

## **The Effect of Working Capital Management on Profitability of Cement Manufacturing Companies in Kenya**

Kioko Collins Wanguu<sup>1</sup> & Sitienei Edwin Kipkirui<sup>2</sup>

<sup>1</sup>- *MSc. Finance Student – University of Nairobi, Kenya*

<sup>2</sup>- *MBA (Finance) Student – Jomo Kenyatta University of Agriculture and Technology, Kenya*

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**Abstract:** *Working capital management is concerned with short-term investment and financing decision of an entity and is a major business requirement and a significant part of corporate finance. Thus, this study sought to examine the effect of working capital management on profitability of cement manufacturing companies in Kenya. The study used a sample of the 3 cement manufacturing firm listed at the Nairobi Securities Exchange. The study used secondary data from the cement manufacturing companies' audited financial statements for a period of 15 years from 2000 – 2014. The data collected was analyzed using the Karl Pearson correlation and the multiple linear regression. The study findings established that inventory conversion period (ICP) positively and significantly influences profitability while average receivables period (ACP) had a positive insignificant relationship with profitability. The study findings also revealed that average payables period (APP) had a significant negative relationship with profitability. In addition, the study findings established a positive significant relationship between leverage and profitability while liquidity and size of the firm had a positive insignificant relationship with profitability. The study concluded that inventory days, receivables period, liquidity, leverage and firm size positively influences profitability while payables period negatively influences the profitability of cement manufacturing firms in Kenya.*

**Keywords:** *Working Capital Management, Profitability, Inventory Conversion Period, Average Receivables Period, Average Payables Period*

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### **I. Introduction**

Working Capital is the flow of ready funds necessary for the working of a concern. It comprises funds invested in current assets, which in the ordinary course of business can be turned into cash within a short period without undergoing diminishing in value and without disruption of the organization (Mohanty, 2013). Working capital is a vital element in any organizational setting that requires cogent attention, proper planning and management (Owolabi and Alu, 2012). A positive working capital indicates the ability of the business to pay off its short term obligations at most when request comes from suppliers but a negative working capital indicates the inability of the business organization to pay short term obligations. As such, excessive working capital indicates an accumulation of idle current assets, which do not contribute in generating income for the firm during the operating period. Inadequate working capital on the other hand harms the credit worthiness and the day-to-day activities of firms, which may lead to insolvency (Singh and Asress, 2010).

Working capital management is concerned with short-term investment and financing decision of an entity and is a major business requirement and a significant part of corporate finance (Sajjad and Bukhari, 2012). WCM covers the planning and controlling activities of companies regarding their current assets and current liabilities in a manner that guarantees their ability to meet their current obligations satisfactorily as well as a maximum return on their precious investment in these floating assets. The ultimate goal of working capital management is to ensure that firms are able to continue their operations with sufficient cash flow that will service their long-term debts and satisfy both maturing short-term obligations and upcoming operational expenses (Owolabi and Alu, 2012). WCM is used as an optimization tool to make the most profitable use of liquid funds while maintaining a minimum level of liquidity to cover possible unexpected short-term expenditures (Kunze and Peri, 2015).

Efficient working capital management involves planning and controlling of current assets and current liabilities in a manner to strike a balance between liquidity and profitability (Uchenna et al., 2012). An improper management of working capital components that is, accounts receivables, accounts payables and inventories will result to difficulties in the firms continued operations and consequently the market value of the firm will also suffer (Mohamad and Saad, 2010). The ultimate objective of any firm is to maximize shareholders wealth and maximizing shareholders wealth can be achieved when a firm maximizes its profit. A firm that wishes to maximize profit must strike a balance between current assets and current liabilities and hence keeping abreast of the liquidity and profitability trade-off (Uchenna et al., 2012). Profitability reflects the final outcome of business operations thus a well designed and implemented working capital management is expected to contribute positively to the creation of a firm's value and profitability.

### **1.1.1 Cement Manufacturing Firms in Kenya**

In Kenya, the cement history started in the early 1930s when in 1933, East Africa Portland Cement Company began importing cement as a trading company. Later, in 1951, Bamburi Cement Ltd was founded and Lafarge a company from France is the principal shareholder of the company (Kinyua, 2007). Currently, there are six cement manufacturing companies with the major manufacturers being Bamburi Cement, East African Portland Cement and Athi River Mining. The other cement manufacturing firms include Mombasa Cement Company Ltd, Savanna Cement and National Cement Company Ltd. Cement firms in Kenya operate in markets closely linked to the economic cycle with a back-forward linkage with many other sectors like energy and transport. Cement, as a product is one of the indicators of the general developments in the construction industry, since it mirrors the level of activity in the sector (Kinyua, 2007).

