THE DETERMINANTS OF COST OF CAPITAL BY INDUSTRY: EVIDENCE FROM COMPANIES QUOTED ON NAIROBI STOCK EXCHANGE

BY:

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A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTERS OF BUSINESS ADMINISTRATION (MBA)
FACUTY OF COMMERCE
UNIVERSITY OF NAIROBI

JULY 2010

DECLARATION

This is my own original work and has never been submitted for a degree in any other university.

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

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DEDICATION

I dedicate this project work to my dear parents the late Cosmas Nalianya and Mrs. Rosemary Naliaka who tirelessly worked against all odds to ensure that I acquire an education to be what I am today. I am indebted to them forever.

ACKNOWLEDGEMENT

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ABSTRACT

In this study an attempt is made to determine the factors that drive the cost of capital in Kenya. An analysis is undertaken of the cost of capital based on a sample of 28 companies quoted on Nairobi Stock Exchange. Three models were used to determine the cost of equity and six for the overall cost of capital. From the analysis the cost of equity is around 9.67-10.67 per cent and the overall cost of capital is roughly between 9.08 – 10.57 per cent.

Step-wise multiple regressions are used to find the underlying determinants. Generally financial risk measured by gearing/leverage and age are found to be important determinant of the cost equity for the whole sample. For Agricultural sector growth and reserves are found to be among the important determinants of the cost of equity for the three models. For commercial and services sector the financial (for model 2) and business risks (for model 1 and 3) are important determinant while for industrial and allied sector growth stands out as the important factor. With regard to overall cost of capital for the whole sample, the key determinants are earnings growth and financial risks (gearing) for model 1 and 3. Sector wise reserves are the determinant of overall cost of capital under model 1 and 3. However model 1 has in addition fixed assets backing and financial risk as important determinants. Model 2 has earnings growth, size and business risk as the important determinant. For commercial and services sector, model 1 and 3 has business risks as important determinants while model 2 has financial risks (leverage) and reserves as the determinant of overall cost of capital.

CHAPTER 1:   INTRODUCTION

1.1.0   Background

1.1.1   Cost of Capital in Financial Decision Making

Funds for investment are provided to the firm by investors who hold various types of claims on the firm's cash flows. Debt holders have contracts (bonds) that promise to pay them fixed schedules of interest in the future in exchange for their cash now. Equity holders provide retained earnings (internal equity provided by existing shareholders) or purchase new shares (external equity provided by new shareholders). They do so in return for claims on the residual earnings of the firm in the future. Also shareholders retain control of the investment decision, whereas bondholders have no direct control except for various types of indenture provisions in the bond that may constrain decision making of shareholders. In addition to these two basic categories of claimants, there are others such as holders of convertible debentures, leases, preferred stock, nonvoting stock and warrants.

Each investor category is confronted with a different type of risk and therefore each requires a different expected rate of return in order to provide funds to the firm. The required rate of return is the opportunity cost to the investor of investing scarce resources elsewhere in opportunity with equivalent risk. The fact that shareholders are the ones who decide whether to accept or reject new projects is critical to understanding the cost of capital. They will accept only those projects that increase their expected utility of wealth.

The cost of capital is the minimum risk-adjusted rate of return that a project must earn in order to be acceptable to shareholders. It is a vital aspect of shrewd business planning and it reflects the opportunity cost of funds for investment in companies. If the companies'

investments were expected to earn a return below their cost of capital, investors would have a superior alternative for their funds. They could find other projects with the same expected return but lower risk, or projects with the same risk, but a higher expected return. Shareholders will require the rate of return on new projects to be greater than the funds supplied by them and the bondholders.

The cost of capital is important in financial decision-making. It has long been recognized as the most important element in business valuation. A company must earn in excess of its cost of capital in order to create economic profit for value for investors. It is used as standard for evaluating investment decisions (capital budgeting). An investment project usually lasts for many years. To determine if the project should be implemented, the net present value of the project is considered the most satisfactory criterion for use in its economic appraisal. This criterion requires the use of a discount rate in order to be able to compare the benefits and costs that arise in different periods over the life of the investment. Knowledge of cost of capital and how it is influenced by financial leverage is useful in designing the firm's debt policy/capital structure. Financial structure of the firm can affect both the size and risk ness of the firms earnings stream and hence the value of the firm. Cost of capital can also be used in appraising the financial performance of top management. Besides a number of other corporate finance decisions including those related to leasing, bond refunding, dividend decisions and working capital policy-require estimates of cost of capital.

Although the cost of capital has been popular in corporate finance, little is known about it on a broader menu of emerging markets (Barry et al 1998). The scarcity of such studies is

partly attributed to the fact that, these markets are relatively young and therefore the data series of companies listed in these markets seem to be short. Globally, a number of studies have been contacted on the cost of capital as detailed in the literature review. This includes work done by Modigiliani-Miller (1958) in which he concluded that the cost of capital is independent of the financing mix. This was extended to incorporate a tax hypothesis with same conclusion regarding influence on cost of capital (Modigiliani and Miller, 1963). Other studies have include Sullivan (1978) concluded that powerful (large) firm is confronted by lower costs to attract capital than a smaller firm, which reduces the overall cost of capital. Oliner and Rudebuch (1992) concluded that large and older firms have lower risk than smaller and younger firms, an indicator that age and size are a determinant of cost of capital. Other studies have included Booth (1991) on relationship between fixed assets and cost of capital. Further studies have found that gearing is positively related to tangibility (collateral) (Rajan & Zingales (1995)- in US, Japan, Germany, France, Italy, the UK and Canada, positively related to size (diversified risk), negatively related to the market to book ratio and negatively related to profitability.

In emerging markets, studies done include Estrada (2000) who studied CAPM-based cost of equity for a sample of 28 emerging markets and the study found out that most of the emerging markets have low betas and when used in CAPM equation generated required rate of return generally considered "too low". Therefore the total risk should be considered to determine the cost of capital for emerging markets.

In Africa, Omran and Pointon (2004) studied the cost of capital in Egypt and found out that size, risks and growth were key determinants of cost of capital. They also found out that the determinants of cost of capital varied between the different categories of the industry.

From the foregoing it is evident that there is room for further studies on cost of capital in emerging markets. It is from this background that this study, which seeks to establish the key determinants of cost capital of companies, quoted on Nairobi Stock Exchange (NSE) is proposed.

1.1.2 The Nairobi Stock Exchange

The investors normally channel their funds (by buying shares or bonds) to organization through securities market. Therefore for such study it is important to understand the operations of the Nairobi stock exchange, which is the only stock market in Kenya.

The history of Nairobi Stock Exchange dates back to 1920's when Kenya was still a British colony. It is this time that dealing in shares and stocks started. The trading was however informal and relied mainly on gentleman's agreement. It was not until 1954 when the Nairobi Stock exchange was established as a voluntary association of stockbrokers registered under the Societies Act. The business of dealing in shares was then confined to the resident European community, since Africans and Asians were not permitted to trade in securities until after attainment of independence in 1963.

Since inception the Nairobi Stock Exchange has experienced a number of setbacks. In 1963, at the dawn of independence there was a lot of uncertainty about the future of

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independent Kenya and this resulted into a slump in stock market activity. The oil crisis of 1972 introduced inflationary pressure on the economy, which depressed share prices. In 1975 a 35% capital gains tax introduced also inflicted losses to the exchange. This tax was suspended 10 years later and remains suspended to date. Changes in the neighboring countries of Uganda and Tanzania i.e. national policies, exchange controls and other restrictions contributed to the loss of regional character of N.S.E.

