

**A SURVEY OF CAPITAL BUDGETING TECHNIQUES APPLIED BY
SUGAR COMPANIES IN WESTERN KENYA**

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DECLARATION

I declare this is my original work and it has not been presented for examination in any university

Sign..........

Elizabeth Kitili

.....15/11/2012.....

Date

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

Sign..........

Dr. Wanjare

.....19/11/2012.....

Date

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I would like to thank the Almighty God for giving me the ability to carry out this research project. When I was discouraged I would hear His still small voice whispering to me, 'Be still and know that I am God'. I would have despaired were it not for God.

I express my sincere gratitudes to my supervisor Dr. Wanjare for his guidance during the whole project. Despite his tight schedule he would always get time to guide me. God bless you sir!

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DEDICATION

I dedicate this project to my wonderful daughter Praise.

ABSTRACT

Capital budgeting is one of the most important factors in the process of corporate decision making. Capital budgeting models have been and continue to remain the predominant means for evaluating and selecting amongst investment opportunities. Firms that choose correctly reap improved financial performance while those that get the decision wrong either suffer losses as a result of making the ill-fated decision or incur a significantly high opportunity cost in the event that they chose not to invest. This was a census survey which intended to collect data from the nine sugar companies in Western Kenya, although data was collected from nine companies. In light of the above, this research paper seeks to provide empirical evidence about the capital budgeting techniques used by the sugar companies. The study utilized a self administered semi structured questionnaire to collect data from the eight chief financial officers of the sugar companies. The study finds that sugar companies regularly and always employ a simple payback period followed by discounted techniques such as NPV and IRR. A small percentage of the companies that use DCF techniques use WACC to determine the discount rate and the weights are determined by target/ market values and book values in the same proportion. However some gaps were noted in the application of finance theory. Some companies use accounting profits as opposed to cash flows, they use book values to determine weights as opposed to market values, they do not treat inflation correctly and finally scenario analysis is the dominant risk measure used as opposed to more sophisticated methods such as decision trees and simulation analysis. Real options approach which is a new technique has low popularity among the sugar companies. An interesting finding is that these companies have high debt to equity ratios indicating that they are highly leveraged. An area worth further research is whether the use of a particular technique leads to high improved financial performance or vice versa.

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LIST OF ABBREVIATIONS AND ACRONYMS

DCF- Discounted Cash Flow

EBIT- Earnings before Interest and Tax

EPS- Earnings per share

KSB- Kenya Sugar Board

KSI- Kenya Sugar Industry

MBA- Master of Business Administration

NPV- Net Present Value

PV- Present Value

RRR- Required Rate of Return

ROA- Return on Assets

ROE- Return on Equity

DEFINITION OF TERMS

Accounting rate of return: Average return on book value (e.g. ROI, ROA, ROE)

Dividend discount model (DDM): When using a dividend discount model, the cost of equity capital is calculated back out from dividend/earnings model. E.g. $\text{Price} = \text{dividends} / (\text{cost of capital} - \text{growth})$.

Internal rate of return (IRR): The discount rate that sets the present value of the project cash flows equal to the initial investment outlay.

Net present value (NPV): The present value of future cash flows discounted at the required rate of return, minus the initial investment.

Nominal cash flows: cash flows are estimated without taking into account inflation.

Nominal required rate of return: inflation is not taken into account in the required rate of return.

Real cash flows: inflation is taken into account in the cash flows.

Real required rate of return: inflation is taken into account in the required rate of return.

CHAPTER ONE

INTRODUCTION

1.1 Background

Butler et al (1993) define investments as the utilization of long-term benefits through short-term costs. It is highly common that cash-flows are skewed so that the initial cost is high and the benefits are realizable later. As much as there are success stories of investments, there are also many examples of bad investment decisions. However, many companies do nowadays steer the investment decisions carefully. It is also common that corporations have clear hierarchical procedures, where all major investment decisions are analyzed and approved by the top management (Arnold et al., 2000).

Capital budgeting is the process in which companies determine whether an investment opportunity is worth pursuing or not. Investment decisions should be made on the ground of some kind of valuation and evaluation. Capital budgeting is a daily operational task for many business controllers and CFO's in competitive, global markets. Investment decisions are interesting also from the organizational point of view. There are not many other operations in a company, where all different units, from marketing and communications to sales and finance, take part in to a common decision that affects the organization as a whole (Byers et.al., 1997).

The importance of investment decisions has lately even increased. There is a short of available funds in the current recessed world economy, and thus all the investments and capital allocations must be directed to profitable projects. In these types of situations, strategic and long-term

aspects become more important than short-term profit. On the other hand, the pressure to comply with the financial targets set to the management is playing key role in some organizations' investment decisions (Bennouna, 2010). If companies do not evaluate projects correctly, and steer the available financial resources to right targets which give out returns more than the cost of capital, it will result to deteriorating value of the corporation (Arnold et al., 2000). Sugar companies lately have been involved in a number of investments and this research would seek to find out how those investments have been appraised.

The need for relevant information and analysis of capital budgeting alternatives has inspired the evolution of a series of methods to assist firms in making the “best” allocation of resources as Shinoda (2010) pointed out. Amongst the earliest methods available were the non-discounted cash flow methods and the discounted cash flow techniques. The non discounted cash flow methods are form of capital budgeting techniques used in evaluating the uncertainty and risk of the value of a firm without considering the time value of money. These techniques are biased in selecting projects and also do not consider cash flows in investment decisions. The techniques constitute the traditional payback period (PB) and the accounting rate of return (ARR) techniques (Byers, 1997). Discounted cash flow analysis on the other hand is a method of evaluating an investment by estimating future cash flows and taking into consideration the time value of money.

1.1.1 Capital budgeting techniques

Corporate capital budgeting decision models are used by corporate managers in the process of critically important decision-making about capital budgeting. There are a variety of capital budgeting methods: the net present value (NPV) method, the internal rate of return (IRR)

method, the simple payback period (SPP) method, the discounted payback period (DPP) method, the accounting rate of return (ARR) method, such as ROI, and the real option (RO) method (Brealey and Myers, 2000).

Almost all academic articles and textbooks recommend that managers should use the most appropriate and exact methods to ensure the highest return for the least risk in order for their firm to maximize shareholder value. Academic literature, in particular that devoted to finance theory, has therefore indicated that discounted cash flow models, such as NPV, are desirable for decision-making concerned with capital investment because an increase of NPV is connected directly with increased corporate value (Alkaraan and Northcott, 2006).

While managers have, over the long term, used various capital budgeting models, the use of such models has not always been in agreement with finance theory (Drury, 1997). In particular, the payback period method is said to be theoretically irrelevant and mistaken because the simple payback period (SPP) method ignores the time value of money and cash flows beyond the cutoff date: the cutoff is usually arbitrary. Even if we use the discounted payback period (DPP) method, which was modified in order to eliminate the limitations imposed by ignoring the time value of money, we cannot resolve the difficulty of ignoring cash flows beyond the cutoff date (Arnold, 2002). This research attempts to evaluate how sugar companies appraise their capital investment decisions.

