

## Relationship between Working Capital Management and Profitability of Cement Companies in Kenya

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### Abstract

**Purpose:** Working capital is an important issue during financial decision making since its being a part of investment in asset that requires appropriate financing investment. However, working capital is always being ignored in financial decision making since it involves investment and financing in short term period. The objective of the study was to establish the relationship between working capital management and profitability in cement companies in Kenya. **Methods:** The research was a casual study design. The population of interest was all the cement companies operating in Kenya as at December 30<sup>th</sup> 2010, whose number stood at five. A census of all the cement companies was undertaken. The respondents for the study were the various heads of finance function from each of the cement companies. The study incorporated data for the last five years (2006 – 2010). **Data analysis:** In order to analyze the effects of working capital management on the firm's profitability, (operating income + depreciation)/total asset (OI) as measure of profitability was used as the dependent variable. With regards to the independent variables, working capital management was measured by cash conversion cycle (CCC). Spearman's Correlation analysis was used to see the relationship between working capital management and profitability. If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable. A multivariate regression model was applied to determine the relationship between working capital management and profitability. The regression model is as follows:  $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3$  **Findings:** Findings of the study indicate that indicate that efficient working capital management increases profitability, and hence a negative relationship exists between the measure of working capital management (cash conversion cycle, sales growth, debt ratio and credit ratio) and profitability variable. The study thus concludes that if efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable. Based on the findings of the study, it is expected that the stakeholders in the cement industry, who include the management, the government and financial regulators will gain a better understanding of the relationship between working capital management and profitability, and on the basis of the findings, the management of the cement manufacturing companies in may undertake working capital management from an informed position, while the regulatory bodies formulate policies that will be supportive of efficient management of working capital.

**Key words:** Profitability; Working capital management; Aggressive working capital management; Trade credit management; Inventory management; Cash management

### ABBREVIATIONS

CCC	-	Cash Conversion Cycle
CMA	-	Capital Markets Authority
ERP	-	Enterprise Resource Management
INV	-	Inventory
JIT	-	Just-In-Time
MRP	-	Material Requirements Planning systems
NSE	-	Nairobi Stock Exchange
OLS	-	Ordinary Least Squares
ROA	-	Return on Assets
ROI	-	Return on Investment
ROS	-	Return on Sales
SG	-	Sales Growth
SPSS	-	Statistical Package for Social Sciences
UK	-	United Kingdom
US	-	United States
WC	-	Working Capital
WCM	-	Working C

## **1.0 INTRODUCTION**

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

#### **1.1.1 Working capital**

Working capital is an important issue during financial decision making since its being a part of investment in asset that requires appropriate financing investment. However, working capital is always being ignored in financial decision making since it involves investment and financing in short term period. Further, also act as a restrain in financial performance, since it does not contribute to return on equity (Sanger, 2001). Though, it should be critical for to a firm to sustain their short term investment since it will ensure the ability of firm in longer period. The crucial part in managing working capital is required maintaining its liquidity in day-to-day operation to ensure its smooth running and meets its obligation (Eljelly, 2004). However, this is not a simple task since managers must make sure that business operation is running in efficient and profitable manner. There are the possibilities of mismatch of current asset and current liability during this process. If this happens and firm's manager cannot manage it properly then it will affect firm's growth and profitability. This will further escort to financial distress and finally firms can go bankrupt.

Dilemma in working capital management is to achieve desired tradeoff between liquidity and profitability (Raheman & Nasr, 2007). Liquidity management plays an important role in a firm's profitability and risk as well as its value (Smith, 1980). 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 then low profitability. Conversely, firm that has low liquidity of working capital, facing high risk results to high profitability. The issue here is in managing liquidity, firm must take into consideration all the items in both accounts and try to balance the risk and return. However, Van Horne and Wachowicz (2004) point out that excessive level of current assets may have a negative effect of a firm's profitability, whereas a low level of current assets may lead to lowers of liquidity and stock-outs, resulting in difficulties in maintaining smooth operations.

Working capital management affects profitability of the firm, its risk, thus its value (Smith 1980). In other words, efficient management of working capital is an important component of the general strategy aiming at increasing the market value (Howorth and Westhead, 2003; Deloof, 2003; Afza & Nazir, 2007). Since the flexibility of this group of assets is very high in terms of adapting to changing conditions and due to these characteristics they can often be applied to realize the main objective of financial management through policy changes.

The fundamental subject of working capital is to provide optimal balance between each element forming working capital. Most of the efforts of finance directors in a firm are the efforts they make to carry the balance between current assets not at optimal level and responsibilities to an optimal level (Lamberson, 1995). The most important of all, it is the determination of investment volume and to which asset it will be invested (Appuhami, 2008:11). One reason for this is the decisive influence of current assets on others, one another reason is the obligation of fulfillment of current responsibilities. Working capital necessity influences liquidity level and profitability of a firm. As a result, it affects investment and financing decisions, too. Despite the compounds of working capital that a company must have, basically depends on the company type and the sector in which it operates. Company size, growth rate and cash flow are the other important factors. If the determination factors are not explained fully and adequacy of working capital is undetermined, companies would be routed to bankruptcy (Appuhami, 2008:11, Ramachandran, Kanakiraman, 2009:64). Amount of current assets to be calculated at a level where total cost is of a minimum degree means an optimum working capital level. The optimum working capital level is the case in which balance between risk and efficiency is provided. A quest for such balance requires a constant monitoring of the elements forming working capital.

#### **1.1.2 Profitability**

Corporate performance has been identified as a potential determinant of working capital financing policies. The tax trade-off models show that profitable firms will employ more debt since they are more likely to have a high tax burden and low bankruptcy risk (Ooi, 1999). However, Myers (1984) prescribes a negative relationship between debt and profitability on the basis that successful companies do not need to depend so much on external funding. They, instead, rely on their internal reserves accumulated from past profits. Titman & Wessels (1988) and Barton *et al.* (1989), agree that firms with high profit rates, all things being equal, would maintain relatively lower debt ratio since they are able to generate such funds from internal sources. Empirical evidence from previous studies (Chittenden *et al.*, 1996; Coleman and Cole, 1999; Al-Sakran, 2001) appears to be consistent with the pecking order theory.

#### **1.1.3 Cement industry in Kenya**

With cement manufacturing industry contributing 18 percent of GDP (1998), the industrial sector in Kenya is a relatively small, albeit important one. Some of the major industries include small-scale consumer goods producers (plastic, furniture, batteries, textiles, soap, cigarettes, and flour), agricultural products processing, oil refining, and cement. Industrial production is confined exclusively to the urban centers, such as Nairobi and Mombasa. Aggregately, the value contribution of manufacturing in the Kenyan economy has steadily increased

over the past 10 years, rising from KSh 6, 833 million in 1991, to KSh11, 976 million in 1994, and KSh 23,490 million in 1996. As other economic sectors have also increased in their value contributions, however, the percentage increase of manufacturing in GDP contribution has not changed significantly. In 1991, manufacturing contributed 3.1 percent of GDP, while this figure only marginally increased to 4.6 percent in 1996. In the same year, the manufacturing sector provided employment for 210,500 Kenyans.

The cement industry, one of Kenya's most valuable, increased the value of its exports from US\$15.2 million in 1992 to US\$43.3 million in 1997. Other sectors did not fare so well, and annual average output for many actually declined. Beverages and tobacco declined on average by 0.13 percent, textiles by 6.9 percent, and clothing by 12.11 percent. The mining sector in Kenya, as a sub-component of the industrial sector, is negligible, though there are small deposits of gold, limestone, soda ash, salt barites, rubies, fluorspar, and garnets. In 1991, mining only accounted for 0.1 percent of GDP, with this figure remaining exactly the same in 1996. Currently, the industry has six manufacturers namely; East African Portland Cement Company, Bamburi Cement Ltd, Athi River Mining, Cemtech, National Cement and Pandlu Cement. According to the Central Bank's Monthly Economic Review for February 2010, total cement production rose by 18.1 per cent in January 2010 compared with January 2009 to reach 292,769 metric tonnes. The per capita cement consumption in Kenya is increasing due to a rise in the middle class. This group is building homes and driving up demand for cement.

The current study sought to raise ideas in the hope that the various stakeholders and persons directly addressing issues related to working capital management and profitability will continue the discussion. It does not presume to offer a prescription for the ideal measures to be employed by the stakeholders so as to reverse the trends. The purpose of this study is to establish the relationship between working capital and profitability in cement manufacturing companies in Kenya.

## 1.2 Statement of the Problem

Management of working capital is crucial for the success of an enterprise. In spite of such a great significance of working capital management, it is strange that so far it could not attract as much attention of the researchers in as it deserves. A brief review of the different efforts of research in the field is attempted in the following paragraphs. Previous researches have indicated that "poor" or "careless" financial management is a major cause of business failures (Matoha, 2007). Some of the most important internal problems businesses need to identify are inadequate capital, cash flows management and inventory control. A survey conducted in the UK indicated that above 20% of firm failures was due to irrecoverable debts or poor receivable management (Padachi, 2006). In other developed countries such as US, Canada, England, Australia and others, it has long been recognized that efficient management of working capital is crucial for prosperity and survival of businesses (Deloof, 2003). Nevertheless in the developing countries such as Kenya very little has been done concerning working capital management practices in manufacturing entities.

