A SURVEY OF THE EXTENT OF USE OF CAPITAL BUDGETING TECHNIQUES IN PROJECT APPRAISAL BY COMPANIES LISTED ON THE NAIROBI STOCK EXCHANGE

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DECLARATION AND RECOMMENDATION

DECLARATION

I declare that this research project is my original work and has not been presented, either in part or full, for examination or degree in this or any other University.

..... 24th March 2012

Paul Kipruto Kimaru Date

CM11/0207/05

RECOMMENDATION

This research project has been submitted with our approval as the University Supervisors

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DEDICATION

To my best friend and Wife Magdaline and my beloved children Cynthia, Dominic, Abigael and Faith who have stood by my side all through and are the pillars of my life.

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ABSTRACT

Capital budgeting techniques are important to organizations in ensuring that funds are invested in projects that add value and ensure growth of shareholders' wealth. The aim of this study was to establish the extent of the use of capital budgeting techniques in appraising the firms' long term projects. The study looked at the use of capital budgeting techniques in evaluating long term projects by listed companies, the capital budgeting techniques that are popularly used by listed companies in evaluating their long term projects and the perception of senior managers towards capital budgeting techniques. This study was necessitated by the fact that, although the benefits that the firm derive by using capital budgeting techniques to evaluate their long term projects are enormous, it is not known whether listed companies in Kenya actually use them or not. The target population was all the fifty five companies listed on the Main Investment and Alternative Investment Market segments of the Nairobi stock exchange. A cross-sectional survey of the entire population of fifty five companies was conducted. Data were collected using structured questionnaires that were administered through direct delivery and mailing. Out of the 55 questionnaires sent out, only 29 responses were received. The results of the study were analyzed using descriptive and inferential statistics such as percentages, pie charts, chi-square and rankings. The study established that listed companies use Capital Budgeting techniques in appraising their long term projects. It also established that the payback period was the most popular Capital Budgeting Technique amongst listed companies. It further established that Managers of listed companies have positive attitude towards Capital Budgeting Techniques.

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ARR	Accounting Rate of Return
BC	Benefit Cost ratio
CBT	Capital Budgeting Techniques
CMA	Capital Markets Authority
CPA	Capital Project Appraisal
Df	Degree of freedom
DPB	Discounted Payback period
IRR	Internal Rate of Return
Mgt	Management
NPV	Net Present Value
NSE	Nairobi Stock Exchange
PB	Pay Back period
PET	Project Evaluation Technique
PI	Profitability Index
WACC	Weighted Average Cost of Capital

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Investment decisions are critical components of management decisions in most firms. This is mainly due to the fact that it requires the utilization of huge resources of the firm and in most cases returns are realized over a long future period of time. That explains why managers attempt at all times to critically analyze the firm's and industry's available information before arriving at a decision to commit the firm's resources in capital projects (Hilton, 1997). Scott and Eugen (2000) notes that a number of factors make capital budgeting decisions perhaps the most important decisions managers must make. First the impact of capital budgeting is long term, thus the firm loses some decision making flexibility when capital projects are undertaken. A good example is when a firm invests in an asset with a ten year economic life, its operations are affected for ten years. Further, since asset expansion is fundamentally related to expected future sales, a decision to buy a fixed asset, that is expected to last ten years involves an implicit ten year sales forecast. An error in the forecast of asset requirements can have serious consequences. Also if the firm invests too much in assets, it will incur unnecessary heavy expenses. However if it does not spend enough on fixed assets, it might result in inefficient production and inadequate capacity leading to lost sales that are difficult, if not impossible to recover. Timing is therefore important in capital budgeting. That is, capital assets must be ready to come to effective use when they are needed, otherwise opportunities might be lost. That is why effective capital budgeting can improve both the timing of assets acquisition and the quality of assets purchased.

That explains why a firm that forecasts its needs for capital assets in advance will have an opportunity to purchase and install the assets before they are needed.

Quirin (1977) noted that investment decisions require special attention. This further explains why every firm uses at least one or a number of approaches in analyzing investment proposals before implementation. Scientific approaches in the developed world, such as internal rate of return (IRR) and net present value (NPV) have become so commonly used today such that surveys such as the ones stated hereafter seems to have dried up. In Kenya's case, we would expect companies or corporate entities listed in Nairobi Stock Exchange (NSE) to fully utilize the scientific approaches, when appraising their long term projects. This is due to the perception that management of listed companies are people who know the gains that the firm would derive by utilizing the various capital budgeting techniques in appraising their long term projects.

Schall (1978) indicated that there is an emerging trend towards the use of more sophisticated capital budgeting techniques. He further noted that if the trend were true, that is, if businesses were becoming 'smatter' at making investment decisions, then one might presume an increase in productivity. If the effects on productivity were weak, then it places doubt in the importance of capital budgeting techniques to begin with. The observation by Schall (1978) was confirmed by a study carried by Stanley and Block (1984) on the application of capital budgeting by multinationals.

Scotty and Eugen (2000) further noted that capital budgeting is clearly important to small firms yet these firms tend not to use the tools that have been developed to improve capital budgeting decisions. Many reasons have been advanced for companies not using these tools. One reason is

that managers of small firms simply are not well trained, hence they are unsophisticated. These arguments suggest that the mangers would make greater use of sophisticated techniques if they understood them better. Another reason related to the fact that management talent is a scarce resource in small firms and managers simply cannot afford the time required to analyze projects using capital budgeting techniques, even if they did understand them.

According to Scott and Eugen (2000), studies carried out by both Block and Runyon also found that small firms tend to be cash oriented. They are concerned with basic survival, so they tend to look at expenditures from the stand point of near-term effect on cash. This cash and survival orientation leads to a focus on relatively short time horizon, which in turn might lead to an emphasis on the payback method. The limitation of payback are well known but in spite of those limitations, the technique is popular in small businesses as it gives the firm a feel of when the cash committed to an investment will be recovered and thus be available to repay loans used to finance them or for new investment opportunities. Block also indicated that when a small firm borrows a loan from a bank, it needs to show that the loan can be paid back within a particular time period, not that the project for which the funds are intended are acceptable using NPV or IRR. Interestingly, Stanly & Block (1984) found that nearly 84 per cent of the firms that use payback period to evaluate capital projects set the payback period equal to three years or less. This suggests that these funds require a return greater than 30 per cent for their capital projects, while large firms generally require less than 15 per cent.

According to Mbaru (2003), Nairobi stock exchange (NSE) is the principal stock exchange of Kenya. It began in 1954 as an overseas stock exchange while Kenya was still a British colony,

with the permission of the London Stock Exchange. The NSE is a member of the African Stock Exchange Association. It is the fourth largest stock exchange in terms of trading volumes, and fifth in terms of market capitalization as a percentage of gross domestic product. The exchange works in cooperation with the Uganda Securities Exchange and the Dar es Salaam Stock Exchange, including the cross listing of various equities. Its main function is to provide a market place where shares of companies can be traded. The shares traded in the stock market are only for those companies which are listed on the Nairobi Stock Exchange.

Pandey (2006) noted that there are many benefits that companies enjoy by using capital budgeting techniques to evaluate their capital project proposals before commiting their resources in them. These benefits include long term growth as a result of increased profitability and reduced risk of loss of investment. This implies that the growth of the firm and its risk is affected by its capital budgeting decisions. Companies which do not use capital budgeting techniques to evaluating their investment proposals may not enjoy the benefits associated with their use, hence risky to investors to put their investments in such companies.

1.2 Statement of the Problem

Capital budgeting decisions are common phenomenon in both listed and unlisted companies in Kenya and in the rest of the world. Managers may either use scientific methods, that is, Capital Budgeting techniques, or other non-scientific methods, to evaluate their investment proposals before committing their resources in them. Capital budgeting techniques are used to evaluate investment proposals before implementation, hence the investor will be able to determine in advance, the anticipated level of growth and risk being pursued by the company. If the firm does

not use any Capital budgeting technique, then the investment lacks basis for implementation, and may lead to investing in non-profitable projects. Non-profitable projects will lead to loss of capital and resources. This study is therefore aimed at providing scientific evidence on whether listed companies in Kenya use capital budgeting techniques, their popularity and the perception of managers towards capital budgeting techniques.