1.1.2 Sugar companies in Western Kenya

Western Kenya has many large factories, including sugar processing plants. Today, sugarcane is grown mainly in four districts of western Kenya: Nyando, South Nyanza, Mumias and Busia. The operational sugar processing plants are; Mumias, Nzoia, West Kenya, Butali, Muhoroni, Chemilil, Sonysugar, Busia, and Kibos and Allied. The largest of these companies is Mumias Sugar Company, based at Mumias, to the west of Kakamega. This factory produces the dominant sugar brand in Kenya. By-products from the factories include molasses (mostly for alcohol production), baggase (for power generation) and filter press mart (for fertiliser).

Unlike Kenya, cane is cultivated as a strategic product to support industries such as: Beverages, Confectionery, Pharmaceuticals, Wines, Spirits, Power Alcohol, Animal Feeds, Energy, Chemicals and Fertilizers. The Kenya sugarcane industry has embraced the market reality that the industry needs to expand its product base as a means of strengthening its competitiveness globally. Some companies within the industry have undertaken projects such as co-generation of electricity, initiation of ethanol production and production of industrial sugar while others are initiating them (Kenya Sugar Board 2009-2014). All these projects require huge capital investments and it would be interesting to understand how these investments are evaluated in order to ensure that shareholder value is maximized.

1.2 Statement of the research problem

It is self-evident that in each investment project that companies do, or try to do; they take into account strategic, qualitative and financial aspects. Although main course of academic literature has stressed the importance of financial appraisal techniques particularly the DCF methods in

investments, companies sometimes accept also projects that aren't financially sound. It might be for example that a corporation faces a situation where it must undertake a project, which has negative net present value, due to strategic reasons. (Ansio, 2010; Myers, 1984).

Although the sugar industry plays a significant role in social-economic development of the Kenyan economy self-sufficiency in sugar has remained elusive over the years as consumption continues to outstrip supply. A substantial amount of capital is tied up in stalled factory expansion equipment in companies such as Nzoia and Chemilil, Muhoroni is under receivership and Miwani went under. The industry wants to enhance its competitiveness through cost reduction strategies and efficiency improvements and expanding product base which calls for numerous capital investments. Academic literature, in particular that devoted to finance theory, has indicated that discounted cash flow models, such as NPV, are desirable for decision-making concerned with capital investment because an increase of NPV is connected directly with increased corporate value (Shinoda, 2010). This research will therefore seek to find out how sugar companies appraise their capital budget whether their intuitions are consistent with financial theory.

Carr and Tomkins (1998) found that in the U.S.A, almost all companies generally use DCF models, but simultaneously half of the same corporations use DCF methods as primary technique in the investment decisions. Hall (2000) provided evidence in his study in South Africa that non-financial criteria plays a significant role in the process of capital investment proposals. He found out that 33.8% of the respondents' capital investments were rejected by non- financial (strategic criteria). In Kenya, Khakasa (2009) conducted a survey of IT investments appraisal techniques in the banking sector. The findings of the study reveal that Payback Period and Return on

Investment were both used by 60% of the responding institutions. Only 8% of banking institutions use at least one of the discounting techniques. Net Present value is used by 8% of the banks, while IRR is used by none of the responding banks. No studies have been done concerning investment decisions evaluation techniques in the sugar industry in Kenya. A natural step is therefore to assess the decision-making process in the sugar industry to determine how far this process is at least qualitatively consistent with the theory.

1.3 Research objectives

The main objective of this study is to find out how sugar companies in Western Kenya appraise their capital budgets.

1.4 Value of the study

The attainment of the study objectives will make significant contributions to the theory and practice of finance. First, this study will provide a greater understanding on whether finance theory as it remains just a theory or it is used in practice. Managers are accused of misusing DCF analysis in the evaluation. This study will also shed light on whether the calculations are consistent with what theory prescribes.

In Kenya, sugar is still the core commodity produced from sugarcane. Value addition to the co-products of sugarcane processing i.e. molasses, bagasse and filter mud is still low keyed and largely unexploited. However most of the companies have expanded or are in the process of expanding their product offerings which has called for immense capital investments. The findings of this research will provide an empirical evidence of how capital budgets are appraised.

This research will also be beneficial to policy makers in the sugar industry in formulating policies regarding how investment projects particularly strategic investments are to be analyzed in the light of the findings of the research. This is because there is no policy in place guiding evaluation of capital investments.

1.5 Chapter summary

This chapter has reviewed the background of the study and described the key variables of the research namely capital investment appraisal techniques and an overview of the sugar companies in Western Kenya. The chapter has also described the statement of the research problem, study objectives and the significance of the study. The next chapter presents a critical review of both conceptual and empirical literature on the study variables with the aim of highlighting research gaps.

CHAPTER TWO

LITERATURE REVIEW

2.1 Preview

This chapter examines the relevant conceptual and empirical literature related to all the variables under study. In particular this chapter discusses Modigliani and Miller's theory of investments as a guide to the study, discounted techniques of capital budgeting, non discounted techniques and options pricing theory. In addition sugar companies in Western Kenya are reviewed to identify the investments they are currently undertaking.

2.2 Modigliani and Miller's theory on investment (1958)

The Modigliani–Miller theorem states that, in the absence of taxes, bankruptcy costs, and asymmetric information, and in an efficient market, a company's value is unaffected by how it is financed, regardless of whether the company's capital consists of equities or debt, or a combination of these, or what the dividend policy is. The theorem is also known as the capital structure irrelevance principle. Modigliani and Miller (1958) argue that managers should ignore financing and dividend decisions as irrelevant and focus on positive net present value (NPV) investment opportunities that would maximize the value of the firm. Thus the analytical framework for determining a project's NPV as derived from discounted cash flows analysis (DCF) came to provide a rational basis for collective decision-making. The classical theory by Modigliani and Miller (1958) identifies sophisticated evaluation methods as a tool for maximizing the profitability of firms.

The Modigliani-Miller Theorem provides conditions under which a firm's financial decisions do not affect its value. Modigliani (1980) explains that with well-functioning markets (and neutral taxes) and rational investors, who can 'undo' the corporate financial structure by holding positive or negative amounts of debt, the market value of the firm – debt plus equity – depends *only* on the income stream generated by its assets. It follows, in particular, that the value of the firm should not be affected by the share of debt in its financial structure or by what will be done with the returns – paid out as dividends or reinvested (profitably).

