A SURVEY OF METHODS USED TO ESTIMATE COST OF CAPITAL BY UTILITY PARASTATALS BASED IN NAIROBI.

By

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DECLARATION

This research proposal is my original work and has not been presented for award of a degree Programme in any other University.

Signed _____ Date 9.11.2011
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This project has been submitted for defense with my approval as the university supervisor.

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DEDICATION

I dedicate this research project to my parents Patrick and the late Anjeline Ochieng whose love and encouragement have been a great source of inspiration throughout my academic life.

ACKNOWLEDGEMENT

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ABSTRACT

Cost of capital estimation has been among the various key decisions required of finance managers. Most studies on cost of capital estimation methods have focused on overseas practice. Very few that had been conducted in Kenya concentrated on testing the practicability of individual models using Kenyan sample. The current study therefore sought to establish the methods used by utility parastatals based in Nairobi to estimate cost of capital.

A census survey method was employed for the study of a population comprising 14 parastatals engaged in provision or regulation of utility services in energy, telecommunications and water sectors. The study employed a survey research design and the data was collected through questionnaires administered vide interviews. Quantitative analysis of data was used in which the collected data was reduced into numerical codes and then calculated into percentages and means. Data presentation was done in form of graphs, pie charts and tables.

The results suggest that non-elaborate models are widely used, CAPM's use is modest, while other asset pricing models are not used. Weighted average cost of capital is computed and is most likely to be based on book value weights. However, tax effects are not factored in.

The study findings will provide important information to practitioners by identifying areas where academic recommendations have not been implemented.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND TO THE STUDY

The Public Sector has played an important role in the functioning of the economies of most countries. This has mainly been through State Owned Enterprises, Regulation and Direct Spending (United Nations Economic Commission for Africa, 2007). State owned enterprises also known as Parastatals are mostly utility companies. According to United Nations Economic Commission for Africa (2007) a utility entity refers to an organization that maintains infrastructure for an essential service or provides such a service using that infrastructure to the public. A State Owned Utility is therefore an enterprise mandated to provide utility services by an enabling legislation (such as an Act of Parliament in case of Kenya) and the Government has a controlling interest or is fully owned by the Government (United Nations Economic Commission for Africa, 2007). In this regard, Parastatals that engage in provision of utility services has been termed as Utility Parastals (UPs).

Cost of capital of capital on the other hand reflects the return that investors require in order to invest (Van Horne, 2007). We can therefore think of cost of capital as cost of obtaining and retaining capital from investors (Brealey and Myers, 2000). Obviously, most investors are concerned with unavoidable risk, the risk that cannot be avoided by diversification of the stocks, bonds and other financial assets they hold. Thus cost of capital is the return on a risk free rate plus the market price of risk to the investor due to one or more factors (Van Horne, 2007). The key factors include market risk, interest rate risk, size, inflation risk and foreign exchange fluctuations (Graham and Harvey, 2001). The survey examined the methods currently used in determining cost of capital by the public utilities located in Nairobi.

Historically, the extensive involvement of the public sector in the world economies has been justified for a wide range of reasons such as raising revenue, promoting technical

progress, public interest, national importance and security, ensuring adequate provision of public goods and distributional objectives (Vishwanath et al, 2008). In essence, these reasons make up for 'market failure' which is the most current justification for the public sector involvement in utilities. Most of the utilities in Nairobi are in the Telecommunications, energry and water sectors.

According to UNDP (2007) numerous challenges still face Utility Parastatals sector in Kenya. Key among them being, the poor service provision occasioned by dilapidated and inefficient infrastructure and low levels of access, in particular in urban slums and in rural areas. For instance, African Development Fund (2010) states that electrification ratio in Kenya is low with only 20% of the population having access to electricity while outside major towns access is much lower, 7 – 8%, with low reliability in some areas. The next is loss making state-owned enterprises that often lead to acute financial problems thus burdening the public coffers. While reforms in this sector have encouraged competition, the continued existence of monopoly power in parts of infrastructure industries such as telecommunications, water and electricity has left a need for some form of regulatory framework.

Regulation is direct Government control over specific sectors of the national economy. It is most commonly imposed upon enterprises that have monopoly on or are dominant in the provision of a specific good or service with the objective of protecting consumers from the abuse of dominance by the enterprise (United Nations Economic Commission for Africa, 2007). In a competitive market, the consumer can choose to purchase the good or service from a different provider if he or she is dissatisfied with the price or quality being offered. Consumers dependent upon monopoly providers have no such choice and particularly in cases where the enterprise is providing a basic good or service, consumers need to be protected against exploitation (Mehta and Virjee, 2007).

Until fairly recently, utility services in Kenya were assumed to be natural monopolies, that is, competition in the provision of those services was perceived not to be economically feasible. Even today, although such competition has been introduced in the

Telecommunications sector, most of utility services such as Electricity and water have continued to be provided by monopolies (Republic of Kenya, 2004). Some form of regulation has therefore been exercised in Kenya to limit the potential of utilities to place consumers at undue disadvantage, especially in the pricing of the essential services. It is in light of this that regulators of the respective utility services issue tariff guidelines from time to time.

The ideal regulation would pass the economies of natural monopoly and network reliability to customers while providing shareholders with a fair return (Vishwanath, 2008). The return on capital must therefore be high enough to attract capital. Irrespective of the rates charged, for a given degree of risk the financial markets expect a UP to earn a minimum required return commensurate with the risk involved. This rate of return is the cost of capital. A UP have therefore been expected to recover its costs of service, which includes "prudently" incurred expenses and a fair return on capital. This is particularly important for utilities because they needed to maintain their financial strength, take advantages to access capital and to maintain open and constructive relationship with regulators (Venneri and Partel, 2008).

There are various methods of estimating cost of capital. Though, studies indicate that Overseas Regulatory Agencies initially employed what is known as the 'comparable earnings' (Vishwanath, 2008). More recently such studies suggested that Capital Asset Pricing Model (CAPM) has gained widespread acceptance in the estimation of cost of equity (Louise, 2002).

A survey of the UPs in Nairobi is unique in two ways. The most obvious was that previous work has almost exclusively focused on multi-sectored samples. Second, previous investments in utilities especially the water sector ignored the central principal of cost recovery. This led to collapse of a good number of projects thus instigating lack of interest by financial organizations in the sector (Mehta and Virjee, 2007).

1.2 STATEMENT OF THE PROBLEM.

UPs needed to know their cost of capital for an array of reasons: to support investment decisions, to asses the opportunities of undertaking supply verses contracting out to third party organizations, and to articulate sound negotiation strategies with regulating authorities (Venneri and Partel, 2008). However, tariff setting for Utilities is a complex process that required sensitivity to social goals as well as reflecting full costs as closely as possible. Cost reflective tariffs required that individual customers be charged a price for each element of service that precisely compensated for the associated costs. But this was not normally the case, since each customer was not treated individually, but rather grouped within classes that can be expected to display similar patterns with respect to primary drivers of cost. Costs were then approximated across the classes based on information available within the existing accounting system. (United Nations Economic Commission for Africa, 2007).

Methods of estimating cost of capital have received much attention in the developed markets' literature (Graham and Harvey, 2001; McLaney et al, 2004; Truong et al, 2008; Vishwanath et al, 2008). Similar studies in Kenya have centered on suitability of cost of capital models. Omosa (1989) and Kerandi (1993) studied the predictive ability of selected models on the companies listed at the Nairobi Stock Exchange. Whereas the former found that CAPM and dividend discount model were good predictor of stock prices, the latter found dividend discount model to be a poor predictor of stock prices. Akwimbi (2003) on the other hand studied the applicability of arbitrage pricing model and the empirical evidence demonstrated that multifactor arbitrage pricing model had a far greater explanatory power than CAPM in predicting stock returns.

The motivation for the study was from the premise that public utilities faced less competition and as such they were assumed to earn abnormal profits. Therefore, in order to protect Kenya's rate payers, regulators prevailed upon utilities to follow tariff guidelines they issue from time to time. However, the only way to establish the existence of abnormal profits in utility sector was by determining their cost of capital.

While the above research outcomes provided empirical evidence on suitability of the models in predicting stock returns in Kenya and cost of capital methods used in developed markets, there was no known study to the researcher, which has been done on the survey of cost of capital methods used by utilities in Kenya. Therefore the knowledge gap existed as to how the Kenyan Utilities arrived at their cost of capital. Thus, this study added on to the existing literature in Kenya by studying the cost of capital estimation methods by utility parastatals in Nairobi.

1.3 RESEARCH OBJECTIVE

To survey methods used by utility parastatals in Nairobi to estimate their cost of capital.

1.4 SIGNIFICANCE OF THE STUDY

The findings of survey analysis were intended to be beneficial in four ways.

1. The analysis will provide a learning opportunity to practitioners in the sector by noting how other utilities operate and by identifying areas where academic recommendations have not been fully implemented.

2. The feedback is intended to assist Regulatory bodies in identifying policy gaps which could be filled, for example by allowing adequate return to encourage investment by utility parastatals while ensuring continued provision of services to rate payers at the lowest possible cost.

3. The survey findings will also help to bridge a gap in finance literature. The findings of the study could be used for educational purposes by scholars to complement the available knowledge in the area of cost of capital.

4. The findings provide information to other entities intending collaboration in the sector. This is particularly important to NGOs, Faith- based charities and financial institutions who may want to fill the financing gap in the sector occasioned by limited resources of the Government.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviewed the theories guiding the study. The models examined include capital asset pricing model, dividend discount model, risk premium model and arbitrage pricing theory. The chapter also coverered previous empirical studies and conclusions from the studies.

2.2 THEORIES OF ESTIMATING COST OF CAPITAL

According to Cooper and Shindler (2003), a theory is a set of systematically interrelated concepts, definitions and propositions advanced to explain and predict a fact or facts. It is a system of ideas which explain something (Oxford Dictionary, 2005). The following are three theories that narrow the range of facts on cost of capital which the researcher intends to survey.

2.2.1 Dividend discount Model (DDM)

In this model, cost of capital is the discount rate which equates the present value of the stream of expected dividends with the current market price of the stock. It is named after Myron J. Gordon who originally published it in 1959. The model is founded on the fact that cash distributions are all that stockholders as a whole receive from their investment; they are all the company pays out. Consequently, the price that investors are willing to pay depends on their expectations of dividends and terminal value. Dividend discount models are designed to compute this implied stock return under specific assumptions: (1) the firm will maintain a stable dividend policy (dividends grow at a constant rate into the indefinite future), (2) and earn stable return on new equity investment over time. If dividends of a company are expected to grow at a constant rate, the calculation of the implied return is as given below.

Required return on stocks = Expected dividend next year / Market value + Expected growth rate in dividends

$$Ke = \frac{D_1}{P_0} + g$$

The weakness of the model is the difficulty in forecasting expected dividends and dividend growth. A problem also exists with the model if the stock does not currently pay a dividend, like many growth stocks and hence more general versions of the discounted dividend model must be used to value the stock. One common technique to use is to assume that the Miller-Modigliani hypothesis of dividend irrelevance is true, and therefore replace the stock's dividend with earnings per share.

2.2.2 Capital Asset Pricing Model (CAPM)

This is an equilibrium model of the trade-off between expected portfolio return and unavoidable risk. Based on the behavior of the risk-averse investor, there is implied equilibrium relationship between risk and expected return for each security. In market equilibrium, a security will be expected to provide a return commensurate with its unavoidable risk. This is simply the risk that cannot be avoided by diversification. The greater the unavoidable risk of a security, the greater the return that investors will expect from the security. The relationship between expected return and unavoidable risk, and the valuation of securities that follows, is the essence of capital asset pricing model (CAPM). This model was developed by William F. Sharpe and John Litner in the 1960s, and it has had important implications for finance ever since.

The model operates on the following assumptions: (i) capital markets are highly efficient where investors are well informed, (ii) there are no transaction costs, (iii) restrictions on investments are negligible and no taxes, (iv) no investor is large enough to influence the market, (v) and investors in general are in agreement about the likely performance and risk of individual securities and that their expectations are based on a common holding

period. Under these conditions all investors perceive the opportunity set of risky securities in the same way and will draw their efficient frontiers in the same place.
When using CAPM, risk free rate, beta estimate and market risk premium are joined in the formula below to arrive the cost of capital.

$$R_j = R_f + (R_m - R_f)\,\beta_j$$

A risk free asset rewards the investor for time value of money alone. It's returns (R_f) are certain (i.e variance is zero) and unconnected with that of the market (i.e covariance is zero). The risk-free rate reflects the rate of return that a person can expect on a completely risk less asset. Whereas Treasury security is generally acceptable as a proxy for risk free asset, there is contention as to suitable maturity of the Treasury security. The dilemma is whether to use interest rate on a short-term Government security like Treasury bill or intermediate-term rate such as 3-year Treasury bond or long term rate like that on 10 – 15 year Treasury bonds. The maturity adopted causes a difference in the required rate because long-term interest rates are usually more than intermediate-term rates, which in turn exceed short term rates.

A security's beta (β_j) is a measure of sensitivity to market return movements. According to Levy (1971), the label 'volatility' is usually employed to designate market related risk. Sharpe (1964) in the article in which he developed the CAPM, called the regression line 'characteristic line'. The beta is simply the slope of the characteristic line. If the slope is 1, it means that excess returns for the stock vary proportionally with excess returns for market portfolio. A slope steeper than 1 ($\beta_j>1$) means that the stock's excess return varies more than proportionally with excess return of the market portfolio. This is to say, it has more systematic risk than the market as a whole. On the other hand, a slope less than 1 ($\beta_j<1$) means that the stock has less systematic risk than does the market as a whole. The greater the slope of the characteristic line for a stock therefore, as depicted by its beta, the greater its systematic risk.

Market risk premium ($R_m - R_f$) is the average return of a market portfolio in excess of risk free rate. In calculating market risk premium, it is usual to use an established stock

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market index as a proxy for the market portfolio such as 'all share' index or one that is made up of the most frequently traded companies.

