

# **An Empirical Analysis of Macro-Economic Influences on Corporate Capital Structure of Listed Companies in Kenya**

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## **Abstract**

Capital structure is an important aspect of financial management however the influence of macroeconomic factors in the determination of capital structure is to some extent under-researched. This article analyzes the influence of the macro economic factors on the capital structure of selected listed companies in Kenya. The article through analytical and descriptive research design aimed at determining the magnitude and the direction of the relationship between selected macroeconomic variables on corporate capital structure of listed companies in Kenya. An econometric model of multiple linear regressions was used where leverage (debt ratios) was regressed against GDP growth rate, inflation and interest rate. The study revealed that indeed macro economic factors have pronounced influence on the capital structure of the listed companies. GDP growth rate was found to have a positive influence on long term debt ratio and a negative influence on total debt ratio and short term debt ratio. Inflation on the other hand had a negative influence on the short term debts while interest rates as measured by the treasury bills have a positive influence on the long term debt ratio and total debt ratio and a negative influence on the short term debt ratio.

**JEL classification numbers:** E44, E02

**Keywords:** Capital structure, GDP growth rate, inflation, interest rate, Kenya.

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## **1 Introduction**

Since the landmark seminal paper by Modigliani and Miller (1958), the issue of capital structure has continued to generate great interests in finance literature. Copeland and Weston (1993) define capital structure as the permanent financing represented by long-term debt, preferred stock, and shareholder equity. Academic researchers and practitioners have come to recognize capital structure decision as a significant managerial decision since it influences the shareholder return and risk (Pandey, 2002). The study of capital structure mainly attempts to explain the mix of securities and financing sources used by corporations to finance real investment (Myers, 2001). In more general terms a firm can choose among many alternative capital structures to have varied mix of debt and equity. However, the rational attempt is to find the particular combination, which maximizes overall market value of the firm.

In respect to an optimal capital structure, the practices of firms are different. There are so many firm specific and external macroeconomic variables, which affect optimal capital structure decisions (Gajurel, 2005). However various theories of capital structure have concentrated on the relationship between capital structure and firm specific variables in an attempt to explain the presence of an optimal capital structure. For example, presence of favorable tax treatment of interest payments and bankruptcy costs associated with increasing debt lead to the notion of an 'optimal' capital structure which maximizes the value of the firm and respectively minimizes its average cost of capital. Further, the use of debt capital provided tax shield on interest payment since interest is a tax-deductible expenses. Therefore, relaxing their earlier assumption of world without tax Modigliani and Miller (1963) proposed that firms should use as much debt capital as possible in order to maximize their value. The optimal level is attained where the debt-tax shield trades off with the bankruptcy cost and maximizes the value of the firm. Therefore, the tax has been thoroughly investigated as a factor that determines the capital structure.

The tax-based and agency-cost-based models, belong to the static tradeoff models which are the result of works of prominent researchers such as Modigliani and Miller (1958, 1963), Miller (1977), Kraus and Litzenberger (1973), Kim (1978), Bradley, Jarrel and Kim (1984), Jensen and Meckling (1976), Jensen (1986), Harris and Raviv (1990), and Stulz (1990). Besides the tax and bankruptcy cost aspects of capital structure management, there are also some other approaches that attempt to contribute to the explanation of the capital structure determination from a micro economic or firm specific point of view.

These theories examine the determinants of capital structure from different aspects and conclude in different outcomes as far as the choice of the determination of the level of financial leverage is concerned (Miller, 1977). In summary therefore, it is worth noting that there is no universal theory of capital structure yet. Several useful conditional theories exist that attempt to approach the determination of optimal capital structure. Researchers have been trying to test and develop different capital structure theories through empirical studies. This study is one such attempt in this direction.

One of the most perplexing issue currently facing financial managers is the relationship between capital structure and the major macro economic variables. Evidence indicates that a relationship does exist between macroeconomic variables and capital structure decisions of corporate entities. The fiscal policy and monetary policy that a country pursues are major macroeconomic directives in this regard (Gajurel, 2005). The monetary policy of a country determines the interest rate that eventually and more significantly

influences the capital structure of firms. Booth Aivazian, Demirguc – Kunt and Maksimovic (2001), provided evidence that from macro economic point of view, the capital structure of a firm is a function of economic growth rate, inflation rate, capital market development, liquid liabilities and Miller tax advantage. Their study was based on the assumption that firms tend to employ more debt during periods of boom on the assumption that they would generate adequate returns to meet the debt repayment. They further concluded that higher inflation leads to decrease in both total and long term debt ratios in developing countries.

Gajurel (2005) established that macroeconomic variables are significant for firm's financing and that Gross Domestic Product (GDP) growth rate was negatively related to leverage ratio for Nepalese firms. He further noted that economic growth tends to cause firms to use more debt consistent with the findings of Booth et al (2001). Dammon (1988) posits that inflation affects capital structure and firm value thus higher inflation forces investors to sell bonds in exchange for stocks and hence firms capital structure measured as debt-equity ratio, tends to drop. In a related literature, Dokko (1989) found empirical support for a change in inflation to create wealth redistribution between creditors (bondholders) and debtors (share holders).

Korajczyk and Levy (2002), studied capital structure choice macro economic conditions and financial macroeconomic conditions and financial constraints. They concluded that the leverage of financially unconstrained firms vary counter cycle with macroeconomic conditions. The findings are supported by Levy (2001). Moreover, macro economic conditions account for 12% to 51% of the time series variation of firms leverage financing decisions and reflect the state of the economy. It can be concluded from the studies conducted so far, a relationship does exist between corporate capital structure and external macroeconomic variables. The development of capital markets was been found to significantly influence capital structure (Booth et al 2001) consistent with (Rajan and Zingales, 1995).