1.3 Research Objectives

The general objective of the study was to establish the extent of use of capital budgeting techniques, in project appraisal by companies listed on Nairobi Stock Exchange.

The specific objectives were;

(i) To establish whether listed companies use capital budgeting techniques to appraise their long term projects or not.

(ii) To determine the most popular capital budgeting techniques used in project appraisal amongst listed companies.

(iii) To establish the perception of senior managers of listed companies on the use of capital budgeting techniques in project appraisal.

1.4 Research Questions

(i) Do listed companies in Kenya use capital budgeting techniques in appraising their long term projects or not?

(ii)Which capital budgeting technique is most popularly used in project appraisal amongst listed companies?

(iii) What are the perceptions of senior managers of listed companies on the use of capital budgeting techniques in project appraisal?

1.4 Significance of the Study

The study is important because we do not know whether companies in Kenya use capital budgeting techniques in evaluating long term projects or not. Despite the popularity of capital budgeting techniques is not known, the perception of senior managers towards capital budgeting techniques is also not known. The study may establish the same which may thereafter help corporate managers, both institutional and individual investors and students appreciate and relate the growth of companies with their investment decisions and determine whether such investment decisions are backed up by capital budgeting techniques. It may further enlighten investors on the long-term risk of firms contributed by their investment criteria and the attitude of top managers towards scientific methods of appraising capital projects. It may also help owners of companies to change their investment policy where applicable, so as to take into account capital budgeting techniques, as a scientific way of evaluating their investment proposals.

1.5 Assumptions of the Study

This study was carried out under the following assumption:

Those who participated in the study would give honest responses to items of information stipulated in the questionnaires

1.6 Scope of the Study

The research covered all the fifty five listed companies in the Nairobi Stock Exchange. Out of the 55 questionnaires delivered, only 29 responses were received. The study looked at the extent of use of capital budgeting techniques by listed companies in evaluating their long term projects and also the perception of senior managers of listed companies towards capital budgeting techniques.

1.7 Limitations of the Study

Since the research covered listed companies only, generalization may not apply to other unlisted companies. The study also suffered from limitations inherent in studies that rely on self report method of data collection such as poor memory or the respondents misunderstanding items in the questionnaire. That was addressed through the use of simple and structured questionnaires that would easily be understood by the respondents.

1.8 Operationalizing definition of Terms

Capital Budgeting - Efficient allocation of current funds to long term assets in anticipation of expected future returns

Capital Budgeting Techniques - Scientific methods used in evaluating long term projects such as Net Present Value, Iinternal Rate of Return, Profitabilty Iindex, Payback Period, Discounted Payback Period & The Accounting Rate of Return

Investment Decisions - Capital budgeting decisions

Listed companies	- Companies whose shares are traded at Nairobi Stock Exchange
Efficient allocation of capital	- Investing fund in projects that gives the highest benefit and reduces the company's risk
Project Appraisal	- Appraising the viability of long term projects
Long term	- A period of time which is more than one year
Funds	- Both monetary and non-monetary resources required for investment
Hurdle Rate	- It is the minimum required rate of return on an investment project, also known as cost of capital
Budgetary Allocations	- Funds set aside in the firm's annual or semi-annual budgets for acquisition of capital projects
Equities	- Ordinary shares of listed companies

CHAPTER TWO: LITERATURE REVIEW

2.1 Background to Capital Budgeting

Pandey (2006), notes that an efficient allocation of capital is the most important finance function in the modern times. It involves decisions to commit the firm's funds to the long-term assets. Capital budgeting or investment decisions are of considerable importance to the firm since they tend to determine its value by influencing its growth, profitability and risk.

The investment decision of a firm is generally known as capital budgeting, or the capital expenditure decisions. A capital expenditure decision may be defined as the firms decision to invest its current funds, most efficiently, in the long term assets, in anticipation of an expected flow of benefits over a series of years. The long term aspects are those that affect the firm's operation beyond the one year period. The firm's investment decisions would generally include expansion, acquisition, modernization and replacement of long-term assets. Sale of a division or business (divestment) is also regarded as an investment decision. Decisions like the change in the methods of sales distribution or an advertisement campaign or a research and development program, have long term implications for the firms expenditure and benefits and therefore they should also be evaluated as investment decisions. It is important to note that investment in the long-term assets invariably requires large funds to be tied up in the current assets such as inventories and receivable. As such, investment in fixed and current assets is one single activity. Investment decisions have the following features; the exchange of current funds for future benefits, the funds are invested in long term assets and the future benefits will occur to the firm over a series of years.

It is important to emphasize that expenditure and benefits of an investment should be measured in cash. In the investment analysis, it is the cash flows which are important and not the accounting profits (Garrison, 2000). It may also be pointed out that investment decision affect the firm's value. The firm's value will increase if investments are profitable and hence the shareholders' wealth will also increase. Thus, investment should be evaluated on the basis of a criterion which is compatible with the objective of shareholders' wealth maximization. An investment is considered to add to the shareholders' wealth, if it yields benefits in excess of the minimum benefits, such as the opportunity cost of capital.

2.2 Importance of Investment Decision

Quirin (1977), notes that investment decision require special attention because the effects of investment decisions extend into the future and have to be endured for a longer period than the consequences of the current operating expenditure. A firm's decision to invest in long term assets has a decisive influence on the rate and direction of its growth. A wrong decision can prove disastrous for the continued survival of the firm. Unwanted or unprofitable expansion of assets will result in heavy operating costs to the firm. On the other hand, inadequate investment in long term assets would make it difficult for the firm to compete successfully and maintain its market share.

Hansen (2000), notes that a long term commitment of funds may also change the risk complexity of the firm. If the adoption of an investment increases average gain, but causes frequent fluctuations in its earnings, the firm will become more risky. Thus, investment decisions shape the basic character of a firm.

Investment decisions generally involve large amounts of funds, which make it imperative for the firm to plan its investment programme very carefully and make an advance arrangement for procuring finances internally or externally.

Most investment decisions are irreversible. It may be difficult to find a market for such capital items once they have been acquired. The firm will incur heavy losses if such assets are scrapped.

According to Atkinson (2001), investment decisions are among the firm's most difficult decisions. They are an assessment of future events, which are difficult to predict. It is really a complex problem to correctly estimate the future cash flows of an investment. Economic, political, social and technological forces cause the uncertainty in cash flow estimation.

2.3 Types of Investment Decisions

Pandey (2006), noted that, there are many ways of classifying investments for purposes of appraising them and proceeded to classify them in different ways as follows:

Expansion. It entails a company adding capacity to its existing product lines to expand existing operations. A firm may also expand its activities in a new business. Expansion of a new business requires investment in new products and a new kind of production activity within the firm. Sometimes a firm in its quest to diversify may acquire existing firms to expand its business. In either case, the firm makes investment in the expectation of additional revenue.

Modernization and replacement. The main objective of modernization and replacement is to improve operating efficiency and reduce costs. Cost savings will be reflected in increased profits although the firm's revenue may remain unchanged. Assets become outdated and obsolete with

technological changes. The firm must strategize to replace those assets with new assets that operate more economically. Replacement decisions help to introduce more efficient and economical assets and therefore are also called cost-reduction investments. However, replacement decisions that involve substantial modernization and technological improvements expand revenue as well as reducing costs.

Mutually exclusive investments. They serve the same purpose and compete with each other. If one investment is undertaken, others will have to be excluded. A company may, for instance, either use a more labor intensive, semi-automatic machine or employ a more capital-intensive, highly automatic machine for production. Choosing the semi automatic machine precludes the acceptance of the highly automatic machine.

Independent investments. They serve different purposes and do not compete with each other. This implies that a firm may invest in two or more investment projects depending on their profitability, the availability of funds and the fact that they do not compete with each other.

Contingent investments. Contingent investments are dependent projects; the choice of one investment necessitates undertaking one or more other investments. A good example is if a company decides to build a factory in a remote area, it may have to invest in houses, roads, hospitals, schools, staff recreational facilities e.t.c., so that employees are attracted to work in such a place. Thus building a factory also requires other contingent facilities. The total expenditure will therefore be treated as a single investment.