2.2.3 Risk Premium Model

Under this model a risk premium is added to the yield on the company's bond to estimate the cost of equity.

Cost of equity = Bond yield + risk premium

However, the following problems characterize the use of the model. Equity risk premium tends to be larger when interest rates are low and smaller when they are high. We also know that it matters whether the company bond maturity is intermediate term or long term.

Besides, the equity risk premium can either be historical or forward looking. Historical risk premium is the difference between the average of annual returns on a stock index in the past, say 10 years and the average of annual returns on a bond index over the same period. The historical estimate is affected by the period chosen and end points of the period. Further, whether average return for the historical estimate is to be reported as arithmetic mean or geometric mean and how frequently average returns should be sampled are also still contentious.

Forward looking risk premium on the other hand is based on DCF analysis and is the difference between the average expected future return on a group of stocks and a concurrent risk free rate just as in CAPM. However, even forward looking estimate is fraught with problems ranging from weaknesses inherent in the use of subjective equity analysts' projections to complex elaborate models of forward looking returns that often generate unstable results.

2.2.4 Arbitrage Pricing Theory (APT) Model

This is an equilibrium model as to how security prices are determined. It is based on the idea that in competitive financial markets arbitrage will ensure that riskless assets provide the same expected return. The model is based on the simple notion that security prices adjust as investors form portfolios in search of arbitrage profits. When such profit opportunities have been exhausted, security prices are said to be in equilibrium. In this context, a definition of market efficiency is the absence of arbitrage opportunities, having been eliminated by arbitragers. This model was developed by Stephen A. Ross in his published work in the Journal of Economic Theory in 1976.

The APT suggests that market equilibration process is driven by individuals eliminating arbitrage profits across multiple factors. However, the model does not tell us what the factors are or why they are economically or behaviorally relevant. It merely states that there is a relationship between security returns and a limited number of factors. Roll and Ross (1980) suggest that different securities have different sensitivities to five systematic factors and that major sources of security portfolio risk are captured in them.

The five factors are (1) changes in expected inflation, (2) unanticipated changes in inflation, (3) unanticipated changes in industrial production, (4) unanticipated changes in the default risk premium on bonds, and (5) unanticipated changes in the term structure of interest rates.

$E(R) = \lambda_0 + \lambda_1 (b_{1j}\, E\Delta \text{ inflation}) + \lambda_2 (b_{2j}\, U\Delta \text{ inflation}) + \lambda_3 (b_{3j}\, U\Delta \text{ industrial production}) + \lambda_4 (b_{4j} U\Delta \text{ bond risk premium}) + \lambda_5 (b_{5j}\, U\Delta \text{ term structure of interest rates})$

Where $E\Delta$ is an expected change, $U\Delta$ unanticipated change, λs' market prices of risk, and b's, the sensitivity coefficients.

According to this equation, the expected return on a security, $E(R)_j$, exceeds the risk free rate by the sum of the products of the market prices of risk and sensitivity coefficients. The sensitivity coefficients simply tell us the average response of the sensitivity return to

unanticipated change in a factor, holding other factors constant. In this model investors are characterized as having risk preferences along five the dimensions.

The major drawback of the model is that there is no agreement as to the risk factors of importance or the number that should be used. Moreover, empirical testing of APT has failed to produce stability of the parameters and consistency over time.

2.3 EMPIRICAL STUDIES

2.3.1 Risk Return Trade off

Munyuoki (1998) in his study of return to systematic risk sampled firms quoted at Nairobi Stock exchange. He was specifically concerned with return to market risk where he observed that return to market risk does not deviate much from the general market interest rates. Obviously, most investors are concerned with systematic risk, also called unavoidable risk. This is the risk that cannot be avoided by diversification of the stocks, bonds and other financial assets they hold. Therefore, for a given degree of risk, the financial markets expect a company to earn a minimum required return commensurate with the risk involved. Thus, cost of capital is the return on a risk free rate plus the market price of systematic risk.

According to Van Horne (2007), cost of capital on any investment is influenced by the whole portfolio of stocks (and other assets) to which an investor can access. For example, an investor may be presented with an opportunity to invest Ksh 50,000 in a project with three states of possible outcome: boom, normal and slump. Assuming the investor has an alternative of investing in a common stock with the same risk profile, say stock X and expects a normal economic performance next year. X's price next year given a normal economy, is forcasted at Ksh 55. the stock price will be higher in a boom and lower in a slump, but to the same degree as the alternative investment (say, Ksh 70 and Ksh 40 in slump). If stock X's current price is ksh 47.80, then stock X offers expected rate of return of 15 %, which is the cost of capital of investing in the project rather than the stock.

2.3.2 Cost of Capital of Utilities Practice Overseas

Graham and Harvey (2001) carried out a comprehensive survey of 392 Chief Finance Officers (CFOs) in the US covering cost of capital, capital budgeting and capital structure. The study answered three questions on cost of capital comprising calculation of cost of equity, risk factors accounted for in arriving at discount rate and/ or cash flows and use of cost of capital models via their mailed questionnaire to CFOs.

The study found that public utilities were more likely to use CAPM in estimating cost of equity in the US with CAPM scoring a rating of 2.92 on a likert scale of 0 to 4 (0 meaning 'never', 4 meaning 'always'). The study further noted that listed firms were more likely to use CAPM than unlisted ones since the beta of unlisted firms could only be determined through analysis of comparable listed firms. On differences conditional to entity characteristics, Graham and Harvey 2001) found that CAPM was more popular with large firms (rating of 3.27) than small firms (rating of 2.49). Small firms determined their cost of equity by "what investors tell us they require".

The study also found that Chief Executives with masters degree in business were more likely to use CAPM in whatever form (single factor or with extra risk factors) than those without. Low indebted and/ or small management owned firms were also more inclined to use CAPM perhaps due to their dominance in equity financing. Given that some UPs are not listed and that CAPM is not the only model that can be used to estimate the required cost of equity, it would be interesting to find out how these entities cope with the problem of beta determination and whether they use other approaches such as discounted cash flows and risk premium analysis. Further, Graham and Harvey (2001) found that risk factors considered when calculating discount rates include: market risk, interest rate, size, inflation and foreign exchange.

In a UK survey of 193 quoted firms, McLaney et al (2004), found that the CAPM was the most popular model used in estimating the cost of capital, but only 47 percent of the companies surveyed used the CAPM compared to 73 percent reported by Graham and Harvey (2001). McLaney et al (2004) also found that 53 percent of UK companies used

WACC for project appraisal and 67 percent incorporated tax effects when estimating cost of capital.

Truong, et al (2008), on the other hand surveyed 356 Australian companies including utilities on cost of capital estimation and capital budgeting practice. The study also mailed questionnaire to sampled respondents. A total of 87 responded resulting to a response rate of 24.4 percent. The results of the study correspond well to findings of Graham and Harvey with 72 percent of respondents in Australia confirming that they used CAPM to estimate their firm's cost of equity and the WACC was being based on target weights for debt and equity. Truong et al (2008) also found out that in Australia long term Treasury bonds were used as proxy for risk free rate, beta was obtained from public sources and a variety of assumptions made about market risk premium

Another recent survey specific to utilities was by Vishwanath et al (2008). This study covered estimation issues and approaches followed by utilities in different parts of the world. It focused on secondary data and sampled UK, US, Australia, Canada and India. The survey results indicated that CAPM was being adopted as the lead method by utilities in determining return on equity within WACC in the four sampled countries. However the use of WACC was only dominant in Ireland, Australia and UK.

As we know, the key ingredient in the CAPM is the use of beta as a measure of risk. This is because in a competitive market, the expected risk premium varies in direct proportion to beta. However, beta has been criticized by scholars. Fama and French (1992) empirically tested the relationship between stock returns and market capitalization (size), market-to-book value and beta. They found the first two variables to be powerful predictors of average stock returns (i.e having significant negative relationships with average returns).

Moreover, when these variables were first regressed against stock returns, beta was found to have little explanatory power (Fama, 1991). Fama and French therefore refuted the ability of CAPM to explain stock returns, suggesting that size and market-to-book value are the appropriate proxies for risk.

However, a number of critics have attacked Fama and French's methodology in defense of CAPM. Key among them is Kothari and Shanken (1995) who discredited Fama and French because they not only focus on realized returns at the expense of risk but they do not also offer theoretical foundation for their findings. Other critics have argued that market value is embraced in both variables (stock returns, size and market-to-book value) and it is the market value that changes, together with dividends, which the regressions try to explain. Given that market value appears in the dependent as well as the independent variables, then this is bound to result in explanatory power (Grundy and Malkiel, 1996, Jagannath and McGrattan, 1995).

Another issue has been whether historical betas are stable overtime to permit their use as estimates of future volatility. Levy (1971) studied the question of beta volatility. He calculated betas for individual securities, as well as for portfolios of securities over a range of time intervals. He concluded that the betas of individual stocks are unstable, hence past betas for individual securities are not good estimates for their future risk, but betas of portfolios of ten or more stocks are reasonably stable, hence past portfolio betas are good estimates of future portfolio volatility. In effect, the errors in the estimates of individual security betas tend to offset one another in a portfolio.

Besides, Vishwanath et al (2008) contrasted cost of equity and cost of capital approaches in an attempt to specify which of the two should be followed by Regulators of Utilities in respective countries. The study showed support for cost of capital approach since it's backed by MM theory of capital structure. MM proposition 1 state that ' a firm cannot change the total value of its securities just by splitting its cash flows into different streams, that is, a firm's value is determined by its real assets and not by securities it issues'. Thus capital structure is irrelevant as long as the firm's investment decisions are

taken as given. This argument taken from consumer point of view would be that the tariff (i.e service charges) charged by utilities should not change just because of changes in capital structure alone. However, imperfections not accounted for in the proposition include taxes, bankruptcy costs, cost of writing debt contracts and market imperfections. Vishwanath et al (2008) further state that the approach is also consistent with 'performance based regulation' which provides incentive for financial engineering by permitting Utilities to retain some of the benefits from operational results. Besides, the adoption of cost of equity approach is complicated by innovations in finance such as development of hybrid instruments that are becoming difficult to classify as either debt or equity. Given the multiple roles of the Government (owner, regulator and facilitator) and that operations of UPs are heavily subsidized, we would be interested to know the approach that have been adopted in practice.

2.3.3 Empirical evidence on methods of estimating the cost of capital in Kenya

Most of local studies focus on suitability of cost of capital models in determining stock returns. Omosa (1989) carried out a study on predictive ability of selected pricing models on the Companies listed at the Nairobi Stock Exchange. The study compared forecasted share prices using Gordon's dividend discount model, CAPM and Accounting based models verses actual share prices of actively traded companies that were quoted in January 1976 to December 1980 at the Nairobi Stock Exchange. A test of significance was then undertaken to determine whether forecasted prices were significantly different from actual prices. The empirical evidence presented found differences between CAPM based prices; DDM based prices and actual prices but was not significant. The difference was attributed to absence of perfect market portfolio and unresolved issues on the stability and sufficiency of beta. Though the accuracy of future estimates of beta for individual securities can be improved by regressing beta estimates from a later period on estimates from an earlier period (Isinta, 2008). According to Omosa (1989), the accounting based models were found to be poor predictor of stock prices. This was perhaps due to assumptions of accounting principles inherent in the models.

Kerandi (1993) also tested the predictive ability of DDM on ordinary shares of thirteen companies quoted at Nairobi Stock Exchange. The study employed a CAPM to estimate the required rate of return for each company. These rates were then used to discount the forecasted dividends per share and terminal values using DDM. The test of significance carried out on the differences between the two set of prices showed that DDM was a poor predictor of stock prices at Nairobi Stock Exchange (only 23% of the sampled companies indicated no significance). However, 54% of the studied companies indicated that CAPM was a good predictor of stock prices. The latter perhaps explains the growing popularity of CAPM among overseas practitioners while the former is a deviation from Omosa's findings.

Akwimbi (2003) on the other hand studied the application of the Arbitrage Pricing Model in predicting stock returns at the Nairobi Stock Exchange. He tested the default risk, term structure risk , market return and unexpected changes in inflation influence on stock returns an their relative significance in explaining returns. The study found that five factors were critical in explaining stock returns, with the aggregate stock market return being the most critical (with explanatory power of 87.3%). The other four were unexpected changes in both foreign exchange reserves and inflation rate; changes in exchange rate of the Dollar and interest rate on loans. The study demonstrated that multifactor Arbitrage Pricing Theory approach has far greater explanatory power than CAPM in explaining expected returns. However, the study suffered from a number of setbacks. These include difficulty to identify the actual number of factors that generate returns; poor proxies for GDP, Default risk and term structure of interest rates. For instance, default risk was measured as the difference between the rate return on relatively risky corporate bonds and the rate of return on Government bonds , both with 20 years maturity.

2.3.4 Conclusions from Empirical Studies

From the reviewed surveys, CAPM dominates in estimation of cost of equity for utilities and other models are not considered superior in the developed countries. The WACC is widely used as a discount rate and cost of capital approach accorded more prominence

except for the US which is biased towards cost of equity approach. These practices in overseas countries reflect reasonably well with the prescriptions of corporate finance.

However, criticism of CAPM is well documented. For example, Fama and French (1992) found beta to have little explanatory power of stock returns; Akwimbi (2003) found CAPM to have lower predictive power on stock returns. Further, empirical literature on cost of capital practices in Kenya is still lacking. This is because much of local studies have concentrated on predictive power of the model. Omosa (1989) tested the predictive ability of DDM, CAPM and Accounting based models and found that these models were not good predictors of share prices due to inefficiencies and market imperfections.. Kerandi (1993) tested the predictive power of DDM and found out that it was a poor predictor of share prices. Akwimbi (2003) studied the predictive power of APT model on stock retuns. The study demonstrated that APT had a greater explanatory power than CAPM.