### **1.1 Statement of the Problem**

Evidence indicates that capital structure of a firm is determined by both firm specific variables as well as external macroeconomic variables (Gajurel, 2005). However, most of the works in this area have concentrated on firm specific variables as determinants of capital structure. Based on the capital structure theories, tax shield, assets structure, profitability, firm size, growth, risk, liquidity, industry class and product uniqueness are the firm specific key attributes which determine the capital structure (Titman and Wessels, 1988; Ozkan, 2001; Gaud, Jani, Hoesli and Bender, 2005;). From a macroeconomic perspective, perhaps the study by Booth et al, (2001) was the first of its type and focused on capital structure in developing countries in which they provided evidence on the influence of macroeconomic factors over capital structure. In their empirical findings they concluded that real economic growth tends to increase total debt ratio and long-term book-debt ratio and higher inflation leads to a decrease in such ratio.

In another study, Gajurel (2005) examined the determinants of capital structure for Nepalese firms and concluded that, higher economic growth rate tends to cause firms to use more debt and as capital markets become more developed they become a viable option for corporate financing. Further, Korajczyk and Levy (2002), studied capital structure choice, macro economic conditions and financial constraints. They provided evidence that the leverage of firms in financially unconstrained firms varied counter cycle

with macroeconomic conditions. The results were supported by the findings of Levy (2001). Moreover, macro economic conditions were found to account for 12% to 51% of the time series variation of firms financing decisions and reflect the state of the economy. The results were consistent with the findings of Booth et al (2001).

In Kenya, most of the empirical studies done have concentrated on firm specific variables as determinants of capital structure and none of them focus on macroeconomic determinants of capital structure. This study aims at determining the link between macroeconomic variables and capital structure of firms listed at the Nairobi stock exchange and provides new evidence with regard to capital structure theories.

## **1.2 Objectives of the Study**

Based on the theoretical framework and the empirical studies conducted previously it has been established that a relationship exist between macroeconomic and corporate capital structure (Booth et al, 2001; Gajurel, 2005; Korajczyk and Levy, 2002). Therefore this study sought to determine the magnitude and direction of the relationships between the capital structure of quoted firms and Inflation, GDP growth rate, interest rate.

## **2 Literature Review**

### **2.1 Capital Structure Theories**

Capital structure theories have extensively been well documented in the finance literature. Modigliani and Miller (1958) work has given the theoretical foundation for empirical enquiry into the capital structure theory. The enormous contribution of most finance researchers and economist has provided varied dimension and reasoning to capital structure theories (Modigliani and miller, 1958: Modigliani–Miller, 1963: Miller, 1977: Ross, 1977: Myers and Majluf, 1984). Although there are corporate capital structure theories explaining firms financing decisions, little is know about how macroeconomic conditions affect firms leverage (Cook and Tang, 2006).

### **2.2 Macro-Economic Determinants of Capital Structure**

From the microeconomic perspective, the theories of capital structure state that tax shield, assets structure, profitability, firm size, growth opportunities, risk , liquidity, industry class and product uniqueness are the firm specific key attributes which determine the capital structure ( Titman and Wessels, 1988; Gaud et. al., 2005). Besides the firm specific attributes discussed by various researchers several macroeconomic factors, such as, economic growth rate, inflation rate, capital market development, government policies etc., also significantly influence capital structure decision of the firms (Booth et al 2001), The common practices of firm, the competencies of financial managers, age of incorporation, the availability of financing alternatives, and other institutional context are some other determinants of capital structure. Further, time variations in macroeconomic conditions; such as changes in the relative pricing of assets classes, can lead to a given firm to choose different capital structures at different points in time other things being equal (Korajczyk and Levy 2002). Several macroeconomic determinants discussed below have critical influence on firms financing

### **2.2.1 Inflation.**

Inflation can be defined as a persistent increase in general price levels in an economy over the time. Low or medium levels of inflation in a country can have a positive effect on the business sector, in that it can act as an incentive to production. High levels of inflation however can harm company's profitability by affecting the cost of inputs as well as reducing final demand for its output. Ultimately the effect of inflation on a firm is determined by the nature of its operations as well as its competitive environment.

A firm which experiences an inelastic demand for its products may be able to cushion itself from adverse impact of inflation by transferring the price increases to final consumers, thus leaving its margin untouched. The same could be said of a company operating in a sector with low levels of competition. From liquidity point of view, inflation is likely to result in an erosion of the real value of any financial claims outstanding an opposed to the nominal value of such claims which may find it with receivables whose real value is diminished, thus inflation harms lenders and tend to benefit borrowers (Myers, 1984). This defect is to some extent remedied by indexing interest payments to the prevailing rate of inflation, however this arrangement is more typical of long-term borrowing arrangements between lenders and lending institutions and is not common in short-term credit arrangement especially amongst non-financial institutions.

Dammon (1988) notes that inflation affects capital structure and firm value thus higher inflation forces investors to sell bonds in exchange for stocks and hence firms capital structure measured as debt-equity ratio, tends to drop. In a related literature, Dokko (1989) finds empirical support for a change in inflation to create wealth redistribution between creditors (bondholders) and debtors (share holders), while Booth et al. (2001) found that higher inflation leads to a decrease in both total and long term debt ratios in developing countries. Kelly and Miles (1989) incorporate the capital structure theory to model the response of nominal interest rates to expected inflation on a world with tax.

Gajurel (2005) reveals that for the firms listed at Nepalese stock exchanges inflation is negatively related to leverage ratio. Noguera (2001). In an essay on the relationship between inflation and capital structures finds a positive relationship between leverage and inflation. Corcoran (1977), Zwick (1977) theoretically explain that inflation leads to more debt since it lowers the real cost of debt, the demand for corporate bonds increases during inflationary periods. On the other hand, bond returns become higher relative to stocks return as inflation decreases and the aggregate demand for corporate bonds thus increases.

