

**CAPITAL BUDGETING TECHNIQUES AND THE MANAGEMENT OF
FINANCIAL RESOURCES IN OIL INDUSTRIES.**

CASE STUDY: A LOOK AT KENOL-KOBIL PETROL STATIONS IN KENYA

BY

MWAWAZA HEZRON SALIM

BBA/7353/51/DF

**A RESEARCH DISSERTATION SUBMITTED TO KAMPALA INTERNATIONAL
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(ACCOUNTING OPTION)**

DECLARATION

I hereby declare that this project is my original work and has not been presented for a degree in any other university.

NAME	REG NO.	SIGNATURE
Hezron Mwawaza Salim	BBA/7353/51/DF	

APPROVAL

This research report has been submitted for an examination with the approval as university supervisor.

Signature: 
.....
MR. MICHEAL RUTEGANDA A.C.I.S

Date: 
.....

DEDICATION

*To my parents,
Guardians, friends, brothers, sisters and scholars
Who gave me the courage to go on*

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ABBREVIATIONS

NPV	Net Present Value
DCF _s	Discounted Cash Flow Techniques
IRR	Internal Rate of Return
PB	Payback
PBP	Payback Period
IFRS	International Financial Reporting Standards
PIEA	Petroleum Institute of East Africa
ROCE	Return on Capital Employed
ROACE	Return on Average Capital Employed
VIR	Value Investment Ratio
PI	Profitability Index
ICT	Information and Communications Technology
CAPM	Capital Asset Pricing Model
ARR	Accounting Rate of Return
ICDC	Industrial and Commercial Development Corporation
KTB	Kenya Tourist Board Corporation
NSE	Nairobi Stock Exchange

ABSTRACT

This paper will look at capital budgeting techniques employed by the oil firms in Kenya. It will look at six major oil firms in Kenya based on their market share. Capital budgeting or investment decision is a very critical area in the success of any firm. Long term investment aid a firm in determining the future of firm since the outlay is undertaken today with the effect running into the unforeseeable future. This paper will be based on a survey study and the findings will show the trend towards sophistication in capital budgeting techniques employed by firms which is in support with past studies in this field and generally more than one technique is employed. In particular it finds that firms have integrated their techniques in their software packages thus making it easier to appraise projects. It is however found that despite the move towards sophistication, traditional payback method still plays a major role as a screening method in project appraisal. In capital budgeting, risk is taken into account subjectively using both qualitative and quantitative techniques. The size of project, to some extent determines the technique employed. The allocation of resources to productive use by a firm will ensure the firm's growth and survival. Some projects are undertaken even when it does not meet the goal of the benchmarks set either due to their regulatory or safety needs inherent. Finally the paper will find that the main goal of any project is to maximize shareholders wealth as it will eventually lead to satisfying all stakeholders.

CHAPTER ONE

1.0 INTRODUCTION

Capital budgeting or investment decision is a very critical area in the success of any firm. Managers are always entangled in the quest to add value to the firms that they manage since success is in most cases defined by value they create for an organization. They can only achieve this if prudent decisions are made as far as investments are concerned i.e. identify an optimal capital expenditure. Projects undertaken are those that can and actually do stand the test of time while adding value to an organization's net worth. Capital budgeting therefore defines a firm's strategic direction since moves into new products, services or markets must be preceded by capital budgeting, Brigham et al (2004).

Many entities have gone burst due to poor investments. For example in the Public Sector there were many projects 20 to 30 years ago, but most of them have collapsed due to poor investment decisions, corruption and gross mismanagement. Examples of these firms that went under are Ramisi Sugar Company, Miwani Sugar Company, Kibarani Kenya Meat Commission plant, the Kilifi and Kwale Cashew Nut factories as well as the Mariakani Kenya Cooperative Creameries plant. The most recent being the giant retail chain of supermarket, Uchumi whose fall is greatly attributed to rapid and myopic branch expansion program worth Ksh. 2.5 Billion. The private sector has also had its share of failure owing to poor management and inappropriate investment decisions. Internationally, major entities have found it rough and rapid restructuring has to be done to salvage such. For example, Brigham et al (2004), points out the General Motors case, where the firm's stock price fell from US\$300 to US\$ 50 between 1996 and 2002 with its earnings per share slumping to US\$ 1.77 in 2001 up from US\$8.53 in 1999. This mainly resulted from over-investment in capital assets and therefore exorbitant depreciation expenses.

A good decision can boost earnings sharply and dramatically increase the value of the firm. A bad decision can lead to bankruptcy, Hirschey et al (1993). Since the results of capital budgeting continue for many years, the firm loses some of its flexibility. The

reason is that most of these decisions involve committing a big sum of money and the results heavily depend on forecasting and creating the future in a competitive and highly dynamic business environment. Thus the risk and uncertainty is inherent in these investments.

Contemporary financial managers are faced with the key decision of investing in those projects that add value to a firm or increase shareholders' wealth. It is through capital budgeting that a firm can mold itself into a profitable organization and therefore achieve its objectives while ensuring its future survival. Capital budgeting results consequently help shape a firm's future opportunities. The choice of projects and the level of investment are critical, not just for stakeholders of the firm but also for the economic well-being of society as a whole. Investment policy has been central to economic theory and practice. Investment decisions constitute economic link to the future – they determine major factors of tomorrow's output, Levy and Sarnat (1998). It is because of this that Kenya's Vision 2030 is fundamentally based on investment in both the manufacturing and service industry. The future of any firm is determined by the current investment choice. An increase in capital budgeting is normally accompanied by optimism, while a decrease is accompanied by recession, Levy and Sarnat (1998).

Economists have expressed various degrees of concern with ignoring the timing effects of uncertainty on capital budgeting decisions, Keynes (1936). Indeed, for there to be no possible benefit associated with waiting to invest, it must be that:

- (a) Investment is completely reversible or
- (b) Investment cannot be delayed.

Complete reversibility suggests that real and financial resources are fully recoverable any time after investment. This ability to costlessly swap the ongoing cash flow from investments for original investment cost is clearly unrealistic for most investments. The alternative extreme assumption of irreversible investments implies that investment cost is sunk once investment is undertaken.

Klammer (1972), Merret and Sykes (1973), and D'Ambrosio & Stephen (1972), agree that an investment has two main aspects; time and risk. In investing, current consumption is foregone in anticipation of future larger benefits. Due to the fact that investments are undertaken presently or now, and the benefits expected in the future, uncertainty exists. Financial managers undertake investments using their current expectations about the future. The future being uncertain, managers have to evaluate projects using techniques that factor in time and risk.

The allocation of resources to productive use by a firm will ensure the firm's growth and survival. The selection and employment of processes and techniques to decide major financial commitments are crucial. Inadequate evaluation and decision tools risk the possibility of applying scarce resources to areas that provide returns less than the cost of capital. Investment appraisal is a process whereby the need for the decision is outlined and set in the context of the organization's strategy, where all realistic options are identified and the relative merits and drawbacks of each option are analysed, culminating in the identification of a preferred course of action. Financial appraisal, though critical, should not be the only basis for making investment decisions. Other factors such as ranking of risk and reward, the intangible benefits of undertaking a particular project, how each project fits in with the strategic aims of the business, the liquidity of the project and the return to shareholders need to be taken into account.

Many techniques have been developed for evaluating projects and in this paper the techniques that are discussed have been classified in two major categories namely:

- (a) Discounted Cash Flow techniques
- (b) Traditional Approaches

The most commonly mentioned appraisal techniques in theory and practice include Net Present Value (NPV), Pay Back (PB), Return on Capital Employed (ROCE), Internal Rate of Return (IRR) and Profitability Index (PI). However, appraisal techniques are not limited to the above mentioned; other sophisticated statistical techniques have been developed as a result of developments in Information and Communications Technology (ICT). These techniques make use of forecasted cash flows.

Both theory and practice agree that the evaluation of benefits to be derived from undertaking capital project must precede the project's implementation. This allows the firm or investing entity to relate the cost of the project with the expected benefits. It enables planning in such projects, Otto (1976). As the company has a responsibility to ensure value for money with the expenditure of corporate funds, all investment decisions should be made on a sound basis where all relevant factors affecting the decision are identified and systematically analyzed. A firm's expectations of the possible future gains from an investment must be based in part on past performance, and in part on forecasts of future performance. As a result, management rarely has precise expectations regarding the future profits to be derived from a particular investment. In fact, the best that a firm can reasonably be expected to do is to make some estimate of the range of possible future costs and benefits and the relative chances of high or low profit on the investment. These estimates or forecasts are mainly cash flows. But which cash flows? The answer to this question is clear and simple: All cash flows have to be included in our analysis whenever they are affected by the decision. These cash flows are affected by different macro-economic variables such as taxes and inflation which make them to be highly uncertain. The uncertainty in cash flows affects their reliability, hence limiting the effectiveness of capital budgeting techniques.

Capital investment decisions would be easy in a world without agency and information problems. The decision-maker would simply and accurately calculate the project's expected rate of return and compare it to the cost of capital. But in the real world, those providing the funds for investment must rely on self-interested agents to identify projects and provide information on expected returns. As a result, the quality of capital allocation depends on how effective the decision process is in attenuating agency problems and bringing forth accurate information, Bernardo et al (2002). Effective capital budgeting can improve both the timing and the quality of asset acquisition, Brigham et al (2004).