However, N.S.E. given the determination to succeed withered all this problems and continued to perform well as witnessed by the number of highly over subscribed public issues. At present it is ranked number four in Africa.

In the 1980's the Kenyans Government realized the need to design and implement policy reforms to foster sustainable economic development with an efficient and stable financial systems. In particular it set out to enhance the role of the private sector in the economy by reducing the demands of public enterprises on the exchequer, rationalize the operation of the public enterprises sector by broadening the base of ownership and enhance capital market development. In 1984 an IFC/CBK study, "Development of money and capital markets in Kenya", became a blue print for structural reforms in the financial markets, culminating in the formation of a regulatory body " The Capital Markets Authority (CMA) " in 1989 to assist in the creation of a conducive environment for the growth and development of the country's capital markets.

To stimulate the growth of capital market the Kenya government has put in place incentives aimed at encouraging both foreign and local investors to participate in stock exchange.

These incentives include the relaxation of exchange control for locally controlled companies subject to a current aggregate limit of 40 % and an individual limit of 5% to help encourage foreign portfolio investments. A favourable tax regime exempts listed securities from stamp duty, capital gains tax and value added tax. Also withholding tax on dividends is low at 5% for residents and 10% for non- residents.

The Nairobi stock exchange has played an important role in the privatization of state owned enterprises. Among the companies, which have privatized through Nairobi stock exchange are the Kenya Commercial Bank, National Bank of Kenya, Kenya Airways, Mumias Sugar Company and Housing Finance Company of Kenya. Shares issued through Nairobi stock exchange have proved popular and have recorded a subscription rates as high as 400%.

Currently NSE has three segments namely the Main Investment Segment which is categorized into four categories namely Agricultural, Commercial and Services, Finance and Investment and Industrial and Allied; Alternative Investment Market Segment and the Fixed Income Securities Market. The Main Investments Market Segment (MIMS) is the main quotation market and has more stringent listing requirements. The Alternative Investments Market Segments (AIMS) was established to provide access to the capital markets for small and medium sized companies with high growth potential and is to serve companies that are unable to meet the stringent listing requirements of the MIMS. Fixed Income Securities Market Segment (FIMS) is a special market for trading in fixed income securities. This study will focus on the MIMS and its categories and the AIMS.

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1.2. Statement of the Problem

The cost of capital has been a popular subject in corporate finance. In emerging markets, although tremendous work has been done on cost of capital, insufficient attention has been paid to the factors that drive it. This could be attributed to the fact that the promotion of financial and capital markets in most of the developing countries is a recent phenomenon, therefore the data series of companies listed in these markets seem to be short, and this might explain the scarcity of such studies. Promotion of financial and capital markets in Africa have only received greater attention in the recent years in an effort to increase domestic resource mobilization; improve the supply of long- term capital; and to encourage efficient allocation of existing resources. This situation has developed as a result of renewed awareness that capital markets can play several key roles, including: lowering the cost of equity and thereby stimulating investment and growth by spreading the risks of long-term investment.

A study carried out by Omran and Pointon (2004) on determinants of cost of capital in Egypt found out that size, risks and growth were key determinants of cost of capital and they varied from one category of the industry to the other. Extending such a study to Kenya is going to improve the understanding of the factors that determine the cost of capital. This study empirically investigates the key determinants of the cost of capital for firms quoted on Nairobi stock exchange by industry and to find out whether there are any fundamental differences between industries.

1.3 Objectives of the study

The objectives of this study are:

1. To check for the variation of cost of capital between the various industries of the Nairobi Stock Exchange (NSE).

2. To identify the differences in the determinants of cost of capital across industries for companies listed at the NSE.

1.4 Importance of the study

1. The study will provide further empirical evidence on variables that affect the cost of capital in emerging market for companies quoted on stock exchange.

1. Provide an insight to investors (shareholders) on key variables that determine the rate of return used in evaluating projects.

2. Help the shareholders and management to design their activities and projects in such a way that minimizes cost of capital and maximize their wealth.

3. Provide information, which can be used by stock analysts in evaluating performance of quoted companies in order to provide prudent advice to their clients.

CHAPTER 2:   LITERATURE REVIEW

2.1   Overview of the cost of capital

Firms require funds for investment and operation that comes from various sources (investors). The major sources however are from debt holders' and equity holders. The investors provide the funds at a cost commensurate with their perceived level of risk. For a firm to operate profitably and attract new investors it has to earn enough income that compensates all the investors and therefore shareholders accept only projects that can increase their expected utility wealth (wealth of the company). Therefore understanding of cost of capital is critical for any firm's success.

Cost of capital has long been recognized as the most critical element in business valuation. Cost of capital is defined as the minimum risk-adjusted rate of return that a project must earn in order to be acceptable to shareholders. The two basic components of cost of capital are equity and debt. Their costs are the interest on the debt, the cost of obtaining the capital itself.

While the cost of debt is normally easy to determine, the cost of equity is more difficult to determine, as share capital carries no explicit cost. Since shareholders expect certain rate of return when they invest in a company, this expectation constitutes cost of equity for the firms. Therefore the cost of equity capital can be seen as comprising returns payable to shareholders and which comes in the form of dividend and capital gains. Thus in measuring the cost of equity dividend yield plus capital gain components are used.

However since the capital gains and dividends are closely related the split between them may be viewed as an arbitrary division of earnings, and so an earning yield model of the cost of equity capital may under certain circumstances, be equivalent to a dividend growth model of the cost equity (Karathanassis, 1983). The well known theoretical basis of this was by Modigiliani and Miller (M-M) (1961) hypothesis of dividend irrelevance and which was based on the assumption of perfect frictionless capital markets where taxes and risks of uncertainty do not exist. However, in practical world tax differential where capital gains are taxed at low rate, investors in high tax-brackets would prefer low dividend pay-out thus implying dividend policy do matter. Further studies have shown that dividend contributes more to value than earnings (Rees 1997) and personal tax effects can be distortionary (Pointon 1996, Dampsey 1997). Other than earnings several other different factors can change the cost of capital estimation for companies and is therefore important to take a closer look at these variables.

2.2 Determinants of the cost of capital

2.2.1 Company Size and age

Long-run financial targets play a role in whether a company should finance their operations through long-term debt, short- term debt or equity. How fast a company alters their capital structure to deal with market adjustments determines its survival and profitability. As a firm grows bigger, it becomes more diversified, less risky and thus less prone to bankruptcy and will have higher debt capacity. Jalivand & Harris (1984) performed an empirical analysis which determined that factors such as firm size played a role in the type of capital that firm used to react to changes in their long-range financial targets. The larger the firm, the less likely the firm was to use common and preferred stock to come up with additional

investments. Large institutional investors may not find it worthwhile to research into the performance and potential of smaller firms, since they avoid investing too much equity in an individual firm. By contrast their investments in larger firms would tend to push up prices and depress returns. As to emerging markets Fama and French (1998) find that smaller stocks tend to generate higher returns than larger stocks. Krishnan and Moyer (1996) find that size and growth are important determinants of capital structure in several countries including the US, Germany, Japan and Italy. The argument on size and leverage is that as a firm grows bigger, it becomes more diversified, less risky and thus less prone to bankruptcy. Large firms have a higher debt capacity and hence size has a direct impact on cost of capital.

