FACTORS AFFECTING COMPETITIVENESS IN THE CEMENT INDUSTRY IN KENYA, 2000-2015

BY

CYRUS W. MUIRU

X50/75021/2009

A Research Project Submitted to the School of Economics in Partial Fulfillment of the Requirement for the Award of Degree of Master of Arts in Economics of the University of Nairobi.

November 2016

DECLARATION

This research project is my original work and to the best of my knowledge had not been presented for examination in any institution for academic award.

Signature: …………………………………… Date: …………………………………………

Name: **CYRUS W. MUIRU**

X50/75021/2009

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

Signature: …………………………………… Date: …………………………………………..

Name: **DR. K AMAU GATHIAKA**

SCHOOL OF ECONOMICS.

DEDICATION

This research project is dedicated to my two sons; Prince and Nish and my wife Joyce who gives me a reason to work hard and who supported me through the study period.

ACKNOWLEDGEMENT

I have accumulated a lot of indebtness in the process of writing this research paper. First sincere thanks to my supervisor Dr. Kamau Gathiaka for his tireless effort reading through my drafts and giving me positive criticisms and guidance. Your valuable comments and guidance greatly helped to improve the quality of this project.

Secondly, I have greatly benefited from the discussion on the research proposal at the School of Economics seminar. In this regard, am grateful to all the panelists, other supervisors and my colleagues at the University of Nairobi for their excellent comments.

A lot of gratitude goes to my friends and colleagues at work who made it easy for me to do the study.

However, I am responsible for errors and views expressed in this paper.

TABLE OF CONTENTS

ABSTARCT

Firm thrive to effectively compete with their opponents in the market. Competition of the firm can give a clue on how better and efficient the resources are allocated in a firm and it is closely related to how better a country's net export can improve over time thus improving the economic growth of a nation. Motivated by these concerns, this study aimed at investigating the determinants of the cement industry firm's competitiveness using a panel data technique for three firms (Bamburi, Athi River and Potland) for a period of 16 years (2000-2015). The study revealed thatthe firm's financial Leverage, liquidity of the firm and export volume had a respective negative impact on the firm's competitive while relative firm's size and firm's age had a positive influence. Equally, the study further revealed that only firm's size and export volume were statistically significant in determining the firm's competitiveness in the period under study. The study therefore recommended that the individual firm in the cement industry to maximize firm's size in terms of opening new branches as this was found to positively affect the firm's competitiveness. Secondly, since the firm's age was also positively related to the firm's competitiveness, the individual firms can strive to hire experienced workers as age is closely related to experience of the workers. Lastly there is a need for minimization of firm's financial Leverage, liquidity and export volume since they were found to have a negative effect on the firm's competitiveness.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The cement industry has become more globalized with multinational firms controlling the world cement manufacturing industry. Playing a crucial role as a main building material globally, the industry has not only led to faster economic growth but helped countries to development (Seboru, 2013). The consumption of cement is used to measure the growth in the building and construction industry with the demand mainly driven by housing and infrastructural construction.

With the world becoming a global village, competition has become more vicious than ever. For instance, according to Liargovas and Skandalis (2012), several factors such as favourable trade terms (through reduction of trade barriers), high trade innovations resulting from improved technology as well as transactional costs such as communication and transportation cost have increased international competition. Such stiff Competition necessitates firms to come up with strategies that improve competitiveness. This is predominant to developing countries like Kenya where competitiveness helps firms surmount the restrictions of their limited domestic markets in order to operate optimally.

American Dictionary (2000) provides a useful initial definition of Competitiveness as "the ability of a company or product to compete with others and the desire to be more successful than other people".

The EU Commission (2003) relates competitiveness on the basis of an economy's ability to provide its citizens with high sustainable standards of living through welfare improvement like quality employment for the workforce. However, at the industry level, Buckley, et al. (1988) is

of the idea that a firm in a given industry will be in competition when it is able to produce high quality goods or services efficiently (at lower costs than other firms and still make more profits than its competitors whether locally or internationally). Thus competitiveness is very crucial for the firm's long run profit performance and its ability to repay its costs as well as providing better returns to the shareholders. Potential investors have used the firm's relative prices or its market share and its profitability to access its competitiveness before they make rational decisions for investment especially in the stock marks (Notta and Vlachvei, 2011).

Globally, the International Cement Review, 2010, estimates an existence of one hundred and forty nine cement producing nations. These 149 firms have a capacity of producing 3.5 billion tonnes of cement per annum. For instance, according to the same report, in 2010 alone, the world production reached 3.3 billion tonnes of cement while the same year approximately 3.29 billion tonnes of cement was consumed.

Seboru (2013), notes that cement industry globally has been doing generally well in terms of supply and demand of cement. For instance, some of this growth of the cement industry in the least developed nations has been attributed to the heavy investments of the product in the social overhead development as well as infrastructure development. At the moment, china is the world's largest producer as well as largest consumer of cement. This is due to its larger population (of about 1.3 billion people) and its priority in infrastructural projects as well as urbanization. It is then closely followed by India whose current population stands at 1.1 billion people with a taste of housing and infrastructure development (Seboru, 2013). In Africa however, Egypt is the largest while East African countries, where Kenya belongs accounts for 7.2 million tons of cement per annum in 2010 alone. This East African capacity has a shortage in

that in the same year (2010), the demand for cement stood at 9.4 million tons. Worse off is that

the production of cement in East Africa has a very small share of the world market accounting

for 0.00022% of the total cement produced globally in 2010.

Kenya leads in the East Africa accounting for over 50% of the total cement produced, translating

to about 0.00011% of the global production. For instance, Kenyan's production has been steadily

increasing since 2010 and is even expected to do even better in 2017 to a tune of 6,900,000

tonnes as shown in the graph below.
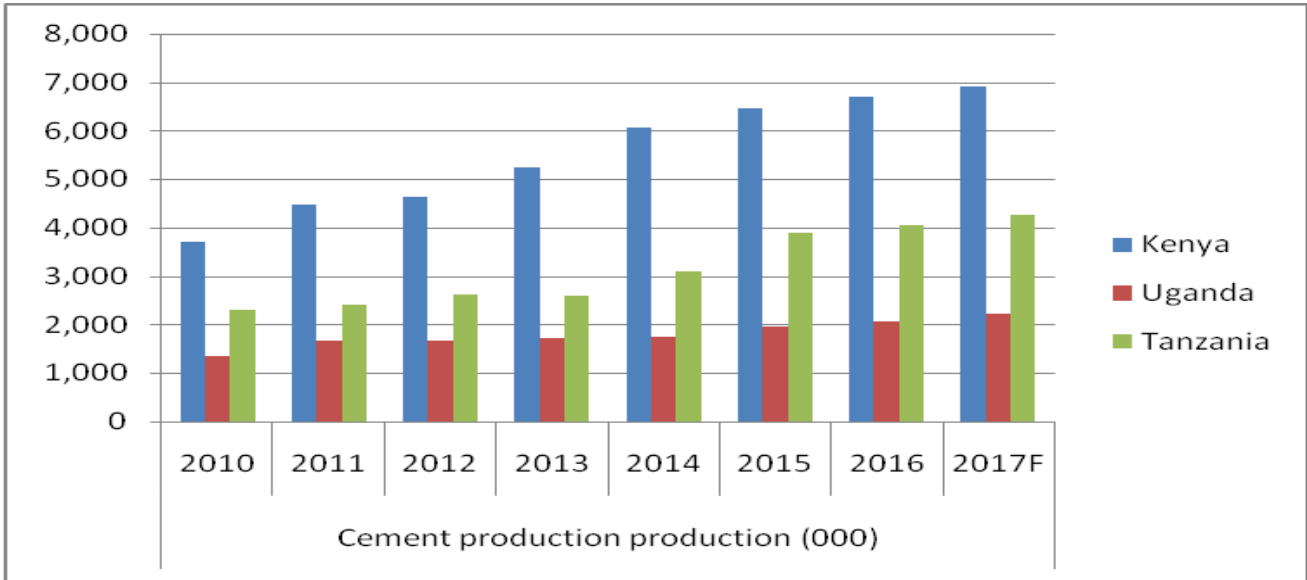
Source: Kenya National Bureau of Statistic, 2016