Lazaridis and Tryfonidis (2006) conducted a cross sectional study by using a sample of 131 firms listed on the Athens Stock Exchange for the period of 2001-2004 and found statistically significant relationship between profitability, measured through gross operating profit and cash conversion cycle and its components. Based on the results analysis of annual data by using correlation and regression tests, they suggest that managers can create profits for their companies by correctly handling the cash conversion cycle and by keeping each component of the conversion cycle at an optimum level. Garcia-Teruel *et al.* (2007) collected a panel of 8872 small to medium-sized enterprises from Spain covering the period 1996-2002. They tested the effects of working capital management on firm profitability using the panel data methodology. The results, which are robust to the presence of endogeneity, demonstrated that managers could create value by reducing their inventories and the number of days for which their accounts are outstanding. Moreover, shortening the cash conversion cycle also improves the firm's profitability.

Mathuva (2009) examined the influence of working capital management components on corporate profitability by using a sample of 30 firms listed on Nairobi Stock Exchange for the periods 1993-2008. He used Pearson and Spearman's correlations, the pooled ordinary least squares and the fixed effects regression models to conduct data analysis. The key findings of his study were that there exists a highly significant negative relationship between the time it takes for firms to collect cash from their customers and profitability, there exists a highly significant positive relationship between the period taken to convert inventories to sales and profitability and there exists a highly significant positive relationship between the time it takes for firms to pay its creditors and profitability.

The conclusive sum of this retrospective review of relevant literature produced till date on the offered subject reveals wide room for the validity and originates of this work and reflects some decisive evidences that affirm its viability, as may be marked here it. Nor has any previous research examined the optimal level of working capital key components through working capital cycle and composition of working capital. No study has incorporated in this fashion before the present one, hence the impetus for the study. This study sought answers to the following research question: what is the relationship between working capital management and

profitability in cement companies in Kenya?

### 1.3 Objective of the Study

The objective of the study was to establish the relationship between working capital management and profitability in cement companies in Kenya.

## 2.0 LITERATURE REVIEW

### 2.1 Introduction

In order to address the aim of the research, it is of importance to have established a sound literature base around which the study is built. This chapter presents a review of the literature related to the purpose of the study. The chapter is organized according to the specific objectives in order to ensure relevance to the research problem. The review has been undertaken in order to eliminate duplication of what has been done and provide a clear understanding of existing knowledge base in the problem area. The literature review is based on authoritative, recent, and original sources such as journals, books, thesis and dissertations. The chapter presents the following: working capital and working capital management concepts; factors influencing a firm's working capital management; importance of working capital management; challenges in working capital management; effect of working capital management on profitability; empirical review; and conclusions

### 2.2 Working capital

#### 2.2.1 The concept of working capital

Working capital is a part of a firm's current assets. Depending on the source, working capital can be defined in different ways. Working Capital is defined as a company's total investment in current assets or assets that a company expects to be converted into cash within a year or less (Keown; Martin; Petty; & Scott, 2005). The investment in working capital involves carrying costs and shortage costs, so the firms have to find the tradeoff between them. From the financial view, the working capital is calculated as current assets less current liabilities (Levy & Sarnat 1994). From operational perspective, working capital is calculated as shown in equation 1.

**Equation 1:**  $Working\ capital = Inventories + Accounts\ receivable - Accounts\ payable$

Successful working capital management requires the right balance between liquidity and profitability. To be able to pay salaries and other payments when needed, sufficient level of liquidity is required. At the same time, a company's inventories need to be big enough in order to avoid disruptions in production and keep customers satisfied. On the other hand, if inventories were too large, profit would be lost because of extra holding costs and interest costs of the capital involved. Large inventories may also lead to losses through deterioration. (Mott 2005 ; Arnold, 1998).

#### 2.2.2 Components of working capital

##### Current assets

Fazzari & Petersen (1993) explain that the three major components of current assets are accounts receivable, inventories and cash and equivalents. Larsson & Hammarlund (2005) define the different items included within this area as: payables systems, receivables system, management of liquid funds, currency management and risks, short term financing, accounts payables and accounts receivables. Gentry *et al.* (1990) describes that "receivables represent delay in the inflow of cash, which must be financed by the firm". Shim & Siegl (2000) point out that accounts receivable management includes selecting the good credit customers and speeding up the collections from the customers. Firms have to know that holding accounts receivable occurs the opportunity cost, meanwhile, the funds is tied up in account receivable than benefiting by investing elsewhere. Mathur (2003) remark that the third largest and most important item of assets in firms is the accounts receivable besides the capital investment in plant and machinery, stocks of inventory.

According to Michalski (2008), if firms tie up too much funds in accounts receivable due to too generous trade credit policy, this does increase the high opportunity cost to the firm. Moreover, possibilities of bad debts from risky customers occur more costly to firms, although the generous credit policy could increase the sales. However, the firms should decide its level of accounts receivable so that the benefits are more than the expenses. As Brealey and Meyers (2006) explains if firms collect earlier their receivables from their customers, the cost invested in the receivables mean the interest which would have been benefited, could be saved and used in business operation. The firm also forgoes the earnings of interest when it holds idle cash balances rather putting the money into use. The cost of holding inventory includes opportunity cost of capital, storage and insurance costs as well as the risk of spoilage or inventories become out of the date.

Mathur (2003) explains that inventories include raw materials, consumable stores and spares (working-in-process and finished goods). Inventory is viewed as an asset and a liability. Smith (1980) explains with a case analyzing that "the tightened inventory policy reduces necessary borrowing to a lower level than does faster collection of receivables or slower payments of current liabilities." Dimitrios (2008) points out that on one hand, too much inventory demand more physical space, could lead to a financial distress, and increases the possibility

of inventories' damages, deterioration and losses. Moreover, holding large amount of inventory frequently indicates for inefficient and careless management, not efficient planned and scheduled, less consideration for process and procedures. On the other hand, too little inventories might lead to the interruption of operation in manufacture, increase the possibility of losing sales and consequently lower the profitability of the firms.

#### **Current liability**

Current liabilities have to compromise between the risk and the return. Current liabilities are one of the flexible financial resources of firms. Current liabilities could be used as short-term financing recourse to meet the firms' need. However, due to the nature of short-term debt, it has to "be repaid or rolled over more often", so it increase the possibility that firms' financial condition may be distressed, because the funds may not be available as it is needed. Keown *et al.* (2006). Brealey & Meyers (2006) define the accounts payable that the firm purchase raw materials but does not pay their bills right after. The time interval is called the period of account payable. Delaying payment is described as stretching the accounts payable. Accounts payable is one of source of short-term financing recourse. Shim & Siegl (2000) argue that long-term debt financing has the less liquidity risks than short-term debt financing since the long-term financing's payment period is longer, but this advantage also present the long-term financing to have higher expenditures than short-term financing due to the greater uncertainties of long-term financing. "Liquidity risk may be reduced by using the hedging approach to financing, in which assets are financed by liabilities with similar maturity".

Cash conversion cycle is an important measurement of the working capital management. Gentry *et al.* (1990) describe the cash conversion cycle measure the number of days while the funds are invested in inventories and accounts receivable minus the number of days that payment to suppliers is performed. Kim *et al.* (1998) explain that the cash cycle is measured as average inventory age plus the collecting period of accounts receivable minus the average period of accounts payment. Shin & Soenen (1998) define the cash conversion cycle as the continuing cash flow from suppliers to inventory to accounts receivable and back into cash is usually defined as the cash conversion cycle.

Brealey & Meyers (2006) demonstrate that the total time period starting from initially purchasing the raw materials and finally payment collected from customers is the inventory and accounts receivable period: first the raw materials should be purchased from their suppliers, raw materials are to be manufactured or processed, goods are to be sold and the payment should be collected. The time period between the firms purchases its raw materials from the suppliers and the firm collects its payment from the customer is defined as the firm's cash conversion cycle (CCC). The longer the cash conversion cycle, the more the firm must invest in working capital. Vice versa, the shorter cash conversion cycle, the fewer funds are tied up in the working capital. As Gentry *et al.* (1990) state that "the shorter the cash conversion cycle, the more efficient the internal operations of a firm and closer the availability of net cash flow, which suggest a more liquid condition of the firm". Soenen (1993) points out that the length of cash conversion cycle decides the extent to which the firm must rely on the resource of external financing. In order to reduce the cash conversion cycle, "firms can reduce number days of inventories, shorten the number days of accounts receivables and prolong number of days in accounts payables."

#### **2.2.3 Working capital and policies**

Mathur (2003) describes that working capital policy may broadly be divided into three categories as: Conservative policy, Aggressive policy and Moderate policy. Under the conservative policy, the company may prefer to hold rather heavy cash and bank balance in current account or investments in readily marketable securities, meanwhile with higher stocks of raw materials and finished goods, in the preparing for reducing the risks for out of the stock and loss of sales. Aggressive or restrictive working capital policy may result in a disproportionately losses by risks of stock outs and the consequential loss of production as well as losing the sales and negatively influence of the profitability of the company. A moderate policy, the level of working capital will be moderate, neither too high nor too low, but just right.

An approach to aggressive working capital management policy of liquidity management results in a lower cash conversion cycle by reducing the inventory period and the accounts receivables period while stretching the accounts payables period. Aggressive asset management leads to the capital being minimized in current assets versus long-term investments. This would result in higher profitability but greater liquidity risk. As an alternative, a more conservative policy places a larger amount of capital invested in liquid assets, but at the sacrifice of some profitability. Aggressive financing policies "utilize higher levels of normally lower cost short-term debt and less long-term capital. Although lowering capital costs, this increases the risk of a short-term liquidity problem" Weinraub & Visscher (1998).

### **2.3 Working capital: Theoretical Framework**

There are basically several theories of working capital, which include the Baumol model, the Miller – Orr model and Continuous Review model. These theories are examined below with their implications.

