

**A SURVEY OF CAPITAL BUDGETING TECHNIQUES USED BY
COMPANIES LISTED AT THE NAIROBI STOCK EXCHANGE.**

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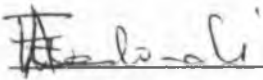
BY
KADONDI, ESTHER AKINYI

**A MANAGEMENT RESEARCH PROJECT SUBMITTED IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
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DECLARATION

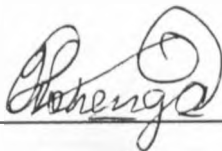
This Management Research Project is my original work and has not been presented for a degree in any other University.

Signed: 

Date: 3/10/02

Esther Akinyi Kadondi

This Management Research Project has been submitted for examination with my approval as University Supervisor.

Signed: 

Date: 4-10-02

Mr. J. Lishenga

DEDICATED TO MY DEAR HUSBAND, OJE.

***YOUR LOVE AND PATIENCE HAVE BEEN THE SOURCE OF MY
INSPIRATION.***

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ABBREVIATIONS

ARR	Accounting Rate of Return
CAPM	Capital Assets Pricing Model
CEO	Chief Executive Officer
CF	Cash Flow
CFO	Chief Financial Officer
DCF	Discounted Cash Flow
IRR	Internal Rate of Return
MBA	Master of Business and Administration
MV	Market Value
NPV	Net Present Value
SPSS	Statistical Package for Social Sciences
WACC	Weighted Average Cost of Capital

ABSTRACT

The heart of Financial Management lies in making decisions that will maximize the value of the firm. Probably the most important financial decisions involve those whose results will be felt over an extended period. Capital investment decisions are some of the very vital decisions taken by management of organizations. They are not easily reversible and place organizations on new paths leading to long-run survival or ultimate failure.

To make sound capital budgeting decisions, theory advocates for the use of a systematic approach which involves, a continuous and creative search for investment opportunities, forecasting the supply and cost of funds for investment purposes, estimating each project's cash flows and other benefits, ranking and choosing among competing projects, post-auditing already committed investments and strategic capital budgeting. Use of discounted cash flow techniques, incremental cash flow approach, project specific cost of capital and risk analysis have been strongly advocated by academicians.

Empirical evidence shows that management of corporations do not necessarily follow theoretically sound techniques but to some extent use techniques from the "dark- ages". It is however reassuring to note that organizations are gradually coming to use more refined techniques in their capital budgeting analysis. What remains of great concern to most management is the problem of increasing complexity of activities and the environment in which they operate.

This study set out to determine the capital budgeting techniques used by companies listed at the Nairobi Stock Exchange, to ascertain whether the techniques used conform to theory and to practices of organizations in the developed economies as evidenced by studies done in these economies.

This study surveyed 43 companies listed at the Nairobi Stock Exchange about the capital budgeting techniques that they employ in their capital investment decisions. Most companies ignore the first stages of the capital budgeting process. Companies are concerned about incorporating risk in their capital budgeting process. Most companies employ non-discounted cash flow techniques to evaluate investment proposals. Companies use cost of specific source of funds and management determined target rates of return to determine project discount rate. Companies consider strategic aspects of capital budgeting and do engage in post auditing of completed projects. No relationship was established between firm, CEO and project characteristics and capital budgeting techniques.

1 CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

"There is a popular feeling that 'theory' is opposed to 'practice' and the merits lie with 'practice'. This is a false conclusion, based on false supposition. If practice has long been successful and does not conform to theory, the theory is bad and in need of revision. The distinction should not be between theory and practice; it should be between good theory and bad theory, between good practice and bad practice. Practice is brick, theory is mortar. Both are essential and both must be good if we are to erect a worthy structure. (D.Paarlberg, Great Myths of Economics - Lumby 1994, preface Xiii). It is on this note that I began to explore the theory and practice of capital budgeting.

The field of capital budgeting and related matters remains a prime concern for financial theorists and business practitioners. For the former, it gives excellent opportunities for developing a practical positive theory based on a rational and quantitative framework. For the latter, the process of resource allocation probably constitutes the most vital decision taken by management, since many projects are not easily reversible and place the company on new paths leading to long-run survival or ultimate failure.

Capital Investment decisions have long-term effects and require heavy capital commitments, making them some of the most important decisions in an organization. To the firm, these decisions, which shape both the pattern and growth of future output, constitute one of the most demanding challenges confronting management, since in a large measure the future benefits are irrevocably determined by the effectiveness of today's capital budgeting decisions.

The capital investment decision is essentially how much not to consume in the present in order that more can be consumed in the future. Managers of corporations, who act as agents for the owners (shareholders) of the firm, must decide between paying out earnings in the form of dividends, which may be used for the present consumption, and retaining the earnings to invest in productive opportunities that are expected to yield future consumption and to maximize shareholders' wealth. Managers of not-for-profit organizations try to maximize the expected utilities of contributors – those individuals who provide external funds. And public sector managers attempt to maximize the expected utility of their constituencies. Even though investment decisions affect every aspect of the economy, individuals as well as organizations, this study, however, focused on investment decisions in a corporate set up.

The Capital Budgeting process is quite complex requiring good strategic management, careful planning and often, large outlays for research and development. Moreover, some very difficult measurement problems are involved: the sales and costs associated with particular projects must be estimated, frequently for many years into the future, in the face of uncertainty. Finally, some difficult conceptual and empirical problems arise over the methods of calculating rates of return and the cost of capital. (Weston and Copeland, 1988).

Hastie (1974) points out that while, the academic community is preoccupied with refining capital expenditure analyses, business practitioners are more concerned with improving decision making. Studies in the early 1960s indicated that relatively few firms were using discounted cash flow (DCF) and other refined techniques to measure the benefits of proposed capital expenditures. By the late 1960s, and early 1970s, studies showed increasing use. However, Klammer's (1972) study showed that as late as 1970, 43 percent of the firms in his study were not using DCF techniques. A more recent study done by Graham and Harvey (2001) indicates that the Net Present Value (NPV) project evaluation

method is becoming dramatically more important and Capital Assets Pricing Model (CAPM) is also being widely used. However, firms continue to use company wide rather than project specific discount rates to evaluate projects, an indication that practitioners might not be applying the CAPM and NPV rules correctly. The study also reveals that Chief Financial Officers (CFOs) pay very little attention to risk factors based on momentum and book-to-market value. These results continue to puzzle researchers and academicians.

Hastie (1974), suggests that the use of refined evaluation techniques should not be discarded but rather an improvement in investment decision making should be done through (1) determining the alternative investments available; (2) weighing the strategic aspects of the alternatives; (3) collecting data and information on the viable alternatives; (4) developing assumptions and calculating the incremental income and cash flow benefits; (5) measuring the net benefits; (6) assessing the effect that different assumptions have on the project's measured results; (7) analyzing the risks of the project; (8) weighing the benefits and strategic purpose of the project against its risks and the constraints of the corporation; and (9) communicating the relevant information to top management in a manner that facilitates effective decision making.

1.2 DEFINITION OF TERMS

The terms capital budgeting and investment decisions are used interchangeably in the literature to refer to one and the same thing. Weston and Copeland (1988), define Capital Budgeting as the entire process of planning expenditures whose returns are expected to extend over a long period of time. They give the examples of capital outlays as land, -buildings, equipment and permanent additions to working capital associated with plant expansion. They also consider advertising or promotion campaign or research and development programme as

being capital budgeting expenditures since they are likely to have long-term impacts.

Lumby (1994), defines an investment decision as one 'which involves the firm making a cash outlay with the aim of receiving, in return, future cash inflows. Decisions about buying a new machine, building a factory, extending a warehouse, improving a delivery service, instituting a staff training scheme or launching a new product line are all examples of the investment decisions that may be made by a firm.

From the two definitions capital budgeting can be considered as long-term investment decisions and therefore the two terms are used interchangeably in this study.

1.3 STATEMENT OF THE PROBLEM

It was evident from my review of theory of capital budgeting and empirical studies that there is a gap between what is advocated by theorists and what is applied practically. However, as observed by Petty and Scott (1980), corporate managements are gradually coming to use more sophisticated and theoretically sound approaches in their capital-budgeting analysis. The aim of this survey was not to confirm or dispute this argument but to find out its place in the Kenyan Economy. It would have been wrong to draw the same conclusions drawn by studies done in a different environment.

I observed some contrasting results between studies done 10 to 20 years ago and a research done recently, 1999, by Graham and Harvey (2001). Past surveys indicated the prevalence of the use of Internal Rate of Return as an evaluation technique, whereas the survey by Graham and Harvey shows that the NPV approach has become dramatically more important as a project evaluation

method than, as indicated in past surveys. Finding out what techniques were used by corporation in Kenya, whether traditional or discounted cash flow techniques was of great interest to this study.

It was evident from my review of past studies that no study of this nature had been done in Kenya. Olum's (1976) study, took a completely different approach to Capital Budgeting from what the researcher studied. It viewed Capital Investment Appraisal Techniques from the point of view of social responsibility, that is, the benefits of such projects to the society as a whole and their contribution to the national economy. It only examined the Capital Budgeting Techniques of 2 public corporations listed at the Nairobi Stock Exchange.

This study looked at capital budgeting from the point of view of shareholders' wealth maximization and examined the extent to which capital budgeting techniques were being practically applied by corporations in Kenya. The researcher adopted a wider definition of corporations to include both public and private companies including manufacturing firms, financial institutions, trading and agricultural companies listed at the Nairobi Stock Exchange. The researcher adopted a survey study approach, which has a wider scope, is exploratory and enabled the researcher gather more information than the case study approach taken by Olum.

This study borrowed quite a lot from previous studies carried out in developed economies on capital budgeting more particularly from studies done by Petty and Scott (1980) and Graham and Harvey (2001) with an aim of applying the same research techniques to determine the status of capital budgeting among corporations in Kenya, particularly those listed at the Nairobi Stock Exchange.

1.4 OBJECTIVES OF THE STUDY

The aim of this study was to document the capital budgeting techniques used by corporations in Kenya and to determine whether the techniques used conform to theory and to practices of organizations in the developed economies. It therefore set out to achieve the following objectives:

- 1) To determine the Capital Budgeting techniques used in investment appraisal decisions amongst companies listed at the Nairobi Stock Exchange.
- 2) To determine how firm and CEO characteristics influence the use of a particular technique.

To aid in the accomplishment of the above set objectives, this study assumed the following;

1. That discounted cash flow techniques are more frequently used than non-discounted cash flow techniques by companies listed at the Nairobi Stock Exchange.
2. That, firm characteristics, CEO characteristics and project characteristics influence the type of capital budgeting techniques used by companies listed at the Nairobi Stock Exchange.

1.5 SIGNIFICANCE OF THE STUDY

This study has the following significance:

1. It is of importance to scholars who may wish to pursue further studies in the area of capital budgeting.
2. It gives an insight to management, especially Chief Financial Officers, of organizations into the most appropriate capital budgeting techniques to apply in their organizations.
3. It provides a practical reference to academic institutions, especially in Kenya, and can assist them in determining whether they have been

putting the right emphasis on capital budgeting techniques and which areas to improve on in their capital budgeting training.

1.6 SCOPE OF THE STUDY

This study surveyed the capital budgeting techniques used by Corporations in Kenya for a five-year period from 1997 to 2001 with the objective of determining whether these techniques conform to what has been advanced theoretically and in line with practices of other firms as revealed by studies done in the more developed economies. Companies listed at the Nairobi Stock Exchange were taken to represent corporations operating in the Kenyan economy and therefore constituted the population of this study.

1.7 LIMITATIONS OF THE STUDY

This study had the following limitations,

1. Due to time and financial constraint, this study focused only on companies listed at the Nairobi Exchange. Better results would have been realised if unquoted companies were also included in the study.
2. Lack of knowledge and experience of respondents in the area of capital budgeting was a big hindrance in having the questionnaire satisfactorily answered.
3. The structuring of the questionnaire could have contributed to the reluctance of the respondents' in answering some questions, especially those questions that required information that was not readily available or were time consuming. In addition, the use of questionnaires with predetermined questions may have forced respondents to respond to questions without necessarily having understood them.

1.8 STRUCTURE OF THE STUDY

This study is organized into five chapters.

Chapter One- Background of the study, gives an introduction to the ideas being put forward in this study. It indicates the need for which the study of this kind was undertaken stating clearly the objectives and importance of the study. **Chapter Two- Literature Review**, forms the basis for which this study was being undertaken. The first section of this chapter gives a quick review of theories that have been advanced in capital budgeting. It acts as a quick reminder to these issues. The second section discusses empirical studies done in this area and highlights the practical use of the theories advanced. **Chapter Three- Research Methodology** gives the step-by-step method by which the study was conducted. It describes how data was gathered and analyzed in order to achieve the objectives of the study. It outlines the research design, population of study, data collection, analysis and presentation. **Chapter Four – Data Analysis, Findings and Interpretation** presents the results of the study. Finally **Chapter Five – Summary and Conclusions** gives the conclusions drawn from the study, implications for management and suggestions for future research in the area of capital budgeting.

2 CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The body of knowledge in the field of corporate investment decision is well covered in the literature. As stated by Jensen and Smith, the analysis of the firm's investment decisions has been well understood for so long that now the best discussions are in textbooks. The textbooks referred to in this study include Brealey and Myers (1981), Brigham and Gapenski (1997), Emery (1998), Haim and Marshall (1994), Weston and Copeland (1988), Van Horne (1997), Gitman (1997), Hampton (1996), Broadbent and Cullen (1997), Hargitay and Shi-Ming Yu (1993), Lumby (1994) and Weston and Copeland (1992).

The first part of this section forms the theoretical background of this study and gives a review of the Capital Budgeting Process. Detailed description of the theory of Capital Budgeting is beyond the scope of this study and therefore readers are referred to various texts listed in the bibliography for more detailed reading. The second part reviews empirical studies done in this area highlighting the capital budgeting techniques that have been applied by corporate managers in practice.

2.2 REVIEW OF THE CAPITAL BUDGETING PROCESS

2.2.1 Investment decisions and shareholders' wealth maximization

As stated by Lumby (1994), in order to help in making investment decisions, and to ensure that they are consistent with each other, a common method of appraisal is required which can be applied equally to the whole spectrum of investment decisions and which should, help to decide whether any particular investment will assist the company in maximizing shareholders' wealth (via share price maximization).

As advanced by Hargitay and Shi-Ming Yu, (1993), in investment, funds are committed to various ventures which promise attractive returns at the price of risking a partial or total loss of the funds without an absolute guarantee of the size of receipt of return. Investment, therefore, represent certain sacrifices for uncertain benefits. Thus, investment has two principal aspects: - anticipated return (profitability) and risk (stability). Empirical evidence indicates that management is generally concerned with these two aspects. However, as argued by Haim and Marshall (1994), these concerns cannot be considered in isolation. Maximizing profits implies that future profits are known with certainty, which is not realistic. On the other hand maximizing stability implies avoidance of risk, and this can lead to less profit, as firms would avoid investing in highly profitable projects if they entail high risks. In the real world, uncertainty prevails, the firm must consider risk as well as profits, and therefore choose that combination of risk and profit, which maximizes the market value of its stock. For the purpose of capital budgeting this means that other things being equal, management will strive to secure the highest net return on its capital investments, which is compatible with the risks incurred.

The goal of a firm and that of capital budgeting is the same, that of maximization of the market value of it's existing common stock or alternatively stated the

maximization of its shareholders wealth. In many models, it has been shown that the shareholder's wealth is the discounted value of after-tax cash flows paid out by the firm. It has also been shown that the after-tax cash flows available for consumption is the same as the stream of dividends, paid to shareholders (Weston & Copeland, [1992]) as shown in the simple model below;

$$\begin{aligned} \text{If } S_0 &\equiv \text{Market Value (MV) of the firm} \\ \text{Div}_t &\equiv \text{Cash Flows (CFs) of firms} \\ K_s &\equiv \text{Cost of capital for the firm} \end{aligned}$$

The discounted value of the stream of dividend is

$$S_0 = \sum_{t=0}^{\infty} \frac{\text{Div}_t}{(1 + k_s)^t}$$

Where S_0 is the present value of shareholders' wealth, and K_s is the market-determined rate of return on equity capital (common stocks).

But, dividends are the residual cash flows of the firm after deducting all costs of operation and new investments from revenues written as;

$$\text{Div}_t = \text{Rev}_t - \text{Costs}_t - I_t$$

Therefore, rewriting shareholders' wealth,

$$S_0 = \sum_{t=0}^{\infty} \frac{\text{Rev}_t - \text{Costs}_t - I_t}{(1 + k_s)^t}$$

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However, as advanced by Jensen and Meckling (1976), there is obviously a difference between ownership and control, and conflicts of interest do arise. There is therefore no reason to believe that the manager, who serves as an agent for the owners, will always act in the best interest of the shareholders. However in investment decisions we assume that managers always make decisions that maximize the wealth of the firm's shareholders, and find and select the best set of investment projects to accomplish this objective. Managers can achieve this by following a systematic Capital Budgeting Process, which consists of at least five managerial activities:

1. Continuous and creative search for investment opportunities;
2. Forecasting the supply and cost of funds for investment purposes;
3. Estimating each project's cash flows and other benefits;
4. Ranking and choosing among competing projects;
5. Post-auditing already committed investments.

2.2.2 Continuous and Creative Search for Investment opportunities

Haynes and Solomon Jr. (1962), point out that the preliminary process of capital budgeting being, (a) search for and discovery of investment opportunities (b) collection of information about alternatives and (c) the application of incremental reasoning to the collected information, are very important in setting up the stage for Capital Budgeting decisions.

"In the absence of a creative search for new investment opportunities, even the most sophisticated evaluation techniques are worthless..." [Haim and Marshall (1994)]. Management ought to set aside time for search activity- search for alternatives and search for information about the alternatives. Some managers fail to take advantage of investment opportunities because of inadequate information or pressure of routine duties. The collection of information is not enough. It is necessary to separate relevant information from the irrelevant and

to organize the data in a meaningful form. In other words there ought to be a procedure for identifying and generating investment proposals as well as gathering and transferring information on alternative courses of action for the purposes of decision-making.

To facilitate this information search process, develop standardized estimation and administration procedures, Haim and Marshall (1994) suggest the following basis of classification of investment proposals;

1. By project size – the amount of cash required to implement project: major projects, regular capital expenditures and small proposals.
2. By degree of dependence – mutually exclusive projects, complements, substitutes.
3. By type of cash flow.

Projects can also be classified by the key motives for making the capital expenditure. As explained by Gitman (1997) these motives include;

Expansion: - For instance, expanding the level of operations – usually through acquisition of fixed assets. Growing firms often find it necessary to acquire new fixed assets rapidly.