Empirical research by Sullivan (1978) on market powers of firms and their risk and capital cost concluded that powerful (large) firm is confronted by lower costs to attract capital than a smaller firm, which reduces the overall cost of capital. Large firms are associated with lower risks and hence low cost of capital. Oliner and Rudebuch (1992) stated that the reason for lower risk of larger and older companies was that they had time and capacity to develop economies of scale and that smaller, younger firms have not established the long – term relationship with financiers that larger, older firms have. The authors concluded that the cost of outside financing would be higher for, smaller, younger firms. This is so because small and younger firms are more risky and therefore to attract funding from banks they should be ready to pay a premium (High interest rates). This position is supported by Sharpe (1990) who stated that competition drives banks to lend to new firms at interest rates that initially generate losses which results into capital being shifted toward the lower quality and inexperienced or younger firms.

2.2.2 Growth

Closely related to size and age, growth effects can be important contributors to cost of equity capital. Common stock earnings and dividends are generally expected to grow as the company grows and this will affect the cost of equity. Growth can be reflected in earnings growth, dividends growth and assets growth and therefore it is important to reconcile the differences between them. As regards to earning growth, it is important not to place overemphasis on growth that may not be sustainable (Barberis 1998, and Wadhwani, 1999). In a classic study on value versus growth stock by Fama and French (1998) they demonstrated that growth stocks tend to under perform compared with value strategies. Lakonishok et al 1993 states that value strategies yield higher returns because these strategies exploit the mistakes of typical investor and not because the strategy is fundamentally riskier.

2.2.3 Taxes and capital structure

Since interest paid on debt is tax deductible, this means that the actual cost of debt is less than the stated costs. There is an ongoing debate in literature about the effects of gearing on the weighted average cost of capital. The traditional view developed by Modigiliani and Miller (1958) argued that there is no optimal capital structure. The Modigiliani-Miller (M-M) theorem states that the cost of capital is independent of the financing mix (the debt-equity ratio) in a world with rational investors, perfect capital market (frictionless), tax-free environment and no default or bankruptcy risks. In such a world the division of the net operating earnings between equity and debt should not affect total value (Modigiliani & Miller, 1958). The initial propositions of the M-M theorem were extended to incorporate a tax hypothesis (Modigiliani and Miller, 1963; Modigiliani, 1988; Miller, 1988). Following

M-M theorem a lot of work has been done to either support or refute the tax adjusted valuation model of the M-M theorem (King, 1977; Hite, 1977Grossman and Stiglitz, 1980; Sundarajan, 1987.). In some of these studies, the possibility of taxation, bankruptcy and financial distress were introduced to produce an optimal capital structure for the firm thereby invalidating the M-M irrelevance theorem. The general conclusion of many of these studies is that even in the absence of confounding effects of taxation, one should expect the existence of an optimal ratio of debt and equity for the firm. For example, Hite (1977) shows that an increase in financial leverage of a firm will reduce the 'user cost of capital' and therefore lead to an increase in the optimal output level of the firm. Sundararajan (1987) in his examination of linkages among interest rates, the debt-equity ratio of firms, the overall cost of capital, savings, investment and investment in Korean economy during 1963-81 concluded that change in administered interest rates affects unregulated rate, the overall cost of capital, the real interest rates and the debt-equity choice of firms.

Further, Sundararajan (1987) asserts that the debt-equity ratio is important because the overall cost of capital to investors- which influences fixed investment, its efficiency and profits- can be expressed as a weighted sum of opportunity cost of bank debt and that of equity, with the weights depending on the debt-equity ratio. Therefore, the multiplier effects of changes in the cost of bank debt (i.e., the interest rate) on the overall cost of capital, and hence on investment incentives and the productivity of capital, depend, among other things, on the share of debt in investment financing and on the induced adjustments in this share, and in the cost of equity. By implication, there exists an optimum debt-equity

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mix for firms. Consequently, the cost of capital depends on the debt-equity mix first falling and then rising as the debt ratio rises.

As to the irrelevance of taxation in a general equilibrium model, Rutterford (1988) found support for this in her results revealing that for several countries tax was not a significant factor in the determination of a firm's capital structure. Other studies that found support for tax irrelevance in relation to capital structure is survey carried out on US &UK firms by Hooper (1994). Norton (1991) found that key determinants of capital structure had included tax implications as well as financial flexibility and stock market concerns.

In an empirical study by Mayer (1986), he concluded that the cost of capital is highly sensitive to the current taxable earnings of the firm, Miles & Ezzell (1985) stated that financial theory implies that each dollar of debt contribute to value in proportion to the firms tax rate.

2.2.4   Fixed Assets to total capital

Fixed assets are durable and usually last for a long life therefore there is a chance that capacity could be underutilized or over utilized which would increase the risk of the company. Booth (1991) studied the relationship between fixed assets and cost of capital to determine if there was a causal relationship. From his research it was determined that there are other factors besides assets which determine a company's cost of capital, therefore, it is not a causal relationship. Booth also stated that an increase in fixed assets or capital intensity would decrease the company's cost of capital and vice versa. This is consistent with trade off theory of capital structure which predicts that the high tangibility of assets

the high the use of cheaper source of financing i.e. the debt. In addition the movement of the two variables is dependant on external factors, such as depreciation rate for capital and out put elasticity of capital, that when changed, move the two variables inversely (negative relationship) (Booth, 1991). Further studies have found that gearing is positively related to tangibility (collateral) (Rajan & Zingales (1995)- in US, Japan<Germany, France, Italy, the UK and Canada, positively related to size (diversified risk), negatively related to the market to book ratio and negatively related to profitability.

2.3 Evidence of work done in emerging markets

Estrada (2000) in his study of CAPM-based cost of equity for a sample of 28 emerging markets states that the use of CAPM to estimate cost of equity has several problems, which include low betas and uncorrelated stock returns. Low betas when used in CAPM equation generated required rate of returns typically considered "too low ".

Omran and Pointon (2004) studied the cost of capital in Egypt and found out that size, risks and growth were key determinants of cost capital. They also found that the determinants of cost of capital varied from one category of the industry in which he had categorized the stock market. These were Food, Heavy industries, contracting and Services. For instance he found out that for heavy industries, financial risk and size are particularly significant.

2.4   Evidence of work done in Kenya

Most of the studies done that touch on cost of capital are on Capital structure. Kamere (1987) in his study on capital structure, sought to establish the factors that management of quoted companies in Kenya consider in making capital structure decisions and also to

establish whether some of the factors had more influence than others. It is important to note that debates on ideal capital structure centers on minimization of the component costs of capital i.e. equity and debt. Therefore factors that management considers in setting up ideal capital structure have direct bearing to the cost of capital, as they will affect either debt or equity. Kamere in his study identified the following factors that influence capital structure:

- Stability of future cash flows

- The level of interest rates in the economy

- The asset structure of a firm

- The need for outside capital

- Lender attitudes towards the firm

- Attitudes of management towards risk

In his conclusion Kamere noted that firms adjust towards some target debt-equity structure. Thus implying that in Kenya there is an optimal capital structure at which the cost of capital is minimum. He also noted that the composition of debt-equity is not uniform among the various sectors of companies quoted on NSE. This implies that the cost of capital is not uniform across the industries and sectors of NSE and this provides an opportunity for further studies.

Omondi (1996) conducted another study on factors that play a significant role in capital structure decisions of publicly quoted companies. The factors considered in his study included industry class, asset structure, profitability, interest charges, growth, changes in cash flows, age and ownership. One of his findings was that there is variation in cost capital among segments and industry groupings.

Kiogora (2000) found out that companies within a sector tend to cluster around some target equity-total assets ratio and there is variation in capital structure within the industry. This is consistent with the trade-off theory where by as risks of the firm increases, investors demand higher returns to compensate them for the high risk and as this continues it reaches a level where the risks are higher than the returns. The high risk is reflected in the returns and hence cost of capital. In her conclusion on variation of capital structure among industry groupings, there is a significant difference in capital structure among groups. Her finding on the relationship between returns and capital structure is consistent with the traditional view of capital structure that earnings yield is either constant or rise with financial risk or leverage within an acceptable level.

