1.654 - 1.05\text{E-}03*\text{ACP} - 2.00\text{E-}04*\text{APP} + 6.28\text{E-}04*\text{ITO} + 0.089*\text{Size} + 0.024*\text{Growth} - 0.017*\text{Current Ratio} + 0.047*\text{Debt Ratio}$$

From the equation, the study found that holding accounts collectible, inventory turnover, accounts payables, size, growth, current ratio and debt ratio at zero profitability ratio (ROA) will be -1.654; signifying loss. Additionally, when inventory turnover, accounts payables and moderating variables are constant, a unit increase in accounts collectible would lead to a 1.05E-03 decrease in financial performance.

When accounts collectible, inventory turnover and moderating variables are constant, a unit increase in accounts payables would lead to a 2.00E-04 decrease in financial performance. Holding accounts collectible, accounts payables and moderating variables constant, a unit increase in inventory turnover would lead to a 6.28E-04 increase in firms' financial performance.

Holding other factors (working capital management variables) constant, and with the exception of current ratio, unit increase in the moderating variables would have positive effect on ROA: size (0.089), growth (0.024) and debt ratio (0.047). A unit increase in current ratio would lead to a 0.017 decrease in profitability. However, as established before, only size would have a significant increase in financial performance given a margin of error of  $p < .001$

Tolerance indicates the percent of variance in the independent variable that cannot be accounted for by the other independent variable while VIF is the inverse of tolerance. Table 4.17 shows that tolerance values ranged between 0.462 and 0.749. VIF values were of the range 2.165 to 1.335. The tolerance values were above 0.1 and VIF below 10, thus there was no multicollinearity in the model.

**Table 4.17: Regression Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.654	.479		-3.452	.002		
ACP	-1.05E-03	5.02E-04	-.435	-2.097	.045	.462	2.165
APP	-2.00E-04	2.87E-04	-.127	-.696	.493	.597	1.675
ITO	6.28E-04	3.52E-04	.367	1.784	.086	.470	2.127
Ln (Size)	.089	.020	.711	4.370	.000	.749	1.335
Growth	.024	.091	.044	.265	.793	.733	1.365
CR	-.017	.046	-.063	-.363	.720	.654	1.528
Debt Ratio	.047	.051	.168	.939	.356	.623	1.605

a. Dependent Variable: ROA

#### 4.4.3 Cash Conversion Cycle

Cash Conversion Cycle was analyzed on its own since it is a set of working capital subsets (accounts collectible, inventory turnover and accounts payables). Cash conversion cycle is the difference of the sum of inventory turnover and accounts collection, and accounts payable (inventory turnover + accounts collection - accounts payable). Cash conversion cycle, thus, spans the time between the payment for raw material and the receipt from the sale of goods. Thus, the regression model become:



$$ROA = \beta_0 + \beta_1 * CCC(ACP + ITO - APP) + \beta_2 (\ln(S)) + \beta_3 (SG) + \beta_4 (CR) + \beta_5 (DR) + \epsilon_i$$

Whereby ROA is Return on assets,  $\ln(S)$  is natural logarithm of size, G is growth, CR is current ratio, DR is debt ratio,  $\beta_0$  is regression constant,  $\beta_0$  to  $\beta_5$  is regression coefficients and  $\epsilon_i$  is model's error term. Owing to this, cash conversion cycle has a high multicollinearity with other working capital variables.

Table 4.18 presents the strength of the relationship between financial performance and cash conversion period. The study established correlation coefficient value of 0.603 and R-square values of 0.363. This depicts that cash conversion cycle accounts for 36.3% of the variations in financial performance as measured by ROA

**Table 4.18: Model Summary**

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>R Std. Error of the Estimate</b>	<b>Durbin-Watson</b>
.603 <sup>a</sup>	.363	.253	.14877	2.419

a. Dependent Variable: ROA

b. Predictors: (Constant), Debt Ratio, Growth, CR, CCC, Ln (Size)

ANOVA statistics presented in Table 4.19 shows that the regression model has a margin of error of  $p = .017$ . This indicates that the model has a probability of less than 1.7% of giving false prediction which point to the significance of the model.