2.4 Stages in Capital Budgeting Decisions

Stages in capital budgeting decisions refer to steps that are involved or that one goes through when evaluating an investment. The seven commonly used steps are: -

Determination of a need. The need to invest in a long term project arises when management and/or directors of a company sees the need to either expand existing operations to meet increased demand, or venture into new business line as a means of diversification, or make strategic decision to beat competition in the market.

Determination of alternatives available to the firm. Here, we consider all the available alternatives available to the firm in filling the gap identified. The company will need to scan the environment to find out how to solve the existing need identified.

Collecting data for the various alternatives. To effectively analyze the alternatives identified management will collect data for all the options available to them. The data will include the discount rate to be applied and the expected cash flows which the project anticipates to achieve.

Evaluating the various alternatives. The firm will use the data obtained to evaluate all the available alternative. The may use either the capital budgeting techniques or other techniques available to them to evaluate the options available to them.

Selecting the best alternative for investment. This stage involves choosing the alternative which addresses the needs identified. The project selected will be the one that adds value to the shareholders in terms of growth, profitability and risk.

Implementing the selected investment option. This is the stage of taking action and implementing the new project that has been identified.

Reviewing the project. After implementation, the project will be reviewed to establish progress in achieving the intended objective. In this stage, corrective measures are put in place to address deviations from the objective.

2.5 Project Evaluation Criteria

According to Pandey (2006), there are three steps that are involved in the scientific evaluation of an investment;

Estimation of cash flows. This stage is about estimating the cash flows that the investment project promises to produce. It may be in terms of increased cash flows from sales or cost savings to the firm. The external environment will always affect the cash flows from an investment project.

Estimation of the required rate of return. The firm will use a discount rate to discount cash flows to present values. The discount rate will reflect the required rate of return which has been adjusted for taxes.

Application of a decision rule for making the choice. This relates to applying the capital budgeting technique that the firm has chosen to use such as the IRR, the NPV and the PI

Porterfield (1965) notes that investment decision rules may also be referred to as capital budgeting techniques, or investment criteria. A sound appraisal technique should be used to measure the economic worth of an investment project. The essential property of a sound

technique is that it should maximize the shareholders' wealth. The following characteristics should be possessed by a sound investment evaluation criterion: It should:

(i) consider all cash flows to determine the true profitability of the project

(ii) provide for an objective and unambiguous way of separating good projects from bad projects.

(iii) help ranking of projects according to their true profitability

(iv) recognize the fact that bigger cash flows are preferable to smaller ones and early cash flows are preferred to later cash flows (wealth maximization and time value of money).

(v) help to choose among mutually exclusive projects, that project which maximizes the shareholders' wealth

(vi) be a criterion which is applicable to any conceivable investment projects, independent of others.

A number of investment criteria (or capital budgeting techniques) are in use in practice. They may be grouped in two categories:

- Discounted cash flow methods
- Non-discounted Cash flow methods

2.6 Discounted cash flow methods;

2.6.1 Net present value (NPV)

Ross, Westerfield and Jordan (2000), noted that the Net Present Value is widely used procedure for a potential investment in light of its effect on the price of the firm's shares. The NPV is the difference between an investment's market value and its cost. This method is the classic economic method of evaluating the investment proposal. It is a discounted cash flow technique that explicitly recognizes the time value of money. It correctly postulates that cash flows arising at different time periods differ in value and are comparable only when their equivalent, present values, are found out. The following steps are involved in the estimation of NPV: Estimation of the cash flows that we expect the new project to generate, then, we apply an appropriate discount rate on the cash flows so that we obtain the present value of cash flows estimated. We then estimate the NPV as the difference between the present value of future cash flows and the initial cost of the investment.

The NPV model is as shown below;

$$\text{NPV} = \sum_{t=1}^{n} \text{Ct}/(1+k)^t - \text{Co}$$

Where;

(i). C1 C2, C3,.... Represents net cash flows in year 1, 2, 3...

(ii). k, is the opportunity cost of capital

(iii). Co, is the initial cost of investment

(iv). n, is the expected life of the investment.

(v). t, is time

The Decision Rule; An investment should be accepted if the NPV is positive and rejected if it is negative.

Those in support of the NPV method argue that it is a good tool for evaluating investment proposals due to the following reasons:

(i) It recognizes the time value of money, that is a shilling received today is worth more than a shilling received tomorrow.

(ii) It uses all the cash flows occurring over the entire life of the project in calculating its worth; hence it is a measure of the project's true profitability.

(iii) NPV complies with the value additivity principle. The discounting process facilitates measuring cash flows in terms of present values that is in terms of equivalent current values. This makes it possible for NPVs of projects to be added. It implies that if we know the NPVs of the individual projects, then the value of the firm will increase by the sum of their NPVs.

(iv) The NPV method is always consistent with the objective of shareholders wealth maximization. The proponents of the NPV usually consider this as the greatest virtue of the method.

The critics of the method say that the main shortcoming of the NPV method arises from the fact that the method is theoretically sound but in practice, may pose some computational problems. These shortcomings are;

(i) Estimation of cash flows. The method is easy to use if forecasted cash flows are known. In practice, it is quite difficult to obtain the estimates of cash flows due to uncertainty.

(ii) It is also very difficult to estimate with precision the discount rate.

(iii) It is also argued that sometimes, it is not a good tool for ranking investment proposals. This is because the ranking of investment projects is not independent of the discount rate. The impact of discounting is more severe for cash flows occurring later in the life of the project.

2.6.2 Internal rate of return (IRR)

The internal rate of return (IRR), is closely related to NPV. It is another discounted cash flow technique, which takes into account the magnitude and timing of cash flows. The use of IRR for appraising capital investment was emphasized in the formal terms, for the first time, by Joel Dean. The other terms used to describe IRR are, yield on investment, marginal efficiency of capital, rate of return over cost, and time-adjusted rate of internal return. IRR is the discount rate that makes the NPV of an investment equal to zero. The firm that evaluates the investment proposal sets their own required rate of return which will be compared with the IRR for decision making.

The IRR evaluation model is as shown

$$\text{IRR} = \sum_{t=1}^{n} \text{Ct}/(1+r)^t - \text{Co} = 0$$

Where;

(i). C1, C2, C3.....represents net cash inflows in year 1,2,.....

(ii). C0 – is the initial cost of investment.

(iii). n – is the expected life of the investment.

(iv). r- is the IRR, determined at which the NPV becomes zero.

(v). t- is time

Decision Rule; based on the IRR rule, an investment is acceptable if the IRR exceeds the required return set by management and rejected if otherwise.

The proponents of the technique argue that IRR is a good investment evaluation technique since it measures profitability as a percentage and can be easily compared with the opportunity cost of capital. They further argue that IRR has the following merits;

(i) Like NPV, IRR method recognizes the time value of money

(ii) It is a good measure of profitability since it considers all the cash flows occurring over the entire life of the project to calculate its rate of return

(iii) It is also consistent with the shareholders' wealth maximization objective since if a project's IRR is greater than the opportunity cost of capital. then the shareholders wealth will be enhanced.

The critics of the IRR investment technique argue that IRR have shortcomings as discussed below;

(i) It may fail to indicate a correct choice among mutually exclusive projects under certain situations. This shortcoming may lead to incorrect decisions in comparisons of mutually exclusive investments.

With the IRR method, a project has multiple rates, or it may not have a unique rate of return. These problems may arise due to the mathematics of IRR computation.

(ii) Unlike in the case of the NPV method, the value additivity principle does not hold when the IRR method is used, that is IRRs of projects do not add.

2.6.3 Profitability index (PI)

According to Ross Westerfield and Jordan (2000), Profitability index (PI) may be defined as the present value of an investment's future cash flows divided by its initial cost. It is also called the benefit cost ratio. Profitability index is therefore the ratio of the present value of cash inflows, at the required rate of return, to the initial cash outflows of the investment

The model or formula for calculating benefit-cost-ratio or the the profitability index is as follows;

$$PI = \sum_{t=1}^{n} c_t/(1+k)^t \div Co$$

Where;

(i). C1 C2, C3,.... Represents net cash flows in year 1, 2, 3...