### **2.2.2 Interest rates**

Interest rates represent the cost of borrowing capital for a given period borrowing capital for a given period of time. However according to Myers and Steward (1984), prevailing interest rates are of much concern to many firms, because of indexing of interest rates to inflation. Studies show that interest rates affect capital structure decisions. Jalilvand and Harris (1984) in a study of United States of America(USA) Corporation obtained results which suggested that financial decisions are interdependent and firm size, interest rate conditions and stock price levels affect speed of adjustments to capital structure implying that they do influence it. According to Singh (1993), if the interest rate is high investment falls, a low rate of interest lead to increase in investment activity. Increased investment may imply use of more debt. However, in the short run interest is inelastic and fails to

influence the level of investment. Hence a relation exists between investment and use of debt and level of interest rates

### 2.2.3 GDP growth rate

The GDP is a measure of the country's overall economic performance. It is the money value of total goods and services produced annually in a country using exclusively the resources of a country (Singh, 1993). Several studies have been conducted at macro economic level to determine the impact of a countries GDP growth rate on the capital structure. The study of Booth et al. (2001), which focuses on capital structure in developing countries, found that real economic growth tends to increase total debt ratio and long-term book-debt ratio. Korajczyk and Levy (2002), studied capital structure choice macro economic conditions and financial macroeconomic conditions and financial constraints. Moreover, macro economic conditions were found to account for 12% to 51% of the time series variation of firms leverage financing decisions and reflect the state of the economy. Hence economic growth rate positively affects leverage ratio. Gajurel (2005) established that macroeconomic variables are significant for firm's financing and that GDP growth rate was negatively related to leverage ratio for Nepalese firms consisted with the findings of Korajczyk and Levy (2002). He further notes that economic growth tends to cause to use more debt consistent with the findings of Booth et al (2001). Cook and Tiang (2007), finds that firms adjust to target leverage faster in good states than in bad states. Hence the GDP growth rate has significant effect on firms leverage and it's therefore an important macroeconomic determinant of capital structure.

## 2.3 Review of Empirical Studies

Existing empirical studies have, however, been largely confined to the USA and other developed countries and clustered around firm specific variables; some recent studies (Gertler and Gilchrist, 1993; Bernanke and Gertler 1995; Rajan and Zingales 1995; Demirguc – Kunt and Maksimovic 1999; Booth et al, 2001; Korajczyk and Levy, 2003) were carried out from macroeconomic perspective.

Other empirical studies have been conducted most of which are largely confined to the developed countries. Gertler and Gilchrist (1993) find that aggregate net debt issues, following recessions associated with a monetary contraction, increase for large firms but remain stable for small firms that rely on private debt. Similarly, Gertler and Gilchrist (1994) show that aggregate net shortterm debt issues are less sensitive to the business cycle for small firms. Theoretically, the literature debates whether these patterns are due to the effect of monetary policy on firm's debt issue patterns through the bank lending channel or through the balance sheet channel. Bernanke and Gertler (1995) provide a description of the debate as well as a review of the literature. The bank lending channel focuses on the possible effects of monetary policy actions on the supply of loans by depository institution.

Rajan and Zingales (1995) examine the differences in the development of banks versus financial marks as possible determinants of capital structure. However, as the Rajan and Zingales (1995) study shows, the relative importance of banking is less indicative of differences in corporate leverage than it is of differences in the relative amounts of private financing ( bank loan) and arm- length financing through open market. Demirguc – Kunt and Maksimovic (1996) find a negative relation between level of stock market

development and both long-term and short-term debt to total equity of firm, and a positive relation between bank development and leverage.

Booth et al., (2001). The study is perhaps the first of its type, which focuses on capital structure in developing countries. By using new data set they assessed capital structure theory across the developing countries with different institutional structure. They analyzed capital structure choice of firms in 10 developing countries (India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico Brazil, Jordan and Korea) by using both firm specific attributes and macroeconomic indicators. In their empirical model, leverage ratio as dependent variable was measured with three proxies; total debt ratio (total liabilities to total liabilities plus net worth), long-term book-debt ratio (total liabilities minus current liabilities divided by total liabilities minus current liabilities plus net worth), and long-term market-debt ratio (total liabilities minus current liabilities divided by total liabilities minus current liabilities plus market value of equity). The tax (average tax rate), business risk (standard deviation of EBIT), tangibility of asset (total assets minus current assets to total asset ratio), size (natural logarithm of sales multiplied by 100), ROA (EBT/total assets), market-to-book ratio (market value to book value of equity) were used as firm specific explanatory variables whereas stock market value/GDP, liquid liabilities/GDP, real GDP growth rate, inflation rate, and miller tax terms were used as macroeconomic explanatory variables.

By running separate models to test the significances of firm specific and macroeconomic variables. They arrived at the following findings and conclusions. Profitability was found the most successful independent variable and negatively related to leverage. In overall, the size and tangibility were observed to be positively related with leverage ratio. The results of risk variable were mixed. They also found that there was 'Miller' tax advantage over equity in most of these developing countries. The statistic was significant. The macroeconomic influences over capital structure were observed as, with some statistical limitations, all three measure of leverage ratio vary negatively with the equity market capitalization; except for the long-term market-debt ratio, the debt ratios vary positively with the proportion of liquid liabilities to GDP. Real economic growth tends to increase total debt ratio and long-term book-debt ratio and higher inflation leads to decrease such ratios. The debt ratios in developing countries were found comparatively lower than advance economy countries and the long-term debt ratio was observed significantly lower in developing countries. From their cross-country study, the authors concluded that the debt ratios in developing countries seem to be affected in the same way and by the same types of variables that are significant in developed countries however in developing countries, they have low long-term debt. Also, there are systematic difference in the way these ratios are affected by country factors, such as GDP growth rates, inflation rates and the development of capital markets. They also noted that the origin of the country is as important as size to determine the leverage. Hence, their study has shed light on capital structure in developing countries.

Korajczyk and Levy (2002), studied capital structure choice macro economic conditions and financial macroeconomic conditions and financial constraints, issuing regression analysis, they regressed optimal leverage ratio as function of known macroeconomic largest variables and known firm specific target variables. They concluded that the leverage of firms in financially unconstrained firms vary counter cycle with macroeconomic conditions. The findings are supported by Levy (2001). Moreover, macro economic conditions account for 12% to 51% of the time series variation of firms leverage financing decisions and reflect the state of the economy. The results are

consistent with elements of both trade off and pecking order theories and with the findings of Booth et al (2001).

