

Effect of Working Capital Management on the Financial Performance of Listed Manufacturing Firms in Kenya

Polycarp Waema* and Tabitha Nasieku

Jomo Kenyatta University of Agriculture and Technology (JKUAT), School of Business
Box 62000 00200, Nairobi, Kenya.

*Corresponding author's email pwaema89 [AT] gmail.com

ABSTRACT--- *Management of working capital aims at maintaining an optimal balance between each of the working capital components, that is, cash, receivables, inventory and payables. This is a fundamental part of an entity's overall corporate strategy. Working capital management plays a key role in creating a balance between liquidity and profitability in a firm, providing a basis for the firm's financing decisions. This study sought to establish the effect of working capital management on the financial performance of listed manufacturing firms in Kenya. Specifically, the study sought to determine the effect of creditor management, debtor management, inventory management and cash management on the financial performance of listed manufacturing firms in Kenya. The study adopted a quantitative research design. The target population was the 10 listed manufacturing firms in Kenya as provided for by the Nairobi Securities Exchange (NSE) databases. The study was based on secondary data obtained from the audited financial reports of the individual listed manufacturing firms for a period of ten years from 2005 to 2014. Panel data model was adopted in data collection and analysis. The study findings were that there exist a positive relationship between creditor management and the financial performance of the firms. The study findings also showed that there exist a negative relationship between debtor management, inventory management as well as cash management and the financial performance of the firms. The study concluded that working capital management significantly impacted on the financial performance of the listed manufacturing firms in Kenya over the 10 year period.*

Keywords--- Debtors' management, Creditor management, Inventory management, Cash management, Working capital management

1. INTRODUCTION

Working capital management (WCM) is a managerial accounting strategy focusing on maintaining efficient levels of a firm's current assets and current liabilities. It deals with the administration of a firm's current assets and current liabilities (Harris, 2005). WCM ensures that a company has sufficient cash flow in order to meet its short-term debt obligations and operating expenses (Mekonnen, 2011). WCM is a very important component of corporate finance because it directly affects the liquidity and profitability of a company (Knauer & Wöhrmann, 2013). Working capital management is important for many reasons. Usually, the current assets of a typical manufacturing firm accounts for over half of its total assets. Thus working capital represents a significant investment in the manufacturing firms. Excessive levels of current assets can easily result in a firm's realizing a substandard return on investment. However, too few current assets may occasion difficulties in maintaining smooth firm operations (Lu, 2013).

Management of working capital, which aims at maintaining an optimal balance between each of the working capital components, that is, cash, receivables, inventory and payables, is a fundamental part of the overall corporate strategy to create value and is an important source of competitive advantage in businesses (Deloof, 2003). In practice, it has become one of the most important issues in organizations with many financial executives struggling to identify the basic working capital drivers and the appropriate level of working capital to hold so as to minimize risk, effectively prepare for uncertainty and improve the overall performance of their businesses (Gill, Biger & Mathur, 2010). The crucial part in managing working capital (WC) is maintaining sufficient liquidity for the day-to-day business operation to ensure the firm's smooth running and meeting its obligations (Ganesan, 2007).

A well calculated and employed working capital management is anticipated to add positively to the firm's performance (Padachi, 2006). Holding of excess amounts of working capital can cause a decline in the profitability of a business (Lu, 2013). Working capital management involves managing the firm's inventory, receivables and payables in order to achieve a balance between risk and returns and thereby contribute positively to the creation of firm value. Excessive investment in inventory and receivables reduces firm profits, whereas too little investment increases the risk of not being

able to meet commitments as and when they become due. Therefore, the importance of maintaining an appropriate level of working capital and its contribution to business survival is a concept that should be understood by every company (Harris, 2005). Similar view was expressed by Mekonnen (2011) who noted that efficient working capital management involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet due short term obligations on the one hand and avoiding excessive investment in these assets on the other hand.

1.1 Working capital management of manufacturing sector: a global perspective

Management and control of working capital is one of the most effective measures of a company's financial health. It is common to assume that a firm's objective is to maximize shareholder value, and effective working capital management can contribute substantially towards this goal. Efficient working capital management can foresee and sometimes avoid potential financial difficulties. Poor working capital management can lead to financial distress, which increases the probability of bankruptcy (Mekonnen, 2011). In the study conducted in Belgium, Deloof (2003) found out that the way working capital is managed will have a significant impact on the profitability of firms. Gill *et al.* (2010) also studied 88 American firms and found out statistically significant relationship between cash conversion cycle and profitability.

Efficiency in working capital management has a significant impact on firm's profitability. Effective working capital management is very important. As a result, many financial managers spend long time managing current assets. For instance, in Canada manufacturing firms, current assets comprise about 40 percent of the total assets and skilful management of these short-term assets is critical for ensuring that the firms can meet their short-term maturing obligations and provide attractive return to its shareholders. In addition, working capital assets are the most manageable accounts and thus require frequent attention and oversight (Lu, 2013).

1.2 Manufacturing sector in kenya: an overview

The Kenyan manufacturing sector is the fourth largest sector in the country's economy after agriculture, transport and communications and whole sale and retail trade. It contributes about 18 per cent of Kenya's Gross Domestic Product (GDP) serving both the local market and exports to the East and Central Africa region. The sector employs about 2.3 million Kenyans in both formal and informal sectors (Waweru, 2011). Although initially developed under the import substitution policy, Kenya's manufacturing sector is now export based in line with the country's policy of emerging as a mid-sized economy in the year 2030. The sector is loosely classified into twelve (12) sub-categories based on the raw materials the companies import and or the products they manufacturer. The individual firm members are organized under the membership of Kenya Association of Manufacturers (KAM) to give them a platform for negotiating common position with the relevant government authorities (*Business Intelligence*, 2011). The Kenyan manufacturing sector is considered as one of the key segments of the economy. In addition, the Kenyan vision 2030 blue print, one of the key pillars of the attainment of the objectives of the strategy is the need for the manufacturing sector to grow at the rate of 8 per cent over a period of 20 years. This can only be achieved if there is growth in the profits of the sector and this will depend upon identifying all the variables that can influence profit of a firm including the management of working capital. The inability of a firm to meet its obligations will lead to the disruption of its manufacturing process by actions such as labor strikes and blacklisting by suppliers (*Kenya's Economic Outlook*, 2014).

