

**DETERMINANTS OF CAPITAL STRUCTURE OF CEMENT
MANUFACTURING FIRMS IN KENYA**

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DECLARATION

This research project is my original work and has not been submitted to any other university for award of a degree.

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This research project has been submitted for examination with my authority as the university supervisor

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DEDICATION

This work is dedicated to my wife Samira and my three sons Muhammad, Faiz and Abdulrahman.

ABSTRACT

The objective of this study was to establish the determinants of capital structure among firms in the cement manufacturing firms in Kenya. A descriptive study was used, the study population was the all the six (6) cement manufacturing firms in Kenya. Data was collected from secondary sources only. This was from the annual reports which were obtained from the NSE for the listed firms and company head offices for the unlisted firms. The data was analysed using a multiple regression model. The dependent variable was leverage while independent variables were profitability, firm size, asset tangibility, firm growth, liquidity and non-debt tax shield. The study established that all variables were predictors of leverage. All the variables had a positive correlation except profitability which had a negative correlation. The study recommended that finance managers of the cement firms come up with financial policies to ensure optimum mix of debt and equity to minimize the negative effect on profitability. The study also recommended that future studies be undertaken in other sectors to verify the findings.

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ABBREVIATIONS AND ACRONYMS

ARM	Athi River Mining
CMA	Capital Markets Authority
EAPCC	East African Portland Cement Company
KAM	Kenya Association of Manufacturers
NDTS	Non debt tax shields
NPV	Net present value
NSE	Nairobi Securities Exchange
WACC	Weighted average cost of capital

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The term capital structure is used to represent the proportionate relationship between debt and equity (Pandey, 2008). The various means of financing represent the financial structure of an enterprise. Traditionally, short term borrowings are excluded from the list of methods of financing the firm's capital expenditure. Capital structure decisions are one of the three financing decisions – investment, financing, and dividend decisions – finance managers have to make (Van Horne, 1989). Capital structure of a firm determines the weighted average cost of capital (WACC). WACC is the minimum rate of return required on a firm's investments and used as the discount rate in determining the value of a firm. A firm can create value for its shareholders as long as earnings exceed the costs of investments (Damodaran, 2001).

Theories of capital structure try to explain what happens to the overall cost of capital and value of the firm when the proportions of the funds that make up the capital are varied. The static trade-off theory encompasses several aspects, including the exposure of the firm to bankruptcy and agency cost against tax benefits associated with debt use. The pecking order theory suggests that firms have a particular preference order for capital used to finance their businesses (Myers, 1984). The signaling hypothesis states that issuing more debt capital can serve as a credible signal of higher expected future cash flows. On the other hand, raising additional equity by a firm signal that the net operating cash flows of current operations are disappointing (Ross, 1977).

The cement industry is capital intensive and only a few cement companies use state of the art facilities. Cement manufacturing is energy intensive and modern cement plants are highly automated. Cement firms operate in markets closely linked to the economic cycle with a back-forward linkage with many other sectors like energy and transport (WBCSD, 2015). The industry plays a significant role in the climate change debate and energy accounts for up to 45 per cent of cement production costs. Challenges facing this industry include; climate protection, responsible use of all fuel and raw materials, enhancing employee health and safety, carbon emissions, local impacts and unharmonized trade tariffs in the region, rising costs of inputs like energy and challenges in internal business processes like integrate sustainable development as a set of principles into management systems, relationships with business partners and civil society (WBCSD, 2015).

1.1.1 Capital Structure

Capital structure refers to the mix of debt and equity used by a firm to finance its assets. It also refers to the proportion of debt instruments and preferred and common stock on a company's balance sheet (Van Horne, 1989). All firms need operating capital to support their sales. To acquire that operating capital, funds must be raised, usually as a combination of equity and debt. The firm's mixture of debt and equity is called its capital structure (Brigham & Ehrhardt, 2005). Generally, a firm can go for different mixes of debt, equity or other financial arrangements. It can combine bond, lease financing, bank loans or many other options with equity in an overall attempt to boost the market value of the firm. Some firms could be all equity financed and have no debt at all, whilst others could have low levels of equity and high levels of debt. Firms having no debt financing are said to be un-levered while those having debt financing are said to be levered.

A capital structure decision plays an important role in the maximization of shareholders wealth. A poor capital structure decision may result in a high cost of capital making fewer investments acceptable and reducing the net present value of accepted investments and also increasing the value of the firm. Although actual levels of debt and equity may vary somewhat over time, most firms try to keep their financing mix close to a target capital structure. The capital structure decisions include a firm's choice of a target capital structure, the average maturity of its debts, and the specific sources of financing it chooses at any particular time. As with operating decisions, managers should make capital structure decisions designed to maximize the firm's value (Van Horne, 1989).

A firm has to make a capital structure decision every time an investment decision is made. Theoretically, an optimal capital structure should be planned for every firm. This should be that mix of debt and equity that simultaneously minimizes the cost of capital and maximizes the firm value. However, a capital structure that is perfectly optimal is almost impossible to determine in practice because several variables, some even conflicting influence capital structure (Brigham & Ehrhardt, 2005).

1.1.2 Determinants of Capital Structure

There are different factors that affect a firm's capital structure, and a firm should attempt to determine its optimal, or best, mix of financing. The optimal mix of financing is that which maximizes the value of the firm and minimizes the cost of capital. But determining the exact optimal capital structure is not a science, so after analyzing a number of factors, a firm establishes a target capital structure which it believes is optimal.

Miller and Modigliani (1958) 'irrelevance theory' suggest that the firm value is independent of its capital structure under certain assumptions. They argued that there would be arbitrage opportunities in the perfect capital market if the value of the firm depends on its capital structure. Furthermore, investor can neutralize any capital structure decision of the firm if both investor and firms can borrow at the same rate of interest. Due to its unrealistic assumptions it gave birth to several other theories such as trade-off theory and pecking order theory which explain different aspects of capital structure.