The cement industry in Kenya has been growing in tandem with the construction sector and cement consumption has been on the increase at an average rate of 14.1% for the period 2006 – 2011, with consumption reaching 3.43 million tonnes in 2011, up from 1.57 million tonnes in 2006 (Dyer & Blair Investment Bank Ltd, 2012). According to the Kenya Economy Survey (2014) cement consumption and stocks in Kenya increased from 3,991.2 thousand tonnes in 2012 to 4,266.5 thousand tonnes in 2013 as a result of increased construction activities. The key drivers of the growth in cement consumption has been attributed to rising demand for housing and commercial construction boom fuelled by increased foreign investment, and extensive government and donor-funded spending on the country's mega infrastructure projects (Dyer & Blair Investment Bank Ltd, 2012).

### **1.2 Research Problem**

Working capital management involves crucial decisions on multiple aspects, including managing account payables and account receivables, preserving a certain level of inventories and the investment of accessible cash (Mohamad and Saad, 2010). However, most financial managers place much premium on other long-term financial decisions, particularly investments and capital structure decisions. According to Madhou, (2011) in the pursuit of running the day to day business of a firm, CEOs and managing directors fail to pay attention to the management of working capital. As such, most of the working capital decisions are delegated to junior employees of the firm and are rarely factored in when major decisions are undertaken by the CEOs. In addition, large number of business failures in the past has been blamed on the inability of the financial manager to plan and control the working capital of their respective firms (Owolabi and Alu, 2012).

In Kenya, the cement manufacturing sector has been identified as one of the core industrial sectors, with ample scope to boost the other sectors of the economy, especially the building and construction industry. However, the Kenyan cement market is marked by rising competition and over-supply of cement, which continues to have a depressing effect on prices (SSA Cement Industry Report, 2014). As such, the East Africa Portland Cement Company one of the major cement manufacturing companies in Kenya has been performing poorly for years and recently issued a profit warning for the financial year 2014/2015. Thus, the need to investigate the effect of working capital management on the profitability of cement manufacturing firms in Kenya.

Additionally, several studies have been carried out internationally, regionally and locally on the effects of working capital management on profitability of different firms. For instance, globally studies by Shahid (2011), Hoang (2015), Mansoori and Muhammad (2012) and Gill et al. (2010) obtained varied results on the relationship between working capital and profitability. Regionally, studies by Egbide et al. (2013), Owolabi and Alu (2012), Padachi (2006) and Agyemang and Asiedu (2013) also examined the effect of various working capital components on profitability. Locally, studies by Nyamao (2012), Makori and Jagongo (2013), Owele and Makokeyo (2015) and Muturi et al (2015) also examined the impact of working capital management on the profitability of various firms in Kenya. However, the above studies concentrated on different industries hence their findings cannot be generalized to the cement industry in Kenya. As such, in Kenya, there exist few studies on the effect of working capital management on the profitability of cement manufacturing companies. Most of the studies combine cement manufacturing firms with other manufacturing firms hence a gap in literature, which needs to be sealed. Hence, this study intends to examine: What is the effect of working capital management on profitability of cement manufacturing companies in Kenya?

### **1.3 Research Objective**

To examine the effect of working capital management on profitability of cement manufacturing companies in Kenya.

## **II. Literature Review**

### **2.1 Theoretical Review**

This study reviews the theory of working capital management and the cash conversion cycle approach as the underlying theories to explain the concept of working capital management.

#### **2.2.1 The Theory of Working Capital Management**

The theory of working capital management emanated from Sagan (1955) and the theory provides the basis for working capital management research. The theory of working capital management emphasizes the need for management of working capital accounts and warns that it could vitally affect the health of the company. Sagan (1955) pointed out the money manager's operations are primarily in the area of cash flows generated in the course of business transactions. However, the money manager must be familiar with what is being done with the control of inventories, receivables and payables because all these accounts affect cash position. Thus, Sagan (1955) advocated that the management of accounts receivable, accounts payable, inventories and cash is vital for the operational functions of a firm.

Further, the theory of working capital management argues that the major task of a money manager is to provide funds as and when needed and to invest temporarily surplus funds as profitably as possible in view of his particular requirements of safety and liquidity of funds by examining the risk and return of various investment opportunities. Thus, a money manager should take his decisions on the basis of cash budget and total current assets position rather than on the basis of traditional working capital ratios (Arabahmadi and Arabahmadi, 2013).