2. THEORETICAL FRAMEWORK

The study was based on 4 theories namely Pecking Order Theory, Cost Trade-off Theory, Operating Cycle Theory and Cash Conversion Cycle Theory, as outlined below;

2.1 Pecking Order Theory

The Pecking Order Theory is based on information asymmetry where the firm's managers are seen to possess more knowledge on the firm's value than the potential investors are. It states that firms prefer internal financing and the use of debt to common stock in case of the need for external funds (Myers & Majluf, 1984). Internally generated funds are assumed to have no transaction costs and the use of debt signals positive information while the use of ordinary shares signals negative firm information (Correa, Basso & Nakamura, 2007). The pecking order theory explains the maintenance of high levels of cash reserves and most liquid assets that ensure obligations are met as they arise and avoid the use of external funds (Chen, 2004). Effective management of working capital management components can enable the firm to maintain adequate levels of internal funds for financing its operational needs and hence reducing the need of the firm to seek external financing through issue of debt or equity (Frank & Goyal, 2003).

2.2 Cost Trade-off Theory

Cost of liquidity and illiquidity are involved in maintaining a particular level of current assets. Very high level of current assets means excessive liquidity hence return on assets will be low as funds are tied up in idle cash and stocks earn nothing while high levels of debtors reduce profitability. Therefore cost of liquidity through low rates of return increases with the level of current assets (Frank & Goyal, 2007). Conversely, cost of illiquidity means holding insufficient current assets whereby a firm will be unable to honor its obligations forcing it to borrow on short term at high interest rates. This

adversely affects a firm's creditworthiness and may limit future access to funds and possible insolvency (Michalski, 2009). An optimal level of holdings of individual current assets will lead to profit maximization for the firm. However, any of the investment above the optimum level may increase the current assets of the firm without increasing proportionately the profits of the firm. Resultantly the rate of return on investment declines (Michalski, 2009). On the other side Weston and Eugene (1979) also explained that if the investment in current assets falls from a certain level, it may lead to an inability of paying bills on time and may also result in inventory shortage leading to halting of production activities. It may also lead to loss of sales due to restrictive credit policy by the firm. This theory is relevant to the study as it emphasizes the need for the firm to maintain a working capital level that minimizes the costs of liquidity and illiquidity associated with management of working capital items for the firm to optimize its profitability.

2.3 Operating Cycle Theory

The flow concept of liquidity can be developed by extending the static balance sheet analysis of potential liquidation value coverage to include income statement measures of a firm's operating activity. In particular, incorporating accounts receivable and inventory turnover measures into an operating cycle concept provides a more appropriate view of liquidity management than does reliance on the current and acid-test ratio indicators of solvency (Harris, 2005). These additional liquidity measures explicitly recognize that the life expectancies of some working capital components depend "upon the extent to which three basic activities- production, distribution (sales), and collection - are non instantaneous and unsynchronized" (Weston & Eugene, 1979).

If firms cannot modify either the payment practices established with trade creditors or their access to short-term debt financing provided by non-trade creditors, decisions that create longer or less liquid holding periods will again be accompanied by a higher current ratio indicator of solvency (Weston & Eugene, 1979). The cumulative days per turnover for accounts receivable and inventory investments approximates the length of a firm's operating cycle. Incorporating these asset turnovers into an operating cycle concept of the current asset conversion period thereby provides a more realistic, although incomplete, indicator of a firm's liquidity position. Integrating the time pattern of cash outflow requirements imposed by a firm's current liabilities is as important for liquidity analysis as evaluating the associated time pattern of cash inflows generated by the transformation of its current asset investments (Bhattacharya, 1987). This theory is relevant to the study as it focuses on how the firm can utilize accounts receivable and inventory balances to enhance the firm's firm's liquidity position.

2.4 Cash Conversion Cycle Theory

The cash conversion cycle (CCC) , which represents the interaction between the components of working capital and the flow of cash within a company, can be used to determine the amount of cash needed for any sales level (Correa *et al.*, 2007). Gitman (1974) developed cash conversion cycle as part of operating cycle which is calculated by adding inventory period to accounts receivables period and then subtracting accounts payables from it. Its focus is on the length of time between the acquisition of raw materials and other inputs and the inflows of cash from the sale of finished goods, and represents the number of days of operation for which financing is needed (Harris, 2005). The shorter the CCC, the fewer are the resources needed by the company. So the longer the cycle the higher will be the investment in the working capital. The cash conversion cycle theory holds that the cash conversion cycle is a comprehensive measure of working capital as it shows the time lag between expenditure for the purchase of raw materials and the collection of sales of finished goods (Padachi, 2006). The theory asserts that day-to-day management of a firm's short term assets and liabilities plays an important role in the success of the firm given that firms with growing long term prospects and healthy bottom lines cannot remain solvent without good liquidity management (Sharma & Kumar, 2011). This theory is relevant to the study as it seeks to explain how the three components of working capital management (namely, accounts receivables, inventory and accounts payables) interact to influence firm liquidity and profitability.

2.5 Empirical Review

2.5.1 Creditor Management and Organizational Performance

Creditors' management represents the average length of time between the purchase of materials and labor and the payment of cash for them. It is calculated as the account payables divided by the average credit purchases per day (Harris, 2005). Account payables plays a critical role in managing working capital because delaying bill payments is one of the tools for management to have access to an inexpensive source of financing. However, the opportunity cost of keeping high account payables may hurt the business if an early payment discount is offered (Lu, 2013).