What is currently understood as the Modigliani-Miller Theorem comprises four distinct results from a series of papers (1958, 1961, and 1963). The first proposition establishes that under certain conditions, a firm's debt-equity ratio does not affect its market value. The second proposition establishes that a firm's leverage has no effect on its weighted average cost of capital (i.e., the cost of equity capital is a linear function of the debt-equity ratio). The third proposition establishes that firm market value is independent of its dividend policy. The fourth proposition establishes that equity-holders are indifferent about the firm's financial policy.

2.3 Capital budgeting techniques

Capital budgeting, which can be described as the formulation and financing of long-term plans for investment Byers, (1997) is one of the most important responsibilities of the owners/managers of firms. The decisions made during the capital budgeting process determine the future growth and productivity of the firm. Capital budgeting is a process designed to achieve the greatest profitability and cost effectiveness in the private and public sectors of the economy. Capital budgeting and the estimation of the cost of capital (the rate of return that a firm must earn

on its investments to ensure that the minimum requirements of the providers of capital are met) are the most important financial decisions facing owners/managers of firms (Martins 2011). The techniques fall under discounted, non- discounted methods and new methods as discussed below.

2.3.1 Discounted techniques

DCF analysis can be divided into two main categories, the net present value method (NPV) and the internal rate of return method (IRR) (Carter and Ejara (2007)). The logic behind DCF analysis is to forecast relevant future cash flows and take the issue of time into account by discounting the cash flows back to present value. The process is performed by the help of a discount rate, representing opportunity costs and risk. The aim of this cost-benefit analysis is to find expected present value of future income and costs, and to compare this value with projects' investment costs (Bennouna et. al 2010). The difference between the present value of net income and the project's investment costs is the project's expected net present value (NPV) as illustrated below:-

$$PV = \sum_{t=1}^T C_t / (1 + r)^t$$

Where

T = Projects life including any salvage value

C_t = Forecasted incremental cash flow after corporate taxes

r = Discount rate/ the cost of capital reflecting the risk of the estimated cash flows

NPV equals PV less the cash outlay required at t = 0.

Both NPV and IRR are consistent with the goal of maximizing a firm's value because use cash flows and consider cash flow timing (Tayler,2004). With NPV, the present value of future cash flows is generated and when compared with initial outflows, an investment project is seen as acceptable whenever a positive NPV is the outcome. IRR is a percentage rate that equates the present value of future cash inflows with the present value of its investment outlay. Finance theory asserts that NPV is the best method for evaluating capital investment projects.

In a normal project, cash outflows are followed by annual cash inflows and under these circumstances, NPV and IRR lead to the same investment decisions (Akalu 2001). Problems with the IRR technique occur in two cases and may lead to incorrect capital budgeting decisions. When project cash flows are abnormal this may lead to multiple IRR calculations, affecting both independent and mutually exclusive projects. When investment projects are mutually exclusive, scale and time differences may lead to incorrect investment decisions and this is a problem associated with the reinvestment rate assumption (Brigham and Ehrhardt, 2002).

2.3.1.1 Proper use of and pitfalls in DCF

DCF techniques deficiencies are considered to be in the application rather than theory. Drury and Tayles (1997) noted that despite the increased usage of the more theoretically sound discounting techniques, several writers in both the UK and US have claimed that companies are under investing because they misapply or misinterpret DCF techniques in:-

Cash flows estimation

The cash flows vary from asset to asset – dividends for stocks, coupons (interest) and face value for bonds, and after-tax cash flows for real projects (Martins 2011). The value of an asset comes from its capacity to generate cash flows. When valuing a firm, these cash flows should be estimated after taxes, prior to debt payments, and after reinvestment needs. Tyles and Colins (1997) found out that there is a mismatch of assumptions regarding cash flow assumptions and discount rates. The most obvious pitfall was using a nominal discount rate derived from financial market data and applying this to current price or real cash flows. It has been asserted by several writers (Myers, 1984; Kaplan, 1986) that firms are guilty of rejecting worthwhile investments because of the improper treatment of inflation in the financial appraisal. This research would seek to find out how cash flows are adjusted for inflation in evaluating investment projects.

Discount rate

The cost of capital is a key parameter of DCF calculation. Firms are expected to use the weighted average cost of funds from various sources including debt, preferred stock and common equity (Brookfield, 1995). Firms that employ a single cost of funds (for example, the cost of debt if the project is financed by borrowings) make an erroneous choice. A study conducted by Payne et al., (1999) revealed that a large number of firms employed theoretically incorrect methods (such as the cost of debt or past experience) to determine the discount rate this research will aim at finding out whether this is the case in the sugar industry.

Risk analysis methods

Effective capital investment decisions require not only the use of DCF techniques, proper cash flows, and discount rate estimates, but also risk analysis (Bennouna, 2010). Uncertainty affects all the parameters required in computing NPV as part of the evaluation phase: the project's life, initial capital expenditure, cash flow estimates and the discount rate. There are many methods available to assist finance managers in handling risk (Pike, 1991). Simple techniques include adjusting the discount rates and the payback period. Sophisticated methods consist of probabilistic risk analysis such as sensitivity analysis, decision-tree analysis and Monte Carlo simulation. This research would seek to find out how risk is taken into account when making investment decisions in the sugar industry.

2.3.2 Other types of discounted methods

2.3.2.1 Discounted payback period (DPP)

The discounted payback period method takes into account the time value of money. The discounted payback period represents the time it takes for the present value of a project's cash flows to equal the cost of the investment. The findings of the survey conducted by Ryan and Ryan (2002), indicate that USA firms use simple payback period and discounted payback period higher than they use NPV and IRR despite many finance textbooks claiming they are not consistent with what finance theory prescribes.

2.3.2.2 Profitability index (PI)

This investment evaluation method is used to evaluate proposals for which net present values have been determined. The profitability index is determined by dividing the present value of

each proposal by its initial investment. The Profitability Index is also referred to as the benefit cost ratio. A project is acceptable if its PI is greater than 1.0 and the higher the PI, the higher the project ranking (Reinford, 2001).

2.3.3 Non-DCF techniques

A number of investment analysis methods do not involve discounting cash flows. The most common of these are the payback period (PP) and accounting rate of return.

2.3.3.1 Traditional payback period (PB)

CIMA (2002) defines payback as 'the time it takes the cash inflows from a capital investment project to equal the cash outflows, usually expressed in years'. When deciding between two or more competing projects, the usual decision is to accept the one with the shortest payback. Payback is often used as a "first screening method". This implies that when a capital investment project is being considered, the first question to ask is: 'How long will it take to pay back its cost'? Several surveys for example Ryan and Ryan (2002), Graham and Harvey (2002), pointed out that the traditional payback period was the most utilized method of appraising the capital budget. This study would seek to establish whether this holds for sugar companies in Western Kenya.