#### **2.3.1 Baumol Model**

Baumol model (Baumol, 1952) of cash management provides a formal approach for determining a firm's

optimal cash balance under certainty. It considers cash management similar to an inventory management problem. As such, firms attempt to minimize the cost of holding cash and the cost of converting marketable securities to cash. As such, firms attempt to minimize the cost of holding cash and the cost of converting marketable securities to cash. This model makes the following assumptions: the firm is able to forecast its cash needs with certainty; the firm's cash payments occur uniformly over a period of time; the opportunity cost of holding cash is known and it does not change overtime and the firm will incur the same transaction cost whenever it converts securities to cash. The optimum cash balance,  $C^*$ , is obtained as shown below:

$$\begin{aligned} \text{Holding cost} &= k(c/2) \\ \text{Trading cost} &= c(T/c) \\ \text{Total cost} &= k(c/2) + c(T/c) \end{aligned}$$

$$C^* = \sqrt{\frac{2cT}{k}}$$

### 2.3.2 The Miller – Orr Model

A limitation of the Baumol model is that it does not allow cash flows to fluctuate. Firms in practice does not use their cash balance uniformly nor are they able to predict daily cash inflows and outflows. The Miller-Orr model (Miller & Orr, 1966) overcomes this shortcoming and allows for daily cash flow variation. It assumes that net cash flows are normally distributed with a zero value at mean and standard deviation. The model provides for two control limits – the upper control limit and the lower control limit as well as a return point. If the firms cash flows fluctuate randomly and it hit the upper limit, them it buys sufficient marketable securities to come back to a normal level of cash balance. Similarly, when the firm's cash flows go below the lower limit, it sells sufficient marketable securities to bring the cash balance back to normal level.

Determining the distance between the upper and lower limits(called  $Z$ ) is as follows:

The difference between the upper limit and lower limit depends on the following factors: the transaction cost, the interest rate and the standard deviation(s) of the net cash flows. The formula for determining the distance between upper and lower control limits called ( $Z$ ) is as follows:

$$\begin{aligned} \text{Upper limit} &= \text{lower limit} + 3Z \\ \text{Return point} &= \text{lower limit} + Z \end{aligned}$$

The net effect is that the firm holds the average cash balance equal to:

$$\text{Average cash balance} = \text{lower limit} + 4/3 Z$$

### 2.3.3 Continuous Review Model

Dollan (1920) states that the model frequently presented is the continuous review model (re-order point / economic order quantity model). This model is very easy to derive; hence it is extremely popular. This view is also supported by Lin (1980). However, an assumption implicit in continuous review models is that a perpetual inventory is maintained so that it is practical to release a replenishment order on the day the re-order point is reached. Thus, continuous review models assume that point of sale information is being collected. The continuous review technique, while very practical for a computerized inventory system collecting point of sale data is not practical for manual systems handling numerous different items.

According to Cox (1935), there are dozens of variations of the continuous review inventory model. The version derived here us derived from the following assumptions: The item under consideration is independent of all other items (no joint replenishment), demand for the item varies (is random), but the average demand is constant overtime, lead time is known and constant, holding costs and replenishment costs are known and constant and the inventory position is maintained at all times. Under these circumstances, a continuous review model calls for an order, of size  $Q$ , to be placed whenever the reorder point,  $S$ , is reached. The formulae for  $Q$  and  $S$  are as follows:

$$\begin{aligned} Q &= 2dr / h \\ S &= Dk v \end{aligned}$$

Where  $d$  = annual demand for the item,  $r$  = replenishment cost per occurrence,  $h$  = holding cost per item per year,  $D$  = average demand during lead time,  $v$  = standard deviation during lead time, and  $k$  = management determined variable.

The management factor determining the level of safety stock,  $k$ , should be set at a value of 2 or 3, A  $k$  value of 2 will result in a small number of stock outs during approximately 2.4 percent of all replenishment cycles. A  $k$  factor of 3 eliminates stock outs almost entirely (less than 1 percent), but causes considerably more inventory to be held as safety stock at all times.

## 2.4 Working capital management

### 2.4.1 Concept of working capital management

According to Bhattacharya (2006), the concept of working capital was perhaps first evolved by Karl Marx,

though in a somewhat different form, and the term he used was “variable capital”. Guthmann & Dougall (1948) defined working capital as current assets minus current liabilities and their view was elaborated by Park & Gladson (1963). This definition is also known as “net working capital”. Current assets are sometimes called as “gross working capital”. The current assets can be divided to four primary components: (1) cash and cash equivalents; (2) marketable securities; (3) accounts receivable; and (4) inventory and the three major items of current liabilities are: (1) accounts payable; (2) expenses payable, including accrued wages and taxes; and (3) notes payable (Cheng *et al.* 2009). Working capital management is an essential part of short-term finance of a firm. Especially during the financial crisis, the importance of working capital management was highlighted by many companies. Working capital management is an important source of liquidity and value enhancement, but attention should be also paid to it on the good times – not only when facing problems (Buchmann 2009, p. 350).

#### **2.4.2 Portfolio of working capital management**

Working capital management includes the portfolio combination management of the cash management, inventory management and trade credit policy management. Mathur (2003) suggest that firms manage their working capital more efficiently and skillfully by holding it “at a minimal level to reduce the quantum of interest outgo and the corresponding rise in their profit”.

##### **Cash management**

Cash is an important element of corporate liquidity in firms. Shim & Siegl (2000) explain that the ideal of cash management is to have the idle cash invested for return and meanwhile have the sufficient liquidity. “Cash management involves accelerating cash inflow and delaying cash outflow”. For example, it could speed up the payment collection from the buyer by extending shorter payment terms, so that accelerates the cash inflow. Negotiating a favorably paying condition from the supplier for prolong the time between the time firms buy the goods and pay their bills in order to delaying the outflow of cash.

There are advantage and disadvantage of cash holdings. Brealey & Meyers (2006) clarify that the advantages to “holding large amounts of ready cash, they reduce the risk of running out of cash and having to borrow more on short notice”. On the other hands, there is an expenditure to keep excessive cash balances rather than investing the money to earn the interest. Keown *et al.* (2006) describe that cash management is a trade-off of risk-return. A large cash investment minimizes the chances of liquidity risk, but it decreases the profitability of company. “A small cash investment free excess balances for investment, this enhances company profitability and the value of the firm’s common shares, but it increases the chances of running out of cash”.

##### **Inventory management**

Brealey & Meyers (2006) explain that firms store the inventories to minimize the risk of running out of the stock and losing sales as well as customers. However, holding inventories causes the costs, such as the funds which are tied up in inventories, could not have the interest earnings instead; storage and insurance have to be paid, furthermore, spoilage, damage and loss of goods lead to the costs to firms. Bhattacharya (2006) points out that inventory management has become to an important key point in a firm’s working capital management. Running out of stock is risky for production and marketing consequences in shortage cost. Excessive stocking reduce the profitability of firms results in holding cost. In recently year’s firms have benefited from the material requirements planning systems (MRP), just-in-time (JIT), ERP management and lean management to reduce significantly their inventory amount to free up the tied up the investment in the inventory.

According to Keown *et al.* (2006), if the size of inventory increase, consequently holding costs of inventory increases, such as storage, insurance, cost of goods deterioration, damage and losses, moreover the demand of return on capital investment in inventory is expected more. So the inventory of firm is increases, the risk of running of stock is reduced, but cost of holding inventory rises.

##### **Trade credit management**

Trade Credit management involves the following steps: first, firms should decide the sales terms on which firms sell their goods to their customers. Second, firms should have decision-making on what evidence firm requires from their customer who owes the payment. Third, firms should analysis the risky customers and non-risky customers are likely to perform their bills, this is called credit analysis. Fourth, firms should draw up the credit policy, it means to what extent the firms allow their customers to pay their bills on credit terms. Fifth, Firms make the sales on credit and have the problem collecting the payment when the bills become due which is called collection policy (Brealey & Meyers, 2006)

Cunat (2005) explains that the trade credit occurs when supplier make the sales on credit to their customers and allow them to postponed their payment when goods are already delivered. “The trade credit is described to be the suppliers as debt collectors and insurance providers”. On the one hand, the suppliers might be in a better position than banks or institute in terms of financing to their customers because suppliers could stop supplying the goods to their customers to alert the borrower. On the other hand, suppliers might act as liquidity providers insurance the liquidity adverse shock which might danger the survival of their customer relationships.

##### **Aggressive working capital management**

Aggressive working capital management is described as maximizing the profitability of the firms. Jose *et al.*

(1998) examines the relationship between profitability and management of ongoing liquidity needs by measuring a cross-section of firms during the period of over twenty-years and find the strong evidence that aggressive working capital policies improve the profitability of the firms. The aggressive liquidity management leads to a shorter cash conversion cycle by reducing the inventory period and the accounts receivables period while increasing the accounts payables period. Abel (2008) explains that “A strong efficient working capital management implies that inventory and accounts receivable are quickly converted to cash and stretching accounts payable leads to a decreased cash conversion cycle and increased cash availability”.

As Weinraub & Visscher (1998) argue that the goal of aggressive working capital management is to minimize the capital in current assets comparing with the long-term investments, however, in this way, firm is expected to have higher profitability but greater liquidity risk. Smith (1980) point out that working capital management is important because of its effects on the firm’s profitability, risk and its value. Working capital investment involves a trade-off between profitability and risk, decisions of firm pursues the increase of profitability, increase also the risk. (Teruel & Solano 2008) Therefore firms have to reserve the cash as security to the risk and uncertainty which firm is exposed to. Firms reducing inventories would increase the risk of out of stocks and sale losses; rely on more suppliers’ just in time delivery which increase the risk. Shortening days of accounts receivable collections from or ungenerous credit terms to firm’s buyers might lead to the lower volume of sales and consequence increase the risk of decreasing the profitability. Extending the accounts payable might forego the discounts for early payments and increasing the probability of financial cost.