From the graph above, Kenyan cement production has maintained an upward trend and has led in

the production of cement in the region. Tanzania follows while Uganda is the least producer with

some years such as 2013 and 2014 registering a decrease in the production of cement in the same

country.

The performance of the cement industry in East Africa has been negatively affected by cheap imports into its market. For instance, the imports are expected to hit 2.8 million tons by 2017 according to the statistics from the Kenya National Bureau of Statistic (2016). Such stiff competition from efficiently producing countries such as those in Asia is likely to persist in the market for a long duration due to the unwillingness of the concerned countries to protect their indigenous cement industries through trade barriers as reflected in the trade openness to the major cement producing countries like China. With the high demand for cement industry products both from the public and private sector investment, the cement industry prospect looks well. For instance, East Africa houses the newly formed world youngest nation- Southern Sudan which provides an opportunity resulting from the various reconstruction areas as well as countries like Republic of Rwanda, Republic of Burundi and DRC which have not fully undergone reconstruction that was delayed from the conflicts they have faced in their nations in the recent past (Seboru, 2013).

In 2014, the Kenya manufacturing industry grew by 3.4% compared to 5.6% in 2013 (Economic Survey, 2015). With the construction industry growing at a faster growth rate mainly due to real estate and property development as well as demand for office space in Kenyan urban centers, the cement industry is expected to perform even better by 2024 (Economic Survey, 2015). For example, Kenya is currently working on a major rail infrastructure (The Standard Gauge Rail - SGR) that is expected to serve Mombasa port and its hinterland such as interior Kenya, Uganda, Southern Sudan and other neighbouring landlocked countries. Equally the Kenyan government is currently expanding its roads (such as Thika super highway in 2010-2014), airport terminal as

well as Mombasa port all of which demand immense cement for construction (Economic Survey, 2015).

The Kenyan cement industry has six operational manufacturing firms which compete highly in the domestic and regional markets. This competition for market share has led to advanced, reliable and durable cement products at competitive prices.

1.1.1 Overview of Cement Industry in Kenya

The history of the cement industry in Kenya dates back to 1930s when in 1933, East Africa Portland Cement (EAPC) started importing cement. The plant initial production was 60,000 tonnes per annum. By 2015, the capacity had grown by approximately 1066.67% to producing 700,000 tonnes per annum (East African Portland Cement - EAPC, 2015). EAPC has a market capitalization of 10 billion (Nairobi Stock Exchange records, 2007). In 1951, Bamburi Cement Ltd was founded. Lafarge, a company from France is the principal shareholder of Bamburi Cement Ltd. At inception the annual capacity was 140,000 tonnes of cement but at present it stands at 2.1 million tonnes a year and a market capitalization of 70 billion shilling (Bamburi Cement, 2015). Athi River Mining Limited-ARML was established in 1974 and its principle shareholder is the Paunrama family. Initially it was a mineral extraction and processing company and later in 1996, the cement division began operation. The company has a market capitalization of 8.7 billion (Athi River Mining Limited, 2015). Currently Kenya's cement factories are owned by six manufacturing firms located in Mombasa, Nairobi's Athi River branch and in Lukenya in Machakos County (Dyer & Blair Investment Bank, 2012).

Table 2.1: Cement Companies in Kenya

	Cement Company	Mines	Cement Brand
1.	Bamburi Cement Limited (BMBC)	Mombasa	Nguvu
2.	A.R.M.L (The Athi River Mining Limited)	Athi River	Rhino
3.	E.A.P.C (The East African Portland Cement Company Limited)	Athi River	Blue Triangle
4.	N.C.C.L (The National Cement Company Limited)	Lukenya	Simba
5.	Mombasa Cement Limited	Athi River	Nyumba
6.	Savannah Cement Company (SCC)	Athi River	Savannah

Source: Dyer & Blair Investment Bank (2012)

There is however new entrants into the cement Industry in Kenya. Dangote Cement that is based in Nigeria has commenced to put up a plant to produce 3m tones in Kitui County per year. India's Sanghli Group through Cemtech Kenya which is its subsidiary intends to put up a cement manufacturing base in Pokot County with a production of 1.2m tone per year. Plans are also there to integrate Athi River Mining Cements to clinker and put up a cement plant in Kitui that will have a capacity of 2.5m tones per annum when completed.

Cement consumption is one of the indicators of the general development in the construction industry. It mirrors the level of activity in the sector (Seboru, 2013). The industry is important as it plays a forward and backward linkage with other economic sectors. It's a critical indicator of the general economic condition. It also contributes revenue to the government and supports other key sectors such as of energy (Central Bank of Kenya-CBK, 2007). It also supports the community in terms of income, community programs and skills through cooperate social responsibility programs. The cement industry requires huge capital and only a few companies use state of the art facilities. Cement manufacturing is energy intensive and modern plants are

highly automated. The industry plays central stage in climate change debate and energy consumption accounts for up to 45% of the cost of production (Kinyua, 2007).

1.2 Statement of the Problem

According to the Economic survey (2015), infrastructural projects such as the standard gauge railway, roads and houses have led to the growth in the construction industry reaching 13.1% in 2014 which is more than double the previous year (Republic of Kenya, 2015). However, according to Athi River Mining,(ARM) the increase in domestic demand has not resulted to good profits for the cement manufacturers. Net profit margins for Kenya's cement firms were at an all-time low of 11per cent in 2014 (ARM, 2015). This, they say may be attributed to cheap imports from other countries such as China and India where the cost of production is low. This begs the question as to how competitive the cement industry in Kenya is.

A lot of work has been done on competitiveness at the country's level but there is little published work on competitiveness at the firm level globally. The work done on competitiveness at the firm level is even less in developing countries particularly of Africa and specifically for Kenya. There is thus little knowledge on competitiveness at the firm level and hence informed policies cannot be formulated. For a nation to be competitive, individual firms have to be competitive.

This study therefore intends to bridge this gap of knowledge by analyzing factors affecting competitiveness of cement manufacturing firms in Kenya.