Corporations employ a variety of decision procedures in practice: Some decisions are fully delegated to division and plant managers (expansion of an existing plant); some decisions require approval of headquarters (construction of a new plant); and other

decisions require approval conditional on the nature of the proposal, such as when projects requiring more than certain amount must be sanctioned by the headquarters while smaller projects can be approved locally, Ross (1986).The size of a project to be appraised does impact on the decision as relatively less initial outlay is tied in such.

Capital budgeting techniques usage within any organization will usually depend on the management's understanding and reliability of the technique to meet the firm's aims. Therefore, managers will have their own expectations and assumptions. Always assumptions and expectations are expressive of an order of preference and not of measure. Furthermore, expectations and assumptions are always short lived; they are conceived by a given person at a given time and in a given action situation and the environment of action is one of constant change.

A firm's expectations of the possible future gains from an investment must be based in part on past performance of related projects, and in part on forecasts of future performance. As a result, management rarely has precise expectations regarding the future profits to be derived from a particular investment. In fact, the best that a firm can reasonably be expected to do is to make some estimate of the range of possible future costs and benefits and the relative chances of high or low profit on the investment.

Capital budgeting therefore is of paramount importance to any organization in shareholders value maximization. The techniques used to appraise projects are therefore significant and should be critically evaluated before being used by any firm. Our study looks at the usage of capital budgeting techniques by oil firms in the energy sector.

1.1 Problem Statement

It is accepted that shareholders wealth maximization is the primary goal that all firms should work towards, Levy and Sarnat (1998). Firms in the oil industry undertake projects that require large amounts of capital. Owners of these corporations therefore want returns that justify the large cash outlays. Financial managers use capital budgeting techniques to assess the viability of such projects.

1.2 Research objectives

- To review current methodologies on capital budgeting techniques employed by oil companies operating in Kenya.
- To identify the commonly used techniques within risk management.

1.3 Significance of the Study

To the Firm

This study will help reinforce the usage of capital budgeting techniques in project evaluation by showing the reliability of the existing techniques.

To The Government

Provides a basis upon which guidelines and policies on public and private sector investment decisions will be founded on.

To Scholars

The study adds to existing literature and provides a basis for further research in capital budgeting decisions.

1.4 Conceptual Framework

The conceptual frame work helps to define the topic of research through the explanation of the variables within the topic. There are independent variables which predict, control, influence and determine the dependent variables.

We also have intervening variables which work with the independent variables to influence the dependent variables.

For the purpose of this research the independent variables will be *Capital budgeting Techniques*. The dependent variables will be *the management of financial resources*

The intervening variables may include; decision making skills of the management, Availability of skilled personnel or human resource etc.

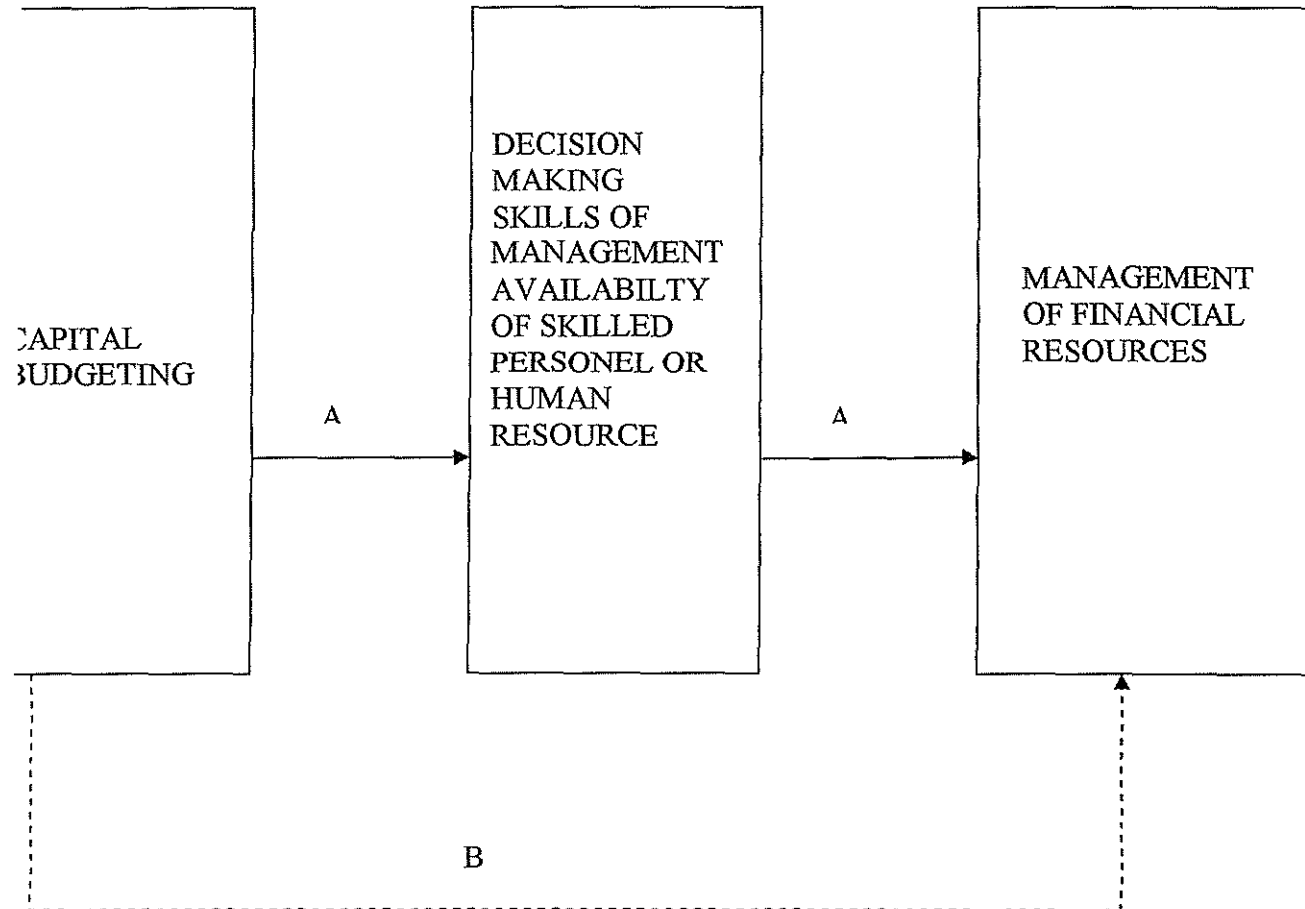
This can be illustrated using a diagram as shown below

CONCEPTUAL MODEL

INDEPENDENT
VARIABLES

INTERVENING
VARIABLES

DEPENDENT
VARIABLES



A – Indirect influences

B – Direct influence

This leads us to the topic of research as follows; Capital budgeting and the management of financial resources in oil industries

Case study; A look at kenol-kobil petrol stations in Kenya

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Investment

An investment is an expenditure on a tangible or intangible asset which is expected to produce benefits. In the most common case, it comprises a planned series of capital expenditures undertaken in anticipation of them generating a larger series of cash flows at various times in the future. There exists foregoing of current expenditure in order to secure a stream of benefits in future, Weston and Copeland (1988).

Merret and Sykes (1973) have defined investment as "... the outlay of valuable resources in the expectation of future gain. In the simplest case it is the outlay of cash in one period in the expectation of the return of a larger sum in the following period. In the most common case, an investment comprises a planned series of capital expenditures undertaken in anticipation of their generating a larger series of cash flows (generally uncertain) at various times in the future." Investment therefore involves an outlay of resources. The resources which are outlaid are expected to produce some benefits. The outlay and the benefits usually occur at different times.

When a firm is first established, it needs some assets that it will use to enable it to produce the goods and services it intends to offer for sale in the market. Later the firm needs new assets to replace the original assets which become worn out or obsolete or when the firm is expanding. Such assets which are acquired by a firm in order to assist it to produce goods and services it will offer in the market are known as capital assets and their acquisition is known as capital investment, Merret and Sykes (1973).

D'Ambrosio and Stephen (1972), state that: "...an investment involves an exchange. Therefore there are two elements in an investment decision. First, there is the element of time where time preference is the dominant consideration. Time preference is the rate at which the present consumption is foregone for future consumption. The second element of the investment decision involves risk aversion i.e. the desire to avoid risk. Given time preference and risk aversion, investment should take place only when the firm is

of its stock. To be sure of his future benefits, an individual should make an elaborate analyses, for it is his wealth which is to be committed. But if an individual is uninformed or inadequately informed, and if he does not form reasoned expectations of the outcomes of alternative investments and selects among alternatives according to his preferences, only by chance will he make choices appropriate to them.

Managers are able to maximize owners' wealth while achieving their goals through effective appraisal of investments.

2.3 Investment Appraisal

In making investment decisions, managers go through a process known as investment appraisal. Investment appraisal is a process whereby the need for the decision will be outlined, set in the context of the firm's strategy, where all realistic options will be identified and the relative merits and drawbacks of each option are analysed, culminating in the identification of a preferred course of action, The Green Book (1997).