Recently Odinga (2003) carried out another study on capital structure and concludes that leverage is influenced by variables such as asset tangibility, growth, size, business risk (earning variability), profitability and non-debt tax shield in varying degrees with profitability and non-debt tax shield being the most significant.

These studies point out that capital structure varies among the sectors and industry of quoted companies and brings out the various factors that influence the capital structure of these companies. One cannot talk of capital structure without mentioning cost of capital being the key consideration in designing the structure.

The study on cost of capital was done by Sagala (2003) on the relationship between cost of capital and leverage for companies quoted on NSE. However being cognizant of the fact

that there may be other factors that impacts on the relationship between cost of capital and leverage the regression model was extended to include them. These factors are size, growth, dividend payout ratio, liquidity and earnings variability. In his findings, all the variables used in regression model were found to have an impact on cost of capital with the most important being size and risk. Leverage and growth in assets also had a considerable effect while liquidity and dividend payout ratio recorded the list impact. In his conclusion Sagala points out that the relationship between cost of capital and leverage varies from company to company implying that for some the cost of capital declines with leverage.

This study focused on the relationship between cost of capital and leverage and did not analyze the determinants of cost of capital. In the study cost of capital was measured as earnings before interest and tax divided by the book values of equity, preference shares and debt. This does not bring out clearly the component cost of capital.

CHAPTER 3:   RESEARCH METHODOLOGY

3.1 Research design

This is a causal study, which seeks to investigate the relationship between the Weighted Average Cost of Capital and its determinants and the variation between industries. Some of the variables (determinants) identified from the literature review include size, leverage, taxes, interest rates, equity, debt, total investments, total assets and company earnings.

3.2 Population

The population consisted of the 47 companies listed on Nairobi Stock Exchange (NSE) as at 31st December 2004. Given the rigorous reporting requirements that quoted companies have to comply with, NSE provides a rich source of information required to achieve the objectives of the research. The study covered all companies listed on Nairobi stock exchange. However in the initial analysis 13 companies from the financial, insurance and investment sectors were eliminated due to their nature of their business that makes that makes it hard to determine the debt financing a necessary ingredient in computing weighted cost of capital. Further 6 loss making companies were eliminated as the cost of capital calculated was negative hence leaving a final sample of 28 companies for further analysis.

3.3 Data collection

Secondary data was used for this study. The data required for the study was gathered from published reports and figures (i.e. balance sheet and Profit and Loss Statements) from the Nairobi stock exchange database and covered the period 1999-2004. The following specific information was collected

- Dividend declared and paid (this included bonus issues) in the preceding year i.e. for 2000 the dividend for 1999 was used. Thus the dividends was gathered for the periods 1999-2003.

- Market share price for each company for each year under study

- Market capitalization for the years under study

- Book value of Debt and Equity for each company

- Total assets for each company

- Fixed assets level

- Tax rate and tax paid

- Turnover and Net earnings

- Interest paid by each company

A five-year period until 2004 was used to determine the growth rate in earnings and dividends and the standard deviation of earnings.

3.4 Data analysis

The cost of capital was split into component costs for equity and debt. The cost of debt was based on the market rates of interest and adjusted for tax effects based on the existing corporate tax rate of 30% as provided by Kenya Revenue Authority. Given that preference shares are not widely traded on NSE they were excluded from this study.

For the cost of equity, the analysis followed one done in Egypt in which three measures were used (Omran and Pointon (2004)). First we looked at the inverse of prices earning ratio (P/E) which was then cast in the dividend model as presented below:-

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$Ke = DIV_1/P_0 + g \qquad = \qquad bEPS_1/Po+g$

$$= \quad bEPS_0(1+g)/Po+g$$

$$= \quad b(1+g)/(P_0/EPS_0)+g$$

Where;

b	=	retention ratio
g	=	earnings growth rate
$EPS_{O \text{ and } 1}$	=	Earnings per share in period 0 and 1 respectively
P_0	=	the current market share price

The second model used to calculate the cost of equity is the familiar Gordon dividend growth model (Gordon 1962), which gives the cost of equity as: -

$Ke \quad = \quad Do(1+g)/Po+g$ which when expressed in terms of earnings becomes:

$$= \quad (e/Po)(1-b)(1+g)+g \quad \text{Hence}$$

$Ke \quad = \quad (1/PE \text{ ratio})[1-(e_o - d_o)/ e_o](1+g)+g$

Where:

Ke	=	the cost of equity capital
b	=	the retention ratio
d_0	=	dividends per share
e_o	=	earnings per share
g	=	growth rate
Po	=	the current ex-dividend share price

While it is known that dividends may grow at different rates for the purpose of this project a constant payout ratio was assumed. The estimate for g was based on the average of net earnings growth over the last five years.

The third model used assumed that the investment opportunities available to a firm are expected to earn a rate of return (r = ROE) equal to cost of equity (Ke). Unlike the first models which assumed growth and therefore attempts to estimate a growth rate this model focuses on expansion of the firm and assumes earnings grows at the rate br = bke where r is the rate of return on the equity financed portion of reinvested funds. The earnings formulation:-

Ke $=$ e1(1-b)/Po+br is modified so that r = ke and hence denoting the cost of capital as Keo we have:

Keo $=$ $1/[PE \text{ ratio}-(e_0-d_0)/e_0]$

Although it may be sensible to consider the Capital Asset Pricing Model (CAPM) in computing each company's cost of equity previous studies have indicated that it has several problems when used in emerging markets. Harvey (1995) found that these markets had very low betas and therefore when CAPM is used to estimate cost of equity it generated returns typically considered too low. Estrada (2000) confirmed results reported in other studies showing that emerging markets exhibit high volatility and a low correlation to the world market. He concluded that the low correlations suggest that emerging markets can still provide substantial diversification benefits. They may also suggest that emerging markets are not completely integrated, thus strengthening the argument against using CAPM to estimate to estimate cost of equity in these markets. In this regard CAPM was not used for this study.

Using the component costs (i.e. Equity and debt costs) calculated the overall cost of capital was determined on the basis of the weights each component commands in the capital structure. Two categories of weights were used namely the book values and market values of debt, and equity respectively. The formula for overall (weighted) cost of capital as illustrated below was used: -

$$Ko = Kd(1-T)D/D+S+Ke(S/D+S)$$

In the formula Ko represents the weighted (overall) cost of capital, Kd(1-T) and Ke represents the after tax cost of debt and cost of equity respectively, D is the amount of debt and S is the amount of equity in the capital structure.

Using the descriptive statistics average cost of equity and overall cost capital for the whole sample and each industry were determined respectively. To establish the relationship between the cost of capital and its determinants multiple regression analysis using the standard equation: $Y=b_1x_1+b_2x_2+b_3x_3+.......+b_nx_n$ where x_1, x_2, x_3.....x_n stands for the various determinants of cost of capital and Y for cost of capital was used. From literature review 13 possible determinants (independent variables) of cost of capital were identified. These included the net earnings growth, net fixed asset growth, the ratio of reserves and retained earnings to total investment, fixed assets/total assets, tax /net profit before tax, long term debt to equity capital, long term debt to total investments, total liabilities to equity, total debt to net assets, size measured by the market capitalization, standard deviation of earnings, current asset ratio and age measured by the number of years the company has been in operation.