(ii). k, is the opportunity cost of capital

(iii). Co, is the initial cost of investment

(iv). n, is the expected life of the investment.

(v). t, is time

Decision Rule; based on the PI rule, an investment is acceptable if the PI is greater than one and the investment proposal rejected if the PI is less than one.

Like the NPV and the IRR, the PI is a conceptually sound method of appraising investment projects and therefore has the following advantages:

(i) It measures the profitability of the investment since the present value of the cash flows is divided by the initial cash outflow.

(ii) It is also consistent with the shareholder value maximization principal. This means that if a project has a PI of more than one, then it means it has a positive NPV and if undertaken will give rise to an increase to share holders' wealth.

(iii) Like the NPV and IRR, PI recognizes the time value of money in its analysis. This is captured through the discounting of cash inflows to present value.

The PI has the following shortcomings;

(i)Like the NPV and IRR criteria, the PI also requires the determination of cash flows and the discount rate. Since the same are estimates. they introduce subjectivity to the outcome hence compromise the reliability of the results of the analysis.

(ii) PI may lead to incorrect decisions in comparison of mutually exclusive projects

2.7 Non-discounted cash flow methods;

2.7.1 Payback period (PB)

Thuesen and Fabrycky (1993), notes that the payback period is probably the most popular method used by the industry for assessing the economic desirability of an investment. The payback period without interest is commonly defined as the length of time required to recover the first cost of an investment from the net cash flows produced by that investment at an interest rate of zero.

The model or formula for calculating payback period is as follows:

$$PB = \frac{\text{Initial Investment}}{\text{Annual Cash in flows}}$$

Decision Rule; when comparing the payback period for investment proposals it is usually more desirable to have a short payback period than a longer one.

The payback period, being a most popular investment technique has the following merits: It is regarded as the most simple to understand and easy to calculate. The business executives consider simplicity of method as a virtue. This is evident from their heavy reliance on it for appraising investment proposals in practice. It is also regarded as the most cost effective method of project appraisal since the method cost less than the most sophisticated techniques that require a lot of the analysts' time and resources. It is an effective tool of project appraisals for firms that require shot term effects or results. A company can have a more favorable short term effects on earning per share by setting up a shorter payback period. Since the emphasis on payback period is on the early recovery of the investment, it gives an insight into the liquidity of the project. The funds released can be put into other use. It provides a good risk shield since the risk of the project can be tackled by having a standard shorter payback period as it may guarantee against loss.

In spite of its simplicity, the payback may not be a good investment criterion since it suffers from a number of serious limitations as discussed below;

The payback period is not an appropriate method of measuring the profitability of an investment project as it does not consider all the cash flows yielded by the project.

The payback period fails to take into account the time value of money. That is, it fails to consider the patterns of cash inflows, i.e., the magnitude and the timing of cash inflows. In other words, it gives equal weights to returns of equal amounts even though they occur in different time periods.

It also suffers subjectivity in determining the maximum acceptable payback period. There is no rationale in setting up a maximum payback period.

2.7.2 Discounted payback period (DPB)

One of the limitations of the payback period which the discounted payback period attempted to address was that it didn't address the time value of money while calculating the payback period. The discounted payback period is therefore the number of periods taken in recovering the investment outlay on the present value basis. The discounted payback period still fails to consider the cash flows occurring after the payback period.

The model or formula for calculating payback period is as follows;

$$DPB = \frac{\text{Initial Investment}}{\text{Discounted Annual Cash in flows}} = \frac{Co}{Cd}$$

Decision Rule; Like the PB period rule, when comparing the discounted payback period for investment proposals it is usually more desirable to have a short payback period than a longer one.

The merits and the demerits of the DPB period are same as those of the PB period except that the DPB period takes into account the time value of money.

2.7.3 Accounting rate of return (ARR)

According to pandey (2006), the accounting rate of return (ARR), also known as the return on investment (ROI), uses accounting information as revealed by financial statements, to measure the profitability of an investment. The accounting rate of return is the ratio of after tax profit divided by the average investment. The initial investment would be equal to half of the original investment if it were depreciated constantly. Alternatively, it can be found out by dividing the total of the investment's book values after depreciation by the life of the project. The accounting rate of return is, thus, is an average rate and can be determined by the following model:

$$ARR = \frac{\frac{\left(\sum_{t=1}^{n} EBIT_t (1 - T)\right)}{n}}{\frac{IO + In}{2}}$$

Where ;

EBIT- is earnings before interest and taxes

T- is tax rate

IO – is the book value of the investment in the beginning

In – is book value of investment at the end of a number of years

n- is number of years

t- is time

Decision Rule; With this method we will accept all those projects whose ARR is higher than the minimum rate established by the management and reject those projects which have ARR which is less than the minimum rate.

The ARR method has the following merits;

The method is simple to understand and use. It does not involve complicated computations.

The needed information will readily be available since it uses the accounting data and unlike the in the NPR and IRR methods, no adjustments are required to arrive at the cash flows of the project.

The ARR rule incorporates the entire stream of income in calculating the projects profitability

The ARR method has the following demerits;

The ARR method uses accounting profits, not cash flows, in appraising the projects. Accounting profits are based on arbitrary assumptions and choices and also uses non-cash items. It is therefore inappropriate to rely on them for measuring the acceptability of the investment projects.

The averaging of the incomes ignores the time value of money. It in fact gives more weight to the distant receipts.

The firm employing the ARR rule uses an arbitrary cut –off yard stick. Generally, the yardstick is the firm's current return on its assets (book- value). Because of this, the growth companies

earning very high rates on their existing assets may reject profitable projects (i.e., with positive NPVs) and the less profitable companies may accept bad projects(i.e., with negative NPVs).

2.8 Evaluating projects with unequal lives

The differences in the life span of two projects especially for mutually exclusive projects can give rise to conflict between the evaluation outcome as analyzed using the NPV and IRR. The practice has been that in case the NPV rule conflicts with IRR, the NPV rule is normally used to choose between the projects since it is always consistent with the wealth maximization principle. If the lives of the two projects are too significant, an adjustment would be necessary. The adjustment can be done by either using

(a) The replacement chain method or

(b) The equivalent annual annuity method

The replacement chain method is used to compare projects of unequal lives by assuming that each project can be repeated as many times as necessary to reach a common life span, then the NPVs over this life span are then compared. The project with the higher common life NPV is chosen.

The equivalent annual annuity method is used by calculating one annual payment a project would provide if it were an annuity. When comparing the projects of unequal lives, the one with the higher equivalent annual annuity is chosen (Hansen & Mowen 2000).

2.9 Evaluating public projects

Thuesen and Fabrycky (1993), notes that the standard by which private enterprises evaluate its activities are markedly different from those that apply to public activities. In general private activities are evaluated in terms of profit, while public activities are evaluated in terms of the general welfare. It is the basic tenet that the purpose of government is to serve its citizens. For convenience in discussion, the aim of government may be considered to be embraced by the single term, general welfare. Public activities are evaluated by a summation of judgment of individual citizens, each of whose basis of judgment has been the general welfare as he sees it. Scientifically, public projects are evaluated by relating benefits to the cost of financing. Many user taxes are structured so that there is a relationship between the benefits derived from the project and the project cost. The most obvious of these user-related taxes are those that provide the revenue for state highway projects. Highway user taxation is designed to recover from the highway users those costs that can be appropriately identified with them. One concept considers that operating expenses provide an accurate assessment of services received. That is the more one drives, the more one uses the highway system. The gasoline tax, which is based on this concept, certainly provides revenue in relationship to the amount of use.

The benefit cost analysis and ratio

The general decision problem is to use the available resources in such a manner that the general welfare of the citizenry is maximized. To help accomplish this goal many government agencies have relied on methods that in some manner quantitatively measure the desirability of particular programs and projects. Of these methods the widely used is a method referred to as benefit-cost

analysis. When applying the benefit-cost analysis, the measure of the project's contribution towards the general welfare is normally stated in terms of the benefits 'to whomsoever they ma accrue' and the cost to be incurred. In order for a project to be considered desirable, the benefit must exceed the cost or the ratio of benefits to cost must be larger than one. A popular method used for deciding upon the economic justification of a public project is to compute the benefit cost ratio. This ratio may be expressed as (Thuesen and Fabrycky 1993).

$$BC = \frac{\text{Benefit to the Public}}{\text{Cost to the Governmen}}$$

Decision Rule; the project is accepted if the BC ratio is greater than one and rejected if less than one.