Given the controversies of cost of capital formulation and approaches and that most of the empirical studies on cost of capital have focused on developed markets (Graham and Harvey, 2001; McLaney et al, 2004; Truong et al, 2008; Vishwanath et al, 2008), a knowledge gap exists. The proposed study therefore differs from the reviewed studies by concentrating on utility parastatals in Kenya which is in a developing market. The proposed study of public utility sector in Kenya is also unique due to multiple roles of the Government (owner, regulator and facilitator), particularly when economy is dominated by public sector just like in Kenya. Consequently, operations of some of the utilities are subsidized.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter details the methodology employed in the study. Among areas discussed under research design are descriptive and survey research approaches. It also covers the target population and sample design. Data collection methods such as questionnaire administered through interview is also discussed as well as how collected data was analyzed.

3.2 RESEARCH DESIGN

According to Nyandemo (2007), research design may be defined as a programme to guide in collecting, analyzing and interpreting the observed facts for a scientific research. The proposed research was designed as a descriptive study. A descriptive study describes characteristics of a population or phenomenon (Cooper and Schindler, 2003). This approach was ideal for this study since it gave an opportunity to ask specific questions about determination of cost of capital by Utilities in the Public sector and also to explore the factors that may cause variations among utilities in arriving at the estimate. The research questions were formulated and the answers to the questions were based on what has happened. It involved a descriptive survey study of cross sectional nature because it was a one-time systematic gathering of information for purposes of understanding the methods used in practice by UPs in Nairobi to arrive at their cost of capital. It involved a structured interview guided by a questionnaire. Since the study was exploratory in nature, no hypothesis was tested.

3.3 POPULATION AND SAMPLE SIZE

A population is the total collection of elements from which an inference can be made. A portion of the population is called a sample (Cooper and Schindler, 2003). The Population of the study comprised all Parastatals engaged in provision or regulation of utility services in telecommunication, water and energy sectors in Nairobi. This was

because these sectors not only provide essential services to rate payers but they have undergone through tremendous reforms (Mehta and Virjee, 2007). In essence, the body of knowledge on Kenyan utilities' experience is mostly focused on the three sectors. The proposed study population was 14 utility parastatals having headquarters or branches in Nairobi got from Inspectorate of State Corporations Report of June 2010.

A census survey method was used since the study units were few (14 Parastatals) and therefore it's more effective and efficient method rather than carrying out the study on sample basis. Our sample compared well with local surveys such as Kipchirchir (2008) and Njiru (2008) who conducted census survey of 20 Distributors of brand new vehicles and 8 commercial parastatals respectively.

3.4 DATA COLLECTION

A Questionnaire offered the most cost-effective method of gauging the extent of practice of cost of capital. The questionnaire was administered through interview. This offered the advantage of receiving immediate feedback from respondents as well as opportunity to clarify questions that could be interpreted differently. Drop and pick later mechanism was employed where the researcher did not get a chance for interview. The follow up was through telephone calls to facilitate high response rates. The questionnaire consisted of both closed ended and open ended questions. It contained two parts. The first part contained general information and the second part was seeking to determine estimation issues on cost of capital. There were twenty questions in the questionnaire.

3.5 DATA ANALYSIS

The primary data collected from the questionnaire was analyzed using descriptive statistics such as measures of central tendency. The results were then presented in the form of frequency tables, charts and graphs where necessary. The data analysis method was quantitative in nature using frequency, percentages and mean. The response from the targeted respondents was used to achieve the research objective of identifying cost of capital estimation methods and the extent they were used in Utility sector in Kenya.

The likert score was analyzed using mean score and standard deviation to help understand the extent to which utilities used cost of capital estimation methods. Data analysis was done using SPSS. This generated quantitative reports through tabulations, percentages and measures of central tendency. Cooper and Schindler (2003) notes that the use of percentages is important for two reasons; first, they simplify data by reducing all the numbers to range between 0 to 100, and second, they translate the data into standard form with a base of 100 for relative comparison.

3.6 DATA RELIABILITY AND VALIDITY

The Cronobach's test was performed on the items of the questionnaire to target Alpha of 0.7. In addition, inferential statistics was used at 95% confidence level to provide basis for generalization of the findings on the usage of various models of cost of capital.

CHAPTER FOUR
PRESENTATION OF RESULTS

4.1 Introduction

This chapter deals with presentation of the findings to the study on methods used by public utility companies to determine their cost of capital. The analysis was done in respect to the research objective. The findings include 5 sections namely, distribution of respondents, cost of capital models, practices in estimation of cost of capital, relationships between the models, cost of debt and risk factors.

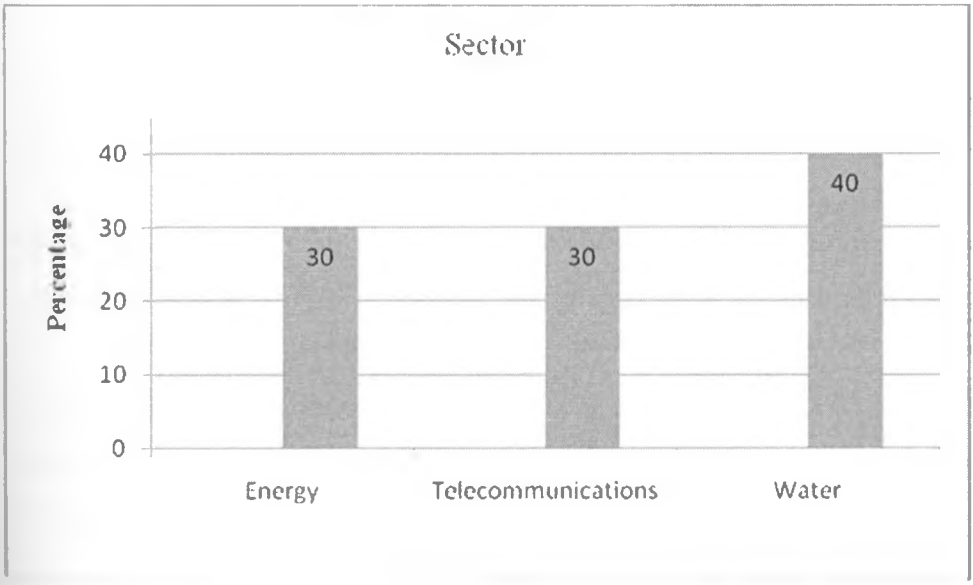
4.2 Distribution of Respondents

The respondents' characteristics was analysed in terms of sectors, period of existence, cumulative years of service to the respondent company and current job position and the respondents' revenue base.

4.2.1 The Distribution by Sector

The following chart shows the distribution of the respondent companies by sector

Figure 4.1 Respondents distribution by sector



As shown in figure 4.1 the public utilities in the water sector formed majority of the respondents at 40%, while communication and energy tied at 30% each

4.2.2 Number of Years in existence

The period with which the respondent companies have been in existence since formation is shown in figure 4.2.

Figure 4.2: **The number of years the organization has been in existence**

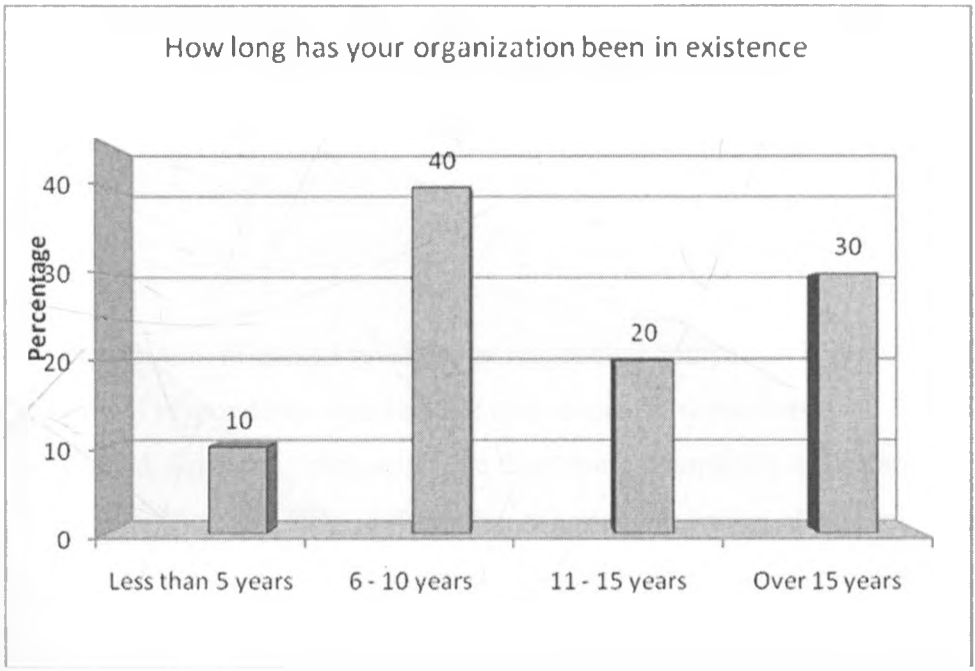
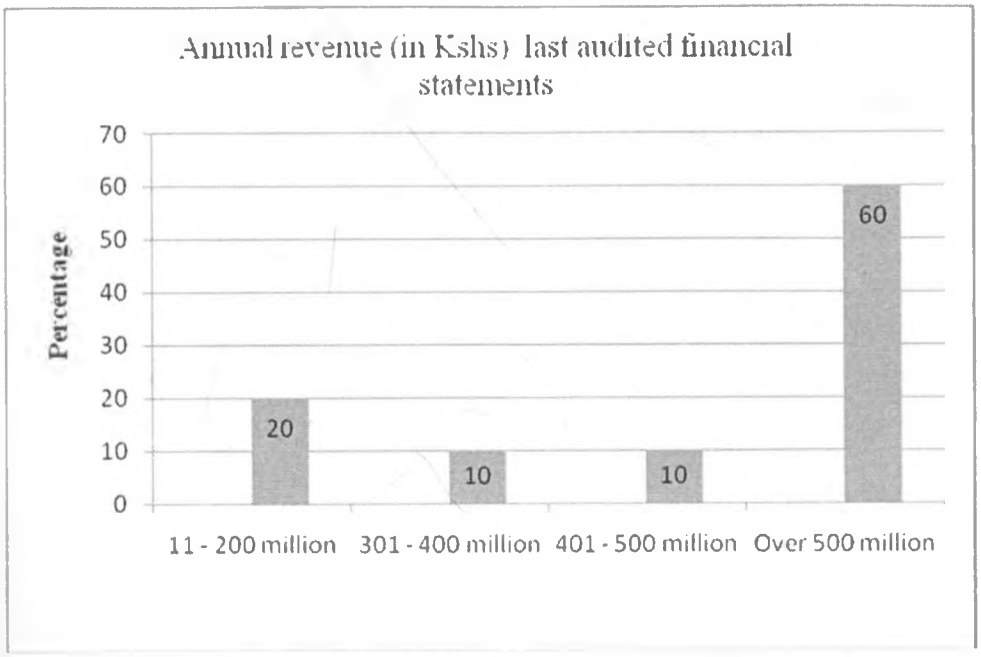


Figure 4.2 shows that a large percentage of companies have been in existence for over 6 - 10 years (a ranking of 40%). A small percentage (10%) has existed for less than 5 years.

4.2.3 Respondents by size

The respondents were categorised according their annual revenue generating capability. The results are summarised in figure 4.3 below.

Figure 4.3 Annual revenues of respondent companies

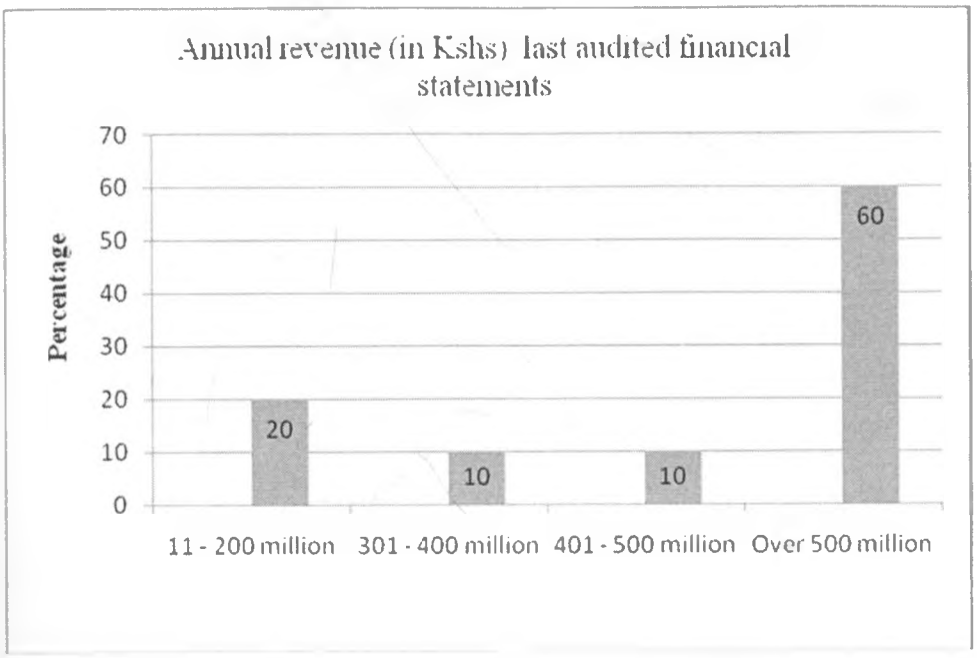


The distribution of annual revenues of respondent companies is given in figure 4.3. majority of respondents reported that their annual revenue was over 500 million as per last audited financial statements . the least were companies whose annual revenues were 301 -400 million and 401 – 500 million at equal percentage of 10 each. The skewness of the revenue distribution towards large firms may be because large firms had a comprehensive cost of capital estimation procedures than small firms and thus were more willing to participate in the survey.

4.2.4 Quoted verses unquoted respondents

Figure 4.4 shows the percentage of respondent utilities which are listed at Nairobi stock exchange and those that are not.