The companies were categorized into three industries namely Agriculture, Commercial and services and Industrial and allied and analysis was done for each industry and individual companies within the industry. Since many variables were involved, stepwise multiple regression method was used to determine the key determinants of the cost of equity and the overall cost of capital respectively. The significance level for entering variable into the model was set at .05 and removal of variable set at .10. The results from regression analysis will further be tested using statistical tests such as T-test, F-tests, Adjusted R square, Durbin Watson statistics and ANOVA to determine the significance of the relationship between the cost of capital and the respective variables before conclusions are made. The results were statistically tested at 95% confidence level or at 0.05 significance level.

This information helped to determine the key determinants of cost of capital for each industry and thus to arrive at conclusions presented in chapter 5.

CHAPTER 4: DATA ANALYSIS AND FINDINGS

4.1. Introduction

The main objective of the study is to determine the key drivers of cost of capital for companies quoted on Nairobi stock exchange. From literature review in chapter 2 an initial checklist of possible independent variables with hypothesized positive or negative relationship is given below:-

a. Reserve and retained earnings/total investments. The hypothesized relationship to cost of capital is negative. Internally generated funds are cheaper since they do not attract floatation costs associated with issuing new stock, consistent with the pecking order hypothesis (Krishna and Moyer, 1996; Myers, 1984).

b. Net Earnings' Growth with positive hypothesized relationship. High growth should command a higher cost of equity although Fama and French (1998) paradoxically find that growth stocks around the world generate lower returns than value stock.

c. Net Fixed asset growth – growth in assets normally follows increase in earnings and therefore should command a higher cost of equity hence has positive relationship. In a similar study carried out by Sagalla (2003) he found out that six companies out of 21 have a negative relationship thus contradictory and which he attributes to favourable terms growth companies receive from providers of capital.

d. Size measured by Natural Logarithm of Market Capitalization with a hypothesized negative relationship. Larger companies enjoy economies of scale in raising finance and therefore should have lower cost of capital. Although empirically small firms tend to generate higher returns (Fama and French, 1998).

e. Gearing measured by total liabilities/equity with a positive relationship. This is used to measure the financial risk.

f. Standard deviation of earnings as a measure of business risks with hypothesized positive relationship. Investors will demand high returns from high risk companies hence the high cost of capital.

g. Current assets ratio with hypothesized positive relationship. Since high current assets constrain profitable investment and hence it is included as an intervening variable. On the other hand , it can be argued that too much current assets indicates an inefficient use of funds, so it is debatable whether the sign should be positive or negative (Omran and Pointon 2000)

h. Tax/net profit before tax with hypothesized negative relationship. Existence of taxes reduces returns to investors and the cost of debt through tax deductibility of interest hence reducing the cost of capital (Modigilian and Miller, 1963)

i. Fixed assets/total assets has a negative relationship since asset backing may make the business more secure and hence reduce the cost of capital.

j. Age – Older companies are predicted to lower cost of capital than younger companies

k. Total debt/net assets – like gearing also has a positive relationship to cost of capital

l. Long term debt/equity-like gearing has a positive relationship to cost capital. It reflects the financial risk

m. Long term debt/net investments   - also has a positive relationship. The higher the ratio the high the cost and vice versa.

4.2   Data analysis and findings

4.2.1 Analysis of Variance – Equity cost of capital

In table 1 we estimate the cost of equity capital under the three models for the whole sample and with companies grouped according to the industry. The companies were categorized into 3 industries as follows:

a) Agriculture

b) Commercial and services

c) Industrial and allied

Table 1: Analysis of Equity cost of capital

	Model 1	Model 2	Model 3
Mean (%)			
Whole sample	9.67	-25.56	10.67
Agriculture	11.22	-29.97	12.24
Commercial and services	9.75	-56.63	11.38
Industrial and allied	8.38	17.38	9.00

The mean cost of equity for the whole sample for model 1 and 3 are 9.67 and 10.67 and therefore not significantly different. However for model 2 the mean cost is negative which does not make sense as cost of capital. The negative is attributable to the growth rate incorporated in this model and which were negative for some companies.

With regard to industry categorization, for model 1 and 3 there is no significant differences between the various pairs of industry categories. Overall the mean costs of equity were between 8-12 per cent using the conservative estimates as reflected in models 1 and 3.

4.2.2 Determinants of cost of equity capital

Multiple regressions were performed to explain the determinants of the cost of equity capital. For model 2 the cost of equity was negative in all the cases and although shown does not make much financial sense. The reason for this is that the growth estimates that were used in formulation for the cost of equity were so extreme negative thus giving negative cost of equity.

4.2.2.1 Determinants of cost of equity capital for the whole sample

Table 2: Multiple Regression of the Cost of Equity (whole sample)

	Model 1	Model 2 (Not applicable)	Model 3
Constant	0.07551		0.125
t	6.036		4.7630
Sig	0.0000		0.0000
Total liabilities/Equity	0.0348		0.0481
t	3.1490		3.4870
Sig	0.0040		0.0020
Age	-0.0013		-0.0017
t	-2.1960		-2.1860
Sig	0.0380		0.0390
ANOVA			
F-Ratio	7.193		8.272
P-Value	0.004		0.002
R-Squared (%)	37.5		40.80
Adjusted R-Squared (%)	32.23		35.90
Durbin Watson statistics	1.418		1.654

In table 2 above, model 1 and 3 cost of equity for the whole sample is determined by gearing/leverage measured by total liabilities/equity and age of the firm. These factors are statistically significant at 1 per cent for both models. The positive coefficient for gearing is consistent with Chang and Rhee (1990) who in their study on the link between gearing and cost of equity, in terms of dividend payout ratios found that the higher the payout ratio the greater the degree of US debt financing. Whereas the negative coefficient for age is consistent with the fact that older firms have a stronger market base and are able to better

manage their cash flows. The negative coefficient is also consistent with the study of John Rand who in his paper on credit constraints and determinants of the cost of capital in Vietnamese manufacturing published in Small Business Economics in 2005 found out that determinants of cost of capital facing Vietnamese manufacturing firms appears to be relatively related to the firm age. Further it is consistent with Olinner and Rudebush (1992) who concluded that the cost of outside financing would be higher for smaller, younger firms because there is additional risk involved.

The adjusted R-Square is 32.23% and 35.90% for model 1 and 3 respectively. The Durbin-Watson statistics does not suggest any serious problems of autocorrelation in the residuals. Compared with a similar study carried out on Egyptian stock market the determinants are different. In a study carried out by Omran and Pointon (2000) the key determinants of cost of equity were found to reserves, earnings growth and size. No results were returned for model 2.

4.2.2.2 Determinants of cost of equity capital for Agriculture Sector

Table 3: Multiple regression of the cost of equity (Agriculture)

	Model 1	Model 2	Model 3
Constant	-0.1970	-1.078	-0.2320
t	-2.6340		-2.444
Sig	0.0078		0.092
Net earnings growth	.02290	-0.246	0.0272
t	6.8720		6.4260
Sig	0.0060		0.008
Reserves and retained earnings/Total investment	0.4520	-0.344	0.5160
	3.8670		3.47
t	0.0310		0.04
Sig			
Ages		1.397	
sig			
t			
Size – Market capitalization		-0.0964	
t			
sig			
ANOVA			
F-Ratio	40.4980		37.394
P-Value	0.0070		0.008
R-Squared (%)	96.40	100	96.61
Adjusted R-Squared (%)	94.00	100	93.60
Durbin Watson statistics	2.6240	1.457	2.5740

Table 3 gives the results of multiple regression of the cost of equity in Agriculture Sector. Under models 1 and 3 the cost of equity capital is determined by net earnings growth and reserves, these factors are significant at the 95% confidence level. The positive coefficient

of reserves is inconsistent with Krishna and Moyer 1996, pecking order hypothesis. With regard to earnings growth, the positive coefficient is consistent with Krishna and Moyer 1996 but inconsistent with Fama and French (1998).