The trade-off theory says that a firm's adjustment toward an optimal leverage is influenced by three factors namely taxes, costs of financial distress and agency costs. The use of debt provides tax benefits and can also create a serious financial distress incase of relying on too much debt. Agency costs may also be a base of conflict of interest between different stakeholders of the firm because of information asymmetry (Jensen, 1986). Under this theory, a firm considers the cost and benefits associated with debt capital in bringing its capital structure near to the optimal level. The pecking order theory is based on the assertion that managers have more information about their firms than investors. The theory tries to explain how a company raises new funds to finance new projects. The pecking order theory states that firms prefer to finance new investments first internally with retained earnings, then debt and finally with issue of new equity (Myers, 1984). It assumes that the company does not target a specific debt equity ratio but it only uses external sources of finance when the cheaper sources of financing (retained earnings) are exhausted.

1.1.3 Capital Structure and its Determinants

Empirical results show a positive relationship consistent with theoretical argument between asset structure and leverage for the firms. Sorensen (1986) however, found a significant and negative coefficient between depreciation expense as a percentage of total assets and financial leverage. Other studies specifically suggest a positive relationship between asset structure and long-term debt, and a negative relationship between asset structure and short-term debt. Marsh (1982) also maintains that firms with few fixed assets are more likely to issue equity. In a similar work, MacKie-Mason (1990) concluded that a high fraction of plant and equipment (tangible assets) in the asset base makes the debt choice more likely. From the foregoing, a positive significant relationship is predicted between tangibility of assets and leverage.

Size has been viewed as a determinant of a firm's capital structure. Two point of view conflict on the relationship between size and leverage of a firm. The first point says that large firms do not consider the direct bankruptcy costs as an active variable in deciding the level of leverage because these costs are fixed by constitution and constitute a smaller proportion of the total firm's value. And also, larger firms being more diversified have lesser chances of bankruptcy (Titman & Wessels 1988).

Myers (1977), however, is of the view that firms with growth opportunities will have a smaller proportion of debt in their capital structure. This is because the conflicts of interest between debt and equity holders are serious for asset that gives the firm the option to undertake such growth opportunities in the future. He argues further that growth

opportunities can produce moral hazard situations and small-scale entrepreneurs have an incentive to take risks to grow. Empirical evidence seems inconclusive in this regard as there is much controversy about the relationship between growth rate and level of leverage.

Most studies found a negative relationship between profitability and capital structure. Cassar and Holmes (2003), also suggest negative relationships between profitability and both long-term debt and short-term debt ratios. Petersen and Rajan (1994), however, found a significantly positive association between profitability and debt ratio. As a firm grows longer in business, it establishes itself as an ongoing business and therefore increases its capacity to take on more debt; hence age is positively related to debt. To address issues of creditworthiness, Diamond (1984) suggests the use of firm reputation, which must have been developed over the years.

1.1.4 Cement Manufacturing Firms in Kenya

Cement is a fine, gray powder which sets and then hardens into a solid, strong material. It is mainly used to make concrete and mortar for construction. Cement is made by heating limestone with other materials (such as clay) to get 'clinker' which is further processed to make Cement. Cement is a vital product and the key constituent of concrete. In Kenya, cement history started in the early 1930s when in 1933, East Africa Portland Cement (EAPC) began as a trading company importing cement. Blue Circle Industries of United Kingdom formed the company. The plant's initial capacity was 60,000 tonnes a year, but presently it stands at 700,000 tonnes a year. EAPC targets 1.3 million tones towards end of year 2007 (www.eastafricanportland). EAPC has a market capitalization of 10 billion

(NSE, 2014). In 1951, Bamburi Cement Ltd was founded and 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 (www.bamburicement.com). ARM (Kenya) 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 targets a capacity production of 200,000 tonnes a year by end of 2007 and has a market capitalization is 8.7 billion (www.armkenya.com).

The Kenyan Cement industry has mainly been dominated by Bamburi Cement Company Limited a subsidiary of Lafarge Company based in France. The indigenous cement companies in Kenya are Athi River Mining and East African Portland Cement Company Limited. Bamburi Cement Company derives tremendous advantages from being part of the Lafarge group, including access to cutting edge technologies for cement manufacture, management and technical support. The second largest player in the industry is Athi River Mining Limited (ARM) which is separated into two distinct divisions; ARM Cement Ltd which concentrates on cement, lime and related products and ARM Minerals and Chemicals for the manufacture and sale of minerals and specialty building and related products. East African Portland Cement Company Ltd (EAPCC) is the third largest cement manufacturer which concentrates on cement only. It is effectively government controlled through a direct government stake and indirectly through National Social Security Fund (Kenya Economic Survey, 2010).

Several challenges confront the cement industry which include high cost of electricity due to high tariffs as well as inadequate power supply, costly imported coal, small capacities for clinker and cement production, lobbying for the introduction of concrete roads in Kenya that will require plenty of cement and inadequate support from the government on policy issues. The industry is also confronted by poor quality of power due to interruptions/outages leading to inefficiencies in production systems and breakdowns and high cost of transport caused by dilapidated roads. The Kenyan cement industry has seen the entry of four new foreign investors who have established cement plants in the country in the recent past. One of this is Mombasa Cement which is a subsidiary of Tororo Cement Company in Uganda and is producing with the help of Taiheiyo Cement Corporation, the largest cement producer in Japan. This foreign based company is equipped with advanced technology which enables it to produce more efficiently hence offering lower prices. The other companies are National Cement Company Limited (Devki Group) and Savannah Cement Limited (Kenya Economic Survey, 2010).