Gajurel (2005) in a study of the determinants of corporate capital structure of Nepalese companies examined the macroeconomic influences on debt equity ratio of Nepalese companies excluding firms in the finance and banking sectors between the periods 1995 to 2004. He regressed capital structure against certain firm specific variables and the macro economic variables (GDP growth rate, inflation and market capitalization to GDP ratio). Results found that macro economic variables are significant for firms capital structure choice specifically he concluded that GDP growth rate negatively related to total debt ratio and short term debt ratio and positively related to long term debt ratio. The results indicate that higher economic growth tends to cause firms to use more long-term debt and he is less short-term debt. The evidence is obvious. This implies that Nepalese companies prefer long-term debt securities and risk less on short-term borrowing. When economic growth is higher, inflation was found to be negatively related to total debt ratio and short term debt ratio as well as positively related to long term debt ratio, implying that increasing inflation supports to an increase in long term debt and decrease short term debt. Market capitalization was observed to be positively related to debt ratios, indicating that as capital markets become more developed they become a viable option for corporate financing. These findings are consistent with results of studies from emerging markets (Booth et al 2001).

Cook and Tang (2007), in a study of macro economic conditions and capital structure adjustments speed for American firms over a thirty years sample period to tested the relationship between macro economic conditions and capital structure adjustment speed using both two stage and integrated partial adjustment dynamic capital structure models. The results are that firms adjust to target leverage faster in good states than in bad states. Where they defined states by the term spread, default spread, GDP growth rate and market dividend yield. Their results are consistent with findings of Hackbarth, Miao and Morellec (2006) and also support the pecking order theory, in that under levered firms adjust faster than firms that are over levered. The findings also support the market timing theory implication that under levered firms have less incentive to adjust toward target leverage when stock market performance is good as measured by dividend yield on the market and price output ratio.

In conclusion therefore it is worth noting that all the above studies provide a strong case for a study on macroeconomic determinants of corporate capital structure in developing countries since they provide a significant grounds and justifications for existence of a relationship between these variables and capital structure.

### **3 Research Methodology**

This was an empirical study which analyzed and described the magnitude and direction of the relationship between leverage (dependent variable) and macroeconomic determinants viz.; GDP growth rate, inflation and interest rates. Hence it followed both analytical and descriptive research design.

The population of interest consisted of all firm listed at the Nairobi stock exchange for the period between January 2004 and December 2008, a period of 5 years. This period is considered sufficient enough to monitor the variation in macro-economic variables and given time constraint over which the study was to be conducted. Gajurel (2005), however,



used 10 year period and regressed debt/equity ratio against macroeconomic variables using data from Nepalese Stock Exchange between 1995 and 2005. The sample consisted of firms that have a clear capital structure consisting of both debt and equity among the firms listed at the NSE for the period 2004 to 2008. (Gajurel, 2005 citing Ozkan, 2001). Therefore the sample size consists of 39 firms in the industrial and allied, agricultural, commercial and allied as well as service sector.

### 3.1 Data Collection

The study relied purely on accounting data of firms listed at Nairobi stock exchange for the period of 1999 to 2008. The required data on the debt-equity ratio were extracted from annual reports of firms available at the NSE database. Hence this study mainly relied on secondary data. The macro-economic data were extracted from Economic Surveys for the period 2004 to 2008, available from Central Bank of Kenya and the annual statistical survey from Central Bureau of Statistics for the period 2004 to 2008.

### 3.2 Model and Variables Specification

The model and variables used in this study was based on theoretical foundations suggested by capital structure theories as well as previous studies. The model described below was used to in the analysis:

#### 3.2.1 Model specification

Multiple regressions are most appropriate for studies involving two or more independent variables (Frankfort-Nachmias and Nachmias, 1996). This study used econometric models of multiple linear regressions where leverage was regressed against GDP growth rate, inflation, ratio of and interest rate. The time series model is adapted from Gajurel (2005) and Korajeczyk and Levy (2002)) and states:

$$DR_t = \alpha + \beta_1 GDP_t + \beta_2 INFL_t + \beta_3 INT_t + e_t$$

Where

$DR_t$  = Debt Equity Ratio over 10 year period

$\alpha$  = Coefficient of regression.

$\beta_s$  = are the unknown parameters (constant of regression).

$GDP_t$  = Annual GDP growth rate

$INF_t$  = is the annual inflation rate measured as changes in consumer price index

$INT_t$  = Represents the interest rate as a proxy of 91 day Treasury bill rate

$e_t$  = is the error term (Noise) and is assumed stochastic.

In this model it was assumed that the underlying time series is stationary (Gajurel, 2005 citing Johnson and Dinardo, 1997).

#### 3.2.2 Variables specification and their proxies

**Leverage( Dependent Variable).** Debt/equity ratio was the measure of capital structure, that is, leverage. Korajeczyk and Levy (2002) citing Rajan and Zingales(1995) argued that the ratio of book value of total debt to total asset is defined as the leverage ratio and it is more appropriate definition of financial leverage. In view of the above studies, this

study adopted the broad view of capital structure to avoid ambiguity and used the following proxies (Booth et al., 2001).

Leverage ratio (DR) was measured as follows:

Total debt ratio (TD) = Total debt (long-term+ short-term)/ Total assets.

Short-term debt ratio (STD) = Total current liabilities/Total assets.

Long-term debt ratio (LTD) = Total long-term liabilities/Total assets

Capital structure (leverage) was regressed against three macroeconomic (independent) variables to establish the relationship between independent and dependent variables. Hence the following independent variables were adopted in this study. The variables were selected on the basis of prior research, which identified them as having an effect on leverage.

**Inflation:** This study used the inflation rate as measured by the annual change in consumer price index based on the assumption that inflation affects leverage (Gajurel, 2005).

