

**MACRO-ECONOMIC FACTORS AND CORPORATE CAPITAL STRUCTURE:
EVIDENCE FROM FIRMS LISTED AT THE NAIROBI STOCK EXCHANGE**

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DECLARATION

I, the undersigned declare that this research proposal is my original work and has not been submitted to any other examination body, institution, college or university other than the University of Nairobi for academic credit.

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APPROVAL

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

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ABSTRACT

This study analyzed macroeconomic factors and corporate capital structure by taking evidence from Non-financial firms listed at the Nairobi Stock Exchange. It utilized data for the period 2007 to 2017 that was drawn from annual reports by the Nairobi Stock exchange, respective annual company reports as well as Kenya Central Bank Website.

The study applied panel data Regression specifically Random effects model to estimate the relationship between capital structure as the dependent variable and macroeconomic factors as the independent variables. Capital structure was represented by debt to equity ratio while the independent variables included annual inflation rate, interest rates, exchange rates, asset tangibility, company size measured by the logarithm of company's total assets, FDI, GDP growth rate, savings as a ratio of GDP, financial development as well as stock market capital development.

The findings were that Inflation, Interest Rates, Company's Asset Tangibility as well as the Size are positively correlated to the Debt to Equity Ratio. This was also similar in regards to Savings to GDP Ratio and Stock market Development. On the other hand, Exchange Rate, GDP and Foreign Direct investment had a negative effect on the Debt to Equity Ratio.

The results of this study provided evidence regarding how changes in macroeconomic factors such as inflation rate, interest rate, exchange rate, S/GDP, Size, FD and foreign investment shift decisions regarding capital formation among non-financial firms listed at the NSE.

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ABBREVIATIONS

CMA	Capital Markets Authority of Kenya
FE	Fixed Effect
FISMS	Fixed Income Securities Market Segment
GDP	Gross Domestic Product
MIMS	Main Investment Market Segment
NSE	Nairobi Stock Exchange
RE	Random Effect
S-GDP	Savings to GDP ratio
FDI	Foreign Direct Investment

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Capital structure has continued to generate great interests in finance literature since Modigliani & Miller's seminal work of 1958. It can simply be described as an aspect of financing a firm through long-term debt, preferred stock, and shareholder equity. Indeed, capital structure has thus far been recognized as one of the key aspects of any managerial decision. This is so because it largely influences shareholder return and risk (Muthama, Mbaluka&Kalunda, 2013).

It is, however, worth noticing that coming up with an appropriate mix of debt and equity is subject to different variables, hence different practices are manifested by different firms. These factors can be both internal and external. Internal factors are mainly those associated with a specific firm. External factors, on the other hand, include macroeconomic variables that generally affect the optimal structure and decisions made by firms (Robb & Robinson, 2014). More importantly, research suggests that 70% of external factors actually cause this difference as far as the ability of firms to make optimal decisions is concerned (Graham, Leary & Roberts, 2015). These include aspects such as inflation, interest rates, exchange rates, GDP and foreign investment flows. Therefore, in an attempt to smoothen this relationship, various theories of capital structure have been used.

As noted by Robb & Robinson, (2014), a firm's capital structure is explained by several factors. An optimal capital structure is the appropriate debt-to-equity ratio for a company that maximizes its value. This basically implies that an appropriate capital structure of a firm is one that strikes a balance of appropriate debt-to-equity and minimizes the company's cost of capital. Through this research paper, therefore, we analyzed the best mix for non-financial firm listed at the NSE, and how this choice is affected by macroeconomic variables at play in the Kenyan Economy.

In order to generate streams of cash flow, a company has to apply its assets towards its core business. In so doing, it not only makes it possible to pay taxes but also make distributions to the providers of its capital who are basically its investors. The remaining balance is what can be used to either plough back into the business or finance any debts owed (Rampini& Viswanathan, 2013). Suppose a firm is equity-financed, then the entire after-tax cash-flow would be beneficial

to the shareholders, which can be done in terms of retained earnings or dividend. On the other hand, in case it has borrowed a portion or all its capital, then a significant amount of after-tax cash flow would be allocated to service that debt. Additionally, since debtors have the initial claim to this cash-flow, then its shareholders will only be entitled to the residual. It is therefore clear that the choice of the capital structure directly affects the overall cost of capital, thereby affecting its market value (Sun, Ding, Guo & Li, 2015).

This view was however not shared by Modigliani and Miller. Instead, they highlighted that a company's earning power is determined by its real assets such that when the firms' capital investment program is fixed and some assumptions satisfied, then its combined market value of equity and debt is unrelated to the choice of capital structure. However, these other assumptions, that include taxes and other macroeconomic variables, almost always make this claim impossible to fulfill.

Corporate sector growth is critical to the economy of any given country. This makes the relationship between capital structure and macroeconomic variables very close so much so that any uncertainties in these variables would render the decision to implement the perfect capital structure mix almost impossible to make. Macroeconomic uncertainty has been described by University of Chicago economist Frank Knight as that highly improbable aspect associated with macroeconomic variables (Knight, 2013). Segal, Shaliastovich & Yaron, (2015) asserted that both favorable and adverse uncertainty have far-reaching implications in the financial market and macroeconomic conditions in the economy.

Studies reveal that most modern managers face major problems in determining the mix of capital structure to use bearing in mind these macroeconomic factors. Empirical evidence suggests that indeed a link exists between macroeconomic variables and capital structure decisions of firms. Moreover, the main macroeconomic variables at play in this relationship are those that come about from fiscal and monetary policies that are pursued by a given nation. Especially, a monetary policy will determine the country's interest rates that eventually and more significantly influence the capital structure of firms.

As highlighted by Jõeveer, (2013) macroeconomic variables are a significant condition for the financing of firms in any given country. In a study that provided evidence from transition

economies, Jõeveer, (2013) asserted that certain specific factors explain the majority of the variations in leverage for firms in the nine European countries studied. On the other hand, Öztekin, (2015) highlighted that growth in the economy tends to increase firms use of debt, while inflation affects capital structure and firms' value such that an increase in inflation levels prompts investors to sell bonds in exchange for stocks making firms' capital structure proxied by debt-equity ratio to decrease. It is also true that inflation causes a change in the balance between creditors and debtors, which does not play well when the decision of the right capital expenditure mix is considered. All these studies point to a definite inference; that there are certain macroeconomic factors that affect capital structure. Any uncertainties associated with these variables would, therefore, affect the optimal mix necessary for optimal usage of firm resources that would eventually result to the optimal output.