**Table 4.19: Analysis of Variance**

	<b>Sum Squares</b>	<b>of Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Regression	.366	5	.073	3.309	.017b
Residual	.642	29	.022		
Total	1.008	34			

a. Dependent Variable: ROA

b. Predictors: (Constant), Debt Ratio, Growth, CR, CCC, Ln (Size)

From Table 4.20, the following regression model was established:

$$\text{ROA} = -1.613 - 5.834\text{E-}06 \cdot \text{CCC} + 0.078 \cdot \text{Size} + 0.076 \cdot \text{Growth} + 0.022 \cdot \text{CR} + 0.095 \cdot \text{DR}$$

Thus, the study established that when cash conversion cycle, size, growth, current ratio and debt ratio are zero ROA will be -1.613; signifying loss. When size, growth, current ratio and debt ratio are constant, a unit increase in cash conversion cycle would lead to a 5.834 ( $p = .017$ ) decrease in financial performance as measured by ROA.

Moreover, holding other factors constant, unit increase in the moderating variables would have positive effect on ROA: size (0.078), growth (0.076), current ratio (0.022) and debt ratio (0.095). However, only size would have a significant increase in financial performance given a margin of error of  $p = .001$ . Tolerance values ranged between 0.775 and 0.866. VIF values were of the range 1.291 to 1.155. Tolerance values were, thus, above 0.1 and VIF below 10 signifying lack of multicollinearity in the model.

**Table 4.20: Regression Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-1.613	.466		-3.464	.002		
CCC	-5.834E-06	1.99E-04	-.005	-3.029	.017	.844	1.185
Ln (Size)	.078	.020	.628	3.873	.001	.835	1.198
Growth	.076	.091	.138	.833	.411	.805	1.242
CR	.022	.042	.082	.515	.610	.866	1.155
Debt Ratio	.095	.048	.336	1.995	.055	.775	1.291

a. Dependent Variable: ROA

#### 4.5 Summary and Interpretation of Findings

From the above analysis, the study found negative correlation coefficient ( $R = -0.261$ ,  $p = .030$ ) between accounts payable period and profitability. Account payable is defined as a debt arising from credit purchases and is the largest single category of short-term debt, representing about 40% of the current liabilities thus affects firms' profitability (Brigham and Houston, 2004). Alipour (2011), taking a sample of firms listed in Tehran Stock Exchange, established a positive significant relationship between no of days accounts payables and profitability. However, Alipour found a negative significant relationship between number of day's accounts receivable, inventory turnover and cash conversion cycle.

Findings show a negative correlation coefficient ( $R = -0.298$ ,  $p = .013$ ) between accounts collectible period and profitability. Uyar (2009) established that profitability has significant negative relation with accounts collectible period. Similarly, Gill, Biger and

Mathur (2010) while they established a positive relationship between CCC and firm's profitability in USA firms, found a highly significant negative relation between accounts receivables and a firm's profitability. Shapiro (2002) argues that firms grant trade credit to customers, both domestically and internationally because they expect investment in receivables to be profitable either by expanding sales volume or by retaining sales that otherwise would be lost to competitors. Account receivables also have opportunity cost associated with them, because company can't invest this money elsewhere until and unless it collects its receivables.

The study found a negative correlation coefficient ( $R = -0.301$ ,  $p = .012$ ) between inventory turnover period and profitability. Padachi (2006) found that the higher the investment in inventories and receivables, the lower the profitability is, and that cash conversion cycle is negatively related to the firms' profitability. According to Fabozzi and Peterson (2003), stock of physical goods for eventual sale and its value depend on sales thus an increase in inventory turnover would influence firms' performance. Inventory should neither be too low to adversely affect the production nor too high to block the funds unnecessarily. Excess investment in inventories is unprofitable for the business and both excess and inadequate investments in inventories are not desirable.