**Interest Rate:** This study used the 91-day Treasury bill interest rate as a proxy for the measure of interest rate consisted with other studies.

**GDP Growth Rate:** As suggested by Gajurel (2005) and following Booth et al., (2001). It was consistent to use GDP growth rate at factor cost as an independent variable in this study. The variables and their proxies are shown in the table 3.1 below.

**Table 1: Variables and their Proxies**

<b>Variables</b>	<b>Proxy measure</b>
Leverage Ratio	Total debt ratio= total debt/total assets
	Long-term debt ratio = Long term debt /total assets
	Short term debt ratio = short term debt /total assets
Inflation	Annual change in consumer price index
Interest Rate	91 day treasury bill interest rate
GDP growth rate	Annual rate of GDP growth

Source: Author

## 4 Data Analysis

This study employed econometric analysis of multiple regressions to investigate the magnitude and directions of the relationship between leverage and various explanatory variables as modeled above. The regression results on the explanatory variables were analyzed at significant level of 0.05 while F-statistics was used to test the strength of the relationship especially between leverage and macroeconomic determinants (Gajurel, 2005).

#### 4.1 Macro Economic Financial analysis

Table 2: Macro Economic Financial Data

Year	Real GDP Growth rate	Annual Inflation rate (%)	Interest rate (%) Treasury bill rate
2004	4.9	11.6	8.04
2005	5.8	10.3	8.14
2006	6.4	14.5	5.83
2007	7	9.8	6.87
2008	1.7	26.2	8.59
Mean	5.16	14.48	7.494
Min	1.7	9.8	5.83
Median	5.8	11.6	8.04
Max	7	26.2	8.59
STDEV	2.083987	6.80125	1.126379

Source: Research findings

Regarding the findings on the macro economic financial data the study found out that real GDP growth rate stood at 5.16, annual inflation rate stood at 14.48 while interest rate 7.494. However looking at the values for the year 2005 and 2006; the years that the total debt ratio was high and low respectively, a conclusion can not be reached at on the influences of the three macro-economic factors on the total debt ratio.

#### 4.2 Total Debt Ratio Findings

Table 3: Break Down of Total Debt Ratio from 2004 to 2008

	2008	2007	2006	2005	2004
Kakuzi	0.4112	0.4667	0.5456	0.5589	0.4918
Rea Vipingo	0.4637	0.3921	0.3884	0.4076	0.4402
Sasini	0.3059	0.2276	0.2088	0.1904	0.2021
Eaagads	0.3039	0.2501	0.2199	0.2139	0.1825
Kapchorua Tea Company Limited	0.3673	0.3597	0.3218	0.3389	0.3226
Limuru Tea	0.3749	0.3469	0.3121	0.3580	0.3312
Williamson Tea Kenya Limited	0.2950	0.2896	0.2652	0.2730	0.2713
Car and General (Kenya) Limited	0.5896	0.5659	0.4881	0.4804	0.4635
CMC Holdings	0.5979	0.5644	0.5467	0.5695	0.5661
Standard News	0.6285	0.6405	0.5603	0.6306	0.7032
Kenya Airways	0.6630	0.7200	0.7510	0.7247	0.7131
NMG	0.3481	0.3666	0.3392	0.2702	0.2945
TPS Serena	0.4236	0.4575	0.4455	0.5246	0.4687
Express Kenya	0.6728	0.4609	0.5783	0.5894	0.6735
Barclays	0.8786	0.8886	0.8738	0.8736	0.8825
NIC Bank	0.8694	0.8485	0.8835	0.8678	0.8411
Stan Chart Bank	0.8839	0.8802	0.8750	0.8684	0.9097
K.C.B	0.8897	0.8904	0.8744	0.8713	0.8767
H.F.C.K.	0.7445	0.8605	0.8497	0.8710	0.8816
CFC Bank	0.8268	0.8610	0.8610	0.8799	0.8051
Diamond Trust	0.8750	0.8478	0.8681	0.8992	0.8713
Jubilee	0.8414	0.7847	0.7645	0.7732	0.7594

Pan African ins	0.8054	0.7563	0.7207	0.7480	0.7617
I.C.D.C	0.0083	0.0087	0.0375	0.9555	0.9814
N.B.K	0.8546	0.8801	0.8935	0.9011	0.9142
E.A Cables	0.5509	0.6566	0.5780	0.4401	0.3559
Unga	0.3775	0.3762	0.3882	0.4509	0.5301
Total Kenya	0.6546	0.6203	0.6962	0.5715	0.5713
Crown Berger	0.5781	0.4666	0.4977	0.4863	0.4435
B.A.T	0.5252	0.4937	0.4606	0.3768	0.3856
E.A.B.L.	0.3349	0.3297	0.2500	0.2521	0.2654
Bamburi	0.4116	0.2724	0.2580	0.2642	0.2921
Kenya Oil	0.6060	0.6244	0.6500	0.5204	0.4558
Athi River -Min	0.6651	0.6066	0.6769	0.6264	0.4871
B.O.C.	0.2932	0.2470	0.2542	0.2148	0.2134
Mumias Sugar	0.3611	0.3003	0.3506	0.3598	0.4094
Kenya Power	0.6007	0.5298	0.4691	0.4727	0.4584
E.A Portland	0.5562	0.5965	0.6601	0.7081	0.7587
Sameer Africa Limited	0.3058	0.3795	0.4408	0.3670	0.3262
Mean	0.5575	0.5414	0.5411	0.5577	0.5529
Min	0.0083	0.0087	0.0375	0.1904	0.1825
Max	0.8897	0.8904	0.8935	0.9555	0.9814
STDEV	0.2206	0.2319	0.2366	0.2356	0.2397