1.1 Nairobi Securities Exchange

The process of financing the overall operations of a company involves using different sources of funds. This makes stock exchanges specifically important for non-financial firms. When a firm opts to raise funds, it can borrow funds or sell stock. For instance, selling stock through private placement yields funds for firm growth while giving the management the ability to determine who those who become holders of stock. Investors also may bring expertise to help the company grow (Singh & Kansil, 2016). Another important factor to consider is risk. Diversifying the risk of ownership is particularly crucial when a firm grows, with the original shareholders aiming to cash in some of their profits while still retaining a percentage of the company. This is made possible through securities exchange, and the Nairobi Stock Exchange provides this platform for Kenyan firms.

The NSE was formed in 1954 as the Nairobi Stock Exchange, officially under the Societies Act (1954). With its base in Kenya's Capital city, Nairobi, the company started out as a voluntary association of stockholders in the European community registered under the Societies Act in British Kenya. It is currently among the leading African Exchange in the Sub-Saharan Africa. Its Board and management team are made up of some of the leading professionals in capital markets who are focused on innovation, diversification and operational excellence in the Exchange. They are also responsible for fostering its mission and vision, which are to provide a world-class

securities trading facility and to be a leading securities exchange in Africa, with a global reach (Nairobi Stock Exchange, 2018).

The Capital Authority of Kenya (CMA) is NSE's regulatory body. Established in 1990, CMA's creation was specifically meant to promote the development of an organized and efficient capital market (Wanja, 2017). This has thus far seen the split of the NSE into different branches serving specific roles in the process. These include the Alternate Investment Market Investment Segment (AIMS), the Main Investment Market Segment (MIMS) and finally the Fixed Income Securities Market Segment (FISMS). Through AIMS, small growing firms can be able to get funds besides using MIMS. FISMS, on the other hand, provides a stand-alone market for fixed income securities.

Several changes have taken place during NSE's 54-year tenure. The year 2014 saw the most notable changes as illustrated by Wanja, (2017). The company demutualized itself and is now listed at the Nairobi Securities Exchange Ltd. It currently has sixty-eight listings (68) companies that operate under thirteen distinct sectors namely Construction and Allied, Agricultural, Telecommunications and Technology, Automobiles and Accessories, Energy and Petroleum, Banking, Commercial and Services, Insurance, Investment Services, Manufacturing, Real Estate and Investment Trust and finally Exchange Traded Fund (NSE, 2017). This study main force was on five (5) sectors that fit the description of a non-financial company, bringing the total to 25 companies (See Appendix D). This research paper therefore, provided a detailed analysis of the macroeconomic variables that influence capital structure choices adopted by these companies.

1.2 Statement of the problem

The economic activities of any given country play a very big role when the capital structure of a company is considered. While it is true that the corporate growth of a nation determines its economic growth, it is, in fact, the nation's economic activities that shape organizational capital structure. As highlighted by Öztekin (2015), the capital structure of a company acts as a signaling tool on the confidence of potential investors and also affects its value. By choosing an optimal capital structure, a firm maximizes its value through significantly minimizing its weighted average cost of capital. This, in turn, increases investor confidence, since the risk associated with that particular firm is reduced. However, macroeconomic factors such as inflation, interest rates, exchange rates and foreign investment flow largely affect this

relationship. In turn, macroeconomic uncertainty upsets all these variables, making it difficult for an appropriate balance between debt and equity. This translates to the adoption of a less than optimal capital structure by most NSE non-financial listed firms. The main problem for listed non-financial firms, therefore, is to obtain the right balance between debt and equity amid this uncertainty.

Studies that have been conducted to illustrate this relationship revealed that indeed capital expenditure is affected by these macroeconomic factors. Internationally, studies have established a relationship between macroeconomic factors and leverage, bearing in mind the GDP effect. Locally, researchers have focused more on macroeconomic variables and how they affect the capital structure of listed companies as opposed to the uncertainties that contribute to changes in the macroeconomic environment. This study was intended to highlight how uncertainties such as inflation, interest rates, exchange rate stability, GDP growth and foreign investment flow affect the macroeconomic environment which subsequently changes capital structure formation of non-financial companies in the country. Therefore, consistent with the research problem this study sought to address the following research questions;

- i. To what extent does inflation and Interest Rates affect the capital structure of non-financial companies listed at the NSE?
- ii. What is the effect of exchange rates on the capital structure of non-financial companies listed at the NSE?
- iii. How does the GDP growth, Savings to GDP Ratio, Size of firms, Financial and Stock Exchange development affect the capital structure of the listed firms?
- iv. What is the effect of Foreign Direct Investments flows on the capital composition of non-financial companies listed at the NSE?

1.3 Objectives of the Study

This study investigated the link between the capital structure of nonfinancial firms and macroeconomic factors. Specifically, the study sought to establish;

- i. The influence of inflation, interest rates, exchange rate on the capital structure of non-financial firms.
- ii. The effect of foreign investments on the capital structure of non-financial firms

- iii. The effect of the GDP growth, S-GDP, Financial and stock sector Development as well as the size of the firms on the capital structure optimal mix

1.4 Significance of the Study

This study intended to extend the literature available on macroeconomic factors and capital expenditure in several ways. First, the study not only provided how inflation, GDP Growth and exchange rates affect capital expenditure as highlighted by other studies but also provided the effects interest rates and foreign investment flows has on capital expenditure as well. This information also considered the latest economic conditions and controlled for Size of the firm as well as financial and Stock sector development. It will be vital to policymakers who intend to identify how various monetary and fiscal policies are affecting the corporate world. Specifically, information from the results is useful for CMA in its objective to promote the growth of capital markets by developing and designing high-quality products, policy interventions and incentives as well as provision of timely and accurate data to be used both internally and externally. The findings can also contribute to the authority's research as it will provide the latest information bearing in mind the latest economic conditions.