The study found a negative correlation coefficient ( $R = -0.169$ ,  $p = .016$ ) between cash conversion cycle and profitability. Similarly, Falope and Ajilore (2009) found a significant negative relationship between cash conversion cycle and firm's profitability. However, Deloof (2003) postulates that a good cash conversion cycle is helpful for the organization to pay its obligations at a right time which will enhance the goodwill of a company; company with poor cash conversion cycle will not be able to meet its current

financial obligations hence face financial distress. Eljelly (2004) found that firm's profitability has a negative relationship with its cash conversion cycle and current ratio. Garcia-Teruel and Marinez-Solano (2007) established that firms can improve profitability by shortening the cash conversion cycle through inventory reduction and reduction in the outstanding number of day's receivables. Deloof (2003) established that if the cash conversion cycle is shorter then, the profitability will be increased. Besides, concerning the relationship between company size (measured by the natural logarithm of total assets) and profitability, the results indicate that as size increases, operating profitability significantly increases ( $p < .001$ ).

## **CHAPTER FIVE:**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATION**

#### **5.1 Introduction**

This chapter presents discussions of the key findings presented in chapter four, conclusions drawn based on such findings and recommendations there-to. This chapter will thus be structured into conclusion, recommendations, limitations and areas for further research.

#### **5.2 Summary**

This study intended to determine the relationship between components of working capital and financial performance of listed agricultural firms quoted at the Nairobi Securities Exchange. In order to do this, the research was designed as a correlation study where relationships were tested. Secondary data was used in conducting the study.

This paper studied the relationship between components of working capital and financial performance in seven (7) agricultural firms listed on Nairobi Security Exchanges, from 2009 to 2013. The findings from correlation analysis shows that (accounts collection period, accounts payable period, inventory turnover period in days and cash conversion cycle) significantly ( $p < .001$ ) and negatively affect financial performance of agricultural firms. Regression analysis results show that accounts payable period ( $2.02E-04$ ;  $p = .019$ ) and accounts collectible period ( $-6.64E-04$ ;  $p = .017$ ) decrease in financial performance while inventory turnover period ( $1.88E-04$ ;  $p = .041$ ) would increase the same.

### **5.3 Conclusions**

The results provided evidence that the cash conversion cycle, as a measure of working capital management, negatively affects profitability. This indicates that companies can increase their profitability by shortening their accounts receivables, inventory and while lengthening their payables periods. These findings are in line with many previous studies, namely with those of (Raheman and Nasr, 2007).

From the results, possessing a lower average collection period is seen by the agricultural firms as optimal, since this means that it does not take them very long to turn receivables into cash. This owes to the fact that the agricultural firms need cash to pay off its own expenses (such as operating and administrative expenses) including farmers who sell canes to them. They also tend to have a longer accounts payable period so as to maintain a high current ratio and avoid operating in the red. Monitoring the working capital is important for the agricultural firms' cash flow and its ability to meet its obligations when they come due. However, they optimize this to ensure that their credit worthiness is not tainted, take advantage of discounts including avoiding accruing interest rates unnecessarily.

The agricultural firms also monitor their turnover ratio to ensure that it is as short as possible since turnover ratio is negatively correlated with profitability. If turnover ratio falls from one period to another, the agricultural firms will take longer to pay off their suppliers and meet their financial obligations. The companies' operations will be choked owing to lack of space and too expensive logistics in storing finished products.

#### **5.4 Recommendations**

Profit of agricultural firms can be maximized by taking care of every component of working capital at individual level. On accounts collectible of receivable, firms need to maintain the debtors at minimum according to the credit policy offered to customers. The firms can offer cash discounts suitably depending on the cost of receivables and opportunity cost of funds blocked in the receivables. Besides, the firms can monitor how well accounts receivable are managed using aging schedules and financial ratios.

It is also recommended that firms should strive to decrease their inventory turnover by increasing sales through marketing, promotions among other things. However, firms should have enough inventories to meet the unexpected rise in demand although the cost of holding this inventory should not exceed its benefit. This is because excess investment in inventories is unprofitable as some of the goods are perishable.

