Working Capital Management and Firm Profitability: Empirical Evidence from Manufacturing and Construction Firms Listed on Nairobi Securities Exchange, Kenya

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Abstract

Working capital management plays a significant role in improved profitability of firms. Firms can achieve optimal management of working capital by making the trade-off between profitability and liquidity. This paper analyzes the effect of working capital management on firm's profitability in Kenya for the period 2003 to 2012. For this purpose, balanced panel data of five manufacturing and construction firms each which are listed on the Nairobi Securities Exchange (NSE) is used. Pearson's correlation and Ordinary Least Squares regression models were used to establish the relationship between working capital management and firm's profitability. The study finds a negative relationship between profitability and number of day's accounts receivable and cash conversion cycle, but a positive relationship between profitability and number of days of inventory and number of day's payable. Moreover, the financial leverage, sales growth, current ratio and firm size also have significant effects on the firm's profitability. Based on the key findings from this study it has been concluded that the management of a firm can create value for their shareholders by reducing the number of day's accounts receivable. The management can also create value for their shareholders by increasing their inventories to a reasonable level. Firms can also take long to pay their creditors in as far as they do not strain their relationships with these creditors. Firms are capable of gaining sustainable competitive advantage by means of effective and efficient utilization of the resources of the organization through a careful reduction of the cash conversion cycle to its minimum. In so doing, the profitability of the firms is expected to increase.

1. Introduction

The concept of working capital management addresses companies' managing of their short-term capital and the goal of the management of working capital is to promote a satisfying liquidity, profitability and shareholders' value. Working capital management is the ability to control effectively and efficiently the current assets and current liabilities in a manner that provides the firm with maximum return on its assets and minimizes payments for its liabilities.

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The short-term capital refers to the capital that companies use in their daily operations and it consists of companies' current assets and current liabilities. A well managed working capital promotes a company's well being on the market in terms of liquidity and it also acts in favor for the growth of shareholders value (Jeng-Ren, Li & Han-Wen, 2006).

Working capital management efficiency is vital especially for manufacturing and construction firms, where a major part of assets is composed of current assets (Horne & Wachowitz, 2000). It directly affects the profitability and liquidity of firms (Raheman & Nasr, 2007). The profitability liquidity tradeoff is important because if working capital management is not given due considerations then the firms are likely to fail and face bankruptcy (Kargar & Bluementhal, 1994). The significance of working capital management efficiency is irrefutable (Filbeck & Krueger, 2005). Working capital is known as life giving force for any economic unit and its management is considered among the most important function of corporate management. Every organization whether, profit oriented or not, irrespective of size and nature of business, requires necessary amount of working capital. Working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of business (Mukhopadhyay, 2004). Working capital management is one of the most important areas while making the liquidity and profitability comparisons among firms (Eljelly, 2004), involving the decision of the amount and composition of current assets and the financing of these assets. The greater the relative proportion of liquid assets, the lesser the risk of running out of cash, all other things being equal. All individual components of working capital including cash, marketable securities, account receivables and inventory management play a vital role in the performance of any firm.

Efficient management of working capital plays an important role of overall corporate strategy in order to create shareholder value. Working capital is regarded as the result of the time lag between the expenditure for the purchase of raw material and the collection for the sale of the finished goods. The way of managing working capital can have a significant impact on both the liquidity and profitability of the company (Shin & Soenen, 1998). The main purpose of any firm is to maximize profit. But, maintaining liquidity of the firm also is an important objective. The problem is that increasing profits at the cost of liquidity can bring serious problems to the firm. Thus, strategy of firm must maintain a balance between these two objectives of the firms. Dilemma in working capital management is to achieve desired tradeoff between liquidity and profitability (Smith, 1980; Raheman & Nasr, 2007). Referring to theory of risk and return, investment with more risk will result to more return. Thus, firms with high liquidity of working capital may have low risk and low profitability. Conversely, a firm that has low liquidity of working capital faces high risk which results to high profitability.

In Kenya, the industrial sector is the fourth biggest sector after agriculture, transport and communication and wholesale and retail trade. The sector had 17 firms listed at Nairobi Securities Exchange (NSE) in 2010 but was split into four sectors in 2011 namely, the automobile and accessories, construction, energy and petroleum, and manufacturing sectors. It contributed about 10.1 per cent of Kenya's GDP serving both the local market and exports to the East African region. The sector, which is dominated by subsidiaries of multi-national corporations, contributed approximately 18% of the Gross Domestic Product (GDP) in 2009 (NSE Handbook, 2010, 2011). As an important sector in the overall economic growth, manufacturing sector requires in depth analysis at industry as well as firm level. As at the end of 2012, there were eighteen (18) manufacturing and construction firms listed in the NSE Exchange with the price movement of 5 of them being used to determine the daily average NSE index.