Bhattacharya (2006) point out that high inventory reduces the firms’ profitability in respect of funds and expenses. Comparing the advantages and disadvantage of aggressive and conservative style of working capital management, firms favor the aggressive working capital management, which manages the individual and integrative components of working capital efficiently.

#### **2.4.3 Working capital management strategies**

There are three factors driving working capital levels. These includes: inventory, accounts receivables and bills payables. In effect account receivables and payables are different ways of financing inventory. Companies need to handle the three simultaneously across the board to drive fundamental reductions in asset levels. Given the wide range of possible actions, management focus is critical. A realistic plan with clear priorities is the best approach, since an overly ambitious agenda can stretch internal capabilities and deliver suboptimal results (Dittmar & Smith, 2005). Instead, companies should focus on the most promising actions that would not impair flexibility and performance. These actions will vary depending on the industry and the company’s condition, but they should have three overall objectives.

##### ***Reduce inventory***

Excess inventory is one of the most over looked sources of cash, in most cases accounting for almost half the savings from working - capital management. By cutting across enterprise processes as well as processes involving suppliers and customers, companies can minimize inventory throughout the value chain. With raw materials, companies can often achieve substantial gains by redefining optimal safety stock levels and batch sizes. This requires a thorough analysis of customer demand patterns; customer forecast quality, and supplier lead times. By assessing these factors, companies can often sharply reduce inventory levels throughout the supply chain. (Dittmar and Smith, 2005)

##### ***Speed up receivables collections***

Many companies are early payers and late collectors. Other companies have cash flows problems caused by a mismatch in timing between incurred costs and receipt of customer payments. One way to ensure a steadier flow of cash is to better align incurred costs with customer payments by asking for a down payment and setting up series of staggered payments to ensure that most receivables have been collected by the time of delivery. All companies should aim to reduce overdue payments and accelerate collection and setting up a schedule of escalating payment demands. Companies should also slowdown their payment terms and conditions against best practice and negotiating with their valued customers. The goal of shortening customers’ payment terms, however, must balance the risk of jeopardizing the relationship (Dittmar and Smith, 2005).

##### ***Rethink payable terms***

Companies are at one end of the business, and then companies that are slow in payment use the unpaid payables as a source of financing at the other end. Between these two extremes is a more effective, integrated approach to payment renegotiation that takes into account all aspects of the customer - supplier relationship, from price and payment terms to delivery time frames. Companies should benchmark terms and conditions against industry best practices and eliminate early payments, except when attractive discounts are offered. When renegotiating payment conditions they should consider the length of their relationship with supplies as well as competitive loyalties. Moreover, linking supplier’s payment terms to their performance in areas such as delivery accuracy complaint ratios, and other lead time can improve underlying processes and reduce working capital overall by analyzing each component of working capital along the line, companies can identify and remove the obstacles that slow cash flow. If working capital is managed well it generates more cash for growth along with streamlined



processes and lower costs (Dittmar and Smith, 2005).

#### **2.4.4 Measuring working capital management**

Some related researches are presented below measuring the influence of working capital in the Companies' profitability. Shin and Soenen (1998) investigated American companies during the period between 1975 and 1994 totaling 59,985 observations. The variables used were profitability, measured by return on assets (ROA) and return on sales (ROS), and cash conversion cycle. Their research found strong evidence of a negative relation between profitability and cash conversion cycle meaning that shorter the days of working capital higher the profitability. Their findings also indicate a positive impact in the shareholder's value.

Lazaridis & Tryfonidis (2006) investigated the relationship that is statistically significant between corporate profitability, the cash conversion cycle and its components. They used a sample of 131 companies listed in the Athens Stock Exchange for the period of 2001-2004. The independent variables used were fixed financial assets, the natural logarithm of sales, financial debt ratio, cash conversion cycle and its components – days inventory, days receivable and days payable. The dependent variable is profitability measured by gross operating profit. The research findings show negative relationship between cash conversion cycle, financial debt and profitability, while fixed financial assets have a positive coefficient. When the authors replaced cash conversion cycle with accounts receivable and inventory, they found negative relationship with these two variables; the opposite occurred with accounts payable. The authors conclude that companies can create more profit by handling correctly the cash conversion cycle and keeping each different component to an optimum level. Similar results were also shown in Deloof (2003) research with Belgian companies from 1992 to 1996. He found negative relationship between gross operating profit and accounts receivable, inventory and accounts payable. The latter might indicate that less profitable companies wait longer to pay their bills taking advantage of credit period granted by their suppliers.

The most common measures for working capital include the number of days inventories (how many days it takes to turn over the value of entire inventory) and the number of days accounts receivable and payable (how long in average it takes to get payment and pay invoices). Other measures include current ratio (ratio between short-term assets and liabilities). A value under one could mean liquidity problems. Quick ratio is similar but takes account of the fact that it may take time to convert inventory into cash. (Planware, 2010). Net liquid balance measures financial decisions of a firm that are irrelevant to the operation cycle. Working capital requirement comes directly from the narrower definition of working capital and measures the needed working capital (Cheng, 2006). The cash conversion cycle is a popular measure of working capital management used in many studies (e.g. Deloof, 2003 and Jose *et al.*, 1996). It is the time between purchase of raw materials and getting finished goods paid. Longer cash cycle means more investment on working capital. Reducing cash conversion cycle to a reasonable minimum generally leads to improved profitability, but in some cases longer cash cycle might increase profitability because it leads to higher sales. (Deloof, 2003).

According to Jose *et al.* (1996), the cash conversion cycle is introduced by Gitman (1974) and later refined by Gitman and Sachdeva (1982). Amount of working capital can change during a financial year of a firm. Usually numbers at the end of financial year are good estimates, but if the operation of a firm is very seasonal they can be misleading. In the statistical studies of working capital management that use financial data number of days inventories, accounts receivable, accounts payable and cash conversion cycle are nearly always used as a measures of working capital management.

#### **2.5 Effect of working capital management on profitability**

Jose *et al.* (1996) found a negative correlation between the cash conversion cycle and profitability and later studies have confirmed their finding. Jose *et al.* further assert that the shorter cash conversion cycle and lesser number of days accounts receivable leads to better profitability but correlations of number of days accounts payable and numbers of days inventory to profitability are conflicting in studies. The numbers of days inventory relation to profitability was positive only in one study and it was caused by sample firms having too small inventories. Deloof (2003) discusses that to some extent relation of working capital management to profitability caused by profitability affecting working capital management, and not vice versa. He argues that the negative relation between inventory and profitability may be caused by declining sales resulting a larger inventory.

Four studies found that number of days accounts payable has a negative relation to profitability (and two inverse relation). According to Deloof (2003) the best explanation for this is that less profitable firms wait longer to pay their bills. According to the definition of Weston and Brigham (2005), "Working Capital refers to a firm's investment in short-term assets, cash, short-term securities, accounts receivables and inventories". Working capital management is important because of its effects on the firm's profitability and risk, and consequently its value (Smith, 1980). On the one hand, maintaining high inventory levels reduces the cost of possible interruptions in the production process or of loss of business due to the scarcity of products, reduces supply costs, and protects against price fluctuations, among other advantages (Blinder & Manccini, 1991). Decisions about how much to invest in the customer and inventory accounts, and how much credit to accept

from suppliers, are reflected in the firm's cash conversion cycle, which represents the average number of days between the date when the firm must start paying its suppliers and the date when it begins to collect payments from its customers. Some previous studies have used this measure to analyze whether shortening the cash conversion cycle has positive or negative effects on the firm's profitability.

Specifically, Shin & Soenen (1998) analyze the relation between the cash conversion cycle and profitability for a sample of firms listed on the US stock exchange during the period 1974-1994. Their results show that reducing the cash conversion cycle to a reasonable extent increases firms' profitability. More recently, Deloof (2003) analyzes a sample of large Belgian firms during the period 1992-1996. His results confirm that Belgian firms can improve their profitability by reducing the number of days accounts receivable are outstanding and reducing inventories. Moreover, he finds that less profitable firms wait longer to pay their bills. Most of these companies' assets are in the form of current assets. Also, current liabilities are one of their main sources of external finance in view of their difficulties in obtaining funding in the long-term capital markets (Petersen and Rajan, 1997) and the financing constraints that they face (Whited, 1992; Fazzari & Petersen, 1993). Teruel & Solano (2007), also find a significant negative relation between an organization's profitability and the number of days accounts receivable and days of inventory. We cannot, however, confirm that the number of accounts payable affects an organization's return on assets, as this relation loses significance when we control for possible problems. Finally, organizations have to be concerned with working capital management because they can also create value by reducing their cash conversion cycle to a minimum, as that is reasonable.

## 2.6 Empirical Review

Existing literature on working capital seems to have lost popularity after the glorious period of the sixties and the seventies when most of the models of working capital management were developed. Even though these models were not formulated in an integrated manner, they were a very important topic for discussion given their direct effect on the value of firms. Due to this "gap" in the literature on the subject, only the more recent papers shall be mentioned as they are aimed at nurturing the discussion on working capital management. Prior studies reported that working capital management may have an important effect on the firm's profitability. Shin & Soenen (1998), Lazaridis & Tryfonidis (2006), Raheman & Nasr (2007), among others, measured working capital with cash conversion cycle, which consists of stockholding period, debtors' collection period and creditors' payment period. These researchers supported that greater investment in working capital (the longer cash conversion cycle) leads to reduction in the firm's profitability (Banos-Caballero *et al.*, 2010, and Nazir & Afza, 2003, 2009).