#### **2.2.2 Cash Conversion Cycle Approach**

The cash conversion cycle approach was developed by Richards and Laughlin (1980). Richards and Laughlin (1980) defined the cash conversion cycle as the net time interval between actual cash expenditures on a firm's purchase of productive resources and the ultimate recovery of cash receipts from product sales, establishes the period of time required to convert one dollar of cash disbursement back into a dollar of cash inflow from a firm's regular course of operations. The CCC comprises the sum of the inventory conversion period and the receivables collection period, minus the payables deferral period. The inventory conversion period and the receivables collection period combined are defined as the operating cycle (Le Roux, 2008). The CCC theory suggests that a cash conversion cycle analysis should be used to supplement the traditional but static liquidity ratio analysis because it provides dynamic insights.

The Cash Conversion Cycle (CCC) is used as a comprehensive measure of working capital as it shows the time lag between expenditure for the purchases of raw materials and the collection of sales of finished goods. The longer the cycle, the larger the funds blocked in working capital (Padachi, 2006). The cash conversion cycle analysis provides more explicit insights for managing a firm's working capital position in a manner that will assure the proper amount and timing of funds available to meet a firm's liquidity needs. In addition, the cash conversion cycle analysis provides more explicit insights for managing a firm's working capital position in a manner that will assure the proper amount and timing of funds available to meet a firm's liquidity needs (Le Roux, 2008). Cash conversion cycle indicates the efficiency of management of current assets hence a shorter the time of cash conversion allows the firms to generate more sales from the amount invested, which shows that business utilized their resources for generating maximum profit.

### **2.2 Empirical Review**

#### **2.2.1 Inventory Conversion Period**

Inventory management is one of the most important factors in working capital management as it is one of the major components of current assets. A study by Arabahmadi and Arabahmadi (2013) analyzed the efficiency of working capital management on automobile industry in Iran for the period 2000 to 2009. The results revealed that inventory management had a positive relationship with working capital. Further, the study found that the correlation between raw material purchase and working capital was positive. In addition, Muturi, Wachira and Lyria (2015) also investigated the effect of inventory conversion period on profitability of tea companies in Meru County for a period of five years from 2009 and 2013. The study findings revealed that inventory conversion period negatively affected the profitability.

Eneje et al. (2012) also evaluated the effect of raw materials inventory management on the profitability of brewery firms in Nigeria. A cross sectional data from 1989 to 2008 was gathered for the analysis from the annual reports of the sampled brewery firms. The study established that the study variable raw materials inventory management designed to capture the effect of efficient management of raw material inventory by a company on its profitability is significantly strong and positive and affects the profitability of the brewery firms in Nigeria. Madishetti and Kibona (2013) examined the relationship between inventory conversion period and SMEs profitability in Tanzania. The study used a sample of 26 SMEs and secondary data from the SMEs annual

financial statements for the period of 5 years from 2006 –2011. The study findings established that there was a significant negative linear relationship between inventory conversion period and profitability.

### **2.2.2 Average Collection Period**

Muscettola (2014) examined the impact the impact and all the influences of the cash conversion cycle on the profitability of firms using data from an extensive sample of Italian manufacturing firms. The study findings established that average receivables period had a significantly positive association with profitability. Akoto et al. (2013) also examined the relationship between working capital management practices and profitability of listed manufacturing firms in Ghana. The study used secondary data collected from all the 13 listed manufacturing firms in Ghana covering the period from 2005-2009. The study findings established a significantly negative relationship between profitability and accounts receivable days.

Ksenija (2013) investigated how public companies listed at the regulated market in the Republic of Serbia manage their accounts receivables during the recession times. A sample of 108 firms was used and the accounts receivables policies were examined in the crisis period of 2008-2011. The study findings revealed that there is a positive but no significant relation between accounts receivables and two dependent variables on profitability return on total asset and operating profit margin. Madishetti and Kibona (2013) also examined the impact of average collection period and average payment period on SMEs profitability in Tanzania. The study findings established that there was a significant negative relationship between average collection period and profitability.