2.10 Investment evaluation under inflation

According to Brealey and Myers (1981), Inflation is a fact of life and it should be recognized in capital budgeting decisions. In that respect, it is good to note the following:

Those inflationary expectations are built into interest rates and money costs (i.e. the discount rates). The inflation factor is reflected in the weighted average cost of capital (WACC) used to find the NPV, and used as the hurdle rate if the IRR method of evaluation is used. This means that inflation is reflected in the cost of capital used in a capital budgeting analysis.

That we can also use certainty equivalents of future cash flows to determine the NPV of a project. This is done by estimating the cash flows of the project by assigning ratios to the different states of nature and calculating the weighted cash flows.

2.11 Dealing with uncertainty in project evaluation

The situation of uncertainty occurs when an investor cannot determine the cash flows of a project with certainty. In such cases, probabilities are assigned the various states of the economy and thereafter an average or weighted cash flows are determined. Which are then subjected to normal evaluation for determination of the viability of the project, for decision making (Clark, 1998).

2.12 Bases for comparison of alternatives

According to Thuesen and Fabrycky (1993), a basis for comparing alternatives is an index containing particular information about a series of receipts and disbursements representing an investment opportunity. The reduction of alternatives to a common base is necessary so that apparent differences become real differences, with the time value of money considered. When expressed in terms of common base, real differences become directly comparable and may be used for decision making. The most common base for comparison are; present worth (or present value), annual equivalent (or annual cash flows), the capitalized equivalent (or present value of annuity), the future worth (or future value), the internal rate of return and the payback period.

2.13 Empirical Research

There has been little research in the field of establishing the extent of use of capital budgeting techniques. The majority of studies have been done in the U.S. The researches which have been done were mainly aimed at determining the use of scientific approach in making investment decisions. Scientific approaches such as the discounted cash flow approaches are popular in the

modern times in analyzing investment proposals. A survey conducted by Moore and Reichert entitled; "An analysis of the financial management techniques currently employed by large U.S. corporations" and appeared in the journal of business finance and accounting (Winter 1983) and another conducted by Stanley and Block entitled "A survey of multinational Capital Budgeting". and appeared in the financial review (March 1984) are some of the few surveys conducted. The first research was aimed at finding out what types of investment criteria they actually use. The observation in the first research was that the payback period is more common as non-discounted cash flow method in investment appraisal in large U. S. corporations. The other research was a historical comparison looking at the primary capital budgeting techniques used by large firms through time. In 1959 only 19 per cent of the firms surveyed used either IRR or NPV and 68% used either payback period or accounting rate of return. However, through time, it became clear according to the research by Stanley and Block. that IRR and NPV have become the dominant investment criteria in the U.S.

Kadondi (2002), carried out a survey of the capital budgeting techniques used by companies listed at NSE. In her survey study approach. she examined the extent to which capital budgeting techniques were being practically applied by corporations quoted in the NSE. The study found that payback period method was the most popular at 31%, NPV and IRR at 21% and 23% respectively.

Wanjiru (2005), carried out a study on the extent of application of capital budgeting techniques by the food and beverage industries in Nairobi. She looked at the factors that inhibit proper application of capital budgeting techniques, the capital budgeting techniques in use. reasons for use of a particular capital budgeting technique and found out the long term investments carried out recently by those firms. She established that the payback period and the NPV were the most popular capital budgeting techniques amongst the food and beverage industries in Nairobi.

Muchiri (2008), carried out on a survey of Capital Investments appraisal techniques used by commercial parastatals based in Nairobi. His study looked at the most commly used investment appraisal techniques and factors that influence the choices of capital investment appraisal techniques by commercial parastatals. The study established and ranked only three commonly used methods as follows; NPV – 25%, IRR – 65% and PB – 10%.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

A cross-sectional survey design was used. This allowed data to be collected from the entire target population at a single point in time. This was considered since the population is small with clearly known registered offices where research data would be obtained.

3.2 Target Population

All the current fifty five (55) companies listed in the Main Investment and Alternative Investment Segments of the Nairobi stock exchange (NSE) were the target population. This population is composed of listed firms in the Main Investment Market Segment which has forty-seven (47) companies and the Alternative Market Segment which has eight (8). The Main Investment Market Segment consists of four Sub-segments. That is Agricultural with three (3) companies, Commercial and Services with twelve (12) companies, Finance and Investment with fifteen (15) companies, and Industrial and Allied with seventeen (17) companies. The information on these companies were obtained from the Capital Markets Authority.

3.3 Method of Data Collection

Primary data was collected using a structured questionnaire that was administered through mailing and direct delivery. As much as all managers participate in decision making, the questionnaires were specifically filled by finance officers of listed companies who decided amongest themselves as to who would fill the questionnaire. Questinnaires which were hand delivered to respondents were collected directly from the respondents and those that were mailed

to respondents were received through mail. The respondents were generally given one week to fill the questinnaire and direct collection was done thereafter. That gave the respondent adequate time to fill the questionnaire. The researcher delivered the questionnaires after doing a pre-test of the questionnaire to ensure its validity by distribution to a few companies that have not been picked in the sample of the test. A total of 29 responses were received which indicated a response rate of 52%. Eight companies were unwilling to give information as contained in the questionnaire.

3.4 Data Analysis

Data was analyzed through the use of both descriptive and inferential statistics such as percentages, pie charts, the Likert Scale and the chi square. The analysis allowed for generalization of the research outcome to explain the population as presented by the respondents. The use of capital budgeting techniques in evaluating investment proposals, perception of top managers on capital budgeting techniques and the most popular capital budgeting techniques were analyzed using either chi square, percentages, pie charts or the Likert Scale covering all the capital budgeting techniques.

The chi square model which was used to analyze the data collected is as shown below;

$$X^2 = \sum \frac{(O - E)^2}{E}$$

X^2 - is the chi square

O - is the observed

E - is the expected

CHAPTER FOUR: DATA ANALYSIS PRESENTATION AND DISCUSSION

4.1 The Use of Capital Budgeting Techniques in project appraisal by Listed Companies.

The first objective of the study was to evaluate whether listed companies use capital budgeting techniques to appraise their long term projects.

Table 1: Investing in Capital Projects by Listed Companies

Capital Project	Responses	(%)
Business Expansion	17	58.6
Purchase of new machines	16	55.2
Diversification into new business	11	37.9
Introduction of new product line	11	37.9
Strategic decisions	14	48.3

Source: Field Data (2010)

Table 1 above shows the various types of capital projects undertaken by listed companies. The study established that majority of listed companies, 58.6% invested in business expansion and 55.2% invested in purchasing new machinery. The study further established that 37.9% of the respondents have undertaken capital projects in diversification into new business and in the introduction of a new product line respectively in the last five years while 48.3% of the listed

companies undertook strategic decisions in the last five years. Generally, the study established that business expansions and purchase of new machines were the most popular forms of capital projects undertaken by listed companies at 58.6% and 55.2% respectively. These findings showed that companies listed on the Nairobi Stock Exchange did undertook one or more of the long term projects giving evidence that listed companies do actually invest in capital projects.

Table 2: Plans to Invest in Capital Projects

Plans	Responses	(%)
Certainly yes	23	79.4
Most likely	5	17.2
Not sure	1	3.4

Source: Field data (2010)

From Table 2 above, the study established that majority of listed companies 79.4% were certainly planning to invest in capital projects compared to 17.2% who were most likely planning to invest in capital projects. This finding showed that listed companies were most likely to invest in capital projects in the future.