The demand for cement in Kenya is estimated to be about 3 million tons per year. The seven companies produce about 3.5 million tons, of which Bamburi Cement produces 2.3 million tons. These companies also export their products to other neighboring countries including Somalia, Democratic Republic of Congo, South Sudan, Mozambique, Rwanda and Burundi (Mumero, 2011). The increased purchase of cement is attributable to continued demand for housing and accommodation due to increase in Kenya's

population. Increased private building projects and also increased government expenditure on roads and building projects caused the increase in cement consumption during the past 3 years (Kenya Economic Survey, 2010).

1.2 Research Problem

The capital structure decision is one of the most important decisions made by financial managers in this modern era. The capital structure decision is at the center of many other decisions in the area of corporate finance. One of the many objectives of a corporate financial manager is to ensure low cost of capital and thus maximize the wealth of shareholders. Hence, capital structure is one of the effective tools of management to manage the cost of capital. An optimal capital structure is reached at a point where the cost of the capital is minimal (Myers, 1984).

The business environment within which the cement producing firms operate has been vibrant and turbulent. Several changes that have had implications on the companies have been witnessed in the past and are expected to influence company actions in the medium and long-term. The political anxieties, threats posed by new entrants, social reforms, technological advancement, legislative changes, government policy changes, economic changes and regionalization are some of the challenges that have greatly affected strategic actions in this industry. These challenges cannot be ignored because the industry plays a significant role in our economy. The challenges posed have financial implications to the industry. This directly impacts on the value addition to the stakeholders in the medium and long- term.

Although several studies have been done on the determinants of capital structure, important questions remain about what determines the choice of capital structure for firms in different sectors. Kinyua (2005) established that profitability, company size, asset structure, management attitude towards risk and lenders' attitude towards the company are key determinants of capital structure for small and medium enterprises in Kenya. Kuria (2010) conducted a study on the determinants of capital structure of firms listed in the NSE and established that profitability and asset structure are the only determinants of capital structure. Turere (2012) examined determinants of capital structure in energy and petroleum sector and concluded that company size, age of company, growth rate and ownership structure are the key determinants of capital structure.

Most capital structure studies to date are based on data from developed countries' firms and very few studies provide evidence from developing countries. Previous studies have also focused on determinants of capital structure of all listed firms, or determinants of capital structure of specific sectors of the economy. To the best knowledge of the researcher few studies have been carried on the determinants of capital structure in the cement industry but none has been done in Kenya. There is therefore a need to assess determinants of capital structure among firms in the cement manufacturing industry in Kenya. This study aimed at answering the following research question: What are the firm-specific determinants of capital structure among firms in the cement manufacturing industry in Kenya?

1.3 Research Objective

The objective of this study was to establish the determinants of capital structure among firms in the cement manufacturing industry in Kenya.

1.4 Value of the Study

This study is useful to cement manufacturing firms in Kenya. The management and board of governors of the cement firms will have an empirical basis upon which they can base their capital structure decisions.

This study also acts as a guide to policy makers in the cement industry in Kenya in coming up with appropriate policies related to capital structure in the sector. Business advisers and finance consultants may be interested in knowing the factors that are considered in designing capital structures for firms in each market segment.

Researchers should find this study very useful as regards the variables measured in the study. The findings of this study will contribute to the body of knowledge in corporate finance especially on capital structure decisions. Future research in Kenya and especially in the manufacturing sector can be based on this study. The recommendations for future studies will also guide future researchers in this area.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter focuses on review of theoretical, conceptual, and empirical literature along the study's conceptualization. First, the chapter presents literature on theoretical underpinnings of the study followed by conceptual and empirical literature on capital structure and its determinants.

2.2 Theoretical Review

This section reviews the theoretical models relevant to this study. The primary focus of the study is capital structure. Theories of capital structure try to explain what happens to the overall cost of capital and value of the firm when the proportions of the funds that make up the capital are varied. They try to guide the corporate finance managers in choosing the optimal proportion of debt and equity for their firm.

2.2.1 The 'Irrelevance' Theory

Modigliani and Miller (1958) demonstrated in their seminal paper 'The cost of capital, corporation finance, and the theory of investment' that in the absence of taxes, bankruptcy costs, transaction costs and asymmetric information and the same rate of interest of borrowing by individuals and corporations, the value of a firm is independent of its financial structure. It does not matter if the firm's capital is raised by issuing or selling debt. It does not matter what the firm's dividend policy is. The model is based on a framework that starts with assumptions of perfect competition in factor and product markets and no transaction costs. Modigliani and Miller (1958) conclude that a firm

cannot increase its value by using debt as part of its permanent capital structure. This argument is based on perfect arbitrage such that investors can assume personal debt to help financing the purchase of unlevered shares, if the value of the levered shares is greater than the unlevered ones. With perfect arbitrage any discrepancies in the value of the stocks of two hypothetical firms, one with levered shares and the other with unlevered shares, will be eliminated. Capital structure is thus irrelevant to firm value.

Including tax deductibility of interest payments into their model, Modigliani and Miller (1963) show that borrowing will only cause the value of the firm to rise by the amount of the capitalized value of the tax subsidy. Relaxing assumptions in their original work and introducing imperfect competition, bankruptcy costs, asymmetric information, and monopoly power, financial structure appears to be an influencing factor on firm value. The introduction of tax deductibility of interest payments has an implication on the choice of capital structure. Profitability increases, non debt tax shields reduce and liquidity increases.