### **2.2.3 Average Payables Period**

Malik and Bukhari (2014) investigated the impact of working capital management (WCM) on corporate performance in cement, chemical and engineering sectors of Pakistan. Data was obtained from annual reports of the companies during 2007-2011. Pooled ordinary least squares method was used to estimate the relationship between the measures of working capital management and performance. The study findings established that average payment period negatively and significantly to ROE whereas cash conversion cycle positively and significantly relate with return on equity. A study by Agyemang and Asiedu (2013) established that there is a negative relationship between accounts payable days and profitability. This suggested that less profitable firms wait longer to pay their bills taking advantage of credit periods granted by their suppliers. Madishetti and Kibona (2013) also established that there is a positive relationship between average payment period and gross operating profit of SMEs profitability in Tanzania.

### **2.2.4 Liquidity**

Ehiedu (2014) investigated the impact of liquidity on profitability of some selected companies. The study used secondary data from the selected companies annual reports and accounts. The study findings established that there was a significant positive correlation between current ratio and profitability, but there was no definite significant correlation between Acid-test ratio and profitability. Egbide et al (2013) investigated the relationship between liquidity and profitability based on a sample of 30 manufacturing companies listed on the Nigeria Stock Exchange for the period 2006-2010. The study findings established that current ratio and liquid ratio are positively associated with profitability while cash conversion period is negatively related with profitability of manufacturing companies in Nigeria.

Saleem and Rehman (2011) examined the relationship between liquidity and profitability in the oil and gas companies of Pakistan. The study findings established that there was a significant impact of only liquid ratio on ROA while insignificant on ROE and ROI. In addition, the findings established that ROE had no significant effect on three ratios current ratio, quick ratio and liquid ratio while ROI was greatly affected by current ratios, quick ratios and liquid ratio. Niresh (2012) also studied the cause and effect relationship between liquidity and profitability. The study covered 31 listed manufacturing firms in Sri Lanka over a period of past 5 years from 2007 to 2011. The study findings established that there was no significant relationship between liquidity and profitability among the listed manufacturing firms in Sri Lanka.

### **2.2.5 Leverage**

A study by Vural, Sokmen and Cetenak (2012) investigated the relationship between working capital management components and performance of the firms by using dynamic panel data analysis. The study established that leverage as a control variable had a significant negative relationship with firm value and profitability of firm which meant an increase in the level of leverage will lead to decline in the profitability of the firm and the value of the firm. Mahmoudi (2014) investigated the relationship between leverage and firm profitability. The study used Short term debt to equity (STD/E) and long term debt to equity (LTD/E) as leverage variables. Firm profitability was measured using return on equity (ROE) and return on assets (ROA).

The study findings established that there was a significant and negative relationship between leverage and firm profitability.

Vijayakumar and Karunaiathal (2014) also examined the relationship between leverage and profitability. The study findings revealed that there was a positive and significant impact of leverage measured in terms of total debt to total. Overly, the study findings established that there was a positive and statistically significant relationship between leverage measured in terms of total debt to total capital and return on equity of most of the selected companies during the study period. The study also disclosed a negative and statistically significant relationship between leverage measured in terms of short-term debt to total capital and long-term debt to total capital with return on equity of the most of the selected companies during the study period.