Shin & Soenen (1998) investigated the relationship between CCC and the profitability of the firms for a sample of companies listed in the United States Stock Exchange during the period spanning from 1975 to 1994; they found a significant negative relationship between the value of the companies and the CCC of the same companies. In addition to this, Shin & Soenen (1998) intended to come up with the determinants of working capital and found that its management is correlated in a positive way to firm size. They also established that industry concentration does not affect working capital management and that a greater compensation paid to the CEO of the firm definitely improves the company's management of working capital. These results suggest that WCM has an important impact on the profitability of the firms.

While Schiff & Lieber (1974), Sartoris & Hill (1983), and Kim & Chung (1990) model the effects of working capital management practices on firm value, they do not provide evidence on whether firms actually do maximize their value by their working capital management choices. The study that comes nearest to addressing this issue is the study by Shin & Soenen (1998), which examines the relation between different accounting profitability measures and net trade cycles, a summary efficiency measure of a firm's working capital management.

Wang (2002) used a sample of Japanese and Taiwanese firms and found that a shorter cash conversion cycle would lead to a better firm's operating performance. Teruel & Solano (2007) took samples of small to medium-sized Spanish firms for the 1996-2002 period and found that the firms can create value by reducing the days-in-inventory period and the debtors collection period, thus leading to the reduction in the cash conversion cycle. On the other hand, though, other researchers support that investing more in cash conversion cycle (conservative policy) may lead to increased profitability since maintaining high inventory levels is expected to increase sales, reduce supply costs, reduce cost of possible interruption in production and protect against price fluctuations (Blinder & Maccini, 1991). A higher debtors' collection period may also strengthen the relationship with customers and hence may lead to an increase in sales revenue (Ng *et al.*, 1999).

Deloof (2003) analyzed a sample of large Belgian firms during the period 1992-1996 and the results confirmed that Belgian firms can improve their profitability by reducing the number of days accounts receivable are outstanding and reducing inventories. He came across a significantly negative relationship between gross profits and the average period of receivables, the average period of inventories, and average period of payables. The results suggest that the managers could create value for stockholders if they were to reduce the time periods

of receivables and inventories to reasonably minimum levels. These results show that there is a certain level of working capital that maximizes the value of the firms. Teruel & Solano (2005) suggested that managers can create value by reducing their firm's number of days accounts receivable and inventories. Similarly, shortening the cash conversion cycle also improves the firm's profitability.

Lazaridis & Tryfonidis (2006) conducted a statistical analysis of 131 firms in Athens for the period 2001 to 2004 and arrived at the conclusion that managers may create benefits for the companies if they manage an adequate level of CCC and maintain each one of its components at an optimal level. They also detected a negative relationship between the company's working capital and its profitability. In the Pakistani context, Rehman (2006) investigated the impact of working capital management on the profitability of 94 Pakistani firms listed on the Islamabad Stock Exchange (ISE) for the period 1999-2004. He studied the impact of different variables of working capital management, including average collection period, inventory turnover in days, average payment period, and CCC on the net operating profitability of firms. His study concluded that there is a strong negative relationship between working capital ratios and profitability of firms.

Chiou & Cheng (2006) analyzed the determinants of working capital management from a different angle. Their study examined how working capital management of a firm is influenced by different variables, such as business indicators, industry effect, operating cash flows, growth opportunity for a firm, firm performance, and size of the firm. The study provided consistent results of leverage and operating cash flow for both net liquid balance and working capital requirements; however, variables such as business indicator, industry effect, growth opportunities, firm performance, and size of the firm were unable to produce consistent results for net liquid balance and working capital requirements of firms.

Taking the study of Faulkender & Wang (2006) as a core model and adding variables to assess the working capital management, Kieschnick, LaPlante, & Moussawi (2009) show the relationship between corporate working capital management and firm value, as well as, like they claim, they became the first ones to examine how financing influences this relationship. They study the US corporations from different industries from 1990 to 2004 and came up with the following conclusions: (i) A dollar invested in net operating capital is worth less on average than a dollar held in cash; (ii) On average, an additional dollar of investment in net operating working capital at current levels of such investment reduces firm value; (iii) The evidence that a dollar invested in net operating working capital is worth less than a dollar is primarily driven by its financing; and (iv) Firms with better access to public capital market, and particularly commercial paper markets, face a lower reduction in value from financing investment in working capital.

A recent working paper of Chatterjee (2010) analyses the impact of working capital management on the profitability of the listed companies in the London Stock Exchange (a sample of 30 UK companies for a period of 3 years from 2006-2008). The findings are in line with those of previously mentioned studies: as the cash conversion cycle increases it will lead 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. The researcher also found that, there is a significant negative relationship between the liquidity and the profitability of the UK firms and that there exists a positive relationship between size of the firm and its profitability. Furthermore, there is also a significant negative relationship between debt used by the firm and its profitability. The results suggest that, the managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories and less profitable firms wait longer to pay their bills.

Turning to the empirical literature on working capital management in Kenya, the researcher found a limited published study on the consequences of working capital management on firm's performance from Kenyan perspectives, hence the impetus for the study.

## 2.7 Conclusions

Working capital management is important part in firm financial management decision. The ability of the firm to continuously operate in longer period is depends on how they deal with investment in working capital management. The optimal of working capital management is could be achieve by firm that manage the tradeoff between profitability and liquidity. Working capital management is highly important in firms as it is used to generate higher returns for the stakeholders; however, it has not elicited much attention from researchers and practitioners. When the working capital requirements are not properly managed and are allocated more than required, it renders the management inefficient and reduces the benefits of short-term investments. On the other hand, if the working capital is too low, the company may miss a lot of profitable investment opportunities or suffer short-term liquidity crisis, leading to the degradation of company credit, as it cannot respond effectively to temporary capital requirements. There may be various external and internal factors that may induce the firms to strike a balance between meeting unforeseen capital requirements and avoiding inefficient management of capital.

Efficient working capital is really a prerequisite to growth and existence of corporate enterprises because it dictates the level of production, inventory and sales. Without working capital every aspect of the

enterprise will cease to exist that is there will be no money for the day-to-day running of the business which is the aim of every business establishment. Well-managed working capital will produce an increased profitability to meet the financial needs of the company at all times. Increasing the corporate setting will bring about good corporate image, going concern ability, increased business value, expansion, peaceful existence amongst workers and management. They are many factors like industry practice, corporate size proportion of a firm's assets in long term, and current assets, market share, nature of business, and business environment are significant determinants of working capital management in an organization.

## 2.8 Conceptual Framework

The conceptual framework for the study is depicted in figure 2.1 below.

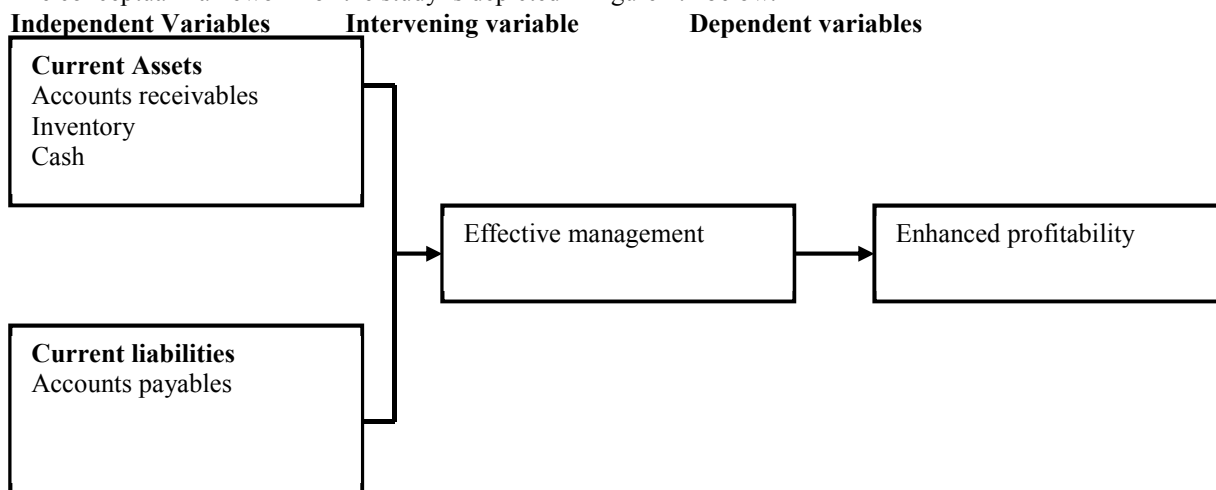


Figure 2.1: Conceptual framework

## 3.0 METHODS

### 3.1 Introduction

In the previous chapter, literature pertaining to the study was reviewed and research gaps identified. This chapter addresses the methodology for the research. The chapter discusses the criteria for determining the appropriate methodology for a study. It covers a description of the study design, target population, sample design, data collection methods, research procedures and data analysis and presentation.

### 3.2 Research Design

The research was a casual study design. Mugenda & Mugenda, (1999) stated that a casual study is an in-depth investigation of an individual group, institution or phenomenon whose purpose is to determine the relationship that has been caused by phenomenon of the study. The research sought to assess the relationship between working capital and profitability of cement manufacturing companies in Kenya.