Table 3: Approval to invest in new Capital Project by Listed Companies

Decisions	Responses	(%)
Approval by directors & committees	21	71.3
Approval through a budget	15	51.7
Use scientific project evaluation techniques	7	24.1
Use of scientific analysis by consultants	5	17.2
Based on past experience	3	10.3

Source: Field Data (2010)

The study established that the majority of listed companies, 71.3% made their decisions on capital projects based on the approval by the directors and committees compared to 51.7% who made their capital budgeting decisions based on the budget approvals. The study further established that 24.1% of listed companies made their capital budgeting decisions based on results of scientific project evaluation techniques, 17.2% made their decision based on scientific analysis from consultants and 10.3% used past experience to make such decision. These findings indicated that listed companies' decisions to invest in new projects were mainly guided by either the approval by their directors or through budgets. The study also established that listed companies based their decisions on scientific project evaluation techniques or scientific analysis by consultants. Generally, listed companies were using capital budgeting techniques in evaluating long term projects according to the above analysis although remotely used.

The first research question of the study was stated that; Does listed companies in Kenya use capital budgeting techniques in appraising their long term projects or not?. The study used chi-square to address this question.

Table 4: Contingency Tabulation of Plans to Invest based on scientific analysis from Consultants

Consultants	Yes	No	Total
Yes	4	19	23
No	1	5	6
Total	5	24	29

Source: Field Data (2010)

Table 4 above shows the cross tabulation of the firms' plans to invest in long term projects (rows) and the decision based on detailed scientific analysis from consultants (columns).

Table 5: Contingency Tabulation of Plans to Invest and Decision based on scientific PET

PET	Yes	No	Total
Yes	4	19	23
No	3	3	6
Total	7	22	29

Source: Field Data (2010).

Table 5 above shows the cross tabulation of the firms plans to invest in long term projects (rows) and the decision based on results from scientific project evaluation techniques (columns).

Table 6: The use of Capital Budgeting techniques by Listed Companies

Decisions	Chi-Square	Critical chi-sq.	df
Scientific analysis from consultants	12.40	3.7	1
Analysis based on scientific PET	7.60	3.7	1

Source: Data (2010)

In this study, capital budgeting techniques included both scientific analysis from the consultants and scientific project evaluation techniques. From table 6 above, the calculated chi-square from scientific analysis by consultants is 12.40 and that based on project evaluation technique is 7.60. The critical chi-square, at 1 degree of freedom and at 0.05 level of significance, was 3.7. Since the calculated chi-square was far much greater than the critical chi-square, there was statistical evidence to confirm that listed companies in Kenya use capital budgeting techniques in appraising long term projects (See table 6 above).

4.2 Popular Capital Budgeting Techniques used by Listed Companies

The second objective of the study was to determine the most popular capital budgeting techniques used in project appraisal amongst listed companies

Table 7: The Capital Budgeting Techniques Used by Listed Companies

Capital Budgeting Technique	Responses	(%)
Net present value	15	51.7
Payback period	11	37.9
Internal Rate of Return	8	27.6
Profitability index	8	27.6
Internal criteria	7	24.1
Discounted Payback period	6	20.7
Accounting Rate of Return	6	20.7
Others	2	6.9

Source: Field Data (2010)

Table 7 above shows the capital budgeting techniques used by listed companies. The study established that the majority of the companies, 51.7% used net present value, 37.9% used the payback period, 27.6% used the internal rate of return and profitability index, 24.1% used their internal criteria, 20.7% used the discounted payback period and the accounting rate of return, and 6.9% used other internally designed criteria as investment evaluation techniques. According to the above analysis, net present value is the method mostly used to evaluate investment projects.

Table 8: Capital Budgeting Techniques recommended by Listed Companies

Capital Budgeting Technique	Responses	(%)
Net present value	12	41.4
Internal Rate of Return	11	37.9
Discounted Payback period	9	31.0
Payback period	7	24.1
Internal criteria	6	20.7
Profitability index	3	10.3
ARR.	2	6.9
Others	2	6.9

Source: Field Data (2010)

The study established that 41.4% of listed companies recommended net present value investment technique, 37.9% recommend internal rate of return, 31.0% recommended discounted payback period, 24.1% recommended the payback period, 20.7% recommended internal criteria, 10.3% recommended the profitability index, 6.9% recommended both the accounting rate of return and other internally designed methods as specifically highlighted by listed companies. Generally, the study established that the majority of the companies, 41.4%, recommend the use of NPV, and the least popular capital budgeting technique was established to be ARR. These findings showed that

companies listed in Nairobi stock exchange did not out rightly prefer the use of one capital budgeting technique, but rather a combination of capital budgeting techniques.

Table 9: Ranking of the use of Capital Budgeting Techniques by the Listed Firms

Investment Techniques	SCORE	Ranking
Pay back period	98	1
Net present value	96	2
Discounted payback period	92	3
Internal criteria	82	4
Internal rate of return	81	5
Profitability Index	69	6
Accounting rate of return	62	7

Source: Field Data (2010)

Table 9 shows the popularity of capital budgeting techniques as used by listed firms. The Likert scale in the table was interpreted as follows; AU – always used, OU – often used, RU – rarely used, LU – least used and NU – not used. The study established that, based on Likert scale, listed firms ranked the use of capital budget techniques based on their scores as follows; Payback period with a score of 98, Net Present Value with a score of 96, Discounted payback period with a score of 92, internal criteria with a score of 82, internal rate of return with a score of 81, Profitability index with a score of 69 and the Accounting Rate of Return with a score of 62. This finding indicated that listed companies popularly used capital budgeting techniques in the

following ranked order; Payback period, Net present value, Discounted payback, accounting rate of return, internal rate of return, internal criteria, profitability index and Accounting rate of return..

The second research question was as stated; Which capital budgeting technique is most popularly used in project appraisal amongst listed companies?. The study used chi-square to address this question.

Table 10: Chi-Square of the Capital Budgeting Techniques used

Investment Technique	Chi-Square	Critical Chi-Square	Degree of freedom
Discounted payback	10.00	3.7	1
Accounting rate of return	10.00	3.7	1
Internal criteria	7.70	3.7	1
Internal Rate of return	5.80	3.7	1
Profitability index	5.80	3.7	1
Payback period	5.69	3.7	1
Net present value	5.03	3.7	1

Source: Field Data (2010)

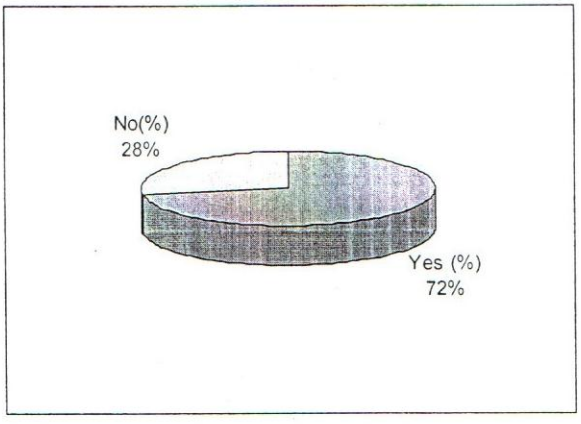
The study used a number of cross tabulation contingency tables between the individual Capital Budgeting techniques used and the companies' use of scientific project appraisal techniques.

Table 10 column one above shows the calculated chi-square results between the capital budgeting techniques and the companies' use of scientific project appraisal approach. Since the calculated chi-square was higher for discounted payback period, accounting rate of return, internal criteria, internal rate of return, profitability index, the payback period and the net present value compared to the critical chi-squares which were all 3.7 at 1 degree of freedom or 0.05 significance level, there was statistical evidence to confirm that other capital budgeting techniques are more popular amongst listed companies than others. This implies that specific capital budgeting techniques are popular in evaluating long term projects.

4.3 Perception of Senior Managers of listed companies to Capital Budgeting Techniques

The third objective of the study was to determine the perception of senior managers of listed companies to capital budgeting techniques

Figure 2: Recommendation of CBT in CPA by the Listed Firms



Source: Field Data (2010)

The figure shows that the majority of listed firms, 72% would certainly recommend the use of capital budgeting techniques on capital projects appraisals compared to 28% who would not recommend the techniques to be used in project appraisal. This shows that majority of listed companies recommend the use of capital budgeting techniques in capital projects' appraisal, signifying positive attitude to capital budgeting techniques.