Source: research finding

The data findings on the total debt ratio was analyzed and presented in table 3 above. According to the findings in the table, year 2005 had the highest mean of 0.5577 and a standard deviation of 0.2356 while 2006 had the lowest mean of 0.5411 or 54.11% and a STDEV of 0.2366. This shows that in 2005 when the leverage ratio was high 55.77% of the total assets were represented by the total debts of companies, attesting to the fact that Kenyan firms largely depend on debt for financing their operations due to the difficulty generating the finance from within companies. However, the minimum value of total debt ratio in the same year was 0.1904, revealing that in some companies most of the assets were financed through equity. The regression model is discussed in the preceding table below

Table 4: Total Debt Ratio Regression Model

	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
(Constant)	.512	.146		3.516	.176	-1.339	2.363
Annual GDP growth rate	-.001	.010	-.232	-.094	.941	-.127	.125
inflation rate	.000	.002	-.125	-.067	.957	-.029	.029
interest rate	.006	.009	.813	.699	.612	-.103	.115

Table 4 presents the data findings on the total debt regression model. According to the table the findings indicated that the intercept was 0.512, that is, when all the factors are equated to zero the total debt ratio will be 0.512, while the coefficients for annual GDP growth rate was -0.001, inflation rate coefficient was 0 while interest rate coefficient was 0.006. This gives the regression model below:

$$DR_t = 0.512 - 0.001GDP_t + 0.006INT_t + e_t$$

According to the model above, an increase in GDP brings about a 0.001n decrease in total debit ratio while an increase in interest rate brings about a 0.006 increase in total debt ratio. This depicts that annual GDP growth rate influences total debt ratio hence capitalization negatively, interest rate positively, while inflation rate has no influence on total debt ratio. The value of R is 0.932 which means that there is a strong positive correlation between the observed and predicted value of the dependent variable and further that the regression model has explained 87.2% of the variations in the dependent variable.

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
				R Square Change	F Change
0.934	0.872	0.489	0.0059520	0.062	0.488

### 4.3 Long-Term Debt Ratio Findings

Table 5: Long Term Debt Ratios for the Listed Companies

Companies	2008	2007	2006	2005	2004
Kakuzi	0.2576	0.2856	0.2877	0.2617	0.3185
Rea Vipingo	0.1240	0.1372	0.1579	0.1751	0.1965
Sasini	0.2528	0.1596	0.1316	0.1234	0.1469
Eaagads	0.2114	0.2037	0.2085	0.1957	0.1703
Kapchorua Tea Company Limited	0.2476	0.2437	0.2480	0.2386	0.2521
Limuru Tea	0.1973	0.2512	0.2265	0.2732	0.2373
Williamson Tea Kenya Limited	0.2179	0.2031	0.1987	0.2058	0.2157
Car and General (Kenya) Limited	0.0756	0.0930	0.1121	0.1030	0.0397
CMC Holdings	0.0200	0.0275	0.0524	0.0524	0.0711
Standard News	0.3138	0.3218	0.1347	0.0880	0.1365
Kenya Airways	0.4792	0.5316	0.5227	0.4125	0.4591
NMG	0.0198	0.0453	0.0678	0.0084	0.0026
TPS Serena	0.2672	0.2617	0.3384	0.3782	0.1599
Express Kenya	0.2870	0.1500	0.1493	0.0676	0.0312
I.C.D.C	0.0000	0.0000	0.0076	0.9167	0.9208
E.A Cables	0.1604	0.2093	0.1747	0.0424	0.0419
Unga	0.0545	0.0136	0.0248	0.0238	0.0324
Total Kenya	0.0000	0.0000	0.0000	0.0000	0.0000
Crown Berger	0.0493	0.0673	0.0759	0.0571	0.0486
B.A.T	0.0983	0.1113	0.0979	0.1059	0.0992
E.A.B.L.	0.0682	0.0660	0.0769	0.0744	0.0773
Bamburi	0.2187	0.1169	0.1253	0.1454	0.1585

Kenya Oil	0.0177	0.0440	0.0299	0.0324	0.0463
Athi River -Min	0.3750	0.3699	0.4227	0.4657	0.1639
B.O.C.	0.2932	0.0336	0.0406	0.0356	0.0315
Mumias Sugar	0.1210	0.1650	0.1816	0.1905	0.2100
Kenya Power	0.2911	0.1527	0.1560	0.1773	0.1938
E.A Portland	0.4265	0.4359	0.5057	0.5922	0.6144
Sameer Africa Limited	0.0418	0.0481	0.0610	0.0456	0.0380
Mean	0.1789	0.1637	0.1661	0.1893	0.1764
Min	0.0000	0.0000	0.0000	0.0000	0.0000
Max	0.4792	0.5316	0.5227	0.9167	0.9208
STDEV	0.1339	0.1341	0.1382	0.2027	0.1984

Source: Author

The table 5 above shown that break down of the long term debt ratios for the period 2004 to 2008. Accordingly, long-term debt ratios were highest at 18.83% in 2005 with a standard deviation of 0.2027 while it was lowest at 16.37% in 2007 and a standard deviation of 0.1341 as shown in table 4.4 above. However the rations are lower than the short term ratios indicating that listed companies in Kenya prefer financing using the short term funds. The regression results are discussed below.

Table 6: Long-Term Debt Ratio Regression Model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.087	.304		.286	.823
Real GDP Growth rate	0.002	.021	.470	.113	.929
Annual Inflation rate (%)	0.000	.005	.151	.048	.969
Interest rate (%) Treasury bill rate	0.010	.018	1.056	.539	.685

The study further regressed long-term debt ratio against real GDP Growth rate, annual inflation rate and interest rate and presented the data in the table 6 above. The study found out that holding other factors constant, a unitary increase in GDP growth rate leads to a 0.002 increase in long-term debt ratio while an increase in interest rate, holding other factors constant, leads to a 0.01 increase in long-term debt ratio. The study however found out that annual Inflation rate has no influence on the long term debt ratio. This shows that as GDP growth rate increases, companies are turn to taking long term debts like loans and debentures so as to increase their scope and scale operations in responsive to the opportunities brought by GDP growth as an indicator of economic growth. As interest rates increases, companies tend to limit taking long term debts since they are costly to them. This leads to the following regression equation:

$$\text{Long-Term Debt Ratio} = 0.087 + 0.002\text{GDP}_t + 0.01\text{INT}_t + e_t$$

The study further found out a strong positive correlation between the observed and predicted value of the dependent variable and further that ( $r = 0.79$ ) as shown below.