### 3.3 Population and Sample of the Study

Brink (1996) defines a population as the entire group of people that is of interest to the researcher. The population of interest was all the cement companies operating in Kenya as at December 30<sup>th</sup> 2010, whose number stood at five. A census of all the cement companies was undertaken. The respondents for the study were the various heads of finance function from each of the cement companies. The study incorporated data for the last five years (2006 – 2010).

### 3.4 Data Collection

Primary data was collected from the selected respondents with the aid of self-administered data sheets. A cover letter, endorsed by the University of Nairobi, was attached with a copy of the data sheet. The letter explained the nature and benefits of the study, and included general instructions on how to complete the data sheets, besides clearly laying down terms of protection on confidentiality of information provided. The data sheet was emailed to the respondents. Duration of one week was given to them to complete the data sheet and return them by email. During this period, a follow up was made using telephone and emails as reminders and as a means of enhancing a higher response rate.

### 3.5 Data Analysis and Presentation

According to Marshall & Rossman (1999), data analysis is the process of bringing order, structure and interpretation to the mass of collected data. Statistical Package for Social Sciences (SPSS) was used as an aid in the analysis. The researcher prefers SPSS because of its ability to cover a wide range of the most common statistical and graphical data analysis and is very systematic. The SPSS was used to generate percentages and frequencies. In order to analyze the effects of working capital management on the firm's profitability, (operating income + depreciation)/total asset (OI) as measure of profitability was used as the dependent variable. With regards to the independent variables, working capital management was measured by cash conversion cycle (CCC). CCC focuses on the length of time between when a firm makes payment and when firm receives cash inflow. The lower the value is better due to reveal that firm has high liquidity which easily converts its short term investment in current asset to cash. However, longer value of CCC indicate greater investment in current assets, and hence the greater the need for financing of current assets. CCC is calculated as the number of days accounts receivable (AR) plus the number of days of inventory (INV) minus the number of days accounts payable (AP). In this respect, AR is calculated as accounts receivable/ [sales/365]. AR represents the number of days that a firm takes to collect payments from its customer. The INV will be calculated as inventories/ [sales/365]. This variable reflects the average number of days of stock held by a firm. Longer storage times represent a greater investment in inventory for a particular level of operations. AP is calculated by accounts payable/ [cost of sale/365]. This measure indicates the average time firm takes to pay their suppliers. The higher the value, the longer firms take to settle their payment commitments to their suppliers. Control variables will be introduced as the growth in firm sales and its leverage. Sales growth (SG) will be calculated by  $(Sales_1 - Sales_0)/Sales_0$ . The leverage (DR) measures by debt ratio as calculated by total debt over total asset. In addition current ratio (CR) which calculated by current asset over current liability, was included as one of independent variable. The reason is current ratio always been used as measure of corporate liquidity conventionally.

*Correlation Analysis:* Spearman's Correlation analysis was used to see the relationship between working capital management and profitability. If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable.

A multivariate regression model was applied to determine the relationship between working capital management and profitability.

The regression model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

$$\text{Profitability} = b_0 + b_1 \text{CCC}_t + b_2 \text{Current Ratio}_t + b_3 \text{Debt Ratio}_t + b_4 \text{Sales Growth}_t$$

The equation above is estimated using the regression-based framework Pooled Ordinary Least Squares (OLS) as employed by Shin and Soenon (1998). Model of this study differs by using CCC as a comprehensive measure of working capital management. The data set to be used for this part will be pooled across the firms and years. Where the fixed effects estimation assumes firm specific intercepts, which capture the effects of those variables that are particular to each firm and that are constant over time.

## 4.0 FINDINGS AND DISCUSSIONS

### 4.1 Introduction

Secondary data pertaining to financial statements of the cement companies was collected with the aid of a data sheet. All the data sheets sent out were returned completed, a 100.0% response rate. Statistical Package for Social Sciences (SPSS) was used to aid in analysis. Spearman's Correlation analysis was used to see the relationship between working capital management and profitability. If efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable.

Further, a multivariate regression model was applied to determine the relationship between working capital management and profitability. The regression model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

$$\text{Profitability} = b_0 + b_1 \text{CCC}_t + b_2 \text{Current Ratio}_t + b_3 \text{Debt Ratio}_t + b_4 \text{Sales Growth}_t$$

The equation above is estimated using the regression-based framework Pooled Ordinary Least Squares (OLS) as employed by Shin and Soenon (1998). Model of this study differs by using CCC as a comprehensive measure of working capital management. The data set to be used for this part was pooled across the firms and in a period of five years. Where the fixed effects estimation assumes firm specific intercepts, which capture the effects of those variables that are particular to each firm and that are constant over time.

### 4.2 Correlation analysis

Spearman's Correlation analysis was used to see the relationship between working capital management and profitability. If efficient working capital management increases profitability, one should expect a negative

relationship between the measures of working capital management and profitability variable.

#### 4.2.1 Correlation between CCC and profitability variable

Findings of the correlation of cash conversion cycle as a measure of working capital management and profitability variable are summarized and presented below.

**Table 4.1: Correlation between CCC and profitability variable**

Control Variables			2006	2007	2008	2009	2010
Profitability variable	2006	Correlation	1.000	.859	.939	.774	-.553
		Significance (2-tailed)	.	.141	.061	.226	.447
		df	0	2	2	2	2
	2007	Correlation	.859	1.000	.714	.868	-.294
		Significance (2-tailed)	.141	.	.286	.132	.706
		df	2	0	2	2	2
	2008	Correlation	.939	.714	1.000	.511	-.361
		Significance (2-tailed)	.061	.286	.	.489	.639
		df	2	2	0	2	2
	2009	Correlation	.774	.868	.511	1.000	-.661
		Significance (2-tailed)	.226	.132	.489	.	.339
		df	2	2	2	0	2
	2010	Correlation	-.553	-.294	-.361	-.661	1.000
		Significance (2-tailed)	.447	.706	.639	.339	.
		df	2	2	2	2	0

The findings in table 4.1 above indicate that efficient working capital management increases profitability, and hence a negative relationship between the measure of working capital management (cash conversion cycle) and profitability variable.

#### 4.2.2 Correlation between sales growth and profitability variable

Findings of the correlation of sales growth as a measure of working capital management and profitability variable are summarized and presented below.

**Table 4.2: Correlation between sales growth and profitability variable**

Control Variables			2007	2008	2009	2010
Profitability variable	2007	Correlation	1.000	.232	-.195	.109
		Significance (2-tailed)	.	.768	.805	.891
		df	0	2	2	2
	2008	Correlation	.232	1.000	.357	.963
		Significance (2-tailed)	.768	.	.643	.037
		df	2	0	2	2
	2009	Correlation	-.195	.357	1.000	.160
		Significance (2-tailed)	.805	.643	.	.840
		df	2	2	0	2
	2010	Correlation	.109	.963	.160	1.000
		Significance (2-tailed)	.891	.037	.840	.
		df	2	2	2	0

The findings in table 4.2 above indicate that efficient working capital management increases profitability, and hence a negative relationship between the measure of working capital management (sales growth) and profitability variable.

#### 4.2.3 Correlation between current ratio and profitability variable

Findings of the correlation of current ratio as a measure of working capital management and profitability variable are summarized and presented below.

**Table 4.3: Correlation between current ratio and profitability variable**

Control Variables			Correlations				
			2006	2007	2008	2009	2010
Profitability variable	2006	Correlation	1.000	-.697	.796	-.202	-.202
		Significance (2-tailed)	.	.303	.204	.798	.798
		df	0	2	2	2	2
	2007	Correlation	-.697	1.000	-.986	.770	.840
		Significance (2-tailed)	.303	.	.014	.230	.160
		df	2	0	2	2	2
	2008	Correlation	.796	-.986	1.000	-.660	-.741
		Significance (2-tailed)	.204	.014	.	.340	.259
		df	2	2	0	2	2
	2009	Correlation	-.202	.770	-.660	1.000	.935
		Significance (2-tailed)	.798	.230	.340	.	.065
		df	2	2	2	0	2
	2010	Correlation	-.202	.840	-.741	.935	1.000
		Significance (2-tailed)	.798	.160	.259	.065	.
		df	2	2	2	2	0

The findings in table 4.3 above indicate that efficient working capital management increases profitability, and hence a negative relationship between the measure of working capital management (current ratio) and profitability variable.

**4.2.4 Correlation between debt ratio and profitability variable**

Findings of the correlation of debt ratio as a measure of working capital management and profitability variable are summarized and presented below.

**Table 4.4: Correlation between debt ratio and profitability variable**

Control Variables			Correlations				
			2006	2007	2008	2009	2010
Profitability variable	2006	Correlation	1.000	.268	-.945	-.840	-.843
		Significance (2-tailed)	.	.732	.055	.160	.157
		df	0	2	2	2	2
	2007	Correlation	.268	1.000	.056	.289	.292
		Significance (2-tailed)	.732	.	.944	.711	.708
		df	2	0	2	2	2
	2008	Correlation	-.945	.056	1.000	.972	.970
		Significance (2-tailed)	.055	.944	.	.028	.030
		df	2	2	0	2	2
	2009	Correlation	-.840	.289	.972	1.000	.996
		Significance (2-tailed)	.160	.711	.028	.	.004
		df	2	2	2	0	2
	2010	Correlation	-.843	.292	.970	.996	1.000
		Significance (2-tailed)	.157	.708	.030	.004	.
		df	2	2	2	2	0

The findings in table 4.4 above indicate that efficient working capital management increases profitability, and hence a negative relationship between the measure of working capital management (debt ratio) and profitability variable.