Stakeholders in the NSE listed non-financial firms would also want to know how their investments are faring or would fair in the Kenyan market given the latest economic conditions. This information is vital in as far as making financial decisions such as whether or not to borrow, or invest is concerned. Additionally, through the study of capital structure, managers can now get the knowledge regarding how organizations are able to optimally determine the perfect balance of securities and financing sources that can be used to give the best output possible given the resources at the firm's disposal. This, therefore, means that firms can come up with a rational capital structure that would maximize their overall market value. Finally, this information is vital to top managers who rely on empirical evidence to make informed decisions that serve their institution's best interest.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter details the theories proposed on capital expenditure as it evolved into what is today. The chapter also highlights some of the empirical studies done on the topic and gives a summary of their findings. Finally, an overview of the chapter, which also presents the research gap, is presented.

2.2 Theoretical Literature

There are several theories on the capital structure of firms. These include: static Trade-off Theory, Pecking-Order Theory, the Agency Cost Theory and the capital structure irrelevance theory. They all apply at different scenarios as described in this sub-section;

2.2.1 Static Trade-off Theory

The trade-off theory of Capital structure asserts that the optimal capital structure is a trade-off between interest tax shields and cost of financial distress. This can be broken down to mean that a company will choose the amount of equity finance to use and the amount of debt to finance by balancing the benefits and costs. The theory, therefore, can be used to describe the fact that many firms are funded by equity and debt in some given proportion. In so doing, firms stand to either get benefits or suffer costs. According to this theory, firms that have safe, tangible assets and more taxable income to shield have a high target debt ratio compared to those that have less safe, intangible assets and less taxable income to shield. The marginal benefit of a further increase in debt reduces as debt rises, while the marginal cost rises. The implication of this is that a firm that seeks to optimize its value will focus on this trade-off when choosing the debt and equity levels for financing (Serrasqueiro & Caetano, 2015).

2.2.2 Pecking-Order Theory

The pecking order theory asserts that an increase in asymmetric information would subsequently lead to the rise in financing costs. As presented by Elsas and Florysiak (2015), the theory suggests that firms get their finances through internal funds, debt as well as new equity. Given these three sources, a firm will prioritize them as follows; internal funding, debt and then lastly new equity. A firm will choose to finance its business activities with the available funds it can

raise internally before opting to borrow. However, when it is no longer sustainable to keep on borrowing, then the firm will choose to look out for new investors.

This pecking order is arrived at best when managers understand their firm's prospects, risks and values (Allini, Rakha, McMillan & Caldarelli, 2017). This information influences the choice made between internal and external financing as well as debt and equity. In most cases, the issue of debt and equity will be favored with an abundant availability of information because debt signals a reduction in stock prices, which means that investors are likely to earn more from their investments. The issue of equity on the other hand signals lack of confidence in the management (Ahmad & Ali, 2017).

This theory is important because it can be used as a signal to any interested party about how a firm is performing. A company that finances itself through debt signals a strong managerial confidence as opposed to that which does not. To fully understand the choice of capital structure adopted therefore, the researcher thought it was prudent to include this theory to the study.

2.2.3 Agency Cost Theory

Jensen and Meckling (1976) developed the agency theory. This theory describes the link between managers (agents) and owners or shareholders (principal) of an organization (Pepper & Gore, 2015). It proposes that the manner in which these agents mediate in a firm's funding has an effect on the financial structure of the company. According to the theory, the optimum capital structure comes from settlement among several funding choices such as equity, debts as well as other securities. Debt makes it possible for stockholders as well as managers to tear the same line with the same intentions for the company, meaning that an appropriate debt level is that which assures the least amount of total agency costs. The theory also proposes that firms that have a significantly higher number of profitable assets will use a large portion of their earnings for debt payments. This means that they increase their credit ratings, making it easier to borrow more. Moreover, these firms can get benefits of debts in that their free cash flow issues will be reduced (Bosse & Phillips, 2016).

The theory is important because it answers the critical question that a positive connection between firm profitability and its leverage exists. Additionally, it can be used to inform that agency costs related to debt are lesser for companies with more tangible assets. This theory is

therefore important to this study as it will be used to better explain the capital structure of listed non-financial firms in Kenya and its relationship to macroeconomic variables.

2.2.4 Modigliani and Miller Theorem

The Modigliani and Miller Theorem is a critical element of economic theory that acts a foundation of modern thinking of capital structure. The theorem, developed by Modigliani & Miller (1958) states that in the absence of agency and bankruptcy costs, taxation and asymmetric information, and that efficient market exist, firms' value is not affected by it financing options. This theorem is termed as the capital structure of irrelevance principle since the firm's value independent on its dividend policy as well as its decision to raise funding by issuing stock or obtaining debt. Considering that the theorem was developed at a time when taxes were not there, the modern business world is largely affected by tax. Today, the interest on debt is tax deductible. Assuming other functions, a rise in debt will proportionally rise the value of a company.

Essentially, the theorem states as follows; consider two businesses which are similar other than on their financial structures. The first company is unlevered, meaning that it is equity-financed. In contrast, the second company is levered meaning that it is funded partly by equity and debt. If this is the case, then both firms are the same according to the Modigliani–Miller theorem. The attempt by these two Nobel Prize winners to solve the leverage ratio puzzle was based on the assumption that companies always set long run leverage targets. (Modigliani & Miller (1958). It is worth mentioning at this point that the reviewed theories of capital structure fail to emphasize on the effect of unpredictable variations of macroeconomic factors on financing decisions.

2.3 Empirical Literature

Several studies have been done to elaborate the link between macroeconomic variables and capital structure of firms in Kenya in general. This section points out the methodology, design and findings as indicated by various researchers. For instance, in the work conducted by Rashid (2015) on the determinants of capital structure of cement manufacturing firms in Kenya, several variables analysed, key among them being leverage, as the dependent and liquidity, firm growth, size, profitability and asset tangibility as the independent variables. The findings of the study were that all the variables had a positive correlation except profitability. This therefore called for

a balance of debt and equity as the best way of minimizing the negative impact on profitability. The main problem with this study was that it relied on data from the Nairobi Stock Exchange, where not all cement manufacturing companies are listed. This excluded other firms that could have shown different results.

This was also echoed by Kyenze (2014) who investigated how management characteristics affects the capital structures of those NSE listed firms listed. The study showed that a firm's performance is not affected by the CEO's gender or education, but age played a key role in the company's performance as far as its capital structure is concerned. It was also concluded that more mature managers were more likely to make capital structure decisions based on experience as compared to younger managers. Although most managers had advanced university degrees, level of education did not play a big part in firm performance. The suggestion therefore was that there is need to involve women more in management because they were as effective as their male counterpart's despite being under represented.