2.3.3.2 Accounting rate of return (ARR)

The accounting rate of return is the ratio of the project's average after-tax income in relation to its average book value (Copper, 1999). Accounting rate of return (ARR) evaluates the project based on standard historical cost accounting estimates. The accounting rate of return also

referred to as the book rate of return, bases project evaluation on average income and on accounting data rather than the projects cash flows. Unlike the payback period, this technique produces a percentage rate of return figure which is then used to rank the alternative investments. Drury and Tayles (2007) points out that non-discounted techniques such as payback period and accounting rate of rate are the most applied appraisal techniques by the companies that do not employ discounted techniques. Can these findings be replicated by Sugar companies in Western Kenya?

2.3.4 New techniques

One of the main developments in the capital budgeting literature over the last decade has been real options. Most capital investment projects have options (for example, option to expand or to abandon) that have value (Ross et al., 2005). Conventional DCF analysis should be complemented by real options analysis in order to determine the true NPV (Amram and Howe, 2002). However, NPV is often calculated without identifying and considering real options. Previous empirical literature found that a relatively small number of firms employed real options (Block, 2007; Graham and Harvey, 2001; Ryan and Ryan, 2002). In Kenya, there appears to be a complete absence of research regarding their use which will be furthered by the findings of this research.

2.4 Variables leading to utilization of different appraisal methods

A number of empirical studies have been conducted on strategic investment evaluation methods. Graham and Harvey (2001) showed that size was one of the biggest factors, which drive the investment decisions of organizations. Large firms are much more frequent to use sophisticated

methods such as DCF in the project analysis than small firms (e.g. Graham & Harvey, 2001). Fundamentals of why smaller firms do in fact use less sophisticated methods are still quite ambiguous and this study would seek to explore the possibilities.

Pike (1996) also found a relation with size and the popularity of sophisticated methods. His longitudinal study of 17-years indicates that the firm size is associated with the utilization of DCF methods. He also found that this is not the case when observing the relation of size and payback period. However, Pike underlines that the firm size is not necessarily the direct causal factor steering the usage of DCF methods, but in his study it also might be distorted with other fundamentals.

Graham and Harvey (2001) have also examined many other variables that affect to the use of sophisticated methods. They used 14 variables with a specific measure, to evaluate contextual settings that might have a reflection on the utilization of sophisticated techniques. They found out that highly levered firms are using DCF techniques much more than the companies with low debt-to-equity ratio. Graham and Harvey (2001) highlights, that the effect of leverage is not entirely related to the size of a firm. It seems that high-levered firms, whether they are small or large, do tend to use the sophisticated evaluation methods more than low-leverage firms.

They also found that the CEO's with Master of Business Administration (MBA) degrees are using the DCF methods more than the non-MBA CEO's, although the difference was not significant. Graham and Harvey (2001) do also find that public companies are much more likely to use the sophisticated methods than private organizations. Thus based on this it is hard to

present unambiguous conclusions on the utilization of DCF methods among public and private organizations.

2.5 The sugar industry and current investments undertaken

The sugar industry plays a significant role in socio-economic development of the Kenyan economy according to (KSI strategic plan 2010-2014). The sector directly supports 200,000 small-scale farmers who supply over 85 percent of the cane milled by the sugar companies.

Recognizing the importance of the sector, the Government and the private sector have been involved in the promotion of the industry through direct investments mainly on factories for processing cane and other related infrastructure. Despite these investments, self-sufficiency in sugar has remained elusive over the years as consumption continues to outstrip supply. Kenya has remained a net importer of sugar.

Overall the industry is engaged in projects for co-generation of electricity, expansion of product base such as ethanol production, production of industrial sugars among others (KSI strategic plan 2010-2014). For example, there are strategies in place to introduce new products such as ethanol production, expanding co-generation, new packages for various market segments, capacity expansion and modernization, investment in computer technology and improved supply chain management for overall efficiency at Mumias Sugar Company. Nzoia Sugar Company is considering a diversification programme which will include co-generation, paper manufacturing, animal feeds, spirits and sugar refining is being put in place to ensure proper utilization of by-products and improvement of the company revenue base which is usually the trend in most companies. These investments require a sophisticated method of evaluation such as DCF. This

study therefore seeks to assess the extent to which DCF analysis methods are employed in these strategic investment decisions.

2.6 Chapter summary

This chapter has presented a critical review of both conceptual and empirical literature on the study variables with the aim of highlighting research gaps. More specifically extant literature on capital budgeting techniques was reviewed. In addition a new approach to capital budgeting such as the options theory was also reviewed. Finally sugar companies in Western Kenya and the investments they are currently undertaking were also reviewed. The next chapter will detail the techniques that will be used in carrying out the actual research.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Preview

This chapter details the procedures that were employed in carrying out the study. It describes the research design used, the population of the study and data analysis methods. In addition measures of validity and reliability which were employed are also examined.

3.2 Research design

This research will follow a descriptive research design. According to Ranjit (2005), descriptive studies are undertaken to understand the characteristics of organizations that follow certain common practices. It will involve description, analysis and interpretation of circumstances at the time of study.

3.3 Population

This was a census study of the nine companies in western Kenya. Target group of this research was all chief finance officers, or equivalent, of the nine sugar companies in Western Kenya (A list of the companies is in the appendix). Some of the organizations in this target group were quite small, which meant that no named chief finance officer was found. In these cases the questionnaire was administered to the person who is responsible for the financial analysis in the firm. The aim of this research was to examine the capital investment appraisal techniques by sugar companies in western Kenya, and whether their intuitions were consistent with what theory prescribes.

3.4 Data collection

Data was collected from the respondents through a self-administered questionnaire using the key informant method. Chief finance officers were the main respondents and only one respondent was involved. The questionnaire was administered through drop and pick method. The researcher approached each company, introduced herself to the relevant respondents explaining to them the nature and purpose of the study then left the questionnaire with the respondents to be completed and picked later.

The questions required responses in three forms numerical ratings (on a five-point scale) expressing subjective estimates of quantifiable characteristics (such as frequency of use of each of the capital budgeting techniques), yes / no responses to questions asking, for example, the treatment of inflation and a numerical figure stating for example the number of employees for open-ended questions.

3.5 Data analysis

All completed questionnaires were edited to ascertain that they are complete and consistent across respondents and to identify omissions. Data was then be coded under different variables with their frequencies. Data was analyzed using descriptive statistics. Descriptive statistics would include measures of location (mean) and measures of dispersion (standard error mean). The statistical analysis would be conducted by using SPSS 12.0 statistical program and the results presented in frequency tables and pie charts.

3.6 Validity and Reliability

Reliability and validity identifies the potential errors in a research data. Reliability refers to the repeatability of the research. For instance if several researchers end up in the same conclusion, the result can be defined as reliable. Also if many scholars use the same test and come up in to the same conclusion, the result is reliable. Validity on the other hand refers to the actual ability of the research to measure exactly what is meant to be measured.