Considering the importance of working capital management the researchers focused on analyzing relationship between working capital management and profitability relationship such as Gul, Khan, Rehman, Khan, Khan and Khan (2013); Oladipupo and Okafor (2013); Almazari, (2013); Akoto, Awunyo-Vitor and Angmor (2013); Maradi, Salehi and Arianpoor (2012); Nyabwanga, Ojera, Lumumba, Odondo and Otieno (2012); Sharma and Kumar (2011); Raheman, Afza, Qayyum and Bodla (2010); and Gill, Biger and Mathur (2010) among others.

However, there are a few studies with reference to Kenya on working capital management and firm profitability, especially in the manufacturing and construction sectors. For example, Mathuva (2010) focused on the influence of working capital management on corporate profitability of firms listed at the Nairobi Securities Exchange. Gakure, Cheluget, Onyango and Keraro (2012) on the other hand, analyzed the relationship between working capital management and performance of 15 manufacturing firms listed at the Nairobi Securities Exchange for a period of five years from 2006 to 2010. Omesa, Maniagi, Musiega and Makori (2013) examined the relationships between Working Capital Management and Corporate Performance of 20 manufacturing firms listed on the Nairobi securities exchange for 5 years from 2007-2011 was selected. Finally, Nyabwanga, Ojera, Lumumba, Odondo, & Otieno (2012) assessed the effect of working capital management practices on the financial performance of SSEs in Kisii South District. However, these studies provide no evidence on the relationship between working capital management and profitability of manufacturing and construction firms in Kenya. In this context, the objective of the current study is to provide empirical evidences about the effect of working capital management on profitability for a sample of 10 manufacturing and construction companies during the period 2003–2013.

The paper is structured as follows: the second section deals with brief review of important theoretical and empirical literature on the relationship between working capital management and firm profitability; the third section provides the conceptual framework while the fourth section indicates the objectives of the study and the research hypotheses. The fifth and sixth sections present methodology employed; and the data analysis and findings of the study respectively. Finally, the main conclusions and recommendations are discussed in seventh and eighth sections respectively.

2. *Review of Literature*

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 conclude a negative relationship between WCM and firm profitability. The studies reviewed have used various variables to analyze the relationship, with different methodology such as linear regression and panel data regression. This section presents the chronology of major studies related to this study in order to assess and identify the research gap.

Gul, Khan, Rehman, Khan, Khan and Khan (2013) investigated the influence of working capital management (WCM) on performance of small medium enterprises (SMEs) in Pakistan. The duration of the study was seven years from 2006 to 2012. The data used in this study was taken from SMEDA, Karachi Stock Exchange, tax offices, company itself and Bloom burgee business week. The dependent variable of the study was Return on Assets (ROA) which was used as a proxy for profitability. Independent variables were Number of Days Account Receivable (ACP), Number of Day's Inventory (INV), Cash Conversion Cycle (CCC) and Number of Days Account Payable (APP). In addition to these variables some other variables were used which included Firm Size (SIZE), Debit Ratio (DR) and Growth (GROWTH). Regression analysis was used to determine the relationship between WCM and performance of SMEs in Pakistan. Results suggested that APP, GROWTH and SIZE have positive association with Profitability whereas ACP, INV, CCC and DR have inverse relation with profitability.

Oladipupo and Okafor (2013) examined the implications of a firm's working capital management practice on its profitability and dividend payout ratio. The study focused on the extent of the effects of working capital management on the Profitability and Dividend Payout Ratio. Financial data were obtained from 12 manufacturing companies quoted on the Nigeria Stock Exchange over 5 years period (2002 to 2006). Using both the Pearson product moment correlation technique and ordinary least square (OLS) regression technique, they observed that shorter net trade cycle and debt ratio promote high corporate profitability. While the level of leverage has negative significant impact on corporate profitability, the impacts of working capital management on corporate profitability appeared to be statistically insignificant at 5% confidence level.

On the other hand, they observed that dividend payout ratio was influenced positively by profitability and net trade cycle but negatively by growth rate in earnings.

Almazari (2013) investigated the relationship between the working capital management (WCM) and the firms' profitability for the Saudi cement manufacturing companies. The sample included 8 Saudi cement manufacturing companies listed in the Saudi Stock Exchange for the period of 5 years from 2008-2012. Pearson Bivariate correlation and regression analysis were used. The study results showed that Saudi cement industry's current ratio was the most important liquidity measure which effected profitability, therefore, the cement firms must set a trade-off between these two objectives so that, neither the liquidity nor profitability suffers. It was also found, as the size of a firm increases, profitability increased. Besides, when the debt financing increased, profitability declined. Linear regression tests confirmed a high degree of association between the working capital management and profitability.