Figure 4.3 Annual revenues of respondent companies



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4.2.4 Quoted verses unquoted respondents

Figure 4.4 shows the percentage of respondent utilities which are listed at Nairobi stock exchange and those that are not.

Figure 4.4 Respondents by listing status

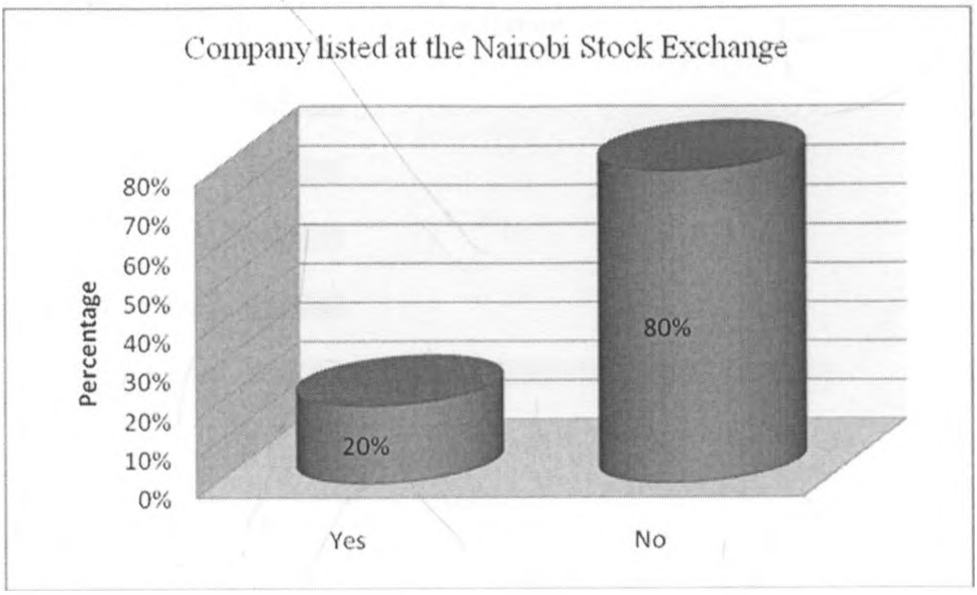


Figure 4.4 shows the respondent companies that were publicly traded at the Nairobi Stock Exchange and those that were not. Majority of the respondents were not publicly traded companies (80%).

4.2.5 Cumulative years of service to the respondent company

Number of years served in respondent utility by manager responding to survey questions was assessed. Table 4.1 summarises the results.

Table 4.5: Respondents average time spent with respondent companies

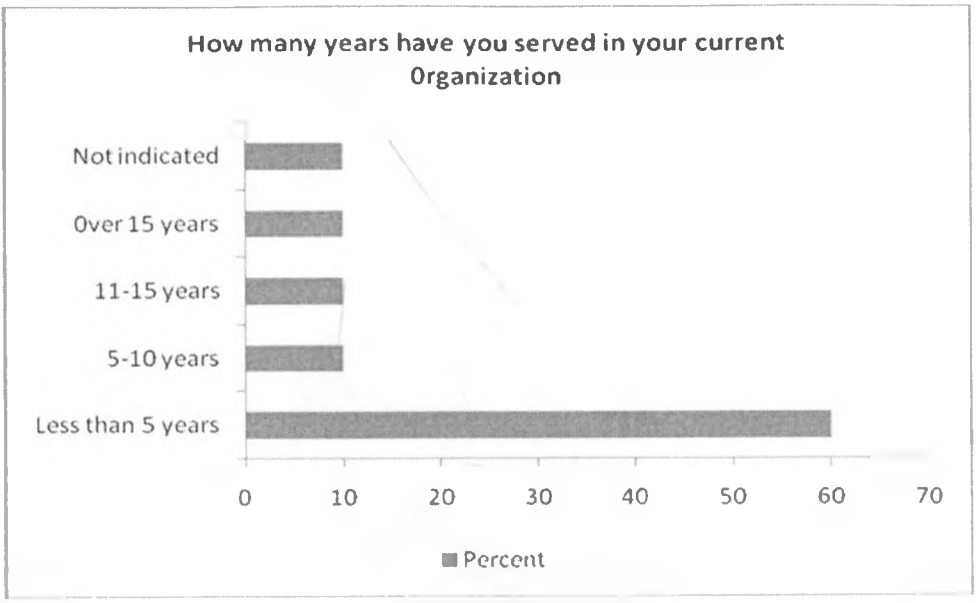
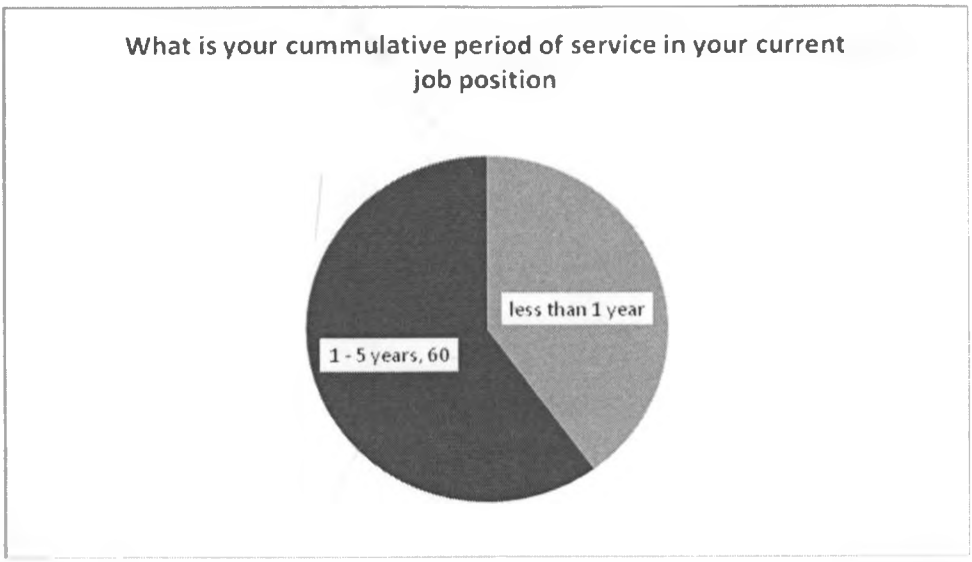


Figure 4.5 reports the average time spent with respondent companies by manager answering the survey questionnaire. Majority of respondents (60%) have spent less than 5 years in their employer company.

4.2.6 Cumulative years served in current managerial position

The survey inquired the period the respondent managers had served in their positions held at the time of survey. The results are presented in figure 4.6.

Figure 4.6 Respondents average time spent in their current managerial position

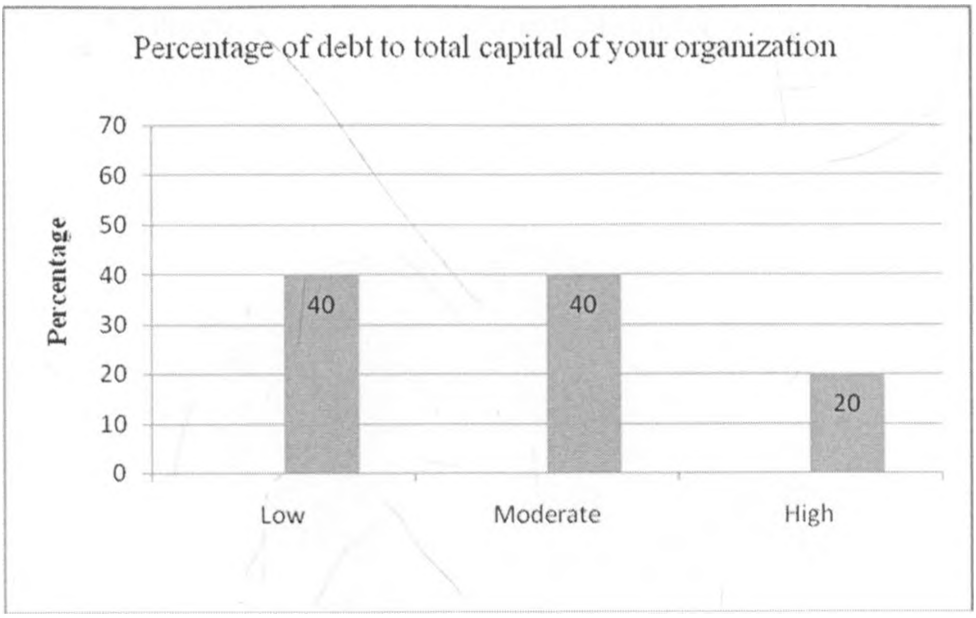


Majority of respondents (60%) has been in their managerial positions held at the time of survey for a period of between 1 to 5 years, while few has held the position for less than 1 year (40%).

4.2.7 Debt ratio

The survey explored the extent of leverage of the respondent companies. The results in figure 4.7 report the debt ratio of the respondents.

Figure 4.7 Debt ratio



As shown in figure 4.7 above, only 20% of the respondents reported a high percentage of debt to capital. Low and moderate indebted companies accounted for 40% of total respondents respectively.

4.3 Practices in estimating the cost of capital

Cost of capital practices with respect to whether utilities estimate their cost of capital or not was assessed. The various aspects of cost of capital estimation covered included cost of capital approaches, the estimation interval, popular models, practices adopted for determination of cost of debt, beta estimate and market risk premium.

4.3.1 Estimation of cost of capital

Respondents were asked directly whether they estimate cost of capital. The question required 'yes' or 'no' answer. The percentage of the respondents for each category is reported in figure 4.8.

Figure 4.8 Practices in estimating the cost of capital

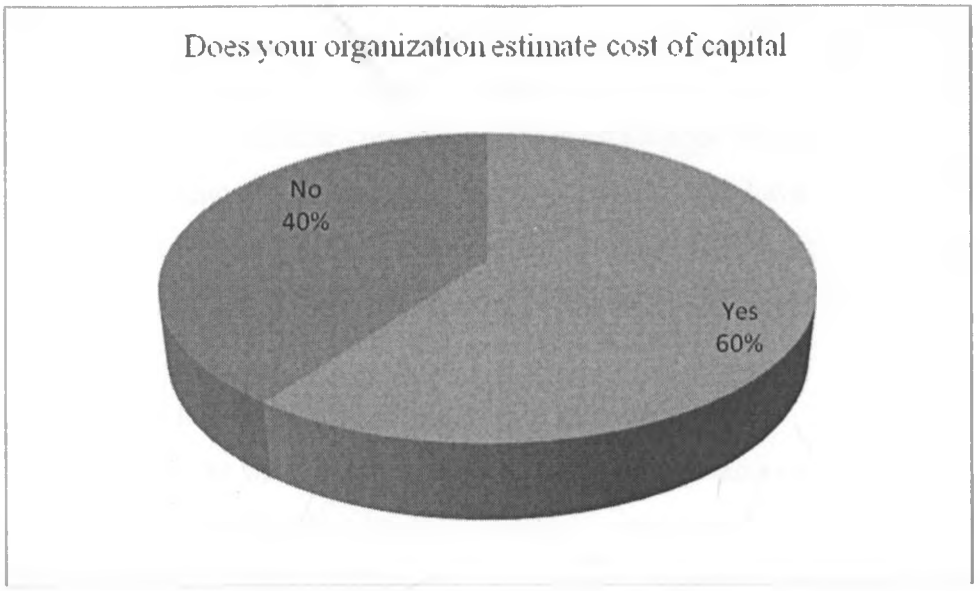


Figure 4.8 reports majority of respondents (60%) estimated their cost of capital.

4.3.1.1 Analysis by sector, listing status and number of years the utility has been in existence

The breakdown of respondents who estimate cost of capital or not by sector and listing status is presented in table 4.1. Similar breakdown by number of years the respondent companies have been in existence was also assessed.

Table 4.1 Estimation of cost of capital by sector, listing status and company age

Does the organization estimate cost of capital?	Sector				Listing Status			No. of years in existence				
	Energy	Telecomm unication	Water	Total	Listed	Unlisted	Total	Less than 5 yrs	6-10 yrs	11 – 15 yrs	Over 15 yrs	Total
Yes	20%	30%	10%	60%	20%	40%	60%	0	10%	20%	30%	60%
No	10%	0	30%	40%	0	40%	40%	10%	30%	0	0	40%
Total	30%	30%	40%	100%	20%	80%	100%	10%	40%	20%	30%	100%

As shown in table 4.1, majority of respondents who estimate cost of capital are from telecommunication sector (30%), while the water sector has the least percentage (10%) of those who estimate cost of capital. With regard to listing status, all listed utilities estimate their cost of capital. However, given that 80% of respondents were unlisted companies, majority of utilities who estimate cost of capital were unlisted (40%). Majority of respondents who estimate cost of capital are established organizations (with more than 15 years of existence). Interestingly, the respondents who have been in existence for less than 5 years did not estimate their cost of capital, but majority of those in existence for between 6 to 10 years (30%) also did not estimate cost of capital

4.3.2 Methods used in estimating cost of capital

Various methods of estimating cost of capital were assessed. This included elaborate models documented at text book level as well as convenient methods based on directives of regulators, investors and chief executives. The results are presented in table 4.2 below.

Table 4.2 Models used to estimate cost of capital

Models used to arrive at cost of capital (Mean)	**Mean**	**Percent**	**Score**
E/P Ratio	1.44	28.8	Not used
Capital Asset Pricing Model, beta approach	2.67	53.4	Moderately used
Arbitrage Pricing Theory (APT) model	1.11	22.2	Not used
Dividend discount model	1.56	31.2	Rarely used
Risk premium approach	1.56	31.2	Rarely used
Cost of debt plus equity premium	2.00	40.0	Rarely used
Fama and French Three Factor Model	1.00	20.0	Not used
The extent to which the following have been used (mean)			
Self-estimate	1.90	38.0	Less extent
Whatever investors tell us they require	1.80	36.0	Less extent
Whatever regulators decide	3.90	78.0	Large extent
Whatever CEO decides (arbitrarily)	2.90	58.0	Moderate extent
Whatever investment analysts recommend	2.10	42.0	Less extent

As shown in table 4.2, Kenyan public utilities prefer 'whatever regulators decide' to a large extent (rating of 3.90 on a scale of 1 to 5; 1 meaning 'Not used', 5 meaning 'Very great extent'). This is followed closely by 'whatever CEO decides' at 58%. The current

survey results differs from the findings of overseas practice (see table 4.3), in that CAPM is found to be moderately popular (at 53%). Truong et al (2008) found that the CAPM was the most popular method of estimating cost of equity among Australian Companies, with 72% of respondents mainly relying on CAPM. Previous surveys by Graham and Harvey (2001) and Mc Laney et al (2004) found 73% and 47% of respondents reporting that they used CAPM.