Cash conversion cycle can be shortened by reducing the inventory conversion period by: processing and selling goods more quickly, reducing the receivables collection period, speeding up collections or lengthening the payables deferral period by slowing down the firm's own payment. This will ensure that there is enough cash for investment on stock and taking opportunity of short-term investments for greater overall profits.

Agricultural firms should lengthen their accounts payables period. This can be done by firms rethinking their corporate financial management such as directing their efforts towards their own resources and bypassing unnecessary financial problems/obligation. Firms should delay payment owed to other entities such as suppliers. However, this cannot be done for long without damaging firms' reputation and attracting high interest



rates on credit including bypassing purchase discounts which would again affect profitability.

Overall, optimizing the time span during which working capital is tied up in the company can be a way to improve profitability. On the one hand, reducing that time releases liquidity which in turn affects the company's financial position. On the other hand, working capital management enables other forms of financing because those financiers who focus on balance sheet structures will invest on companies with solid positions and reducing the capital lockup contributes towards that. Proper working capital management can be ensured by delaying payment for short-term liabilities, reducing sales in debt and enhancing sale of inventory.

### **5.5 Limitations**

The main focus of the study was on agricultural companies listed on Nairobi Securities Exchange; as such the results are therefore only applicable to agricultural companies in Kenya that are listed on the NSE and these findings should not be generalized. The analysis of the findings and conclusion drawn may have been different had the listed and non-listed agricultural companies in Kenya been taken into consideration in the study. The target population could also have affected the results and thus the findings should not be considered as one-size-fits-all mantra

Also the time taken to carry out the study was by no means sufficient for the amount of detail and analysis that a more extensive study could required. With more time, detailed tests could be conducted to determine whether the same conclusion could be drawn when the study population is increased and other variables included. Against this background,

other factors may have affected financial performance and therefore alter the results of the findings and conclusion drawn. WCM should therefore not be applied in isolation. More studies with blends of other factors relating to financial performance together with WCM would be more objective and helpful to the management of agricultural companies in Kenya.

### **5.6 Areas for Further Research**

This study can be replicated in the commercial and services industry to establish mechanisms in which working capital management can be optimized in a bid to increasing the company's financial performance. Further studies can also be carried out to establish other various ways in which components of working capital can be managed and how that will impact in the overall goals of businesses in Kenya.

Also similar studies should be done on other firms and other industries as the relationship adduced does not conform to the rule of thumb or one-size-fits-all mantra as different industries and sector have different operational environment. This might affect the relationship between working capital and profitability. There is need for further studies to carry out similar tests for a longer time period. This will help in observing the agricultural firms and the relationship between working capital management and profitability through the longer periods.

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## APPENDICES

### **Appendix 1: Listed Agricultural Companies in Kenya**

1. Eaagads Limited
2. Kapchorua Tea Company Limited
3. Kakuzi Limited
4. Limuru Tea Company Limited
5. Rea Vipingo Plantations Limited
6. Sasini Limited
7. Williamson Tea Kenya Limited

**Appendix II: Data Collection Form**

Company: .....

<b>Item</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
Receivables (account receivable)					
Sales					
Inventory					
Cost of Sales					
Payables (accounts payable)					
Purchases					
Total Assets					
Current Assets					
Current Liabilities					
Total Debt					
Net Profits					