Akoto, Awunyo-Vitor and Angmor (2013) analyzed the relationship between working capital management practices and profitability of listed manufacturing firms in Ghana. The study used data collected from annual reports of all the 13 listed manufacturing firms in Ghana covering the period from 2005-2009. Using panel data methodology and regression analysis, the study found a significant negative relationship between Profitability and Accounts Receivable Days. However, the firms' Cash Conversion Cycle, Current Asset Ratio, Size, and Current Asset Turnover significantly positively influence profitability. The study suggests that managers can create value for their shareholders by creating incentives to reduce their accounts receivable to 30 days. It is further recommended that, enactments of local laws that protect indigenous firms and restrict the activities of importers are eminent to promote increase demand for locally manufactured goods both in the short and long runs in Ghana.

Omesa, Maniagi, Musiega and Makori (2013) examined the relationships between Working Capital Management and Corporate Performance of manufacturing firms listed on the Nairobi securities exchange. A sample of 20 companies whose data for 5 years from 2007-2011 was selected. For analysis Principal components analysis (PCA) is used due to its simplicity and its capacity of extracting relevant information from confusing data sets. From the results using PAC and multiple regression, working capital proxies Cash Conversion Cycle (CCC), Average Collection Period (ACP) and control variables Current Liabilities (CLTA), Net Working Capital Turnover Ratio (NSCA) and Fixed Financial Ratio (FATA) were significant at 95% confidence (p values are < 0.05) to performance as measured by Return on Equity (ROE). Further, ACP was found to be negatively related to ROE while CCC, CLATA, NSCA and FATA.

Maradi, Salehi and Arianpoor (2012) compared working capital management of two groups of listed companies in Tehran Stock Exchange (TSE), which comprised of chemical industry and medicine industry. In chemical industry, 34 companies and medicine industry, 30 companies were selected and information related to these companies was gathered over 10 years (2001-2010) and analyzed using OLS multiple regression. The results show that, in medicine industry compared to chemical industry, debt ratio makes more impact on reduction of net liquidity. But examination of impact of LEV over WCR indicate that, in chemical industry, debt ratio makes more impact on reduction of working capital requirements, compared to medicine industry.

Nyabwanga, Ojera, Lumumba, Odondo and Otieno (2012) assessed the effect of working capital management practices on the financial performance of SSEs in Kisii South District. A sample of 113 SSEs comprising 72 trading and 41 manufacturing enterprises was used. Pearson's correlation coefficients and multiple regression analysis techniques were used to analyze data. Consequently, the findings of the study were that, working capital management practices were low amongst SSEs as majority had not adopted formal working capital management routines and their financial performance was on a low average.

The study also revealed that SSE financial performance was positively related to efficiency of cash management (ECM), efficiency of receivables management (ERM) and efficiency of inventory management (EIM).

Gakure, Cheluget, Onyango and Keraro (2012) analyzed the relationship between working capital management and performance of 15 manufacturing firms listed at the Nairobi NSE from 2006 to 2010 and for a total 75 firms year observations. They used secondary data from a sample of 18 companies at the NSE. A regression model was used to establish the relationship between the dependent variable and the independent variables. Pearson's correlation and regression analysis were used for the analysis. The results indicated that there is a strong negative relationship between firm's performance and liquidity of the firm. The study found that there is a negative coefficient relationship between accounts collection period, average payment period, inventory holding period and profitability while the cash conversion cycle was found to be positively correlated with profitability. However, the effects of the independent variables except the average payment period were no statistically significant though the overall model was statistically significant.

Sharma and Kumar (2011) examined the effect of working capital on profitability of Indian firms. They collected data about a sample of 263 non-financial BSE 500 firms listed at the Bombay Stock (BSE) from 2000 to 2008 and evaluated the data using OLS multiple regression. The results revealed that working capital management and profitability is positively correlated in Indian companies. The study further reveals that inventory of number of days and numbers of day's accounts payable are negatively correlated with a firm's profitability, whereas number of days accounts receivables and cash conversion period exhibit a positive relationship with corporate profitability.

Raheman, Afza, Qayyum and Bodla (2010) analyzed the impact of working capital management on firm's performance in Pakistan for the period 1998 to 2007. For this purpose, balanced panel data of 204 manufacturing firms was used which are listed on Karachi Stock Exchange. The results indicate that the cash conversion cycle, net trade cycle and inventory turnover in days are significantly affecting the performance of the firms. They concluded that manufacturing firms were in general facing problems with their collection and payment policies. Moreover, financial leverage, sales growth and firm size also had significant effect on the firm's profitability. They study recommended that effective policies must be formulated for the individual components of working capital.