Working capital management rule states that firms should strive to lag their payments to creditors as much as possible, taking care not to spoil their business relationship (Napompech, 2012). Through this, Mathuva (2009) in the study "the influence of working capital management components on corporate profitability: a survey on Kenyan listed firms" shows that average payment period has a positive relationship with profitability. The positive relationship suggests that an increase in the number of day's accounts payable by 1 day is associated with an increase in profitability. Sharma and Kumar (2011) examined the effect of working capital management on firm profitability in India. The finding of the study

confirmed negative relation between debtors management with firm performance while the creditor management had positive relation with firm performance.

Ganesan (2007) selected telecommunication equipment industry to study the effectiveness of working capital management on profitability. The sample used in his study was 349 telecommunication equipment companies covering the period 2001 to 2007. Data was gathered from the annual financial statements of the companies. The statistical tests used included correlation, regression analyses and Analysis of variance (ANOVA). The results showed that days of the average creditors positively affected the profitability of these firms. To test the relationship between working capital management and corporate profitability, Deloof (2003) used a sample of 1,009 large Belgian non-financial firms for a period covering 1992-1996. By using correlation and regression tests, he found significant positive relationship between gross operating income and the number of days of accounts payable of Belgian firms. Based on the study results, he suggests that managers can increase corporate profitability by increasing the number of days of accounts payables.

Tirngo (2013) examined impact of working capital management on profitability of micro and small enterprises in Ethiopia for the case of Bahir Dar City Administration. The study had taken a sample of 67 micro and small enterprises. Data for this study was collected from the financial statements of the enterprises listed on Bahir Dar city micro and small enterprises agency for the year 2011. The study applied Pearson's correlation and OLS regression with a cross sectional analysis. The result showed that there is a strong positive relationship between number of day's accounts payable and enterprises profitability. Falope and Ajilore (2009) used a sample of 50 Nigerian quoted non-financial firms for the period 1996 -2005. Their study utilized panel data econometrics in a pooled regression, where time-series and cross-sectional observations were combined and estimated. They found a significant negative relationship between net operating profitability and the average collection period, inventory turnover in days, average payment period and cash conversion cycle for a sample of fifty Nigerian firms listed on the Nigerian Stock Exchange. Furthermore, they found no significant variations in the effects of working capital management between large and small firms.

2.5.2 Debtors Management and Organizational Performance

Debtors' management refers to the average length of time required to convert the firm's receivables into cash following a sale. It is calculated by dividing accounts receivable by the average credit sales per day. This ratio measures the length of time it takes to convert the average sales into cash. This measurement defines the relationship between accounts receivable and cash flow (Garcia-Teruel & Martinez-Solano, 2011). A longer debtors' management period requires a higher investment in accounts receivable. A higher investment in accounts receivable means less cash is available to cover cash outflows, such as paying bills (Sharma & Kumar, 2011).

Firms can improve their profitability by reducing the number of day's accounts receivable outstanding. This can be interpreted as the less the time it takes for customers to pay their bills, the more cash is available to replenish inventory hence the higher the sales realized leading to high profitability of the firm. The negative relationship between debtors' management and profitability suggests that an increase in the number of day's accounts receivable by 1 day is associated with a decline in profitability. Through this, managers can improve profitability by reducing the credit period granted to their customers (Lazaridis & Tryfonidis, 2006).

The study by Deloof (2003) stated that managers can increase corporate profitability by reducing the debtors' management period. The longer the number of day's accounts receivable outstanding, the greater the chance that the firm may lose its profitability. Tirngo (2013) examined impact of working capital management on profitability of micro and small enterprises in Ethiopia for the case of Bahir Dar City Administration and found that number of days of accounts receivable had a significant negative impact on profitability (Tirngo, 2013). Padachi (2006) examined the trends in working capital management and its impact on firm's performance. The results proved that a high investment in inventories and receivables is associated with lower profitability. Further, he showed that account receivables days correlated negatively with profitability.

Mathuva (2009) examined the influence of working capital management components on corporate profitability by using a sample of 30 firms listed on the Nairobi Securities Exchange (NSE) for the periods 1993 to 2008. He used Pearson and Spearman's correlations, the pooled ordinary least square (OLS), and the fixed effects regression models to conduct data analysis. The key findings of his study was that there existed a highly significant negative relationship between the time it takes for firms to collect cash from their customers (debtors' management) and firm profitability. On his part, Waweru (2011) carried out a study on the relationship between working capital management and the value of companies quoted at the NSE. The study used secondary data obtained from annual reports and audited financial statements of companies listed on the NSE. A sample of 22 companies listed on the NSE for a period of seven years from 2003 to 2009 was studied. The regression models indicated that there was some relationship between working capital management and the firm's value while the result of the Pearson correlation indicated a negative relationship between debtors' management period and the value of the firm.

2.5.3 Inventory Management and Organizational Performance

Inventory management refers to the average time required to convert materials into finished goods. Inventory turnover ratio, which represents the efficiency of inventory management, is expected to be high for firms with greater profitability. A low inventory turnover ratio could indicate either poor sales or an excess amount of inventory (Lu, 2013). Knauer and Wöhrmann (2013) on their study show that managers can improve firms' profitability by shortening their inventory management period.

Vural *et al.* (2012) conducted a study on the effect of working capital on firm's performance. The study was based on a sample of 75 manufacturing firms listed on Istanbul Stock Exchange Market for the period 2002-2009 with the aim of investigating the relationship between working capital management components and Istanbul firm's performance by using dynamic panel data analysis. The study did not find any relationship between the number of days' inventory and the profitability. However in a similar research conducted in Cyprus for the period between 1998 and 2007, the number of days' inventory was found to be negatively related to profitability. This is in conformity with the findings obtained by Raheman and Nasr (2007), Lazaridis and Tryfonidis (2006) and Jayarathne (2014).