Table 11: Listed Companies' Views on Scientific Project Appraisal Techniques

Views	(%)
Very good management tool	31.0
Sometimes a good mgt. tool	34.5
Fairly good management tool	24.1
Not applicable	10.4

Source: Field Data (2010)

The study established that 31% of the listed companies found scientific project appraisal techniques to be very good management tools, while 34.5% found it sometimes good management tools and 24.1.9% found it a fairly good management tools although a paltry 10.4% found it not applicable. These findings show that 89.6%, of listed companies consider scientific capital project appraisal techniques to be good management tools, signifying positive attitude.

Table 12: Information required by listed firms so as to appraise Capital Projects

Information required	Responses	%
So necessary but demanding	20	69
Impossible to obtain but necessary	5	17.6
Too costly to obtain compared with return	4	13.4

Source: Field Data (2010)

The study established that, majority of the listed firms, 69.0% responded that the information required to carry out capital projects appraisals were so necessary and so demanding and 17.6% of the listed companies responded that the information required to carry out capital projects appraisal were impossible to obtain but necessary and 13.4% indicated that the information required was too costly compared with its returns. These findings indicate that listed firms have positive knowledge of the application of evaluation procedures of capital budgeting techniques. It also shows that companies appreciate capital budgeting techniques despite the difficulty of collecting information.

Table 13: Perception of Senior Managers of listed companies to Capital Budgeting Techniques

Investment Techniques	Score	Ranking
Net Present Value	102	1
Payback Period	101	2
Discounted payback Period	91	3
Internal rate of return	87	4
Internal criteria	81	5
Accounting rate of return	69	6
Profitability Index	65	7

Source: Field Data (2010)

Table 13 above shows the perception of senior managers of listed companies to capital budgeting techniques. The scores were obtained by using the Likert scale. The study established that based on Likert scale, senior managers' perception to capital budgeting techniques as to their level of importance were as follows; Net Present Value, Payback Period, Discounted Payback Period, Internal rate of return, Internal criteria, Accounting rate of return and Profitability index. These findings showed that senior managers of listed companies perceive Capital budgeting techniques as important tools for project appraisals.

The third research question was as stated; What are the perceptions of senior managers of listed companies on the use of capital budgeting techniques in project appraisal? The study used chi-square to address this question.

Table 14: Chi-Square of the Senior Managers of listed companies' Perception to CBT

Investment Technique	Chi-Square	Critical Chi-Square	Degree of freedom
Discounted Payback period	6.00	3.7	1.00
Accounting rate of return	5.70	3.7	1.00
Internal Rate of return	10.00	3.7	1.00
Probability index	32.50	3.7	1.00
Payback period	5.30	3.7	1.00
Net present value	15.30	3.7	1.00
Average	11.79	3.7	1.00

Source: Field data (2010).

Table 14 shows a cross-tabulation of senior managers comments about CBT and the actual use of capital bubgeting techniques by senior managers to determine whether their perceptions differ significantly. A number of cross tabulation contingency tables between the specific capital budget techniques used and the manager's views on the use of the techniques. The study

established that the calculated chi-square values for all the techniques were higher than the critical chi-square 3.7 at 1 degree of freedom or 0.05 significance level. Since the calculated chi-square was higher than the critical chi-square, there is statistical evidence to confirm that senior managers have positive perceptions to capital budgeting techniques. This implies that all managers of listed companies have positive attitude to capital budgeting techniques.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Investment decisions are critical components of management decisions in most firms. Scientific analysis is important in such decision making process due to the risks involved because of the investment of huge sum of money and the long period the investment decision would affect the firm. The main aim of the study was to determine whether listed companies in Kenya use capital budgeting techniques in appraising long term projects. The study came up with many important findings that this section intends to discuss. The findings are presented in terms of the use of capital budgeting techniques in investment decisions, the popular capital budgeting technique used by listed companies and the perception of the senior managers of listed companies on capital budgeting technique.

5.1.1 The use of capital budgeting techniques in investment decisions.

First, companies listed in the Nairobi Stock Exchange were not keen on such capital projects as; diversification into new business, introduction of new product line and strategic decisions. Second, listed companies have invested in capital projects in the past and were likely to invest in capital projects in the future. Third, although there is statistical evidence justifying that listed companies use capital budgeting techniques in their project appraisals, the companies did not like using either results from scientific project evaluation techniques or scientific analysis from the

consultants. It came out clearly that companies use more than one capital budgeting techniques in their project appraisal.

5.1.2 The popular capital budgeting technique used by listed companies

First, the most popular capital budgeting technique used by listed companies was the Payback period, Net present value and the discounted payback period. Second, the level of recommendation of capital budgeting techniques to other users, by listed companies fell below their own use of the same. That implies that listed companies do not have total faith in the use of capital budgeting techniques. That explains why a number of companies use their own internal criteria to evaluate long term projects, along with capital budgeting techniques. Third, listed firms agreed that the information required to carry out capital budgeting decisions were necessary, and so demanding and in small investments, costly to obtain compared with return.

5.1.3 The perception of senior managers of listed companies on capital budgeting technique

First, although managers of listed companies use capital budgeting techniques alongside their other internal criteria, they would still recommend them to other users. Second, managers of listed companies indicated their preferences to the investment techniques in the following order from the most important to the least important technique; Net Present Value, Payback Period, Discounted Payback Period, Internal rate of return, Internal criteria, Accounting rate of return and Profitability index. Third, Managers of listed companies perceive Capital Budgeting Techniques as important tools for project appraisal.

5.2 Conclusion

Every company needs to establish reliable investment decision tools that will not only manage the unforeseen investment risks but also maximize profitability and growth of the companies. The study at its conceptualization sought to evaluate the use of capital budgeting techniques in project appraisal by listed companies. The study established that listed companies use capital budgeting techniques in their investment decisions and that Payback period, Net present value and the discounted payback period were the most popular capital budgeting techniques among the listed companies. The study further established that managers of listed companies have positive attitude towards capital budgeting techniques.

5.3 Recommendations

From the findings and conclusion of this study, the following recommendations are important in relations to how the companies use capital budgeting technique in their investment decisions. First, the regulators such as the Capital Markets Authority, institutions for higher learning and professional bodies such as the Institute of Certified Public Accountants of Kenya should encourage the use of capital budgeting techniques in evaluation of investment projects and also highlight investment opportunities that are available in business expansions, purchasing new machineries, diversification, introduction of new product lines and other strategic decisions. Secondly, there is need of creating awareness on emerging other home grown internal techniques of project appraisal. Third, companies need to promote the scientific approaches to their operations in order to minimize investment risks, increase growth of shareholders' wealth and profitability of the firm. Fourth, regulators such as the Capital Market Authority should promote

awareness to investors on the benefits that accrue to the firm for using capital budgeting techniques and to empower them through workshops and seminars on ways of ensuring that managers use capital budgeting techniques, along with other internal techniques when appraising long term projects.

5.4 Recommendation for further research

The following related areas can be researched on to add up to the knowledge of what this study has achieved. First, there is a need to carry out a study to evaluate the effect of the use of capital budgeting techniques on the listed companies' trading volumes at the Nairobi stock exchange. The findings from such a study will be useful in understanding whether there is any relationship between the trading volumes of their shares at the Nairobi stock exchange and the use of capital budgeting techniques by those companies in evaluating their investment proposal. Secondly, there is need to carry out a study to evaluate the relationship between profitability and investment in capital projects. The findings will shade light on the correlation, if any between investing in capital projects and profitability. Thirdly, further research should be done to find out if those companies which did not responded would repond and to establish the reasons for their non-response.