Mathuva (2010) in his study on the influence of working capital management on corporate profitability found that there exists a highly significant negative relationship between the time it takes for firms to collect cash from their customers and profitability. He explained that the more profitable firms take the shortest time to collect cash from the customers. The study further revealed that there exist a highly significant positive relationship between the inventory conversion period and profitability. It was explained that firms, which maintain sufficiently high inventory levels reduce costs of possible interruptions in the production process and loss of business due to scarcity and products. Finally, the study established that there exists a highly significant positive significant positive relationship between the average payment period and profitability. He held that the longer a firm takes to pay its creditors, the more profitable it is. In this study, a sample of 30 firms listed on Nairobi Stock Exchange for the periods 1993 to 2008 was used. Both the ported OLS and the fixed effects regression models were used.

Gill, Biger and Mathur (2010) analyzed the relationship between working capital management and profitability of 88 American firms listed on New York Stock Exchange for a period of 3 years from 2005 to 2007 was selected. The data was analyzed using Pearson Bivariate Correlation Analysis and Weighted Least Squares (WLS) Regression techniques. They found statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit. It followed that managers can create profits for their companies by handling correctly the cash conversion cycle and by keeping accounts receivables at an optimal level.

Although studies on working capital management have been carried out by various scholars such as Gul, Khan, Rehman, Khan, Khan and Khan (2013); Oladipupo and Okafor (2013); Ahmad (2013); Akoto, Awunyo-Vitor and Angmor (2013); Omesa, Maniagi, Musiega and Makori (2013); Maradi, Salehi and Arianpoor (2012); Gakure, Cheluget, Onyango and Keraro (2012); Sharma and Kumar (2011); Mathuva (2010); and Gill, Biger and Mathur (2010, it is instructive to note that there is still ambiguity regarding the appropriate variables that might serve as proxies for working capital management. 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 manufacturing and construction sectors of Kenya. Therefore, the present study is an attempt to fill this gap and estimates the relationship between working capital management variables (Average Collection Period, Inventory Conversion Period, Average Payment Period and Cash Conversion Cycle) and firm profitability of manufacturing and construction firms in Kenya.

3. Conceptual Framework

Figure 1 below presents schematic conceptual framework of the relationship between working capital management measures and profitability of firms.
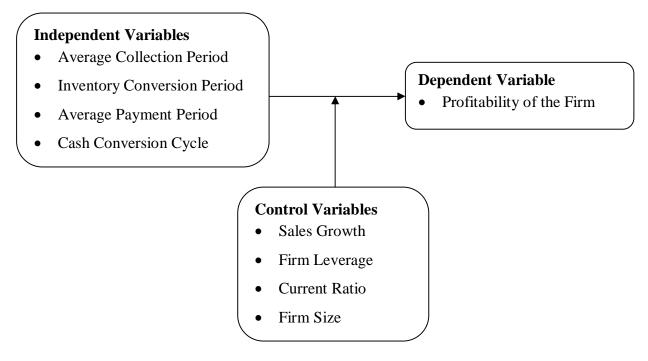
Independent Variables
- Average Collection Period
- Inventory Conversion Period
- Average Payment Period
- Cash Conversion Cycle

Dependent Variable
- Profitability of the Firm

Control Variables
- Sales Growth
- Firm Leverage
- Current Ratio
- Firm Size

Figure 1: Schematic Conceptual Framework
Source: Author (2013)

4. Objectives of the Study and Research Hypotheses

4.1 General Objective

The main objective of the paper is to examine the relationship between working capital management and profitability of manufacturing and construction firms listed on the Nairobi Securities Exchange (NSE).

4.2 Specific Objectives

To achieve the general objective, the following specific objectives were used:

i.   To determine whether there is a significant relationship between Average Collection Period (ACP) and Profitability of the firm.
ii. To establish whether there is a significant relationship between Inventory Conversion Period (ICP) and Profitability of the firm.
iii. To ascertain if there is a significant relationship between Average Payment Period (APP) and Profitability of the firm.
iv. To examine if there is a significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.

4.3 Research Hypotheses

i. Ho_1: There is no significant relationship between Average Collection Period (ACP) and Profitability of the firm.
ii. Ho_2: There is no significant relationship between Inventory Conversion Period (ICP) and Profitability of the firm.
iii. Ho_3: There is no significant relationship between Average Payment Period (APP) and Profitability of the firm.
iv. Ho_4: There is no significant relationship between Cash Conversion Cycle (CCC) and Profitability of the firm.