Capkun, Hameri, and Weiss (2009) studied the relationship between inventory and financial performance in manufacturing companies. The researchers studied 52,254 businesses for a period of 25 years between 1980 and 2005; they used multiple regressions to determine the correlation between financial performance and various inventory levels. They measured financial performance using gross profits and operating profit results and Inventory levels in regard to raw materials, partially manufactured products, and finished products. The results revealed a positive correlation between a company's inventory management and its financial performance. They also noted that degrees of correlation vary depending on the type of inventory and the financial performance reference.

Zariyawati *et al.* (2012) empirically analyzed the relationship between working capital management and corporate performance using a case of Malaysia for the period 2003–2008. Using the regression and correlation analysis methods, they deduced that inventory management was positively correlated with firm performance. Ben-Caleb (2009) examined working capital management and profitability of listed companies in Nigeria. Using a descriptive research and a sample size of two hundred and forty eight (248) respondents, they established that there is significant relationship between good inventory management and organizational profitability. Inventory management was found to have a significant effect on organizational productivity. There was a high positive correlation between good inventory management and organizational profitability. They concluded that inventory management is very vital to the success and growth of organizations

2.5.4 Cash Management and Organizational Performance

Cash management represents the length of time between the firm's actual cash expenditures to pay for productive resources (materials and labor) and its own cash receipts from the sale of products (that is, the length of time between paying for labor and materials and collecting on receivables) (Mekonnen, 2011). The cash management thus represents the average length of time a shilling is tied up in current assets. It is calculated as; $(\text{Average Collection Period} + \text{Inventory turnover in days} - \text{Average Payment Period})$ (Vural *et al.*, 2012). Cash management essentially denotes the number of days a company's cash is tied up by its current operating cycle. Cash conversion cycle can be shortened in three ways: One, by reducing inventory conversion period by processing and selling goods more quickly. Two by reducing receivables period by speeding up collections from sales and three by lengthening payables or deferral period through slowing down firm's own payments (Lu, 2013).

Lazaridis and Tryfonidis (2006) investigated the relationship between corporate profitability, the cash management and its components. They used a sample of 131 companies listed in the Athens Stock Exchange for the period of 2001-2004. The research findings showed negative relationship between cash management, financial debt and profitability, while fixed financial assets had a positive coefficient. The authors concluded that companies can create more profit by handling correctly the cash management and keeping each different component to an optimum level. Naimulbari (2012) in the study of "the impact of working capital management on profitability" of pharmaceuticals sector in Bangladesh" showed that there was a negative relationship between cash management and profitability. As cash management has a negative relationship with the profitability then the cash management cycle should be short as much as possible without hurting the operations. This would improve profits, because the longer the cash management cycle, the greater the need for external financing, and that financing has a cost (Naimulbari, 2012).

A study by Dong and Su (2010) reported that the firms' profitability and liquidity are affected by working capital management. From the research it was found that the relationship between cash management and profitability was strongly negative. This denoted that decrease in the profitability occurred due to increase in cash conversion cycle. In a similar study but based on working capital management and profitability in Pakistani firms carried out by Raheman and Nasr (2007) evaluated the effect of different variables of working capital management including debtors management, inventory management, creditor management, cash management and current ratio on the firm's net operating profitability. They selected a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of six years

from 1999 - 2004 and found a strong negative relationship between variables of working capital management and profitability of the firm. They found that as the cash conversion cycle increases, it leads to decreasing profitability of the firm and managers can create a positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level (Raheman & Nasr, 2007).

3. STUDY POPULATION AND MODEL OF ANALYSIS

The target population of this study was all the listed manufacturing firms in Kenya as provided for by the NSE databases. The choice of the listed manufacturing firms in Kenya as the study population was based on the fact that their audited annual financial reports were readily accessible from the NSE's and CBK's databases. Currently there are 10 listed manufacturing firms in Kenya (NSE, 2015). This study used census sampling technique to select the 10 listed manufacturing firms as the study units.

The study adopted a quantitative research design. This was because quantitative research design is appropriate where the study seeks to explain phenomena by collecting numerical data that is analyzed using statistically based methods (Cooper & Schindler, 2011). The study used secondary data. The secondary data was obtained from the financial reports of the listed manufacturing firms in Kenya from the individual firms' databases spanning ten years (2005-2014). The study period of 10 years enabled the researcher to gather sufficient data on the study variables thereby being able to establish the trend in the manufacturing firms' WCM components and financial performance. The study adopted panel data model in data collection and analysis.

Data collected was edited, coded and classified into different components to facilitate a better and efficient analysis. For the purpose of this study, working capital management was analysed using its various components namely; creditor management, debtors' management, inventory management and cash management while financial performance was analysed using ROA. In analysing the quantitative data, the study used quantitative and descriptive statistical techniques. Given the time series nature of the study data, panel data model was used.

The effect of working capital management on the financial performance of the listed manufacturing firms in Kenya was modeled using the following regression equation:

$$ROA_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 ACP_{it} + \beta_3 ICP_{it} + \beta_4 CCC_{it} + \beta_5 SIZE_{it} + \mu_{it}$$

Where;

ROA = Return on Assets

APP = Average Payment Period

ACP = Average Collection Period

ICP = Inventory Conversion Period

CCC = Cash Conversion Cycle

SIZE = Firm size

i = the 10 listed manufacturing firms from the 1st to the 10th

t = time period in years, starting from year 1,2,...year 10 [that is, 2005-2014]

μ = error term of the model

β_1 - β_5 = regression model coefficients

To support the regression analysis, correlation analysis was performed to examine the relationship between working capital management components and financial performance of the listed manufacturing firms. The integrity of the model was assessed through analysis of variance. Test of significance was carried out for all variables using t-test at 95% level of significance. The descriptive and quantitative statistics were conducted using Statistical Package for Social Sciences (SPSS) V.20.