Replacement: - As a firm's growth slows and it reaches maturity, most of its capital expenditures will be for the worn-out assets. Each time a machine requires a major repair, the outlay for the repair should be evaluated in terms of the outlay to replace the machine and the benefits of replacement.

Renewal: - Renewal, often an alternative to replacement, may involve rebuilding, overhauling, retrofitting an existing machine or facility.

Other purposes: - Some capital expenditures do not result in the acquisition or transformation of tangible fixed assets shown on the firm's balance sheet. Instead, they involve a long-term commitment of funds by the firm in expectation

of a future return. These expenditures include outlays for advertising, research and development, management consulting, and new products.

The investment proposals can be based on market research, technical and engineering methods studies, employee suggestions, and significant changes in the competitive environment, amongst other techniques.

An organization should also have a capital budgeting policy or an administrative framework, which facilitates the gathering and transferring of relevant information on alternative courses of action both for purposes of decision-making. The framework can include the following information;

- (1) how to estimate the amount of funds needed for a project by use of a combination of past performance and historical data, future expectations, and recommendation of all interested departments of the firm;
- (2) Origination of investment proposals
- (3) the approval process: depending on the size and nature of investment;
- (4) the planning horizon: short, medium or long term.

Van Horne (1997) suggests that, depending with the firm involved, investment proposals can emanate from various sources. For a new product, the proposal may originate in the marketing department. On the other hand, a proposal to replace a piece of equipment may emanate from the production area of the firm. Surveys on capital budgeting practice found that operating personnel, plant managers or divisional managers originated 33 per cent to 79 per cent of investment proposals. These personnel were less likely to originate proposals related to new product lines and more likely to originate proposals to replace existing equipment, [Scott and Petty (1984)].

The approval process varies from firm to firm. The actual dollar outlay and the importance of a capital expenditure determines the organizational level at which

the expenditure decision is made, [Gitman (1997)]. Firms typically delegate capital expenditure authority on the basis of certain dollar limits. Generally the board of directors reserves the right to make final decisions on capital expenditures requiring outlays beyond a certain amount, and the authority for making smaller expenditure is given to other organizational levels. Inexpensive expenditures are normally treated as operating outlays not requiring formal analysis.

2.2.3 Forecasting the supply and cost of funds for investment purposes

When financing new projects, should the firm follow the firm's optimal capital structure? Should firms maintain and do firms have an optimal capital structure? As advanced by Modigliani and Miller (1958), the type of instrument used to finance an investment project is irrelevant to the question of whether or not the investment is worthwhile. This does not mean that the owners (or the managers) have no grounds whatsoever for preferring one financing plan to another: or that there are no other policy or technical issues in finance at the level of the firm.

Several theories have been advanced to explain the relevance of capital structure, and whether there exists an optimal capital structure. These theories include, the capital structure irrelevance theory advanced by Modigliani and Miller (1958, 1963, 1977), the static trade off framework and the pecking order framework explained by Myers (1984) and Jensen and Meckling (1976) theory of effect of Agency Costs on Capital Structure. These theories are not discussed in detail as they are beyond the scope of this study. Haim and Marshall (1994) propose that, if we assume that the goal of the firm is to maximize its market value (thereby maximizing the market value of the shareholders' equity), it follows that the firm should strive to achieve that financing mix which it believes to be optimal in the long run. This implies that the firm should finance each project in the same proportions as its optimal (target) capital structure.

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Empirical evidence however, shows that even a firm which has set a target financial structure will tend to deviate from this optimal mix from time to time, because practical considerations (floatation costs, market considerations etc) make the alternative of raising capital each year by issuing a financing 'package', in fixed proportions of debt and equity undesirable. These temporary deviations from the long-run policy should be ignored, but this does not mean that the firm should not re-examine from time to time its long-term policy.

Having seen that the firm should try to follow its optimal capital structure when financing new investments, we now turn to how the firm determines the minimum required rate of return on the new project. Dean (1951) recommends that the firm make investment decisions by looking to the capital markets for the firm's cost of capital, accepting each project with an internal rate of return that exceeds this market-determined cost of capital. This point is well explained by Weston and Copeland (1992), that, the firm essentially receives its investment funds from two classes of investors; creditors and shareholders, providing debt and equity capital respectively. Both groups expect to receive a rate of return that compensates them for the level of risk they accept. Therefore projects undertaken by the firm must earn enough cash flow to provide the required rate of return to creditors, repayment of the face amount of debt, and payment of expected dividends to shareholders. In other words the shareholders will require the rate of return on new projects to be greater than the opportunity cost of the funds supplied by them and the creditors. Only when cash flows exceed these amounts will there be any gain on shareholder's wealth. A positive NPV is achieved only after creditors and shareholders have received their expected rates of return. The Cost of Capital is the minimum risk-adjusted rate of return that a project must earn in order to be acceptable to shareholders.

The cost of capital to be used in this case is the firm's Weighted Average Cost of Capital as it reflects the costs of the individual sources of funds, weighted by their

share on the firm's capital structure. It is the appropriate discount rate to use since it ensures that the value of the existing owner's equity will be maximized. Setting a lower rate, would induce the firm to accept projects which are not in the existing shareholders best interest; setting the rate above the Weighted Average, on the other hand, would lead the firm to forego projects whose acceptance would increase the value of the existing shareholders' equity.

The Weighted Average Cost of Capital ($k = WACC$) is the after-tax cost of debt, $k_b (1 - t_c)$, multiplied by the percentage of the market value of the firm owned by creditors, $[B / (B + S)]$, plus the cost of equity, k_s , multiplied by the percentage of the firm's value owned by shareholders, $[(S / (B + S))]$.

$$K = WACC = k_b (1 - t_c) B / B + S + k_s S / B + S$$

t_c is the firm's marginal tax rate.

However, as pointed out by Haim and Marshall (1994), there is a distinction between the firm's cost of capital and specific project's cost of capital, which varies from one project to another in accordance with the project's risk profile. The firm's cost of capital which is the Weighted Average Cost of Capital could be employed to evaluate a project only in cases where the risk profile of the new project is a "carbon copy" of the risk profile of the firm. Haim and Marshall argue that it is difficult, if not impossible, to estimate a separate cost of capital for each individual project. Thus, it is common to estimate the weighted average cost of capital of the firm as a first approximation and adjust this to reflect the specific risk profile of the project under consideration.

Haim and Marshall point out that it is crucial to recognize that the firm's costs of specific sources of financing are neither constant over time nor independent of the firm's overall financial strategy. The costs of capital are affected by the

following risk factors – financial leverage risk and the firm's economic or business risk. The greater the risk the larger will be the required rate of return and therefore the higher will be the financing cost. Each specific cost component is composed of the risk less interest rate (representing the time value of money) plus a risk premium. This risk premium, in turn, is determined by the firm's economic risk (which exists even when financial leverage is zero) plus its financial risk. Thus each specific source can be decomposed into two parts:

$$K_i = r + BRP + FRP$$

Where:

K_i = ith cost component

r = risk less interest rate

BRP = business risk premium

FRP = financial risk premium

The Capital Assets Pricing Model, developed almost simultaneously by Sharpe [1963, 1964], and Treynor [1961] offers a solution to incorporating the above risk factors in the cost of capital.

CAPM may be written as

$$E(R_j) = R_f + [E(R_m) - R_f]B_j,$$

Where

$E(R_j)$ = the expected rate of return on asset j,

R_f = the (constant) risk-free rate,

$E(R_m)$ = the expected rate of return on the market portfolio,

B_j = $COV(R_j, R_m)/VAR(R_m)$.

Incorporating CAPM into the Cost of Capital the various components of Cost of Capital are determined as follows;

Cost of debt $k_b = R_f + [E(R_m) - R_f] B_b$

Cost of Unlevered equity $p = R_f + [E(R_m) - R_f] B_u$

Cost of Levered equity $k_s = R_f + [E(R_m) - R_f] B_l$

WACC for the firm $WACC = k_b (1-t_c) B/B+S + k_s S/B+S$

When using CAPM to find the Weighted Average Cost of Capital, the focus should be on the risk (beta risk) of the project and not the risk (beta risk) of the firm that is undertaking it. Thus the company's cost of capital is irrelevant while considering a project whose beta risk is very different from those of the projects that currently constitute the company.

Unfortunately, the implementation of CAPM in practice is complicated. By its very nature, the investment in physical assets requires a multi period analysis, the capital assets pricing model is a one period model. Bogue and Roll (1974) analyzed capital budgeting of risky projects in a multi period framework and concluded that it may be incorrect to discount cash flows by using a single-period risk-adjusted discount rate. The Arbitrage Pricing model (APT) derived by Ross [1976] offers a testable alternative to the Capital Assets Pricing Model. The CAPM predicts that security rates of return will be linearly related to a single common – factor the rate of return on the market portfolio. The Arbitrage Pricing Model allows the use of many factors, not just one, to explain security returns. The APT assumes that the rate of return on any security is a linear function of k factors as shown below:

$$R_i = E(R_i) + b_{i1}F_1 + \dots + b_{ik}F_k + \epsilon_i$$

Where

R_i = the random rate of return on the i th asset,

$E(R_i)$ = the expected rate of return on the i th asset,

b_{ik} = the sensitivity of the i th asset's returns to the k th factor,

F_k = the mean zero k th factor common to the returns of all assets under consideration.

ϵ_i = a random zero mean noise term of the i th asset.

2.2.4 Estimating each project's cash flows and other benefits

From the inception of the investment proposal, the expected costs and revenues generated by the project must be estimated. Van Horne (1997) reasons that it is cash not income that is central to all decisions of the firm. Thus, whatever benefits expected from a project, are expressed in terms of cash flows rather than income. The firm invests cash now in the hope of receiving cash returns in a greater amount in the future. Only cash receipts can be re-invested in the firm or paid to shareholders in the form of dividends.

The Incremental Cash flows Principle

Haim and Marshall (1994) explain this principle as follows; that a project should be evaluated by considering all of the cash inflows and outflows induced by the investment. It follows that attention must be given to the magnitude and timing of cash flows, rather than to the accounting concepts of income and expenses. In order to properly appraise an investment opportunity, we have to appraise all the cash flows that arise either directly or indirectly as a result of the project. This is

the principle of incremental cash flows. Therefore when determining the cash flow for an investment project the following should be taken into consideration;

- ◆ All costs incurred (and revenues generated) prior to the investment appraisal decision should be excluded. They are sunk costs, in that they are unaffected by the investment decision under appraisal.
- ◆ Deduct the initial investment outlay when it is incurred because that is when the actual cash flow occurs. Since the capital cost is fully taken into account by deducting the initial investment outlay from the project's cash flow, depreciation charges should be ignored, deducting them would amount to double counting.
- ◆ Ignore all financing cash flows (e.g. interest charges, loan repayment, dividends etc) and all their tax effects (e.g. interest tax relief and advance corporation tax (ACT)). This is because these are all implicitly taken into account through the discounting process.
- ◆ Ignore all non-incremental cash flows. Only those cash flows that arise because of the project should be included in an NPV analysis. Any cash flow that would arise whether or not the project was undertaken should be excluded.
- ◆ The 'opportunity' or 'alternative' costs, and not just the direct outlay costs, must be taken into consideration.
- ◆ Sometimes, at the end of the project's life, assets have a positive value called salvage value. This value should be incorporated into the cash flows.

The effect of inflation – The Fisher Effect:

Lumby (1994) gives a simple definition of inflation as being a situation where prices in the economy are, in general, rising over time. This may have effect on the cash flows and discount rates. This effect as explained by Weston and

Copeland (1992), is reflected in the required rate of return on the project or on the applicable cost of capital for the project – a relationship they acknowledge as having been recognized in financial economics and known as the Fisher effect. This is expressed as follows:

$$[1 + \text{Real Interest rate}] [1 + \text{General rate of inflation}] = [1 + \text{Market Interest rate}]$$

They explain further that, the market data utilized in the estimated current capital costs will include a premium for anticipated inflation. But while the market remembers to include an adjustment for inflation in the discount rate factor, the cash flow estimates used by the firm in the Capital Budgeting analysis may fail to include an element to reflect future inflation. Sound analysis requires that the anticipated inflation rate be taken into account in the cash flow estimates. Given that the cost of capital (observed using market rates of return) already includes expected inflation, the decision maker can correct for inflation either (a) by adding an estimate of inflation to the cash flows or (b) by not including an adjustment for inflation in the cash flows and removing an inflation factor from the market rate.

The effect of Taxation:

In the appraisal of an investment project, what is of importance is the cash flows that will be generated by the project, and that are available for shareholders. Corporate taxes are a cash outflow and must be taken into account when evaluating a project's desirability. Therefore as far as investment appraisal is concerned, we would wish to evaluate the after-tax cash flows of a project. This approach is well explained by Lumby (1994) and Weston and Copeland (1992).

Lumby (1994) states the following tax impacts on project appraisal:

- ◆ Tax relief on capital expenditure
- ◆ Tax charge on the project's profit
- ◆ Tax relief on debt interest and or advance corporate tax liability caused by dividends. This impact is ignored since it is implicitly taken into account through the discounting process.

He argues that considering the above three factors, the approach taken to project appraisal is to evaluate the after-tax cash flows using the after-tax discount rate. The after –tax project cash flows take account of the capital expenditure tax relief and the tax charge on the project's profit. The third tax impact is taken into account through the after-tax discount rate.

Weston and Copeland (1992) define cash flows for capital budgeting purposes as free operating cash flows minus taxes on free operating cash flows as given by;

$$\begin{aligned} \text{NCF for Cap. Budgeting} &= (\Delta \text{Rev} - \Delta V_c - \Delta F_{cc}) - t_c (\Delta \text{Rev} - \Delta V_c - \Delta F_{cc} - \\ &\quad \Delta \text{dep}) - \Delta I \\ &= (\Delta \text{Rev} - \Delta V_c - \Delta F_{cc}) (1 - t_c) + t_c (\Delta \text{dep}) - \Delta I \end{aligned}$$

They argue that cash flows for capital budgeting purposes can be thought of as, the after-tax cash flows the firm would have if it had no debt. Interest expenses and their tax shield are not included in the definition of cash flow for capital budgeting purposes. The reason is that when we discount at the weighted average cost of capital we are implicitly assuming that the project will return the expected interest payments to creditors and the expected dividends to

shareholders. Hence inclusion of interest payments (or dividends) as a cash flow to be discounted would be double counting.

The definition of free cash flows shows what the firm will earn after taxes, assuming that it has no debt capital. Thus changes in the firm's debt-equity ratio have no effect on the definition of cash flows for capital budgeting purposes. The effect of financial decisions (e.g., changes in the ratio of debt to equity) is reflected in the firm's weighted average cost of capital.

2.2.5 Ranking and choosing among competing projects

There are several techniques as suggested in finance literature (Brealey and Myers [1996]) that managers can employ in evaluating projects. The best technique will maximize shareholders' wealth, consider all cash flows, discount cash flows at the opportunity cost of funds, select from a set of mutually exclusive projects the one that maximizes shareholder's wealth and consider one project independently from all others (this is known as the value-additivity principle).

There are five widely used capital budgeting techniques (i) the payback period method, (ii) the accounting rate of return, (iii) the Net Present Value, and (iv) the Internal Rate of Return (v) profitability index.

The Payback and the Accounting Rate of return methods are referred to as the traditional capital budgeting techniques while the others are discounted cash flow methods.

The Payback Period Method.

The payback period for a project is simply the number of years it takes to recover the initial cash outlay on a project. If managers were adhering strictly to the payback period method, they would choose projects with the shortest payback period. This method is popular with managers due to the fact that it is quick and simple to calculate, readily understood by management, it is thought to lead to selection of the less risky project in mutually exclusive decision situations, saves management the trouble of having to forecast cash flows over the whole of a project's life and it is a convenient method to use in capital rationing situations. However, this method does not consider all cash flows and fails to discount the cash flows.

The Accounting Rate of Return.

The Accounting Rate of Return (ARR) is the average after-tax profit divided by the initial cash outlay. Using this method, managers would choose projects with the highest Accounting Rate of Return. This method has the advantage of using the familiar percentage concept and it evaluates projects on the basis of profitability. However, this method uses accounting profits instead of cash flows and it does not consider the time value of money.

The Net Present Value and the Internal Rate of Return methods are referred to as discounted cash flow approaches. The fact that money has a time value (i.e. an opportunity cost in terms of rate of interest) means that cash flows that arise at different points in time cannot be compared directly but must first be converted to common point of time (usually to the present value). This can be achieved by use of either of these two approaches.

Net Present Value.

The Net Present Value (NPV) criterion will accept projects that have an NPV greater than zero. The NPV is computed by discounting the cash flow at the firm's opportunity cost of capital. The equation for Net Present Value is,

$$NPV = \sum_{t=1}^N \frac{NCF_t}{(1 + K)^t} -$$

Where NCF_t is the net cash flow in time period t ,

I_0 is the initial cash outlay,

K is the firm's Weighted Average Cost of Capital,

N is the number of years in the project.

Internal Rate of Return.

The rate of return on a project is generally called the Internal Rate of Return (IRR). It is the discount rate that equates the present value of cash inflows with the present value of cash outlays. In other words, it is the rate that makes the computed NPV exactly zero. Hence this is the rate of return on invested capital that the project is returning to the firm.

$$NPV = 0 = \sum_{t=1}^N \frac{NCF_t}{(1 + IRR)^t} -$$

If managers use the IRR criterion and the projects are independent, they would accept any project that has an IRR greater than the opportunity cost of capital.

Analysis done by Fisher (1907), 1930) and Lutz and Lutz (1951) and subsequently by Lorie and Savage (1955) and Hirshleifer (1958) indicate deficiencies in the internal rate of return criteria. First it does not obey the value-additivity principle, and consequently managers who use the IRR cannot consider projects independently of each other. Second, the IRR rule assumes that funds invested in projects have opportunity costs equal to the IRR for the project. This implicit reinvestment rate assumption violates the requirement that cash flows be discounted at the market-determined opportunity cost of capital. Finally, the IRR rule can lead to multiple rates of return whenever the sign of cash flows changes more than once. They offer the Net Present Value criterion as a solution. The NPV rule directs the manager to discount project cash flows at the market-based cost of capital and to accept all projects with positive discounted values.

The NPV rule avoids all the problems the IRR is heir to. It obeys the value – additivity principle, it correctly discounts at the opportunity cost of funds, and most important, it is precisely the same thing as maximizing the shareholders wealth i.e. maximizing discounted cash flows provided by investment projects.