1.3 Research Questions

The following research questions guided the study:

i. How are the profit/asset ratios among the firms in the cement industry in Kenya and what do they say of competitiveness among firms in the industry.

ii. What makes some firms to have better profit/asset ratios than others in the industry.

iii. What policy options can help to improve competitiveness in the cement industry in Kenya.

1.4 Study objectives

The main objective of this study was to establish the key determinants of competitiveness in manufacturing, focusing on the cement industry in Kenya. The study's specific objectives were:

i. To analyse competitiveness among cement manufacturing firms in Kenya using the index of profit/asset ratio or the return on assets (ROA) indicator.

ii. To analyse the factors affecting ROA paying attention to the influence of financial leverage, liquidity, firm size and export performance in the industry.

iii. To recommend policies to promote competitiveness in the cement manufacturing sector in Kenya

1.5 Justification of the Study

The findings of this study will be useful to the cement manufacturing firms in Kenya. It will help them formulate strategies to make them more competitive.

The policy makers and regulators may use the findings of the study as reference for policy guidelines on competitiveness in the manufacturing industry. The study will provide additional information in the already existing body of literature on competition economics. This is of

interest to academicians and researchers who may seek to explore and carry out further investigations on firm competitiveness.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

According to Porter (1998), Competitiveness of firms is capability to make profitably products that have the ability to compete within the global environment, at the same time having some opportunity to meet the cost of returns on resources employed (Porter, 1998). To others such as WEF (2015), competitiveness is viewed as some sets of policies that influence the level of a firm's productivity within a given industry. With the level of productivity this study means those factors that influence the rates of return from a given investment in a country (Global Competitiveness Report 2014-2015).

2.1.1 Profit performance as a measure of competitiveness

Firm's ability to possess a comparative advantage over the others in the same industry has been closely linked to its success in terms of performance and profitability (Buckley et al., 1988). Thus according to performance measure, financial performance is likely to be a strategy of a firm that increases its production and sales when profitable opportunities exist. Firms especially those dealing with differential products can reflect competitiveness through their ability to make profits in a flooded market. However, this concept has a limitation in that it does not explain the source of competitiveness (Liargovas and Skandalis, 2012).

2.1.2 Drivers of Competitiveness

According to Liargovas (2012), firm's competitiveness has multifaceted drivers/indicators used to reflect the complex relationships. Equally the World Economic Forum has recognized twelve (12) pillars that influence the competitiveness of any given nation and are mostly applicable when dealing with the measurement of the worldwide competitive index. The pillars identified are: various institutions in place, the macroeconomic situation/environment of a nation,

infrastructure, health status and the level of both primary and higher education, efficiency of available market, the efficiency of the labor market, the financial market development, the readiness to adopt and availability of technology, the size of the market, business leverage/sophistication as well as innovations (Global Competitiveness Report, 2014-2015).

These pillars however apply to economies in general at the macro rather than the micro level of a firm. For instance, a firm recruits its labor force from the market without taking into consideration the level of primary, higher or training in the country as a whole.

According to Wuttipong (2006), competitiveness of firms is mainly influenced by production economies, technology, the input costs, the firm's product differentiation and quality, the advertising and promotion, as well as other external factors.

The World Economic Forum (2015) contends that today the world has become a global village and that technology is progressively becoming important for firm/industry to compete and thrive. According to Global Competitiveness Report (2015), technological readiness can be linked to response of a given nation to adopt existing technologies that is used to enhance the productivity of its industries.

2.1.3 Financial leverage and competitiveness in the manufacturing industry

The performance of any firm, according to agency theory, is closely influenced by its financial leverage due to the fact that financial leverage is a crucial tool for disciplining management. But this may not be practical to a firm with high indebtedness since it is associated with financial limitations which negatively lead to underperformance of a firm (Mahmoudi, 2014). From a theoretical perspective, firm's performance has been pegged on three important aspects namely

firm's operating margins, return on equity as well as return on the firm's asset. Equally many theoretical studies have pointed out that the firm's debt to total assets is crucial in determining the firm's financial leverage measure. Such financial leverage do play a role of indicating the degree at the firm is utilizing borrowed funds and therefore according to Skandalis (2012), firms with high leverage may be rendered bankrupt when they fail to repay their borrowed credit.

2.1.4 Liquidity and competitiveness in the manufacturing industry

Ehiedu (2014) while investigating the influence of firm's liquidity on its financial performance revealed that liquidity showed a statistical significant influence and that it had a positive influence on the performance of the firm in term of profit growth. Same study was done by Egbide et al (2013) in Nigerian Stock Exchange which revealed two important result: firstly, their study found out that the firm's current ratio and liquid ratio were statistically significant and that they positively influenced the firm's profitability among the NSE. Lastly the study revealed that cash conversion period was negatively related with profitability of the listed NSE manufacturing companies in Nigeria.

2.1.5 Firm size and competitiveness in the manufacturing industry

A firm requires expanding in size as this is closely related to the economies of scale. For instance, Attari and Raza (2012) while investigating causality between cash conversion cycle with firm size as well as profitability of the firms showed an existence of a negative statistical significant correlation between the cash conversion cycle and the firm size. Similar study by Becker-Blease et al., (2010) did reveals an existence of a negative relationship between the firm size and its profitability but stresses that the relationship was more industry specific

2.1.6 Export performance and competitiveness in the manufacturing industry

Export performance is a factor that must be taken into consideration in economic policy decision making (Sousa, 2008). Achievement of a good export performance is taken into consideration by both planners of a private or public entity especially those involved in the strategic decision-making process. At a global outlook, a firm's ability to perform well in its export growth do reflect the extent at which such firms can obtain their objective/aims thus reflecting their suitability to the chosen strategic plan to appraising to its internal and external conditional circumstances. Thus with the revelation that exporting can be a strategic choice for a firms, the aims can be different between nationals, firms of same industry or in time horizons. Studies such as Katsikeas et al (2000), while investigating hundred export-related research works, come up with over forty performance measures/indicators for export performance. But Sousa (2008), increased this performance indicators to 50 in a more recent analysis of seven year interval (1998-2004) reflecting that indicators for export performance can vary in a wide range.

Despite the various variables used as measures of export performance, a number of them appear to be used more often than others. Some of them are firm's export intensity, the firm's export sales expansion, firm's export profitability, firm's export share of the market, as well as perceived export achievement (Sousa, 2008).

2.2 Empirical Literature

The African Competition Forum assert that trade between bordering countries- commonly called regional trade, may stiffen competition both internally or externally among partner. Thus according to the African Competition Forum (2014), trade in the regional blocs like in EAC, is mainly driven by David Ricardo's comparative advantage and as well as the ability of local firms

14

to leverage their capabilities and capacity into producing products for export at competitive terms of trade.

This actually applies to all industries including the cement industry as the competitiveness of any country or region is determined by the competitiveness of the individual company in that nation or region. The duty of the government or the country as a whole is to create an enabling environment for the individual firms to be competitive.