2.3.1 Steps in Investment Appraisal

According to The Green Book (1997), Investment appraisal can be broken down into the following basic steps:

- a. Identify the need or problem, set in the context of the company's strategies and define the objectives of the project
- b. Identify the options
- c. Assess the cost and benefits, financial and otherwise, of each option
 - i. Analysis of non financial benefit
 - ii. Financial Analysis - Calculation of Net Present Value over an appropriate time period
- d. Consider risk and uncertainty
- e. Presentation of results and assessment of affordability

A. Identifying the Need or Problem Set in the Context of the Company's Strategies and Defining the Objectives of the Project

According to The Green Book (1997), the objectives of the project, will be in accordance with the identified need, and should be clearly defined to provide criteria against which options can be judged and against which the success of the project can be evaluated. It is important that the objectives are not so narrowly defined as to prevent consideration of an appropriate range of options, not so loose as to generate unnecessary work. Investments undertaken by the firm curve the firm's position in future and must therefore be consistent with where the firm intends to be. Shapiro (1985) emphasizes that generating projects likely to yield positive excess returns is as important as the usual quantitative investment analysis. According to him, managers' knowledge of the strategies employed is crucial to any systematic evaluation of investment opportunities for the success of any firm. More important, a good understanding of corporate strategy should help uncover new and potentially profitable projects. Drury (2004), states that identifying the need or problem should be based on the strategic objectives of the firm.

B. Identify the Options

It is important that all feasible options are considered including a "do nothing" or "do minimum" option which should be included as a base case even if totally unacceptable in operational terms. In practice, for high levels of investment, an initial long list of all conceivable options should be identified. Following an assessment of all options against appropriate criteria some of these options will then be eliminated as unfeasible leaving only feasible projects for detailed analysis.

C. Assess the cost and benefits, financial and otherwise, of each option

When a list of feasible options has been identified, the costs, incomes and benefits of each should be identified and appraised. This is done systematically using a two stage approach, which firstly assessed and compares the non financial benefits of each option and secondly by carrying out a financial appraisal for each option, The Green Book (1997).

a) Analysis of non financial benefit

Whilst the financial viability of any investment decision is of paramount importance it is essential to also realize that at times some of the benefits to be derived may not be measurable or realized in financial terms, Drury (2004). An assessment should therefore be made of the various non-financial benefits which will accrue from each option under consideration. Although any comparisons of these benefits will inevitably be subjective it is important that the relative merits of each option be presented in a rational way to help clarify the decision making process.

Examples of criteria which may be used include:

- Contribution to Institutional (or other relevant) Strategy
- Flexibility for the future
- Operational effectiveness
- Enhancement of corporate image
- Staff satisfaction
- stakeholder satisfaction

Van Horne (1980) however argues that the ultimate measure of an investment is tied to its cash generating ability and therefore a means of “converting the non-cash benefit into cash equivalent” is important for discounting purposes.

b) Financial Analysis

This involves identifying all the expenditure (including opportunity costs) and income (including benefits quantifiable in financial terms) associated with each option, both currently and in the future. The expected cash flows are analysed over a suitable appraisal period by applying an appropriate appraisal technique. It is at this stage that the financial manager decides which technique to apply. If the firm employs Discounted Cash Flows (DCF) techniques, they will also identify an appropriate discount rate that takes account of the time value of money and gives more weight to earlier income and expenditure flows, Weston and Copeland (1988).

All the fundamental assumptions governing the calculations and those used to arrive at estimated income and expenditure figures should be clearly stated in the appraisal. A good financial analysis should incorporate the use of at least two methods to enhance comparison.

D. Consider Risk and Uncertainty

Risk arises in capital budgeting because we cannot anticipate the occurrence of the possible future events with certainty, and consequently, cannot make any correct predictions. The estimated expenditure and income streams used to inform the financial appraisal will invariably involve assumptions about the future. Changing assumptions, particularly those relating to future income levels, may significantly alter the ranking of options. Investment forecasts are influenced by general economic conditions, industry factors and company factors do influence. It is therefore important that the effects of variability are assessed. A number of efforts to cope with uncertainty have been advanced.

1. Payback

This is the oldest and commonly used risk adjustment technique as it explicitly recognizes risk associated with an investment project, Pandey (1998). This method doubles up as a capital budgeting technique and will therefore be discussed under the traditional appraisal techniques.

2. Sensitivity Analysis

This is a risk analysis technique in which key variables are changed one at a time and the resulting changes in the project's NPV or IRR, 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. It begins with a base-case situation, which is developed using the expected values for each input. It is the degree of sensitivity that determines the magnitude of risk, Brigham et al (2004). This method does not measure risk; it shows the impact of NPV from making alternative assumptions in the variables used to compute it. And because of this, Drury (2004) pose that it should be used to compliment Capital

Asset Pricing Model (CAPM). It allows managers to assess those variables that greatly affect NPV and/or IRR and focus on how to control them once an investment is undertaken.

3. Scenario Analysis

A risk analysis technique in which “bad” or “good” sets of financial circumstances are compared with a most likely or base case situation. It 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. Here the project can have three scenarios: best case, base case and worse case scenarios, Brigham et al (2004)

4. Simulation

This uses the Monte Carlo Simulation technique. It represents a refinement which does employ probability estimates. 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, Brigham et al (2004).

Simulation compels the decision maker to look keenly into the relationship between factors affecting the cash flows, Drury (2004). Therefore full scale simulation may be important for investment projects that involve large outlays.

5. Decision Tree Analysis

In practice, the present investment decisions may have implications for future investment decisions and may affect future events and decisions. They involve a sequence of decisions over time. A decision tree is a graphic display of the relationship between a present decision and future events, future decisions and their outcomes. The sequence of events is mapped out over time in a format similar to the branches of a tree. Its logical analysis of a problem enables a complete strategy to be drawn up to cover all eventualities, Kadondi (2002).

6. Certainty Equivalent

This refers to reducing the forecasts of cash flows to some conservative levels. In formal way it can be defined as:

$$NPV = \sum_{t=0}^n \frac{\alpha_t NCF_t}{(1 + k_f)^t}$$

Where:

NCF_t = the forecasts of net cash flows without adjustments.

α_t = the risk adjustment factor for the certainty equivalent coefficient (assumes a value between 0 and 1).

K_f = risk-free rate assumed to be constant for all periods.

These coefficients are subjectively or objectively established by the decision maker. It represents the decision maker's confidence in obtaining a particular cash flow in period t . Certainty equivalent coefficient can be determined as a relationship between the certain cash flows and the risky cash flows.

$$\alpha_t = \frac{NCF^*_t}{NCF_t}$$

Where:

NCF^*_t = certain net cash flows

NCF_t = risky net cash flows

One of the most commonly used methods as it explicitly recognizes risk, but the procedure for reducing the forecasts of cash flows is implicit and likely to be inconsistent from one investment to another. However its subjectivity makes it largely dependent on the risk perception of the decision maker, Pandey (1998).

In risk analysis it is also important to incorporate non-quantitative factors such as insecurity, political instability and other environmental factors which could affect the viability of certain projects. Any nation facing un-quantifiable economic instability may transfer such impediment of growth to organizational survival. Company's investments suffer in a poorly controlled economy be it in a developed or developing country. Future prediction of income becomes uncertain and risky in an un-conducive socio-economic

and political atmosphere, Elumilade et al (2006). From their study, we observe that for cash flows to be reliable, some form of stability should exist in the economy. If absent, more risk is implied and there is need to incorporate more risk factors so that huge variations between actual and expected are avoided. In an unstable environment, more viable projects are often left leading to massive losses in terms of the firm's goal of shareholders wealth maximization.

E. Presentation of Results and Assessment of Affordability

The results of both the analyses of non-financial benefits and the financial appraisal together with any relevant sensitivity analysis should be clearly presented. In some appraisals, all results will concur in terms of ranking resulting in a clear cut recommendation. In others there may be a conflict between the two assessment techniques or sensitivity analysis may significantly alter the results. In circumstances where the decision is finely balanced the appraisal should clearly document the relevant results and reasons for the judgment made.

The investment appraisal methodology concentrates on comparing the costs and benefits of investment alternatives. However, it is of paramount importance that an assessment is made of the impact that the preferred option has on the overall financial position.

2.4 Appraisal Techniques

It is very natural to evaluate investment on the financial and economic basis. After all, the fundamental purpose of any investment is to augment wealth which is measured by profits or economic rent, Weston and Copeland (1988). Hirschey et al (1993) refers to capital budgeting as "the process of planning expenditures that generate cash flows expected to extend beyond one year." All this is achieved through use of appraisal techniques.

This section gives a general review of current methodologies on capital investment appraisal followed by some discussions about the weaknesses and virtues of different methodologies. Sound decisions can only be reached by combining the scientific methodology with decision makers' expertise. The two major approaches include:

- (a) Discounted Cash Flow techniques
- (b) Traditional Approach

2.4.1 Discounted Cash Flow techniques

Discounted cash flow techniques are methods for ranking investment proposal that employ time value of money concepts, Brigham et al, (2004). These methods include:

- **Net Present Value (NPV)** - The net present value of an investment or capital project is the aggregation of the present values of all cash benefits by deducting the present value of all cash.
- **Internal Rate of Return (IRR)** - It is described as the rate of interest at which the present value of expected capital investment outlays is exactly equivalent to the present value of expected cash earnings on that capital project.
- **Profitability Index (PI)** - is the ratio of the present value of future cash benefits, at the required rate of return to the initial cash outlay of the investment.