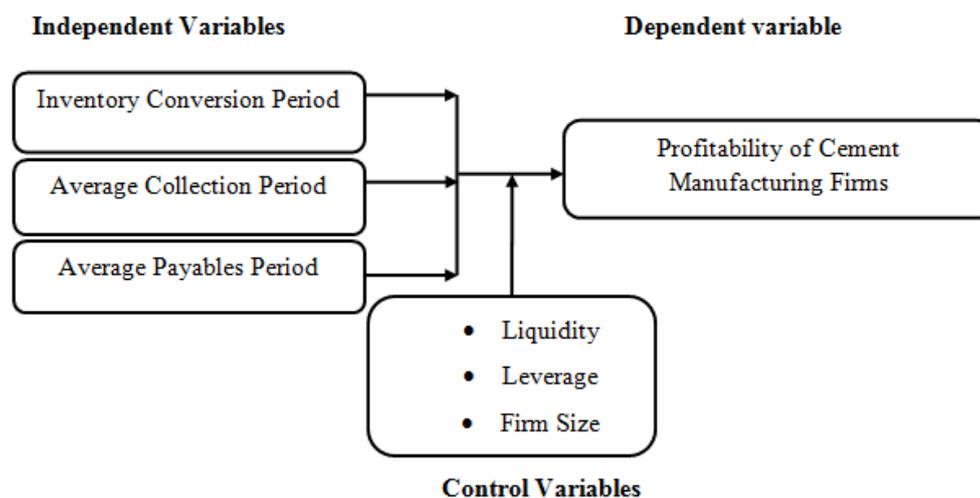
### 2.2.5 Firm Size

Size of the company has a lot to do with its profitability such that as the company increases in size, the ROA also increases and vice versa. A study by Attari and Raza (2012) examined the optimal relationship of cash conversion cycle with firm size and profitability. The study established a significant negative correlation between the cash conversion cycle and the firm size in terms of total assets which meant that the larger the firm size, the shorter is the cash conversion cycle in terms of days. Becker-Blease et al. (2010) also examined the relation between firm size and profitability within 109 SIC four-digit manufacturing industries. The study established that depending on the measure of profitability, the relation between size and profitability is industry specific and that profitability is negatively correlated with the number of employees for firms of a given size measured in terms of total assets and sales.

Babalola (2013) investigated the effect of firm size on the profitability of manufacturing companies listed in the Nigerian Stock Exchange was analyzed by using a panel data set over the period 2000-2009. Profitability was measured by using Return on Assets, while both total assets and total sales were used as the proxies of firm size. The study findings established that firm size, both in terms of total assets and in terms of total sales, has a positive impact on the profitability of manufacturing companies in Nigeria. Pervan and Visic (2012) investigated the relationship between firm size and performance. The analysis was conducted for the 2002-2010 period and the results revealed that firm size has a significant positive influence on firm profitability.

### 2.3 Conceptual Framework

Figure 2.1 shows the conceptual framework



**Figure 2.1 Conceptual Framework**

### III. Methodology

To achieve the study objective this study adopted a quantitative research design. A quantitative research design addresses research objectives through empirical assessments that involve numerical measurement and analysis approaches (Zikmund et al., 2011). The target population comprised all the six cement manufacturing companies in Kenya. A sample of the 3 cement manufacturing firm listed at the Nairobi Securities Exchange was selected for the study. The 3 firms included Bamburi Cement, ARM Cement and East African Portland Cement Company. The listed companies were preferred due to availability of secondary data since they are required to publish their financial reports to the public. The study used secondary data from the cement manufacturing companies' audited financial statements. The data covered a period of 15 years from

2000 – 2014. The data collected was analyzed using Karl Pearson correlation and multiple linear regression. The regression model took the following form

$$ROA = \beta_0 + \beta_1(ICP) + \beta_2(ACP) + \beta_3(APP) + \beta_4(CR) + \beta_5(DR) + \beta_6(FS) + \varepsilon$$

Where,

$$\text{Return on Assets (ROA)} = \frac{\text{Net Income}}{\text{Total Assets}}$$

$$\text{Inventory Conversion Period (ICP)} = \frac{\text{Average stock}}{\text{Cost of sales}} \times 365$$

$$\text{Average Collection Period (ACP)} = \frac{\text{Average Debtors}}{\text{Credit sales}} \times 365$$

$$\text{Average Payables Period (APP)} = \frac{\text{Average Payables}}{\text{Credit purchases}} \times 365$$

$$\text{Current Ratio (CR)} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

$$\text{Debt Ratio (DR)} = \frac{\text{Total debt}}{\text{Total assets}}$$

$$\text{Firm Size (FS)} = \text{Natural Log of Sales}$$

#### IV. Results And Discussions

##### 4.1 Summary Statistics

Table 1 shows the summary descriptive statistics from the research findings. The table shows the number of observations, the minimum and maximum values, the mean and standard deviation.

**Table 1 Summary Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	45	-.067	1.32	.1072	.19599
ICP	45	46	181	93.30	31.714
ACP	45	10	220	47.22	36.067
APP	45	31	149	77.36	30.582
CR	45	.469	9.76	1.958	1.3751
DR	45	.000	3.40	.3309	.5227
Firm size	45	10.49	17.44	15.635	1.2287

**Source: Research Findings**

The results on table 1 show that the cement manufacturing firms had an average ROA of 0.1072 and a standard deviation of 0.19599. The results also indicate that the average inventory conversion period (ICP) for the firms is 93 days with a standard deviation of 31.714 whereas the average collection period (ACP) is 47 days with a standard deviation of 36.067 while the average payables period (APP) for the firms is 77 days with a standard deviation of 30.582. The results also show that that the mean current ratio for the firms is 1.375 with a standard deviation of 1.3751 whereas the average debt ratio is 0.3309 with a standard deviation of 0.5227 while the average size for the firms is 15.64 with a standard deviation of 1.2287 respectively.

##### 4.2 Correlation Analysis

Correlation analysis was under taken to measure of the strength of a linear association between the dependent and the independent variables.