However, as far as Kiprop (2014) was concerned, majority of firms listed on the NSE have a higher debt to equity ratios, meaning they largely depended on debts than equity to finance their operations. However, a notable criticism of this study, that aimed to investigate the effect of capital structure on value of firms listed in the NSE was that the sample size and the reliant on secondary data. This therefore meant that for a more concrete result, more firms needed to be included in subsequent studies. This is why Gichangi (2014) analysed the link between capital structure and profitability of all listed non-financial firms in Kenya. Aiming to analyse the link between capital structure and profitability of non-financial firms listed in the NSE over a period of 5 years, the study revealed that a positive link existed between a firm's profitability and short-term debt. Omara (2012) also focused on finding out the effects of macroeconomic structures on the capital structures of Multinational Corporations and Domestic Companies. Indeed, in his study was very comprehensive and provided a clear image of the link between the variables. Unlike the others, this study was broader in that it considered not only the firm's internal capital structures but also the macroeconomic environment. In addition, Chekanskiy (2011) investigated the effects of macroeconomic structures involving unemployment as well as changes in inflation and deflation on capital structure decisions and found that that indeed,

macroeconomic factors do play a significant part in a company's capital structure decisions. A key recommendation is the maintenance of a balance between long-term and short term debt.

Muhamad et al, (2011)'s study on the effects of macroeconomic parameters including foreign investment, inflation and unemployment on the capital structure of firms, with specific focus on Pakistan, suggested that a number of factors have an effect on firms' capital structure decisions. One such factor is market size, which positively influenced the debt choice of the firms. According to the study, the bigger the market size, the more options the firm had for debts management, both in the long-term or long-term. A more recent study by Kinyua and Muriu (2017) analysed the factors determining the capital structure of agricultural firms in Kenya. Evidence from the study showed that firm age, liquidity, firm size and profitability are important in determining the capital structure of an agricultural firm. While profitability and long-term debt share a negative relationship, firm age exerts a positive effect on short term debt. Kinyua and Muriu (2017) however, focused on the determinants of the capital structure of agricultural firms. Convergence on the findings about capital structure of non-financial firms has been established by several studies. For instance, in a study that included panel data collected between 1998 and 2009 in South Africa, Sunjay (2015) found a positive link between capital structure and leverage as well as profitability. Other studies that found the same include Fan, Titmanand-Twite (2012) who found that financial leverage positively influences the financial performance of South African firms and Serghiescu and Vaidean (2014) found that liquidity exerts a negative effect on capital structure on the analysis of Romanian firms listed on the Bucharest Stock Exchange between 2003 and 2010.

Additionally, several studies have also focused on macroeconomic factors of specific countries and how they determine capital structure of their non-financial organizations. For instance, Chen (2004) specifically studied factors in China, while others included Negash, (2002) (South Africa), and Abor and Biekiye (2005) (Ghana). Others chose to focus on developed economies while others on less developed economies, with the key determinants of capital structure tested being asset tangibility, profitability, firm size and growth, business risk, the composition of management, tax rate among others. A good example would be Myers and Majluf (1984), who assumed that since managers almost always have insider information about the value of the firm, they will always act in the interest of the shareholders when making major decisions such as

capital structure. As such, the preference for internal funds to external funds as predicted by the POT theory is based on this assumption. Indeed, the study of this theory has been the subject of many studies that have been mentioned throughout this literature review.

As illustrated by its main theorists Myers (1984), Myers and Majluf (1984) and Syam-Sunder and Myers (1999), most organizations will prefer to have internal funding as opposed to external funding because these sources had the lowest cost in as far as information asymmetry is concerned. They asserted that debt had the lowest cost of information asymmetry followed by equity. This was further proved by a study conducted in Australia by Allen (1991) who found that firms in the country follow the POT prediction in as far as their funding of capital is concerned. Transaction costs have also been found to affect the capital structure decisions made by organizations. As illustrated by Titman Wessels (1988) who used data from the United States between a period of 1974 and 1982 concluded that firms that have a huge debt tend to impose high charges on the transactions. Another study that confirmed this to be true was that conducted by Odnga (2003) in Kenya which asserted that firms with a high income returns use more debt compared to those with a low income-return.

2.4 Overview of the Literature Review

The reviews of studies suggest that macroeconomic environment of firms as well as the micro economic play a key role in determining forms' capital structure decisions. There was a general acceptance by Omara (2012) and Chekanskiy (2011) of the fact that firms are affected by the macroeconomic conditions including inflation rate, exchange rate, unemployment and foreign investments just as they are affected by the microeconomic conditions including GDP in their capital structure decisions.

A notable shortcoming by most of the studies is that there was over-reliance on secondary data. The danger of relying on secondary data is that this is not data that was fully intended for the study. It could have been data produced and modified specifically for other purposes. What would set this study apart from the rest is that it would utilize both secondary and primary data. In cases where the primary and secondary data are inconsistent, it would be more dependable to use primary data as it has higher chances of accuracy than secondary sources.

In the case of the studies on Kenyan firms, the studies focused more on data from the Nairobi Securities Exchange (NSE). This means that despite using sampling methods to obtain representative samples, focusing only on the firms listed in the NSE leaves out a significant number of firms which are not listed, and which could give different results. Also, given the geographical distribution of firms, the studies overlooked a number of big firms that have turnovers larger than some listed firms. This study therefore added to existing studies by using larger data for the period that had a lot of uncertainty.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section provides the methodology that was adopted by the study. This includes the theoretical framework adopted, the empirical model, definition and measurement of variables, the econometric approach and the sources of data.

3.2 Conceptual Framework

A conceptual framework is an analytical tool that is used to organize abstract ideas with several variations and contexts. This allows the researcher to not only explain but also predict and understand the phenomenon at hand. In this case, the conceptual framework developed is employed to explain the link between macroeconomic factors and capital formation. Miller and Modigliani (1958) asserted that the firm's value is largely relies on its future value, which is in turn dependent on the growth prospects and operating profits it will have. As pointed out by Kinyua & Muriu (2017), a high market value results from high future growth prospects. For such a feat to be achieved, the organization needs to make a decision regarding how it will fund its operations. Myers and Majful (1984) pointed out that many firms prefer receiving funds internally before committing themselves to external sources. However, there are certain macroeconomic factors that tend to affect these growth prospects regardless of the choice made by firms. Sinha & Agnihotri (2015) referred these factors as microeconomic risks that should be considered when making financing decisions. They include interest rates, inflation, exchange rates and foreign investment.