The measures of the study variables were as follows;

Table 3.1 Measures of the Study Variables

Variables	Proxy	Measure/Formulae
Financial performance	ROA	Earnings After Tax (EAT) / Total assets
Creditor management	APP	[Creditors / COGS] * Days in a year
Debtors management	ACP	[Debtors / Sales] * Days in a year
Inventory management	ACP	[Inventory / COGS] * Days in a year
Cash management	CCC	ICP + ACP - APP
Firm size	SIZE	Natural logarithm of total assets

Source: Azam and Haider (2011)

4. RESEARCH FINDINGS AND DISCUSSIONS

4.1 Financial performance (ROA) of the manufacturing firms

Table 4.2 Financial performance (ROA) of the manufacturing firms

Year	N	ROA	
		Mean (%)	Std. Dev.
2005	10	11.34	3.788
2006	10	12.35	4.114
2007	10	13.53	5.179
2008	10	12.05	4.745
2009	10	15.07	5.413
2010	10	16.93	5.782
2011	10	18.44	6.760
2012	10	19.42	6.910
2013	10	20.43	6.881
2014	10	21.04	6.120

According to Table 4.2, the lowest value for ROA for the manufacturing firms was a mean of 11.34% in year 2005 while the highest value for ROA was a mean of 21.04% in year 2014. This represented a positive change in the ROA mean values of 9.7% over the 10 year period. The steady rise in ROA mean values over the 10 year period indicates that the financial performance of the manufacturing firms had been on the increase over the 10 year period. This agreed with Waweru (2011) who noted that the manufacturing sector in the country reported good performance in the recent past owing to the roll out of common tariff under the newly integrated EAC customs union which positively impacted on their sales levels. However, this contrasted with Mathuva (2009) who noted that the financial performance of the manufacturing firms in the country suffered due to high operation costs.

The study also carried out skewness test of the ROA data of the manufacturing firms to ascertain whether it was significantly statistically skewed. The results are as shown in Table 4.3.

Table 4.3 Skewness test for ROA values

ROA	Statistics	
	N	Valid
	Missing	0
Skewness		1.638
Std. Error of Skewness		2.592
Statistical significance of the skewness		0.632

The skewness was estimated at 1.638 with an associated standard error of 2.592. The statistical significance of the skewness value was 0.632 which was less than the Z value of 1.96 at 5% significance level. This means that the ROA values were not statistically significantly skewed and also that there was no out layers.

4.2 Working Capital Management

To study the working capital management of the manufacturing firms, the study extracted data on creditor management, debtor management, inventory management and cash management of the firms over the 10 year period between 2005 and 2014. Creditor management was evaluated using the Average Payment Period (APP), debtor management was evaluated using the Average Collection Period (ACP), inventory management through the Inventory Conversion Period (ICP) while cash management was evaluated through the Cash Conversion Cycle (CCC). The findings are as illustrated in Table 4.4.

Table 4.4 Working Capital Management Components

Year	N	APP		ACP		ICP		CCC	
		Mean (days)	% change	Mean (days)	% change	Mean (days)	% change	Mean (days)	% change
2005	10	54.6	-	38.0	-	31.5	-	30.2	-
2006	10	54.6	0.0	36.7	-3.4	29.9	-5.1	29.8	-1.3
2007	10	56.6	3.7	35.4	-3.5	28.9	-3.3	28.5	-4.4
2008	10	60.7	7.2	30.1	-15.0	29.6	2.4	29.5	3.5
2009	10	61.3	1.0	33.1	10.0	29.3	-1.0	28.9	-2.0
2010	10	60.6	-1.1	29.8	-10.0	28.6	-2.4	29.0	0.3
2011	10	62.7	3.5	29.0	-2.7	29.1	1.7	28.5	-1.7
2012	10	65.3	4.1	30.0	3.4	29.7	2.1	29.5	3.5
2013	10	66.7	2.1	29.0	-3.3	27.9	-6.1	27.9	-5.4
2014	10	67.0	0.4	27.2	-6.2	27.3	-2.2	27.2	-2.5
Aggregate % change			20.9		-30.7		-13.9		-10.0

For the average payment period (APP) values of the listed manufacturing firms, the study found that there was a positive aggregate change of 20.9% between 2005 and 2014. This implies that on average the manufacturing firms were granted longer credit periods by their creditors over the 10 year period. The findings depicted that average payment period (or creditors' management) positively related to the financial performance of the listed manufacturing firms in Kenya over the 10 year period. This agreed with Ganesan (2007) who in their study of the effectiveness of working capital management on profitability of selected telecommunication equipment industry found that showed that days of the average creditors positively affected the profitability of the firms.

For the average collection period (ACP) values of the listed manufacturing firms, the study established that there was a negative aggregate change of 30.7% between 2005 and 2014. This showed that on average the manufacturing firms reduced the credit period granted to the trade debtors over the 10 year period. This implies that the manufacturing firms effectively managed their debtors through shorter collection periods for amounts owed. The findings showed that average collection period (or debtors' management) inversely related to the financial performance of the listed manufacturing firms in Kenya over the 10 year period. This is consistent with Lazaridis & Tryfonidis (2006) who argued that firms can improve their profitability by reducing the number of day's accounts receivable outstanding. They argued that the less the time it takes for customers to pay their bills, the more cash is available to replenish inventory hence the higher the sales realized leading to high profitability of the firm.

On the inventory conversion period (ICP) values of the listed manufacturing firms, the study found that there was a negative aggregate change of 13.9% between 2005 and 2014. This depicts that on average the manufacturing firms reduced their inventory holding periods over the 10 year period. This implies that the manufacturing firms effectively managed their inventory through shorter inventory conversion periods. The findings showed that inventory conversion period (or inventory management) negatively related to the financial performance of the listed manufacturing firms in Kenya over the 10 year period. This agreed with Knauer and Wöhrmann (2013) who on their study showed that managers could improve firm profitability by shortening their inventory management period. However, it contrasted with Mathuva (2009) who suggested a positive relationship between inventory turnover in days and profitability by asserting that maintaining sufficiently high inventory levels reduces costs of possible interruptions in the production process and loss of doing business due to scarcity of products which positively influences firm performance.