5. *Research Methodology*

5.1   Model Specification

Consistent with previous studies (Nazir & Afza, 2009); Zariyawati, *et al.*, 2008; Samiloglu & Demirgunes, 2008; and Garcia-Teruel & Martinez-Solano, 2007) the firm's profitability is modeled as a function of the four core working capital management measures in addition to other firm characteristics. The effects of working capital management on the firm's profitability are modeled using the following OLS regression equations to obtain the estimates:

$$ROA = f(ACP, ICP, APP, CCC, GROWTH, LEV, CR, SIZE)$$

Model 1: $ROA_{it} = \beta_0 + \beta_1 GROWTH_{it} + \beta_2 DR_{it} + \beta_3 CR_{it} + \beta_4 SIZE_{it} + \beta_5 ACP_{it} + \varepsilon_{it}$

Model 2: $ROA_{it} = \beta_0 + \beta_1 GROWTH_{it} + \beta_2 DR_{it} + \beta_3 CR_{it} + \beta_4 SIZE_{it} + \beta_5 ICP_{it} + \varepsilon_{it}$

Model 3: $ROA_{it} = \beta_0 + \beta_1 GROWTH_{it} + \beta_2 DR_{it} + \beta_3 CR_{it} + \beta_4 SIZE_{it} + \beta_5 APP_{it} + \varepsilon_{it}$

Model 4: $ROA_{it} = \beta_0 + \beta_1 GROWTH_{it} + \beta_2 DR_{it} + \beta_3 CR_{it} + \beta_4 SIZE_{it} + \beta_5 CCC_{it} + \varepsilon_{it}$

Model 5: $ROA_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_1 ICP_{it} + \beta_1 APP_{it} + \beta_2 GROWTH_{it} + \beta_3 DR_{it} + \beta_4 CR_{it} + \beta_5 SIZE_{it} + \varepsilon_{it}$

Where, ROA denotes the return on assets, GROWTH is the sales growth, DR is the debt ratio, SIZE is the company size as measured by natural logarithm of total assets, CR is the current ratio, ACP is the average collection period, ICP is the inventory conversion period, APP is the average payment period and CCC is the cash conversion cycle. Subscripts *i* denote firms (cross-section dimensions) ranging from 1 to 10, *t* denotes years (time-series dimensions) ranging from 1 to 10, ε is the error term of the model and $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$=Regression model coefficients. In the first regression model, the ACP has been regressed against the ROA. In the second regression model, the ICP has been regressed against the ROA. The third regression model involves a regression of the APP against the ROA. In the fourth regression model, the CCC is regressed against the ROA. Finally, the three working capital measures (ACP, ICP and AP) have been regressed together against the ROA. The CCC was not included in the last regression model because its inclusion results to a high degree of multicollinearity among the working capital management variables as shown by the variance inflation factors (VIFs) (Montgomery *et al.*, 2007).

5.2 Data and Variables

Data for this study was collected from the listed firms on the NSE for the period 2003-2012. Consistent with Barako *et al*. (2006), data were obtained from the NSE handbooks and the Kenya Capital Markets Authority. The required financial data of these firms was obtained from the companies' annual reports. Consequently, the sample data begins in 2003 and ends in 2012 in order to ensure accuracy of the collected data and a number of filters were applied. Observations of items from the balance sheet and profit and loss accounts showing signs contrary to reasonable expectations were removed. Thus a balanced panel dataset of 100 firm year observation was obtained, with observation of 10 firms between 2003 and 2013.

In order to analyze the effects of working capital components on the profitability of manufacturing and construction companies in Kenya, profitability is measured by Return on Assets (ROA), which is defined as the ratio of earnings before interest and tax to total assets. ROA is used as a dependent variable. ROA has been used by Samiloglu and Demirgunes (2008), Garcia-Teruel and Martinez-Solano (2007) and Nazir and Afza (2009). The return on assets determines the management efficiency to use assets generates earnings. It is a better measure since it relates the profitability of the company to the asset base (Padachi, 2006).

The average collection period (ACP); the inventory conversion period (ICP); the average payment period (APP); and the Cash Conversion Cycle are used as the independent variables and are considered for measuring working capital management. ACP is the time taken to collect cash from customers; ICP refers to the time taken to convert inventory held in the firm into sales; APP is the time taken to pay the firm's suppliers while CCC is used as a comprehensive measure of working capital as it shows the time-lag between payment for the purchase of raw material and the collection of sales of finished goods. Apart from these variables, the size of the firm, the growth in its sales, firm leverage and current ratio are introduced as control variables. The reason for choosing these variables is that most of researchers (Deloof, 2003; Garcia-Teruel & Martinez-Solano, 2007; Jose *et al*., 1996; Nazir & Afza, 2009; Raheman & Nasr, 2007; Huang *et al.* (2009); and Shin & Soenen, 1998) have used these to calculate the relationship between WCM and profitability in various markets. Table 1 below presents the variables, abbreviations and their measurements as used in the analysis.