As stated by Sinha & Agnihotri (2015), inflation rates pose a risk to growth prospects of a firm and should thus be considered when making financing decisions for a firm. According to their results, a higher inflation risk will adversely affect a firm's leverage position. The higher levels of inflation uncertainty, the greater the firm's risk prompting firms to have decreased debt-to-equity ratio. For this reason, this study expects to have a negative effect on capital structure with an increase in inflation rate.

There exists a stochastic correlation between interest rates and the asset value of a firm as illustrated by Chang, Lin, & Yang, (2015). In their study, they asserted that inclusion of the

stochastic interest rates depresses the equity value of a firm while enhancing its debt value. They went ahead to conclude that a stronger impact on the capital structure of the firm is experienced when the correlation between the variations in the asset of a firm and interest rate is strong. This study therefore also expects a negative relationship between an increase in interest rate and the capital structure of a firm.

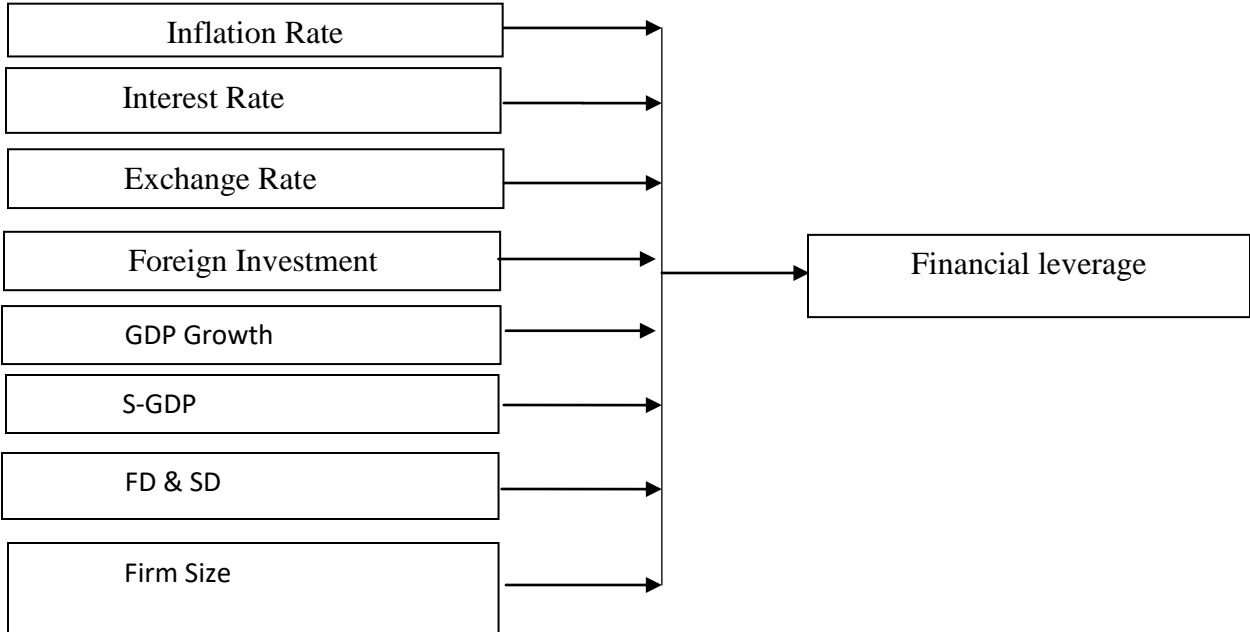
According to Smith & Stulz (1985), theoretical risk management literature underlines the effect of exchange rate risk on firm's cash flows encouraging firms risk management in the presence of capital market imperfections such as agency costs. Also, while investigating exchange rate and capital structure decision in New Zealand, Dong, (2011) noted that all financial products are subject to globalization and as such, firms are bound to be affected by exchange rates. Their study found that the additional variable of the one year forward appreciation rate of the New Zealand dollar against the US dollar is found to have a significant negative relationship with changes in the long term debt ratio. Similarly, this study expects to find that firms will significantly reduce their long term debt when the market signals an increase in exchange rates.

As established by Handoo & Sharma, (2014), foreign investment has a significant effect on the firms' leverage structure. As such, it is expected that a firm will choose to reduce their long term debt in the even that more local investors are interested in investing in foreign firms as opposed to local ones.

The conceptual framework based on theoretical literature can be depicted as follows;

Independent Variables

Dependent Variable



3.3 Empirical model

This study aims to analyze the effect of macroeconomic variables on capital structure formation non-financial firms listed at the NSE. Independent variables of the study will comprise of inflation rate, interest rate, exchange rate, GDP, S-GDP, Size, FD , SD and foreign investments. The model specification is as follow

$$DTE_{it} = \beta_0 + \beta_1 IF_{it} + \beta_2 IR_{it} + \beta_3 EXR_{it} + \beta_4 LS_{it} + \beta_5 LFI_{it} + \beta_6 GDP_{it} + \beta_7 S.GDP_{it} + \beta_8 FD_{it} + \beta_9 SD_{it} + \mu_{it} + \epsilon_{it}$$

Where:

DtE_{it} : Debt-to-Equity ratio of the company i at time t

IF_{it} : Inflation Rate i at time t

IR_{it} : Interest Rate i at time t

EXR_{it} ; Exchange Rate i at time t

FI_{it} : Foreign Investment i at time t

LS_{it} : Log of size

GDP : Gross Domestic Product

FD : Financial Development

SD : Stock Development

β_i is the parameters to be estimated where $i = 1...4$

Further, the equation includes an unobserved firm-specific effect μ and the random error-term ϵ that is normally distributed with mean 0 and variance σ^2 .