Due to the highly theory based approach to the questionnaire, it was estimated that some of the respondents might not know all different techniques and methods stated in it. A separate attachment containing definition was constructed and attached to the questionnaire. Definitions were partly developed by the researcher and partly derived from current literature. To ensure validity construction of the questionnaire was built so that the respondents would have minimal possibility to false interpretations among the different questions and answer options. The reliability of the study measures was assessed by computing Cronbach's Alpha coefficients, which is used to assess the internal consistency or homogeneity among the research instrument items (Sekeran, 1992).

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Preview

This chapter will discuss the response level rate, data coding and cleaning and an assessment of reliability of study measures. In addition the results of the survey are presented with a detailed discussion of the findings.

4.2 Response Level, Data Coding and Cleaning

Although the survey was to cover all sugar companies in operation by August 2012, (A copy in appendix ii) data was collected from eight sugar companies out of the targeted nine which represented a 88.8% response rate therefore the effective population was eight companies. Data was coded and then cleaned to check for consistency. Data was then analyzed using SPSS version 12.0 statistical program.

4.3 Assessment of Reliability of study measures

Although the questionnaire was constructed using the variables in the extant literature reliability tests using Cronbach's alpha coefficient was conducted and the results are presented in appendix IV . The coefficient was above 0.6 indicating a high level of reliability of the findings (Sekaran, 1999).

4.4 Findings on Respondent and company demographics

Respondent demographics are shown in Table I. Based on the characteristics of the companies; a picture emerged of CFOs aged in their 40s (75%), with a Master's degree typically an MBA (50)

Table1: Respondent and firm demographics

Demographics	n	%
Age		
<40	6	75
40-49	2	25
Tenure		
<4years	5	62.5
4-9 years	3	37.5
Level of education		
Undergraduate	4	50
Masters	4	50
No. of employees		
Below 1000	4	50
1000-1500	2	25
1500-2000	2	25
Ownership structure		
Public	5	62.5
Private	3	37.5
Assets owned		
0-10 billion	5	62.5
11-20 billion	2	25.5
21-30 billion	1	12.5
Debt Ratio		
Nil	2	25
Below 50%	2	25
Above 50%	4	50

who had been in their current position for less than four years (62.5%). Most of the companies surveyed were labour intensive with 50% of them with employees over one thousand. 62.5% of

the companies are publicly owned with a majority commanding an asset base of below ten billion shillings. An interesting fact is that 50% of these companies are highly levered with a debt to equity ratio of above 50%.

4.5 Common investment decisions and their time horizon

Most of the surveyed companies are currently investing in new products and services (50%). Since sugar manufacture produces a varied variety of inputs for manufacture of different products such as ethanol and electricity, most companies have diversified into the manufacture of such. Investment into new equipment and replacement of old equipment is also a major investment each carrying 25%. New equipment is needed since new products call for new investments in equipments. Replacement of equipment is also a major investment because most companies are using old equipment which leads to constant breakdowns (KSB2012-2014). The time horizon of investment calculations in most companies is ten years (50%) while 37.5% have investment calculations of five years. This is expected because most of these new projects are capital intensive and an extensive duration of time is needed for the project to be able to pay back.

4.6 Extent of use of capital budgeting techniques

The extent to which different financial appraisal techniques are used is shown in Table iii. These findings are similar to those reported by previous surveys. The survey findings indicate that non discounting methods continue to be used by most of the companies. Previous studies have suggested that payback is the most widely used method and according to the results presented in table iii 87% of the respondents use a simple payback period. The justification for using the

payback method, as a simple proxy measure to capture the impact of liquidity constraints and risk, have been documented in the literature (e.g., Pike, 1985).

Table II: Frequency of use of capital budgeting techniques

	Never/ (%)	Rarely	Regularly/Always (%)
Internal rate of return	37.5		62.5
Payback period,	12.5		87.5
Discounted payback period	62.5		37.5
Accounting rate of return	50		50
Net present value	37.5		62.5
Real options	75		25
Profitability index	62.5		37.5

For DPP, the payback periods needed to recover initial investment given accumulated amounts of the present value of cash inflows are calculated. Thus, in DPP, the time value of money is considered under the aspect of cash inflow. According to the findings of this survey, 37.5% of the respondents use this method. This reveals that sugar factories consider payback period to be an important decision tool when making investment decisions. This supports what extant literature has documented (e.g. Graham and Harvey (2001) and Ryan and Ryan (2002)).

Accounting rate of return which considers accounting income is also an important decision tool when making investment decisions in sugar companies. 50% of the respondents regularly and always use this method. The only justification for using the accounting rate of return method can may be because top management believes that reported profits have an impact on how financial markets evaluate a company. This is further reinforced in many companies by linking management rewards to short-term financial accounting measures. Thus a project's impact on the financial accounting measures used by financial markets would appear to be a factor that is taken into account within the decision-making process.

The results of this survey indicate a huge margin of firms that are using the discounted methods. For the surveyed companies IRR is used 62.5% regularly and always. This is the same practice for NPV which constitutes the same percentage. In this research, an overwhelming percentage of firms (62.5 percent) correctly compute NPV or IRR on a cash flow basis rather than accounting income. Interest expense and other financial costs however are incorrectly treated with 75% not deducting interest and other financing costs from income to arrive at cash flows.

Despite the drawbacks of IRR, it seems that managers find it naturally attractive because it appraises investment value in percentage terms, which can be easily compared across capital budgeting projects. The respondents who use discounted techniques favour NPV over IRR when evaluating projects. Possible explanations for more widespread use of DCF are the availability of computer software that greatly facilitates computations such as Microsoft excel (Pike, 1996 ;), and improvement in the formal education level of managers (Sangster, 1993) as 50% of the

respondents have an MBA. 37.5% of the respondents use profitability index regularly and always. This indicates that it is the least used discounting technique.

Although academic literature has emphasized the use of real options for companies who are faced with strategic options, this development is rarely employed by sugar companies. Only 25% regularly and always use this technique. The reasons for not using real options as Block,(2007) pointed out may include skepticism, complex and cumbersome techniques, lack of management support, DCF being considered a proven method, and real options being seen as too risky.

Project related financial parameters such as expected cash outflows and inflows, macroeconomics (for example the inflation rate), and post-audit review data were satisfactorily acquired from firms' capital budgeting information systems. Conversely, project expected economic life and cost of capital and required returns were less frequently obtained from the information system (a quarter indicated often or very often available). All the companies conduct post-audits of major capital investment projects even though suitable data from the information system was not always reported as being available.

Generally, the surveyed companies use more than one method to evaluate investments. Most of the organizations used a combination of appraisal techniques. For example 62.5 per cent of those organizations which often or always used the payback method combined it with a discounting method and 50 per cent of those firms often always using the accounting rate of return also combined it with a discounting method. Although previous research has highlighted the fact that

if firms use a combination of techniques, it is unclear which techniques are considered to be most important in the decision-making process.