2.2.2 Static Trade-off Theory

The static trade-off choice encompasses several aspects, including the exposure of the firm to bankruptcy and agency cost against tax benefits associated with debt use. Bankruptcy cost is a cost directly incurred when the perceived probability that the firm will default on financing is greater than zero. One of the bankruptcy costs is liquidation costs, which represents the loss of value as a result of liquidating the net assets of the firm. This liquidation cost reduces the proceeds to the lender, should the firm default on

finance payments and become insolvent. Given the reduced proceeds, financiers will adjust their cost of finance to firms in order to incorporate this potential loss of value. Firms will, therefore, incur higher finance costs due to the potential liquidation costs (Cassar & Holmes, 2003).

Another cost that is associated with the bankruptcy cost is distress cost. This is the cost a firm incurs if non-lending stakeholders believe that the firm will discontinue. If a business is perceived to be close to bankruptcy, customers may be less willing to buy goods and services due to the risk of a firm not being able to meet its warranty obligations. In addition, employees might be less inclined to work for the business and suppliers less likely to extend trade credit. These stakeholders' behaviour effectively reduces the value of the firm. Therefore, firms which have high distress cost would have incentives to decrease debt financing so as to lower these costs. Given these bankruptcy costs, the operating risk of the firm would also influence the capital structure choice of the firm because firms which have higher operating risk would be exposed to higher bankruptcy costs, making cost of debt financing greater for higher risk firms. Research has found that high growth firms often display similar financial and operating profiles (Hutchinson & Mengersen, 1989).

Firms also consider within the static trade-off framework, the tax benefits associated with the use of debt. This benefit is created as the interest payments associated with debt are tax deductible while payments associated with equity such as dividends are appropriated from profit. This tax effect encourages the use of debt by firms as more debt increases the

after-tax proceeds to the owner. The theory among other things predicts a positive relationship between tax and leverage.

The trade-off theory has contributed a lot in finance. It yields an intuitively pleasing interior optimum for firms and gives a rationale for cross-sectional variation in corporate debt ratios i.e. firms with different types of assets will have different bankruptcy and agency costs and different optimal debt ratios. However, the theory has limitations i.e. debt ratios as produced by this theory are significantly higher than observed. Secondly, in many industries, the most profitable firms often have the lowest debt ratios, which is the opposite of what the trade off theory predicts (Sunder & Myers, 1999). According to Myers (1984) the trade-off theory also fails to predict the wide degree of cross-sectional and time variation of observed debt ratios.

2.2.3 Pecking Order Theory

The pecking order theory is based on the assertion that managers have more information about their firms than investors. This disparity of information is referred to as information asymmetry. According to Myers and Majluf (1984), if investors are less informed than the firm insiders about the value of the firm, then equity may be mispriced by the market. When firms need to finance new investments, under pricing may be so severe that new investors capture more than the net present value (NPV) of the project resulting in a dilution of value to the existing investors. This can lead to under-investment result, that is, the project will be rejected. To avoid this, firms establish a preference conditions;

firms prefer internal finance over external finance, safe debt over risky debt and convertibles and finally common stocks (Donaldson, 1961; Myers & Majluf, 1984).

This theory is based upon costs derived from asymmetric information between managers and the market and the assumption trade-off theory costs and benefits of debt financing are of second order importance when compared to the costs of issuing new securities in the presence of asymmetric information. Tangible assets are less subject to information asymmetries and usually have a greater value than intangible assets in the event of bankruptcy. This therefore means that tangibility of assets should be a factor to consider in the choice of capital structure. Myers (1984), states that an optimal capital structure is difficult to define as equity appears at the top and at the bottom of the 'pecking order'. Internal funds incur no flotation costs and require no disclosure of the firm's proprietary financial information that may include the firm's potential investment opportunities and gains that are expected to accrue as a result of undertaking such investment. This brings into perspective the issue of growth as a determinant of capital structure.

According to pecking order theory hypothesis, a firm will use first internally generated funds which may not be sufficient for a growing firm so the next option is for the growing firms to use debt financing which implies that a growing firm will have a high leverage (Drobotz & Fix, 2003). Hence firm growth should be considered as a determinant of capital structure.

2.2.4 Signaling Theory

Another capital structure theory is the signaling theory which can be best explained by the use of two hypotheses; information asymmetry hypothesis and the implied cash flow hypothesis, Myers & Majluf (1984) assumed that the firm's managers have superior information about the true value of the company. If management has favourable information that is not yet reflected in market prices, the release of such information will cause a larger increase in stock than in bond prices. To avoid diluting the value of existing shareholders, managers that believe their shares to be undervalued will choose to issue debt rather than equity, conversely, managers will time a new equity issue if the market price exceeds their own assessment of the stock value i.e. if the stocks are overvalued by the market. This well known propensity of companies to "time" their stock offerings helps explain the market's systematically negative response to announcements of such offerings (Myers & Majluf, 1984).

Secondly, another signaling theory hypothesis is implied cash flow hypothesis which is premised on the idea that managers know more than investors do. It claims that financing decisions are designed primarily to communicate management's confidence in the firm's prospects and, in cases where management thinks the firm is undervalued, to increase the value of the shares. Increasing leverage has been suggested as one obligates the firm to make a fixed set of cash payments over the term of the debt security, with potentially serious consequences on default. Issuing more debt capital can therefore serve as a credible signal of higher expected future cash flows. On the other hand, raising additional equity by a firm signal also that the net operating cash flows of current operations are

disappointing. Investors associate relatively large issues of equity with more severe cash flow changes, resulting in more severe price reactions and therefore firm value (Ross, 1977).

2.3 Firm-Specific Determinants of Capital Structure

Theoretical and empirical literature suggests a number of factors that may influence the capital structure of companies. Leverage will be used as the dependent variable and measured as the ratio of interest-bearing debt to total assets. The following independent variables shall be considered for this study: tangibility of assets, firm size, firm growth, profitability, non-debt tax shields and liquidity. Some factors have positive, some negative and others have interactive and complex relationship with capital structure.