2.4.1.1 Net Present Value and Internal Rate of return

Despite the increased acceptance of DCFs, Levy and Sarnat (1998) argue that as long as the firm assumes equal annual receipts, the simple rule of thumb often provide a close approximation to a projects true IRR in the domain of the projects life and profitability which is relevant to the firm in practice.

The basic principle underlying the Discounted Cash Flow (DCF) methodologies is the time value of money, which is generally based on the cost of capital, Hirschey et al (1993). By analyzing the historical financial data of the company and investigating market, the marketing, engineering, and financial departments make estimates of cash flows of an investment proposal. When all the cash flows are changed into the present value at a certain discount rate, the present value should be greater than or at least equal to zero if the proposal is to be accepted.

Surveys of capital budgeting practices among large firms have indicated a widespread use of discounted cash flow methods, especially internal rate of return. At the same time,

many firms state that they also continue to use simple payback or related methods Schall et al (1978).

Brick (1984) found that firms use either an "After Tax Weighted Average Cost of Capital" (ATWACOC) or Capital Asset Pricing Model (CAPM). Similarly, Ryan and Ryan (2000) confirm the managerial preferences for weighted average cost of capital (WACC). There is little use of CAPM (return from a risk free asset plus a premium associated with the risk class) since it is a single period and therefore not a good basis for evaluating Multi-period projects, Schall et al (1978). The cost of a specific source of fund can also be used in determining a hurdle rate, Ross (1986). Under rationing, projects compete against each other, not against a profitability standard. The study reported here uses empirically determined hurdle rates and other data to examine the capital allocation practices. Ross (1986) found out 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.

In practice, mainly two methods are used to justify the investment, Evans and Forbes (1993). NPV (by ranking proposal in order of descending positive NPV) and IRR (by ranking proposal in order of descending IRR when IRR is greater than minimum attractive rate of return or discount rate). Although both methods are theoretically correct, they don't always give the same ranking.

Pinches (1982) after his discussion with managers, point out that difference has always existed between theory and practice. That in theory, NPV was superior but in practice, IRR and payback dominated. Larger firms use DCFs more than smaller and moderate firms. He cited lack of agreement between academicians as having negative impact on business executives since they are made to implement capital budgeting techniques without adequately considering how they interface in the firm's strategic objectives, information systems, formal and informal organization process and the evaluation and reward structure employed. In many respects the NPV method is better than IRR.

However IRR method is familiar to many corporate executives and thus widely entrenched in practice, Brigham et al (2004).

Regarding the choice of the two methods, Evans and Forbes (1993) argue that capital budgeting practices reveal that IRR is much preferred over the NPV as an investment decision tool even though business scholars prescribe the NPV as theoretically optimal. IRR is treated as display method. As such it is more compatible with decision-makers' expectations and therefore, is more cognitively efficient. Because the IRR is expressed as an interest rate, it more closely resembles an analogy display, in which the IRR is simply compared to the required return. In contrast, the NPV is stated in dollars, resembling more a very precise digital display. Evans and Forbes (1993) finally suggest that academicians should reorient their efforts from promoting the NPV teaching methods to ameliorate the pitfalls of the IRR.

Levy and Sarnat (1998) state that NPV provides an optimal solution to the capital budgeting problems on the assumption that the future cash flows and the appropriate discount rate or cost of capital are known. The popularity of IRR rule is in part psychological: a measure of investment worth which is set out in percentage terms is appealing to executives. Ryan and Ryan (2002) also agree that the net present value is the most frequently cited capital budgeting tool of choice, followed closely by IRR. Additionally, firms with larger capital budgets tend to favor NPV and IRR.

2.4.1.2 Profitability Index (PI)

The Profitability Index (PI) also known as the "Benefits-Cost Ratio" is the ratio of the present value of future cash benefits, at the required rate of return to the initial cash outlay of the investment. It is another technique at the disposal of an entrepreneurs or decision makers to assist in choosing among several causes of actions. In a layman language, if the monetary cost of a project/programme is ascertained and is also compared with its expected benefits in monetary terms. For a project to be acceptable, its benefits must outweigh its costs. While PI may be used for exposition, it should not be used as a measure of investment worth of projects of different sizes, when mutually exclusive choices have to be made, Levy and Sarnat, (1998). They state that in cases of

mutually exclusive projects, PI may contradict the shareholders wealth maximization goal. Consider the following situation, where projects C and D are mutually exclusive:

	PV of cash flow (Ksh)	Initial Cash Outlay (Ksh)	Profitability Index
Project C	1,000,000	500,000	2.0
Project D	1,800,000	1,000,000	1.8

Project D maximizes shareholders wealth, but according to PI, project C is chosen. However, in cases of capital rationing, PI can be a useful method of ranking those projects with positive NPV, because it gives the highest NPV, Drury (2004).

Since DCF methodologies heavily depend on the estimating and forecasting of future financial data, the inherent risk and uncertainty becomes a major concern of decision makers. Recently, a new approach utilizing fuzzy set theory is explored by some scholars, Ghotb and Warren (1995), to deal quantitatively with imprecision or uncertainty. Due to the development of computers and easy-to-use software packages, there is a strong increase in the use of both sensitivity analysis and adjustment of hurdle rates for risk in DCF models.

2.4.2 Traditional Approaches

Among other financial analysis tools, the most used methods include Payback (PB) and Accounting Rate of Return (ARR) or Return on Capital Employed (ROCE), Garrison (1997).

2.4.2.1 Payback Period

Payback depends on the number of period (usually in years) taken for the future net cash flows on a capital investment to payback the initial or original net cash outlay. Since it is based on an immediate retrieval of gain from the executed project, formulation of this decision will consider specifically payback period. Any project with PB above the specified PBP maximum is however rejected because it will take too long a time to retrieve initial capital. Application of PB rule on mutually exclusive projects will favour

the choice of the best alternative for the project having the shortest payback period which is ultimately acceptable. Payback is the most trusted capital budgeting technique since it refers to how quickly the incremental benefits that accrues to a company from an investment project. It is used as a guide or an initial screening device prior to use of more sophisticated capital budgeting techniques especially in large firms, Levy and Sarnat (1998). In such a case, it rejects obviously a highly unprofitable project, Drury (2004).

It is also of much importance to a firm facing liquidity problems and requires fast repayment of investment. Due to this, it is sometimes employed in capital rationing cases. Nonetheless it is defective because it does not consider the time preference for money, as it gives equal weight to all future net cash flows over each project's Payback period. Elumilade (2006) has agreed that the PB rule is not fully accepted as a desirable rule for evaluating capital project because it violates the following capital budget properties, in the sense that:

- (i) All cash flows should be considered (It ignores cash flows after payback period)
- (ii) These cash flows should be discounted at the opportunity cost of funds.(Time value of money)

Due to its ease, management may also undertake it for self interest. For example, if management compensation is tied to profitability, the manager may choose projects with quick payback period to show improved operating profits as soon as possible, Levy and Sarnat (1998).

2.4.2.2 Accounting Rate of Return

Also called Return on Capital Employed (ROCE). This rate of return is computed by dividing a proposal's annual net profit (after depreciation) by either the *total* or the *average* initial outlay, Levy and Sarnat (1998). Accounting Rate of Return (ARR) also overlooks the time value of money. Moreover AAR implicitly assumes a stable cash receipts over time. Apart from this, it is possible that, the use of accounting profit which is a reporting concept and not cash which is an economic resource could provide a misleading interpretation of net cash flows emerging from the project outlay. This may

happen, since depreciation of the initial cost of capital over the future life of a capital investment is concisely treated as cash costs, Elumilade, (2006). It is used by small business firms because it is easy to understand and manipulate, Garrison (1997). It was preferred by managers since it took profit into account. However, its usage has dropped due to inflationary effects, Levy and Sarnat (1998).

2.5 Empirical Review

This section looks at past studies on capital budgeting techniques taking into account its relevance to our study.

2.5.1 Capital Budgeting Techniques

Despite the fact that there is movement towards the most sophisticated capital budgeting techniques, scholars are yet to agree on a strong preference for a particular technique. Klammer (1972) in a survey based on a sample of 184 large U.S. firms found that 57 per cent indicated that they used the Discounted Cash Flow (DCF) technique methods as their primary method in evaluate projects in 70s up from 19 percent who employed DCFs in 59. The majority of firms used either PB (34 per cent of the total sample) or Accounting Rate of Return (ARR) methods (34 per cent) as their primary method of evaluation in 1959 had fallen to 12 percent and 26 percent respectively in 1970. On risk analysis in capital budgeting, he observed that as a standalone, raising the required rate of return was the most popular. There was also a general increase in taking risk into account when making capital expenditure decisions. Management science techniques such as game theory, linear programming and computer simulation were also gaining popularity especially in large firms. This confirms the assertion that risk assessment has become a fundamental part of investment appraisal.