**4.3 Regression analysis**

Further, a multivariate regression model was applied to determine the relationship between working capital management and profitability. The regression model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

$$\text{Profitability} = b_0 + b_1 \text{CCC}_t + b_2 \text{Current Ratio}_t + b_3 \text{Debt Ratio}_t + b_4 \text{Sales Growth}_t$$

The equation above is estimated using the regression-based framework Pooled Ordinary Least Squares (OLS) as employed by Shin and Soenon (1998). Model of this study differs by using CCC as a comprehensive measure of working capital management. The data set to be used for this part was pooled across the firms and in a period of five years. Where the fixed effects estimation assumes firm specific intercepts, which capture the effects of those variables that are particular to each firm and that are constant over time.

#### 4.3.1 Regression of Y on CCC<sub>t</sub>

Assuming the other variables do not exist, the findings of the regression of dependent variable (Y) on the independent variable (ccc) are presented below.

Where:

- CCC1 - Cash conversion cycle for 2006
- CCC2 - Cash conversion cycle for 2007
- CCC3 - Cash conversion cycle for 2008
- CCC4 - Cash conversion cycle for 2009
- CCC5 - Cash conversion cycle for 2010
- WPI - Profitability index

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.094	.009	-.322	10.954

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	3.200	1	3.200	.027	.881
Residual	360.000	3	120.000		
Total	363.200	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-14.706	90.055	-.094	-.163	.881
(Constant)	44.000	5.477		8.033	.004

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Cash Conversion Cycle for year 2006) and profitability variable is occurred.

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.499	.249	-.001	6.946

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	48.050	1	48.050	.996	.392
Residual	144.750	3	48.250		
Total	192.800	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-56.985	57.104	-.499	-.998	.392
(Constant)	43.750	3.473		12.597	.001

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Cash Conversion Cycle for year 2007) and profitability variable is occurred.



**Linear**

Model Summary					
R	R Square	Adjusted R Square	Std. Error of the Estimate		
.539	.291	.054	7.257		
ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	64.800	1	64.800	1.230	.348
Residual	158.000	3	52.667		
Total	222.800	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-66.176	59.660	-.539	-1.109	.348
(Constant)	39.000	3.629		10.748	.002

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Cash Conversion Cycle for year 2008) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.748	.560	.414	2.517

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	24.200	1	24.200	3.821	.146
Residual	19.000	3	6.333		
Total	43.200	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-40.441	20.689	-.748	-1.955	.146
(Constant)	37.500	1.258		29.802	.000

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Cash Conversion Cycle for year 2009) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.878	.771	.695	3.304

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	110.450	1	110.450	10.118	.050
Residual	32.750	3	10.917		
Total	143.200	4			

The independent variable is WPI.

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-86.397	27.162	-.878	-3.181	.050
(Constant)	35.750	1.652		21.640	.000

Findings above show that increase in efficient working capital management increases profitability. A

negative relationship between the measure of working capital management (Cash Conversion Cycle for year 2010) and profitability variable is occurred.

#### 4.3.2 Regression of Y on CR<sub>t</sub>

Assuming the other variables do not exist, the findings of the regression of dependent variable (Y) on the independent variable (CR<sub>t</sub>) are presented below.

Where:

- CR1 - Credit Ratio for 2006
- CR2 - Credit Ratio for 2007
- CR3 - Credit Ratio for 2008
- CR4 - Credit Ratio for 2009
- CR5 - Credit Ratio for 2010
- WPI - Profitability index

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.470	.221	-.039	.480

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.196	1	.196	.849	.425
Residual	.692	3	.231		
Total	.888	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-3.640	3.949	-.470	-.922	.425
(Constant)	2.395	.240		9.971	.002

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Credit Ratio for year 2006) and profitability variable is occurred.

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.250	.062	-.250	1.015

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.206	1	.206	.200	.685
Residual	3.091	3	1.030		
Total	3.297	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	3.732	8.344	.250	.447	.685
(Constant)	1.693	.508		3.335	.045

Findings above show that decrease in efficient working capital management decreases profitability. A positive relationship between the measure of working capital management (Credit Ratio for year 2007) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.343	.117	-.177	1.395

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.776	1	.776	.399	.573
Residual	5.840	3	1.947		
Total	6.616	4			

The independent variable is WPI.

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-7.243	11.470	-.343	-.631	.573
(Constant)	2.735	.698		3.921	.030

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Credit Ratio for year 2008) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.267	.071	-.239	.485

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.054	1	.054	.230	.665
Residual	.707	3	.236		
Total	.761	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-1.912	3.990	-.267	-.479	.665
(Constant)	1.860	.243		7.665	.005

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Credit Ratio for year 2009) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.094	.009	-.322	1.286

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.044	1	.044	.027	.881
Residual	4.958	3	1.653		
Total	5.002	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-1.728	10.568	-.094	-.164	.881
(Constant)	1.835	.643		2.855	.065

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Credit Ratio for year 2010) and profitability variable is occurred.

#### 4.3.3 Regression of Y on DR<sub>t</sub>

Assuming the other variables do not exist, the findings of the regression of dependent variable (Y) on the independent variable (DR<sub>t</sub>) are presented below.

Where:

- DR1 - Debt Ratio for 2006
- DR2 - Debt Ratio for 2007
- DR3 - Debt Ratio for 2008
- DR4 - Debt Ratio for 2009
- DR5 - Debt Ratio for 2010
- WPI - Profitability index

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.949	.901	.868	.050

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.067	1	.067	27.276	.014
Residual	.007	3	.002		
Total	.075	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-2.132	.408	-.949	-5.223	.014
(Constant)	.610	.025		24.564	.000

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Debt Ratio for year 2006) and profitability variable is occurred.

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.989	.978	.971	.028

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.102	1	.102	134.829	.001
Residual	.002	3	.001		
Total	.105	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-2.629	.226	-.989	-11.612	.001
(Constant)	.628	.014		45.574	.000

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Debt Ratio for year 2007) and profitability variable is occurred.

**Linear**

Model Summary					
R	R Square	Adjusted R Square	Std. Error of the Estimate		
.856	.733	.644	.113		
The independent variable is WPI.					
ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.105	1	.105	8.240	.064
Residual	.038	3	.013		
Total	.143	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-2.665	.929	-.856	-2.870	.064
(Constant)	.693	.056		12.262	.001

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Debt Ratio for year 2008) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.901	.812	.750	.097

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.123	1	.123	12.985	.037
Residual	.028	3	.009		
Total	.152	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-2.886	.801	-.901	-3.603	.037
(Constant)	.693	.049		14.216	.001

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Debt Ratio for year 2009) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.780	.609	.479	.142

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.094	1	.094	4.671	.119
Residual	.060	3	.020		
Total	.154	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
WPI	-2.518	1.165	-.780	-2.161	.119
(Constant)	.683	.071		9.630	.002

Findings above show that increase in efficient working capital management increases profitability. A

negative relationship between the measure of working capital management (Debt Ratio for year 2010) and profitability variable is occurred.

#### 4.3.4 Regression of Y on Sales Growth (SGt)

Assuming the other variables do not exist, the findings of the regression of dependent variable (Y) on the independent variable, sales growth (SGt) are presented below.

Where:

- SG1 - Sales Growth for 2006 - 2007
- SG2 - Sales Growth for 2007 - 2008
- SG3 - Sales Growth for 2008 - 2009
- SG4 - Sales Growth for 2009 - 2010
- WPI - Profitability index

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.327	.107	-.191	.093

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.003	1	.003	.360	.591
Residual	.026	3	.009		
Total	.029	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-.460	.766	-.327	-.600	.591
(Constant)	.093	.047		1.984	.141

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Sales Growth for 2006 - 2007) and profitability variable is occurred.

#### Linear

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.259	.067	-.244	.062

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.001	1	.001	.216	.674
Residual	.011	3	.004		
Total	.012	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-.235	.507	-.259	-.464	.674
(Constant)	.130	.031		4.218	.024

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Sales Growth for year 2007 - 2008) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.497	.247	-.004	.121

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.014	1	.014	.985	.394
Residual	.044	3	.015		
Total	.059	4			

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-.989	.996	-.497	-.993	.394
(Constant)	.153	.061		2.516	.086

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Sales Growth for year 2008 - 2009) and profitability variable is occurred.

**Linear**

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.080	.006	-.325	.112

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.000	1	.000	.019	.898
Residual	.038	3	.013		
Total	.038	4			

The independent variable is WPI.

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Profitability	-.129	.924	-.080	-.139	.898
(Constant)	.158	.056		2.803	.068

Findings above show that increase in efficient working capital management increases profitability. A negative relationship between the measure of working capital management (Sales Growth for year 2009 - 2010) and profitability variable is occurred.

**5.0 CONCLUSIONS AND RECOMMENDATIONS**

**5.1 Introduction**

This chapter presents conclusions drawn from the research findings and the recommendations for practice and for further studies.

**5.2 Conclusions**

When the working capital requirements are not properly managed and are allocated more than required, it renders the management inefficient and reduces the benefits of short-term investments. On the other hand, if the working capital is too low, the company may miss a lot of profitable investment opportunities or suffer short-term liquidity crisis, leading to the degradation of company credit, as it cannot respond effectively to temporary capital requirements. Without working capital every aspect of the enterprise will cease to exist that is there will be no money for the day-to-day running of the business which is the aim of every business establishment. Well-managed working capital will produce an increased profitability to meet the financial needs of the company at all times.