While the usage of other models is almost non-existent among Kenyan utilities, cost of debt plus equity premium is gaining some ground. Cost of debt plus equity premium was rated at 2.00 on a scale of 1 to 5 (40%).

Table 4.3 Cost of capital estimation practices of Kenyan utilities compared with practices overseas.

	Kenya	**Australia**	**US**	**UK**
Methods of estimating cost of capital	**This survey (2011)**	**Truong et al (2004)**	**Graham & Harvey (2001)**	**Mc Laney et al (2004)**
E/P ratio	15%	15%		27%
CAPM	53%	72%	73%	47%
APT Model	22%	1%		
Dividend Discount Model	31%			
Cost of debt plus premium	40%	47%		
Fama and French 3 factor	20%	0%		
By regulatory decisions	66%	4%	7%	
Details of survey				
Year surveyed	2011	2004	1990	1997
Survey sample size	14	356	4440	1292
Response rate	71%	24%	9%	15%

4.3.2.1 CAPM use by sector

Table 4.4 shows the frequency of use of CAPM across the three sectors; Energy, Telecommunications and Water. 66.7 % of respondents from telecommunication sector reported that they frequently used CAPM to estimate cost of capital. 33.3% of respondents from energy sector always use CAPM. However, majority of respondents from water sector do not use CAPM (66.7%).

Table 4.4 popularity of CAPM by sector

		Model used to arrive at cost of capital -- Capital Asset Pricing Model, beta approach					
		Not used at all	Rarely used	Moderately used	Frequently used	Always used	Total
Which sector does your organizaton fall	Energy	33.3%		33.3%		33.3%	100.0%
	Telecommunications			33.3%	66.7%		100.0%
	Water	66.7%	33.3%				100.0%
Total		33.3%	11.1%	22.2%	22.2%	11.1%	100.0%

4.3.2.2 Use of CAPM and organizational age

Results in table 4.5 reports the use of CAPM verses the number of years the respondent utility has been in existence. Mature utilities (with over 15 years of existence) frequently or always used CAPM in their estimation of cost of capital (a score of 50% and 25% respectively). The opposite is true for young utilities (with less than 5 years in existence), in that all of them do not use CAPM in their cost of capital decisions.

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		Not used at all	Rarely used	Moderately used	Frequently used	Always used	Total
Which sector does your organizaton fall	Energy	33.3%		33.3%		33.3%	100.0%
	Telecommunications			33.3%	66.7%		100.0%
	Water	66.7%	33.3%				100.0%
Total		33.3%	11.1%	22.2%	22.2%	11.1%	100.0%

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Table 4.5 use of CAPM across organizations' age

		Model used to arrive at cost of capital -- Capital Asset Pricing Model, beta approach					
		Not used at all	Rarely used	Moderately used	Frequently used	Always used	Total
How long has your organization been in existence	Less than 5 years	100.0%					100.0%
	6 - 10 years	66.7%	33.3%				100.0%
	11 - 15 years			100.0%			100.0%
	Over 15 years			25.0%	50.0%	25.0%	100.0%
Total		33.3%	11.1%	22.2%	22.2%	11.1%	100.0%

4.3.2.3 CAPM and respondent's revenue base

Table 4.6 shows the use of CAPM across annual revenues of respondent utilities. The results show that utilities with large revenue base were more likely to use CAPM than those with small revenue bases. 40% of respondents whose annual revenues exceed 500 million indicated they frequently used CAPM and another 20% always used CAPM. However, 50% of the respondents with less than 200 million in annual revenues reported they rarely used CAPM.

Table 4.6 use of CAPM across annual revenues

		Model used to arrive at cost of capital -- Capital Asset Pricing Model, beta approach					
		Not used at all	Rarely used	Moderately used	Frequently used	Always used	Total
Which of the following best describes annual revenue (in Kshs) your company reported in its last audited financial statements	11 - 200 million		50.0%	50.0%			100.0%
	301 - 400 million	100.0%					100.0%
	401 - 500 million	100.0%					100.0%
	Over 500 million	20.0%		20.0%	40.0%	20.0%	100.0%
Total		33.3%	11.1%	22.2%	22.2%	11.1%	100.0%

4.3.2.4 CAPM and managers' tenure

Table 4.7 compares the use of CAPM and managers' tenure in the respondent companies. The findings reveal a direct relationship between manager's tenure and the use of CAPM. This is because 100% of respondents who have served for over 15yrs in their organization reported they always used CAPM. 100% of respondents who have served between 11 to 15 years in their organization reported moderate use of CAPM, while another 100% of respondents who have served between 5 to 10 years indicated they rarely used CAPM. Finally, 60%those who have served for less than 5 years indicated they rarely used CAPM.

Table 4.7 Use of CAPM versus managers' tenure

		Model used to arrive at cost of capital -- Capital Asset Pricing Model, beta approach					
		Not used at all	Rarely used	Moderately used	Frequently used	Always used	Total
How many years have you served in your current organization	Less than 5 years	60.0%			40.0%		100.0%
	5 - 10 years		100.0%				100.0%
	11 - 15 years			100.0%			100.0%
	Over 15 years					100.0%	100.0%
Total		37.5%	12.5%	12.5%	25.0%	12.5%	100.0%

4.3.2.5 Whatever regulators decide by sector

Table 4.8 compares the use of 'whatever regulators tell us' vis-a-vis the three sectors covered in the survey. 67% of respondents from energy and telecommunications sectors use 'whatever regulators decide' to large and very great extent. However, only 50% of respondents from the water sector reported use of 'whatever regulators decide' to a large extent.

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		Model used to arrive at cost of capital -- Capital Asset Pricing Model, beta approach					
		Not used at all	Rarely used	Moderately used	Frequently used	Always used	Total
How many years have you served in your current organization	Less than 5 years	60.0%			40.0%		100.0%
	5 - 10 years		100.0%				100.0%
	11 - 15 years			100.0%			100.0%
	Over 15 years					100.0%	100.0%
Total		37.5%	12.5%	12.5%	25.0%	12.5%	100.0%

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Table 4.8 relationship between the sectors and the use of 'whatever regulators decide'

		Cost of capital -- Whatever regulators decide					
		Not at all	Less extent	Moderate extent	Large extent	Very great extent	Total
Which sector does your organization fall	Energy	33.3%			33.3%	33.3%	100.0%
	Telecommunications	33.3%			33.3%	33.3%	100.0%
	Water		25.0%	25.0%	50.0%		100.0%
Total		20.0%	10.0%	10.0%	40.0%	20.0%	100.0%

4.3.2.6 Whatever regulators decide and organizational age

Table 4.9 compares the use of 'whatever regulators decide and the number of years the respondent utility has been in existence. 50% of mature respondents (with over 15 years of existence) reported the use of 'whatever regulators decide' to very great extent. However, all the young utilities (with less than 5 years of existence) indicated that they used 'whatever regulators decide' to a large extent.

Table 4.9 relationship between 'whatever regulators decide' and respondents period of existence

		Cost of capital -- Whatever regulators decide					
		Not at all	Less extent	Moderate extent	Large extent	Very great extent	Total
How long has your organization been in existence	Less than 5 years				100.0%		100.0%
	6 - 10 years		25.0%	25.0%	50.0%		100.0%
	11 - 15 years				100.0%		100.0%
	Over 15 years	50.0%				50.0%	100.0%
Total		20.0%	10.0%	10.0%	40.0%	20.0%	100.0%

4.3.2.7 Whatever regulators decide and respondents' annual revenues

Table 4.10 compares the annual revenues of respondent utilities and the use of 'whatever regulators decide. The results indicate indirect relationship between revenues and use of the method. 100% of respondents having annual revenue size of less than 200 million indicated they used the method to a large extent. This is followed by those having revenues of between 301 to 400 million (100% of respondents reported the use to a large extent). Only 33.3% of respondents with over 500 million in revenues reported the use of the method to a very great extent.

Table 4.10 relationship between the use of 'whatever regulators decide' method and respondents revenues

		Cost of capital -- Whatever regulators decide					
		Not at all	Less extent	Moderate extent	Large extent	Very great extent	Total
Which of the following best describes annual revenue (in Kshs) your company reported in its last audited financial statements	11 - 200 million				100.0%		100.0%
	301 - 400 million				100.0%		100.0%
	401 - 500 million			100.0%			100.0%
	Over 500 million	33.3%	16.7%		16.7%	33.3%	100.0%
Total		20.0%	10.0%	10.0%	40.0%	20.0%	100.0%

4.3.2.8 Whatever regulator decides and respondent managers' tenure

Table 4.11 compares 'what regulators decide' method and the number of years the respondent managers responding to survey questions have served their organizations. 100% of respondents who have served over 15 years reported they used 'whatever regulators decide' method. With regard to respondents who have served between 11 to 15 years, 100% indicated they did not use the method

Table 4.11 relationship between the use of 'what regulators decide' method and respondent tenure

% within How many years have you served in your current organization

		Cost of capital -- Whatever regulators decide					
		Not at all	Less extent	Moderate extent	Large extent	Very great extent	Total
How many years have you served in your current organization	Less than 5 years	16.7%	16.7%	16.7%	33.3%	16.7%	100.0%
	5 - 10 years				100.0%		100.0%
	11 - 15 years	100.0%					100.0%
	Over 15 years					100.0%	100.0%
Total		22.2%	11.1%	11.1%	33.3%	22.2%	100.0%

4.3.3 Approaches to estimation of cost of capital

The two approaches to estimation of cost of capital namely; cost of capital approach and cost of equity approach were assessed. The table 4.4 shows the preference of the approaches by the respondents

Figure 4.9 Approaches to cost of capital estimation

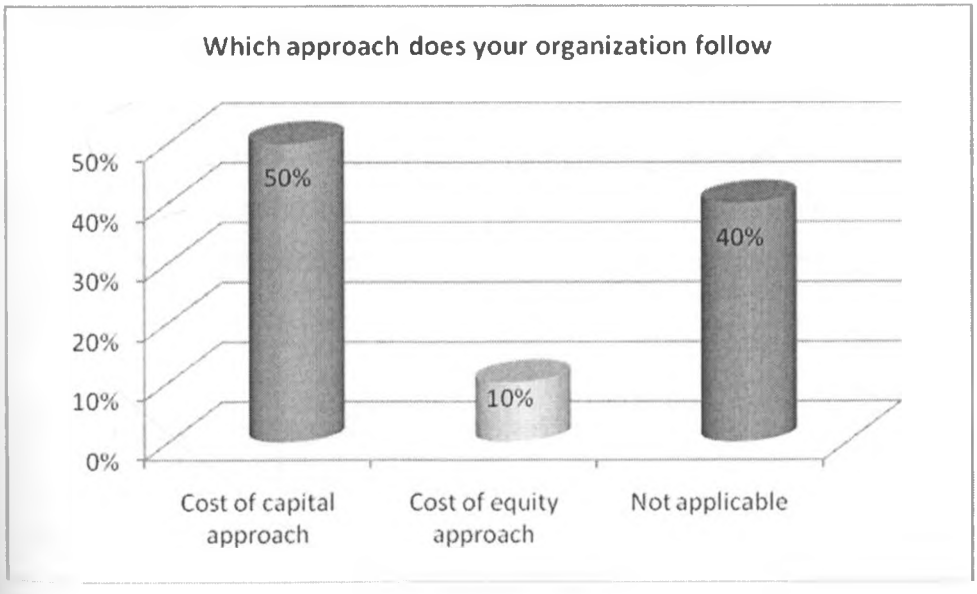
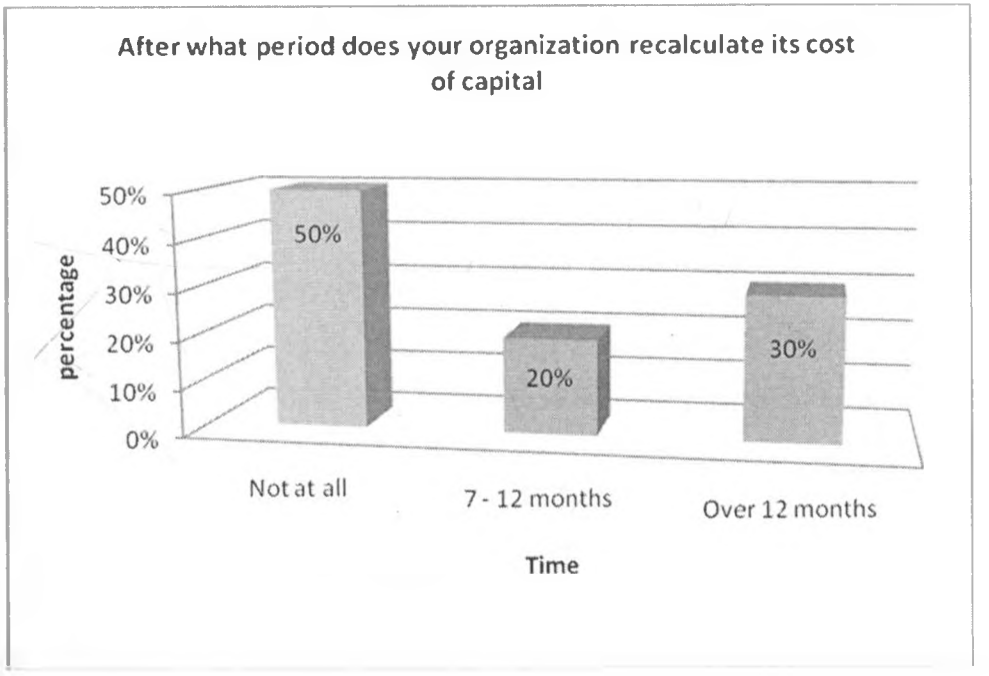


Table 4.4 indicates that majority of respondents backed the cost of capital approach. Only 10% showed support for cost of equity approach.