Voulgaris (2013) while investigating the determinants of firm's competitiveness in the manufacturing sector on the technology sectors in Greece using a panel data techniques, found out that the main factors in play included the firm's size, firm's age, firm's leverage, firm's capital intensity and new fixed assets formation to be crucial among the Greece firms. Equally the study revealed that the country's economic crisis was significantly in determining the pattern of the tested relationship. A similar study by Liargovas and Skandalis (2012) using data from Greece stock listed companies investigated the influence of both financial and non financial determinants of firm's competitiveness. Their study revealed concealed that the firm's leverage, firm's export activity; firm's location, firm's size and the firm's index for management competence were significant in affecting firm's competitiveness.

A study by Cheng (2010) in China investigates the factors behind the comparative advantage of an export-oriented garment industry located in Guangdong (China) after the Post-Crisis Era of the financial crisis of 2009. This study employed both the Comparative Advantage Index and Michael E. Porter's "Diamond Model" and found out that the export-oriented garment industry maintained a strong industrial downward competitiveness. This was attributed to the firm's low cost labor force, firm's complete chain of textile as well as firm's garment industry and lots of

15

specialized industrial clusters. However, the study warned that an increase of firm's costs or shortage of building space or even firm's lack of own could weaken the firm's competitive advantage (Cheng, 2010).

Liargovas & Skandalis (2012) while investigating the factors affecting firm competitiveness among 102 industrial firms listed in the Athens's stock exchange between 1997 and 2004 revealed that the firm's leverage, management index of competence; location, size and the export activity significantly affect firm competitiveness. The study also revealed that the relation between firm competitiveness indicators and drivers is due to effective management.

2.3 Overview of literature review

The studies reviewed did not give insights on the factors affecting competitiveness in the manufacturing industry in Kenya and specifically for the cement industry.

Studies such as by Liargovas and Skandalis (2012) that investigated the factors affecting firm competitiveness in Greek industry found out that the firm's leverage, firm's export activity; firm's location, firm's size and the firm's index for management competence were significant in affecting firm's competitiveness. However, this may not be the case for Kenya's industries as they operate in different economic environment.

This study therefore intends to bridge this gap in knowledge.

2.4 Theoretical Literature

2.4.1 Porter's Diamond model

In his book "The Competitive Advantage of Nations", Michael Porter developed an economic model that is known as the diamond model. The model explains why some industries become more competitive in particular location.

Porter's diamond model is of the view that the reason why some countries and firms within the country are competitive on the global rating is because of some inherent factors. The argument is that the domestic condition of a firm provides it with competitive advantage on the global market.

Porter's diamond model includes four determinants of competitive advantage. Under factor condition, he classifies those factors that are available in a given nation and which can be exploited to the advantage of that particular nation. They are factors such as certain raw materials, skilled workforce etc.

Under demand condition, the argument here is that if the domestic demand for a product in greater than the export demand, local firms will most likely improve than the foreign companies thus increasing their competitiveness globally in the export market. A high domestic demand will be seen as a driver of growth, innovation and efficiency.

Under related and supporting industries, Porter argues that when other local supporting industries and supplies are efficient, domestic firms will tend to have quality and innovative inputs. This will make them competitive even in the export market.

Under firm Strategy, structure and rivalry, Porter points out that structure and management system of a firm affects competitiveness. Different structures have advantages to different industries. It's up to a firm to adopt a structure that has competitive advantage than the other. Similarly, where rivalry in domestic market is high, firms are able to build up capacities that result to competitiveness in the global market.

By using the Porter's diamond model, firms are able to analyze and know the competitive factors in their country and exploit these factors to attain global competitiveness.

<div align="center">**CHAPTER THREE**</div>

<div align="center">**METHODOLOGY**</div>

3.0 Introduction

This chapter represents conceptual framework, empirical model, model specification, definition and measurement of variables, estimation and testing technique and data source.

3.1 Theoretical framework

3.1.1 Porter's Diamond model

In Porter's work, the diamond model identifies four sets of components explaining national level competitiveness. These components are: firm strategy, structure and rivalry; demand conditions; factors conditions; and related and supporting industries. The diamond model is a relevant theoretical basis for analyzing firm level competitiveness because of its clear structure. As argued before, the competitiveness of a nation is the sum total of the competitiveness of the individual firms in that nation. The national level competitiveness diamond model is below.

Source: Porter, M. (1990).
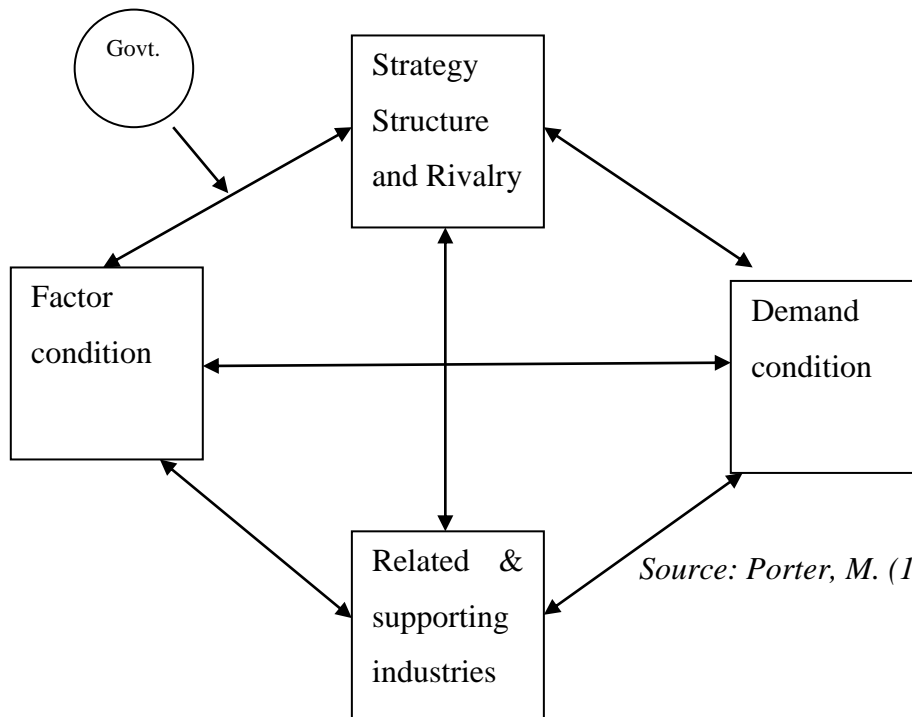
3.1.2 Herfindahl - Hirschman Index

The Herfindahl-Hirschman Index (HHI) is an index that is used to measure market concentration and has been used by many studies to detect any anticompetitive behavior by a firm/ industry. It thus measures the firm's size in relation to the industry thus revealing the amount of competition among firms of the same industry.

It is measured as

$$HHI = \sum_{i=1}^{n} S_i^2$$

Where:
S_i - represent the ith firm's percent of market controlled.
n - Represent the total number of firms in the market.