Hertz (1963) reasons that much effort has been applied to the development of ways to improve our ability to discriminate among investment alternatives. The focus of all of these investigations has been to sharpen the definition of the value of capital investments to the company and the discounted cash flow methods has been resolved as a reasonable means of calculating this value, the rate of return. The fact is that, no matter what mathematics are used, each of the variables entering into the calculation of rate of return is subject to a high level of uncertainty. The “expected” rate of return represents only a few points on a continuous curve of possible combinations of future happenings. A number of efforts to cope with uncertainty have been advanced. Some of these include;

a) **Sensitivity Analysis**

This focuses on determining by how much the NPV of a project will change in response to a given change in input variable, holding other things constant for instance, change in price, change in cost of capital, change in tax etc.

b) **Scenario Analysis**

This considers both the sensitivity of NPV to changes in key variables as well as the range of likely variable values. Under this approach managers assess various possibilities which are grouped.

c) **Decision Tree Analysis**

This is suitable for use in a multi-stage or sequential decision where more than one variable may be uncertain and also the value of some variable may be dependent on value of other variables. Decision trees are designed to illustrate the full range of alternatives that can occur. Its logical analysis of a problem enables a complete strategy to be drawn up to cover all eventualities.

d) **Simulation**

In practice it may be necessary to produce separate possibilities for all the alternative variables affecting a project for example, alternative sales revenue outcomes, different items of costs and so on. Consequently, a decision tree can consist of thousands of branches. In addition, the cash flows may be correlated for over the years, for example, if a new product is successful in the early years, then it is also likely to be successful in later years. This situation becomes too complex to use a simple decision trees analysis and this problem can be overcome by use of simulation analysis with the aid of a computer. To carry out the analysis, a company must follow three steps:

1. Estimate the range of values for each of the factors (e.g., range of selling price, sales growth rate, and so on) and within that range the likelihood of occurrence of each value.
2. Select at random from the distribution of values for each factor one particular value. Then combine the values for all of the factors and compute the rate of return (or present value) from that combination.
3. Do this over and over again to define and evaluate the odds of the occurrence of each possible rate of return.

Other complex models of dealing with capital budgeting under uncertainty acknowledged at this point but not discussed in detail include, models developed by Bogue and Roll (1974) and Fama (1977); Adjusting the risk adjusted discount rate when comparing costs (rather than total income) data for mutually exclusive projects; the abandonment problem which deals with how to evaluate the residual value of investment assets and the application of the Option Pricing Models.

2.2.6 Post-auditing already committed investments

The post-completion of capital investment projects is one stage of the decision-making process which is often overlooked. Strictly speaking, the post-audit is not part of the current decision-making process since it refers to implemented projects. However, a systematic program of evaluating past decisions can contribute to the improvement of current decision-making by analyzing the patterns of past estimation errors by department, by personnel, or by type of expenditure. The accumulated information can be extremely valuable on revising current forecasting and evaluation methods.

As pointed out by Emery (1998) the two main objectives of post auditing are to improve the company's planning procedures and to update the estimate of the project's market value. Process improvements come from normal feedback and from identifying and removing sources of bias in cash flow forecasts. A revised estimate of a project's market value may cause the company to expand, contract, accelerate, delay, or abandon the project.

2.2.7 Corporate Strategy and Capital Budgeting

Bertoneche (1975) argues that in as much as traditional capital budgeting has been refined, particularly with the use of probabilistic risk analysis, and then by linking capital – investment decisions to the market performance of the company's shares through the capital asset pricing model and related theoretical concepts, the common underlying assumption of all financially based approaches to the resources allocation process is that of the fundamental strategic decisions, that is, those "strategic moves which direct an organization's critical resources toward perceived opportunities in a changing environment". The business environment has changed and is likely to be unstable for the unforeseen future.

He therefore suggests the following;

1. That the general strategy of the firm must be made clear at the various levels of management so that projects may receive a more complete and precise review of their strategic ramifications. The capital expenditure analysis should not only be pages of figures and computations, but they should also clearly state the basic assumptions and raise the right strategic questions.
2. Research should be directed toward the integration of the traditional capital-budgeting framework into the overall resource allocation process of the company by stressing the strategic aspects and adapting the current techniques to the increasing environmental complexity.

The issue of strategic capital budgeting is beginning to receive more attention in the finance literature. Shapiro, (1985), stresses that generating projects likely to yield positive excess returns is at least as important as the conventional quantitative investment analysis. This is the essence of corporate strategy: creating and then taking advantage of imperfections in product and factor markets. Thus, an understanding of the strategies followed by successful firms in exploiting and defending those barriers to entry created by product and factor market imperfections is crucial to any systematic evaluation of investment opportunities. More important, a good understanding of corporate strategy should help uncover new and potential profitable projects.

2.2.8 Factors affecting capital budgeting techniques

Capital budgeting techniques vary from firm to firm depending on various factors. Research indicates that there is a relationship between corporate finance practices and the characteristics of the firm. A study done by Graham and Harvey (2001) examined responses on cost of capital, capital budgeting and capital structure in relation to firm size, price earnings ratio, leverage, credit rating, dividend policy, industry, management ownership, CEO age, CEO tenure and education of CEO. The results of this study indicate that firm size for instance, significantly affects the practice of corporate finance. According to the study, large firms are significantly more likely to use the net present value techniques and capital assets pricing model for project evaluation than are small firms, while small firms are more likely to use the payback criterion. Highly levered firms are significantly more likely to use net present value and internal rate of return than are firms with small debt ratios.

Interestingly the study also indicates that executives use the main line techniques that business schools have taught for years NPV and CAPM, to value projects and to estimate the cost of equity, suggesting that techniques applied by MBA

and NON MBA executives may differ. The study found that CEO's with MBAs are more likely than non-MBA CEO's to use net present value, but the difference is only significant at the 10% level of significance.

2.3 CAPITAL BUDGETING TECHNIQUES IN PRACTICE

Having reviewed the theoretically accepted capital budgeting procedures it is imperative to compare this with what happens practically. As stated by Haim and Marshall (1994), the ultimate test of a theory in corporate finance is not its formal elegance but lies rather in our ability to apply the theoretical concepts to actual business problems.

Empirical evidence shows that the first stage of capital budgeting, the continuous and creative search for investment opportunities is often neglected. Haynes and Solomon (1962), in their article 'a misplaced emphasis on Capital Budgeting', based on detailed research on small business investments, give evidence that small firms often do neglect the early stages of the capital budgeting decision-making process. But this neglect is however, less likely in large firms, which have definite procedures for finding investment opportunities and developing information.

They argue that much of the literature stresses on the precise computation of the relative worth of investment alternatives while the administrative and organizational aspects of decision-making are ignored. In addition to this they point out that most businessmen do not use the theoretically correct methods as suggested in the literature, but prefer alternative methods that are simpler, more direct and involve fewer hidden assumptions.

They conclude that accumulation of information must take priority over refinement in computations. It is not particularly helpful to apply a theoretically correct formula to the wrong information – Precise computations applied to the wrong information cannot result in correct measurements of investment worth.

While their argument is correct, we cannot fail to stress the importance of quantification of evaluations of investment. Having the right information is not enough, applying the correct evaluation technique completes the whole capital budgeting process. This study embraced both the qualitative and quantitative aspects of capital budgeting, bridging the gap between emphasis on computation aspects and search for alternatives and information as suggested by Haynes and Solomon (1962).

Empirical evidence shows an increased use of Net Present Value and Internal Rate of Return in evaluating projects; companies are beginning to adopt the use of Capital Assets Pricing Model; and most companies use the company wide Weighted Average Cost of Capital as evidenced from the studies done by Petty and Scott (1980), Graham and Harvey (2001) and Ross (1986).

Petty and Scott (1980) present an analysis and review of several studies that dealt with the integration of investment theory into investment practice. They summarize the findings of a total of 17 Capital Budgeting Surveys from 1960 to 1979. They also present their findings from a new study of investment decision-making practice derived from responses to a two-page questionnaire that was sent to the Chief Financial Officer of each firm listed in the May 1977 directory of Fortune "500" firms.

The objectives of their paper were (1) to present a synthesis of several important surveys into Corporate Capital Budgeting practices and (2) to present the results of a new study of Capital Budgeting procedures employed by large organizations.

They observed from their study of prior research, that there is a definite trend in Capital Budgeting practices – Corporate managements are gradually coming to use more sophisticated and theoretically sound approaches in their capital-budgeting analysis. Complementing this historical overview, the empirical portion of the current research affords several conclusions. First, the principal financial objective of large companies is the firm's return on investment. Second, the initiation of new projects continues to be a bottom-up process. Third, the internal rate of return has unequivocally maintained its preferred position vis-à-vis other evaluation techniques. However, the payback period is still viewed as a strong supplementary tool. Fourth, management's concept of risk aligns reasonably well with theory; however, the practical application of this concept apparently is still proving difficult. Fifth, the financial manager's interest in diversification as a means of reducing risk is slowly increasing, even to the point that a few executives are attempting to use the capital asset pricing model. Finally, investment hurdle rates are used regularly in the accept-reject decision, with the primary types being a management-determined target rate of return and a weighted cost of capital.

Graham and Harvey (2001), surveyed 392 CFOs about the cost of capital, capital budgeting and capital structure. They examine the relation between the executives' responses and firm size, P/E ratio, leverage, credit rating, dividend policy, industry, management ownership, CEO age, CEO tenure, and the education of the CEO.

What was of interest to this study was their results on cost of capital and capital budgeting. Their results brought in some variation in the results of the studies summarised by Petty and Scott (1984) above. Their results show that most companies frequently used Net Present Value and Internal Rate of Return to evaluate new projects. Other than NPV and IRR, the Payback Period method is the most frequently used capital budgeting technique. They observe that CAPM

is the most popular method of estimating the cost of equity capital. The second and the third most popular methods are average stock returns and a multibeta CAPM respectively. Their results further indicate that small and large firms have different priorities when adjusting for risk. For large firms the most important risk factors (in addition to market risks) are foreign exchange risk, business cycle risk, commodity price risk and interest rate risk. Most companies use a single company – wide discount rate to evaluate the projects rather than a project-specific discount rate.

Ross (1986) presents the results from an in-depth study of capital budgeting for discretionary projects at twelve firms in the process industry. The results indicate that, while discounted cash flow techniques are normally used at most firms, it is important to ask whether the calculations are carried out incorporating essential details and whether it is a DFC criterion or simple payback that is actually relied on. For the small projects, most firms in the sample severely simplify their DFC analysis and or rely primarily on simple payback. Results of the study also indicate that project approval at many firms follows different criteria depending on the locus of the decision. The effect of this is that smaller projects are subject to high de facto hurdle rates. Only large projects are observed to face a hurdle rate near the cost of capital. Firms with thorough financial analysis of smaller projects tend to be the same firms that do not discriminate against smaller projects.

An important conclusion of the study is that a common practice in capital budgeting procedures results in capital rationing for small projects. The challenge involves devising a procedure that avoids systematically denying capital to small, potentially high-return projects.

One area that has received little attention is strategic capital budgeting as emphasized by Bertoneche (1975). He conducted a study on the impact of increasing complexity of business conditions on the capital budgeting process.

The objectives of his paper were to raise the question of the nature of capital budgeting, to investigate the impact of increasing complexity of business conditions in the capital investment process, and to report the main conclusions drawn from interviews conducted in six large European firms. The companies interviewed had detailed procedure manuals based on discounted cash flow techniques, but the managers were of the general feeling that these methods and other refined techniques to appraise the desirability of proposed capital expenditures do not help the decision –making process. These methods have instead led to a great deal of disillusionment, confusion, and frustration, which have increased with the new complexity of business conditions. Most of the difficulties associated with the stages of the capital- budgeting process occur in the project definition and cash flow estimation and in the project implementation and review, not in the financial analysis and project selection phase. He concludes that strategic criteria should be the driving mechanism behind the capital investment process.

No study has been done so far on the capital budgeting techniques as practiced by organizations in Kenya. A study done by Olum (1976) sought to investigate whether a solution has been found for the lack of specific appraisal technique for projects to be partly undertaken and partly owned by the corporation on behalf of the whole society and partly undertaken and partly owned by private investors.

He argues that the current Capital Investment Appraisal techniques are applied from only two points of view; namely, that of a private entrepreneur and that of the whole society, considering commercial profitability and public profitability respectively. This leaves a Capital Investment appraiser who wants to appraise a project to be jointly undertaken by a private entrepreneur and a public corporation (the latter acting on behalf of the whole society), with a problem. Such an appraiser does not have an appraisal technique specifically developed

for such a project to be jointly undertaken by a private entrepreneur and a public corporation.

He examined how two public corporations in Kenya, the Industrial and Commercial Development Corporation and the Kenya Tourist Development Corporation which undertake and manage projects jointly with private entrepreneurs had solved the problem of how to appraise partly public and partly private projects. He concluded from his research that the two corporations have not tackled the problem of how to appraise partly private and partly public projects.

2.4 SUMMARY AND CONCLUSION

In summary, we have seen that, managers need to pay more attention to the search for alternatives and the search for information about alternatives as these set up the stage for the capital budgeting process. We have also seen that the shareholders wealth is the discounted value of after-tax cash flows paid out by the firm and that managers should select the best set of investment projects that maximize this wealth. Empirical evidence shows that very little attention is paid to the initial stages of capital budgeting and most managers think of the objective of the firm as maximizing the firm's return on investment.

The payback and the Accounting Rate of return techniques may be suitable as initial screening devices, or to evaluate small, short-lived projects. However, they should not be used otherwise, with the possible exception of discounted payback. The IRR errs in many ways and thus is not also suitable for evaluating investment projects. The NPV approach proves to be the best technique for project evaluation as it is precisely the same thing as maximizing the shareholder's wealth. Empirical evidence shows an increase use of NPV and IRR and to some great extent, the discounted payback approach.

Due to the fact that return on investment is uncertain, theorists advocate for the use of such methods as sensitivity analysis, scenario analysis, decision trees and simulation analysis to evaluate projects. There is very little evidence of the use of these methods in practice.

The correct definition of cash flows for capital budgeting purposes is free cash flows minus taxes on free operating cash flows. This cash flow is discounted at the Weighted Average Cost of Capital. Care should be taken to adjust for inflation either on the discount rate or the cash flows.

The Weighted Average Cost of Capital (WACC) is the same as the after-tax market-determined opportunity cost of funds and therefore is the appropriate discount rate to use in discounting cash flows. Empirical evidence shows that most firms use company wide WACC.

Under conditions of uncertainty, the discount rate should be adjusted for risk and Capital Assets Pricing Model (CAPM) offers the best solution for that. The Arbitrage Pricing Model (APT) offers a testable alternative to CAPM in conditions of multi-period, multi-factor uncertainty. Other methods of incorporating uncertainty in capital budgeting include such methods as sensitivity analysis, scenario analysis, decision tree analysis and simulation. Empirical evidence shows that firms are beginning to adopt the use of CAPM as a means of incorporating risk in project evaluation.

After implementation of projects, a post audit of the completed project should be done to monitor its progress, an area that is often neglected. Another area that has received little attention is the area of strategic capital budgeting, an area that is quite critical due to the ever changing business environment.

Finally, research suggests that the likelihood of use of specific evaluation techniques is linked to firm and CEO characteristics.

3 CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This section describes the technique that was used to conduct this study in order to achieve the objectives of the study.

3.1 SCOPE OF THE STUDY

This was a survey study covering the capital budgeting techniques of companies listed at the Nairobi Stock Exchange for a period of five years from 1997 to 2001.

3.2 RESEARCH DESIGN

This study surveyed the capital budgeting techniques used by corporations in Kenya. The survey approach was found to be best suited for this study as it is exploratory and gives an opportunity to ask very specific and qualitative questions about capital budgeting techniques and characteristics of corporations in Kenya. Another factor used in adopting this technique is the fact that this study borrows from techniques used by studies done in developed economies on capital budgeting techniques. All the studies reviewed (Haynes and Solomon [1962], Petty and Scott [1980], Graham and Harvey [2001], Ross [1986] and Bertoneche [1975]) used the survey approach. It would therefore beat the purpose of comparative analysis if a different approach were adopted.

However, surveys measure beliefs and not necessarily actions and thus findings may not completely be in tune with practice. Survey analysis also faces the risk that the respondents are not representative of the population of firms, or that the survey questions are misunderstood.

3.3 POPULATION AND SAMPLE

The population of this study comprised companies listed at the Nairobi Stock Exchange. These companies were chosen since they represent the main sectors of the Kenyan economy and were therefore considered as adequate representation of corporations in Kenya. In addition, since they are publicly quoted and publish their annual reports and accounts, information about these companies was more readily available than that of unlisted companies.

The study covered all the 54 companies listed at the Nairobi Stock Exchange as at 31st July 2002 (see appendix I for the list of companies listed at the Nairobi Stock Exchange). The study covered a period of five years from 1997 to 2001. The annual reports and accounts of the companies were used to determine company characteristics, and therefore, only companies whose annual reports and accounts were available at the Nairobi Stock Exchange for the five-year period were finally included in the study. The total number of companies therefore analyzed was 43 (see appendix II for the list of companies analyzed).

3.4 DATA AND DATA COLLECTION

3.4.1 Data

Data collected for this study comprised both primary and secondary data. The primary data related more to the qualitative than the quantitative aspects of the capital budgeting process. This data addressed issues on the constitutional framework of the capital budgeting process, including aspects such as, the stages of capital budgeting, the capital budgeting decision process, capital budgeting policy and manual, strategic aspects of capital budgeting, post-auditing of completed projects and difficulties faced by management in its capital budgeting process.

The secondary data addressed issues on the extent of use of capital budgeting techniques, types of projects, determination of cost of capital, firm characteristics, Chief Executives' (CEO) characteristics and project characteristics.

The capital budgeting techniques analyzed included the Net Present Value, the Internal Rate of Return, the Accounting Rate of Return, the Payback period method and other methods such as intuition.

The firm characteristics that were of interest to this study included:

1. Company size: This was determined using market capitalization.
2. Industry: Defined as the sector of the economy in which the company operates. This was taken as classified by the Nairobi Stock Exchange, that is, Agricultural, Finance and Investment, Commerce and Services and Industrial and Allied sectors.
3. Net Profit Margin
4. Debt/Equity ratio
5. Ownership – Foreign versus local ownership. Companies, which are above 50% subsidiaries of a foreign company, were considered foreign owned.

Data relating to CEO characteristics included CEO age, tenure and education. While data relating to project characteristics included, project size in value, and project type, that is, whether an expansion, a replacement or new investment.