4.3.3.1Review of cost of capital estimates

Respondents were asked whether public utilities review their cost of capital estimates after an interval of less than six months, between six months and one year or over a year. The results are indicated in figure 4.10

Figure 4.10 Duration it takes to review cost of capital estimate.

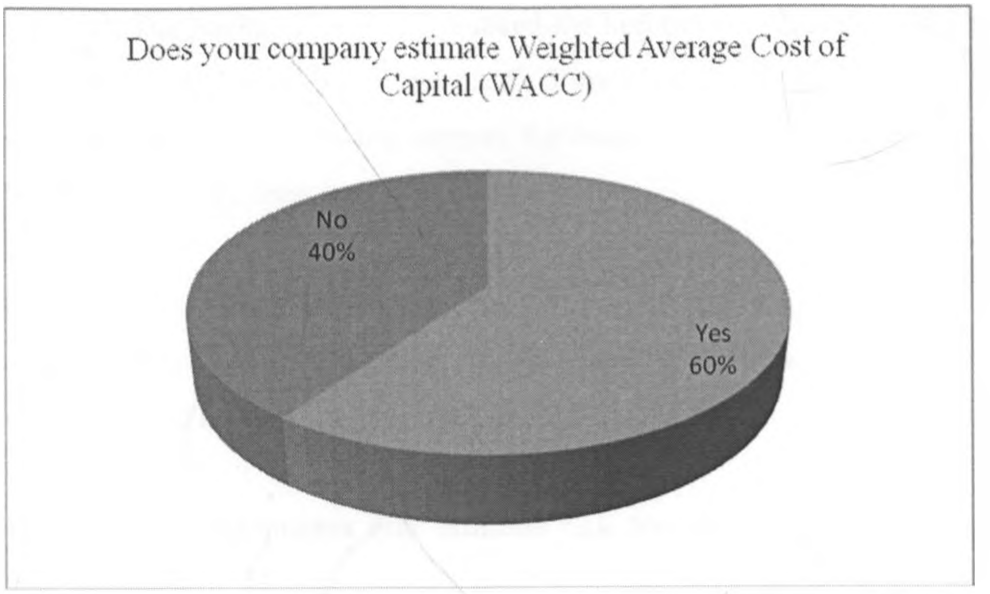


As shown in figure 4.10, 50% of the respondents reported that they do not review their cost of capital estimates. However, only a few respondents indicated that their organizations recalculate cost of capital estimate in an interval period of six months to one year.

4.3.4 Weighted Average Cost of Capital

Respondents were asked whether their organizations calculated weighted average cost of capital. The results are given in figure 4.11

Figure 4.11 Respondents that estimate Weighted Average Cost of Capital

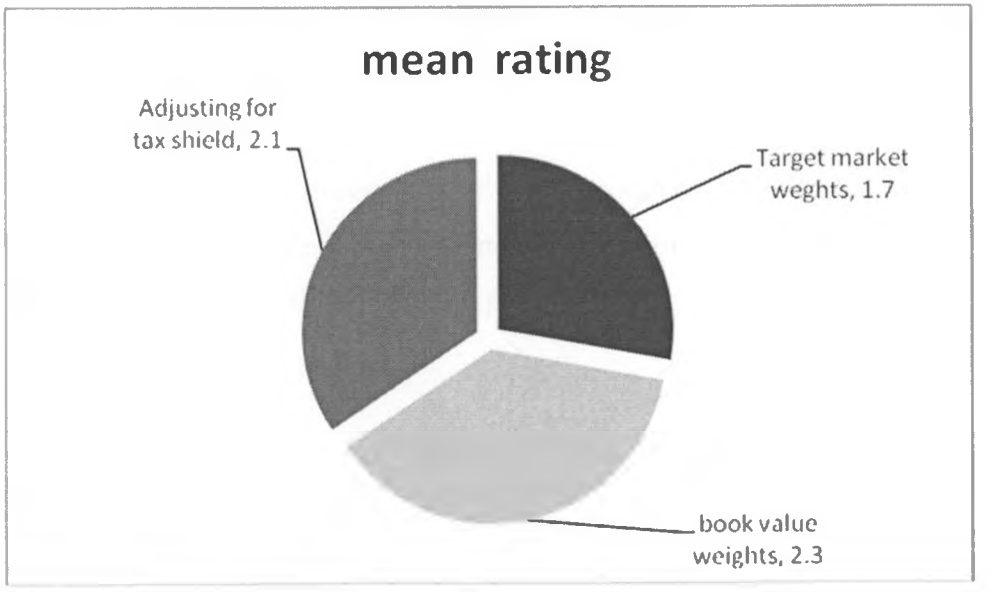


The results in figure 4.11 shows that majority of the respondent companies estimate their WACC (60/% of respondents reported that they estimate WACC).

4.3.4.1 Weights employed in estimating WACC

The respondents were also asked whether they used target weights, book value weights and or adjust cost of debt for interest tax shield when calculating WACC. The results are presented in table 4.6

Figure 4.12 Respondents use of target weight, book weights and adjusting for tax effect.

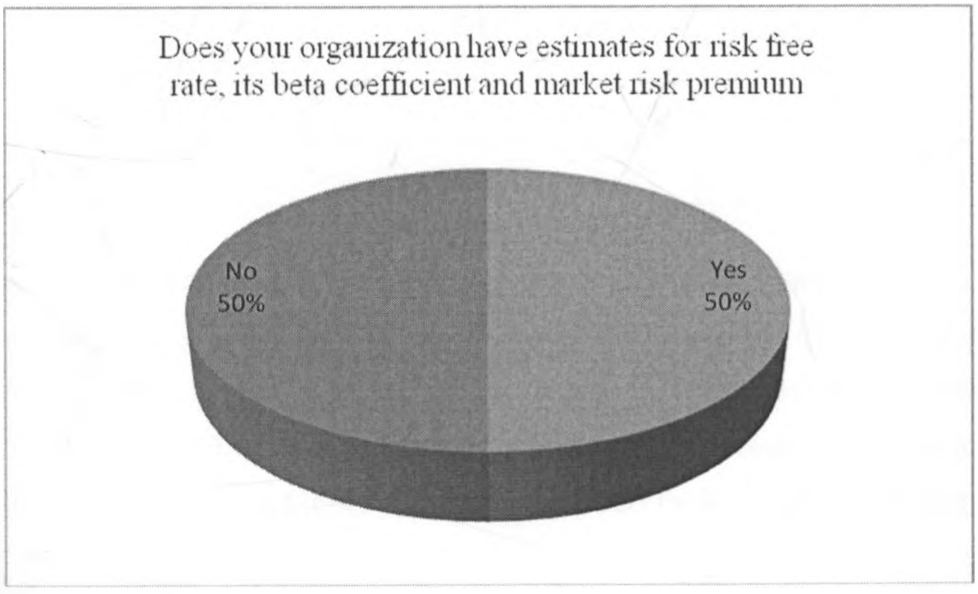


As shown in figure 4.12 the use of the weights and / or adjusting for tax effects is minimal. The books value weight ranked the highest with the mean of 2.3 (on the likert scale of 1 to 5: 1 meaning 'never used', 5 meaning 'very great extent'). This represents 46% of respondents showing support for books value weights. However target value weights scored the least (rating of 1.7).

4.3.5 Issues in CAPM estimation

The elements of CAPM includes risk free rate, beta estimate and risk premium. These elements were assessed in the survey and the results are summarised in figure 4.13

Figure 4.13 Respondents that estimate risk free rate, beta co-efficient and market risk premium



Results in figure 4.13 shows that 50% of respondents companies have estimates for risk free rate, beta co-efficient and market risk premium. The respondents who not have these estimates constituted 50% of the sample.

4.3.5.1 Government Security as a proxy for risk free asset

Treasury security is generally accepted as a proxy for risk free asset. However, the dilemma among practitioners is whether to use short-term bills, intermediate term rate bonds or long term bonds. The survey assessed the practice among respondent companies and results are summarised in table 4.12 below.

Table 4.12 Maturity of Government security used as proxy for risk free rate

	Frequency	Percent
90 day treasury bills	4	40.0
6 - 10 year treasury bonds	1	10.0
11 - 15 year treasury bonds	0	0.0
Other	0	0.0
Not Applicable	5	50.0
Total	**10**	**100.0**

As shown in table 4.12, 50% of respondents do not know the maturity of Government security to use as a proxy for risk free rate (50% reported not applicable). The survey found only a modest evidence that managers used the prevailing interest rates on the treasury bills (40% of respondents reported they used treasury bills). The long term bonds are, however, not used (only 10% showed support for long term bond rates).

4.3.5.2 The Beta co-efficient

The respondents were asked to describe the estimate of beta coefficient for their organizations. The results are given in figure 4.14. Again, 50% of respondents did not know their beta estimate. However, 40% reported a beta estimate of less than 1.

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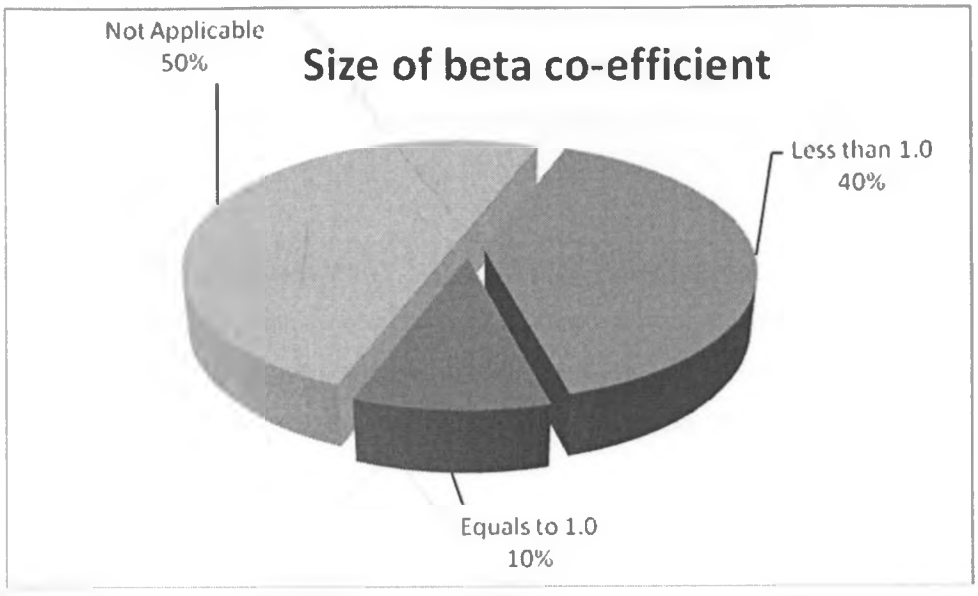
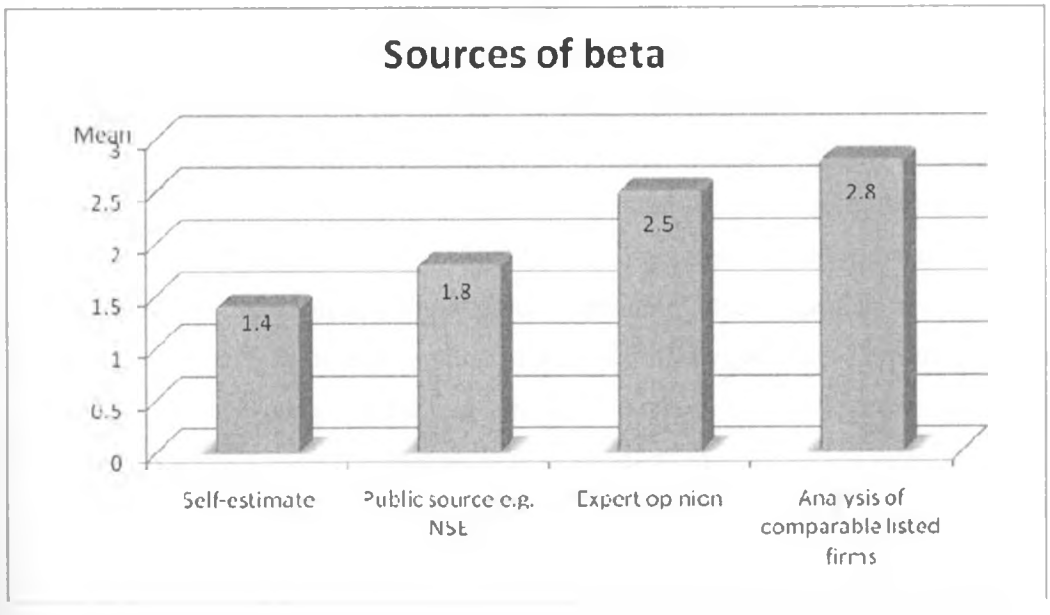
Figure 4.14 Size of Beta co-efficient



4.3.5.3 Sources of beta

The source of beta for the respondents was also assessed. Respondents were asked to rate self estimate, public source, expert opinion and analysis of comparable listed firms as possible sources of their beta. The results are summarized in table 4.15

Figure 4.15 Sources of beta for the respondents



As shown in table 4.15 the survey found a moderate evidence that utilities get their beta co-efficient from analysis of comparable listed firms (rating of 2.8 on a scale of 1 to 5: 1 meaning not important, 5 very important). Expert opinion was the second popular source of beta estimate (a rating of 2.5) after analysis comparable listed firms. The survey found even less evidence that utilities used self estimate or estimates from public sources as their beta (ranking of 1.8 and 1.4 respectively).