3.4 Definition and measurement of variables

3.4.1 Dependent Variable

Capital structure will be the dependent variable of this study. The study measured capital structure using the debt-to-equity ratio. Debt and equity are two ways through which companies can raise capital. Unlike equity, debt is cheap and comes with tax advantages since interest payments are tax deductible. It also enables a firm to retain ownership. Businesses that tend to

have higher debt than equity in financing their assets tend to record high leverage ratio and an aggressive capital structure. In contrast, a business that funds its assets with higher levels of equity compared to debt tend to record low leverage ratio and hence a conservative capital structure. The debt to equity ratio, which is used to determine a company's capital structure, is calculated by dividing debt by equity.

3.4.2 Inflation Rate

Inflation relates to the general rate at which the prices of goods and services rise. An increase in price levels implies that a unit of currency purchases fewer goods and services. It also represents a decline in the purchasing power of a currency. Inflation is measured as an annual percentage change in consumer price index. It is important to consider how inflation affects earning volatility of a firm. As pointed out by Sinha & Agnihotri (2015), inflation affects price and costs structures as well as sales structures since a shift in inflation will affect the economy's consumption. For this reason, firms need to consider their cash flow stability with respect to the fixed charges related with debt financing.

3.4.3 Interest Rate

Interest rate is the proportion of borrowed assets expressed as a percentage. It is based on the annual percentage rate (APR). Essentially, this is a leasing charge to the borrower for the use of assets including cash and other consumer goods. Interest rates constitute a cost of debt to businesses. Companies compare the borrowing cost vis-à-vis equity cost, such as dividend payments, to determine the least expensive source of funding. Since most companies finance their capital from debt or equity, the cost of the capital is analyzed so as to obtain an optimal capital structure.

3.4.4 Exchange Rate

This is the price of a country's currency in terms of another currency. In a direct quotation, the foreign currency is the base currency and the domestic currency is the counter currency. In an indirect quotation, the domestic currency is the base currency and the foreign currency is the counter currency. This has an effect on a firm's choice between debt and equity considering its international involvement (Panda & Nanda, 2015).

3.4.5 Foreign Investment

This relates to flows of capital from one nation to another essentially allowing extensive ownership stakes in its domestic companies. This implies that foreigners have a crucial role in running of the companies as a result of their investment. This study will consider foreign direct investments measured by an evaluation of the physical investments and purchases made by a foreign country.

The GDP growth is also considered since it has an effect on the Capital structure. The Savings to GDP Ratio, Size of the firm, Financial and Stock sector Development are the control variables in this analysis.

3.5 Econometric Approach

This study employed a panel regression approach to estimate the effect of macroeconomic factors on capital structure formation of listed non-financial firms in NSE. This is a data analysis technique where the behavior of the entities is observed across time whose advantage is that it allows control over the variables that are time variant but entity invariant. This made it best suitable for this study as it accounts for individual heterogeneity and has the freedom to include variables at any stage of the analysis. Fixed Effect and Random Effect models have been experimented to capture the functional relationships between the models.

The Fixed Effect model is useful when assessing the effect of variables that are time-variant. Additionally, it explores the link between explanatory and the dependent variable within a firm and each of the entity has its own features that may or may not be captured by the explanatory variables. This model also eliminates the effects of the time invariant features of the explanatory variables so that the net and unbiased effect of the explanatory variables can be captured. Several studies have chosen to use fixed effects model including Abor (2005), Aulova and Hlavsa (2013), Muriu (2016) and Kinyua and Muriu (2017). In contrast, random effects model assumes that the variation across firms is random and unrelated with the explanatory variables. It is used when the differences across firms has some effect on the outcome variable.

The appropriate model was therefore selected using the Hausman test. This test identifies whether the unique error (μ) is correlated with repressor. The null hypothesis for the test is as follows;

H₀: μ_i is not correlated with repressor.

If H₀ is rejected, then Fixed Effect (FE) model will be the appropriate model otherwise Random Effect (RE) model would be the alternative selection.

It should also be noted that differences in variations of the estimates in different study periods can lead to heteroscedasticity. A Breusch-Pagan test was employed to test its existence in the residual variance. In the event that it was present, the Eicker-White standard errors were used to achieve homoscedastic estimates.

3.6 Sources of data

This study used annual company data as published in the audited accounts. Data between 2007 and 2017 for the listed non-financial firms was used. The study only considered firms with available, consistent data from 2007 to 2017. Data on the independent variables was obtained from the central bank of Kenya website

CHAPTER FOUR

EMPIRICAL FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the empirical findings of the macroeconomic factors that influence the capital structure of non-financial firms for the period 2007 to 2017. This includes descriptive statistics, correlation matrix, and the regression results.

4.2 Summary Statistics 33

Table 1 shows the descriptive statistics. The summary statistics indicate that on average debt to equity ratio of the non-financial companies listed at the NSE stood at 0.3735 with a standard deviation of 1.3165. Further, the statistics indicate that the maximum debt to equity ratio was 3.6938 while the minimum was -17.8709. The summary statistics also reveal that the difference between the mean and the median of the debt to equity variable is 0.101 implying that the variable is not highly skewed since its mean and median values almost present the same information.

Concerning the inflation variable, the summary statistics indicate that on average, annual average inflation level in the country averaged 9.462 percent with the deviation from the mean being 5.916. The highest inflation for the study period was 26.74 percent with the minimum level of inflation being 3.961 percent. The inflation rate is slightly skewed to the right since the skewness value is 1.980. The symmetrical value is normally 0.

Table 1: Summary Statistics

Variable	Obs	Mean	Median	Std.Dev.	Min	Max	Skewness	Kurtosis
DTE	275	0.3735	0.2725	1.3165	-17.8709	3.6938	-9.5913	136.17
IF	275	9.4620	6.8775	5.9159	3.9613	26.2398	1.980	6.0665
IR	275	6.8485	7.792	3.8682	-0.9849	12.03	-0.4299	2.2672
EXR	275	85.77	86.12	11.53	67.32	103.37	-0.0269	1.9693
Tan	275	0.5395	0.5916	0.2459	-0.2858	0.9375	-0.6041	3.1064
LSize	275	16.03	15.96	1.6182	10.79	19.75	-0.1249	3.329
L FDI	275	20.02	20.33	0.9223	18.38	21.10	-0.6364	1.998
GDPG	275	5.1978	5.7185	1.9998	0.2322	8.4056	-1.0349	4.2179
S_GDP	275	12.6716	12.5545	2.2525	9.4201	16.6619	0.2131	1.8203
FD	275	39.6346	40.3092	2.5083	36.069	43.245	-0.1820	1.6403
SD	275	1.8799	1.9838	0.8697	0.5357	3.5289	0.5010	2.4571

The summary statistics also reveals that on average real interest level during the study period stood at 6.489 percent with the maximum and minimum values being 12.03 percent and -0.985 percent respectively. The data also shows that the exchange rate averaged 85.77 with the maximum rate being 103.4.