3.4.2 Data collection

Data was collected using questionnaire and data collection sheets. The questionnaire was aimed at collecting primary data as at the point of time of administering the questionnaire. It was administered through dropping and

picking for companies whose offices are in Nairobi. For companies whose offices are located outside Nairobi, the questionnaire was administered through mailing and faxing. Follow up on the questionnaire administered was done through phone calls and re-faxing the questionnaire. A combination of all these ways of administering the questionnaire and follow up was done to maximize response rate. The officers targeted were Chief Financial Officers or others responsible with Capital Budgeting.

The questionnaire was structured to capture information regarding all the activities of the capital budgeting process. Questions 3 to 10 covered continuous and creative search for investment opportunities. Questions 11 to 16 covered evaluation methods. Questions 17 and 18 covered post-auditing completed projects. The rest of the questions covered any other aspects of capital budgeting. The questionnaire was both open and closed ended to ensure that as much information as possible was gathered. A copy of the questionnaire is attached as appendix V.

Two data collection sheets were used to collect the secondary data. The first data sheet was filled by the respondent and was administered together with the questionnaire. This data sheet was intended to collect data on the frequency of use of the capital budgeting techniques, determination of cost of capital and risk analysis. The data covered a period of five years from 1997 to 2001. A copy of the data collection sheet is attached as appendix VI.

The second data collection sheet was filled by the researcher and was intended to collect data on the firm and chief executive's characteristics. The data on firm characteristics covered a period of five years from 1997 to 2001 and was collected from the annual reports and accounts of the companies and the Nairobi Stock exchange Facts and Figures 2000, published by the Market Intelligence, August 2000.

Data on CEO characteristics, proved difficult to obtain through indirect methods such as the companies' websites and annual reports as had earlier been intended. A quick investigation was done to find out whether companies would be willing to disclose this kind of information and the response was positive.

Therefore data collection sheet 2 was circulated to companies to fill the section on the CEO characteristics. A copy of the data collection sheet is attached as appendix VII.

3.5 DATA ANALYSIS

The questionnaires were edited and relevant questions that needed coding were coded and arranged for ease of analysis. The statistical package for social sciences (SPSS) was then used to analyze the data into frequency distribution. The results of this analysis are attached as appendix VIII.

The primary data collected by use of the questionnaire was analyzed using descriptive statistics, particularly frequencies and percentages. Information was then generalized and summarized using tables and histograms where appropriate.

The data on firm characteristics were averaged for the five-year period to determine the mean value of each of the characteristics. The range of these mean values were determined and the median used to group firms as follows:
(see appendix IX for the analysis)

Characteristic	Group	
Company Size	Small	Large
	Market capitalization below Ksh 1,317,600,000	Market capitalization of Ksh 1,317,600.000 and above

Net Profit Margin	Low Net Profit Margin below 8%%	High Net Profit Margin of 8% and above.
Debt/Equity ratio	Low Debt/ Equity ratio below 4%	High Debt/ Equity ratio of 4% and above

It is worth mentioning at this point that the debt equity ratio of most companies listed in the Nairobi Stock Exchange is quite low. Only 30% of the listed companies have a debt equity ratio above 10%. The median of the debt/equity ratio is only 4% and was therefore used to determine the cut-off between the low and high debt-equity ratio. This low debt-equity ratio could have some impact on the low level of investment in capital investment projects by companies listed at the Nairobi Stock Exchange.

For the CEO characteristics, groupings were done as follows

CEO age	Below 50 years Young	51 and above Older
CEO Tenure (number of years on the job)	Below 8 years Short	8 years and above Long
CEO MBA	Yes	No

The mean values of the total capital expenditure for each of the companies for the five-year period were determined. These mean values were then arranged in ascending order ranging from 0 to 2 billion Kenya Shillings. This data was then classified into five groups as follows;

0 – 249,999,999

250,000,000, - 499,999,999

500,000,000 – 749,999,999

750,000,000 – 999,999,999

1,000,000,000 and above

(See appendix X for the analysis)

Capital expenditure was also classified into the following types of projects (1) New Projects (2) Expansions and (3) Replacement

Data collected on the capital budgeting techniques using the data sheet circulated to companies were arranged into a frequency distribution to determine the popularity of the use of a particular technique. This data was first analyzed for the sample as a whole to distinguish between the use of discounted and non-discounted techniques as well as to determine the method of cost of capital determination and risk analysis used by the companies. Secondly, the data was again analyzed per firm and project characteristics as determined above, and chi-square statistical test carried out at 5% level of significance to establish whether there is any relationship between the characteristic and the techniques used.

Chi-square (x^2) test is used when testing a hypotheses about the relation between two attributes, in this case, whether there existed any relationship between industry, size of companies, Net Profit Margin, Debt/Equity ratio, project size, project type and capital budgeting techniques used.

The results of the analysis are attached as appendix XI.

4 CHAPTER FOUR

4.0 FINDINGS, INTERPRETATIONS AND DISCUSSIONS

In this chapter the results of the research are reported, interpreted and discussed. The first section presents the results of the research and the second section discusses these results.

4.1 RESPONSE RATE

Out of the 43 questionnaires distributed, 28 were returned giving a response rate of 65 per cent, which was considered adequate for analysis. This response rate represented 52 per cent of the original population of 54 listed companies. The distribution of responses by industry is shown on the table below.

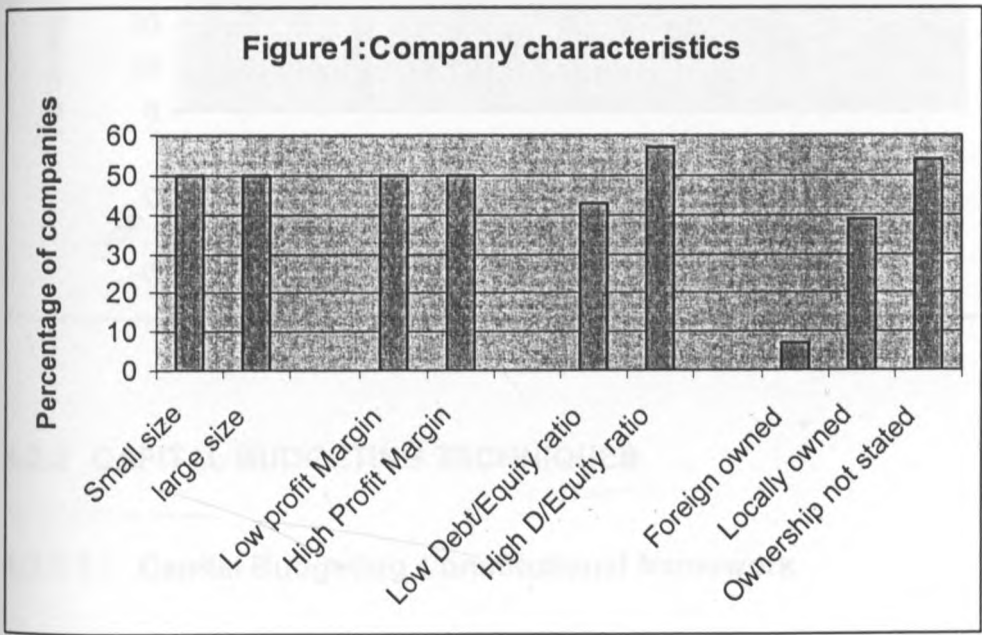
Table 1: Distribution of responses by industry

Industry	Frequency	Percent
Finance and Investments	9	32%
Commercial and services	8	29%
Industrial and Allied	6	21%
Agriculture	5	18%
Total	28	100%

4.2 FINDINGS

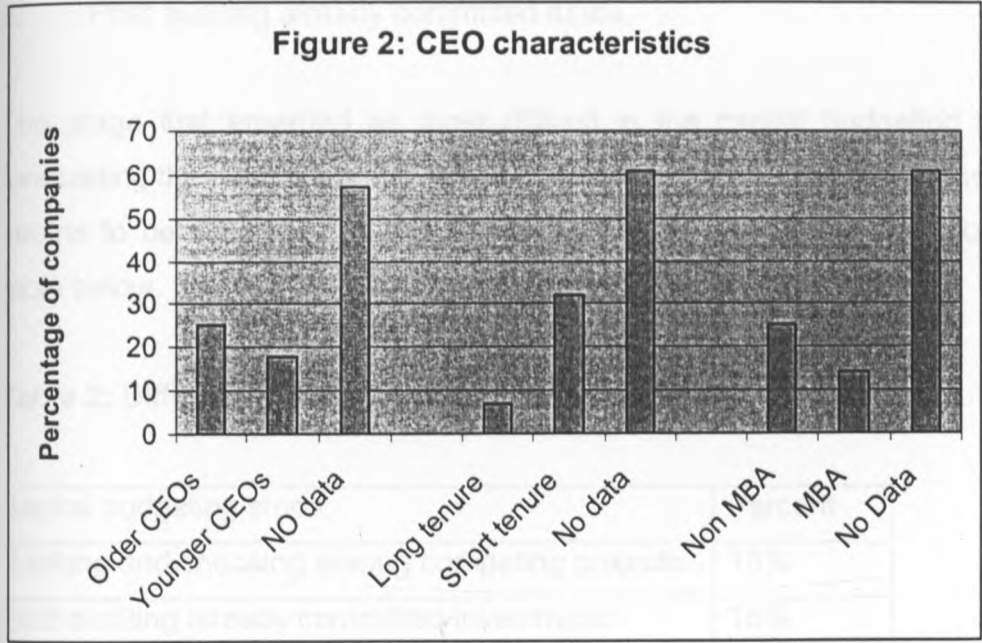
4.2.1 COMPANY AND CEO CHARACTERISTICS

Out of the 28 companies that responded, 50% were small in size, while 50% large in size; 50% had a low profit margin, while 50% had high profit margin; 43% had low debt-equity ratio, while 57% had high debt-equity ratio; 7% were foreign owned while 39% were locally owned, data on ownership of 54% of the companies could not be obtained. The data obtained on ownership of the companies was not sufficient enough to warrant further analysis, therefore analysis of capital budgeting techniques based on ownership structure of the firm was not carried out. These results are presented in the graph below.



25% of the companies had older CEOs while 18% had younger CEOs; Data on CEO age for 57% per cent of the companies could not be obtained; 7% of the companies had CEOs with long tenure, while 32% had CEOs with short tenure;

Data on CEO tenure for 61% of the companies could not be obtained; 25% of the companies had Non MBA CEOs while 14% had CEOs with MBA; Data on CEO education for 61% of the companies could not be obtained. Due to insufficient data on CEO characteristics, analysis of capital budgeting techniques based on CEO characteristics could not be carried out. These results are presented in the graph below.



4.2.2 CAPITAL BUDGETING TECHNIQUES

4.2.2.1 Capital Budgeting Constitutional framework

Most of the companies analyzed carry out their capital budgeting process in stages. 82% of the companies analyzed responded to yes on the question about whether or not they carry out their capital budgeting process in stages.

However, the capital budgeting process seems to follow various steps which are as varied as the responses received. From the results it can be generalized that, the companies capital budgeting processes follow the following steps:-

- 1. Ranking and choosing among competing projects
- 2. Estimating each projects cash flow
- 3. Forecasting the supply and cost of funds
- 4. Continuous and creative search for investment opportunities
- 5. Post auditing already committed funds.

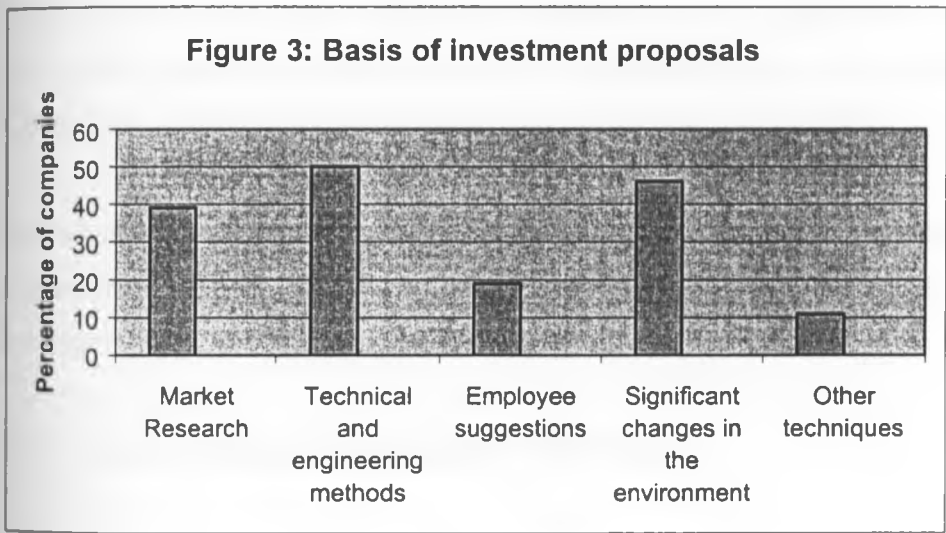
The stage that emerged as most difficult in the capital budgeting process is forecasting the supply and cost of funds for investment purposes. Generally there seems to be difficulties in all the stages of capital budgeting as shown on the table below.

Table 2: Difficulty among capital budgeting stages

Capital budgeting steps	Percent
Ranking and choosing among competing projects	15%
Post-auditing already committed investments	15%
Continuous and creative search for investment opportunities	20%
Estimating each projects cash flow and other benefits	20%
Forecasting the supply and cost of funds for investment purposes	25%
Other reasons	5%

82% of the companies indicated that they have a capital budgeting policy but only 32% had a capital budgeting manual.

Most companies base their investment proposals on the technical and engineering methods as well as on market research and to some extent on significant changes in the environment. Very few organizations use their employees suggestions as a basis for their investment proposal (only 18% of the companies use employee suggestions). Other techniques that came up on techniques for investment proposals include, use of investment companies and strategic plans. These results are shown on the graph below.



75% of the companies indicated that their capital investment proposals are generated by Executive Management. 42% indicated that their capital investment proposals are generated by Divisional Managers. There is minimal use of Budget Committees since only 7% of the companies indicated that their capital investment proposals are originated by this group of people. Other people

indicated as originating investment proposals include operating staff, the board of directors and heads of departments.

Majority of the organizations capital budgeting decision making seem to start with the operating staff, followed by the divisional or plant managers, then the executive management, the Board of Directors and finally the Budget Committee.

61% of the respondents stated that size of the projects influence the capital budgeting techniques they use. Despite stating this most of the companies did not indicate the evaluation techniques used per each cash outlay. The cash outlay authorization levels follow the organizations' hierarchy. Capital investment proposals with low cash outlays are authorized at the organizations lower levels and as the amounts increase they are authorized higher up the hierarchy, with the highest authorization level being that of the board of directors.

Executive Management originates most expansion projects. Plant and Divisional managers originate most replacement proposals. And plant and divisional managers originate most renewal projects.

4.2.3 Capital budgeting evaluation techniques

Most companies use the payback period method to evaluate their investment projects as indicated by 31% frequency in usage. The use of NPV and IRR however, cannot be ignored (27% and 23% frequency in usage respectively). See the table below for the results on this analysis.

Table 3: Frequency of usage of capital budgeting evaluation techniques by industry.

	Agriculture	Commercial and Services	Finance and Investment	Industrial and Allied	Total
Net Present value	8%	12%	4%	4%	27%
Internal Rate of Return	8%	4%	8%	4%	23%
Accounting rate of Return	8%	0%	0%	0%	8%
Payback Period	8%	0%	8%	8%	31%
Other methods	0%	8%	4%	0%	12%

Most companies use cost of specific source of funds to determine their discount rate. The next popular method of determining project discount rate is management determined target rates of return. See the table below.

Table 4: Frequency of usage of cost of capital determination techniques by industry.

	Agriculture	Commercial and services	Finance and Investment	Industrial and Allied	Total
Cost of specific source of funds	0%	13%	7%	13%	33%
Weighted Average Cost of Capital	0%	0%	7%	0%	7%
Project Specific discount rate	0%	7%	7%	0%	13%
Company historical rates of return	0%	7%	0%	7%	13%
Industry historical rate of return	0%	7%	0%	7%	13%
Management determined target rate of return	0%	13%	0%	7%	20%
other methods	0%	0%	0%	0%	0%

The most popular method of risk adjustment is sensitivity analysis followed by risk adjusted discount rate. See the table below.

Table 5: Frequency of usage of risk adjustment methods by industry.

	Agriculture	Commercial and services	Finance and Investment	Industrial and Allied	Total
Risk adjusted discount rate	0%	12%	12%	0%	24%
Changing the payback period	0%	12%	0%	6%	18%
Adjusting cash flow	0%	12%	6%	0%	18%
Sensitivity analysis	0%	12%	6%	12%	29%
Simulation analysis	0%	6%	6%	0%	12%
Other	0%	0%	0%	0%	0%

79% of the respondents adjust for either tax or inflation or both tax and inflation in their project cash flows.

68% of the respondents are familiar with the CAPM but only 25% apply CAPM in their capital budgeting process.

4.2.4 Post-auditing completed projects

Most of the organizations (68% of the respondents) review/monitor implemented projects on a continuous basis. See the table below.

Table 6: Frequency of review/monitoring of implemented projects

Frequency	Percent of companies
Not at all	4%
On a continuous basis	68%
At regular intervals	25%
Once	4%
Total	100%

Most of the implemented projects are reviewed by executive management.

4.2.5 Other aspects of capital budgeting

71% of the respondents indicated that their companies consider the capital budgeting process a strategy for achieving competitive advantage over their competitors.

12% of the respondents indicated that they incorporate strategic decision making in their capital budgeting by structuring investment decisions to fully exploit economies of scale, 18% indicated that they do this by structuring investment projects to create a position in the industry, 24% by structuring investment projects to achieve the lowest delivered cost position in the industry, 35% by investments devoted to gaining better product distribution and 11% mentioned other methods such as assessing technological impact of investment projects.

The companies indicated that they faced the following difficulties in capital budgeting process:

- ▣ Estimating cash flows
- ▣ Determining the discount rate
- ▣ Incorporating risk
- ▣ Adjusting for inflation
- ▣ Creating time for investment search activities

Other difficulties mentioned include, funds limitations, uncertainty, project prioritization, market changes, competition, and unanticipated events such as the September 11th terrorist attack.

The most challenging of these difficulties is incorporating risk followed by estimating cash flows.

4.2.6 Capital budgeting techniques versus company, CEO and project characteristics

4.2.6.1 Analysis by company characteristics

It is observed that companies in the Agricultural sector use NPV, IRR, ARR and Payback Period methods of evaluating investment proposals almost equally likely. Companies in the Commercial and Services industry mostly use NPV. While those in the Financial and Investment sector mostly use IRR and Payback period method. Companies in the Industrial and Allied sector use pay back period method. See table 3 above for the results of this analysis.