A (HHI) < 100 indicates a highly competitive market, while a 100 < (HHI) < 1, 000 implies t such a market is un-concentrated while a scale of 1, 000 < (HHI) < 1, 800 could mean an existence of i a moderately concentrated market. A HHI > 1, 800 indicates a highly concentrated market. HHI can be used to track changes in concentration over a period of time. An improvement in the absolute value of the HHI index can be seen as an indicator of actions which may lessen competition that is likely to create a monopoly. Changes in concentration may be due to mergers, acquisitions, failures, withdrawals from the market, or simple shifts in market shares due to the dynamics of competition among an established set of firms. To Bikker and Haff (2002) notes that the HHI scale can be applied to summarize the measure of concentration in the theoretical literature and which more often forms a basic foundation benchmark for evaluating other concentration indices.

Roberts (2014), notes that industry behavior strongly correlates with industry structure and that the larger a firm is within the industry, the more likely it is to engage in super competitive pricing or other anticompetitive conduct.

3.2 Conceptual framework

For the purpose of this research, a conceptual framework was developed showing the influence of the moderating variable on the relationship between the independent and dependent variables

Figure 3.2: Conceptual framework
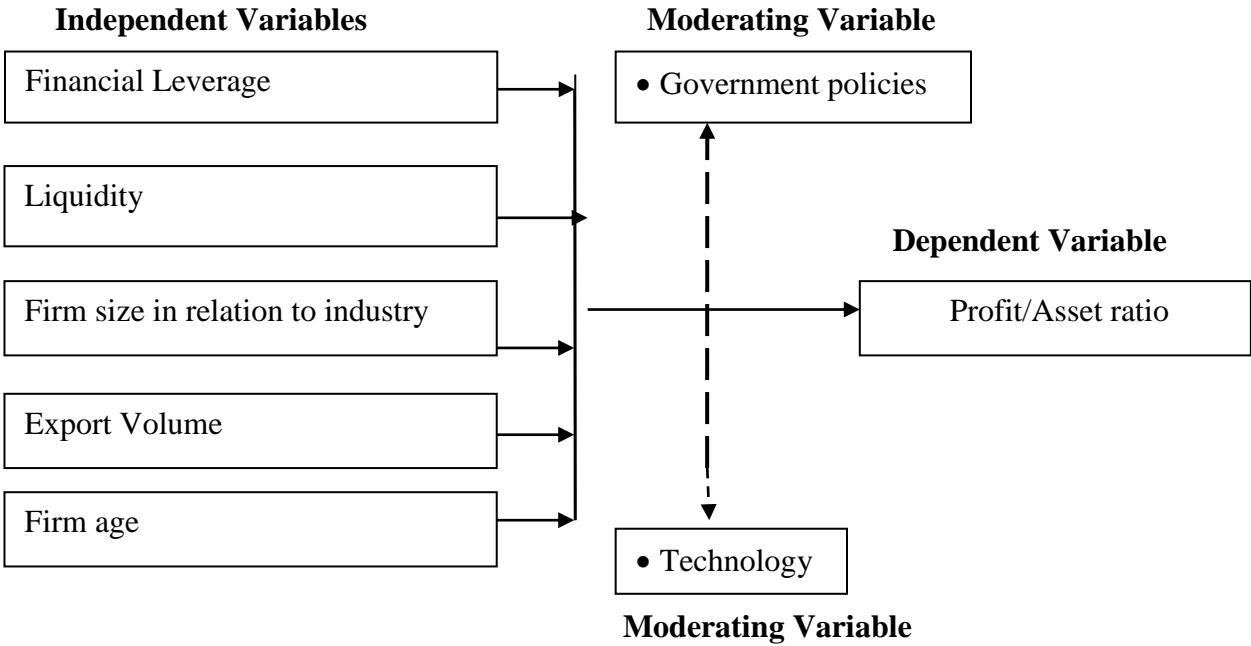
Source: Representation from the Porter's Diamond model

The above conceptual framework gives a depiction on how the variables are related to one another. The variables defined here are the dependent, independent and intervening variables.

Independent variables in this case are the main variables the study seeks to investigate their influence on the dependent variable.

3.3 Empirical model

This study adopts panel model as employed by Voulgaris (2013) in analyzing the factors influencing the competitiveness among the cement manufacturing firms in Kenya. The model captures how different firm specific variables compete in the market.

3.4 Model Specification

There is no consensus in the literature on measures of competitiveness especially at the micro- or firm level. This study will use profit/asset ratio to measure competitiveness as in Ferguson, (1982). This ratio is also called Return on Assets (ROA).

ROA indicates how profitable a firm is relative to its total assets. It shows how efficient a firm is in utilizing its assets to generate earnings. ROA is calculated by dividing a firm's annual earning by its total assets. The independent variables are: financial leverage, liquidity, firm size export and Firm age. The Multiple Regression similar to Liargovas and Skandalis (2012) who studied factors affecting firm competitiveness will be adopted for this study. The model is shown in equation (1)

$$Y_{it} = \alpha_o + \beta_1 X_{1(t-1)} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + _t + e \ldots\ldots\ldots(1)$$

Where: Y= is the return on assets ROA (which is a proxy of firm competitiveness)

$X_{1(t-1)}$ = Lagged value of financial Leverage (lagged ratio of total debt to equity (debt/equity ratio).

X_2 = Liquidity (current assets to current liabilities (current ratio).

X_3 = Relative firm size (firm output/industry output).

X_4 = Export volume (volume of exports).

X_5 = Firm age (years of existence of the firm)

ε is the error term of the stochastic model

α_o = Constant

$\beta_{i=}$ Parameters to be estimated

In addition we note that i = 1, 2, …..n since we are analyzing 3 cement firms while

t = 1, 2…..15 since our analysis captures 15 years from 2000 to 2015.

3.5 Estimation and testing Techniques

The study used a panel data estimation technique because of its several advantages over both cross-section and time-series data sets. Panel data refers to the pooling of observations on a cross-section of firms under study over several time periods in our case years. According to Liargovas and Skandalis (2012), "Panel data suggests that firms are heterogenous and therefore do not run the risk of obtaining biased results." The technique has a greater degrees of freedom and less Multicollinearity leading to more efficient estimates and gives greater flexibility in modeling differences in firm performance in this study which enables us to control for unobserved heterogeneity (Hsiao, 2003).

3.5.1 Unit root test

To avoid change of the estimates over time due to non stationarity, unit root test was applied to investigate or detect non stationarity in all the study variables. Failure to consider its presence can in turn leads to spurious estimates. The study applied the Levin-Lin-Chu test for Unit Root which was used to determine if variables are non-stationary for every variable across the panels. Therefore, if variables were found to be non- stationary, first differencing or successful lagging would have been applied until the bias is eliminated. The null hypothesis in this case was that the variable under consideration was non-stationary or had unit root and in our case, it was stated as;

H_0: Panels contain unit roots

H_1: Panels are stationary

3.5.2 Normality assumption of the random variable

To proceed with estimation, the study applied the Shapiro Wilk test to check the distribution of the stochastic random error terms. The error term was used to capture all other variables that influenced dependent variable but were not included in the model. It was however, believed that the omitted variables had a small influence and at best random. If the p-value of the residuals exceeded significance level of 5%, it would have implied that the null hypothesis of normality of residuals is not rejected and vice versa (Mukras, 1993).