2.3.1 Profitability

There are two opposite views relating relationship between profitability and leverage. Myers (1984) in his pecking order theory predicts that firms prefer raising capital from retained earnings, then from debt, then from issuing equity. The cost of capital dictates the rank of the pecking order under asymmetric information and market imperfections. If pecking order applies, then, higher profitability will correspond to a lower debt ratio holding other things equal. As a result, pecking order theory assumes negative relationship between leverage and profitability. Studies conducted by Harris and Raviv (1991), Rajan and Zingales (1995) and Bevan and Danbolt (2001) empirically proved negative relation between leverage and profitability.

In the trade off theory, agency costs, taxes and bankruptcy costs push more profitable firms toward higher book leverage. First, expected bankruptcy costs decline when profitability increases. Secondly, the deductibility of corporate interest payments induces more profitable firms to finance with debt. In a trade off theory framework, when firms are profitable, they prefer debt to benefit from the tax shield. In addition, if past profitability is a good proxy for future profitability, profitable firms can borrow more, as the likelihood of paying back the loans is greater.

2.3.2 Firm Size

There are two conflicting view points about the relationship of size to leverage of a firm. According to trade off theory, larger firms are well diversified, having stable cash flows and their chances of bankruptcy are less as compared to small firms. Therefore, large firms prefer leverage and are having high level of leverage (Myers & Majluf, 1984). Due to the large size, high level of fixed assets, economies of scale, stable cash flow and creditworthiness larger firms have the bargaining power over lender and can borrow at relatively lower rate (Marsh, 1982).

Second, contrary to first view, Rajan and Zingales (1995) argue that there is less asymmetrical information about larger firms. This reduces the chances of undervaluation of the new equity issue and thus encourages the large firms to use equity financing. This means there is negative relationship between size and leverage of a firm. In this study we expect a positive relationship between size and leverage of the firm. To measure size sales are considered a sound measure. So the natural logarithm of sales is taken to

measure the size as used in some previous studies. (Myers & Majluf, 1984) and Turere (2012) used the same measure.

2.3.3 Tangibility of Assets

Tangibility is defined as the ratio of fixed assets to total assets. Fixed assets play important role in leverage level of firms. A firm with large amount of fixed assets can borrow at relatively lower rate of interest by providing the security of these assets to creditors. Having the incentive of getting debt at lower interest rate, a firm with higher percentage of fixed asset is expected to borrow more as compared to a firm whose cost of borrowing is higher because of having less fixed assets. Tangible assets are less subject to informational asymmetries and usually they have a greater value than intangible assets in the event of bankruptcy. The trade off theory predicts a positive relationship between measures of leverage and the proportion of tangible assets (Rajan & Zingales, 1995).

Relative to this theory, Bradley et al (1984) and find leverage to be positively related to the level of tangibility. Following Rajan and Zingalez (1995), positive relationship between tangibility and leverage is expected. Rajan and Zingales (1995), Odinga (2003) and Kuria (2010) measured tangibility of assets as the ratio of total fixed assets to total assets. In this study, tangibility will be defined as fixed/tangible assets divided by total assets.

2.3.4 Liquidity

There are two opposite views relating the relationship between liquidity and leverage. According to trade off theory, the more liquid firm would use external financing due to their ability of paying back liabilities and to get benefit of tax shields, resulting in positive relationship between liquidity and leverage. Pecking order theory assumes that the more liquid firm could use first its internal funds and would decrease level of external financing, resulting in negative relationship between liquidity and leverage. Most studies have found the negative relationship (Mazur, 2007).

In this study negative relationship between liquidity and leverage is expected. Not many studies have tested the effect of liquidity on the choice of capital structure. Mazur (2007) and Ahmad et al (2011) measured liquidity as the ratio of current assets to current liabilities. In this study, Liquidity will also be measured as the ratio of current assets to current liabilities.

2.3.5 Firm Growth

Empirically, there is much controversy about the relationship between growth rate and level of leverage. According to pecking order theory hypothesis, a firm will use first internally generated funds which may not be sufficient for a growing firm so the next option is for the growing firms to use debt financing which implies that a growing firm will have a high leverage (Drobetz & Fix, 2003). Hence, pecking order theory assumes positive relationship between leverage and growth. Growing firms, thus, facing higher cost of debt will use less debt and more equity. Barclay, et al (1995) and Rajan and

Zingales (1995) find a negative relationship between growth and leverage. In this study, growth is taken to have a positive relationship with leverage. Titman and Wessels (1988) used market-to-book ratio as a proxy for growth opportunities. Odinga (2003) used percentage change in total sales to measure growth. However, Drobetz and Fix (2003) measured growth as a percentage increase in total assets. Kuria (2010) and Turer (2012) used the same measure. This study will measure Growth as the percentage increase in total assets.

2.3.6 Non-Debt Tax Shields

The effective tax rate has been used as a possible determinant of the capital structure choice. According to Modigliani and Miller (1963), if interest payments on debt are tax deductible, firms with positive taxable income have an incentive to issue more debt. That is, the main incentive for borrowing is to take advantage of interest tax shields. Other items apart from interest expenses, which contribute to a decrease in tax payments, are labeled as non debt tax shields (NDTS), for example the tax deduction for depreciation and investment tax credits.

De Angelo and Masulis (1980) argue that non-debt tax shields are substitutes for the tax benefits of debt financing and a firm with larger non-debt-tax shields, *ceteris paribus*, is expected to use less debt. Therefore, the relation between non-debt tax shields and leverage should be negative. De Angelo and Masulis (1980) measured non-debt-tax shields as depreciation divided by total assets as in most studies. Depreciation divided by total assets is used in order to proxy for non-debt tax shield in this study.