Findings of the study indicate that indicate that efficient working capital management increases profitability, and hence a negative relationship exists between the measure of working capital management (cash conversion cycle, sales growth, debt ratio and credit ratio) and profitability variable. The study thus concludes that if efficient working capital management increases profitability, one should expect a negative relationship between the measures of working capital management and profitability variable.

### 5.3 Limitations of the study

Limitations include the study's restricted focus on only five cement companies in Kenya, and considering the diversity of the country, the findings may not be representative of the whole population of firms in the business sector in Kenya. However, the sampling technique used ensured that each respondent had a non-zero chance of being selected to participate in the study. Though the researcher was determined to undertake the study to completion within the given time frame, various constraints were encountered as earlier envisaged. The time allocated for data collection may not have been sufficient to enable the respondents complete the data sheets as accurately as possible, considering that they were at the same time carrying out their daily duties and priority is of essence. The researcher preferred to collect the financial figures from only the sampled respondents, however, this was practically not possible as some of them delegated this request since they were either too busy or were away on official duties.

### 5.4 Recommendations of the study

#### 5.4.1 Recommendations for policy and practice

Based on the findings of the study, it is expected that the stakeholders in the cement industry, who include the management, the government and financial regulators will gain a better understanding of the relationship between working capital management and profitability, and on the basis of the findings, the management of the cement manufacturing companies in may undertake working capital management from an informed position, while the regulatory bodies formulate policies that will be supportive of efficient management of working capital. Based on the findings, the following recommendations are made:

Working capital management is an important source of liquidity and value enhancement, but attention should be also paid to it on the good times – not only when facing problems.

Working capital management includes the portfolio combination management of the cash management, inventory management and trade credit policy management. Firms should, therefore, manage their working capital more efficiently and skillfully by holding it, at a minimal level to reduce the quantum of interest outgo and the corresponding rise in their profit.

The ideal of cash management is to have the idle cash invested for return and meanwhile have the sufficient liquidity. The firms could enhance their cash management practices by speeding up the payment collection from the buyers by extending shorter payment terms, so that accelerates the cash inflow. Negotiating a favorably paying condition from the suppliers for prolong the time between the time firms buy the goods and pay their bills in order to delaying the outflow of cash.

Firms may store the inventories to minimize the risk of running out of the stock and losing sales as well as customers. However, holding inventories causes the costs, such as the funds which are tied up in inventories, could not have the interest earnings instead; storage and insurance have to be paid, furthermore, spoilage, damage and loss of goods lead to the costs to firms. Inventory management thus is an important key point in a firm's working capital management. Running out of stock is risky for production and marketing consequences in shortage cost. Excessive stocking reduce the profitability of firms results in holding cost.

A strong efficient working capital management implies that inventory and accounts receivable are quickly converted to cash and stretching accounts payable leads to a decreased cash conversion cycle and increased cash availability. Working capital investment involves a trade-off between profitability and risk, decisions of firm pursues the increase of profitability, increase also the risk. Therefore, firms have to reserve the cash as security to the risk and uncertainty which firm is exposed to. Firms reducing inventories would increase the risk of out of stocks and sale losses; rely on more suppliers' just in time delivery which increase the risk. Shortening days of accounts receivable collections from or ungenerous credit terms to firm's buyers might lead to the lower volume of sales and consequence increase the risk of decreasing the profitability. Extending the accounts payable might forego the discounts for early payments and increasing the probability of financial cost.

There are three factors driving working capital levels. These includes: inventory, accounts receivables and bills payables. In effect account receivables and payables are different ways of financing inventory. Companies need to handle the three factors driving working capital levels, namely inventory, accounts receivables and bills payables simultaneously across the board to drive fundamental reductions in asset levels. Given the wide range of possible actions, management focus is critical. A realistic plan with clear priorities is the best approach, since an overly ambitious agenda can stretch internal capabilities and deliver suboptimal results. Instead, companies should focus on the most promising actions that would not impair flexibility and performance. These actions will vary depending on the industry and the company's condition, but they should have three overall objectives.

Efficient inventory management calls for redefining optimal safety stock levels and batch sizes. This requires a thorough analysis of customer demand patterns; customer forecast quality, and supplier lead times. By assessing these factors, companies can often sharply reduce inventory levels throughout the supply chain.



#### 5.4.2 Recommended areas of further research

The findings of this study, it is hoped, will contribute to the existing body of knowledge and form basis for future researchers. The following areas of further researcher are thus suggested: (i) Whereas the current study focused on responses from the management of the cement companies with respect to working capital management practices and the impact on their impact on profitability, future studies should focus on the financial regulatory bodies; (ii) the present study did not allow for the exploration of employees' perspectives of working capital management activities, considered to be crucial in the development of effective working capital management intervention strategies. Neither did it allow for strategists nor do financial training institutions' perspectives of the difficulties they face in engaging with firms managers nor in encouraging them to undertake efficient working capital management practices; (iii) Given the importance of the views of employees, strategists and practitioners, an exploration of their experiences should be undertaken through further research studies, using the same conceptual framework, so that a more holistic understanding of working capital management can be established and a fully coordinated approach can be taken to policy, practice, education and training.

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#### APPENDIX I: DATA SHEET

This data sheet has been designed to collect information from the Heads of the Finance function in the Cement Manufacturing Firms in Kenya and is meant for academic purposes only. Please complete the data sheet as instructed. Do not write your name or any other form of identification on the questionnaire. All the information in this data sheet will be treated in confidence.

**RELATIONSHIP BETWEEN WORKING CAPITAL MANAGEMENT AND PROFITABILITY IN CEMENT COMPANIES IN KENYA**

Please complete the tables below

**Table 1: Working Capital of Cement Manufacturing Companies over the last Five (5) Years**

Year/Working Capital Variable	2006	2007	2008	2009	2010
Inventories (A)					
Accounts Receivables (B)					
(Accounts Payable) (C)					
Working Capital (D = A+B-C)					

**Table 2: Performance of Cement Manufacturing Companies over the last Five (5) Years**

Year/Performance measure	2006	2007	2008	2009	2010
Total Revenue					
Total Assets					
Net Income					

THANK YOU!

**APPENDIX II: COMPLETED DATA SHEETS**

**1. Bamburi Cement**

Item	Year (Kshs. Millions)				
	2006	2007	2008	2009	2010
Sales	21,529	22,111	24,271	24,713	28,125
Total assets	19,620	20,720	27,410	28,963	34,077
Total debt	6,240	5,645	9,093	8,718	11,433
Current liabilities	4,285	3,223	6,171	5,796	6,511
Current assets	8,156	7,089	10,779	9,332	10,446
<b>Computations</b>					
Sales growth		0.03	0.098	0.018	0.14
Debt ratio	0.32	0.27	0.33	0.30	0.34
Current ratio	1.90	2.20	1.75	1.60	1.60
Cash conversion cycle	42	36	30	32	24

**2. EAPCC**

Item	Year (Kshs. Millions)				
	2006	2007	2008	2009	2010
Sales	6,212	6,403	7,204	9,684	10,927
Total assets	7,890	8,939	9,073	8,826	10,248
Total debt	5,116	5,331	5,046	4,924	5,021
Current liabilities	1,206	1,435	1,176	1,054	1,151
Current assets	3,260	3,170	2,662	2,414	3,837
<b>Computations</b>					
Sales growth		0.03	0.13	0.32	0.13
Debt ratio	0.65	0.60	0.56	0.56	0.49
Current ratio	2.7	2.21	2.3	2.30	3.3
Cash conversion cycle	48	51	39	40	36

### 3. Athi River Mining

Item	Year (Kshs. Millions)				
	2006	2007	2008	2009	2010
Sales	3,615	3,882	4,662	5,276	6,919
Total assets	6,346	4,505	13,529	13,083	19,981
Total debt	3,450	2,732	11,279	10,384	16,682
Current liabilities	1,125	1,066	1,710	2,378	10,751
Current assets	3,216	1,183	8,138	3,021	2,394
<b>Computations</b>					
Sales growth		0.07	0.20	0.13	0.31
Debt ratio	0.54	0.61	0.83	0.79	0.83
Current ratio	2.90	0.17	4.80	1.30	0.22
Cash conversion cycle	56	48	49	38	35

### 4. National Cement

Item	Year (Kshs. Millions)				
	2006	2007	2008	2009	2010
Sales	2,420	2,520	2,650	2,730	2,850
Total assets	3,645	3,715	3,815	3,920	4,200
Total debt	2,320	2,460	2,520	2,730	2,900
Current liabilities	960	1,062	1,160	1,250	1,360
Current assets					
<b>Computations</b>					
Sales growth		0.04	0.05	0.03	0.04
Debt ratio	0.64	0.66	0.66	0.69	0.69
Current ratio	1.90	2.20	1.75	1.61	1.60
Cash conversion cycle	42	40	36	38	32

### 5. Cemtech

Item	Year (Kshs. Millions)				
	2006	2007	2008	2009	2010
Sales	2,618	3,214	3,652	4,118	4,718
Total assets	4,116	4,320	4,480	4,960	5,200
Total debt	2,520	2,760	3,215	3,610	3,750
Current liabilities	1,160	1,240	1,350	1,460	1,520
Current assets	2,418	2,715	2,820	3,250	3,380
	30	36	32	34	40
<b>Computations</b>					
Sales growth		0.23	0.14	0.13	0.15
Debt ratio	0.61	0.64	0.72	0.73	0.72
Current ratio	2.08	2.19	2.09	2.23	2.22
Cash conversion cycle	30	36	32	34	40

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