3.5.3 Data source and type

The study utilized data from annual reports of the cement manufacturing firms. Some of the data was available at the Nairobi Security Exchange (NSE) library. The rest was collected from annual reports from the respective companies and the Kenya National Bureau of Statistic.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This section presents the study analysis and findings. It begins with the descriptive statistics, test of multicollinearity and then the unit root test as well as the normality test before it proceeds to empirical finding using the Random-effect GLS regression.

4.1Descriptive Statistics

Descriptive statistics was mainly carried out in this study to ascertain the statistical characteristics of the data used in the model. This study used a panel data between 2000 and 2015. The table 4.1 below shows the result of the descriptive statistics

Table 4.1: Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max
y	overall	-.2715483	10.73808	-55.6605	40.39473
	between		.5546564	-.8699169	.1219962
	within		10.72754	-55.06213	40.9931
x1t_1	overall	2482.306	15498.06	0	96786
	between		3725.318	.2121306	6453.108
	within		15168.26	-3970.802	92815.2
x2	overall	5.516888	10.99592	.0686431	63.29463
	between		4.136828	1.23249	9.466135
	within		10.37258	-2.862491	59.34538

x3	overall	3.40e+07	5059077	2.82e+07	4.30e+07
	between		0	3.40e+07	3.40e+07
	within		5059077	2.82e+07	4.30e+07
x4	overall	145.9353	79.52328	11.504	331.16
	between		70.04453	89.682	224.39
	within		54.62176	14.70534	252.7053
x5	overall	54.5	17.55962	26	82
	between		20.51828	33.5	74.5
	within		4.658554	47	62

Source: Author's computation

From the table 4.1 above, the mean of return on assets, which is a proxy of firm competitiveness, is -.2715483 while its overall standard deviation is 10.73808. Equally the ROA had a between and within variation of 0.5546564 and 10.72754 respectively. The lagged value of financial Leverage has a standard deviation of 2482.306 and a respective overall, between and within mean of 15498.06, 3725.318 and 15168.26. Relative firm size that was proxied by the total asset of the firm had a standard deviation of 3.40e+07 and an overall, between and within mean of 5059077, 0 and 5059077. Lastly the firm's age that reflected how long the firm has been operational had a standard deviation of 54.5 with an overall, between and within mean of 17.55962, 20.51828 and 4.658554 respectively.

4.2 Multicolinearity

This problem arises when two or more independent variables are strongly related. To test for multicolinearity, correlation matrix was run and the result is as presented in table 4.2 below.

Table 4.2: **Correlation Matrix**

	y	x1t_1	x2	x3	x4	x5
y	1.0000					
x1t_1	0.0053	1.0000				
x2	-0.0002	-0.0512	1.0000			
x3	-0.3537	-0.3340	-0.3140	1.0000		
x4	0.0290	-0.1862	0.3317	0.0915	1.0000	
x5	0.0162	-0.2017	0.2033	0.0755	0.3536	1.0000

Source: Author's computation

From table 4.2 above all the variables have a weak correlation indicating an absence of multicolinearity among the variables in our model. Relative firm size and liquidity were found to have a negative correlation with the firm's competitiveness, while financial Leverage, export performance and firm age revealed a positive correlation.

4.3 Unit root test

The study employs Pesaran-Shin test to test for stationary in the individual variables. According to Pesaran-Shin test, a variable is declared stationary when it's t-calculated is smaller than the t-critical

Table 4: Unit root test for ROA

```
Im-Pesaran-Shin unit-root test for y
─────────────────────────────────────
Ho: All panels contain unit roots         Number of panels      =      3
Ha: Some panels are stationary            Avg. number of periods =  14.00

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: No lags included
──────────────────────────────────────────────────────────────────────
                                            Fixed-N exact critical values
                  Statistic      p-value        1%      5%      10%
──────────────────────────────────────────────────────────────────────
 t-bar             -4.1831                          (Not available)
 t-tilde-bar       -2.2372
 Z-t-tilde-bar     -2.1109        0.0174
──────────────────────────────────────────────────────────────────────
```

Source: Author's computation

From the table above, P-value is greater than the t-critical and hence we conclude that ROA is not stationary at order zero.

Table 5: Unit root test for lagged value of financial leverage

```
Im-Pesaran-Shin unit-root test for x1
─────────────────────────────────────
Ho: All panels contain unit roots         Number of panels      =      3
Ha: Some panels are stationary            Avg. number of periods =  14.00

AR parameter: Panel-specific              Asymptotics: T,N -> Infinity
Panel means:  Included                                      sequentially
Time trend:   Not included

ADF regressions: No lags included
──────────────────────────────────────────────────────────────────────
                                            Fixed-N exact critical values
                  Statistic      p-value        1%      5%      10%
──────────────────────────────────────────────────────────────────────
 t-bar             -2.1143                          (Not available)
 t-tilde-bar       -1.7167
 Z-t-tilde-bar     -0.8996        0.1842
──────────────────────────────────────────────────────────────────────
```

Source: Author's computation

The result in table 5 above reveals that lagged value of financial Leverage is non stationary at order zero

Table 6: Unit root test for Liquidity

```
Im-Pesaran-Shin unit-root test for x2
─────────────────────────────
Ho: All panels contain unit roots        Number of panels      =      3
Ha: Some panels are stationary           Avg. number of periods =  14.00

AR parameter: Panel-specific             Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: No lags included
─────────────────────────────────────────────────────────────────
                                              Fixed-N exact critical values
                    Statistic      p-value      1%      5%      10%
─────────────────────────────────────────────────────────────────
 t-bar              -2.1864                          (Not available)
 t-tilde-bar        -1.7516
 Z-t-tilde-bar      -0.9808       0.1633
─────────────────────────────────────────────────────────────────
```

Source: Author's computation

With a p-vale of 0.1633, our conclusion is that liquidity is non stationary at order zero and therefore requires differencing to make it stationary

Table 7: Unit root test for Relative firm size

```
Im-Pesaran-Shin unit-root test for x4
─────────────────────────────
Ho: All panels contain unit roots        Number of panels  =      3
Ha: Some panels are stationary           Number of periods =     16

AR parameter: Panel-specific             Asymptotics: T,N -> Infinity
Panel means:  Included                                    sequentially
Time trend:   Not included

ADF regressions: No lags included
─────────────────────────────────────────────────────────────────
                                              Fixed-N exact critical values
                    Statistic      p-value      1%      5%      10%
─────────────────────────────────────────────────────────────────
 t-bar              -1.3683                    -2.500  -2.190  -2.040
 t-tilde-bar        -1.3255
 Z-t-tilde-bar       0.0750       0.5299
─────────────────────────────────────────────────────────────────
```

Source: Author's computation

The result from table 7 shows that relative firm size is non stationary at level zero since its p-value p - value 0.5299 is greater than the critical value 0.05.

4.3.1 First order difference

This was done to make the variables above stationary. From the result of the first difference, all variables were stationary as shown in table 8 below.