<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
0.799	0.638	-0.449	0.0124224

#### 4.4 Short Term Debt Ratio Findings

Table 7: Short Term Debt Ratios of Listed Companies

Companies	2008	2007	2006	2005	2004
Kakuzi	0.1536	0.1811	0.2579	0.2972	0.1733
Rea Vipingo	0.3397	0.2549	0.2306	0.2325	0.2437
Sasini	0.0531	0.0680	0.0772	0.0670	0.0552
Eaagads	0.0925	0.0463	0.0114	0.0182	0.0122
Kapchorua Tea Company Limited	0.1197	0.1160	0.0739	0.1003	0.0706
Limuru Tea	0.1776	0.0957	0.0856	0.0849	0.0939
Williamson Tea Kenya Limited	0.0771	0.0865	0.0665	0.0672	0.0556
Car and General (Kenya) Limited	0.5140	0.4729	0.3760	0.3774	0.4239
CMC Holdings	0.5778	0.5369	0.4943	0.5171	0.4950
Standard News	0.3146	0.3186	0.4255	0.5426	0.5666
Kenya Airways	0.1838	0.1884	0.2283	0.3122	0.2539
NMG	0.3283	0.3213	0.2714	0.2618	0.2919
TPS Serena	0.1563	0.1958	0.1070	0.1464	0.3088
Express Kenya	0.3858	0.3109	0.4291	0.5218	0.6423
I.C.D.C	0.0083	0.0087	0.0299	0.0388	0.0606
E.A Cables	0.3906	0.4472	0.4033	0.3977	0.3140
Unga	0.3230	0.3626	0.3633	0.4272	0.4977
Total Kenya	0.6546	0.6203	0.6962	0.5715	0.5713
Crown Berger	0.5288	0.3993	0.4218	0.4291	0.3949
B.A.T	0.4269	0.3824	0.3627	0.2709	0.2864
E.A.B.L.	0.2667	0.2637	0.1731	0.1778	0.1881
Bamburi	0.1929	0.1556	0.1328	0.1188	0.1335
Kenya Oil	0.5883	0.5803	0.6201	0.4880	0.4095
Athi River -Min	0.2901	0.2367	0.2543	0.1607	0.3231
B.O.C.	0.0000	0.2133	0.2136	0.1792	0.1820
Mumias Sugar	0.2401	0.1354	0.1691	0.1694	0.1994
Kenya Power	0.3096	0.3771	0.3131	0.2953	0.2646
E.A Portland	0.1297	0.1606	0.1544	0.1159	0.1444
Sameer Africa Limited	0.2640	0.3315	0.3798	0.3214	0.2882
<b>Mean</b>	<b>0.2789</b>	<b>0.2713</b>	<b>0.2697</b>	<b>0.2658</b>	<b>0.2739</b>
<b>Min</b>	<b>0.0000</b>	<b>0.0087</b>	<b>0.0114</b>	<b>0.0182</b>	<b>0.0122</b>
<b>Max</b>	<b>0.6546</b>	<b>0.6203</b>	<b>0.6962</b>	<b>0.5715</b>	<b>0.6423</b>
<b>STDEV</b>	<b>0.1777</b>	<b>0.1623</b>	<b>0.1740</b>	<b>0.1674</b>	<b>0.1714</b>

Source: Author

As shown in table 7 above, short-term debt ratios were highest at 27.89% in 2008 with a standard deviation of 0.1777 while it was lowest at 26.58% in 2005 and a standard deviation of 0.6474 as shown in table 4.6 above. However the ratios are higher than the long term ratios indicating that listed companies in Kenya prefer financing using the short term funds.

Table 8: Short Term Debt Ratio Regression Model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.329	0.128		2.569	.236
Real GDP Growth rate	-0.005	0.009	-2.010	-.540	.685
Annual Inflation rate (%)	-0.001	0.002	-0.740	-.265	.835
Interest rate (%) Treasury bill rate	-0.003	0.008	-0.764	-.438	.737

Source: Author

The table 8 above shows the coefficients of short term debt ratio of the regression model. The study found out that when real GDP growth rate, annual inflation rate and interest rate constant are all zero, short-term debt ratio will be 0.329. The study further found out that holding other factors constant, a unit increase in real GDP growth rate will lead to a 0.005 decrease in short term debt ratio, a unit increase in annual inflation rate leads to a 0.001 decrease in short term debt ratio while a unit increase in interest rates leads to a 0.003 decrease in short term debt ratio.

This could be explained by the fact that when the GDP growth rate increases signifying economic growth most assets will be financed by the company's equity. It can also be depicted that when there is an increase in inflation rate, companies would prefer long term debts to short term debts partly owing to the fact that short term debts will be too expensive in comparison and partly because they would anticipate mitigation against the factors leading to the inflation while when interest rates increase, companies would opt for financing their assets either through equity or long term debts since short term debts have high interest.

## 5 Conclusions, Recommendations and suggestions for further research

### 5.1 Discussions

As regards the total debt ratio, the study found out that when all the factors are equated to zero, the total debt ratio will be 0.512 which means that 51.2% of the companies total assets will be represented liability. The study further found out that when interest rates and inflation rates are held constant, an increase in annual GDP growth rate will lead to a 0.001 decrease in total debt ratio/leverage. This is consistent with Gajurel (2005) finding that GDP growth rate is negatively related to total debt ratio for Nepalese firms. The study also found out that with GDP growth rate and inflation held constant, a unit increase in interest rate will lead to a 0.006 increase in total debt ratio while inflation rate do not influence the total debt ratio.