4.7 Details of how discounted cash flow is carried out

The theory-practice gap is a recurrent theme in the capital budgeting literature, in particular with regard to NPV. Despite the increased use of more sophisticated methods by companies most researchers have asserted that many companies misapply or misuse them which is not an exception by the sugar companies. Table IV below shows some of the attributes indicating how DCF is carried out by the sugar companies.

Table III: How DCF is carried out

Attribute	Percentage
Methods for calculating discount rate	
WACC	25
Cost of Debt	75
Weights in WACC	
Market value	12.5
Book value	12.5
N/A	75
Use of multiple Discount rates	
Yes	12.5
No	87.5
Risk analysis methods used	
Sensitivity analysis(Always and Regularly)	25
Scenario analysis (Always and Regularly)	75
Decision trees (Always and Regularly)	25

4.7.1 Calculation of the discount rate and weights used in WACC

The cost of capital is a key parameter of DCF calculation. Firms are expected to use the weighted average cost of funds from various sources including debt, preferred stock and common equity (Brigham 2002). Firms that employ a single cost of funds (for example, the cost of debt if the project is financed by borrowings) make an erroneous choice. The weights used in calculating the cost of capital should preferably be based on the firm's capital structure target or market values, rather than book values. In this survey only 25% of the respondents who employ DCF techniques use WACC and 75% use cost of debt when estimating the discount rate as shown in the table above. In addition half of those who calculate WACC use book values. This reveals that the current finance theory as it is grossly misapplied in practice by the sugar companies.

4.7.2 Multiple discount rates and Risk

The opportunity cost of capital varies from project to project, depending on risk. In principle, each project has its own cost of capital. In practice, firms usually simplify by grouping similar projects in risk classes, and use the same cost of capital for all projects in a class. Using a single WACC for all investment proposals is not advisable. This survey however reveals that only 12.5% of the respondents use multiple discount rates which further widen the theory- practice gap. Scenario analysis is the most widely used method of calculating risk by the sugar companies (75%) as shown in table IV with only 25% using decision trees and sensitivity analysis. 75% of the companies adjust payback period to allow for risk regularly and always, 25% adjust cash flows and ROI regularly and always while 50% of the respondents adjust the discount rate to allow for risk.

4.7.3 Treatment of inflation

Finance theory prescribes that the correct treatment of inflation should be to compare like with like in the financial appraisal. Thus real cash flows should be discounted at a real discount rate or nominal cash flows should be discounted at a nominal rate. There is clearly a potential for a mismatch of assumptions regarding cash flow assumptions and discount rates. The most obvious pitfall as revealed in the literature is to use a nominal discount rate derived from financial market data and apply this to current price or real cash flows. The findings of this survey reveal that only 50% of the respondents who use discounted techniques adjust cash flows for inflation. This means that NPV values are being understated, in some cases contributing to the rejection of projects. The converse situation means that where inflation adjusted cash flows are discounted at the real discount rate results in NPV evaluations are being overestimated. This can explain may be why most sugar companies are highly leveraged since the pay offs from projects cannot be estimated properly.

4.8 Chapter summary

This chapter has discussed the findings of the survey. In particular response rate, data cleaning and editing, reliability testing using cronbach's coefficient, extent of use of capital budgeting techniques and the common types of investments carried out by sugar companies and their time horizons. In addition the last section discussed in depth how discounted cash flow calculations are carried and the common pitfalls of the procedure. The next chapter will present a detailed summary of the findings recommendations and a conclusion.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Preview

This chapter presents a summary of the survey findings, a detailed conclusion of the capital budgeting techniques and recommendations for further research.

5.2 Summary

Capital investments are crucial to the future of a company. The proper economic analysis to support selection of investments is of great importance to management because their main goal is to create value in order to maximize shareholder value. Proper identification, selection and management of projects are important since realizing returns in excess of the cost of capital adds value to the company. Therefore the proper analysis of capital projects is essential for any firm and hence the purpose of this survey in order to investigate how capital projects are appraised by sugar companies in Western Kenya. Although data was to be collected from nine companies eight companies were willing to give the researcher information. The findings of the research are important to the theory and practice of finance for it provides an empirical evidence of the current practice, to sugar companies and also for policy makers.

Both conceptual and empirical literature was reviewed concerning capital budgeting techniques. The guiding theory was Modigliani and Millers' Theory of investment (1958) which stipulates that the value of the firm is not affected by how it is financed but rather by how the firm is able to invest in projects which generate positive NPV's. The literature extant literature stipulates that

non discounted techniques are the most commonly used methods of appraisal. Payback period is the most utilized method followed by accounting rate of return. Moreover discounted techniques are seen to be gaining some ground where previous research shows a growing use of NPV and IRR. Real options tend to be the least used technique.

The researcher utilized descriptive research design and data was collected using a self administered questionnaire where the target population was the CFO's of the sugar companies or a person who was involved in capital budgeting. Data was coded under different variables and the edited to check for consistencies. Descriptive statistics was then used to analyze the data which included frequencies of the variables. The findings of the research indicate that a large number of the companies are utilizing the payback period to appraise investment projects. Discounted techniques are also utilized such as NPV and IRR although a good percentage of the respondents calculate DCF wrongly. The findings also reveal that a combination of methods is used by companies to appraise projects. Risk analysis methods most commonly used are sensitivity analysis and scenario analysis.

5.3 Conclusions

According to previous surveys conducted for example Graham and Harvey (2001) and Ryan and Ryan (2002), payback period is the most utilized capital budgeting appraisal technique used. The findings of this survey reveal that it is still the most utilized by sugar companies (87.5%). It can therefore be concluded that despite the fact that it does not take into account time value of money it is still considered a superior appraisal tool even in Kenya. Although many authors have for many

decades warned of the disadvantages of using the payback criterion it is a surprising and noteworthy gap between academic theory and practice.

Despite the relatively widespread use of DCF, sophistication in detailed application is moderate to good, suggesting restrained improvement since earlier studies. Although NPV and IRR are highly utilized (62.5%) project appraisal techniques, a number of firms favour NPV as compared to IRR. Financial theory advocates using the superior NPV. However as extant literature has pointed out the current theory as it is misapplied or misused. The results of this survey has concluded this fact since only 25% of respondents use WACC while a huge percentage (75%) use cost of debt when calculating the discount rates which is not consistent with what theory prescribes. In addition half of the companies that use WACC determine the weights by using book values as opposed to market values. Moreover only a small percentage of respondents (12.5%) use multiple discount rates for different projects which is theoretically incorrect because they are required to use multiple discount rates for different projects.

The findings of this survey further reveal that inflation is not uniformly treated with 50% of the respondents incorrectly discounting real cash flows at a nominal discount rate. It can be concluded that most of these firms are under investing due to inaccurate calculation which constitutes one of the challenges of the sugar industry in Kenya. In addition scenario analysis seems to be the most dominant risk analysis method employed. Sophisticated techniques are less utilized with only 25% using either decision trees or sensitivity analysis.