On the cash conversion cycle (CCC) values of the listed manufacturing firms, the study established that there was a negative aggregate change of 10% between 2005 and 2014. This depicts that on average the manufacturing firms reduced their cash conversion cycle over the 10 year period. This implies that the manufacturing firms effectively managed their operating cash flows through shorter cash conversion cycle. The findings showed that inventory conversion period (or inventory management) negatively related to the financial performance of the listed manufacturing firms in Kenya over the 10 year period. This agreed with Lazaridis and Tryfonidis (2006) whose study results showed a negative relationship between cash management and firm profitability. They concluded that companies can create more profit by handling correctly the cash management and keeping each different component of working capital at an optimum level.

4.3 Correlation Analysis

Results of the Pearson’s correlation coefficient (as illustrated in Table 4.5) depicts that there is a strong positive relationship between creditors management (as denoted by the APP) and listed manufacturing firms’ financial performance ($r=0.912$, $p\text{-value} < 0.05$). Therefore, it can be implied that an increase in the average payment period is associated with increased manufacturing firms’ financial performance. The findings also showed that there is a significant negative relationship between debtors management ($r=-0.821$, $p\text{-value} < 0.05$), inventory management ($r=-0.752$, $p\text{-value} < 0.05$) and cash management ($r=-0.751$, $p\text{-value} < 0.05$) and the listed manufacturing firms’ financial performance, implying that an increase in average collection period, inventory conversion period and cash conversion cycle is associated with decreased manufacturing firms’ financial performance. The findings concurred with Falope and Ajilore (2009) who found a positive relationship between net operating profitability and creditors’ management and a significant negative relationship between net operating profitability and debtors’ management, inventory management and cash management for a sample of 50 listed Nigerian firms. The findings also concurred with Woldu (2011) whose study results indicated that cash management and debtors’ management had negative impact on net operating profitability of a firm.

Table 4.5 Correlation Matrix

	ROA	APP	ACP	ICP	CCC
ROA (r)	1.000				
(p) Sig. (2 tailed)					
APP (r)	0.912	1.000			
(p) (2 tailed)	0.000				
ACP (r)	-0.821	0.216	1.000		
(p) Sig. (2 tailed)	0.004	0.000			
ICP (r)	-0.752	0.122	0.154	1.000	
(p) Sig. (2 tailed)	0.012	0.018	0.012		
CCC (r)	-0.751	0.103	0.074	0.092	1.000
(p) Sig. (2 tailed)	0.012	0.023	0.033	0.000	

Pearson’s product moment correlation analysis was used to assess the relationship between the study variables.

4.4 Regression Analysis

4.4.1 Tests of Normality

Use of inferential parametric statistical procedures requires that the assumptions of such tests of normality are tested. This is to assist the graphical tests to be performed about the normality of the data to check for skewness and kurtosis coefficients. These tests help to confirm whether the data follows a normal distribution or not. If the normality is not achieved, the results may not depict the true picture relationship amongst the variables. In this study, normality was tested using Kolmogorov-Smirnov Test and the Shapiro-Wilk Test. The Shapiro-Wilk Test is more appropriate for small

sample sizes (< 50 samples), but can also handle sample sizes as large as 2000. For this reason, this study used the Shapiro-Wilk test as our numerical means of assessing normality. If the Sig. value of the Shapiro-Wilk Test is greater than 0.05, (P-value test statistic) the data is normal. If it is below 0.05, the data significantly deviate from a normal distribution.

Table 4.6 Shapiro-Wilk Test of Normality

Variables	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
APP	.288	9	.331	.747	9	.401
ACP	.364	9	.331	.656	9	.401
ICP	.309	9	.331	.742	9	.401
CCC	.329	9	.331	.703	9	.401
Return on assets	.284	9	.331	.748	9	.401

a. Lilliefors Significance Correction

Source: Field data (2016)

The findings depict that, the significance values for the Shapiro-Wilk tests were 0.401 for APP, ACP, ICP, CCC and ROA, each. For the Kolmogorov-Smirnov tests, the significance values were 0.331 for APP, ACP, ICP, CCC and ROA, each. This implies that since the p-value is greater than the chosen alpha level of 0.05 then we fail to reject the hypothesis based on that the data came from a normally distributed population. The results of the tests are therefore of normally distributed population.

4.4.2 Heteroskedasticity Test

Heteroskedasticity occurs when the variance of the error terms differ across observations. Heteroskedasticity is useful to examine whether there is difference in residual variance of the observation period to another period of observation (Godfrey, 1996). The study utilized Glejser test (1969) conducted by regression residual value of the independent variable. In the case there is an assumption that if the Sig. value >0.05, then there is no problem of heteroskedasticity. The results for tests of heteroskedasticity are as presented in Table 4.7.

Table 4.7 Test for Heteroskedasticity

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	1.125	.012		3.856	0.000
APP	.198	.045	.186	0.156	0.269
1 ACP	.096	.056	.112	0.258	0.148
ICP	.256	.089	.349	0.481	0.861
CCC	.118	.068	.148	0.165	0.063

a. Dependent Variable: Financial Performance (ROA)

Source: Field Data (2016)

Based on the coefficients of the four study variables (APP, ACP, ICP and CCC) being tested for Heteroskedasticity, the obtained Sig. values are >0.05, thus there is no problem of heteroskedasticity. Hence, there is no difference in residual variance of independent to dependent variables tested.

4.4.3 Regression Analysis Results

To determine the relationship between the study’s independent variables and the dependent variable, the study used the following panel data regression model;

$$ROA_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 ACP_{it} + \beta_3 ICP_{it} + \beta_4 CCC_{it} + \mu_{it}$$

The results of the panel data regression model were as outlined in Table 4.8.