Continuing with capital budgeting, Klammer (1973) wanted to find out any correlation between firm performance and the level of sophistication in capital budgeting. That a firm employing discounted cash flow techniques (DCF) was positioned to make better decisions and therefore perform better than that using the traditional techniques. Using the operating rate of return to measure performance, his findings from regression analysis

never showed any correlation between firm performance and the technique employed. Quoting from Klammer;

“Given the restrictive assumptions of capital budgeting theory-near certainty, equivalent risk classes, etc., a firm might be justified in using simple capital budgeting techniques as they may yield the same basic decisions. Thus it is possible that performance and capital budgeting techniques are totally uncorrelated.”

Klammer (1973) concluded that the success of any capital budgeting technique depended on a number of factors- the generation of ideas, availability of good analytical techniques, and the proper use of such techniques, making good cash flows estimates of the proposed investments. This means that the level of sophistication per se does not lead to optimal projects; other softer issues e.g. how the project fits into the organizations structure must be considered.

Graham and Harvey (2002) in a comprehensive survey on how Chief Financial Officers (CFOs) make capital budgeting and capital structure decisions in the United States (US), Canada and the United Kingdom (UK) found that NPV and IRR were the most adopted. His survey covered 392 CFOs. NPV and IRR were more common among firms that pay dividends than firms that do not pay dividends regardless of whether the firm is large or small. Public companies are significantly more likely to use NPV and IRR than are private corporations. Other than NPV and IRR, the payback period is the most frequently used capital budgeting technique (56.7% always or almost always use). Small firms use the payback period almost as frequently as they use NPV or IRR. They also find that among small firms, CEOs without MBAs are more likely to use the payback criterion. The payback is most popular among mature CEOs. Payback is also frequently used by CEOs with long tenure. They never found any evidence to support the claim that payback is useful in capital constrained firms but the fact that longer-tenure CEOs without MBAs prefer it suggests that lack of sophistication is a driving factor behind the popularity of the payback criterion.

Ryan et al (2002) in a recent survey of the Fortune 1000 Chief Financial Officers finds Net Present Value to be the most preferred tool over Internal Rate of Return and all other capital budgeting tools and that the advancement in computing had led to ease of their application.

Merret and Sykes (1973) conclude that the IRR's marked superiority over the commonly used accounting methods, particularly the IRR method, justifies widespread practical adoption.

Gitman and Forrester (1977), in their survey of the extent of sophistication in capital budgeting techniques used by 103 large firms in the US found that there was a massive support for the use of quantitative risk adjusted data in capital budgeting with 103 large firms, find that only 9.8% of firms use net present value as their primary method and 53.6% report IRR as primary method. That most firms also had a strong preference for sophisticated techniques in investment appraisal and that the cost of capital was adjusted for risk subjectively. Treating risk subjectively means that the cost of a project – in terms of sources of funds must be considered. The return must be in excess of the cost of such funds. For example if a project is finance partly by equity and partly by debt, the return on such must be such that it can repay the obligation and add value to the owners.

Schall et al (1978) looking into the capital budgeting techniques found that firms use more than one technique in appraising investments. That payback was the most used but not as a stand alone. Its use was attributed to its ease and the fact that it easily identified the very risky projects. He also noted large increase in DCFs usage since Klammer (1973) with findings of 86% compared to 56%. He also conferred with Gitman and Forrester (1977) that risk was being assessed subjectively and that the cost of capital used was an after tax weighted average cost of capital. Level of sophistication in capital budgeting technique had slight relationship with the size of the firm's capital budget and negatively to the market risk as measured by beta value. It is not unusual to find a mix of traditional techniques and the DCFs in project evaluation. His findings also show that size is not a major factor in determining which technique to employ, but the one used is determined by the company's policy.

Petty and Scott (1984) found out that there was growth of capital budgeting practices and in particular discounted cash flow (DCF) models - such as Net Present Value (NPV) and Internal Rate of Return (IRR). Overseen often by controllers and financial department, capital budgeting practices of large corporations widely incorporate DCF models in the financial analysis of capital investment proposals. While small firms tend to rely more on non-DCF methods such as payback period and accounting rate of return, Schall (1978). Elumilade et al (2006) adds that a countries development level determines the technique used.

Ross (1986), in an attempt to find out the differences between theory and practice in the implementation of DCF analysis, surveyed 12 large manufacturers. Results (in eight of the twelve firms studied) also indicate that project approval at many firms follows different criteria depending on the level of the decision. The effect of this is that smaller projects are subject to higher return rates. At these firms only large projects are observed to face a hurdle rate near the cost of capital. Only four of the twelve firms studied impose uniform hurdle rates regardless of the level of decision making (or size of project). Not surprisingly, firms with thorough financial analysis of smaller projects tend to be the same firms that do not discriminate against smaller projects. The implication of his findings is that different projects may have different appraisal techniques, depending on their size and that smaller project(s) are often discriminated. Even when they prove more profitable, agents of shareholders may reject them for a large project having relatively low returns. This is the case in the oil industry since most of the investments require massive capital outlay. However, whichever technique used, thorough financial analysis is necessary to ensure reliability. Capital rationing can hinder the growth of a firm since it restricts capital expenditure i.e. projects compete against each other and not against profitability.

Elumilade et al (2006) looked at capital budgeting and economic development in the third world. They looked at the form and approach of the Nigerian government towards capital budgeting. They wanted to unravel the causes of project abandonment, capital disappearance and inhibition placed on capital budgeting as the country related to other

countries outside her borders (particularly in the Western world). They cited political climate, corruption and greed, which make it difficult to rely on forecasted cash flows. If a country has stable economic prediction, capital investment demands could significantly be financed and implemented according to a company's designed goals and objectives. Their findings showed a preference towards shortening payback as a means of taking account of risk in developing nations (Nigeria) because of high economic instability of such regions. Yet we know that forecasted cash flows are fundamental for capital budgeting techniques.

A study by Otto (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 appraisal techniques are applied from two points of view: 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 undertaken jointly by a private entrepreneur and a public corporation.

He examined how two public corporations in Kenya, the Industrial and Commercial Development Corporation (ICDC) and the Kenya Tourist Board Corporation (KTB), which undertake and manage projects jointly with the private entrepreneurs have solved the problem of how to appraise partly public and partly private projects. He concluded that the two corporations have not tackled the problem of how to appraise partly private and partly public projects. At the moment, the government has entered into a joint venture with the oil companies in Kenya, to upgrade the Mombassa Oil Refinery. The question therefore is which appraisal technique these companies use.

Kadondi (2002) undertook a study on capital budgeting companies listed at the Nairobi Stock Exchange. The study covered all the 54 listed companies at 31st July 2002 for the

period 1997 to 2001. She wanted to find out the techniques used and factors that determine use of a particular technique. She found that most firms in the Nairobi Stock Exchange used payback together with DCFs in their capital budgeting. Her paper did not however look into industry specific techniques in capital budgeting despite covering in her study two listed oil firms. Our study is narrowed down towards the oil industry. We want to find out whether companies in the oil industry do use capital budgeting techniques in investment appraisal.

2.6 Conclusion

To conclude the review on literature, there seems to be quite some difference with respect to the use of capital budgeting techniques by scholars. Financial managers and academics have not been in full agreement as to the choice of the best capital budgeting method. This shows that there is no one acceptable technique that offers superior results to finance managers. It also emerges that risk is taken into consideration subjectively depending on the past performance of related projects and the future expectations of the decision maker. From past studies it is observed that there is a general trend towards the use of more sophisticated capital budgeting techniques such as NPV and IRR. This has been attributed to the developments in the Information and Communications Technology (ICT). However, finance managers still use traditional techniques in appraising their projects.

It also emerges that capital budgeting is one of the most important decisions made by the financial manager. In this process, it is crucial that management use reliable methods that will result in the maximization of shareholder wealth.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This section describes the techniques that were used to conduct this research in order to achieve the objectives of the study. It provides the guidelines on how the entire research was conducted and the specific areas where emphasis was laid.

3.1 Scope of the Study

This is a survey study, covering the capital budgeting techniques employed by oil firms in Kenya. First it is meant to identify the capital budgeting techniques employed by the oil firms while evaluating projects and secondly the most commonly used capital budgeting techniques within the oil industry. In light of the study objectives, the research looked at extracts of past projects undertaken by some firms in the oil industry. Through interviews, I was able to know the capital budgeting techniques employed by the firms within the oil industry. By asking direct questions on the types and most preferred method of capital budgeting, the research was able to meet the study objectives. During the interviews, the interviewees were able to clearly state their preferred choices of capital budgeting techniques and the challenges faced in practically using the techniques.