Table 1: Abbreviation and Measurement of Variables

Variable	Abbreviation	Measurement
Return on Assets	ROA	Earnings Before Tax And Interest/Total Assets
Average Collection Period	ACP	Accounts Receivable/Net Sales*365
Inventory Conversion Period	ICP	Inventory/Cost of Sales*365
Average Payment Period	APP	Accounts Payable/Cost of Sales*365
Cash Convention Cycle	CCC	ACP + ICP – APP
Sales Growth	GROWTH	$(Sales_t – Sales_{t-1})/Sales_{t-1}$
Debt Ratio	DR	Total Liabilities/Total Assets
Current Ratio	CR	Current assets/Current Liabilities
Firm Size	SIZE	Ln(Total Assets)

Source: Author (2013)

6. Empirical Analysis

In this section, the empirical results are presented from quantitative data analysis using and E-Views and SPSS. Descriptive analysis is presented first followed by the Pearson's correlation and regression analysis.

6.1 Descriptive Statistics

Descriptive analysis shows the mean, and standard deviation of the different variables of interest in this study. It also presents the minimum and maximum values of the variables which help in getting a picture about the maximum and minimum values a variable has achieved.

Table 2: Descriptive Statistics of Variables for Manufacturing Firms

Variable	Mean	Median	SD	Minimum	Maximum
ROA	0.157	0.135	0.104	-0.052	0.379
ACP	56.535	52.812	32.476	8.747	174.390
ICP	93.851	85.949	47.652	27.135	249.527
APP	96.503	86.099	49.846	18.969	264.555
CCC	53.883	48.612	54.538	-89.363	201.210
GROWTH	0.161	0.149	0.185	-0.313	0.926
LEV	0.439	0.426	0.165	0.144	0.881
CR	2.513	1.719	2.628	0.803	14.681
SIZE	15.668	15.826	1.180	12.782	17.815

Source: 2003-2012 Survey Data, E-Views & SPSS Output

Table 2 presents the summary statistics of the variables used in the present study for 100 firm year observations were used. The mean value of return on assets is 15.7% with a standard deviation of 10.8%. The mean accounts collection period is 56.535 days with a standard deviation of 32.476 days. On average, firms take 93.851 days (approximately three months) to convert their inventories into sales with a standard deviation of 47.652 days. The table also shows that on average the firms take 96.503 days to pay its creditors with a standard deviation of 49.846 days. The mean cash conversion cycle is 53.883 days. The table further shows that an average firm has a size of 15.668 as measured by the natural logarithm of its total assets. The mean leverage ratio is 43.9% lagged by total assets. The typical firm in the sample has a current assets ratio of 2.513. Together with this, the firms have seen their sales growth by almost 16.1% annually on an average.

6.2 Pearson Correlations Analysis

Consistent with Sharma and Kumar (2011), Table 3 shows both the Pearson correlations among the observed variables.

Table 3: Pearson Bivariate Correlation Coefficients

	ROA	ACP	ICP	APP	CCC	Growth	LEV	CR	Size
ROA	1								
ACP	-0.161	1							
ICP	0.265**	-0.026	1						
APP	0.552**	0.026	0.562**	1					
CCC	-0.370**	0.549**	0.344**	-0.407**	1				
GROWTH	0.133	0.127	0.052	-0.127	0.237*	1			
LEV	-0.419**	0.068	0.151	-0.036	0.205*	0.119	1		
CR	0.181	0.187	-0.249*	-0.078	-0.034	0.013	-0.572**	1	
SIZE	0.243*	-0.418**	-0.000	0.354**	-0.574**	-0.249*	0.134	-0.409**	1

**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed).
Source: 2003-2012 Survey Data, E-Views & SPSS Output

Table 3 shows that the ROA is negatively related to ACP, CCC and LEV. The negative relation between ROA and ACP is consistent with the view that the less the time taken by customers to pay their bills, the more cash is available to replenish the inventory hence leading to more sales which result to an increase in profitability. The negative relationship between ROA and CCC is consistent with the view that the time lag between the expenditure for the purchases of raw materials and the collection of sales of finished goods can be too long and that decreasing this time lag increases profitability (Deloof, 2003). The Table also shows that the ROA is positively related to ICP, APP, GROWTH, CR and SIZE. The positive relationship between ROA and ICP can be explained by the fact that firms which maintain high inventory levels reduce the cost of possible interruptions in the production process. This helps in preventing loss of business due to the scarcity of products and reducing the cost of supplying the goods. In so doing, firms are protected against price fluctuations (Blinder & Maccrni, 1991).

The positive relation between ROA and APP can be explained by the fact that lagging payments to suppliers ensures that the firm has some cash to purchase more inventory for sale thus increasing its sales levels hence boosting its profits. Further, Firm size is positively related to ROA which means that larger firms report higher profits compared to smaller firms. This may be due to larger firm's ability to exploit the economies of scale. The correlation coefficients of Inventory Conversion Period, Average Payment Period, Cash Conversion Cycle, Firm Leverage and Company Size are significant while the correlation coefficients of Average Collection Period, the Sales Growth and Current Ratio are not significant.