4.3.5.4 Market risk premium

The survey asked how utilities arrive at their market risk premium. The respondents were required to rate the extent they used arithmetic mean, geometric mean, analysts' projections, past realized returns and domestic or global market portfolio. The results are presented in table 4.9 below.

Table 4.13 Methods used to determine market risk premium

	Determination of market risk premium (%)	Mean	Percent	Score
i	use of arithmetic mean to calculate average returns	1.0	24.0	Not used
ii	use of geometric mean to calculate average returns	2.8	56.0	Moderaletly used
iii	use of past realized returns as proxy for future returns	1.9	38.0	Rarely used
iv	use of projections by investment analysts as proxy for future returns	1.5	30.0	Rarely used
v	MRP based on domestic market portfolio return	1.8	36.0	Rarely used
vi	MRP based on global market portfolio return	1.2	10.0	Rarely used

In table 4.13, respondents show that methods used to arrive at market risk premium are moderately important in their cost of capital decisions. Row ii of table 4.13 shows that respondents scored a mean response of 2.8 for use of geometric mean to calculate average returns on a scale from 1 to 5 (1 meaning 'not used', 5 meaning 'always used'). In contrast to moderate preference of expert opinion as source of beta, utilities rarely use projections by investment analysts when calculating market risk premium (rating of 1.5). The survey found the least evidence that utilities use arithmetic mean to calculate average returns (a rating of just 1).

4..4 Cost of Debt

The survey had separate questions about debt ratio, sources of debt and actual verses benchmark cost of debt. This section distils findings from the cost of debt questions and presents the results grouped by concept.

4..4.1 Sources of debt.

Access to debt capital by public utilities was assessed. The sources of debt covered included Government, Multilateral/ bilateral lending Agencies and financial institutions. The results are presented in table 4.14.

Table 4.14 Sources of debt for utility companies

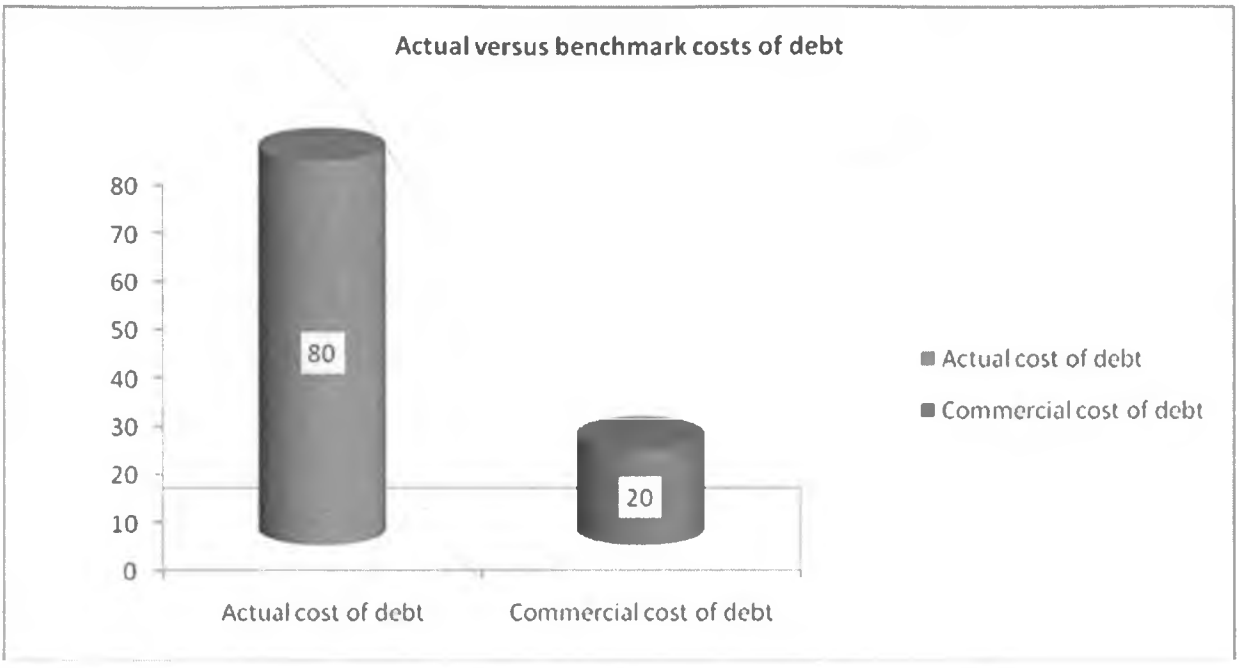
Source	Responses		Percent of Cases
	N	*Percent*	
The government	3	21.4%	30.0%
Bilateral / multilateral lending agencies	4	28.6%	40.0%
Financial institutions	7	50%	70.0%
Total	**14**	**100.0%**	**140.0%**

The results from table 4.14 indicates that majority of respondents secure their debt capital from financial institutions: 70% of respondents source their debt capital from financial institutions. However, a small percentage of respondents have debt from the Government.

4.4.2Benchmark verses Actual cost

The survey assessed whether benchmark or actual cost of debt are adopted by utilities. This is because Public Utilities have access to relatively cheaper debt from the Government and / or multi-lateral / bilateral lending Agencies. The results are shown in figure 4.16

Table 4.16 Benchmark verses Actual costs of debt



The results in figure 4.16 report that respondents mainly preferred actual over benchmark costs when arriving at cost debt. 80% of respondents indicated that they adopt actual cost of debt.

4.5 Sources of risk

The survey investigated sources of risk other than market risk. The results are summarised in table 4.15 below.

Table 4.15 Risk factors considered by important by respondents

	Risk Factors (%)	mean	percent	Score
i	Changes in general interest rates	2.7	54.0	Moderately used
ii	Fluctuations in foreign exchange rates	2.1	42.0	Rarely used
iii	Changes in GDP (business cycles)	1.9	38.0	Rarely used
iv	Unanticipated inflation risk	3.6	72.0	Almost always used
v	Commodity price fluctuations	3.8	76.0	Almost always used
vi	Term structure risk	1.7	34.0	Rarely used
vii	Distress risk (probability of bankruptcy)	1.2	24.0	Never used
viii	Ratio of market value of firm to book value of assets	1.3	26.0	Never used
ix	Recent stock price performance	1.4	28.0	Never used
x	Size (small firms are perceived to be riskier)	1.4	28.0	Never used

Overall, the most important additional risk factors for utilities are: interest rate risk, commodity price fluctuations and inflation risk. Commodity price fluctuations is the most important risk factor (a ranking of 3.8 on a scale of 1 to 5; 1 meaning 'never used', 5 meaning 'always used'). This is then followed by unanticipated inflation and changes in general interest rates (rating of 3.6 and 2.7 respectively). Interestingly, only few utilities consider distress risk, market to book value of assets, size and recent stock performance when adjusting hurdle rate. The least number of respondents considered distress risk (rating of 1.2 on a scale of 1 to 5: 1 meaning 'never used', 5 meaning 'always used').

4.5.1 Risk factors by sectors

Table 4.16 reports the ratings of risk factors considered by respondent utilities when adjusting hurdle rate by the 3 sectors. The rating is on a scale of 1 to 5: 1 meaning 'never used' and 5 meaning 'always used'.

Table 4.16 analysis of factors by sector

Risk factors	Sector mean			
	Energy	Communication	Water	**Total mean**
Changes in general interest rates	3.3	2.0	2.8	**2.7**
Fluctuations in foreign exchange rates	4.0	1.0	1.5	**2.1**
Changes in GDP (business cycles)	3.3	1.7	1.0	**1.9**
Unanticipated inflation risk	4.3	3.7	3.0	**3.6**
Commodity price fluctuations	4.5	3.3	3.6	**3.8**
Term structure risk	1.5	2.0	1.5	**1.7**
Distress risk (probability of bankruptcy)	1.5	1.0	1.3	**1.2**
Ratio of market value of firm to book value of assets	2.0	1.0	1.3	**1.3**
Recent stock price performance	2.0	1.0	1.5	**1.4**
Size (small firms are perceived to be riskier)	1.5	1.0	1.8	**1.4**

As shown in table 4.16, utilities in energy sector value most commodity price fluctuations (rating of 4.5). This is followed closely by unanticipated inflation risk and fluctuations in foreign exchange rates (rating of 4.3 and 4.0 respectively). Change in general interest

rates was only rated at 3.3. (However, distress risk, term structure risk and size are the least risk factors considered in energy sector (rating of 1.5 respectively). With regard to telecommunications sector, unanticipated inflation and commodity price fluctuations were the significant risk factor (rating of 3.7 and 3.3 respectively). Water sector placed prominence on commodity price fluctuations (rating of3.6), unanticipated inflation risk (rating of 3.0) and changes in general interest rates (rating of 2.8). Overall, Energy sector was more conscious of its risk factors than the other two sectors.

4.5.1.1 Respondents by sector on commodity price fluctuations

Table 4.17 below details the proportion of respondents categorised by sector who considered commodity price fluctuations as a significant risk factor. 66.7% of respondents from energy sector considered commodity price fluctuations risk almost always important. However 50% of respondents from water sector considered the risk factor moderately important.

Table 4.17 proportions of respondents by sector who favoured commodity price fluctuations risk

		Risk factors – Commodity price fluctuations				
		Rarely important	Moderately important	Almost always important	Always important	Total
Which sector does your organization fall	Energy			66.7%	33.3%	100.0%
	Telecommunications		66.7%	33.3%		100.0%
	Water	25.0%	50.0%	25.0%		100.0%
Total		10.0%	30.0%	50.0%	10.0%	100.0%

4.5.1.2 Respondents by sector on unanticipated inflation risk

Table 4.18 reports the proportion of respondents categorised per sector who considered unanticipated inflation risk as a significant risk factor. 33.3% of respondents from energy sector always perceived unanticipated inflation risk important. Another 33.3% from the

sector also almost always perceived unanticipated inflation risk important. With regard to Telecommunications, 100% of respondents perceived the risk factor moderately important. 50% of respondents from water sector however, do not consider unanticipated inflation a risk factor.

Table 4.18 Respondents per sector that favoured unanticipated inflation as a risk factor.

		Risk factors – unanticipated inflation risk				
		Not mportant	Moderately important	Almost always important	Always important	Total
Which sector does your organization fall	Energy	33.3%		33.3%	33.3%	100.0%
	Telecommunications		100%			100.0%
	Water	50.0%	25.0%	25.0%		100.0%
Total		30.0%	40.0%	20.0%	10.0%	100.0%

4.5.1.4 Respondents by sector on Changes in general interest rates risk

Results in table 4.19 reports respondents' perceptions on changes in general interest rates risk categorised by sector. 66.7% of the respondents in energy sector perceived changes in general interest rates to be almost always important. Similar percentage of respondents in the Telecommunications sector also considers changes in general interest rates risk as moderately important. With respect to water sector, 25% regard changes in general interest rates to always important. However, a similar number of the respondents from the sector did not perceive the risk factor important.

Table 4.19 Respondents perceptions on changes in general interest rates as a risk factor risk per sector

		Risk factors -- Changes in general interest rates				
		Not important	Moderately important	Almost always important	Always important	Total
Which sector does your organization fall	Energy	33.3%		66.7%		100.0%
	Telecommunications	33.3%	66.7%			100.0%
	Water	25.0%	25.0%	25.0%	25.0%	100.0%
Total		30.0%	20.0%	40.0%	10.0%	100.0%

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.

5.1 Introduction

This chapter presents summary of the findings of the study, conclusions and suggest some recommendations. At the end of the chapter, areas for further research are provided.

5.2 Summary of findings

This study had the broad objective to establish the methods used by utility parastatals baed in Nairobi to estimate cost of capital. A census survey of 14 parastastals was conducted and the targeted respondents were finance managers. The response rate was 71%. From the study the researcher found that 60% of all the respondents estimate cost of capital. The questionnaire responses suggested the following for respondent companies.

Cost of capital would usually be estimated using whatever regulators and chief executives decide, while CAPM would have significant use. Utilities in energy and Telecommunications sector were more likely to use CAPM than those in the water sector. Cost of debt plus equity premium has also attracted significant application. Other asset pricing models were not used in estimating cost of capital. This could perhaps be attributed to the fact that most of utility companies in Kenya are not listed. The use of elaborate models prescribed by corporate finance texts could only be possible via analysis of comparable publicly traded firms. However, such comparable firms are hard to come by in Kenyan utility market set up.

With regard to computation of WACC, majority of utilities computed weighted average cost of capital (WACC) and was most likely to be based on book value weights. Actual cost of debt was being used but not adjusted to allow for the effect of tax shields, except by a minority of companies. The discount rate is not reviewed regularly.

Further, a significant percentage of respondents determined market risk premium by use of geometric mean to compute average market returns. Beta was obtained from analysis

of comparable listed firms and 90 day treasury bills used as proxy for risk free asset by significant minority.

Sources of risk other than market risk was also investigated. Commodity price fluctuations, unanticipated inflation, changes in general interest rates were the most significant sources of risk for utilities. Fluctuations in foreign exchange rates were only significant to Energy sector. Distress risk was the least important.

5.3 Conclusions

The current practice of Kenyan utilities surveyed represents a significant departure from the prescriptions of corporate finance texts in many aspects. For example, the dominant use of non-elaborate methods in estimation of cost of capital. There is also the use of book values in computing the weights instead of target weights. Another issue is the use of short-term treasury security as proxy for risk free asset as opposed to intermediate term security.

Similar differences were also noted when the current findings were compared to overseas practice. More recent studies overseas suggested that CAPM has gained widespread acceptability and weighted average cost of capital was being based on target weights for debt and equity

No reasons for this were obtained, but possibly it is considered too difficult to identify a comparable firm in the sectors dominated by parastatals that are not publicly traded. To a greater extent, it could also be attributed to underdeveloped market in Kenya characterized by absence of perfect market portfolio and instability of beta.