Table 4.8 Regression Analysis Results

Dependent Variable: ROA				
Method: Least Squares				
Sample: 2005-2014				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
APP	0.719	.262	2.744	.000
ACP	-0.679	.294	-2.310	.012
ICP	-0.343	.197	-1.741	.031
CCC	-0.555	.291	-1.907	.023
C	7.463	4.241	1.760	.024
R-squared	0.8601	Mean dependent variable		16.06
Adjusted R-squared	0.7482	S.D. dependent variable		3.668
S.E. of regression	1.8407	Akaike info criterion		4.365
Sum squared resid	16.9414	Schwartz criterion		4.516
Log likelihood	16.8253	Hannan-Quinn criterion		4.199
F-statistic	7.6861	Durbin-Watson statistic		1.225
Prob (F-statistic)	0.0231			

Hence the model became;

Equation 1: $ROA (Y) = 7.463 + 0.719APP + \text{`}0.679ACP + \text{`}0.343ICP + \text{`}0.555CCC + \varepsilon$

According to the equation 1, taking all factors (that is, creditor management, debtor management, inventory management and cash management) constant at zero, financial performance of the manufacturing firms would be 7.463. A unit increase in average payment period would lead to a 0.719 increase in the firms' financial performance; a unit increase in average collection period would lead to a 0.679 decrease in the firms' financial performance; a unit increase in inventory conversion period would lead to a 0.343 decrease in the firms' financial performance while a unit increase in cash conversion cycle would lead to a 0.555 decrease in the firms' financial performance. This means that average payment period had a positive relationship with the firms' financial performance while the average collection period, inventory conversion period and cash conversion period had a negative relationship with the firms' financial performance.

4.4.4 Creditor management and financial performance

Table 4.8 shows that there is a significant positive relationship between creditors management and listed manufacturing firms' financial performance ($\beta=0.719$ and P value < 0.05). This indicates that a unit increase in average payment period would lead to an increase in the financial performance of the listed manufacturing firms by 0.719 units. This agreed with Deloof (2003) who found a significant positive relationship between gross operating income and the number of days of accounts payable of Belgian firms. However, this was in contrast with Vural *et al.* (2012) who found a negative relationship between creditors' management and the firm profitability.

4.4.5 Debtor management and financial performance

Table 4.8 also shows that there is a significant negative relationship between debtors management and listed manufacturing firms' financial performance ($\beta=\text{`}0.679$ and P value < 0.05). This indicates that a unit increase in average collection period would lead to a decrease in the financial performance of the listed manufacturing firms by 0.679 units. This concurred with Sharma and Kumar (2011) who found that if the number of days of account receivables were diminished then profitability increased. They suggested an inverse relation between accounts receivable in days and profitability.

4.4.6 Inventory management and financial performance

Table 4.8 also shows that there is a negative relationship between inventory management and listed manufacturing firms' financial performance ($\beta=\text{`}0.343$ and P value < 0.05). This indicates that a unit increase in inventory conversion period would lead to a decrease in the financial performance of the listed manufacturing firms by 0.343 units. This agreed with Ray (2012) who argued that the stock sitting on shelves for long periods of time ties up money which may reduce the profitability of firms. Sharma and Kumar (2011) also found that if the number of days of inventories were diminished then profitability increased. They suggested an inverse relation between inventory turnover in days and profitability.

4.4.7 Cash management and financial performance

Table 4.8 further shows that there is a significant negative relationship between cash management and listed manufacturing firms' financial performance ($\beta=0.555$ and P value < 0.05). This implied that a unit increase in cash conversion cycle would lead to a decrease in the financial performance of the listed manufacturing firms by 0.555 units. This agreed with Mengesha (2014) who found that there existed significant negative relationship between cash management and profitability measures of sampled firms in Addis Ababa, Ethiopia.

5. CONCLUSION

Given the steady increase in average payment period (APP) mean values over the 10 year period and the corresponding increase in financial performance of the listed manufacturing firms in Kenya over the same period, the study concludes that creditors management as a working capital component positively impacted on the financial performance of the listed manufacturing firms in Kenya over the 10 year period.

Given the steady decrease in average collection period (ACP) mean values over the 10 year period and the corresponding increase in financial performance of the listed manufacturing firms in Kenya over the same period, the study concludes that debtors management as a working capital component negatively impacted on the financial performance of the listed manufacturing firms in Kenya over the 10 year period.

Given the steady decrease in inventory conversion period (ICP) mean values over the 10 year period and the corresponding increase in financial performance of the listed manufacturing firms in Kenya over the same period, the study concludes that inventory management as a working capital component negatively impacted on the financial performance of the listed manufacturing firms in Kenya over the 10 year period.

Given the decrease in cash conversion cycle (CCC) mean values over the 10 year period and the corresponding increase in financial performance of the listed manufacturing firms in Kenya over the same period, the study concludes that cash management as a working capital component negatively impacted on the financial performance of the listed manufacturing firms in Kenya over the 10 year period.

6. RECOMMENDATIONS

The study recommends that the manufacturing firms should enter into strategic supplier partnerships that offer them favourable credit periods for supplies made. The study also recommends that the manufacturing firms should review their existing credit policy with a view of shortening the credit period extended to their customers to agreeable limits without losing them. In addition the manufacturing firms should adopt lean inventory systems that would help them maintain optimal inventory levels. Finally the study recommends that the manufacturing firms should lower their cash conversion cycle as a measure of efficient working capital management. Investment in working capital could be optimized and cash flows could be improved by reducing the timeframe of the physical flow from receipt of raw material to shipment of finished goods as well as to the receipt of cash from customers for credit sales made.