6.3 Regression

In order to test the hypotheses, pooled OLS regression analysis has been conducted to determine the whether there is significant relationship between working capital management and profitability. Results in Table 4 and 5 provide results for the models tested in the present study. In order to check the presence of autocorrelation and multicollinearity in the data, Durbin Watson (D-W) and Variance Inflation Factor (VIF) statistics was analyzed respectively.

Table 4: Variance Inflation Factor

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5
ACP	1.254				1.387
ICP		1.081			1.978
APP			1.155		2.218
CCC				1.781	
GROWTH	1.094	1.095	1.095	1.099	1.100
LEV	1.588	1.537	1.541	1.586	1.612
CR	1.811	1.883	1.786	1.865	1.992
SIZE	1.491	1.320	1.465	2.105	2.154

Source: 2003-2012 Survey Data, SPSS Output

It is evident that the statistics are within the limit, leading to the conclusion that there is no presence of autocorrelation and multicollinearity in the data. The highest value of VIF statistics obtained is 2.218 whereas a commonly given rule of thumb is that VIF's of 10 or higher may be a reason for concern (Gujarati & Sangeetha, 2008). D-W statistics value was found to be 1.137 in model 2, which was highest in all five models. Durbin-Watson statistic ranges in value from 0 to 4 with an ideal value of 2 indicating that errors are not correlated, although values from 1.75 to 2.25 may be considered acceptable. Further some authors (Makridakis & Wheelwright, 1978) consider D-W value between 1.5 and 2.5 as acceptable level indicating no presence of collinearity.

Table 5: OLS Regression Results

Parameter	Model 1	Model 2	Model 3	Model 4	Model 5
Dependent Variable: Return on Assets (ROA)					
Constant	-0.306 (0.053)*	-0.459 (0.001)***	-0.166 (0.170)	-0.128 (0.476)	-0.115 (0.440)
ACP	-3.98E-005 (0.894)				-0.0003 (0..130)
ICP		0.001 (0.000)***			0.0001 (0.546)
APP			0.001 (0.000)***		0.001 (0.000)***
CCC				-0.000 (0.091)*	
GROWTH	0.163 (0.001)***	0.157 (0.001)***	0.170 (0.001)***	0.168 (0.001)***	0.170 (0.000)***
LEV	-0.289 (0.00)***	-0.288 (0.000)***	-0.271 (0.000)***	-0.271 (0.000)***	-0.256 (0.000)***
CR	0.003 (0.468)	0.008 (0.067)*	0.002 (0.511)	0.002 (0.722)	0.004 (0.319)
SIZE	0.036***	0.040 (0.000)***	0.020 (0.000)***	0.025 (0.019)**	0.017 (0.060)*
Adjusted R^2	0.312	0.444	0.540	0.333	0.547
F-Value	9.989 (0.000)***	16.780 (0.000)***	24.273 (0.000)***	10.874 (0.000)***	18.045***
D-W Statistic	0.847	1.137	1.217	0.836	1.282
Firm Years	100	100	100	100	100

*, **and ***Denotes significance level at 10%, 5% & 1% levels, respectively
Source: 2003-2012 Survey Data, E-Views & SPSS Output

Model 1 tests the hypothesis that there is no significant relationship between Average Collection Period and profitability. The regression results indicates that the coefficient of ACP is negative with -3.98E-005, but it is not significantly different from zero (p-value =0.894). Thus, Ho_1 hypothesis is not rejected and is concluded that ACP is not statistically significant at 1% significance level (p>0.01). This suggests that, though short ACP is good for explaining the financial success of listed manufacturing and construction firms in Kenya, it is not a critical factor to consider when taking decision to improve profitability. The result is consistent with Raheman, Afza, Qayyum, & Bodla (2010); and Sharma and Kumar (2011) but significantly differs from those conducted by Gakure, Cheluget, Onyango and Keraro (2012); Mathuva (2010); and Filbeck, *et al*. (2005) which found a significant relationship between average collection period and profitability. However, the overall model is statistically significant, as it is indicated by the F-value of 9.989 (p<0.01). The model's adjusted R^2 implies that 31.2% of the variation in the profitability of the firms can be explained by the model. The coefficients of the other variables included in the model are also highly significant. Return on Assets increases with Firm Size (measured by the natural logarithm of Total Assets) and Sales Growth, and decreases with financial debt. The Current Ratio which is a theoretical measure of liquidity has no significant impact on profitability in case of manufacturing and construction firms in Kenya.