3.2 Research Design

This study surveys the capital budgeting techniques used by major oil corporations in Kenya. The survey approach is 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. Review of past studies by different scholars has shown that the survey method is best suited for studies in the area of capital budgeting. Studies reviewed Klammer (1972), Gitman et al (1977), Petty and Scott (1984), Ross (1986), Graham and Harvey (2002) all used the survey approach. Kadondi (2002) did a survey of 54 firms listed in the NSE for the period 1997 – 2001 to find out capital budgeting techniques employed by these firms. 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 the study is comprised of all players in the oil industry. At present there are 23 oil firms operating in Kenya, according to the Petroleum institute of East Africa, (Appendix I). The selected sample comprises 6 oil companies in Kenya (Appendix II). These companies were chosen since they represent major players within the oil industry. The basis of this selection was taken from Petroleum Institute of East Africa (PIEA), which had classified these companies according to their respective market share in 2006. The total industry sales market share of these six firms is 86.72%. Therefore they are considered an adequate representation of the oil companies in Kenya for study.

3.4 Data and Data collection

3.4.1 Data

Data collected for this study comprises both primary and secondary data. The primary data relates more to the qualitative aspects of the capital budgeting process. The data addresses issues of capital budgeting process such as; the stages of capital budgeting decision process, risk assessment in capital budgeting, post-implementation audit of completed projects and hurdles faced by management in its capital budgeting process. The data also addresses issues on the extent of use of capital budgeting techniques, nature of projects and the determination of discounting rate.

Capital budgeting techniques analyzed include ; the Net Present Value, the Internal Rate of Return, Return on Capital Employed, the Payback Period, Profitability Index and other methods such as intuition. Data relating to project characteristics includes, size of the project in terms of value and project type, .i.e. whether an expansion, a replacement or new investment.

3.4.2 Data Collection

Data is collected through interviews. The interviews will be conducted using an interview guide which the interviewee will be given before the actual interview. The interview guide (Appendix IV) is structured to capture information regarding all the activities of capital budgeting process. Question 1 looks at the nature of projects that engage capital budgeting. Questions 2 and 3 look at the process of capital budgeting. Question 4 capture information on the investment appraisal techniques used by different firms in the oil industry. Question 5 to 6 tries to see whether cash flows are forecasted reliably citing any factors that may cause deviations of actual from forecasted. Question 7 covers the techniques used in risk analysis. Post-implementation auditing of completed projects is covered in question 8. This looked at past projects undertaken and whether they met the preset expectations under which decision were based.

The officers targeted are those responsible for capital budgeting. This includes the business analyst, retail business analyst, the finance managers and productions and operations managers. Any other persons directly involved in capital budgeting, depending on the firm's structure will also be interviewed. I had four interviews with four out of the six firms in my sample. The interviewees included two business analysts, a control accountant and a retail business analyst. Two firms responded via mail to my interview guide due to their tight schedules.

3.5 Data Analysis

The data collected using personal interviews is analyzed in view of the capital budgeting techniques mentioned in the literature review. The applicability of the capital budgeting techniques by the companies is analyzed by statistically computing the relative percentage of usage by the sample oil firms.

In the area of risk analysis, the respondents cited some of the methods used by the companies and the analysis of this is based on relative importance placed by each specific firm upon the technique. Risk management methods are categorized into qualitative and quantitative techniques. Here, I looked at the number of firms employing a specific technique in terms of the percentage and absolute value.

I did a qualitative analysis on the response I got from the interviewees on the size and nature of projects requiring investment appraisal techniques. The projects are classified into different categories of maintenance, expansion, cost-reduction and safety and environmental.

I also wanted to find out the critical stages in capital budgeting. I did this by asking the respondents to rank them in order of importance. Further, they were supposed to list them sequentially.

CHAPTER FOUR

4.0 DATA ANALYSIS

This chapter presents the findings of the capital budgeting techniques employed by the oil firms in Kenya. These findings are as a result of the interviews carried out with the business analysts and or financial managers of different oil corporations in Kenya. It found that all the firms employ capital budgeting techniques in project appraisal. However, they are governed by firm specific policies as far as capital budgeting process is involved. Most ideas do arise from customers of the oil industry for instance, if a customer wants a service station at a given location, the firm will undertake all the necessary assessments to identify whether the project the customer wants is fit. If it cannot be profitable, the firm advises the customer based on their findings. Some ideas are as a result of technological development and regulatory pressures.

4.1 Risk Analysis Methods

During the interviews I was able to identify the commonly used techniques within risk management. The techniques used by the oil firms in risk analysis can be broadly categorized into two groups, namely qualitative and quantitative.

4.1.1 Qualitative Techniques

Qualitative techniques are used to distinguish the possibility of a risk occurring in a linguistic manner; for example, a risk will be described as low if that risk is unlikely to occur. It is an analysis in relative terms of the outcome and probability of a risk, for example a high risk compared to a medium or low risk. It is dependent on the experience of the firm, thus it is inclined to be subjective. The methods cited by these firms are;

- Interviewing risk managers and those responsible for the implementation of the projects.
- Brainstorming by top management and employees.
- Engineering judgment
- Personal experience of finance managers and project managers.
- Corporate experience from historical data.

Table 1

Showing Qualitative techniques used in determining possibility of a risk

Risk Management Technique	No. of Firms employing the technique	% of Firms Employing the technique
Interviewing	3	50
Brainstorming	5	83.3
Engineering Judgment	6	100
Personal Experience	2	33.3
Corporate Experience	6	100

Source: primary data

From the above data, I found that in the oil industry, there is usage of qualitative risk management tools. All companies (100%) use corporate experience from historical data and Engineering method so as to incorporate risk into capital budgeting. These techniques are prone to inconsistencies but are useful in the planning and control of a project.

4.1.2 Quantitative Techniques

The methods cited by the firms included;

- Simulation
- Expected net present value
- Decision matrix
- Break-even analysis
- Scenario analysis
- Expected monetary value
- Risk adjusted discount rate
- Certainty equivalent

Table 2

Showing most commonly used Quantitative Techniques used in risk management.

Risk Management Technique	No. of Firms employing the technique	% of Firms Employing the technique
Simulation	4	66.7
Expected net present value	5	83.3
Decision matrix	3	50
Break-even analysis	6	100
Scenario analysis	5	83.3
Risk adjusted discount rate	6	100
Expected monetary value	5	83.3
Certainty equivalent	5	83.3

Source: primary data

These techniques are mathematically and/or computationally based and provide numerical probabilities, or frequencies, of the consequences and likelihood of identified risks. The values used in these techniques are obtained from historical databases or are estimates; they still contain some extent of uncertainty, due to the possible use of subjectively attained values.

Qualitative techniques are employed at the beginning to identify and rank risks. Those risks with a high or intermediate rank may be further analysed through quantitative techniques. The results of a quantitative technique are compared against company criteria and decisions made as to whether the risks are acceptable or not.

I asked whether the respondents used qualitative or quantitative methods, or in combination. From the table below, it can be seen that qualitative techniques, and their use in combination with quantitative techniques, is common while the use of qualitative methods alone is rare.

Table3

showing how the respondents used the various methods in making decisions.

Type of Technique	No of companies	% of Companies
Qualitative Only	0	0
Quantitative Only	1	16.7
Combination of Both	5	83.3

4.2 Size and Nature of Projects that Employ Capital Budgeting Techniques

4.2.1 Nature of Projects

During the interviews, I found out that the companies do capital budgeting for all the projects but the only distinction was the level of detail of the process. This is determined by the size (monetary outlay) and the nature of project.

The respondents informed me that some projects are undertaken by the companies for other motives other than profits; but most are return driven. Projects relating to Health Safety Security and Environment (HSSE) were inevitable. These projects are mandatory due to regulatory requirements and at the same time they are part of corporate social responsibility. Some projects such as installation of alarm systems and environmental safety procedures are necessary to the firm. The consequences of not implementing such projects are usually of great magnitude to the future cash flows of the firm. The main categories of projects as cited by the respondents include:-

- **Maintenance of Business Projects**

These include expenditures necessary to replace worn-out or damaged equipment used to produce profitable products. Such maintenance decisions are usually routine and elaborate capital budgeting processes have to be undertaken.

- **Health Safety Security and Environmental Projects**

Such projects are popularly known as HSSE in the oil industry. They are compulsory non-revenue producing investments made necessary by government regulation, collective bargaining agreements, or insurance policy requirements and security

measures. Most of these projects usually have negative returns when capital budgeting techniques are employed.

- **Cost Reduction Projects**

These are projects that are meant to lower operational costs of the firm. These projects include investments in improved technology, expenditures to replace serviceable but obsolete plant and equipment, to lower the cost of labour, raw materials, electricity etc. Detailed capital budgeting analysis is usually undertaken to support the expenditure (s).

- **Expansion Projects**

These investments are complex because they require an explicit forecast of the firm's future supply and demand conditions. The expenditures are meant to increase the productivity and availability of existing products and services. It also involves expansion into new products and services or to expand into new geographical areas. These are strategic decisions that could change the fundamental nature of the firm's business; hence, very detailed and thorough analysis is invariably required.

4.2.2 Size of the Project

The respondents were not willing to provide information about the threshold values for projects. Therefore it was impossible to analyze the implication of size of a project to capital budgeting decision. However, I found out that projects that meet the International Financial Reporting Standards (IFRS) definition of capital expenditure – an expenditure with a value in excess of €5, 000 (KShs. 442,000.00 @ current exchange rate) and have a life in excess of one year –are subject to the same investment appraisal as outlined by the firm.