Small companies use IRR and Payback period methods while large companies use NPV and pay back period method.

Companies with low Net profit Margin use ARR and Payback while those with high Net profit Margin use NPV, IRR and Payback period methods.

Companies with low Debt/Equity ratio use Payback period method while those with high Debt/Equity ratio use NPV and payback period methods.

Companies in the agricultural sector did not indicate how they determine project discount rate. Commercial and services sector mostly uses cost of specific source of funds and management determined target rate of return. Companies in the Finance and Investment sector almost equally use cost of specific source of funds, Weighted Average Cost of Capital and Project specific discount rate to determine project discount rate. Companies in the Industrial and Allied sector mostly use Cost of a specific source of funds. See table 4 above for the results of this analysis.

Small as well as large companies mostly use cost of specific source of funds to determine project discount rate.

Companies with low Net Profit Margin mostly use cost of specific source of funds and management determined target rate of return to determine project discount rate, while those with high Net Profit Margin use cost of specific source of funds.

Companies with low Debt/Equity ratio mostly equally use cost of specific source of funds, Weighted Average Cost of Capital, Project specific discount rate and management determined target rate of return to determine project discount rates. Companies in high Debt/Equity ration mostly use cost of specific source of funds.

Companies in the Agricultural sector did not indicate how they analyze risk. In the Commercial and Services Sector, companies mostly use risk-adjusted discount rate, changing the payback period, adjusting cash flow and sensitivity analysis. Those in the Financial and Investment sector mostly use risk-adjusted discount rate. Those in the Industrial and Allied sector mostly use sensitivity analysis. The results of this analysis are shown in table 5 above.

Small companies mostly use Risk adjusted discount rate, adjusted cash flow and sensitivity analysis to incorporate risk, while large companies mostly use sensitivity analysis.

Companies with low Net Profit Margin mostly use changing payback period and sensitivity analysis while those with high Net profit Margin use risk-adjusted discount rate.

Companies with low Debt/Equity ratio mostly use Risk adjusted discount rate, adjusting cash flow and sensitivity analysis to incorporate risk. Those with high Net profit margin mostly use changing payback period and sensitivity analysis.

Analysis by company ownership structure was not carried out, as the data obtained was not sufficient enough for a meaningful analysis to be done.

4.2.6.2 Analysis by project type and project size.

For all the projects whether new, replacement or expansion companies mostly use NPV and Payback period methods. Project evaluation criteria therefore do not seem to vary with project type. The same case applies to project size. The difference of use of a particular technique by project size was very small.

4.2.6.3 Analysis by CEO characteristics

Analysis by CEO characteristics was not carried out, as the data obtained was not sufficient enough for meaningful analysis to be done.

4.2.6.4 Chi-square test

To enable the chi-square test to be performed, the following hypothesis was formulated;

Null Hypothesis: That the capital budgeting techniques applied are independent of the company and project characteristics.

When chi-square test was performed at 5% level of significance to determine whether there was any relation between the firm and project characteristics and the budgeting techniques used, the result was the acceptance of the null hypothesis that there was no relationship. Therefore, at 5% level of significance, there is no meaningful relationship that can be drawn between the techniques used as observed above and the firm and project characteristics. The results of the chi-square test are attached as appendix XI.

4.3 DISCUSSIONS OF FINDINGS

4.3.1 Capital Budgeting Constitutional framework

There does not seem to be a logical flow in the way the companies carry out their capital budgeting process. From the steps indicated, it seems that more emphasis is being placed on Ranking and Choosing among competing projects rather than on the other areas of capital budgeting. The continuous and creative search for investment opportunities is misplaced in the ranking, implies that the companies may not really be engaging in this activity. This confirms Haynes and Solomon's (1962) argument that organizations are not really paying much attention to the first stages of the capital budgeting process, particularly the continuous and creative search for investment activities. Ideally the steps that capital budgeting should follow are as follow:

1. Continuous and creative search for investment opportunities;
2. Forecasting the supply and cost of funds for investment purposes;
3. Estimating each project's cash flows and other benefits;
4. Ranking and choosing among competing projects;
5. Post-auditing already committed investments.

The fact that most of the companies do not have a capital budgeting manual could be one of the reasons why the organizations do not have a logical flow in their capital budgeting process. There does not exist a manual to guide them through the process.

The difficulties faced by companies analyzed in their capital budgeting process confirms the results of Bertoneche's (1975) study that the most difficulties faced by companies in their capital budgeting process is project definition, cash flow estimation and project implementation and review.

The capital budgeting decision process amongst the companies analyzed follow a bottoms-up approach. This was also confirmed by a study done by Petty and Scott (1980). The capital budgeting decision making process shows a logical flow of decisions. However, the ranking of the budget committee seems misplaced, an indication of the limited use of budget committees by companies.

4.3.2 Capital budgeting evaluation techniques

The findings that most companies use payback period method to evaluate investment projects, is consistent with Solomon (1962) findings that most companies do not use the theoretically correct methods of evaluation. However, the use of NPV and IRR by these companies confirm Petty and Scott (1980), Graham and Harvey (2001) and Ross (1986) findings that companies are beginning to use these methods of evaluation.

The finding that companies use cost of specific source of funds and management determined target rates of return to determine project discount rates is contrary to findings by Graham and Harvey (2001) that companies use a single company-wide discount rate to evaluate investment projects.

The fact that most companies adjust for risk in their capital budgeting evaluation is a good indication, but the question that lingers is how the risk methods stated by the companies are applied.

The results on the adjustment of tax and inflation is consistent with the capital budgeting theory. The capital budgeting theory advocates for the adjustment of the cash flow to take account of tax and inflation effects.

Contrary to Graham and Harvey (2001) findings that there is increased use of CAPM by companies, the companies analyzed generally do not apply CAPM in their Capital budgeting process. This may be due to limited knowledge by organizations on the application of the CAPM model or it may be too complex to apply and therefore deliberately ignored.

4.3.3 Post-auditing completed projects

Post auditing of already implement projects is not ignored by the companies analyzed contrary to what is stated in the literature that this stage is often overlooked.

Contrary to the argument by Bertoneche (1975) that the strategic aspect of capital budgeting is often ignored, the companies analyzed do consider the strategic aspects of capital budgeting.

The fact that incorporating risk turned out to be the most difficult aspect of capital budgeting aligns quite well with other findings such as those of Petty and Scott (1980).

4.3.4 Capital budgeting techniques versus company, CEO and project characteristics

The findings by Graham and Harvey (2001) that firm, CEO characteristics and project characteristics affect the capital budgeting techniques used by organizations could not be confirmed by the results of similar analysis in this study. The chi-square test carried out to test whether there existed any relationship between the observed capital budgeting techniques and firm and project characteristics indicated that no relationship existed. Therefore the results are just observations and no conclusions can be drawn from the observations.

5 CHAPTER FIVE

5.0 SUMMARY AND CONCLUSIONS

5.1 CONCLUSIONS AND IMPLICATIONS

This study to set out to achieve the following objectives:

1. To determine the Capital Budgeting techniques used in investment appraisal decisions amongst companies listed at the Nairobi Stock Exchange.
2. To determine how firm and CEO characteristics influence the use of a particular technique.

Regarding the first objective, this study affords the following conclusions. Firstly, companies listed at the Nairobi Stock Exchange to some extent ignore the first stages of capital budgeting more so continuous and creative search for investment opportunities, use of budget committees and employee suggestions in their capital budgeting process. The capital budgeting process of these companies do not seem to follow a logical flow and most emphasis is placed on ranking and choosing among competing projects. This implies that these companies may not have sufficient information upon which to base their investment proposals. Without sufficient information, the wrong projects may end up being selected. Therefore companies need to put more emphasis on the first stages of capital budgeting.

Secondly, the greatest difficulty that these companies face in their capital budgeting process is incorporating risk. However, for the companies that seem to incorporate risk analysis in their capital budgeting process, the right techniques seem to be used. Capital budgeting is all about making decisions in the face of uncertainty and without incorporating risk the companies may not end up maximizing returns on their investment projects. Risk is an important aspect of

capital budgeting and companies should continue finding better ways of dealing with it.

Thirdly, the most popular method of investment appraisal used by these companies is the Payback Period method. To some extent these companies also use NPV and IRR methods of investment appraisal. The assumption put forward that discounted cash flow techniques are more frequently used than non-discounted cash flow techniques by companies listed at the Nairobi Stock Exchange cannot therefore be upheld. The use of theoretically incorrect methods of investment appraisal implies that the companies may not be making optimal investment decisions. The companies therefore, need to adopt more refined techniques of investment appraisal.

Fourthly, most of the companies use cost of specific source of funds and management determined target rate of return to determine project discount rates. This implies that for one reason or another, managers seem to prefer simpler and direct methods of calculating discount rates to sophisticated techniques - Perhaps due to time constraint or limited knowledge in the subject. This further implies that investment projects selected by these companies may not necessarily end up with an increase in shareholders' wealth. Therefore for companies to maximize shareholders' wealth, the minimum risk adjusted discount rate that they can use is the Weighted Average Cost of Capital. But ideally companies should use project specific discount rate in investment appraisal.

Lastly these companies engage in post –auditing of completed projects activities and do consider strategic aspects of capital budgeting.

Regarding the second objective, it cannot be concluded that firm, CEO, and project characteristics do affect the capital budgeting techniques used. Neither

can we conclude otherwise. The fact that the chi-square test did not confirm the existence of a relationship could have been caused by lack of sufficient data to draw meaningful conclusions, since not all the parts of the data sheet were filled correctly by all the companies. The assumption that firm characteristics, CEO characteristics and project characteristics influence the type of capital budgeting techniques used by companies listed at the Nairobi Stock Exchange cannot therefore be upheld.

5.2 SUGGESTIONS FOR FURTHER RESEARCH

The results of this study are only conclusive in as far as the data collected and analyzed for this study is concerned, therefore there is still room for further research in this area.

More conclusive results would be reached if further research can be done on the evaluation criteria versus company characteristics, this time involving a wider population than just companies listed at the Nairobi Stock Exchange.

More investigations can be carried out to find out whether the capital budgeting techniques reported to be used by these companies are actually being applied correctly, especially the application of the risk adjustment methods such as sensitivity and risk adjusted discount rates.

Finally it is worth investigating in more detail, the strategic aspect of capital budgeting, as the concept is wide and the coverage given in this study may not be sufficient enough to cover the whole aspect.

APPENDIX I

COMPANIES LISTED AT THE NAIROBI STOCK EXCHANGE AT 31 JULY 2002

AGRICULTURAL SECTOR

- 1 Brooke Bond Limited
- 2 Eaagads Ltd
- 3 George Williamson Kenya Ltd
- 4 Kakuzi
- 5 Kapchorua Tea Co. Ltd
- 6 Limuru Tea Co. Ltd
- 7 Rea Vipingo Plantations Ltd
- 8 Sasini Tea & Coffee Ltd

COMMERCIAL AND SERVICES SECTOR

- 9 Africa Lakes Corporation
- 10 A. Bauman & Co. Ltd
- 11 CMC Holdings Ltd
- 12 Car & General (K) Ltd
- 13 Express Ltd
- 14 Hutchings Biermer Ltd
- 15 Kenya Airways Ltd
- 16 Marshalls (E.A) Ltd
- 17 Nation Media Group
- 18 TPS Serena Ltd
- 19 Tourism Promotions Services Ltd
- 20 Standard Newspapers Group
- 21 Uchumi Supermarket Ltd

FINANCE AND INVESTMENT SECTOR

- 22 Barclays Bank Ltd
- 23 City Trust Ltd
- 24 C.F.C Bank Ltd
- 25 Diamond Trust Bank Kenya Ltd
- 26 I.C.D.C Investments Co. Ltd
- 27 Housing Finance Co. Ltd
- 28 Jubilee Insurance Co. Ltd
- 29 Kenya Commercial Bank Ltd
- 30 National Bank of Kenya Ltd
- 31 National Industrial Credit Ltd
- 32 Pan Africa Insurance Ltd
- 33 Standard Chartered Bank Ltd
- 34 Regent Undervalued Assets
- 35 Chancery Investments

INDUSTRIAL AND ALLIED SECTOR

- 36 Athi River Mining
- 37 British American Tobacco Kenya Ltd
- 38 Bamburi Cement Ltd
- 39 B.O.C Kenya Ltd
- 40 Carbacid Investments Ltd
- 41 Crown Berger Ltd
- 42 Dunlop Kenya
- 43 E.A Cables Ltd
- 44 E.A. Packaging Ltd
- 45 E.A. Portland Cement Ltd
- 46 East African Breweries Ltd
- 47 Firestone East Africa Ltd
- 48 Kenya National Mills Ltd
- 49 Kenya Oil Co. Ltd
- 50 Kenya Orchards Ltd
- 51 Kenya Power & Lighting Ltd
- 52 Total Kenya Ltd
- 53 Unga Group Ltd
- 54 Mumias Sugar Company

Source: Nairobi Stock Exchange August 2002

APPENDIX II

LIST OF COMPANIES ANALYZED IN THE STUDY

- 1 Brooke Bond Limited
- 2 Eaagads Ltd
- 3 George Williamson Kenya Ltd
- 4 Kakuzi
- 5 Kapchorua Tea Co. Ltd
- 6 Limuru Tea Co. Ltd
- 7 Rea Vipingo Plantations Ltd
- 8 Sasini Tea & Coffee Ltd
- 9 CMC Holdings Ltd
- 10 Express Ltd
- 11 Kenya Airways Ltd
- 12 Marshalls (E.A) Ltd
- 13 Nation Media Group
- 14 Standard Newspapers Group
- 15 Uchumi Supermarket Ltd
- 16 Barclays Bank Ltd
- 17 City Trust Ltd
- 18 C.F.C Bank Ltd
- 19 Diamond Trust Bank Kenya Ltd
- 20 I.C.D.C Investments Co. Ltd
- 21 Housing Finance Co. Ltd
- 22 Jubilee Insurance Co. Ltd
- 23 Kenya Commercial Bank Ltd
- 24 National Bank of Kenya Ltd
- 25 National Industrial Credit Ltd
- 26 Standard Chartered Bank Ltd
- 27 Athi River Mining
- 28 British American Tobacco Kenya Ltd
- 29 Bamburi Cement Ltd
- 30 B.O.C Kenya Ltd
- 31 Carbacid Investments Ltd
- 32 Crown Berger Ltd
- 33 E.A Cables Ltd
- 34 E.A. Packaging Ltd
- 35 E.A. Portland Cement Ltd
- 36 East African Breweries Ltd
- 37 Firestone East Africa Ltd

- 38 Kenya National Mills Ltd
- 39 Kenya Oil Co. Ltd
- 40 Kenya Power & Lighting Ltd
- 41 Total Kenya Ltd
- 42 Unga Group Ltd
- 43 Mumias Sugar Company



UNIVERSITY OF NAIROBI
FACULTY OF COMMERCE

Telephone: 732160 Ext. 215
 Telegrams: "Varsity", Nairobi
 Telex: 22095 Varsity
 E-mail: commerce @ nbnet.co.ke

P.O. Box 30197
 Nairobi, Kenya

September 4, 2002

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Dear Sir or Madam:

**RE: A SURVEY OF CAPITAL BUDGETING TECHNIQUES USED BY
 COMPANIES LISTED AT THE NAIROBI STOCK EXCHANGE:**

Capital budgeting decisions have long term effects and require heavy capital commitments, making them some of the most important decisions in an organization. Many capital investment projects are not easily reversible and place the company on new paths leading to long-run survival or ultimate failure. This project undertakes to determine the capital budgeting techniques applied by companies listed at the Nairobi Stock Exchange with an aim of shedding light on the most appropriate techniques to apply in order to maximize shareholders' wealth.

Your opinion is very important in achieving the objectives of this study which is a part of the requirements for the degree of Masters of Business Administration (M.B.A) of the University of Nairobi.

We would be very grateful if you would spend sometime to give candid responses to the questions and statements in the questionnaire as well as to fill the data collection sheet attached. Your responses will be used in aggregate and treated in strict confidence. Individual responses will not be discussed or disclosed.

At your request, the results of the study will be sent to you. We shall appreciate your cooperation in the conduct of this survey by completing the questionnaire and the data collection sheet on or before September 20th, 2002.

Yours faithfully,

ESTHER A. KADONDI
 M.B.A. STUDENT





UNIVERSITY OF NAIROBI
FACULTY OF COMMERCE

Telephone: 732160 Ext. 215
 Telegrams: "Varsity", Nairobi
 Telex: 22095 Varsity
 E-mail: commerce@nbnet.co.ke
 September 4, 2002

P.O. Box 30197
 Nairobi, Kenya

.....

Dear Sir or Madam:

**RE: A SURVEY OF CAPITAL BUDGETING TECHNIQUES USED BY
 COMPANIES LISTED AT THE NAIROBI STOCK EXCHANGE:**

Capital budgeting decisions have long term effects and require heavy capital commitments, making them some of the most important decisions in an organization. Many capital investment projects are not easily reversible and place the company on new paths leading to long-run survival or ultimate failure. This project undertakes to determine the capital budgeting techniques applied by companies listed at the Nairobi Stock Exchange with an aim of shedding light on the most appropriate techniques to apply in order to maximize shareholders' wealth.

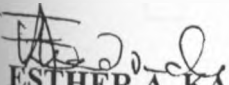
Your opinion is very important in achieving the objectives of this study which is a part of the requirements for the degree of Masters of Business Administration (M.B.A) of the University of Nairobi.

We would be very grateful if you would spend sometime to give candid responses to the questions and statements in the questionnaire as well as to fill the data collection sheet attached. Your responses will be used in aggregate and treated in strict confidence. Individual responses will not be discussed or disclosed.

At your request, the results of the study will be sent to you. Enclosed find a reply -paid envelope in which you are kindly requested to return the completed questionnaire and data collection sheet.

We shall appreciate your cooperation in the conduct of this survey by sending them to us on or before September 20th, 2002.

Yours faithfully,


ESTHER A. KADONDI
 M.B.A. STUDENT



APPENDIX V

The purpose of this questionnaire is to assess the extent of use of Capital Budgeting Techniques by corporations in Kenya.

Your assistance in providing this information, which will be kept confidential, is appreciated. It is part of a University of Nairobi postgraduate management research project.

1. Name of Company: _____
2. Position Held: _____
3. Do you carry out your capital budgeting process in stages?
Yes ☐ No ☐
4. If yes to (3) above rank the following stages of capital budgeting in the order in which you apply them.