Model 2 tests the hypothesis that there is a significant relationship between Inventory Conversion Period and profitability ROA. In this model, there are variables are the similar to those in Model 1 except ACP which has been replaced with ICP. The regression result shows a significant positive relation between ROA and ICP (p-value = 0.000). Thus, Ho_2 hypothesis is rejected and is concluded that ICP is statistically significant (p<0.01). This means that there exists a positive relationship between the ICP and profitability. This finding is consistent with studies carried out on conservative working capital policies (Mathuva, 2010).

This means that maintaining high inventory levels reduces the cost of possible interruptions in the production process and the loss of business due to scarcity of products. Maintaining high levels of inventories also helps in reducing the cost of supplying the products and protects the firm against price fluctuations as a result of adverse macroeconomic factors as observed by Blinder and Maccirri (1991). However, the results of this study are inconsistent with the results of the studies conducted by Padachi (2006), Garcia-Teruel and Martinez-Solano (2007), Deloof (2003), Raheman and Nasr (2007) and Raheman, Afza, Qayyum, & Bodla (2010) in their respective analysis of the relationship between profitability and number of days of inventory. The other variables in model 2 are also significant. The model's adjusted R^2 is 44.4% with an F-value of 16.780 which is highly significant ($p<0.01$).

Model 3 tests the hypothesis that there is a significant relationship between Average Payment Period and Profitability. The coefficient of APP shows a very significant positive relation between ROA and APP. This positive relation confirms the positive correlation between ROA and APP in Table 4.2. Ho_3 hypothesis is rejected and is concluded that APP is statistically significant ($p<0.01$). This suggests that, an increase in the number of day's accounts payable by 1 day is associated with an increase in profitability. Contrary to Deloof (2003), Raheman and Nasr (2007), Sharma and Kumar (2011) and Padachi (2006), this finding holds that more profitable firms wait longer to pay their bills. This implies that they withhold their payment to suppliers so as to take advantage of the cash available for their working capital needs. The other variables in the model except current ratio are significant. The model's adjusted R^2 is 54.0% with an F-value of 24.273 which is highly significant ($p<0.05$).

Model 4 tests the hypothesis that there is a significant relationship between Cash Conversion Cycle and profitability. The regression coefficient indicates a significant negative relation between CCC and ROA Ho_3 hypothesis is rejected and is concluded that CCC is statistically significant ($p<0.1$). This supports the notion that the cash conversion cycle is negatively related with profitability. Shin and Soenen (1998) argued that the negative relation between profits and the cash conversion cycle could be explained by the market power or the market share, i.e., a shorter CCC because of bargaining power by the suppliers and/or the customers as well as higher profitability due to market dominance. The other variables in the model are also statistically significant except current ratio. The model's adjusted R^2 is 33.3% with an F-value of 10.874 which is highly significant ($p<0.01$).

Model 5 acts as a control model for the variables under study. The model was run so as to provide an indicator as to the most significant variables affecting the study. The model shows that all the variables included are highly significant at 1% level with an exception of firm size (significant at 10%) and ACP, ICP and CR which are not significant. In this model, the ACP and the leverage are negatively related with the firm's profitability while all the other variables exhibit a positive relationship. The model's adjusted R^2 is 54.7%% with an F-value of 18.045 which is highly significant ($p<0.01$).

7. Conclusion

Most of the Kenyan manufacturing firms have large amounts of cash invested in working capital. It can therefore be expected that the way in which working capital is managed will have a significant impact on profitability of those firms. The study found out existence of negative correlation between Return on Assets and the firms average collection period and cash conversion cycle. However, the study findings suggests that there is a positive correlation between Return on Inventory Holding Period, Accounts Payment Period and. These results suggest that managers can create value for their shareholders by reducing the number of day's accounts receivable and increasing the accounts payment period and inventories to a reasonable maximum.

8. Policy Implications

The results shows that for overall manufacturing and construction sectors, Working Capital Management has a significant impact on profitability of the firms and plays a key role in value creation for shareholders as longer Cash Conversion Cycle have negative impact on Profitability of a firm.

The negative association of Average Collection Period with Return on Assets, a measure of profitability, helps the management in setting credit policy for the sector in general for the firms in manufacturing and construction sector in Kenya. The study recommends a longer credit period for the firms to realize higher profitability. There exists positive association between Inventory Turnover in Days and Return on Assets for the manufacturing and construction sectors in Kenya as a whole, which implies that firms, which maintain sufficiently high inventory levels, reduce costs of possible interruptions in the production process and loss of business due to scarcity of products. Similarly there is a positive relationship between Accounts payment period and Return on Assets of manufacturing and construction firms in Kenya. The study recommends that the longer the accounts payable, the better the profitability this could be due to good name created by suppliers and suppliers will not interrupt supplies to the firm which in turn leads to smooth operation during the year and ends up with better profitability.

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