5.4 Recommendations

A theory-practice gap remains in the DCF application among firms in the sugar industry. Apart from some firms not using DCF, several areas of DCF analysis were misapplied. This study provides those evaluating investment projects as well as those conceiving capital budgeting manuals or policies, knowledge about common pitfalls which, if acted on, could improve decision making. Training for managers and analysts should be provided to ensure capital budgeting tools, in general, and DCF, in particular, is applied in accordance with normative textbook approaches. Moreover a small percentage of sugar firms should start using DCF techniques as it is superior compared to the traditional methods. Areas that need to be emphasized during training and considered in decision making are:-

- i. Sugar companies should use multiple discount rates for different projects or divisions with different risks or group similar projects in a single class as Myers (1984) pointed out. A more sophisticated techniques of assessing risk should be employed other than the simple scenario analysis.
- ii. NPV and IRR companies should use cash flows and not accounting profits which can be achieved by deducting interest expenses and other financing costs.
- iii. WACC should be the recommended discount rate that should be used. Therefore a fraction of firms should avoid using cost of debt to determine the interest rate. In addition target or market weights should be employed in calculating the WACC and not book values.
- iv. Supportive capital budgeting information systems should be established to ensure that information such as the cost of capital is easily available.

- v. The correct treatment of inflation should be emphasized to avoid overstating or understating the NPV or IRR which leads to a wrong decision.
- vi. Decision makers can utilize the advances in computer technology by using tools and packages that help determine which investments are beneficial to the company.

5.5 Limitations of the study

The survey conducted was not without limitations. One of the main short-comings of the survey was that it was limited to sugar companies in Western Kenya. Thus the capital budgeting techniques used may not be a good representative of all companies in Kenya or may not apply to other sectors. Responses by individual CFO's or those responsible for capital budgeting may be their personal point of view and therefore they may not reflect the practices of companies they represent. Additionally the focus of this study was on selected aspects of capital budgeting which is the project appraisal. However successful use of the appraisal techniques is one of the many decisive factors leading to successful capital investment. Other capital budgeting phases for example, generating investment ideas are important and were ignored. Finally, some of the respondent organizations have bureaucratic organizational procedures which prolonged the period for data collection.

Despite the above limitations, this research adds to the body of knowledge on capital investments in general and DCF in particular, by showing where the sugar industry fits in this decade and identifying specific areas for improvement. This study improves practice by addressing the most common pitfalls encountered by those who use DCF techniques. Even though best practice in DCF is well known in academic literature, in practice it is not uniformly well-utilized.

5.6 Issues needing further research

Little is known about the extent, and the approaches which are used to incorporate those benefits that are difficult to quantify (Sometimes referred to as real options) into the financial appraisal. It is unlikely that such information can be ascertained directly from questionnaire surveys and there is a need for future research to concentrate on in depth field studies which describe how the cash flow estimates are derived. Secondly, a further research is needed to identify organizational procedures which lead to the utilization of a given appraisal technique. Finally, since finance theory recommends the use of sophisticated techniques such as the NPV or IRR; further research is needed to identify whether the use of a given capital investment technique leads to improved financial performance.

REFERENCES

- Adler, R.W., (2000), Strategic Investment Decision Appraisal Techniques: The Old and the New. *Business Horizons*, 43 (6), 15-22.
- Akalu, M.M. (2001), "Re-examining the project appraisal and control: developing a focus on wealth creation", *International Journal of Project Management*, Vol. 19 No. 7, pp. 375-85.
- Anderson, J., Narus, J. and Van Rossum, W. (2006), "Customer value propositions in business markets", *Harvard Business Review*, Vol. 84 No. 3.
- Alkaraan, F. and Northcott, D., (2006). Strategic capital investment decision-making: A role for emergent analysis tools? A study of practice in large UK manufacturing companies. *British Accounting Review*, 38 (2), 149-173.
- Arnold, G.C. and Hatzopoulos, P.D. (2000). The Theory-Practice Gap in Capital Budgeting: Evidence from the United Kingdom. *Journal of Business Finance & Accounting*, 27 (5-6), 603-626.
- Bennouna K. et al., (2010), "Improved capital budgeting decision making: evidence from Canada", *Management Decision*, Vol. 48 Iss: 2 pp. 225 – 247.
- Brealey, R. and Myers, S. (2003), *Principles of Corporate Finance*. McGraw-Hill, New York, NY.

- Butler, R. et al. (1993). *Strategic investment decisions: Theory, Practice and Processes*. Routledge; London.
- Byers, S. et al., (1997), "Capital investment analysis for managers", *Management Decision*, Vol. 35 Iss: 3 pp. 250 – 257.
- David Brookfield, (1995), "Risk and capital budgeting: avoiding the pitfalls in using NPV when risk arises", *Management Decision*, Vol. 33 Iss: 8 pp. 56 – 59
- Bryson, M. (1988). A strategic planning process for public and non-profit organizations. *Long range planning journal*. Vol. 21, No. 1, pp 73-81.
- Carter, T. and D. Ejara. (2007). Value innovation management and discount cash flow. *Journal of Management Decisions*. Vol. 46, No. 1, pp 58-76.
- Dimson, E. and Marsh, P. (1982), "Calculating the cost of capital", *Long Range Planning*, Vol. 15 No. 2, pp. 113-20.
- Drury, C. and Tayles, M. (1997), "The misapplication of capital investment appraisal techniques". *Management Decision*, Vol. 35 No. 2, pp. 86-93.
- Fernandez, P. (2007). 'Valuing companies by cash flow discounting: Ten Methods and nine theories'. *Journal of Managerial Finance*. Vol. 33, No. 11, pp 853-876.
- Goldmart, M., Koller, T. and Wessels, D. (2005), "What really drives the market", *MIT Sloan Management Review*, Vol. 4 No. 1.

Graham, J.R. and Harvey, C.R., (2001). The Theory and Practice of Corporate Finance: Evidence from the Field. *Journal of Financial Economics*, 60, 187-243.

Hall, J.H. (2000). Investigating aspects of capital budgeting process used in evaluation of investment projects. *South African Journal of Economics and Management Sciences*. Vol.3 No. 3; pp 353-368.

Kaplan, S. and Ruback, R. (1995), “The valuation of cash flow forecasts: an empirical analysis”. *Journal of Finance*, Vol. 50 No. 4, September.

Martins.A.(2011). The valuation of privately held firms and litigation: a case study. *International Journal of Law and Management*. Vol.53, No.3.pp 207-220.

Myers, S. (1999), “Finance theory and financial strategy”, in Chew, D. (Ed.), *The New Corporate Finance: Where Theory Meets Practice*, Irwin/McGraw-Hill, New York, NY, pp. 119-126

Pike, R.H., (1996). A longitudinal survey on capital budgeting practices. *Journal of Business Finance & Accounting*, 23 (1), 79-92.