4.3 Stages of Capital Budgeting

Question 2 of the interview guide wanted to find the critical stages of capital budgeting as applied by firms in the oil industry. The respondents listed the stages as applied by the firm. Below is a table indicating the findings (stage 1 being the first and stage 6 being the last):

Table 4

showing critical stages of capital Budgeting as applied by the firms

		Ranking by companies					
		Co. 1	Co. 2	Co. 3	Co. 4	Co. 5	Co. 6
	Stage of Capital Budgeting						
1	Ranking and Choosing among competing projects	4	2	2	3	3	2
2	Post auditing already committed investments	1	5	5	5	5	5
3	Generating ideas for capital investments	2	1	1	1	1	1
4	Estimating each project's cash flow	3	4	4	2	2	4
5	Forecasting the supply and cost of funds	5	3	3	4	4	3
6	Others	-	-	-	-	-	-

Source: secondary data

Key:

Co. is the abbreviation for company

From the table, 5 out of the 6 companies ranked generating of ideas as the first stage. The only company that ranked stage 2 as the first argued that it was important to do a review of past projects before starting new ones as this would help them evaluate the reliability of their capital budgeting process. Five out of the six companies agree that stage 2 (post implementation audit) is their last stage.

My interview guide also touched on the most difficult stage as considered by the companies. Out of my six respondents 4 highlighted ranking and choosing among competing projects as the most difficult stage while only two ranked estimation of projects' cash flows as the most difficult. Ranking and choosing among competing projects was considered difficult because the companies had very many projects, each promising good returns and very many customers all of which they wanted to satisfy. On the other hand, the companies that cited estimation of cash flows and other benefits as the

most difficult stage told us that uncertain / unstable economic conditions and government regulations (especially taxation) made it difficult to accurately forecast the cash flows. Some of the benefits were also difficult to quantify especially the non-financial benefits like security, safety measures and environmental safety requirements.

4.4 Investment Appraisal Techniques

One of the main research objectives was to find out the most commonly used capital budgeting techniques by companies in the oil industry. The other objective was to review the current methodologies employed by companies in the oil industry.

Table5

showing the commonly used techniques by the companies

Capital Budgeting Technique	No. of Companies Employing the Technique	Relative %
NPV	6	100%
PB	6	100%
IRR	4	66.70%
PI	6	100%
ARR	3	50%
VIR	1	16.70%
ROACE	3	50%

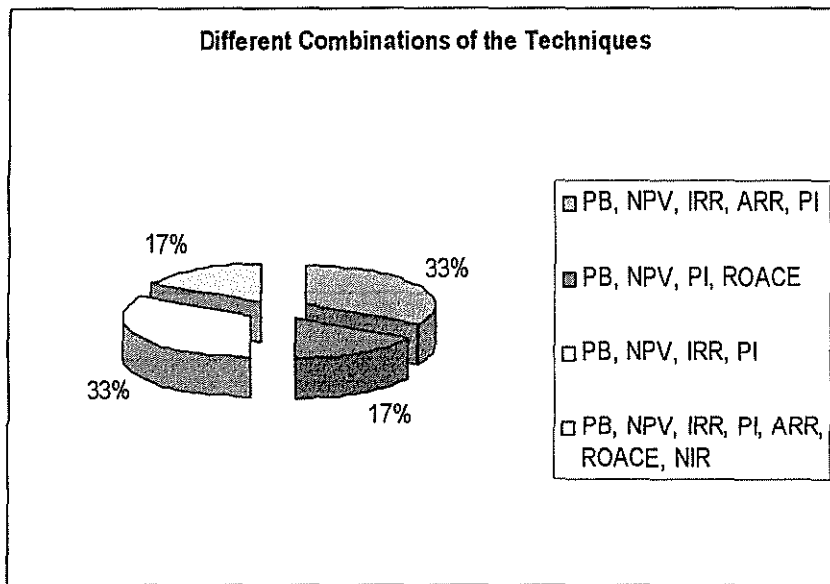
From the table above, NPV, PB and PI are used by all the companies. 66.7% of the population employ IRR while only 16.7% company employs the Value Investment Ratio (VIR). 50% use ARR and ROACE. The main difference between ROACE and ARR from my findings was the adjustment made on net income for minority interests in ROACE.

Table 6 showing current methodologies as applied by the companies

Techniques	No. of Companies	Relative %
PB, NPV, PI, ROACE, IRR	2	33.3%
PB, NPV, PI, IRR	1	16.7%
PB, NPV, PI, ARR	2	33.3%
PB, NPV, IRR, PI, ARR, ROACE, VIR	1	16.7%

From Table above, it shows that Payback Period, NPV and PI models are the most used techniques. 33.3% use the combination of PB, NPV, PI, IRR and ROACE; 16.7% use NPV, PB, PI and IRR; 33.3% use NPV, PB, PI and ARR; 66.7% use PB, NPV, IRR, PI, VIR, ROACE and ARR. It is clear from the above table that these methods are increasingly being used together.

Pie chart: showing how the various methodologies are combined



Source secondary data

4.5 Conflicts among Techniques

The firms have their own judgment criteria for selecting projects, when there is a conflict among the techniques. I found that firms use benchmarks which have been incorporated in the firm policy. Each firm within the industry has a preferred technique that is used

incase of conflicts, provided it meets its set-out benchmark. Some firms employ subjective judgment by top managers, others use profit margins that each project should generate while there was a firm that gave VIR the most weight.

4.6 Post-Implementation Audit

Regular appraisal of project in progress is important to understand the health of the project. The companies studied undertake post implementation review of projects to look at how they perform.

Table 7

showing how the post implementation review and how the companies perform.

Frequency of post-implementation audit	Number of firms	Relative %
After every two months	2	33.3
Quarterly	1	16.7
Semi-annually	1	16.7
Annually	0	0
As need arises	2	33.3

Source: secondary data.

From my study, I found that no firm in the oil industry reviewed its projects on an annual basis. This they associated to the erratic changes taking place in the industry worldwide. Post-implementation audit was done using the forecasts as the benchmark. This approach will protect the company from financing cost overrun and value destroying projects.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The study reveals that all the companies surveyed used at least one capital budgeting technique in selection of projects. A greater revelation was that all the companies surveyed combined the techniques (at least four) in their appraisal process. In line with my objective of identifying the current methodologies, I found that some companies employed other techniques such as the Value Investment Ratio (VIR) and Return on Average Capital Employed (ROACE). My unstructured interview with the business analysts and/or finance managers from the firms also revealed that investment proposals go through a very thorough screening up the management ladder before approval. This screening complements the use of the techniques. How a project blends into the firms strategic fit is also assessed via this necessary bureaucracy.

5.2 Conclusions

During my study, there was a problem of obtaining data from the oil firms owing to stringent privacy policies. This therefore made it impossible to perform reliability tests on the capital budgeting techniques employed by the firms. However, it is worth noting that developments in technology have prompted the use of more advanced techniques. Some companies have also developed company-specific approaches / software that are tailor-made for the companies and therefore incorporates the unique characteristics within the company. The use of these customized approaches reduces the probability of post-implementation failure to almost nil.

It is also important to note that some projects may prove unacceptable from evaluation by the techniques but due to their importance, their implementation remains inevitable e.g. installation of fire alarms at an oil well (tank).

It is therefore conclusive that the companies still employ the commonly recognized capital budgeting techniques in their project evaluation alongside the new models. Risk is also incorporated in capital budgeting decisions.

5.3 Limitations of the Study

This study faced the following limitations:

- Since the study was limited to only six oil firms out of a possible 23 companies, the outcome of this study cannot be generalized to the oil industry in Kenya.
- The study depended on the narratives provided by the respondents which are usually biased and persuasive.
- Meager financial resources made it difficult for me to frequently visit already implemented projects so as to verify the information given to me by the respondents.
- Failure to get financial data on past projects from the respondents citing reasons like company policy, unavailability and lack of time made it impossible for me to analyse the reliability of forecasted cash flows. I was therefore not able to research on what causes forecasted cash flows to deviate from actual cash flows.
- Time constraints limited our study to only 6 firms instead of 23. Our sample comprises of major oil firms and therefore may not be a true reflection of capital budgeting techniques in the industry.

5.4 Recommendations

The development of Information Communication Technology (ICT) should help firms to come up with firm-specific software/programs that incorporate the usage of more variables and data.

Firms should continue to use more than one technique in capital budgeting. This is because each technique is unique and is able to capture different aspects of capital budgeting.

Stringent privacy policies within the oil industry make it difficult to access research materials, therefore the university should liaise with these firms so as to allow scholars to access information for their research.

5.5 Suggested Area for Further Research

The new methodologies such as VIR should be researched further for their relevance and reliability in capital budgeting. At the same time, the question arises as whether capital

budgeting techniques used by Multinational companies are different from those employed by the indigenous companies.

There is a need to identify a superior technique that prevails over other capital budgeting techniques in cases of conflict.