Table 8: The first order difference

variable	p-value	status
y	0.0035	stationary
x1t_1	0.00165	Stationary
x2	0.0154	Stationary
X3	0.00113	Stationary
X4	0.0022	Stationary
X5	0.0193	stationary

Source: Author's computation

4.4 Normality test

Table 9: Shapiro-Wilk test

```
            Shapiro-Wilk W test for normal data

   Variable |     Obs        W        V        z      Prob>z
   ---------+------------------------------------------------
   residual |      15    0.94910    0.987   -0.026    0.51039
```

Source: Author's computation

For normality test, the study applied the Shapiro Wilk test to check the distribution of the stochastic random error terms. The error term was used to capture all other variables that influence dependent variable but are not included in the model. The result from the table 9 above reveals that all variables are normally distributed.

4.5 Empirical result

The study applied the Random-effect GLS regression to determine the impact of the independent variables on the dependent variable. The result is as shown in the table below.

Table 10: Random-effect regression

```
Random-effects GLS regression                    Number of obs      =         15
Group variable: Company                          Number of groups   =          3

R-sq:                                            Obs per group:
    within  = 0.5352                                        min =          5
    between = 0.9999                                        avg =        5.0
    overall = 0.8207                                        max =          5

                                                 Wald chi2(5)       =      41.19
corr(u_i, X)   = 0 (assumed)                     Prob > chi2        =     0.0000
```

y	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
x1	-.0153637	.0177009	-0.87	0.385	-.0500569	.0193294
x2	.0031591	.0016315	1.94	0.053	-.0000386	.0063567
lnx3	-.1778074	.0980447	-1.81	0.070	-.3699715	.0143567
x4	.0005512	.0001945	2.83	0.005	.00017	.0009324
x5	-.0020596	.0006886	-2.99	0.003	-.0034092	-.0007099
_cons	3.166147	1.700546	1.86	0.063	-.1668618	6.499156
sigma_u	0					
sigma_e	.03969328					
rho	0	(fraction of variance due to u_i)				

Source: Author's computation

To analyze the impact of independent variables on the depended variable, this study used the random effect GLS regression. The model was found to be the best as shown by a small p-value of 0.0000. The result from table 8 above reveals that the firm's financial Leverage, liquidity of the firm and export volume had a respective negative impact on the firm's competitive at -0.015367, -0.1778074 and -0.0020597. The result also reveals a positive impact of relative firm's size and firm's age with 0.0031591 and 0.0005512. Holding all other factors constant, the firm's competiveness will be 3.17 as shown by the constant in table 10 above. The study also reveals that holding other factors constant, a unit percentage increase in the firm's size will lead to a 3.2

31

percent increase in the firm's competitiveness. Equally, a unit increase in the firm's age by one year leads to a less than 1 percent (0.5%) increase in the firm's competitiveness holding other factors constant. The study further reveals that taking a partial equilibrium, a unit percentage increase in firm's financial Leverage, liquidity of the firm and export volume will lead to a respective reduction in the firm's competitiveness by 1.54%, 17.78% and 0.21%. Finally, the result reveals than only firm's age and export volume were statistically significant in determining the firm's competitiveness during the period under study.

CHAPTER FIVE:

5.0 SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Summary

The study aimed at identifying the factors influencing the competitiveness in Kenyan cement industry. Using Return on asset as a proxy of the individual firm's competitiveness (dependent variable) and financial Leverage, relative firm's size, liquidity of the firm, firm's age and export volume as the independent variables, the study reveals that whereas firm's size and firm's age were found to have a positive influence on the firm's competitiveness, firm's financial Leverage, liquidity of the firm and export volume affected the ability of a firm to compete negatively. Equally, the study further revealed that only the firm's age and export volume were statistically significant in determining the firm's competiveness while the rest of the variables were statistically insignificant during the period under study.

The study also revealed that if all other factors were held constant, the firm's competiveness would be 3.17 units while a unit percentage increase in the firm's size alone would lead to a 3.2% improvement in the firm's competitiveness. Equally, a unit increase in the firm's age by one year leads to a less than 1 percent (0.5%) increase in the firm's competitiveness holding other factors constant. The study further reveals that taking a partial equilibrium, a unit percentage increase in firm's financial Leverage, liquidity of the firm and export volume will lead to a respective reduction in the firm's competitiveness by 1.54%, 17.78% and 0.21%.

5.2 Conclusion

In conclusion, the study revealed that the most important factors affecting the competitiveness of firms in the cement industry were financial Leverage, relative firm's size, liquidity of the firm, firm's age and export volume with various degrees. Firm's size and age were found to positively influence the firm's competitiveness (implying their improvement led to individual firm's comparative advantage) while financial Leverage, liquidity of the firm and export volume were found to have a negative impact (that's their increase led to the firm losing its comparative advantage in the market as it reduced the return on assets)

33

5.3 Recommendation

Firm's competition is very healthy for product quality either within or without the nation. It is the individual firms at the macro level that makes a country competitive at the macro level. In theoretical point of view, lack of competition among firms may lead to a monopoly kind of market, which is associated with resource under utilization and inefficient in resource allocation. Consumers need choices to maximize their utility and this is given by a competitive market structure. Thus the studies revelation of the factors determining the cement industry's competitiveness in Kenya should be taken serious by stakeholders so as to maximize the satisfaction level of the customers both in the domestic and the export markets.

This study's recommendations are in three folds: that the individual firm in the cement industry to maximize firm's size in terms of opening new branches as this was found to positively affect the firm's competitiveness. Large firms have more competitive advantage than small firms due to economy of scale.

Secondly, since the firm's age was also positively related to the firm's competitiveness, the individual firms can strive to hire experienced workers as age is closely related to experience of the workers. Older firms may benefit from reputation effects which would result to higher margins on sales.

However, the study recommends a minimization of firm's financial Leverage as it was found to have a negative effect on the firm's competitiveness. High financial leveraged may lead a firm to bankruptcy if they are not able to meet debts obligations. They may also be unable to find new lenders in the future.

The study also recommends a minimization liquidity as it was found to have a negative effect on the firm's competitiveness. This is the degree to which a firm can be able to meet debts obligations arising in the next 12 months from cash or assets that can be turned into cash. When liquidity is to much it has a negative effect on competitiveness.

The study also recommends a minimization of export volume since they were found to have a negative effect on the firm's competitiveness. Though exports have the benefit of trade, the study has reveled that cement industry can be harmed by foreign competition.

5.4 Areas for further research

The study had a problem in obtaining all the variables that were needed for the analysis. For instance, output volume for individual firm was very difficult to obtain. The study therefore used total asset as a proxy which is an assumption. There is a need for a further study on the same topic but using real variable figures rather than proxy.

REFERENCES

Agiomirgiannakis, G., Voulgaris, F. & Papadogonas, T. (2006). Financial factors affecting profitability and employment growth: the case of Greek manufacturing. Int. J. Financial Services Management, 1, 2/3, 232–242.

Athi River Mining Limited, (2015). Athi River Mining Limited official website, available at: www.armkenya.com, accessed on 6th November, 2015.