2.4 Empirical Review

According to 'Irrelevance theory' of capital structure by Miller and Modigliani (1958), studies relating to capital structure are divided into two groups, that is, capital structure determinants and effects of capital structure on firm's value. This study relates to the first group. Ferri and Jones (1979) studied the determinants of financial structure and used four variables, that is, business risk, industry type, operating leverage and firm size.

The results proved that firm size and operating leverage are significantly related to leverage. The previous researches of Carleton and Silberman (1977) and Marsh (1982) showed that independent variables including fixed assets, growth opportunities, operating risk, firm size, and non-debt tax shield were positively related with leverage. Variables such as expenditures of advertisement, research and development, insolvency, volatility of earnings, profitability and uniqueness of products were negatively related with leverage.

In 1981, Aggarwal ignored industry type as variable and use growth rate, international risk and profitability and showed that they are not significantly related with leverage. Aggarwal (1981) argued that country effect is an important factor in determining capital structure. Myers and Majluf (1984) proved that capital structure is positively correlated with firm size, while profitability can either be negatively or positively related to leverage. De Angelo and Masulis (1980) analyzed non-debt tax shield as determinant and argued that non-debt tax shield like depreciation is replicable by tax deduction of interest payments. Kim and Sorensen (1986) proved that non-debt tax shield is negatively related

to leverage, but a research by Ozkan (2001) proved significant positive relation between non-debt tax shield and showed a significant relation among dividend policy and capital structure.

Anwar (2011) took a Sample of 199 firms (149 from textile, 23 from cement and 27 from energy sector) and set out to investigate cross industry determinants of capital structure with data collected between 2005 and 2009. Empirical analysis proved that profitability and asset tangibility are the most consistent determinants of capital structure in all the three sectors.

Kamere (1987) carried out a research on factors that influence capital structures of public companies. He found out that management of quoted companies preferred internally generated funds and debt financing. This could be attributed to the desire for existing shareholders to retain control hence lack of new equity issue which could dilute ownership. He also found that stability of future cash flows and level of interest rates as determinants of capital structure were significantly related to leverage.

Omondi (1996) set out to study capital structure in Kenya. He tested whether asset structure, industry structure, interest rate, size of firm, growth of firm, profitability, changes in cash flows, age and ownership structure affected debt to equity ratio of listed firms. In his findings, industry structure was not a statistically significant determinant of capital structure, and that capital structure of firms on the sectoral basis was different. He concluded that industrial class plays a significant role in capital structure.

Kiogora (2000) undertook a research to establish the nature of capital structures employed by listed firms in NSE. Her objective was to determine if the capital structures differ per industry and whether firms in the same sector had similar capital structures. The results indicated differences in capital structures in different industries and that firms within the same sector exhibited almost similar capital structures. Chode (2003) studied determinants of capital structure of public sector enterprises in Kenya. His period of study was between 1994 and 1998. He used regression analysis and found out that enterprises depended on government funding, which he categorized as equity. He also concluded public enterprises did not endeavor to maximize profits in a competitive market and their managers did not have the motivation to respond to competition.

Odinga (2003) carried out a study on determinants of capital structure of companies listed in NSE and used multiple regression analysis to analyze the data. He tested variables such as tangibility, profitability, business risks, growth, size and non-debt tax shield. He concluded that profitability and non-debt tax shield are the most significant variables in determining leverage. He also found out that many variables vary from company to company indicating that firm specific factors play a role in determining capital structure.

Kinyua (2005) looked at the determinants of capital structure of small and medium-sized enterprises in Kenya. In his study which covered four years, between 1998 and 2002, he used multiple regression and correlation to analyze the collected data. He established that profitability, company size, asset structure, management attitude towards risk and

lenders' attitude towards the company are key determinants of capital structure for small and medium enterprises in Kenya.

Matibe (2005) set out to study the relationship between ownership structure and capital structure for listed companies in Kenya. The study covered five years, between 1998 and 2002. Correlation analysis was used to analyze the collected data. The study found out that firms owned by the state are more likely to borrow than those owned by individuals, institutions or foreign investors. He concluded that state-owned firms have more access to debt than firms owned by individuals and foreign investors.

Kamau (2010) conducted a study on the relationship between capital structure and financial performance of insurance companies. He found that there was a weak relationship between financial performance and capital structure, hence debt to equity ratio accounted for a very small percentage of financial performance of insurance companies in Kenya.

Kuria (2010) set out to analyze the determinants of capital structure of firms listed in the NSE. In her findings, she concluded that larger and highly profitable firms maintain high debt ratio while high growth firms use less debt financing. She also found that firms with high non-debt tax shields use more debt than equity.

Turere (2012) set out to study the determinants of capital structure in the energy and petroleum sector and concluded that company age, growth rate of the company and

ownership structure have a negative impact on total leverage of the company. He also found out that size of a company and its financial performance has a positive impact on leverage. However, while size, age, growth rate and ownership structure have a significant impact on leverage, financial performance has an insignificant impact on total leverage. The study therefore found out that the key determinants of capital structure in energy and petroleum sector are: size, age of company, growth rate and ownership structure and that financial performance is not a key determinant of capital structure.

2.5 Summary of Literature Review and Knowledge Gap

From the foregoing literature, it is evident that empirical evidences on the various determinants of capital structure give conflicting results. For instance, Titman and Wessels (1988) provided empirical proof that there is a positive relationship between firm size and leverage of a firm while Rajan and Zingales (1995) concluded that there is a negative relationship between size and leverage of the firm.

Despite extensive capital structure research since Modigliani and Miller (1958) surveyed the literature, important questions remain about what determines the choice of capital structure for firms within the same industry. Although it is widely held that industry factors are important to firm financial structure, empirical evidence shows that there is wide variation in capital structure.