7. REFERENCES

- Ben-Caleb, E. (2009). Working capital management and profitability of listed companies in Nigeria. *Nigeria Research Journal of Accountancy*, 1(1), 44-57.
- Bhattacharya, H. (1987). Towards a Comprehensive Theory of Working Capital—A Techno—Financial Approach. *Economic and Political Weekly*, 22(35).
- Capkun, V., Hameri, A. P., & Weiss, L. A. (2009). On the relationship between inventory and financial performance in manufacturing companies. *International Journal of Operations & Production Management*, 29(8), 789-806.
- Chen, J.J. (2004). Determinants of capital structure of Chinese-listed companies. *Journal of Business research*, 57(12), 1341-1351
- Cooper, S. & Schindler, D. (2011). *Business Research Methods, 11th, edition*. McGraw-Hill Publishing, Co. Ltd. New Delhi-India
- Correa, C., Basso, L., & Nakamura, W. (2007). What determines the capital structure of the largest Brazilian firms? An empirical analysis using panel data. *An Empirical Analysis Using Panel Data (February 22, 2007)*
- Deloof, M. (2003). Does working capital management affect profitability of Belgian firms? *Journal of business finance & accounting*, 30(3-4), 573-588.
- Dong, H., & Su, J. (2010). The relationship between working capital management and profitability: a Vietnam case. *International Research Journal of Finance and Economics*, 49, 59-67

- Falope, O., and Ajilore, O. (2009). Working capital management and corporate profitability: Evidence from panel data analysis of selected quoted companies In Nigeria. *Research Journal of Business Management*, 3(3), 74-84.
- Frank, M., & Goyal, V. (2003). Testing the pecking order theory of capital structure. *Journal of financial economics*, 67(2), 217-248.
- Frank, M., & Goyal, V. (2007). Trade-off and pecking order theories of debt. Available at SSRN 670543
- Ganesan, V. (2007). An analysis of working capital management efficiency in telecommunication equipment industry. *Rivier academic journal*, 3(2), 1-10.
- Garcia-Teruel, P., & Martinez-Solano, P. (2011). Effects of working capital management on SME profitability. *International Journal of managerial finance*, 3(2), 164-177.
- Gill, A., Biger, N., & Mathur, N. (2010). The relationship between working capital management and profitability: Evidence from the United States. *Business and Economics Journal*, 10(1), 1-9.
- Gitman, L.J. (1974). Estimating corporate liquidity requirement: A simplified approach. *Finance Revision Journal*, 9(1), 26-35
- Harris, A. (2005). Working capital management: difficult, but rewarding. *Financial Executive*, 21(4), 52-54.
- Jayarathne, T. A. N. R. (2014, February). Impact of working capital management on profitability: Evidence from listed companies in Sri Lanka. In *Proceedings of the 3rd International Conference on Management and Economics* (Vol. 26, p. 27).
- Knauer, T., & Wöhrmann, A. (2013). Working capital management and firm profitability. *Journal of Management Control*, 24(1), 77-87.
- Lazaridis, I., & 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).
- Lu, R. (2013). Impact of working capital management on profitability: the case of Canadian firms. Unpublished Master Thesis, Saint Mary's University: Canada.
- Mathuva, D. (2009). The influence of working capital management components on corporate profitability: a survey on Kenyan listed firms. *Research Journal of Business Management*, 3(1), 1-11.
- Mekonnen, M. (2011). The Impact of Working Capital Management on firms Profitability. *School of Public and*
- Mengesha, W. (2014). *Impact of Working Capital Management on Firms' Performance: The Case of Selected Metal Manufacturing Companies in Addis Ababa, Ethiopia* (Doctoral dissertation, Jimma University).
- Michalski, G. (2009). Inventory management optimization as part of operational risk management. *Economic Computation and Economic Cybernetics Studies and Research*, 213-222.
- Myers, S.C., & Majluf, N.S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13(2), 187-221.
- Naimulbari, K. (2012). A research paper on “the impact of working capital management on profitability” of pharmaceuticals sector in Bangladesh.
- Napompech, K. (2012). Effects of Working Capital Management on the Profitability of Thai Listed Firms. *International Journal of Trade, Economics and Finance*, 3(3), 227.
- Padachi, K. (2006). Trends in working capital management and its impact on firms' performance: an analysis of Mauritian small manufacturing firms. *International Review of business research papers*, 2(2), 45-58.
- Raheman, A., & Nasr, M. (2007). Working capital management and profitability—case of Pakistani firms. *International review of business research papers*, 3(1), 279-300.
- Ray, S. (2012). Evaluating the impact of working capital management components on corporate profitability: evidence from Indian manufacturing firms. *International Journal of Economic Practices and Theories*, 2(3), 127-136.
- Sharma, A.K., & Kumar, S. (2011). Effect of working capital management on firm profitability empirical evidence from India. *Global Business Review*, 12(1), 159-173.

- Tirngo, D. (2013). Impact of working capital management on profitability of micro and small enterprises in Ethiopia: The case of Bahir Dar City Administration. *International journal of accounting & taxation*, 1(1).
- Vural, G., Sökmen, A., & Çetenak, E. (2012). Effects of Working Capital Management on Firm's Performance: Evidence from Turkey. *International Journal of Economics and Financial Issues*, 2(4), 488.
- Waweru, C.G. (2011). *The relationship between working capital Management and Value of Companies quoted at the NSE*. Unpublished MBA Research project, University of Nairobi
- Weston, J.F., & Eugene F.B. (1979). *Essentials of Managerial Finance* (5th Ed.). Hinsdale: The Dryden Press
- Woldu, E. (2011). Impact of working capital management on profitability of small and medium scale enterprises in Addis Ababa. (*The Case of Nifas-Silk-Lafto and Kirkos Sub Cities*) (Doctoral dissertation, aau)
- Zariyawati, M., Annuar, M., Taufiq, H., & Rahim, A. (2009). Working capital management and corporate performance: Case of Malaysia. *Journal of Modern Accounting and Auditing*, 5(11), 47