Attari, A. and Raza, K. (2012), "The optimal relationship of cash conversion cycle with firm size and profitability", International Journal of Academic Research in Business and Social Sciences, Vol. 2 No. 4 , pp. 189-203

Babalola, A. (2013). The Effect of Firm Size on Firms Profitability in Nigeria. Journal of Economics and Sustainable Development, 4(5), 90-94

Bamburi Cement, (2015). Bamburi Cement official website, available at: www.bamburicement.com, accessed on 6th November, 2015.

Becker-Blease, R., Kaen, R., Etebari, A. & Baumann, H. (2010). Employees, Firm Size and Profitability in U.S. manufacturing industries. Investment Management and Financial Innovations, (7)2, 7-23

Buckley, P., Pass, C., and Prescott, K. (1988). Measures of international competitiveness: critical survey. *Journal of Marketing Management*, Vol 4, pp.175-200.

Central bank of Kenya (2007). GDP Growth, Monthly Economic Review, January.

Cheng, W. (2010). The Competitiveness of Export-Oriented Garment Industry in Guangdong (China) in the Post-Crisis Era, A published thesis for Master of International Economics, Lund University.

Cooper, R. and Schinder, P. (2008). *Business research methods*. 10th Ed. New York: Mc Graw Hill.

Dyer & Blair Investment Bank (2012). Kenya Cement industry Brief Overview, pp.1-3.

Economic Survey (2015). Annual economic survey release of the 2015 Economic Survey at KICC, Nairobi, on April 29, 2015.

Egbide, B. Uwuigbe, O. & Uwalomwa, U. (2013). Liquidity Management and Profitability of Manufacturing Companies in Nigeria. IOSR Journal of Business and Management, 9 (1), 13-21

Ehiedu, C. (2014). The Impact of Liquidity on Profitability of Some Selected Companies: The Financial Statement Analysis (FSA) Approach. Research Journal of Finance and Accounting, 5(5), 81-90

European Union-EU Commission. (2003). European competitiveness report. http://europa.eu.int/comm/enterprise/enterprise_policy/competitiveness/doc/comprep_20 03_en.pdf (accessed 5th November, 2015).

Ferguson, R. and Dickenson, R. (1982). Critical success factors for directors in the eighties, Business Horizons, May-June.

Global Competitiveness Report 2008-2009, World Economic Forum, Geneva, Switzerland 15.

Global Competitiveness Report 2014-2015, World Economic Forum, Geneva, Switzerland

Henricsson P. & Ericsson S. (2005). Measuring construction industry Competitiveness: a holistic approach, (Paper presented at the Research Week International Conference, The Queensland University of Technology, Brisbane, Australia).

Ibeh, N and Wheeler, N. (2005) A resource-centred interpretation of export performance. International Entrepreneurship and Management Journal.1: 539–556.

Ibidunni, S. (2009). Impact of competitive marketing on performance of multinational and indigenous food and beverage manufacturing companies in Nigeria. A published Ph.D on Marketing, Covenant University, Ota, Nigeria

International Cement Review (2011). Global Cement Report (9th edition.).Britain.

Katsikeas, S., Leonidou, C. and Morgan, A. (2000), "Firm-level export performance Assessment: Review, Evaluation, and Development", Journal of the Academy of Marketing Science, Vol. 28, No. 4, pp. 493-511.

Kinyua, N. (2007). Strategic responses by the cement manufacturing companies in Kenya. A published thesis for master of business administration, University of Nairobi.

Lall, S. (2001). Competitiveness, technology and skills, (Cheltenham, UK: Edward Elgar Publishing).

Lall, S. (2001). Competitiveness, technology and skills. Cheltenham, UK, Northampton, MA, USA: Edward Elgar.

Liargovas, P. and Skandalis, P. (2012). Factors Affecting Firm Competitiveness: The Case of Greek Industry, University of Peloponnese

Longman Advanced American Dictionary (2000). (Essex: Pearson Education Limited).

Mahmoudi, S. (2014). The Effect of Leverage on Cement Industry Profitability. Reef Resources Assessment and Management Technical Paper, 40 (1), 673-676

Mahoney, L. Thorne (2005). Corporate social responsibility and long-term compensation: evidence from Canada. Journal of Business Ethics, 57 (3) (2005), pp. 241–253

Mugenda, O. and Mugenda, A. (2003). Research methods: *Quantitative and qualitative approaches*.2nd. Rev. ed. Nairobi: Act press.

Nairobi Stock Exchange (2007). List of companies, Annual report, Nairobi.

Nderitu, N. (2010). Influence of corporate environmental management on business competitiveness: a case of East African Portland Cement Company. A published thesis in Environmental Planning and Management, University of Nairobi.

Niresh, A. (2012). Trade-Off between Liquidity & Profitability: A Study of Selected Manufacturing Firms in Sri Lanka. Journal of Arts, Science & Commerce, 3(4), 34-40

Notta, O. and Vlachvei, A. (2011). Competitiveness in food and beverage manufacturing industries, International Conference on Applied Economics.

Organisation for Economic Co-operation and Development. (1996). Globalisation and competitiveness: Relevant indicators (STI Working Papers 5). http://www.oecd.org/LongAbstract/0,2546,en_+html (accessed 5th November, 2015).

Pervan, M. & Visic, J. (2012). Influence of Firm Size on its Business Success. Croatian Operational Research Review, 3, 213-223

Porter, M. (1980). Competitive Strategy: Techniques for Analyzing Industries and Competitors. New York, USA: The Free Press.

Porter, M. (1990). *The Competitive Advantage of Nations*, New York, USA: The Free Press.

Porter, M. (1996). What Is Strategy?. *Harvard Business Review* November- December 1996: pp.61-78.

Roberts W. (1998). A stakeholder approach to the corporate single audit Critical Perspectives on Accounting, 9 (1998), pp. 227–232

Saleem, Q. & Rehman, R. (2011). Impacts of liquidity ratios on profitability (Case of oil and gas companies of Pakistan). Interdisciplinary Journal of Research in Business, 1(7), 95-98

Seboru, S. (2013). Environmental challenges affecting performance of the cement industry in Kenya - a case of East African Portland Cement. A published thesis for master of business administration, Kenyatta University.

Sousa, P, Martínez-López, .J and Coelho, F. (2008). The determinants of export performance: A review of the research in the literature between 1998 and 2005. International Journal of Management Reviews.10 (4): 343–374.

Tangen S. (2003). An overview of frequently used performance measures, International Journal of Productivity and Performance Management, 52, 7, 347-354

Tangen S. (2003). An overview of frequently used performance measures, International Journal of Productivity and Performance Management, 52, 7, 347-354

Voulgaris, F., Papadogonas, T., and Lemonakis, C. (2013). Drivers of Competitiveness in the Manufacturing Industry: The Case of Technology Sectors in Greece, *Journal of Economics and Development Studies*, Vol. 1 No. 3, pp.32-37

Vural, Sokmen & Cetenak (2012). Affects Of Working Capital Management on Firm's Performance: Evidence from Turkey. International Journal of Economics and Financial Issues, 2(4), 488-495

Wuttipong, A. (2006). The Competitiveness of the Sugar Industry in Thailand, University of Hohenheim