On the long term debt ratio, the study found out that holding other factors constant, a unitary increase in GDP growth rate leads to a 0.002 increase in long-term debt ratio while an increase in interest rate, holding other factors constant, leads to a 0.01 increase in long-term debt ratio. Gajurel (2005) also found out that GDP growth rate is positively related to long term debt ratio since higher economic growth tends to cause firms to use



more long-term debt and less short-term debt. The study however found out that annual inflation rate has no influence on the long term debt ratio.

On the short term debt ratio, the study found out that when growth rate, annual inflation rate and interest rate constant are all zero, short-term debt ratio will be 0.329. The study further found out that holding other factors constant, a unit increase in real GDP growth rate will lead to a 0.005 decrease in short term debt ratio, a unit increase in annual inflation rate leads to a 0.001 decrease in short term debt ratio while a unit increase in interest rates leads to a 0.003 decrease in short term debt ratio. The study thus explained this by the fact that when the GDP growth rate increases signifying economic growth most assets will be financed by the company's equity while when there is an increase in inflation rate, companies would prefer long term debts to short term debts partly owing to the fact that short term debts will be too expensive in comparison and partly because they would anticipate mitigation against the factors leading to the inflation. This concurs with the Gajurel (2005) findings that inflation is negatively related to short term debt ratio, implying that increasing inflation decreases short term debt. From the same findings, the study found out that when interest rates increase, companies would opt for financing their assets either through equity or long term debts since short term debts have high interest.

## **5.2 Conclusions**

Macroeconomic factors influence corporate capital structure in different ways; for instance, GDP growth rate has a positive influence on long term debt ratio consisted with the findings of Booth et al (2001) and a negative influence on total debt ratio and short term debt ratio. Meaning that an increase in GDP growth rate Kenyan firms revert from financing assets with short term debts to long term debts like loans from banks however the companies would prefer generating finances from within than without. Inflation has a negative influence on the short debts of the listed companies. However the same has no influences on the long term debt ratio and total debt ratio. The study also concludes that interest rate as measured by the treasury bills has a positive influence on the long term debt ratio and total debt ratio and a negative influence on the short term debt ratio.

## **5.3 Recommendations**

The study recommends that when the economic growth as indicated by the GDP growth rate increases, the Kenyan companies should generated more finances from within than without so as finance their operations and growth. This is because economic growth provides more business opportunity for firms and they should, however, minimize risks and costs associated with short-term and long-term debts by generating finances internally. The study also recommends that the same should be the case when there is an increase in the interest rates, since an increase in interest rate means that the cost of debt financing becomes higher. The study further recommends that as a policy finance managers before designing capital structure of any company , a careful attention should be paid on appropriate features of capital structure and various determinants of capital structure. It is observed that most executives do not pay attention to macro environment while making their financing decisions. The government fiscal and monetary policies should focuses on creating conducive environment for firms to make financing decisions. The findings of this study owe to certain methodological and conceptual limitations. The reliance on secondary data which is collected from annual financial statements implies

that the study suffers from those limitations that are associated with preparation of annual financial statements. Further the assumptions and limitations of econometric modeling are inherent in the study.

#### 5.4 Suggestions for Further Research

The researcher suggests that further research on the macro-economic influence and cost of capital so as to get a holistic view on how macro economic factors affect the firms financing decisions. Since capital structure is one of the most controversial issues in corporate finance, there is room for study from different perspectives. A rigorous study of capital structure from macroeconomic perspective is also expected. A longitudinal study covering a longer period can be conducted to establish the long-term stability of the results. Also the determinants of capital structure vary from one period to another period, from one firm to another firm and from one industry to another industry. Hence the macroeconomic influence on capital structure for individual firm, particular industry should be conducted.

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## **Appendix**

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### **Listed of Companies at the NSE**

#### **MAIN INVESTMENT MARKET SEGMENT**

##### **AGRICULTURAL SECTOR**

Kakuzi

Rea Vipingo Plantations Ltd

Sasini Ltd

Unilever Tea (Delisted early 2009)

##### **COMMERCIAL AND SERVICES**

Accesskenya Ltd

Car & General (K)

CMC Holdings Ltd

Hutchings Biemer Ltd

Kenya Airways Ltd

Marshalls (E.A.) Ltd

Nation Media Group

Safaricom Ltd

ScanGroup Ord.

Standard Group Ltd

TPS Eastern Africa (Serena)

Uchumi Supermarket Ltd

##### **FINANCE AND INVESTMENT**

Barclays Bank Ltd

Centum Investment Co. Ltd

CFC Stanbic Holdings Ltd

Diamond Trust Bank Kenya Ltd

Equity Bank Ltd

Housing Finance Co Ltd

Jubilee Holdings Ltd

Kenya Commercial Bank Ltd

Kenya Re-Insurance Corporation Ltd

National Bank of Kenya Ltd

NIC Bank Ltd

Olympia Capital Holdings Ltd

Pan Africa Insurance Holdings Ltd

Standard Chartered Bank Ltd

The Co-operative Bank of Kenya

##### **INDUSTRIAL AND ALLIED**

Athi River Mining

B.O.C Kenya Ltd

Bamburi Cement Ltd

British American Tobacco Kenya Ltd

Carbacid Investments Ltd  
Crown Berger Ltd Ord  
E.A.Cables Ltd Ord  
E.A.Portland Cement Ltd  
East African Breweries Ltd  
Eveready East Africa Ltd  
Kenya Oil Co Ltd  
Kenya Power & Lighting Ltd  
KenGen Ltd.  
Mumias Sugar Co. Ltd  
Sameer Africa Ltd  
Total Kenya Ltd  
Unga Group Ltd

**ALTERNATIVE INVESTMENT MARKET SEGMENT**

A.Baumann & Co.Ltd  
City Trust Ltd  
Eaagads Ltd  
Express Ltd  
Williamson Tea Kenya Ltd  
Kapchorua Tea Co. Ltd  
Kenya Orchards Ltd  
Limuru Tea Co. Ltd

**Source: NSE, (2009), NSE Handbook 2008**