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APPENDICES

APPENDIX I: POPULATION OF THE STUDY

COMPANY

1. Shell/BP
2. Kenol-Kobil
3. Total Kenya
4. Chevron
5. Mobil Oil (Tamoil)
6. NOCK
7. Gapco
8. Bakri International
9. Oilcom
10. Petro
11. Metro Petroleum
12. Galana Oil
13. Dalbit Petroleum
14. Engen
15. Tecaflex
16. Global Petroleum
17. MGS International
18. Fossil
19. Hass Petroleum
20. Addax Kenya
21. Hashi Empex

Source: Petroleum Institute of East Africa

APPENDIX II: SAMPLE OF THE STUDY

1. Shell/BP
2. Kenol-Kobil
3. Total Kenya
4. Chevron
5. Mobil Oil (Tamoil)
6. NOCK

Note: the above sample treats Kenol-Kobil as one company which differs from the un-updated Petroleum Institute of East Africa's website.

Source: Petroleum Institute of East Africa

APPENDIX III: KENYA OIL INDUSTRY SALES MARKET SHARE – 2006

COMPANY	MARKET SHARE
Shell/BP	19.61
Kobil	17.68
Total Kenya	17.12
Chevron	14.24
Mobil Oil (Tamoil)	10.89
NOCK	4.31
Kenol	2.87
Gapco	2.78
Bakri International	1.49
Oilcom	1.33
Petro	1.21
Metro Petroleum	1.07
Galana Oil	0.93
Dalbit Petroleum	0.67
Engen	0.67
Tecaflex	0.48
Global Petroleum	0.22
MGS International	0.18
Fossil	0.16
Hass Petroleum	0.07
Addax Kenya	0.04
Hashi Empex	0.01
Total	100.00

Source: Petroleum Institute of East Africa

APPENDIX IV: INTERVIEW GUIDE ON CAPITAL BUDGETING

1. For which kind of projects do you carry out capital budgeting (size and nature)?
2. Please list the stages of capital budgeting in the order in which you apply them.
3. Which Stage do you consider most difficult and why?
4. Which investment appraisal technique (s) does the firm employ and why?
5. How reliable were the cash flow forecasts (comparison of actual vs. forecasted cash flows)?
6. What caused the deviations in the cash flow forecasts?
7. Please provide us with details of at least two projects that have been undertaken by the company in the past and the post implementation audit reports.
8. Which Risk analysis techniques does the firm employ?



**KAMPALA
INTERNATIONAL
UNIVERSITY**

Ggaba Road, Kansanga * PO BOX 20000 Kampala, Uganda
Tel: +256 (0) 41 – 266 813 * Fax: +256 (0) 41 – 501 974
E-mail: admin@kiu.ac.ug * Website: http://www.kiu.ac.ug

**OFFICE OF THE DEAN
SCHOOL OF BUSINESS AND MANAGEMENT**

Date: 20th May, 2009

Our Ref: KIU/SBM/RL/002-05/09-3

THE HUMAN RESOURCE MANAGER,
KENOL – KOBIL PETROL STATIONS
IN KENYA.

Dear Sir/Madam,

RE: MWAWAZA HEZBON SALIM REG.NO.BBA/7353/51/DF

The above mentioned is a bonafide student of Kampala International University pursuing a Bachelor of Business Administration in the School of Business and Management of the University.

He is currently conducting field research and the title of the Research project is "CAPITAL BUDGETING TECHNIQUES AND THE MANAGEMENT OF FINANCIAL RESOURCES IN OIL INDUSTRIES" A CASE STUDY OF KENOL – KOBIL PETROL STATIONS IN KENYA . As part of his studies (research work) he has to collect relevant information through questionnaires, interviews and other relevant reading materials.

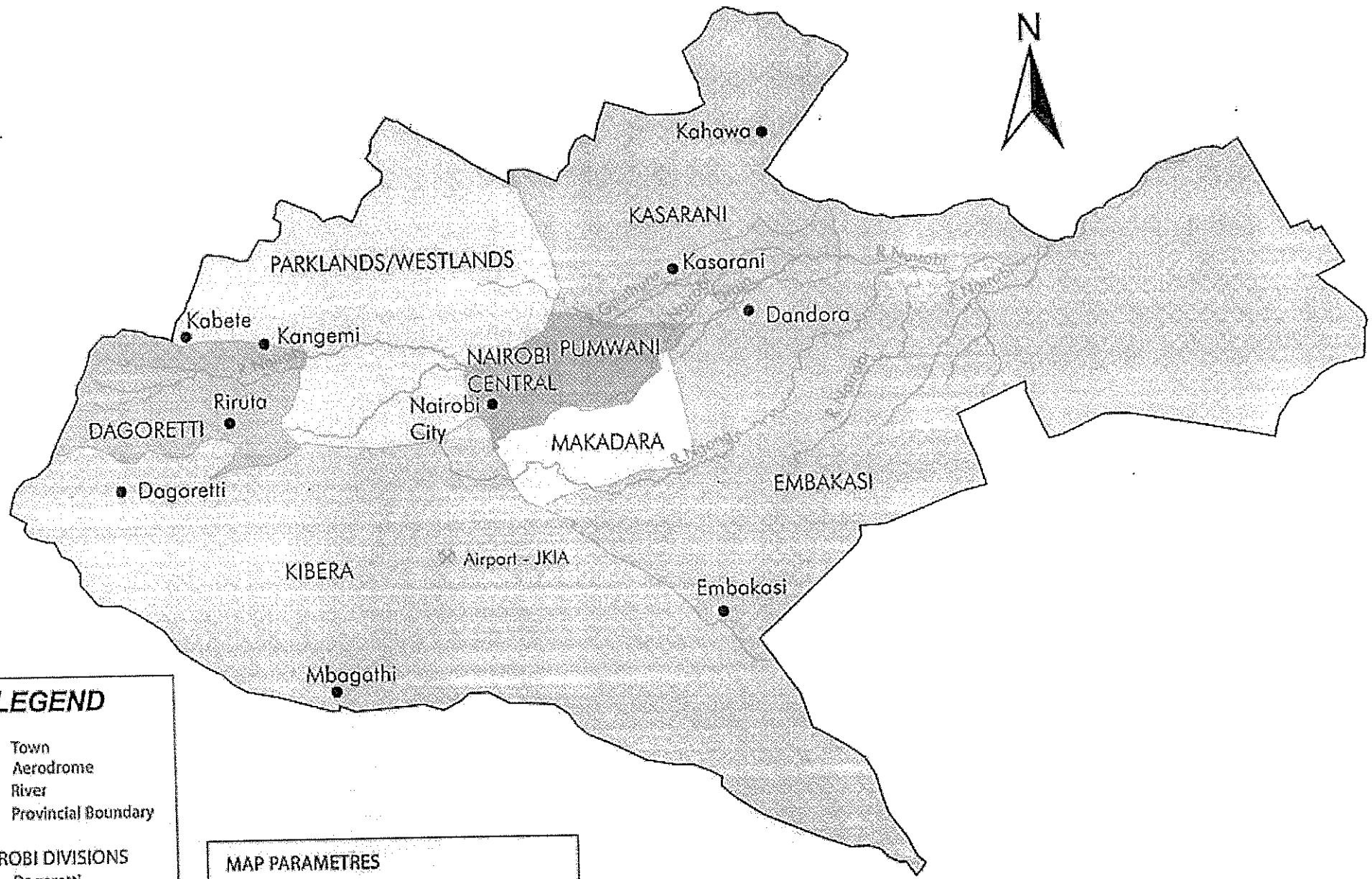
The purpose of this letter is to please request you to avail him with the necessary information he may need.

All and any information shared with him will be used for academic purposes only and we promise to share our findings with your institution.

Any assistance rendered to him in this regard will be highly appreciated.

Yours Sincerely,

**DR. ALFRED NUWAGABA
DEAN SCHOOL OF BUSINESS AND MANAGEMENT**



LEGEND

- Town
- ✈ Aerodrome
- River
- ▭ Provincial Boundary

NAIROBI DIVISIONS

- ▨ Dagoretti
- ▨ Embakasi
- ▨ Kasarani
- ▨ Kibera
- ▨ Makadara
- ▨ Nairobi Central

MAP PARAMETRES

Grid: UTM
 Datum of height: Mean Sea level
 Projection: UTM
 Central Meridian: 39°00' East Greenwich
 Latitude of Origin: Equator
 Scale of Measurement: Meters



CURRICULUM VITAE

HEZRON MWAWAZA SALIM

EMAIL ADDRESS hmwawaza@yahoo.com
ADDRESS P O BOX 22441 NAIROBI
TEL +254 722 536693

NATIONALITY: KENYAN

DATE OF BIRTH: 21 JANUARY 1982

EDUCATIONAL BACKGROUND

PRIMARY SCHOOL 1990-1997

**ST GEORGES PRIMARY
KENYA CERTIFICATE OF PRIMARY EDUCATION**

SECONDARY SCHOOL 1998-2001

**AQUINAS HIGH SCHOOL
KENYA CERTIFICATE OF SECONDARY EDUCATION**

COLLEGE

2002-2003

**AGUSTANA COLLEGE
PRE-UNIVERSITY**

2004

**VISIONS INSTITUTE
KENYA ACCOUNTING TECHNICIANS CERTIFICATE
(part 1)**

UNIVERSITY

**2005-CURRENT KAMPALA INTERNATIONAL UNIVERSITY
BACHELORS OF BUSINESS ADMINISTRATION
(ACCOUNTING OPTION)**