### Descriptive Data

Co.	Year	ROA	Ln (Size)	Growth	CR	Debt Ratio	ACP	APP	ITO	CCC
Sasini Limited.	2009	0.3782	23.206	0.1531	1.346	0.361	80.23	133.91	51.57	-2.11
Rea Vipingo Ltd.	2009	0.0303	21.844	0.2264	1.380	0.486	114.79	339.87	127.08	-98.01
Williamson Tea Ltd	2009	0.1383	21.983	0.4485	0.397	1.430	128.24	245.65	104.02	-13.39
Kapchorua Tea Ltd.	2009	0.2847	21.290	0.2413	0.811	1.247	149.48	340.71	206.95	15.72
Limuru Tea Ltd	2009	0.0829	21.223	-0.2037	1.614	0.531	245.33	89.59	235.20	390.94
West Kenya Sugar	2009	0.3862	21.968	1.2020	1.785	1.249	59.36	150.41	132.25	41.20
Eaagads Limited	2009	0.0356	18.591	0.6390	1.991	0.899	40.37	289.59	69.31	-179.92
Sasini Limited.	2010	0.2486	23.191	-0.0149	1.356	0.426	101.00	186.01	34.48	-50.52
Rea Vipingo Ltd.	2010	0.1724	21.944	0.1048	1.295	0.581	99.65	353.05	145.81	-107.59
Williamson Tea Ltd	2010	0.1759	22.147	0.1779	0.332	1.903	182.02	228.41	86.72	40.32
Kapchorua Tea Ltd.	2010	0.2160	21.106	-0.1682	0.857	1.303	201.75	367.45	424.49	258.78
Limuru Tea Ltd	2010	0.1092	21.181	-0.0415	1.079	0.792	175.10	320.98	226.51	80.63
West Kenya Sugar	2010	0.2166	21.848	-0.1133	1.578	1.289	50.41	90.38	148.86	108.89
Eaagads Limited	2010	0.0397	18.615	0.0236	1.153	1.614	50.79	105.36	89.99	35.42
Sasini Limited.	2011	0.3659	23.472	0.3245	1.999	0.400	77.76	141.33	32.63	-30.94
Rea Vipingo Ltd.	2011	0.1729	22.344	0.4916	1.013	0.663	105.65	279.85	83.40	-90.79
Williamson Tea Ltd	2011	0.1290	22.096	-0.0493	0.494	2.411	97.80	195.26	49.83	-47.62
Kapchorua Tea Ltd.	2011	0.4330	21.552	0.5633	0.774	1.471	111.82	332.26	415.97	195.53
Limuru Tea Ltd	2011	0.1595	21.533	0.4217	1.041	1.001	134.07	356.35	177.84	-44.44
West Kenya Sugar	2011	0.6567	22.248	0.4927	1.420	1.454	36.79	125.11	28.74	-59.58
Eaagads Limited	2011	0.0253	18.455	-0.1479	1.236	1.620	53.54	79.49	67.78	41.84
Sasini Limited.	2012	0.2915	23.483	0.0114	2.199	0.375	89.28	108.07	42.04	23.24
Rea Vipingo Ltd.	2012	0.1442	22.303	-0.0394	1.219	0.517	96.03	334.44	112.75	-125.65
Williamson Tea Ltd	2012	0.1268	22.081	-0.0150	0.361	2.263	79.40	183.69	68.83	-35.46
Kapchorua Tea Ltd.	2012	0.4454	21.722	0.1846	0.781	1.629	123.66	472.39	186.50	-162.23
Limuru Tea Ltd	2012	0.1672	21.584	0.0523	0.891	0.937	151.43	278.51	124.74	-2.34
West Kenya Sugar	2012	0.5121	22.256	0.0077	1.392	1.711	21.88	95.59	52.88	-20.83
Eaagads Limited	2012	0.0329	18.598	0.1547	1.237	1.720	39.98	311.12	213.82	-57.32
Sasini Limited.	2013	0.2021	23.467	-0.0160	1.264	0.426	107.65	153.31	55.31	9.65
Rea Vipingo Ltd.	2013	0.2397	22.480	0.1937	0.975	0.622	83.47	419.02	94.74	-240.82
Williamson Tea Ltd	2013	0.2660	22.368	0.3317	3.851	1.877	68.24	186.75	190.10	71.58
Kapchorua Tea Ltd.	2013	0.3258	21.506	-0.1940	0.648	1.750	171.68	148.93	253.65	276.41
Limuru Tea Ltd	2013	0.1057	21.100	-0.3836	0.761	0.999	378.68	351.26	293.78	321.19
West Kenya Sugar	2013	0.7273	22.107	-0.1387	0.962	1.674	29.79	243.06	115.06	-98.21
Eaagads Limited	2013	0.0673	19.051	0.5722	0.696	2.280	24.58	362.39	254.10	-83.71