The adjusted R-Square are high at 94 and 93.6 percent for model 1 and 3 respectively implying an excellent explanation of cost of equity. Although 2 gave earnings growth, reserve and size with negative coefficient and age with positive coefficients as determinants of cost of equity, influence statistics could not be computed as the variance-covariance matrix is singular.

The Durbin-Watson statistics for model 1 and 3 of 2.624 and 2.574 are above the critical 1.4 value and therefore does not suggest serial correlation in the residual.

4.2.2.3 Determinants of cost of equity capital for Commercial and services

Table 4: Multiple regression of the cost of equity (Commercial and services)

	Model 1	Model 2	Model 3
Constant	0.049	0.6500	2.5100
t	3.1597	5.7090	0.046
Sig	0.0196	0.0047	
Total liabilities/Equity		0.2681	
T		4.8966	
Sig		0.0081	
Long term debt/equity		-0.3055	
t		-6.5025	
Sig		0.0029	
Total debt/net assets		-0.9649	
t		-12.5179	
sig		0.0002	
Risk – Standard deviation	0.0000		0.0000
t	5.5944		6.372
sig	0.0014		0.001
ANOVA			
F-Ratio	31.297	90.259	40.598
P-Value	0.001	0.019	0.001
R-Squared (%)	83.9	98.5	87.1
Adjusted R-Squared (%)	81.2	97.5	85.0
Durbin Watson statistics	0.796	2.3873	1.009

In commercial and services sector 83.9 per cent (81.2 percent when adjusted) and 87.1 percent (85 percent when adjusted) for model 1 and 3 respectively of the variation in cost of equity is determined by business risks as indicated by the standard deviation of earnings and agrees with the inference of Modigliani and Miller (1958). The factors are significant at

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95 percent level of confidence. The Durbin-Watson values are less than a 1.4 critical value and therefore residual may indicate some serial correlation. For model 2 the cost of equity capital is determined by the financial risks measured by leverage/gearing (total liabilities/equity, long term debt/equity and long term debt/net assets) and accounts for 98.5 percent (97.5 percent adjusted) of the variation in the cost of equity in the commercial and services sector. The negative coefficient for long term debt to equity is unexpected. The factors are significant at 95 percent level of confidence. The Durbin-Watson statistics does not suggest serial correlation problem as it is above 1.4

4.2.2.4 Determinants of cost of equity capital for Industrial and allied

Table 5: Multiple regression of the cost of equity (Industrial and allied)

	Model 1	Model 2	Model 3
Constant	0.0583	0.0922	0.0546
t	5.9712	2.0450	4.7454
Sig	0.0001	0.0655	0.0008
Net Earnings Growth	0.0334	0.2243	0.0445
T	3.2236	3.7354	3.6434
Sig	0.0091	0.0033	0.0045
Net fixed assets growth	0.1354		0.1936
t	2.3846		2.8920
Sig	0.0383		0.0161
ANOVA			
F-Ratio	7.4724	13.953	10.041
P-Value	0.0104	0.003	0.0040
R-Squared (%)	59.91	55.92	66.76
Adjusted R-Squared (%)	51.89	51.91	60.11
Durbin Watson statistics	1.3260	1.547	1.3860

In the industrial and allied sector, the important determinants of cost of equity are earnings growth (for all the 3 models) and fixed assets growth for model 1 and 2. These factors are significant at 95% confidence level. For the three models the adjusted R-Square are above 50% and Durbin-Watson statistics for model 1 and 3 are below 1.4 suggesting significant serial correlation.

4.2.3 Overall cost of capital – Analysis of variance

Table 6: Analysis of overall Cost of Capital

	Model 1		Model 2		Model 3	
	Book	Market	Book	Market	Book	Market
Mean (%)						
Whole sample	9.08	9.63	-17.44	-25.33	9.73	10.57
Agriculture (A)	10.67	11.33	-19.98	-29.95	11.27	12.22
Commercial and Services	8.63	9.75	-43.88	-56.63	9.13	11.25
Industrial and allied	8.46	8.38	16.54	17.38	8.85	9.00

In table 6 we make comparison of the weighted average cost of capital for the whole sample and with companies grouped according to the industry using both the book values and market values as weights. For models 1 and 3 the overall cost of capital for the whole sample is around 9-10 per cent regardless of the choice between book and market values. For Agriculture sector the cost is between 10-12 per cent and for commercial and services and industrial and allied it ranges between 8-9 per cent (with exception of market values for commercial and services which stands at 11.25 per cent) for both book and market weights. For model 2 the overall cost of capital is negative for the whole sample and both Agriculture and commercial services sector which does not make sense. However for

Industrial and allied sector the overall cost of capital is 16-17 per cent and this is higher

than in model 2 and 3.

4.2.4 Determinants of overall cost of Capital

4.2.4.1 Determinants of overall cost of Capital for the whole sample

Table 7: Multiple Regression of Overall Cost of Capital (Whole sample)

	Model 1		Model 2		Model 3	
	Book	**Market**	**Book**	**Market**	**Book**	**Market**
Constant	0.0849	0.0682	-0.0724	-0.9750	0.0784	0.0690
t	12.2020	6.0360	-0.5290	-2.5270	8.5555	4.9670
sig	0.0000	0.0000	0.6020	0.0190	0.0000	0.0000
Net earnings Growth	0.0092	0.0114	-0.1580	-0.1760	0.0108	0.0139
t	3.0850	2.8330	-2.6930	-2.5370	3.3260	2.8030
Sig	0.0050	0.0090	0.0120	0.0180	0.0030	0.0100
Reserves and retained earnings/Total investment				1.4310		
t				2.4360		
Sig				0.0230		
Total liabilities/equity		0.0344			0.0196	0.0459
t		3.2400			2.2800	3.5180
Sig		0.0030			0.0320	0.0020
ANOVA						
F-Ratio	9.5150	9.7260	7.2520	7.9520	8.5130	10.6120
P-Value	0.0050	0.0010	0.0120	0.0020	0.002	0.0000
R-Squared (%)	17.00	44.80	22.50	39.90	41.50	46.90
Adjusted R-Squared (%)	27.60	40.20	19.40	34.80	36.60	42.50
Durbin – Watson statistics	1.2850	1.8280	1.8210	1.8100	1.3930	2.0150

The stepwise multiple regressions of the overall cost of capital for the whole sample reveal

different determinant factors to those of equity cost of capital. Model 1 and 3 has earnings

growth and gearing/leverage (total liabilities/equity) as the key determinants of overall cost of capital. Model 2 has in addition to the two factors, reserves as a determinant of the cost of capital. However the adjusted R-square are similar and vary between 19.48 – 42.5 per cent.