☐ Ranking and choosing among competing projects

☐ Post-auditing already committed investments

☐ Continuous and creative search for investment opportunities

☐ Estimating each projects cash flow and other benefits

☐ Forecasting the supply and cost of funds for investment purposes

☐ Other (please specify) _____

5. Which stage (in 4 above) do you consider most difficult?

6. Do you have a capital budgeting policy? ☐ YES ☐ NO

7. Do you have a capital budgeting manual? YES ☐ NO ☐

8. Tick the technique(s) on which you base your investment proposals.

- ☐ Market Research
- ☐ Technical and engineering methods
- ☐ Employee suggestions
- ☐ Significant changes in the environment
- ☐ Other (please specify)

9. Tick below the people who originate your capital budgeting proposals.

- ☐ Executive management
- ☐ Budget committee
- ☐ Plant / Divisional managers
- ☐ Operating personnel
- ☐ Other (specify) _____

10. Rank the following levels in the order in which your capital decision process follows.

- ☐ Executive management
- ☐ Budget committee
- ☐ Board of Directors
- ☐ Divisional / plant managers
- ☐ Operating staff

11. Does size of project influence your capital budgeting techniques?

- ☐ Yes ☐ No

12. If yes to (11) above, Indicate below, the cash outlay limits the authorization level and the project appraisal technique (e.g. Net Present Value, Internal Rate of Return, Accounting Rate of Return, Payback period method) used by your organization.

Cash outlay limit	Highest authorization level	Project appraisal technique

13. Indicate below, the project type, the originator and the project appraisal technique used by your organization.

Project type	Originator (<i>refer to (9) above</i>)	Project appraisal technique
Expansion		
Replacement		
Renewal		
Other (specify)		

14. Tick if you adjust the following factors in your project cash flows

☐ Tax

☐ Inflation

15. Are you familiar with the Capital Assets Pricing Model (CAPM)?

☐ Yes ☐ No

16. Do you apply CAPM in your capital budgeting process?

☐ Yes ☐ No

17. Indicate how often you review/monitor implemented projects

☐ Not at all

☐ On a continuous basis

☐ At regular intervals

☐ Once

18. Who reviews implemented projects?

☐ Executive management

☐ Budget committee

☐ Plant/ division managers

☐ Operating staff

19. Do you consider your capital budgeting process as strategy for achieving competitive advantage over your competitors?

☐ Yes ☐ No

20. If yes to (19) above, state how you incorporate strategic decision making concept in your capital budgeting process

21. Tick the difficulties your organization faces in its capital budgeting process.

- ☐ Estimating cash flows
☐ Determining the discount rate
☐ Incorporating risk
☐ Adjusting for inflation
☐ Creating time for investment search activities
☐ Others (specify) _____

22. Of the difficulties listed in (21) above, which one do you consider most challenging?

Thank you very much for your co-operation.

APPENDIX VI

DATA COLLECTION SHEET 1

Company _____

Fill columns (i), (ii), (iii), (iv), (v) and (vi) with the appropriate information regarding the capital expenditure of your organization according to the year when the expenditure was incurred.

Year	Total Capital Expenditure (Ksh)	No. of separate capital expenditure decisions	Type of expenditure (new, replacement, expansion, other (specify))	Methods of appraisal (NPV, IRR, ART, PB, other (specify))	Cost of capital determination (A, B, C, D, E, F or G)	Method of risk adjustment (K, L, M, N, O, P)
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
1997						
1998						
1999						
2000						
2001						

Key

NPV – Net Present Value

IRR – Internal Rate of Return

ART – Accounting Rate of Return

PB – Payback method

K- Risk adjusted discount rate

L- Changing the payback period

M- Adjusting cash flow

N- Sensitivity analysis

O- Simulation analysis

P- Other (specify)

A- Cost of a specific source of funds

B- Weighted Average Cost of Capital

C- Project specific discount rate

D- Company historical rates of return

E- Industry historical rates of return

F- Management determined target rate of return

G- Other (specify)

APPENDIX VII

DATA COLLECTION SHEET 2

Company _____

Industry _____

Percentage owned by foreign company (ies) _____

Figures in Kenya Shillings

	2001	2000	1999	1998	1997
Market capitalization					
Net Profit Margin					
Debt/equity ratio					

CEO age	
CEO Tenure	
CEO level of education	

APPENDIX VIII

RESULTS OF THE SPSS ANALYSIS

Frequencies Frequency Table

Position Held:

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	7.1	7.1	7.1
Accountant	4	14.3	14.3	21.4
Admin Manager	1	3.6	3.6	25.0
Chief Accountant	1	3.6	3.6	28.6
Company secretary	1	3.6	3.6	32.1
Cost Accountant	2	7.1	7.1	39.3
Financial controller	1	3.6	3.6	42.9
G.I.A	1	3.6	3.6	46.4
Group Accountant	1	3.6	3.6	50.0
Group Financial controller	1	3.6	3.6	53.6
Group management Accountant	1	3.6	3.6	57.1
Investment Manager	1	3.6	3.6	60.7
Management Accountant	1	3.6	3.6	64.3
Management Information manager	1	3.6	3.6	67.9
Manager Accounts	1	3.6	3.6	71.4
MGT Accountant	2	7.1	7.1	78.6
New Business Head	1	3.6	3.6	82.1
Planning Accountant	1	3.6	3.6	85.7
Regional Controller	2	7.1	7.1	92.9
Senior Manager Finance	1	3.6	3.6	96.4
Unit Leader-Finance	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Do you carry out your capital budgeting process in stages?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	23	82.1	82.1	82.1
No	5	17.9	17.9	100.0
Total	28	100.0	100.0	

The rank of Ranking and choosing among competing projects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	25.0	31.8	31.8
	2	4	14.3	18.2	50.0
	3	4	14.3	18.2	68.2
	4	6	21.4	27.3	95.5
	5	1	3.6	4.5	100.0
	Total	22	78.6	100.0	
Missing	System	6	21.4		
Total		28	100.0		

The rank of Postauditing already committed investments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	21.4	31.6	31.6
	2	3	10.7	15.8	47.4
	3	1	3.6	5.3	52.6
	4	2	7.1	10.5	63.2
	5	6	21.4	31.6	94.7
	6	1	3.6	5.3	100.0
	Total	19	67.9	100.0	
Missing	System	9	32.1		
Total		28	100.0		

The rank of Continuous and creative search for investment opportunities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	17.9	26.3	26.3
	2	5	17.9	26.3	52.6
	4	5	17.9	26.3	78.9
	5	4	14.3	21.1	100.0
	Total	19	67.9	100.0	
Missing	System	9	32.1		
Total		28	100.0		

The rank of Estimating each projects cash flow and other benefits

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	17.9	22.7	22.7
	2	6	21.4	27.3	50.0
	3	7	25.0	31.8	81.8
	4	2	7.1	9.1	90.9
	5	2	7.1	9.1	100.0
	Total	22	78.6	100.0	
Missing	System	6	21.4		
Total		28	100.0		

The rank of Forecasting the supply and cost of funds for investment purposes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	10.7	14.3	14.3
	2	2	7.1	9.5	23.8
	3	7	25.0	33.3	57.1
	4	4	14.3	19.0	76.2
	5	5	17.9	23.8	100.0
	Total	21	75.0	100.0	
Missing	System	7	25.0		
Total		28	100.0		

The rank of Other please specify

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1	3.6	100.0	100.0
Missing	System	27	96.4		
Total		28	100.0		

Which stage in 4 above do you consider most difficult?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ranking and choosing among competing projects	3	10.7	15.0	15.0
	Postauditing already committed investments	3	10.7	15.0	30.0
	Continuous and creative search for investment opportunities	4	14.3	20.0	50.0
	Estimating each projects cash flow and other benefits	4	14.3	20.0	70.0
	Forecasting the supply and cost of funds for investment purp	5	17.9	25.0	95.0
	Other please	1	3.6	5.0	100.0
	Total	20	71.4	100.0	
Missing	System	8	28.6		
Total		28	100.0		

Do you have a capital budgeting policy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	82.1	82.1	82.1
	No	5	17.9	17.9	100.0
	Total	28	100.0	100.0	

Do you have a capital budgeting manual?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	9	32.1	32.1	32.1
	No	19	67.9	67.9	100.0
	Total	28	100.0	100.0	

Do you base your investment proposals on Market Research

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	11	39.3	100.0	100.0
Missing	System	17	60.7		
Total		28	100.0		

Do you base your investment proposals on Technical and engineering methods

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	14	50.0	100.0	100.0
Missing System	14	50.0		
Total	28	100.0		

Do you base your investment proposals on Employee suggestions

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	5	17.9	100.0	100.0
Missing System	23	82.1		
Total	28	100.0		

Do you base your investment proposals on Significant changes in the environment

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	13	46.4	100.0	100.0
Missing System	15	53.6		
Total	28	100.0		

Do you base your investment proposals on Other techniques

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	3	10.7	75.0	75.0
5	1	3.6	25.0	100.0
Total	4	14.3	100.0	
Missing System	24	85.7		
Total	28	100.0		

Do Executive management originate your capital budgeting proposals

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	21	75.0	100.0	100.0
Missing System	7	25.0		
Total	28	100.0		

Do Budget committee originate your capital budgeting proposals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	2	7.1	100.0	100.0
Missing	System	26	92.9		
Total		28	100.0		

Do Plant - Divisional managers originate your capital budgeting proposals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	42.9	100.0	100.0
Missing	System	16	57.1		
Total		28	100.0		

Do Operating personnel originate your capital budgeting proposals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	10	35.7	100.0	100.0
Missing	System	18	64.3		
Total		28	100.0		

Do Other originate your capital budgeting proposals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	10.7	100.0	100.0
Missing	System	25	89.3		
Total		28	100.0		

How do you rank Executive management in which your capital decision process follows

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	14.3	16.0	16.0
	2	5	17.9	20.0	36.0
	3	12	42.9	48.0	84.0
	4	4	14.3	16.0	100.0
	Total	25	89.3	100.0	
Missing	System	3	10.7		
Total		28	100.0		

How do you rank Budget committee in which your capital decision process follows

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	6	21.4	31.6	31.6
	3	8	28.6	42.1	73.7
	4	4	14.3	21.1	94.7
	5	1	3.6	5.3	100.0
	Total	19	67.9	100.0	
Missing	System	9	32.1		
Total		28	100.0		

How do you rank Board of Directors in which your capital decision process follows

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	28.6	28.6	28.6
	2	2	7.1	7.1	35.7
	3	4	14.3	14.3	50.0
	4	6	21.4	21.4	71.4
	5	8	28.6	28.6	100.0
	Total	28	100.0	100.0	

How do you rank Divisional - plant managers in which your capital decision process follows

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	21.4	27.3	27.3
	2	10	35.7	45.5	72.7
	4	6	21.4	27.3	100.0
	Total	22	78.6	100.0	
Missing	System	6	21.4		
Total		28	100.0		

How do you rank Operating staff in which your capital decision process follows

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	39.3	64.7	64.7
	5	6	21.4	35.3	100.0
	Total	17	60.7	100.0	
Missing	System	11	39.3		
Total		28	100.0		

Does size of project influence your capital budgeting techniques?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	17	60.7	60.7	60.7
No	11	39.3	39.3	100.0
Total	28	100.0	100.0	

Cash outlay limit

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19	67.9	67.9	67.9
25000	1	3.6	3.6	71.4
5 Million	1	3.6	3.6	75.0
5000000	1	3.6	3.6	78.6
Above 1 Million	1	3.6	3.6	82.1
All limits	1	3.6	3.6	85.7
Less 1,000,000	1	3.6	3.6	89.3
New property	1	3.6	3.6	92.9
over 2,000,000	1	3.6	3.6	96.4
upto 10,000,000	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Highest authorization level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18	64.3	64.3	64.3
Board	4	14.3	14.3	78.6
CEO	3	10.7	10.7	89.3
MD	1	3.6	3.6	92.9
MD Board directors	1	3.6	3.6	96.4
MD of subsidiaries	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Cash outlay limit

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	71.4	71.4	71.4
100000	1	3.6	3.6	75.0
30 Million	1	3.6	3.6	78.6
500,000-2,000,000	1	3.6	3.6	82.1
Major room rehab	1	3.6	3.6	85.7
More than 1,000,000	1	3.6	3.6	89.3
More than 5,000,000	1	3.6	3.6	92.9
upto 50, 000,000	1	3.6	3.6	96.4
upto 500,00	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Highest authorization level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	71.4	71.4	71.4
Board	3	10.7	10.7	82.1
CEO & FD	1	3.6	3.6	85.7
Chairman, One other director	1	3.6	3.6	89.3
Division Directors	1	3.6	3.6	92.9
Execute board	1	3.6	3.6	96.4
MD of subsidiaries	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Cash outlay limit

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22	78.6	78.6	78.6
100000	1	3.6	3.6	82.1
50,000-500,000	1	3.6	3.6	85.7
60 Million	1	3.6	3.6	89.3
Above 50,000,000	1	3.6	3.6	92.9
Major replacement & Additional items	1	3.6	3.6	96.4
upto 100,00	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Highest authorization level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22	78.6	78.6	78.6
Annual General meeting	1	3.6	3.6	82.1
Below 50,000	1	3.6	3.6	85.7
Board	2	7.1	7.1	92.9
Department heads	1	3.6	3.6	96.4
Group chief executive	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Cash outlay limit

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25	89.3	89.3	89.3
100 Million	1	3.6	3.6	92.9
Financial Controller	1	3.6	3.6	96.4
upto 4,000,000	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Highest authorization level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	26	92.9	92.9	92.9
Annual General meeting	1	3.6	3.6	96.4
Management committee	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Cash outlay limit

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	27	96.4	96.4	96.4
Over 4,000,000	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Highest authorization level

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	27	96.4	96.4	96.4
Board	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Originator of Expansion

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7	25.0	25.0	25.0
Board	1	3.6	3.6	28.6
CEO	1	3.6	3.6	32.1
Division Directors	1	3.6	3.6	35.7
Division Manager	1	3.6	3.6	39.3
Divisional Director	2	7.1	7.1	46.4
Executive Committee	1	3.6	3.6	50.0
Executive management	5	17.9	17.9	67.9
Executive Manager	1	3.6	3.6	71.4
Executive mgt	4	14.3	14.3	85.7
Executive Mgt	2	7.1	7.1	92.9
Plant Manager	1	3.6	3.6	96.4
User	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Originator of Replacement

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	12	42.9	42.9	42.9
Departmental Heads	1	3.6	3.6	46.4
Divisional	2	7.1	7.1	53.6
Divisional Director	2	7.1	7.1	60.7
Divisional Mgrs	4	14.3	14.3	75.0
Exec Mgt	1	3.6	3.6	78.6
Operating personal	1	3.6	3.6	82.1
Operating personnel	1	3.6	3.6	85.7
Plant Manager	1	3.6	3.6	89.3
Plant/Div Mgrs	2	7.1	7.1	96.4
Plant/Division Managers	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Originator of Renewal

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19	67.9	67.9	67.9
Budget committee	1	3.6	3.6	71.4
Departmental Heads	1	3.6	3.6	75.0
Divisional Mgrs	1	3.6	3.6	78.6
Exec Mgt	2	7.1	7.1	85.7
Executive Mgt	1	3.6	3.6	89.3
Plant/Division Managers	1	3.6	3.6	92.9
Senior managers	2	7.1	7.1	100.0
Total	28	100.0	100.0	

Originator of Other

	Frequency	Percent
Missing System	28	100.0

What factors do you adjust in your project cash flows

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Tax	5	17.9	22.7	22.7
Inflation	4	14.3	18.2	40.9
Both	13	46.4	59.1	100.0
Total	22	78.6	100.0	
Missing System	6	21.4		
Total	28	100.0		

Are you familiar with the Capital Assets Pricing Model CAPM?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	19	67.9	67.9	67.9
No	9	32.1	32.1	100.0
Total	28	100.0	100.0	

Do you apply CAPM in your capital budgeting process?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	7	25.0	25.9	25.9
No	20	71.4	74.1	100.0
Total	27	96.4	100.0	
Missing System	1	3.6		
Total	28	100.0		

Indicate how often you review-monitor Implemented projects

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	1	3.6	3.6	3.6
	On a continuous basis	19	67.9	67.9	71.4
	At regular intervals	7	25.0	25.0	96.4
	Once	1	3.6	3.6	100.0
	Total	28	100.0	100.0	

Do Executive management reviews implemented projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	23	82.1	100.0	100.0
Missing	System	5	17.9		
Total		28	100.0		

Do Budget committee reviews implemented projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	28.6	100.0	100.0
Missing	System	20	71.4		
Total		28	100.0		

Do Plant- division managers Who reviews implemented projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	28.6	100.0	100.0
Missing	System	20	71.4		
Total		28	100.0		

Do Operating staff Who reviews implemented projects?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	1	3.6	100.0	100.0
Missing	System	27	96.4		
Total		28	100.0		

Do you consider your capital budgeting process as strategy for achieving competitive advantage over your competitors?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	20	71.4	71.4	71.4
No	8	28.6	28.6	100.0
Total	28	100.0	100.0	

How you incorporate strategic decision making concept in your capital budgeting

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Structuring investment decisions to fully exploit economies	2	7.1	11.8	11.8
Structuring investment projects to create a position in the	3	10.7	17.6	29.4
Structuring investment projects to achieve the lowest delive	4	14.3	23.5	52.9
Investments devoted to gaining better product distribution	6	21.4	35.3	88.2
Others	2	7.1	11.8	100.0
Total	17	60.7	100.0	
Missing System	11	39.3		
Total	28	100.0		

Does your organization faces Estimating cash flows difficulties in its capital budgeting process

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	17	60.7	100.0	100.0
Missing System	11	39.3		
Total	28	100.0		

Does your organization faces Determining the discount rate difficulties in its capital budgeting process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	5	17.9	83.3	83.3
	No	1	3.6	16.7	100.0
	Total	6	21.4	100.0	
Missing	System	22	78.6		
Total		28	100.0		

Does your organization faces Incorporating risk difficulties in its capital budgeting process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	17	60.7	100.0	100.0
Missing	System	11	39.3		
Total		28	100.0		

Does your organization faces Adjusting for Inflation difficulties in its capital budgeting process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	10.7	100.0	100.0
Missing	System	25	89.3		
Total		28	100.0		

Does your organization faces Creating time for Investment search activities difficulties in its capital budgeting process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	25.0	100.0	100.0
Missing	System	21	75.0		
Total		28	100.0		

Does your organization faces Others difficulties in its capital budgeting process

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	2	7.1	100.0	100.0
Missing	System	26	92.9		
Total		28	100.0		