Ryan, P. A. and G. P. Ryan (2002) “Capital Budgeting Practices of the Fortune 1000: How have things changed?” *Journal of Business and Management*, 8(4), pp.355-364.

Sangster .A.(1993), 'Capital investment appraisal techniques: a survey of current usage'. *Journal of Business Finance and Accounting*, 20(3): 307-332.

Schauten.M. (2010). The discount rate for discounted cash flow valuations of intangible assets. *Journal of Managerial Finance*. Vol. 36, No. 9.

Shapiro, A. C. (2005). *Capital Budgeting and Investment Analysis. 1st Edition*, Pearson Education Inc., New Jersey.

Shinoda.T. (2010), Capital Budgeting Practices in Japan- A focus on the use of capital budgeting methods. *Economic Journal of Hokkaidouniversity*. Vol. 39,PP 39-50.

Taylor. S. et al. (2004),"Stakeholders' perceptions of the DCF method in hotel valuations", *Property Management*, Vol. 22 Iss: 5 pp. 358 – 376.

APPENDIX 1: QUESTIONNAIRE

Dear participant/ respondent,

I am a Master of Business Administration Student at The University of Nairobi (Kisumu Campus). In order to fulfill the requirements for the award of the Masters degree I am undertaking a research study entitled, 'A survey of capital budgeting techniques applied by Sugar companies in Western Kenya.' I humbly request you to act as a respondent to make my research a success. Definition of the terms used is attached to the questionnaire for clarification purposes. All responses will be held in strict confidence and no individual responses will be reported.

Please provide the following demographic information

- a. What is the name of your organization?
- b. What position do you hold in the company?
- c. What is your age in years?
 - <40 ()
 - 40-49 ()
 - 50-59 ()
 - ≥60 ()
- d. How long have you held that position?
 - <4 years ()
 - 4-9 years ()
 - >9 years ()
- e. What is our highest level of education?
 - Undergraduate ()
 - MBA masters ()
 - Non- MBA masters ()
 - >Masters degree ()

SECTION A: CAPITAL BUDGETING TECHNIQUES

1. Among the investments listed below please indicate the most important decisions which have taken place in the company in recent years.

New equipment investment ()

Extensive equipment investment ()

Replacement equipment investment ()

Investments in new products and services ()

Research and development ()

Research in information systems ()

Investment in foreign business ()

Mergers and Acquisitions ()

2. What is the typical time horizon of investment calculations in your company?

5 years ()

10 years ()

15 years ()

20 years ()

Any other (Specify).....

3. Please indicate how frequently your company employs the following evaluation techniques when deciding which investment projects to pursue. (Tick where appropriate)

	Never	Rarely	Occasionally	Regularly	Always
	1	2	3	4	5
Internal rate of return (IRR)					
Payback period					
Discounted payback period					
Accounting rate of return					
Net Present value					
Real options					
Profitability index					

10. How often does your company use the following risk analysis methods when deciding which strategic investment projects to pursue?

	Never	Rarely	Occasionally	Regularly	Always
	1	2	3	4	5
Sensitivity analysis					
Scenario analysis					
Simulation analysis e.g. Monte Carlo simulation					
Decision tree analysis					

11. Which method does your company use to incorporate risk in capital budgeting decisions?

	Never	Rarely	Occasionally	Regularly	Always
	1	2	3	4	5
Adjust cash flows to allow for risk					
Adjust required ROI to allow for risk					
Adjust discount rate to allow for risk					
Adjust required payback to allow for risk					

12. Does your company require a standard model such as Microsoft excel for deriving IRR's or NPV's?

Yes ()

No ()

OTHER INFORMATION

13. What is your firm's approximate number of employees?

.....

14. What is the ownership structure of your company?

Publicly owned ()

Privately owned ()

Partly publicly / partly privately owned ()

Others (specify)

15. What is the size of your organization in terms of the assets owned?

0-10 billion shillings ()

11-20 billion shillings ()

21-30 billion shillings ()

31-40 billion shillings ()

Above 40 billion ()

16. What is your firm's approximate long term debt to total assets ratio? (Please provide a percentage).....

Thank you for taking part in this survey!

APPENDIX 2: DEFINITION OF TERMS IN THE QUESTIONNAIRE

Accounting rate of return: Average return on book value (e.g. ROI, ROA, ROE)

Decision trees: A decision support tool that uses a tree-like graph or model of decisions and their possible consequences and probabilities. Decision trees can be used as a descriptive means for calculating conditional probabilities and estimating the value of an investment project.

Capital budgeting information system- an organized collection, storage and presentation of system of data and other knowledge for capital investment decision making.

Discounted payback period: like payback period, but cash flows are discounted

Internal rate of return (IRR): The discount rate that sets the present value of the project cash flows equal to the initial investment outlay.

Net present value (NPV): The present value of future cash flows discounted at the required rate of return, minus the initial investment

Nominal cash flows: cash flows are estimated without taking into account inflation.

Nominal required rate of return: inflation is not taken into account in the required rate of return.

Payback period: the time necessary to recoup the initial investment from net cash flows.

Profitability index: Profitability index = Present value of future cash flows / Present value of initial investment

Real cash flows: inflation is taken into account in the cash flows.

Real options: Financial option theory based method for estimating the value of an investment in real assets.

Real required rate of return: inflation is taken into account in the required rate of return.

Scenario analysis: A process of analyzing possible future events by considering alternative possible outcomes.

Sensitivity analysis: An analysis method that analyses an investment project's sensitivity for changes in one or more key parameters.

Simulation analysis: An analysis method that enables analyzing the simultaneous effect of several key variables. The analysis entails the identification of key variables and the determination of their probability distributions and potential correlations. The analysis results in a probability distribution of a project's NPV.

**APPENDIX 3: LIST OF OPERATIONAL SUGAR COMPANIES IN
WESTERN KENYA BY JULY 2012. (KENYA SUGAR BOARD ANNUAL
REPORT)**

1. Mumias Sugar company
2. Nzoia Sugar company
3. West Kenya Sugar company
4. Butali Sugar company
5. Chemilil Sugar company
6. Muhoroni Sugar company
7. Sony Sugar
8. Kibos and Allied
9. Soin Sugar company

APPENDIX4: RELIABILITY TESTS

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
What is used in DCF calculations	13.3750	11.982	.867	.817
Deduction of interest and financing costs	13.3750	17.125	.503	.864
Determination of Discount rate	13.3750	16.554	.664	.853
Determination of weights in WACC	11.7500	13.357	.518	.883
Different rates used	13.2500	18.500	.211	.881
Cash flows adjusted for inflation	13.6250	15.411	.851	.835
Model used to derive IRR and NPV	13.7500	15.357	.898	.833
Discounted technique favoured	13.3750	11.982	.867	.817