4.2.4.2 Determinants of overall cost of Capital for the Agriculture Sector

Table 8: Multiple Regression of Overall Cost of Capital (Agriculture)

	Model 1		Model 2		Model 3	
	Book	**Market**	**Book**	**Market**	**Book**	**Market**
Constant	0.0330	0.000	-0.9160	-1.2750	0.0113	-0.0151
t	116.7560		-24.758	-18.352	3.4460	-5.9750
sig	0.0000	0.0020	0.0020	0.0030	0.0260	0.0040
Fixed assets/Total assets	0.0042					
t	13.7260					
Sig	0.0050					
Reserves and retained earning/Total investment	0.7570	1.0000			0.8950	1.2110
t	729.805				34.55	60.512
Sig	0.0000				0.0000	0.0000
Total Debt/Net assets	-0.0340					
t	-67.3960					
sig	0.0000					
Net earnings growth			-0.1760	-0.2370		
t			-106.689	-76.55		
Sig			0.0000	0.0000		
Size–Market capitalization			0.0705	0.0959		
t			27.485	19.897		
sig			0.0010	0.0030		
Risk - Standard deviation			0.0000	0.0000		
t			-11.987	-8.7610		
sig			0.0070	0.0130		
ANOVA						
F-Ratio	229198.87		7010.83	3618.993	1193.678	3661.672
P-Value	0.000		0.0000	0.00000	0.0000	0.0000
R-Squared (%)	100	100	100	100	99.70	99.90
Adjusted R-Squared (%)	100	100	100	100	99.60	99.90
Durbin – Watson statistics	1.8710		2.9450	2.4630	1.4670	1.0960

For Agriculture sector, model 1, the cost of capital using book weights is determined by fixed assets, reserves and capital gearing/leverage. However the cost of capital using market weights for model 1, the variance-covariance matrix is singular hence influence statistics could not be computed. For model 2 the determinants of overall cost of capital are earnings growth, Size (with positive coefficients which is inconsistent with Fama and French (1998) and business risk (Net earnings growth). For model 3 reserves is the main determinant of overall cost of capital with positive coefficient. All the three models produce high adjusted R-Squares (99.60-100 percent) and therefore all the three models provide a perfect explanation of the overall cost of capital of agricultural sector.

4.2.4.3 Determinants of overall cost of Capital for Commercial and services sector

Table 9: Multiple Regression of Overall Cost of Capital (Commercial and services)

	Model 1		Model 2		Model 3	
	Book	Market	Book	Market	Book	Market
Constant	0.0651	0.049	0.6040	0.6499	0.0636	0.0480
t	4.8706	3.1597	2.1320	3.1597	4.6174	2.5811
sig	0.0028	0.0196	0.0770	0.0047	0.0036	0.0417
Fixed assets/Total assets					-0.1436	
Sig					-2.3005	
Total Debt/Net assets			-0.8029	-0.9649	0.0300	
t			-4.4291	-12.5179		
sig			0.0044	0.0002		
Reserves and retained earning/Total investment				-0.3055		
t				-6.5025		
Sig				0.0029		
Total liabilities/Equity				0.2681		
t				4.8966		
sig				0.0081		
Risk - Standard deviation	0.0000	0.0000			0.0000	0.0000
t	2.8357	5.5944			3.5829	6.2153
sig	0.0297	0.0014			0.0116	0.0008
ANOVA						

F-Ratio	8.0413	0.0014	19.6169	90.2595	12.8369	38.6303
P-Value	0.0297	28.74	0.0044	0.0004	0.0116	0.0008
R-Squared (%)	57.27	83.91	76.58	98.54	68.15	86.56
Adjusted R-Squared (%)	50.25	81.23	72.67	97.45	62.84	84.32
Durbin – Watson statistics	1.0951	0.796	1.0862	2.3870	1.2008	0.997

For commercial and services business risk (standard deviation of earnings) is the main determinant of overall cost of capital for model 1 and explains 81.23 per cent (R-Square adjusted) for market value weights and 50.25 per cent of book value weights, the variation in the overall cost of capital. Durbin Watson statistics is less than 1.4 and serial correlation could be a problem.

In model 2 the overall cost of capital is determined by capital risk (total debt/net assets), reserves and gearing (total liabilities/equity) and produces high R-Square (76.58-98.54) when unadjusted and 72.67-97.45 percent when adjusted.

For model 3 fixed assets backing (fixed assets/total assets) and business risk are the main determinants of overall cost of capital with high adjusted R-square (62.84-84.32 per cent). Serial correlation however could be a problem as Durbin Watson statistics is less than 1.4

4.2.4.4 Determinants of overall cost of Capital for Industrial and allied sector

Table 10: Multiple Regression of Overall Cost of Capital (Industrial and allied)

	Model 1		Model 2		Model 3	
	Book	Market	Book	Market	Book	Market
Constant	0.0595	0.0583	0.0939	0.0922	0.0569	0.0546
t	6.3066	5.9712	2.4233	2.0450	5.4103	4.7454
sig	0.0001	0.0001	0.0338	0.0655	0.0003	0.0008
Net earnings growth	0.0334	0.0334	0.1964	0.2243	0.0394	0.0445
t	3.3396	3.2236	3.8065	3.7354	3.5347	3.6434
Sig	0.0075	0.0091	0.0029	0.0033	0.0054	0.0045
Net fixed assets growth	0.1306	0.1354			0.1354	0.1936
t	2.3801	2.3846			2.8386	2.8920
sig	0.0386	0.0383			0.0176	0.0161
ANOVA						
F-Ratio	7.8233	7.4724	14.4896	13.9532	9.5347	10.0409
P-Value	0.0090	0.0104	0.0029	0.0033	0.0048	0.0041
R-Squared (%)	61.01	59.91	56.85	55.92	65.60	66.76
Adjusted R-Squared (%)	53.21	51.89	52.92	51.91	51.89	60.11
Durbin – Watson statistics	1.2910	1.326	1.7320	1.4570	1.3200	1.3860

For industrial and allied sector the earnings growth and fixed assets growth are the key determinants of overall cost of capital and explains 51.89-60.11 percent (adjusted R-square) of the variation in costs. Using a five per cent regression, the coefficient is significant when comparing the t-Stat of above 2 to the required critical value of 1.65. The coefficients for both factors are positive indicating a positive relationship between growth and cost of capital. The Durbin Watson statistics for model 1 and 3 are less than 1.4 and therefore present a serial correlation problem.

CHAPTER 5:   CONCLUSION AND RECOMMENDATIONS

According to Pointon and Omran, although the cost of capital has been a popular topic in corporate finance for a long time insufficient attention has been paid to the factors that drive the cost of capital in the Middle East Region. A similar argument can be extended to East Africa region. Most of the studies undertaken have focused mainly on the determinants of capital structure. In this paper, an analysis was undertaken on the cost of capital in Kenya based on a sample of 28 companies quoted on Nairobi stock exchange.

The companies were grouped into 3 groupings based on the industry in which they fall namely; Agriculture, commercial and services and Industrial and allied. Three models were used for the cost of equity and six for the overall weighted average cost of capital (one half based on book values and the other based on markets value weights.) The cost of equity for model 1 which is based on the inverse of the PE ratio is around 9.67 per cent and overall cost of capital is around 9.08 per cent and 9.63 per cent using book and market values respectively. The cost of equity for model 3 is around 10.57 per cent and the overall cost of capital is around 9.73 and 10.57 per cent respectively. For model 2 both the estimated cost of equity and overall cost of capital are negative which doe not make much sense. The reason for this is that the growth rate in dividends which is difficult to predict is treated as equal to the growth rate in earnings which was substantially negative in some companies included in the final analysis.

Using stepwise multiple regressions, financial risk measured by gearing/leverage and age are found to be important determinant of the cost equity for the whole sample. For Agricultural sector growth and reserves are found to be among the important determinants of the cost of equity for the three models. For commercial and services sector the financial

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(for model 2) and business risks (for model 1 and 3) are important determinant while for industrial and allied sector growth stands out as the important factor. With regard to overall cost of capital for the whole sample, the key determinants are earnings growth and financial risks (gearing) for model 1 and 3. However for model 2 reserves besides earnings growth is also a determinant.