Of the difficulties listed in 21 above, which one do you consider most challenging?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Estimating cash flows difficulties in its capital budgeting	10	35.7	38.5	38.5
	Incorporating risk difficulties in its capital budgeting pro	11	39.3	42.3	80.8
	Adjusting for inflation difficulties in its capital budgetin	1	3.6	3.8	84.6
	Creating time for investment search activities difficulties	2	7.1	7.7	92.3
	Others	2	7.1	7.7	100.0
	Total	26	92.9	100.0	
Missing	System	2	7.1		
Total		28	100.0		

INDUSTRY

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Finance & Investments	9	32.1	32.1	32.1
	Commercial & services	8	28.6	28.6	60.7
	Industrial & Allied	6	21.4	21.4	82.1
	Agriculture	5	17.9	17.9	100.0
	Total	28	100.0	100.0	

SIZE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	14	50.0	50.0	50.0
	Large	14	50.0	50.0	100.0
	Total	28	100.0	100.0	

PROFIT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	14	50.0	50.0	50.0
	High	14	50.0	50.0	100.0
	Total	28	100.0	100.0	

DEBT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low	12	42.9	42.9	42.9
	High	16	57.1	57.1	100.0
	Total	28	100.0	100.0	

OWNER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Foreign	2	7.1	15.4	15.4
	Local	11	39.3	84.6	100.0
	Total	13	46.4	100.0	
Missing	System	15	53.6		
Total		28	100.0		

AGE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Older	7	25.0	58.3	58.3
	Young	5	17.9	41.7	100.0
	Total	12	42.9	100.0	
Missing	System	16	57.1		
Total		28	100.0		

TENURE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Long	2	7.1	18.2	18.2
	Short	9	32.1	81.8	100.0
	Total	11	39.3	100.0	
Missing	System	17	60.7		
Total		28	100.0		

EDUC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non MBA	7	25.0	63.6	63.6
	MBA	4	14.3	36.4	100.0
	Total	11	39.3	100.0	
Missing	System	17	60.7		
Total		28	100.0		

APPENDIX IX

GROUPING OF COMPANIES USING MARKET CAPITALIZATION

Company	Average 1997 - 2001 KSH'000'
1 City Trust Ltd	103,901
2 Express Ltd	126,384
3 E.A. Packaging Ltd	138,778
4 Limuru Tea Co. Ltd	159,280
5 Crown Berger Ltd	185,286
6 Eaagads Ltd	199,048
7 Standard Newspapers Group	207,123
8 Rea Vipingo Plantations Ltd	299,600
9 Marshalls (E.A) Ltd	324,513
10 E.A Cables Ltd	325,823
11 Athi River Mining	455,400
12 Kapchorua Tea Co. Ltd	471,005
13 Kenya Oil Co. Ltd	499,451
14 Carbacid Investments Ltd	522,730
15 Kenya National Mills Ltd	739,590
16 George Williamson Kenya Ltd	845,855
17 Jubilee Insurance Co. Ltd	866,700
18 B.O.C Kenya Ltd	1,090,490
19 Unga Group Ltd	1,090,809
20 Housing Finance Co. Ltd	1,180,820
21 National Bank of Kenya Ltd	1,286,000
22 E.A. Portland Cement Ltd	1,317,600
23 CMC Holdings Ltd	1,376,389
24 C.F.C Bank Ltd	1,396,200
25 Diamond Trust Bank Kenya Ltd	1,474,725
26 I.C.D.C Investments Co. Ltd	1,524,274
27 Kakuzi	1,626,800
28 Sasini Tea & Coffee Ltd	1,729,937
29 National Industrial Credit Ltd	2,138,664
30 Uchumi Supermarket Ltd	2,442,000
31 Total Kenya Ltd	2,690,091
32 Mumias Sugar Company	3,238,500
33 Kenya Airways Ltd	3,674,459

34 Firestone East Africa Ltd	3,688,966
35 Kenya Commercial Bank Ltd	4,876,212
36 Brooke Bond Limited	5,122,100
37 British American Tobacco Kenya Ltd	5,250,000
38 Kenya Power & Lighting Ltd	5,663,718
39 East African Breweries Ltd	6,265,209
40 Nation Media Group	7,385,557
41 Standard Chartered Bank Ltd	9,815,563
42 Bamburi Cement Ltd	10,790,266
43 Barclays Bank Ltd	15,629,051

Median **1,317,600**

Small Companies **Market capitalization below Ksh 1,317,600,000**

Large Companies **Market capitalization Ksh 1,317,600,000 and above**

GROUPING OF COMPANIES BY NET PROFIT MARGIN

Company	Average 1997 - 2001
1 National Bank of Kenya Ltd	-15%
2 Marshalls (E.A) Ltd	-7%
3 Unga Group Ltd	-5%
4 Kenya National Mills Ltd	-5%
5 Standard Newspapers Group	-2%
6 E.A. Packaging Ltd	-1%
7 Express Ltd	0%
8 Kenya Power & Lighting Ltd	1%
9 E.A. Portland Cement Ltd	2%
10 Total Kenya Ltd	2%
11 Rea Vipingo Plantations Ltd	2%
12 Housing Finance Co. Ltd	2%
13 Kenya Commercial Bank Ltd	2%
14 Mumias Sugar Company	2%
15 Crown Berger Ltd	3%

16 CMC Holdings Ltd	3%
17 Uchumi Supermarket Ltd	4%
18 Athi River Mining	4%
19 Brooke Bond Limited	5%
20 Kenya Oil Co. Ltd	6%
21 Kakuzi	6%
22 East African Breweries Ltd	8%
23 Kapchorua Tea Co. Ltd	8%
24 Sasini Tea & Coffee Ltd	8%
25 E.A Cables Ltd	9%
26 George Williamson Kenya Ltd	9%
27 Bamburi Cement Ltd	9%
28 British American Tobacco Kenya Ltd	10%
29 Diamond Trust Bank Kenya Ltd	10%
30 Nation Media Group	10%
31 Kenya Airways Ltd	10%
32 C.F.C Bank Ltd	12%
33 Eaagads Ltd	13%
34 B.O.C Kenya Ltd	14%
35 Firestone East Africa Ltd	15%
36 Limuru Tea Co. Ltd	19%
37 National Industrial Credit Ltd	22%
38 Barclays Bank Ltd	24%
39 Standard Chartered Bank Ltd	29%
40 Carbacid Investments Ltd	39%
41 Jubilee Insurance Co. Ltd	62%
42 City Trust Ltd	66%
43 I.C.D.C Investments Co. Ltd	77%

Median	8%
---------------	-----------

Low Net Profit Margin

Below 8%

High Net Profit Margin

8% and above

GROUPING OF COMPANIES BY DEBT/EQUITY RATIO

Company	Average 1997 - 2001
1 Eaagads Ltd	0%
2 Uchumi Supermarket Ltd	0%
3 Barclays Bank Ltd	0%
4 Diamond Trust Bank Kenya Ltd	0%
5 Jubilee Insurance Co. Ltd	0%
6 Kenya Commercial Bank Ltd	0%
7 National Industrial Credit Ltd	0%
8 Standard Chartered Bank Ltd	0%
9 Carbacid Investments Ltd	0%
10 E.A. Packaging Ltd	0%
11 Firestone East Africa Ltd	0%
12 I.C.D.C Investments Co. Ltd	0%
13 Total Kenya Ltd	0%
14 E.A Cables Ltd	1%
15 Crown Berger Ltd	2%
16 Express Ltd	2%
17 Sasini Tea & Coffee Ltd	3%
18 Unga Group Ltd	3%
19 Kenya National Mills Ltd	3%
20 British American Tobacco Kenya Ltd	4%
21 City Trust Ltd	4%
22 Limuru Tea Co. Ltd	4%
23 Housing Finance Co. Ltd	4%
24 Kenya Oil Co. Ltd	4%
25 CMC Holdings Ltd	6%
26 Marshalls (E.A) Ltd	6%
27 Kapchorua Tea Co. Ltd	7%
28 B.O.C Kenya Ltd	8%
29 East African Breweries Ltd	8%
30 George Williamson Kenya Ltd	9%
31 Athi River Mining	10%
32 Mumias Sugar Company	12%
33 Nation Media Group	12%
34 Rea Vipingo Plantations Ltd	13%
35 Bamburi Cement Ltd	13%
36 Brooke Bond Limited	15%
37 Kakuzi	15%
38 C.F.C Bank Ltd	17%
39 Kenya Power & Lighting Ltd	32%

40 National Bank of Kenya Ltd	45%
41 Kenya Airways Ltd	66%
42 E.A. Portland Cement Ltd	71%
43 Standard Newspapers Group	75%

Median **4%**

Low debt / equity ratio **Below 4%**

High debt/equity ratio **4% and above**

APPENDIX X

CLASSIFICATION OF CAPITAL EXPENDITURE

Company	Average 1997 - 2001 KSH'000'
1 Limuru Tea Co. Ltd	982
2 Eaagads Ltd	6,074
3 Jubilee Insurance Co. Ltd	7,470
4 E.A Cables Ltd	10,481
5 Crown Berger Ltd	14,299
6 Diamond Trust Bank Kenya Ltd	18,300
7 Marshalls (E.A) Ltd	28,507
8 Kapchorua Tea Co. Ltd	30,056
9 E.A. Packaging Ltd	30,199
10 Housing Finance Co. Ltd	31,223
11 Carbacid Investments Ltd	45,135
12 Standard Newspapers Group	49,159
13 City Trust Ltd	49,180
14 National Industrial Credit Ltd	52,483
15 Express Ltd	59,831
16 B.O.C Kenya Ltd	60,817
17 I.C.D.C Investments Co. Ltd	68,734
18 Sasini Tea & Coffee Ltd	78,866
19 George Williamson Kenya Ltd	84,152
20 Athi River Mining	84,898
21 Kenya Oil Co. Ltd	106,321
22 Rea Vipingo Plantations Ltd	107,474
23 CMC Holdings Ltd	115,180
24 National Bank of Kenya Ltd	142,091
25 C.F.C Bank Ltd	145,814
26 Uchumi Supermarket Ltd	168,620
27 Kakuzi	178,663
28 Unga Group Ltd	179,748
29 Nation Media Group	233,460
30 Kenya National Mills Ltd	243,016
31 E.A. Portland Cement Ltd	245,776
32 Firestone East Africa Ltd	251,335
33 Brooke Bond Limited	263,836
34 Mumias Sugar Company	282,673
35 Total Kenya Ltd	298,923

36 British American Tobacco Kenya Ltd	401,046
37 Standard Chartered Bank Ltd	404,490
38 Barclays Bank Ltd	450,800
39 Kenya Commercial Bank Ltd	473,070
40 Bamburi Cement Ltd	997,200
41 East African Breweries Ltd	1,072,101
42 Kenya Power & Lighting Ltd	1,806,754
43 Kenya Airways Ltd	2,002,400

0 - 249,999,999

250,000,000 - 499,999,999

500,000,000 - 749,999,999

750,000,000 - 999,999,999

1,000,000,000 and above

APPENDIX XI

RESULTS OF THE ANALYSIS OF CAPITAL BUDGETING EVALUATION TECHNIQUES

CODING OF DATA

CODE Type of project

- 1 New
- 2 Replacement
- 3 Expansion
- 4 Other

Evaluation Criteria

- 1 NPV
- 2 IRR
- 3 ART
- 4 PB
- 5 Other

Risk Analysis

- 1 Risk adjusted discount rate
- 2 Changing the payback period
- 3 Adjusting cash flow
- 4 Sensitivity analysis
- 5 Simulation analysis
- 6 other

Cost of capital determination

- 1 Cost of a specific source of funds
- 2 Weighted Average Cost of Capital
- 3 Project specific discount rate
- 4 Company historical rates of return
- 5 Industry Historical rates of return
- 6 Management determined target rate of return
- 7 other

Project Size

- 1 0 - 249,999,999
- 2 250,000,000 - 499,999,999
- 3 500,000,000 - 749,999,999

- 4 750,000,000 - 999,999,999
- 5 1,000,000,000 and above

Analysis of Evaluation criteria by Industry

Compan y	Agriculture	Commercial and services	Finance and Investment	Industrial and Allied			
1			2,4				
2							
3							
4							
5							
6							
7				5			
8				1,2,4			
9							
10					4		
11		1,4					
12		1,5					
13							
14	2,4,1,3						
15	1,2,3,4						
16			2				
17							
18							
18							
20							
21							
22							
23			1,2,4				
24							
25		1,4,5					
26							
27							
28							
					Total		
1	2		3	1	1	7	27%
2	2		1	2	1	6	23%
3	2		0	0	0	2	8%
4	2		2	2	2	8	31%
5	0		2	1	0	3	12%
Total	8		8	6	4	26	
1	8%		12%	4%	4%	27%	

2	8%	4%	8%	4%	23%
3	8%	0%	0%	0%	8%
4	8%	8%	8%	8%	31%
5	0%	8%	4%	0%	12%

CHI-SQUARE TEST

FREQUENCY TABLE

1	2	3	1	1	7
2	2	1	2	1	6
3	2	0	0	0	2
4	2	2	2	2	8
5	0	2	1	0	3
Total	8	8	6	4	26

EXPECTED FREQUENCY TABLE

1	2.15	2.15	1.62	1.08	7
2	1.85	1.85	1.38	0.92	6
3	0.62	0.62	0.46	0.31	2
4	2.46	2.46	1.85	1.23	8
5	0.92	0.92	0.69	0.46	3
Total	8	8	6	4	26

CONTINGENCY TABLE

1	0.01	0.33	0.23	0.01	0.58
2	0.01	0.39	0.27	0.01	0.68
3	3.12	0.62	0.46	0.31	4.50
4	0.09	0.09	0.01	0.48	0.67
5	0.92	1.26	0.14	0.46	2.78
Total	4.15	2.68	1.12	1.26	9.21

5% level of significance

12 Degrees of freedom

Chi-Square

Critical value

21.026

Calculated value

9.21

Accept Null Hypothesis that there is no relation

Thus there is no relation between evaluation criteria and industry

Analysis of Evaluation criteria by company size

Company	Small	Large		
1	2,4			
2				
3				
4				
5				
6				
7			5	
8		1,2,4		
9				
10			4	
11		1,4		
12		1,5		
13				
14	2,4,1,3			
15	1,2,3,4			
16		2		
17				
18				
18				
20				
21				
22				
23		1,2,4		
24				
25	1,4,5			
26				
27				
28				
1	3	4	7	27%
2	4	2	6	23%
3	2	0	2	8%
4	4	4	8	31%
5	1	2	3	12%
	14	12	26	
			.	
1	12%	15%	27%	
2	15%	8%	23%	
3	8%	0%	8%	
4	15%	15%	31%	
5	4%	8%	12%	

CHI-SQUARE TEST

FREQUENCY TABLE

1	3	4	7
2	4	2	6
3	2	0	2
4	4	4	8
5	1	2	3
	14	12	26

EXPECTED FREQUENCY TABLE

1	3.77	3.23	7
2	3.23	2.77	6
3	1.08	0.92	2
4	4.31	3.69	8
5	1.62	1.38	3
	14	12	26

CONTINGENCY TABLE

1	0.16	0.18	0.34
2	0.18	0.21	0.40
3	0.79	0.92	1.71
4	0.02	0.03	0.05
5	0.23	0.27	0.51
	1.39	1.62	3.01

3.01

4

5% level of significance

4 Degrees of freedom

Chi-Square

Critical value 9.488

Calculated value 3.01

Accept Null Hypothesis that there is no relation

Thus there is no relation between evaluation criteria and company size

Analysis of Evaluation criteria by Net Profit Margin

Company	Low	High
1		2,4
2		
3		
4		
5		
6		
7		5
8	1,2,4	
9		
10		4
11	1,4	
12		1,5
13		
14		2,4,1,3
15		1,2,3,4
16		2
17		
18		
18		
20		
21		
22		
23		1,2,4
24		
25	1,4,5	
26		
27		
28		

1	3	4	7
2	2	4	6
3	0	2	2
4	4	4	8
5	2	1	3
	11	15	26

1	12%	15%	27%
2	8%	15%	23%
3	15%	8%	23%
4	15%	15%	31%
5	8%	4%	12%

CHI-SQUARE TEST

FREQUENCY TABLE

1	3	4	7
2	2	4	6
3	0	2	2
4	4	4	8
5	2	1	3
	11	15	26

EXPECTED FREQUENCY TABLE

1	2.96	4.04	7
2	2.54	3.46	6
3	0.85	1.15	2
4	3.38	4.62	8
5	1.27	1.73	3
	11	15	26

CONTINGENCY TABLE

1	0.00	0.00	0.00	
2	0.11	0.08	0.20	
3	0.85	0.62	1.47	
4	0.11	0.08	0.19	
5	0.42	0.31	0.73	
	1.49	1.10	2.59	2.59
			4	

5% level of significance

4 Degrees of freedom

Chi-Square

Critical value 9.488

Calculated value 2.59

Accept Null Hypothesis that there is no relation

Thus there is no relation between evaluation criteria and net profit margin

Analysis of Evaluation criteria by Debt/Equity ratio

Company	Low	High		
1	2,4			
2				
3				
4				
5				
6				
7		5		
8		1,2,4		
9				
10			4	
11		1,4		
12		1,5		
13				
14		2,4,1,3		
15		1,2,3,4		
16			2	
17				
18				
18				
20				
21				
22				
23	1,2,4			
24				
25	1,4,5			
26				
27				
28				
1	2	5	7	
2	2	4	6	
3	0	2	2	
4	3	5	8	
5	2	1	3	
	9	17	26	26
1	8%	19%	27%	
2	8%	15%	23%	
3	0%	8%	8%	
4	12%	19%	31%	
5	8%	4%	12%	

CHI-SQUARE TEST

FREQUENCY TABLE

1	2	5	7
2	2	4	6
3	0	2	2
4	3	5	8
5	2	1	3
	9	17	26

EXPECTED FREQUENCY TABLE

1	2.42	4.58	7
2	2.08	3.92	6
3	0.69	1.31	2
4	2.77	5.23	8
5	1.04	1.96	3
	9	17	26

CONTINGENCY TABLE

1	0.07	0.04	0.11
2	0.00	0.00	0.00
3	0.69	0.37	1.06
4	0.02	0.01	0.03
5	0.89	0.47	1.36
	1.68	0.89	2.57