Previous studies have focused on either the determinants of capital structure of all listed firms or a particular sector only. For instance, Chode (2003) studied determinants of capital structure of public sector enterprises in Kenya. Kinyua (2005) studied the

determinants of capital structure of small and medium-sized enterprises in Kenya. Kuria (2010) analyzed the determinants of capital structure of all firms listed in the NSE. Turere (2012) investigated the determinants of capital structure in the energy and petroleum sector. This study is to the best of this researcher's knowledge, the first in exploring the determinants of capital structure among firms in the cement industry in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section encompasses the research design that was used to conduct the study, the target population, method of collecting data and the technique that were employed to analyze the data.

3.2 Research Design

A descriptive study was used to establish the determinants of capital structure among firms in the cement industry in Kenya. A descriptive research is designed to describe the characteristics of a phenomenon e.g. discovering variation within variables (Mugenda & Mugenda, 1999). In this study, a descriptive research was preferred because it describes how leverage is related to any one of the independent variables, that is; Profitability, Firm size, Firm growth, Non-debt tax shields, Liquidity and Tangibility of assets.

3.3 Population of Study

The population of the study comprised of all the cement manufacturing companies in Kenya. According to the Kenya Association of Manufacturers (KAM, 2014) there are six (6) cement manufacturing firms in Kenya as at 31st July 2014 (see appendix 1).

3.4 Data Collection

Secondary data was drawn from the financial statements of the cement manufacturing firms in Kenya from 2005-2014. The data collected for the study from these sources included capital structure variables which include debt, equity and total assets as well as the data on determinants (independent variables in the model below).

3.5 Data Analysis

This study used multivariate regression analysis. The dependent variable was leverage while independent variables will be profitability, asset tangibility, non-debt tax shield, firm size, firm growth and firm liquidity. Following Holmes (2003) the dependent variable was firm's leverage. The leverage (LEV) is total debts divided by total capital. The independent variables will include profitability (PF), Asset Tangibility (AT), Non-debt tax shield (NDTS), Firm size (FS), Firm growth (FG) and Liquidity (LQ). All the variables for this study will be based on book value in line with the argument by Myers (1984) that book values are proxies for the value of assets in place.

The analytical model for this study is developed from Anwar (2011) who used a similar model to analyze data for three different sectors. The estimated model is:

$$\text{LEV} = \beta_0 + \beta_1\text{PF} + \beta_2\text{FS} + \beta_3\text{AT} + \beta_4\text{FG} + \beta_5\text{LQ} + \beta_6\text{NDTS} + \epsilon$$

Where:

LEV = Leverage (Total interest-bearing Debt divided by Total Assets)

PF = Profitability (EBIT divided by Total Assets)

FS = Firm Size (Natural logarithm of sales)

AT = Asset Tangibility (Total fixed Assets divided by Total assets)

FG = Firm Growth (% change in Total Assets)

LQ = Liquidity (Current Assets divided by Current Liabilities)

NTDS = Non-Debt Tax Shield (Depreciation divided by Total Assets)

β_0 = Constant term

$\beta_1 - \beta_6$ = Regression coefficients – define the amount by which LG (response variable) is changed for every unit change in the predictor variable.

ε = the error term, which defines the variation in the response variable, LEV which cannot be explained by the included predictor variables.

Correlation Coefficient (r) was determined and used to measure the strength and direction of the relationship between the dependent variable (Leverage) and each of the independent variables. Coefficient of determination (R^2) was used to measure the proportion of variance in the dependent variable that can be explained by independent variables.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of data analysis and research findings. The research findings presented were based on the research objective which was to establish the determinants of capital structure among firms in the cement manufacturing industry in Kenya. Data was collected from published financial statements available at NSE and CMA as well as the company head offices for those that are not listed. This was then used to compute the various ratios which constituted variables in the study. The chapter presents the summary of descriptive statistics and regression analysis followed by a summary and interpretation of the findings.

4.2 Summary of Descriptive Statistics

The values of the mean, median, mode and standard deviation of all variables was calculated for the 10 year period and summarized in table 4.1 below.

Table 4.1 Summary of Descriptive Statistics

	Ten year Summary of Descriptive Statistics						
	LEV	Profitability	Firm Size	Asset Tangibility	Firm Growth	Liquidity	Non-Debt Tax Shield
Mean	0.61	3.22	0.04	1.16	0.24	0.56	0.08
Median	0.62	3.29	0.02	1.11	0.09	0.54	0.09
Mode	N/A	N/A	0.30	N/A	0.37	0.45	N/A
Std dev	0.18	0.54	0.12	0.33	0.54	0.48	0.5

Source: Research Findings

Note: The values of the profitability and growth were taken as a percentage, size as logarithm and ratio analysis was used for leverage, asset tangibility, liquidity and non-debt tax shield.

The results indicate that over the ten year period the cement firms had a mean leverage of 0.61, profitability of 3.22, firm size of 0.04, asset tangibility of 1.16, and firm growth mean of 0.24. Liquidity had a mean 0.56 while non-debt tax shield a mean of 0.08. The standard deviation values were all less than 1 indicating that there were no significant variations in the responses.

4.3 Regression Analysis

The regression analysis was conducted using the leverage as the dependent variable and the independent variables were profitability, firm size, asset tangibility, firm growth, liquidity and non-debt tax shield. The results are tabulated below.

Table 4.2 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.936 ^a	.876	.783	.02471
a. Predictors: (Constant), profitability, size, tangibility, growth, liquidity, non debt tax shield				

Source: Research Findings

The correlation coefficient (R) measures the strength and direction of a linear relationship between two variables. Table 4.2 shows that R is 0.936 which indicates a strong positive correlation. The R-squared indicates the coefficient of determination, which is the

proportion of variance in the dependent variable that can be explained by independent variables. In this case, 87.6% of variations in leverage can be explained by the determinants of capital structure: profitability, size, tangibility, growth, liquidity and non debt tax shield. This leaves 12.4% of the variations to be influenced by other factors.