Sector wise reserves are the determinant of overall cost of capital under model 1 and 3. However model 1 has in addition fixed assets backing and financial risk as important determinants. Model 2 has earnings growth, size and business risk as the important determinant. For commercial and services sector, model 1 and 3 has business risks as important determinants while model 2 has financial risks (leverage) and reserves as the determinant of overall cost of capital.

There are many variables that influence the cost of capital and this paper examined 13 of the variables. However some of the factors considered here are interrelated could significantly affect the results of the analysis. Nevertheless the results from the analysis are clear that a number of factors including finance and business risks, growth, fixed assets backing, reserves and size are legitimate factored influencing equity and overall cost of capital. For companies quoted on Nairobi Stock Exchange

5.2. Limitations of the Study

The sample is small and therefore the model used may not give absolutely accurate result as it is more suited for large samples. It is also important to note that statistical testing using

regression is very sensitive to omission of significant variable and may bias the results. For the final sample outlier companies were excluded due to abnormal figures.

5.3. Suggestion for further studies

In this study 13 variable were considered. From the correlation some of the variables were highly correlated suggesting interrelationship and if eliminated the final model could result in different outcome. I therefore suggest that a similar study be conducted whereby highly correlated variables are eliminated after first run and model rerun. Further studies should be done including financial institutions, insurance and Investment Companies.

References

1. Barberis, N (1998), "Mastering finance: Part 7", **(Financial times)** pg 10

2. Barker, R. G. (1999), **"Survey of Market-based Evidence of Industry-dependence in Analysts preference Between the Dividend Yield and Price Earnings Ratio Valuation Models" Journal of Business Finance and Accounting,** Vol. 26, No. 3 and 4, April/May, pp 393-418

3. Barry, C. B., J.W Peavey III and M. Rodriguez (1998), "Performance Characteristics of Emerging Capital Markets' **Financial Analysts Journal,** January/February, PP. 72-80

4. Benninga S. Z and Sang O. H, "Corporate Finance: A valuation approach" pp 237-304

5. Weston J.F and Brigham E.F: "Managerial Finance", Seventh edition, pp 587-662

6. Chang, R. P and S. G Rhee (1990), "The Impact of Personal Taxes on Corporate Dividend Policy and Capital Structure Decisions", **Financial Management,** Summer pp. 21-31

7. Copeland T.E and Weston J.F, " Financial theory and Corporate Policy" 3rd edition, pp 437-542

8. Dampsey, M. (1997), "Capital Gains Tax: implications for the Firm's Cost of Capital, Share Valuation and Investment Decision Making", **Accounting and Business Research,** Vol. 28, No. 2, Spring, pp. 91-96

9. Fama, E.F. and K.R. French (1995), "Size and Book-to-Market Factors in Earnings and Returns", **Journal of Finance,** Vol. 50, No. 1 March, pp. 131-155

10. Fama, E.F. and K.R. French (19985), "Value Versus Growth: the International Evidence", **Journal of Finance,** Vol. 53, No. 6, December, pp. 1975-1999

11. Harvey, C. R. (1995), "The Risk Exposure of Emerging Equity Markets", **The World Bank Economic Review,** Vol. 9, No. 1, January, pp. 19-50

12. Kamere N. I. (June 1987), "Some factors that influence the capital structures of public companies in Kenya", **Unpublished MBA Thesis.** University of Nairobi

13. Kiogora G.M (2000), "Testing the variations in the capital structure of companies quoted at the NSE: An empirical study", **Unpublished MBA Project.** University of Nairobi.

14. Miller, M. and F. Modigiliani (1961), "Some Estimates of the Cost of Capital to the Electric Utility Industry, 1954-57", **American Economic Review,** Vol. 56, pp. 333-91

15. Modigiliani, F. and M. H. Miller (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment", **American Economic Review,** June, pp. 261-97

16. Modigiliani, F. and M. H. Miller (1963), "Corporate Income Taxes and the Cost of Capital: A correction" **American Economic Review,** Vol. 53, No. 3, June, pp. 433-443

17. Moyer R.C, McGuigan J.R and Kretlow W. J, "A contemporary Financial Management" 5th Edition, 476-513

18. Myers, S. C. (1984), "The Capital Structure Puzzle" **Journal of Finance,** Vol. 39, July, pp. 575-92

19. Odinga G.O (2003), "Determinants of Capital Structure of Companies listed at Nairobi stock Exchange (NSE)" **Unpublished MBA Project.** University of Nairobi

20. Oliner, S.D. and Rudebusch, G.D (1992). "Sources of financing hierarchy for business investment" **, The Review of Economics and Statistics,** 74, 4 643-654

21. Omondi W. A (July 1996) "A study of capital structure in Kenya", **Unpublished MBA project.** University of Nairobi.

22. Omole D.A and G. O Falokun (1999), "The Impact of Interest rate liberalization on the corporate financing strategies of quoted companies in Nigeria", **AERC Research Paper No. 88,** March 1999

23. Omran M. M and J. Pointon (2000), "The Determinant of the Cost of Capital by Industry within an Emerging Economy: Evidence from Egypt" **International Journal of Business,** Vol. 9, No. 3, 2004

24. Sagala G "The Relationship between Cost of Capital and Leverage for Companies quoted on the Nairobi Stock Exchange", **Unpublished MBA project.** University of Nairobi.

25. Sullivan, Timothy G. (1978). "The cost of capital and the market power of firms". **The Review Economics and Statistics,** 60,2, 209-217

26. Yagill, Joe, 1982. "On Valuation, beta, and the cost of equity capital" **Journal of Financial and Quantitative Analysis,** 17, 3, 441-449

Appendix 1. List of listed companies

	COMPANY NAME
1	Unilever Tea Kenya Limited
2	Kakuzi Limited
3	Rea Vipingo Plantations Ltd
4	Sasini Tea and Coffee Limited
5	Eaagads Limited
6	Kapchorua Tea Company Limited
7	Limuru Tea Company Limited
8	Kenya Orchards Limited
9	Williamson Tea Kenya Limited
10	Car and General (Kenya) Limited
11	CMC Holdings Limited
12	Kenya Airways Limited
13	Marshalls (East Africa) Limited
14	Nation Media Group Limited
15	Tourism Promotion Services Limited
16	Uchumi Supermarkets Limited
17	Express Kenya Limited
18	Standard Group Limited
19	Barclays Bank of Kenya Limited
20	CFC Bank
21	Diamond Trust Bank (Kenya) Limited
22	Housing Finance Company Limited
23	ICDC Investment Company Limited
24	Jubilee Insurance Company Limited
25	Kenya Commercial Bank Limited
26	National Bank of Kenya Limited
27	NIC Bank Limited
28	Pan Africa Insurance Company Limited
29	Standard Chartered Bank Kenya Limited
30	City Trust Limited
31	Athi-River Mining Limited
32	Bamburi Cement Company Limited
33	British American Tobacco Kenya Limited
34	BOC Kenya Limited
35	Carbacid Investments Limited
36	Crown-Berger Kenya Limited
37	Olympic Capital Holdings Limited – Formerly Dunlop Kenya
38	East African Cables Limited
39	East African Portland Cement Company

40	East African Breweries Limited
41	Sameer Africa Limited (formerly Firestone)
42	Kenya Oil Company Limited
43	Mumias Sugar Company Ltd
44	Kenya Power and Lighting Company Limited
45	Total Kenya Ltd
46	Unga Group Limited
47	A. Baumann & Company Limited