However, managers have knowledge of elaborate models. This is evidenced by half the respondents possessing estimates of risk free rate, beta co-efficient and market risk premium. Majority of the respondents also use geometric mean to calculate market average returns.

5.4 Recommendations and policy implications

From the results of the study, the researcher recommends that the Government should continue to encourage competition in the utility sector to encourage corporate best practices. This is because competitive firms tend to be more conscious to stakeholders expectations.

The academics should also carry out research on gaps between practice and academic prescriptions and give recommendations on how to close the gaps. This perhaps could result in reviews of existing finance literature to reflect the practice. Investors could also insist on earning a return commensurate to the risk profile of the investment to encourage best practice. Specifically, greater attention can be directed to the water sector where the principal of cost recovery has not been applied.

Regulating authorities also need to support the tariff guidelines they issue from time to time by best practices in the utility sector. This would increase acceptability and compliance by individual utility companies. It could also erase or confirm the long held notion that public utilities earn abnormal profits and that regulators intervene to protect the rate payers.

5.5 Suggestions for further research

This study was done in the public utility sector Therefore similar studies can be conducted on methods used to estimate cost of capital by companies listed at Nairobi Stock exchange. This will help in gauging the practice across all the sectors in Kenya.

The study can also be extended to a comparative study across the African region to establish how firms in Africa estimate there cost of capital. This will enable practitioners to compare themselves with others and possibly learn from best practices within the continent.

A correlational study between non-elaborate models and utility market returns can also be conducted to test their predictive ability. This could perhaps bridge the gap in finance literature by giving new insights of suitability of non elaborate models

5.6 Limitation of the study

The researcher was a part time student who needed to balance studies with full time employment. As a result, the researcher was unable to undertake an extensive and exhaustive research thus opting for a small target population whose study could be accomplished with less research time.

Financial constraints also contributed to limit the study. The researcher was a self sponsored student relying on savings to progress his studies. Consequently, the researcher concentrated on public utilities whose headquarters were based in Nairobi.

There were challenges also during data collection whereby some target respondents were inaccessible and the researcher had to make many trips on appointments that were not honoured. The researcher however, worked at winning the confidence of those involved in this research by giving them the reasons for the research and assuring them of confidentiality.

Finally, the design for this research was survey. Surveys collect respondents' views or perceptions. As such, the researcher has no way of determining that the findings reflect the actual practice.

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APPENDIX 1

RESEARCH QUESTIONNAIRE

The information provided here is for academic research purposes and will be treated with maximum confidentiality.

PART I: GENERAL INFORMATION

Name (Optional) use surname & initials _____

Name of the Company / Board _____

1. Which sector does your organization fall?

   (i) Electricity sector ☐

   (ii) Telecommunication sector ☐

   (iii) Water Sector ☐

2. How long has your organization been in existence?

   i. Less than 5 Years ☐ iii. 11 – 15 Years ☐

   ii. 6 – 10 Years ☐ iv. Over 15 Years ☐

3 What is your cumulative period of service in your current job position

   (i) less than 1 Year ☐

   (ii) 1 – 5 Years ☐

   (iii) 5 – 10 Years ☐

   (iv) Over 10 Years ☐

4. Which of the following best describes annual revenue (in Kshs) your company reported in its last audited financial statements?

   i. Less than 10 million ☐ iv. 301 – 400 million ☐

   ii. 11- 200 million ☐ v. 401 -500 million ☐

   iii. 201 -300 million ☐ vi. Over 500 million ☐

5. How many years have you served in your current organization?

i. Less than 5 Years ☐ iii. 11 – 15 Years ☐

ii. 5 – 10 Years ☐ iv. Over 15 Years ☐

PART II: ESTIMATION OF COST OF CAPITAL

SECTION A

6. Does your organization estimate cost of capital? (tick where applicable)

Yes ☐ No ☐

7. If yes, which approach does your organization follow? (tick where applicable)

i. Cost of capital approach ☐

ii. Cost of equity approach ☐

8. After what period does your organization recalculate its cost of capital?

iii. Not at all ☐

iv. 6 months and below ☐

v. 7 – 12 months ☐

vi. Over 12 months ☐

9. The following may have be some of the models your organization used to arrive at its cost of capital. In a scale of 1 – 5, rate by ticking against each of the model, extent to which you consider them relevant in arriving at your organizations cost of capital.

Use the scale as follows:

1-Not used at all, **2**-Rarely used, **3**-Moderately used **4**-Frequently used, **5**-Always used

	1	**2**	**3**	**4**	**5**
i. E/P Ratio	[ ]	[ ]	[ ]	[ ]	[ ]
ii. Capital Asset Pricing Model (CAPM, beta approach)	[ ]	[ ]	[ ]	[ ]	[ ]
iii. Arbitrage Pricing Theory (APT) Model	[ ]	[ ]	[ ]	[ ]	[ ]

iv. Dividend discount model [ ] [ ] [ ] [ ] [ ]

v. Risk premium approach [ ] [ ] [ ] [ ] [ ]

vi. Cost of debt plus equity premium [ ] [ ] [ ] [ ] [ ]

vii. Fama and French Three Factor Model [ ] [ ] [ ] [ ] [ ]

Others (list and rate)

i._____

ii._____

10. In a scale of 1 – 5, rate the extent to which the following has been used in your organization as cost of capital in the last 24 months. Use the key as follows:

1- not at all, **2**-Less extent, **3**-Moderate extent, **4**-Large extent, **5**-Very great extent

	1	**2**	**3**	**4**	**5**
i. Self estimate (based on a model)	[ ]	[ ]	[ ]	[ ]	[ ]
ii. Whatever investors tell us they require	[ ]	[ ]	[ ]	[ ]	[ ]
iii. Whatever regulators decide	[ ]	[ ]	[ ]	[ ]	[ ]
iv. Whatever CEO decides (arbitrarily)	[ ]	[ ]	[ ]	[ ]	[ ]
v. Whatever investment analysts recommend	[ ]	[ ]	[ ]	[ ]	[ ]

11. When determining the cost of debt for your organization, which of the following you are likely to adopt? (tick where applicable)

i. Actual cost of debt ☐

ii. Benchmark cost of debt ☐

iii. Commercial cost of debt ☐

12. Has your organization secured a debt from any of the following sources in the last 5 years? (tick where applicable)

i. The Government ☐

ii. Bilateral / multi-lateral lending agencies ☐

iii. Financial institutions ☐

13. Which of the following best describes the percentage of debt to total capital of your organization? (tick where applicable)

i. Low ☐

ii. Moderate ☐

iii. High ☐

14. a) Do your company estimate Weighted Average Cost of Capital (WACC)

Yes ☐ No ☐

b) If yes, the following are employed when weighting costs of individual components of financing. Please rate by ticking each according to extent they are applied in your organization. Use the scale as follows:

1-Not at all, **2**-Less extent, **3**-Moderate extent, **4**-Large extent, **5**-Very great extent

	1	**2**	**3**	**4**	**5**
i. target market value weights	[ ]	[ ]	[ ]	[ ]	[ ]
ii. use of book value weights	[ ]	[ ]	[ ]	[ ]	[ ]
iii. adjusting cost of debt for interest tax shield	[ ]	[ ]	[ ]	[ ]	[ ]

SECTION B

15. Does your organization have estimates for risk free rate, its beta coefficient and market risk premium?

Yes ☐ No ☐

16. If the answer is yes:

a) what maturity of the treasury security has been adopted as a proxy for risk free asset by your organization? (tick where it applies)

i. 90 day Treasury bills ☐

ii. 2 – 5 Year Treasury bonds ☐

iii. 6 – 10 Year Treasury bonds ☐

iv. 11 – 15 Year Treasury bonds ☐

v. Other (Please specify) _____

17. How would you describe the beta coefficient used by your organization?

i. Less than 1.0 ☐

ii. Equals to 1.0 ☐

iii. Higher than 1.0 ☐

18. In your view, how would you rate the following sources of beta for an organization? Use the scale as follows: **1**-Not important at all, **2**-Less important, **3**- Moderately important, **4**-Important, **5**-Very important

	1	**2**	**3**	**4**	**5**
i. Self estimate	[ ]	[ ]	[ ]	[ ]	[ ]
ii. Public source (e.g NSE)	[ ]	[ ]	[ ]	[ ]	[ ]
iii. Expert opinion	[ ]	[ ]	[ ]	[ ]	[ ]
iv. Analysis of comparable listed firms	[ ]	[ ]	[ ]	[ ]	[ ]

Others (Please list and rate)

i._____

ii._____

16. If the answer is yes:

a) what maturity of the treasury security has been adopted as a proxy for risk free asset by your organization? (tick where it applies)

i. 90 day Treasury bills ☐

ii. 2 – 5 Year Treasury bonds ☐

iii. 6 – 10 Year Treasury bonds ☐

iv. 11 – 15 Year Treasury bonds ☐

v. Other (Please specify) _____

17. How would you describe the beta coefficient used by your organization?

i. Less than 1.0 ☐

ii. Equals to 1.0 ☐

iii. Higher than 1.0 ☐

18. In your view, how would you rate the following sources of beta for an organization? Use the scale as follows: **1**-Not important at all, **2**-Less important, **3**- Moderately important, **4**-Important, **5**-Very important

	1	**2**	**3**	**4**	**5**
i. Self estimate	[ ]	[ ]	[ ]	[ ]	[ ]
ii. Public source (e.g NSE)	[ ]	[ ]	[ ]	[ ]	[ ]
iii. Expert opinion	[ ]	[ ]	[ ]	[ ]	[ ]
iv. Analysis of comparable listed firms	[ ]	[ ]	[ ]	[ ]	[ ]

Others (Please list and rate)

i._____

ii._____

19. The following may have been adopted by your organization to determine market risk premium. Please rank each according to the extent it applies in your organization. Use the scale as follows:

1-Not used at all, **2**-Rarely used, **3**- Moderately used, **4**-Frequently used, **5**-Always used

	1	**2**	**3**	**4**	**5**
i. use of arithmetic mean to calculate average returns	[ ]	[ ]	[ ]	[ ]	[ ]
ii. use of geometric mean to calculate average returns	[ ]	[ ]	[ ]	[ ]	[ ]
iii. use of past realized returns as proxy for future returns	[ ]	[ ]	[ ]	[ ]	[ ]
iv. use of projections by investment analysts as proxy for future returns	[ ]	[ ]	[ ]	[ ]	[ ]
v. MRP based on domestic market portfolio return	[ ]	[ ]	[ ]	[ ]	[ ]
vi. MRP based on global market portfolio return	[ ]	[ ]	[ ]	[ ]	[ ]

Others (please list and rate)

i._____

ii._____

SECTION C: ADJUSTING FOR RISK

20. Please rate the extent to which the following risk factors have been used to adjust hurdle rate in your organization. Use the scale as follows:

1-Never used, **2**-Rarely used, **3**-Moderately used, **4**-Almost always used, **5**-Always used

		1	**2**	**3**	**4**	**5**
i.	Changes in general interest rates	[ ]	[ ]	[ ]	[ ]	[ ]
ii.	Fluctuations in foreign exchange rates	[ ]	[ ]	[ ]	[ ]	[ ]
iii.	Changes in GDP (business cycles)	[ ]	[ ]	[ ]	[ ]	[ ]
iv.	Unanticipated inflation risk	[ ]	[ ]	[ ]	[ ]	[ ]
v.	Commodity price fluctuations	[ ]	[ ]	[ ]	[ ]	[ ]
vi.	Term structure risk	[ ]	[ ]	[ ]	[ ]	[ ]
vii.	distress risk (probability of bankruptcy)	[ ]	[ ]	[ ]	[ ]	[ ]
viii.	Ratio of market value of firm to book value of assets	[ ]	[ ]	[ ]	[ ]	[ ]
ix.	Recent stock price performance	[ ]	[ ]	[ ]	[ ]	[ ]
x.	Size (small firms are perceived to be riskier)	[ ]	[ ]	[ ]	[ ]	[ ]

Others (list and rate)

i.

ii.

SECTION C: ADJUSTING FOR RISK

20. Please rate the extent to which the following risk factors have been used to adjust hurdle rate in your organization. Use the scale as follows:

1-Never used, **2**-Rarely used, **3**-Moderately used, **4**-Almost always used, **5**-Always used

		1	**2**	**3**	**4**	**5**
i.	Changes in general interest rates	[ ]	[ ]	[ ]	[ ]	[ ]
ii.	Fluctuations in foreign exchange rates	[ ]	[ ]	[ ]	[ ]	[ ]
iii.	Changes in GDP (business cycles)	[ ]	[ ]	[ ]	[ ]	[ ]
iv.	Unanticipated inflation risk	[ ]	[ ]	[ ]	[ ]	[ ]
v.	Commodity price fluctuations	[ ]	[ ]	[ ]	[ ]	[ ]
vi.	Term structure risk	[ ]	[ ]	[ ]	[ ]	[ ]
vii.	distress risk (probability of bankruptcy)	[ ]	[ ]	[ ]	[ ]	[ ]
viii.	Ratio of market value of firm to book value of assets	[ ]	[ ]	[ ]	[ ]	[ ]
ix.	Recent stock price performance	[ ]	[ ]	[ ]	[ ]	[ ]
x.	Size (small firms are perceived to be riskier)	[ ]	[ ]	[ ]	[ ]	[ ]

Others (list and rate)

i.

ii.

APPENDIX 2

POPULATION OF STUDY

The Kenya Electricity Generating Company Ltd (KenGen)

Kenya Power and Lighting Company Ltd

Kenya Electricity Transmission Company

Telkom Kenya Ltd

Energy Regulatory Commission

Communication Commission of Kenya

The Postal Corporation of Kenya

Kenya Broadcasting Corporation

Water Services Regulatory Board

Athi Water Services Board

Water Resources Management Authority

National Water Conservation and Pipeline Corporation

Nairobi Water and Sewerage Company

Kenya Pipeline Corporation

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Water Resources Management Authority

National Water Conservation and Pipeline Corporation

Nairobi Water and Sewerage Company

Kenya Pipeline Corporation