On the GDP growth rate variable, the results indicate that on average the economy grew at 5.198 percent. The maximum and minimum ever reported value for the GDP growth rate variable during the study period was 8.406 percent and 0.23 percent respectively. The descriptive statistics also shows that savings as a ratio of GDP in the economy stood at 12.6716 with the maximum and minimum 16.6619 and 9.4201. Further, the descriptive statistics show that the average financial and stock market development stood at 39.6346 and 1.8799 respectively. The summary statistics also indicate that on average companies' asset tangibility ratio stood at 0.540 with the maximum and minimum values being 0.938 and -0.286 respectively.

4.3 Correlation Analysis

We also present the correlation matrix of the variables used in the analysis in table 2. The correlation matrix shows that the correlation between some of the variables used in the study exists. In particular, the results indicate that inflation, real interest, asset tangibility, size, FDI, savings as a ratio of GDP and stock market development is positively correlated with debt to

equity variable. Similarly, exchange rate, GDP growth rate as well as financial development are negatively correlated to debt to equity variable.

Table 2: Correlation matrix

	DTE	IF	IR	EXR	TAN	L Size	LFDI	GDPG	S_GDP	FD	SD
DTE	1										
IF	0.0280	1									
IR	0.0295	-0.8188	1								
EXR	-0.0824	-0.5153	0.4585	1							
Tan	0.0701	-0.1134	0.1058	0.1541	1						
L Size	0.0690	-0.1173	0.1180	0.194	0.379	1					
L FDI	0.00540	-0.3685	0.4362	0.403	0.116	0.0971	1				
GDPG	-0.0212	-0.7819	0.6751	0.248	0.0889	0.0548	0.450	1			
S_GDP	0.0192	0.5320	-0.6106	-0.803	-0.129	-0.190	-0.475	-0.170	1		
FD	-0.0281	-0.4838	0.5523	0.503	0.126	0.146	0.617	0.425	-0.729	1	
SD	0.0716	0.1244	0.1235	-0.501	-0.0486	-0.0827	0.391	0.266	0.219	0.0128	1

4.4 Hausman Specification Test

We first conducted a Hausman specification test to decide the most appropriate model between the fixed and random effects model. The null hypothesis of the Hausman states tests whether the unique errors are correlated with the regressors. We present the Hausman test results in Table 3.

Table 3: Hausman fixed random specification

DTE	Coefficients		
	Fixed (b)	Random (B)	Difference (b-B)
IF	0.1514	0.1532	-0.001845
IR	0.0750	0.0736	0.001399
EXR	-0.0963	-0.1006	0.004388
TAN	-0.2607	0.21478	-0.47547
LSize	-0.0738	0.0548	-0.1286
LFDI	0.4829	0.4807	0.00223

GDPG	0.4199	0.4262	-0.006333
S_GDP	-0.5018	-0.5060	0.004198
FD	-0.2491	-0.2580	0.008940
SD	-0.8777	-0.8815	0.003854

Test: Ho: difference in coefficients not systematic $\text{Chi}^2(8) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 1.05$ Prob>chi2 = 0.9998

The Hausman test indicates that we cannot reject the null hypothesis since the p-value of the Hausman chi-statistic is 0.9571 which is greater than 5 percent level of significance. The implication of the Hausman test is that we use the random effects model in our analysis and interpretations.

4.5 Regression Analysis

The regression results of the link between the capital structure and macroeconomic factors are presented in Table 4. We used the panel regression techniques since our study combines non-financial NSE listed firms as cross-sectional units N and the time period component T . Particularly, the study employs random effects as well as fixed effects techniques.

Table 4 presents the estimation results based on the random-effects model. The estimation results show that inflation, interest rate, exchange rate, FDI, GDP growth rate, savings as a ratio of GDP, financial development and stock market development significantly affect companies' debt to equity ratio. However, asset tangibility and company size have no significant effects on the capital structure of NSE's listed non-financial companies.

Table 4: Estimation results

Variable	Random effects model
IF	0.153** (2.39)
IR	0.0736* (1.68)
EXR	-0.101*** (-2.86)
TAN	0.215 (0.51)
L Size	0.0548 (0.77)
L FDI	0.481** (2.31)
GDPG	0.426** (2.10)
S_GDP	-0.506** (-2.42)
FD	-0.258** (-2.50)
SD	-0.882** (-2.39)
Constant	12.52** (2.07)
<i>Observations</i>	275
No of firms	25

Notes: (i) Debt to Equity ratio is the dependent variable (ii) t statistics in parentheses, (iii), ** and *** indicate significance at 1, 5 and 10 percent respectively.*

The estimation results indicate that inflation has positive and significant effects on the capital structure of NSE's non-listed companies at 5 percent level of significance. In particular, the results indicate that a one percent increase in inflation rates increases the capital debt ratio of companies by 0.153. This research finding is consistent with the results by Hanousek and Shamshur (2011) where they found that inflation has a positive and significant effect on the

leverage of firms. The implication of these findings is that NSE's listed non-financial firms tend to use more debt since the real cost of debt declines during an inflationary period. In particular, Frank and Goyal (2009) argue that inflation is positively related to the capital structure since companies tend to repay their debts more easily due to their greater pricing power and higher returns during periods of high inflation.

Concerning exchange rate, the estimation results show that an increase in the exchange rate reduces the debt-to-equity ratio of NSE's non-financial listed firms. In particular, the results indicate that a one percent increase in exchange rate reduces the debt-to-equity ratio by 0.101. This result implies that firms tend to reduce their debt levels when there's an increase in the exchange rate in the market. A similar result of the exchange rates reducing the debt-to-equity ratio is obtained by the study by Dong (2011). The implication of the increase in the exchange rate reduces the debt-to-equity ratio is that the increase in exchange rate tends to prompt firms to reduce their long-term debts.