**Table 2: Correlation Matrix**

	ROA	ICP	ACP	APP	CR	DR	Firm Size
ROA	1						
ICP	-.079	1					
ACP	-.132	.132	1				
APP	-.215	.297*	.307*	1			
CR	.156	-.234	-.040	-.126	1		
DR	.787**	-.293	-.044	-.003	.077	1	
Firm size	.172	.134	-.327*	-.307*	-.107	.038	1

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

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

**Source: Research Findings**

The results on table 2 indicates that inventory conversion period, average collection period and average payables period had a negative correlation with profitability which means a reduction of inventory days,

receivables period and payables period negatively affects profitability of cement manufacturing firms. In addition, the results established that liquidity, leverage and size of the firm had a positive correlation with profitability an indication that increase in liquidity, leverage and the size of a firm positively influences the profitability of cement manufacturing firms in Kenya.

### 4.3 Regression Analysis

Regression analysis was also carried out to establish the relationship between the dependent and the independent variables.

**Table 3 Summary of the Coefficients of the Regression Model**

Variables	Coefficients	Std Error	t-stat	P-value
(Constant)	-.111	.256	-.432	.668
ICP	.002	.001	2.898	.006
ACP	.000	.000	-.424	.674
APP	-.002	.001	-2.720	.010
CR	.018	.012	1.429	.161
DR	.321	.033	9.701	.000
Firm size	.004	.015	.232	.818
F - value	17.662	P- value	.000 <sup>a</sup>	
R <sup>2</sup>	.736			
Adjusted R <sup>2</sup>	.694			

a. Dependent Variable: ROA

#### Source: Research Findings

The results on table 3 show that the R-square value is 0.736, which indicates that 73.6% of the variation in the dependent variable (ROA) is explained by the independent variables while the remaining 26.4% is explained by other factors outside the model. The results also show that the F statistics value is 17.662 and the P value is  $0.000 < 0.005$  hence the model is significant in explaining the relationship between working capital management and profitability. The results also show there is a positive significant relationship between inventory conversion period (ICP) and profitability, which indicates that inventory days positively influence profitability. This findings conforms to those of Arabahmadi and Arabahmadi (2013) and Eneje et al. (2012) who established that inventory management had a positive relationship with working capital however the finding are inconsistent with those of Madishetti and Kibona (2013) and Muturi et al. (2015) who established a negative relationship between inventory conversion period and profitability.

The study findings also established that average receivables period (ACP) had a positive and insignificant relationship with profitability an indication that receivables period positively influences the profitability of cement manufacturing firms in Kenya. This finding conforms to that of Ksenija (2013) who established that there is a positive but no significant relation between accounts receivables and profitability but the findings are conflicting to the findings of Akoto et al. (2013) who established a significantly negative relationship between profitability and accounts receivable days. The results also established that the average payables period had a significant negative relationship with profitability, which indicates that payables period negatively influences profitability. This observation is similar to those of Malik and Bukhari (2014) and Agyemang and Asiedu (2013) who established a negative relationship between average payable days and profitability.

The results also revealed that there is a positive and significant relationship between leverage and profitability which is an indication that leverage positively influences profitability of cement manufacturing firms in Kenya. In similar are the findings of Vijayakumar and Karunaiathal (2014) who established that there was a positive and significant impact of leverage measured in terms of total debt to total capital with the return on equity of both the Indian paper industry and the large scale sector. However, the findings are contradictory to those of Mahmoudi (2014) and Vural et al. (2012) who established a negative and significant relationship between leverage and profitability. The study also established liquidity and size of the firm had a positive insignificant relationship with profitability, which means that an increase in liquidity and the size of the firm positively influences profitability of cement manufacturing firms in Kenya.

## V. Summary And Conclusion

The study established that inventory conversion period (ICP) positively and significantly influences profitability whereas average receivables period (ACP) has a positive and insignificant relationship with profitability. The study also revealed that average payables period (APP) has a significant negative relationship with profitability, which indicates that payables period negatively, influences profitability. In addition, the study established that positive and significant relationship between leverage and profitability while liquidity and size of the firm have a positive insignificant relationship with profitability. Thus, the study concludes that inventory period, receivables period, liquidity, leverage and firm size positively influences profitability while payables

period negatively influences the profitability of cement manufacturing firms in Kenya. The study recommends that the management of cement manufacturing firms in Kenya should effectively manage working capital items to ensure that they maximize profitability.

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