2.57

5% level of significance

4 Degrees of freedom

Chi-Square

Critical value 9.488

Calculated value 2.57

Accept Null Hypothesis that there is no relation

Thus there is no relation between evaluation criteria and Debt/Equity ratio

Analysis of Cost of Capital Determination by Industry

Firm	Agriculture	Commercial and services	Finance and Investment 1,3	Industrial and Allied			
1							
2							
3							
4							
5							
6							
7							
8						1	
9							
10					1,4,5,6		
11		3,4,5,6					
12			1				
13							
14							
15							
16			1				
17							
18							
18							
20							
21							
22							
23					2		
24							
25			6				
26							
27							
28							
1	0		2	1	2	5	33%
2	0		0	1	0	1	7%
3	0		1	1	0	2	13%
4	0		1	0	1	2	13%
5	0		1	0	1	2	13%
6	0		2	0	1	3	20%
7	0		0	0	0	0	0%
	0		7	3	5	15	
1	0%		13%	7%	13%	33%	
2	0%		0%	7%	0%	7%	
3	0%		7%	7%	0%	13%	
4	0%		7%	0%	7%	13%	
5	0%		7%	0%	7%	13%	
6	0%		13%	0%	7%	20%	
7	0%		0%	0%	0%	0%	

CHI-SQUARE TEST

FREQUENCY TABLE

1	0	2	1	2	5
2	0	0	1	0	1
3	0	1	1	0	2
4	0	1	0	1	2
5	0	1	0	1	2
6	0	2	0	1	3
7	0	0	0	0	0
	0	7	3	5	15

EXPECTED FREQUENCY TABLE

1	0.00	2.33	1.00	1.67	5
2	0.00	0.47	0.20	0.33	1
3	0.00	0.93	0.40	0.67	2
4	0.00	0.93	0.40	0.67	2
5	0.00	0.93	0.40	0.67	2
6	0.00	1.40	0.60	1.00	3
7	0.00	0.00	0.00	0.00	0
	0	7	3	5	15

CONTINGENCY TABLE

1	0.00	0.05	0.00	0.07	0.11
2	0.00	0.47	3.20	0.33	4.00
3	0.00	0.00	0.90	0.67	1.57
4	0.00	0.00	0.40	0.17	0.57
5	0.00	0.00	0.40	0.17	0.57
6	0.00	0.26	0.60	0.00	0.86
7	0.00	0.00	0.00	0.00	0.00
	0.00	0.79	5.50	1.40	7.69

7.69

10

18

5% level of significance

18 Degrees of freedom

Chi-

Square

Critical value

28.869

Calculated value

7.68

Accept Null Hypothesis that there is no relation

Thus there is no relation between cost of capital determination and industry

Analysis of Cost of Capital Determination by Size

Firm	Small	Large		
1	1,3			
2				
3				
4				
5				
6				
7				
8			1	
9				
10		1,4,5,6		
11		3,4,5,6		
12			1	
13				
14				
15				
16	1			
17				
18				
18				
20				
21				
22				
23			2	
24				
25	6			
26				
27				
28				
1	2		3	5
2	0		1	1
3	1		1	2
4	0		2	2
5	0		2	2
6	1		2	3
7	0		0	0
	4		11	15
				15
1	13%		20%	33%
2	0%		7%	7%
3	7%		7%	13%
4	0%		13%	13%

5	0%	13%	13%
6	7%	13%	20%
7	0%	0%	0%

CHI-SQUARE TEST

FREQUENCY TABLE

1	2	3	5
2	0	1	1
3	1	1	2
4	0	2	2
5	0	2	2
6	1	2	3
7	0	0	0
	4	11	15

EXPECTED FREQUENCY TABLE

1	1.33	3.67	5
2	0.27	0.73	1
3	0.53	1.47	2
4	0.53	1.47	2
5	0.53	1.47	2
6	0.80	2.20	3
7	0.00	0.00	0
	4	11	15

CONTINGENCY TABLE

1	0.33	0.12	0.45
2	0.27	0.10	0.36
3	0.41	0.15	0.56
4	0.53	0.19	0.73
5	0.53	0.19	0.73
6	0.05	0.02	0.07
7	0.00	0.00	0.00
	2.13	0.77	2.90

2.90

6

5% level of significance

6 Degrees of freedom

Chi-Square

Critical value 12.592

Calculated value 2.9

Accept Null Hypothesis that there is no relation

Thus there is no relation between cost of capital determination and company size

Analysis of Cost of Capital Determination by Industry Net Profit Margin

Firm	Low	High	
1		1,3	
2			
3			
4			
5			
6			
7			
8		1	
9			
10	1,4,5,6		
11	3,4,5,6		
12		1	
13			
14			
15			
16		1	
17			
18			
18			
20			
21			
22			
23		2	
24			
25	6		
26			
27			
28			
1	3	2	5
2	0	1	1
3	1	1	2
4	2	0	2
5	2	0	2
6	3	0	3
7	0	0	0
	11	4	15

1	20%	13%	33%
2	0%	7%	7%
3	7%	7%	13%
4	13%	0%	13%
5	13%	0%	13%
6	20%	0%	20%
7	0%	0%	0%

CHI-SQUARE TEST

FREQUENCY TABLE

1	3	2	5
2	0	1	1
3	1	1	2
4	2	0	2
5	2	0	2
6	3	0	3
7	0	0	0
	11	4	15

EXPECTED FREQUENCY TABLE

1	3.67	1.33	5
2	0.73	0.27	1
3	1.47	0.53	2
4	1.47	0.53	2
5	1.47	0.53	2
6	2.20	0.80	3
7	0.00	0.00	0
	11	4	15

CONTINGENCY TABLE

1	0.12	0.33	0.45
2	0.73	2.02	2.75
3	0.15	0.41	0.56
4	0.19	0.53	0.73
5	0.19	0.53	0.73
6	0.29	0.80	1.09
7	0.00	0.00	0.00
	1.68	4.63	6.31

6.31

6

5% level of significance
6 Degrees of freedom
Chi-Square

Critical value	12.592
Calculated value	6.31

Accept Null Hypothesis that there is no relation
 Thus there is no relation between cost of capital determination and Net Profit Margin.

Analysis of Cost of Capital Determination by Debt/Equity ratio

Firm	Low	High		
1	1,3			
2				
3				
4				
5				
6				
7				
8			1	
9				
10		1,4,5,6		
11		3,4,5,6		
12			1	
13				
14				
15				
16			1	
17				
18				
18				
20				
21				
22				
23		2		
24				
25		6		
26				
27				
28				
1	1		4	5
2	1		0	1
3	1		1	2
4	0		2	2
5	0		2	2

6	1	2	3	
7	0	0	0	
	4	11	15	15

1	7%	27%	33%
2	7%	0%	7%
3	7%	7%	13%
4	0%	13%	13%
5	0%	13%	13%
6	7%	13%	20%
7	0%	0%	0%

CHI-SQUARE TEST

FREQUENCY TABLE

1	1	4	5
2	1	0	1
3	1	1	2
4	0	2	2
5	0	2	2
6	1	2	3
7	0	0	0
	4	11	15

EXPECTED FREQUENCY TABLE

1	1.33	3.67	5
2	0.27	0.73	1
3	0.53	1.47	2
4	0.53	1.47	2
5	0.53	1.47	2
6	0.80	2.20	3
7	0.00	0.00	0
	4	11	15

CONTINGENCY TABLE

1	0.08	0.03	0.11
2	2.02	0.73	2.75
3	0.41	0.15	0.56
4	0.53	0.19	0.73
5	0.53	0.19	0.73
6	0.05	0.02	0.07
7	0.00	0.00	0.00
	3.63	1.32	4.94
			4.94

5% level of significance	
6 Degrees of freedom	
Chi-Square	
Critical value	12.592
Calculated value	4.94

Accept Null Hypothesis that there is no relation
 Thus there is no relation between cost of capital determination and Debt/Equity ratio

Analysis of Risk analysis by Industry

Firm	Agriculture	Commercial and services	Finance and Investment	Industrial and Allied			
1				1			
2							
3							
4							
5							
6							
7							
8						4	
9							
10				2,4			
11		1,2					
12		1,3,4,5					
13							
14							
15							
16			2				
17							
18							
18							
20							
21							
22							
23			1,3,4,5				
24							
25		3,4					
26							
27							
28							
1	0		2	2	0	4	24%
2	0		2	0	1	3	18%
3	0		2	1	0	3	18%
4	0		2	1	2	5	29%

5	0	1	1	0	2	12%
6	0	0	0	0	0	0%
	0	9	5	3	17	
1	0%	12%	12%	0%	24%	
2	0%	12%	0%	6%	18%	
3	0%	12%	6%	0%	18%	
4	0%	12%	6%	12%	29%	
5	0%	6%	6%	0%	12%	
6	0%	0%	0%	0%	0%	

CHI-SQUARE TEST

FREQUENCY TABLE

1	0	2	2	0	4
2	0	2	0	1	3
3	0	2	1	0	3
4	0	2	1	2	5
5	0	1	1	0	2
6	0	0	0	0	0
	0	9	5	3	17

EXPECTED FREQUENCY TABLE

1	0	2.12	1.18	0.71	4
2	0	1.59	0.88	0.53	3
3	0	1.59	0.88	0.53	3
4	0	2.65	1.47	0.88	5
5	0	1.06	0.59	0.35	2
6	0	0.00	0.00	0.00	0
	0	9	5	3	17

CONTINGENCY TABLE

1	0.00	0.01	0.58	0.71	1.29
2	0.00	0.11	0.88	0.42	1.41
3	0.00	0.11	0.02	0.53	0.65
4	0.00	0.16	0.15	1.42	1.72
5	0.00	0.00	0.29	0.35	0.64
6	0.00	0.00	0.00	0.00	0.00
	0.00	0.38	1.91	3.42	5.72

5.72

15

5% level of significance

15 Degrees of freedom

Chi-

Square

Critical value

24.996

Calculated value

5.72

Accept Null Hypothesis that there is no relation
 Thus there is no relation between risk analysis and industry

Analysis of Risk analysis by Size

Firm	Small	Large		
1		1		
2				
3				
4				
5				
6				
7				
8			4	
9				
10		2,4		
11		1,2		
12		1,3,4,5		
13				
14				
15				
16			2	
17				
18				
18				
20				
21				
22				
23		1,3,4,5		
24				
25	3,4			
26				
27				
28				
1	1		3	4
2	0		3	3
3	1		2	3
4	1		4	5
5	0		2	2
6	0		0	0
	3		14	17
				17
1	6%		18%	24%

2	0%	18%	18%
3	6%	12%	18%
4	6%	24%	29%
5	0%	12%	12%
6	0%	0%	0%

CHI-SQUARE TEST

FREQUENCY TABLE

1	1	3	4
2	0	3	3
3	1	2	3
4	1	4	5
5	0	2	2
6	0	0	0
	3	14	17

EXPECTED FREQUENCY TABLE

1	0.71	3.29	4
2	0.53	2.47	3
3	0.53	2.47	3
4	0.88	4.12	5
5	0.35	1.65	2
6	0.00	0.00	0
	3	14	17

CONTINGENCY TABLE

1	0.12	0.03	0.15
2	0.53	0.11	0.64
3	0.42	0.09	0.51
4	0.02	0.00	0.02
5	0.35	0.08	0.43
6	0.00	0.00	0.00
	1.44	0.31	1.75

1.75

5

5% level of significance

5 Degrees of freedom

Chi-Square

Critical value

11.07

Calculated value

1.75

Accept Null Hypothesis that there is no relation
 Thus there is no relation between risk analysis and company size

Analysis of Risk analysis by Net Profit Margin

Firm	Low	High		
1			1	
2				
3				
4				
5				
6				
7				
8	4			
9				
10	2,4			
11	1,2			
12		1,3,4,5		
13				
14				
15				
16	2			
17				
18				
18				
20				
21				
22				
23		1,3,4,5		
24				
25	3,4			
26				
27				
28				
1	1		3	4
2	3		0	3
3	1		2	3
4	3		2	5
5	0		2	2
6	0		0	0
	8		9	17
				17

1	6%	18%	24%
2	18%	0%	18%
3	6%	12%	18%
4	18%	12%	29%
5	0%	12%	12%
6	0%	0%	0%

CHI-SQUARE TEST

FREQUENCY TABLE

1	1	3	4
2	3	0	3
3	1	2	3
4	3	2	5
5	0	2	2
6	0	0	0
	8	9	17

EXPECTED FREQUENCY TABLE

1	1.88	2.12	4
2	1.41	1.59	3
3	1.41	1.59	3
4	2.35	2.65	5
5	0.94	1.06	2
6	0.00	0.00	0
	8	9	17

CONTINGENCY TABLE

1	0.41	0.37	0.78
2	1.79	1.59	3.38
3	0.12	0.11	0.23
4	0.18	0.16	0.34
5	0.94	0.84	1.78
6	0.00	0.00	0.00
	3.44	3.06	6.50

6.50

5

5% level of significance

5 Degrees of freedom

Chi-Square

Critical value

11.07

Calculated value

6.5

Accept Null Hypothesis that there is no relation
 Thus there is no relation between risk analysis and Net Profit Margin

Analysis of Risk analysis by Debt/Equity ratio

Firm	Low	High			
1		1			
2					
3					
4					
5					
6					
7					
8			4		
9					
10		2,4			
11		1,2			
12		1,3,4,5			
13					
14					
15					
16			2		
17					
18					
18					
20					
21					
22					
23	1,3,4,5				
24					
25	3,4				
26					
27					
28					
1	2		2	4	
2	0		3	3	
3	2		1	3	
4	2		3	5	
5	1		1	2	
6	0		0	0	
	7		10	17	17

1	12%	12%	24%
2	0%	18%	18%
3	12%	6%	18%
4	12%	18%	29%
5	6%	6%	12%
6	0%	0%	0%

CHI-SQUARE TEST

FREQUENCY TABLE

1	2	2	4
2	0	3	3
3	2	1	3
4	2	3	5
5	1	1	2
6	0	0	0
	7	10	17

EXPECTED FREQUENCY TABLE

1	1.65	2.35	4
2	1.24	1.76	3
3	1.24	1.76	3
4	2.06	2.94	5
5	0.82	1.18	2
6	0.00	0.00	0
	7	10	17

CONTINGENCY TABLE

1	0.08	0.05	0.13
2	1.24	0.86	2.10
3	0.47	0.33	0.80
4	0.00	0.00	0.00
5	0.04	0.03	0.06
6	0.00	0.00	0.00
	1.82	1.28	3.10

3.10

5% level of significance

5 Degrees of freedom

Chi-Square

Critical value

11.07

Calculated value

3.1

Accept Null Hypothesis that there is no relation
 Thus there is no relation between risk analysis and Debt/equity ratio

Analysis of Evaluation Criteria by Project Type

Firm	New	1 Replacement	2 Expansion	3 Other	4		
1							
2							
3							
4							
5							
6							
7			5	5			
8		1,2,4	1,2,4				
9							
10		4	4	4			
11	1,4	1,4	1,4				
12	1,5	1,5	1,5				
13							
14							
15							
16		2	2				
17							
18							
18							
20							
21							
22							
23	1,2,4	1,2,4	1,2,4				
24							
25	1,4,5	1,4,5	1,4,5				
26							
27							
28							
1		4	5	5	0	14	39%
2		2	4	2	0	8	22%
3		0	0	0	0	0	0%
4		4	5	5	0	14	39%
5		2	3	3	0	8	22%
		10	14	12	0	36	
1		11%	14%	14%	0%	39%	
2		6%	11%	6%	0%	22%	
3		0%	0%	0%	0%	0%	

4	11%	14%	14%	0%	39%
5	6%	8%	8%	0%	22%

CHI-SQUARE TEST

FREQUENCY TABLE

1	4	5	5	0	14
2	2	4	2	0	8
3	0	0	0	0	0
4	4	5	5	0	14
5	2	3	3	0	8
	10	14	12	0	36

EXPECTED FREQUENCY TABLE

1	3.89	5.44	4.67	0	14
2	2.22	3.11	2.67	0	8
3	0.00	0.00	0.00	0	0
4	3.89	5.44	4.67	0	14
5	2.22	3.11	2.67	0	8
	10	14	12	0	36

CONTINGENCY TABLE

1	0.00	0.04	0.02	0.00	0.06
2	0.02	0.25	0.17	0.00	0.44
3	0.00	0.00	0.00	0.00	0.00
4	0.00	0.04	0.02	0.00	0.06
5	0.02	0.00	0.04	0.00	0.07
	0.05	0.33	0.26	0.00	0.64

12

5% level of significance

12 Degrees of freedom

Chi-

Square

Critical value

21.026

Calculated value

0.64

Accept Null Hypothesis that there is no relation

Thus there is no relation between evaluation criteria and project type

Analysis of Evaluation criteria by project size

Firm	1	2	3	4	5
1	2,4				
2					
3					
4					
5					
6					
7		5	5		
8	1,2,4			1,2,4	
9					
10	4	4		4	
11					
12	1,5	1,5		1,5	
13					
14	2,4,1,3				
15	1,2,3,4				
16	2				
17					
18					
18					
20					
21					
22					
23	1,2,4	1,2,4	1,2,4	1,2,4	
24					
25	1,4,5				
26					
27					
28					

1	4	3	2	1	2	12	29%
2	6	1	1	1	1	10	24%
3	2	0	0	0	0	2	5%
4	6	2	1	2	1	12	29%
5	0	3	2	0	1	6	14%
	18	9	6	4	5	42	

1	10%	7%	5%	2%	5%	29%
2	14%	2%	2%	2%	2%	24%
3	5%	0%	0%	0%	0%	5%
4	14%	5%	2%	5%	2%	29%
5	0%	7%	5%	0%	2%	14%

CHI-SQUARE TEST

FREQUENCY TABLE

1	4	3	2	1	2	12
2	6	1	1	1	1	10
3	2	0	0	0	0	2
4	6	2	1	2	1	12
5	0	3	2	0	1	6
	18	9	6	4	5	42

EXPECTED FREQUENCY TABLE

1	5.14	2.57	1.71	1.14	1.43	12
2	4.29	2.14	1.43	0.95	1.19	10
3	0.86	0.43	0.29	0.19	0.24	2
4	5.14	2.57	1.71	1.14	1.43	12
5	2.57	1.29	0.86	0.57	0.71	6
	18	9	6	4	5	42

CONTINGENCY TABLE

1	0.25	0.07	0.05	0.02	0.23	0.62
2	0.69	0.61	0.13	0.00	0.03	1.46
3	1.52	0.43	0.29	0.19	0.24	2.67
4	0.14	0.13	0.30	0.64	0.13	1.34
5	2.57	2.29	1.52	0.57	0.11	7.07
	5.18	3.52	2.28	1.43	0.74	13.15

13.15

16

5% level of significance

16 Degrees of freedom

Chi-Square

Critical value 26.296

Calculated value 13.15

Accept Null Hypothesis that there is no relation

Thus there is no relation between evaluation criteria and project size

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