With regards to the GDP growth rate, the study finds that an increase in the economic growth rate increases the Debt to Equity ratio of NSE' non-financial listed companies. In particular, a one percent increases in GDPG rate increases debt to equity ratio by 0.426. This result is indicative of the fact that the increase in economic growth increased the growth opportunities available for firms and that firms can easily access long-term debts as a form of financing from the public. Frank and Goyal (2009) also argue that during economic expansions, expected bankruptcy goes down, taxable income in the economy goes up implying increase in the cash levels and therefore more opportunities for the companies to borrow more.

Concerning the foreign direct investment (FDI), the estimation results indicate that foreign direct investment positively and significantly increases companies' debt-to-equity. In particular, the findings show that a one percent increase in FDI increases the capital structure of NSE non-financial listed firms by 0.481. The results are indicative of the fact that an increase in the FDI flows to the economy tends to increases cash available for companies for borrowing.

The estimation results also indicate that savings as a ratio of GDP have negative and statistically effects on the capital structure of companies. In particular, the study finds that a one percent increase in the savings as a ratio of GDP reduces the debt to equity ratio of NSE's non-financial listed firms by 0.506. This result is indicative of the fact that an increase in savings in an

economy tends to make available funds that potential investors can use in acquiring equity in listed companies.

Turning to financial development variable, proxied by the broad money as a percentage of GDP, the estimation results indicate that an increase in financial development indicator reduces companies' capital structure by 0.258. Similar results of negative effects of financial development on capital structure are found by Perera (2015). Perera (2015) argues that financial development exerts a negative effect on the capital structure of firms since developments of a country's financial sector tend to prompt more credit protection and better quality of law might discourage firms from borrowing since companies might be aiming at reducing the risks involved with debts. On the effects of stock market development on debt to equity ratio of the companies, the results show that the increase in the measure of stock market development reduces capital structure by 0.882. This result implies that with development stock markets, listed firms are more likely to access equity and therefore resort to less long-term borrowing.

CHAPTER FIVE

CONCLUSION

5.1 Introduction

The main objective of this study was to examine the link between macroeconomic factors and the capital structure of the NSE's listed non-financial firms for the period 2007 to 2017. The study employed a panel regression analysis and in particular the random effects model. The dependent variable was capital structure measured by the ratio of the company's long-term debt to equity. The independent variables included annual inflation rate, interest rates, exchange rates, asset tangibility, company size measured by the logarithm of company's total assets, FDI, GDP growth rate, savings as a ratio of GDP, financial development as well as stock market capital development.

5.2 Summary of the findings

The study used a sample of 25 listed non-financial companies across 6 sectors. The sectors included agriculture, automobile, commercial, construction, energy, and manufacturing. The companies were selected based on data availability.

The study established that inflation positively and significantly affects the capital structure of the NSE's listed non-financial companies.

In addition, the study establishes that a rise in economic growth proxied by the GDP growth rate positively and significantly increases the capital structure of the listed NSE's non-financial firms.

The study also established that exchange rate, savings as a ratio of GDP, financial development as well as stock market development negatively and significantly affects capital structure of NSE's listed non-financial firms.

5.3 Policy Implications

The study findings evidently show that an increase in the interest rate, positively and significantly increases the capital structure of the NSE listed non-financial firms.

Concerning the FDI variable, the study establishes that increase in the level of FDI positively and significantly increases the capital structure of firms. This means that FDI flows to the economy tends to increase cash available for companies to borrow.

In regards to the exchange rate, we can evidently infer that an increase in the exchange rate reduces the debt-to-equity ratio since firms tend to reduce their long-term debts.

From the results, it is evident that increase in a country's financial development tends to exert a negative effect on the capital structure of firms. This is because developments of a country's financial sector tend to prompt more credit protection and better quality of law that might discourage firms from borrowing so as to reduce the risks involved with debts.

Similarly, development in the stock market tends to reduce the amount of debt levels available in the market since listed firms are more likely to access equity and therefore resort to less long-term borrowing.

From the study findings, it is evident that firms tend to use less debt in their capital structure with the growth in the ratio of savings to the GDP, improvement in financial development as well as stock market development. From this findings, we can, therefore, infer that efforts to increase firms' access to equity as a source of funding can be enhanced in an economy with mobilizing savings in the economy and developing both financial and stock markets. Policy practitioners can, therefore, in an effort to reducing the risks associated with debts for non-financial listed firms, put measures of enhancing saving mechanisms in the country and promote the development of both financial and stock markets.

5.4 Conclusion

Based on the findings, we can conclude that capital structure of NSE's listed non-financial firms in Kenya tends to be positively and significantly affected by the inflation rate, interest rates, GDP growth rate, and foreign direct investment. On the contrary, exchange rates, savings as a ratio of GDP, financial development as well as stock market development negatively and significantly affect the capital structure of listed non-financial firms.

5.5 Areas for further research

This study focused on examining the effects of macroeconomic factors on the capital structure of NSE's listed non-financial firms. Further studies on this subject could be extended to unlisted non-financial listed firms to examine whether the relationship between macroeconomic factors and capital structure are consistent or different from the findings of this study.

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APPENDIX I
LIST OF NON-FINANCIAL FIRMS LISTED AT THE NSE

	AGRICULTURAL
1	Eaagads Ltd
2	Kapchorua Tea Co. Ltd
3	Kakuzi
4	Limuru Tea Co. Ltd
5	Rea Vipingo Plantations Ltd
6	Sasini Ltd
7	Williamson Tea Kenya Ltd
	AUTOMOBILES AND ACCESSORIES
8	Car and General (K) Ltd
	COMMERCIAL AND SERVICES
9	Express Ltd
10	Sameer Africa
11	Kenya Airways Ltd
12	Nation Media Group
13	Standard Group Ltd
14	TPS Eastern Africa (Serena) Ltd
15	Scangroup Ltd
16	Uchumi Supermarket Ltd
17	Longhorn Publishers Ltd
18	Atlas Development and Support Services
19	Deacons (East Africa)
20	Nairobi Business Ventures Ltd
	CONSTRUCTION AND ALLIED
21	Athi River Mining
22	Bamburi Cement Ltd
23	Crown Paints Kenya
24	E.A.Cables Ltd

25	E.A.Portland Cement Ltd
	ENERGY AND PETROLEUM
26	KenolKobil Ltd
27	Total Kenya Ltd
28	KenGen Ltd
29	Kenya Power & Lighting Co Ltd
30	Umeme Ltd