Table 4.3: ANOVA

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.035	6	.006	9.444	.003 ^a
	Residual	.005	8	.001		
	Total	.039	14			
a. Predictors: (Constant), profitability, size, tangibility, growth, liquidity, non debt tax shield						
b. Dependent Variable: Leverage						

Source: Research Findings

Table 4.2 shows that the independent variables statistically predicts the dependent variable $(6, 95) = 9.44, p < 0.05$ (i.e. the regression model is a good fit for the data). This implies that the independent variables are predictors of the dependent variable. This means that profitability, size, tangibility, growth, liquidity, non debt tax shield are predictors of leverage.

Table 4.4 Regression Coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.180	.799		-1.476	.178
	Profitability	-.270	.095	-.828	-2.850	.021
	Size	.066	.052	.281	1.282	.236

	Tangibility	.132	.097	.523	1.367	.209
	Growth	.022	.082	.053	.265	.798
	Liquidity	.006	.022	.061	.266	.797
	Non debt tax shield	3.037	1.814	.829	1.675	.133
Dependent variable: Leverage						

Source: Research Findings

From the Coefficients table the regression model is as follows:

$$\text{LEV} = -1.180 + -0.270\text{PF} + 0.066\text{FS} + 0.132\text{AT} + 0.022\text{FG} + 0.006\text{LQ} + 3.037\text{NDTS} + \epsilon$$

The results in Table 4.4 indicate that Profitability is the only variable with a negative correlation with leverage and also statistically significant at 2.1% level of significance. This implies that for the cement manufacturing firms, as the level of profits increases, the use of debt to finance investments decreases. Liquidity has a coefficient of 0.006 implying that liquidity has little or no correlation with leverage though this relationship is statistically insignificant. Tangibility, growth, non debt tax shield and size have a positive but insignificant correlation with leverage. This implies that as they increase the level of leverage also increases.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of findings, conclusion and recommendations based on the results.

5.2 Summary

The objective of the study was to establish the determinants of capital structure of cement manufacturing firms in Kenya. The results indicated that over the ten year period the cement firms had a mean leverage of 0.61, mean profitability of 3.22, firm size of 0.04, asset tangibility of 1.16, and firm growth mean of 0.24. Liquidity had a mean 0.56 while non-debt tax shield a mean of 0.08. The standard deviation values were all less than 1 indicating that there were no significant variations in the responses.

The coefficient of correlation (R) was 0.936 which indicated a strong positive correlation between leverage and the determinants: profitability, size, tangibility, growth, liquidity, non debt tax shield. The coefficient of determination (R-squared) of 0.876 indicated that 87.6% of variations in leverage in the cement manufacturing firms can be explained by variations in profitability, firm size, asset tangibility, firm growth, liquidity and non debt tax shield. This leaves 12.4% of the variations to be influenced by other factors.

The results further indicated that profitability had a negative correlation with leverage and was also statistically significant at 2.1% level of significance. This implies that for the cement manufacturing firms, as the level of profits increases, the use of debt to

finance investments decreases. All other variables were positively correlated to leverage. Liquidity had a coefficient of 0.006 implying that liquidity has little or no correlation with leverage though this relationship is statistically insignificant. Tangibility, growth, non debt tax shield and size have a positive but insignificant correlation with leverage. This implies that as they increase the level of leverage also increases. Non-debt tax shield had the highest impact with a regression coefficient of 3.037 and a p-value of 0.133.

5.3 Conclusion

Literature suggests that debt requirements of a firm in one industry differ from the firm in another industry; hence determinants of capital structure are different across industries (Titman & Wessels, 1988). The reason for this is because in the environment, business risk varies across the industries. The cement manufacturing industry is unique in many aspects compared to other sectors in Kenya.

This study concludes profitability, firm size, asset tangibility, firm growth, liquidity and non debt tax shield are determinants of the capital structure of cement manufacturing firms in Kenya. The most influential variable is the non-debt tax shield followed by asset tangibility, then firm size and firm growth. Liquidity has the least impact on leverage of the cement manufacturing firms in Kenya.

The study also concludes that profitability has a negative correlation with the leverage of the cement manufacturing firms in Kenya. This implies that as leverage of the firms

increases profitability will fall. All the other variables have a positive correlation with leverage.

5.4 Recommendations

Some of the factors to consider when making capital structure choice include profitability, size of the firm, growth of the firm, liquidity, non-debt tax shields and tangibility of assets. Chief Finance officers of firms in the cement manufacturing firms should take into account the industry norms when developing their financial policies. Capital structure of comparable companies in the industry should be considered because it might reflect the unique risks inherent in that industry.

5.5 Limitations of the Study

Not all data was available in the NSE because they had summarized data. The Capital markets authority (CMA) provided comprehensive data. However data for some years was missing. Not all companies used debt in their capital structure hence companies that were unlevered were excluded from this study.

Some of the cement manufacturing firms are not listed at the NSE hence it was challenging to get the data. The study period was ten (10) years from 2005 to 2014. Some of the newly established firms did not have data for some of the periods making it difficult to make comparisons.

5.6 Suggestions for Further Research

A similar study may be carried out with the objective of addressing financial structure of firms as opposed to capital structure. This would be worthwhile because it was noticed that a number of firms used large amounts of short term borrowing rather than long term debt.

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APPENDICES

Appendix 1: List of Cement Manufacturing Companies in Kenya

1. Bamburi Cement Ltd
2. East Africa Portland Cement Ltd
3. ARM Africa Ltd
4. Mombasa Cement Ltd
5. National Cement Ltd
6. Savannah Cement Ltd