REFERENCES

Block B. S., (2002); *Foundations of Financial Management, Tenth Edition*, R. R. Donnelley, McGraw-Hill New York USA

Brealey R., Myers S., (1981); *Principles of Corporate Finance*, Making Investment Decisions with the net Present Value Rule Von Hoffmann Press, Inc., McGraw-Hill USA

Clark, et al, (1998); *Capital Budgeting, Political Risk and Prudence*, International Journal of Finance, Vol.10, No.1, Pg1-5

Edmonds T. P., et al, (2000); *Fundamental Managerial Accounting Concepts, Reprint version,* Von Hoffmann Press, Inc., McGraw-Hill USA

Florence T. W., (2005); *An Investigation into the Extent of Application of Capital Budgeting Techniques by the Food and Beverage Industries in Nairobi*, MBA, Kenyatta University

Garrison R. H., et al, (2000); *Managerial Accounting, Ninth edition,* Von Hoffmann Press, Inc., McGraw-Hill USA Von Hoffmann Press, Inc., McGraw-Hill USA

Hansen D. R., Mowen M. M., (2000); *Management accounting* – Capital Investment Decisions, Fifth edition, Von Hoffmann Press, Inc., McGraw-Hill USA

Harris M., Raviv A., (1998); Capital *Budgeting and delegation*, Journal of Financial Economics, Pg 1-8

Hilton W. R., (1997); *Managerial Accounting, Third Edition*, Von Hoffmann Press, Inc., McGraw-Hill USA

Jones, et al, (2000); *Introduction to Managerial Accounting, a Users Perspective,* Prentice Hall, Upper Saddle River, New Jersey USA

Kadondi E. A., (2002); *A Survey of the Capital Budgeting Techniques used by companies listed at Nairobi Stock Exchange*, MBA, University of Nairobi

Larson K. D., et al, (1999); *Fundamental Accounting Principles, Fifteenth edition,* Von Hoffmann Press, Inc., McGraw-Hill USA

Mbaru J., (2003); *Transforming Africa,* East Africa Education Publishers, Kenya

Moore J. S. and Reichert A. K., (1998), An Analysis of the Financial Management techniques Currently employed by large U.S. Corporations, Journal of Business Finance and Accounting, Pg 1-9

Njiru B. M., (2008); *A Survey of Capital Investment Appraisal Techniques used by commercial parastatals based in Nairobi*, MBA, University of Nairobi

Pandey I. M., (2006); *Financial Management - Capital Budgeting Decisions, Ninth edition*, Vikas Publications House Pvt Ltd, New Dehli,

Portefield J. T. S.,(1965); *Investment Decisions and Capital Cost,* Prentice Hall, Upper Saddle River, New Jersey USA

Quirin G. D., (1977); *The Capital Expenditure Decisions,* Prentice Hall, Upper Saddle River, New Jersey USA

Ross S. A., et al, (2000); *Fundamentals of Corporate Finance, Fifth edition,* Von Hoffmann Press, Inc., McGraw-Hill USA

Schall L. D., (1978); Survey and Analysis of Capital Budgeting Methods, Journal of Finance, Pg7

Stanley M. T., Block S. B., (1984); *A Survey of Multinational Capital Budgeting*, the Financial Review, USA, Short Paper

Thuesen G. J. and Fabrycky W. J. (1993); *Engeneering Economics,* Prentice Hall, USA

Weygandt J. J., et al, (2002); *Accounting Principles, Annotated Instructor's edition, Sixth edition* Von Hoffmann Press, Inc., McGraw-Hill USA

APPENDICES

APPENDIX I

SPECIMEN INTRODUCTORY LETTER TO RESPONDENTS

Egerton University,

Department of Business Studies,

Faculty of Commerce,

P.O Box 325,

NJORO.

TO WHOM IT MAY CONCERN

Dear Respondent,

RE: RESEARCH PROJECT.

I am a student of Egerton University pursuing a Master of Business and Administration degree, specializing in Finance. I am carrying out a research on "Evaluation of the use of capital budgeting techniques in project appraisal by listed companies".

The purpose of the attached questionnaire is to gather information from listed companies. You have therefore been selected as one of the respondents in this research. Your responses in the attached questionnaire shall provide very important data for the study.

Kindly note that the information you will give will be treated as confidential and will strictly be used for academic purposes only.

Thank you for your co-operation.

Yours faithfully,

PAUL KIPRUTO KIMARU

RESEARCHER

APPENDIX II

QUESTIONNAIRE TO BE FILLED BY RESPONDENTS

COMPANY: .....

POSITION: .....

Please answer the questions as accurately as possible by ticking at least one per question (√) on the boxes provided next to the statement, if given the option of choosing, OR rank using numbers 1 to 5 as explained. Be accurate as much as you can.

Q1. What kind of capital projects have you undertaken in the last five years?

	Choose
Business expansion	( )
Purchase of new machines	( )
Diversification into new business	( )
Introduction of new product line	( )
Strategic decisions	( )
Did not invest in capital projects at all	( )
Other (Specify).....	( )

Q2. Do you plan to invest in capital projects in the next five years?

	Choose
Certainly yes	( )
Most likely	( )
Not so sure	( )
Not at all	( )

Q3. How did you or intend to decide on your new capital project investment?

	Choose
It was or shall be decided by a committee	( )
It was or shall be after the approval of the C.E.O.	( )
It was or shall be approved through a budget	( )
It was or shall be after receiving a detailed scientific analysis from our Consultant	( )
It was or shall be undertaken based on our past experience	( )
It was or shall be undertaken based on results of scientific project evaluation techniques	( )
Other (Specify)	( )

Q4. What investment techniques did you use or intend to use?

	Choose
The Payback period	( )
The Discounted payback period	( )
The Accounting Rate of Return	( )
The Internal Rate of Return	( )
The Profitability index	( )
The Net Present Value	( )
The firm's own internal criteria	( )
Others (specify)	( )

.....

Q5. Besides what you intend to use in Q4 above, which investment technique do you recommend to other users, for future use in capital projects appraisals?

	Choose
The Payback period	( )
The Discounted payback period	( )
The Accounting Rate of Return	( )

The Internal Rate of Return	( )
The Profitability index	( )
The Net Present Value	( )
The firm's own internal criteria	( )
Others (specify)	( )

.....

Q6. What could be your comment on the scientific project appraisal techniques?

	Choose
A very good management tool for project appraisal	( )
Sometimes a good management tool for project appraisal	( )
A fairly good management tool for project appraisal	( )
Not possible to use in real life situation	( )
Not sure	( )

Q7. What could be your comment on the information required as data for appraising capital projects?

	Choose
So necessary but so demanding	( )
So necessary but readily available	( )
Not necessary and can do without	( )
Impossible to obtain although necessary	( )
Impossible to obtain and not necessary	( )
Too costly to obtain compared with its return	( )

Q8. Would you recommend the use of Capital Budgeting Techniques in Capital project appraisals, to other Companies/organizations?

Certainly Yes	( )
May Recommend Sometimes	( )
Not at All	( )
Not Sure	( )

Q9. What would be your ranking of the Investment techniques, if you were asked to rank in order of your preference?

		5	4	3	2	1
1	The Payback period					
2	The Discounted payback period					
3	The Accounting Rate of Return					
4	The Internal Rate of Return					
5	The Profitability index					
6	The Net Present Value					
7	The firm's own internal criteria					

RANKING

5. Very Important

4. Important

3. Necessary

2. Not Important

1. Unnecessary

Q10. What would you say about the use of the following capital budgeting techniques in your organization?

		5	4	3	2	1
1	The Payback period					
2	The Discounted payback period					
3	The Accounting Rate of Return					
4	The Internal Rate of Return					
5	The Profitability index					
6	The Net Present Value					
7	The firm's own internal criteria					

RANKING

5. Always used

4. Often used

3. Rarely used

2. Least used

1. Not used

APPENDIX III

Perception of Senior Managers of listed companies to Capital Budgeting Techniques

Investment Techniques	VI	I	N	NI	U	Total
SCORE	5	4	3	2	1	Score
Net Present Value	13	4	3	4	4	102
Payback Period	12	6	4	2	1	101
DPB Period	8	5	7	4	2	91
IRR	6	9	4	4	1	87
Internal criteria	10	4	4	1	1	81
ARR	2	1	15	4	2	69
Profitability Index	4	5	5	4	2	65

Source: Field Data (2010)

Ranking of the use of Capital Budgeting Techniques by the Listed Firms

Investment Techniques	AU	OU	RU	LU	NU	Total
SCORES	5	4	3	2	1	Score
Pay back period	9	7	5	4	2	98
Net present value	11	5	5	2	2	96
Discounted payback period	7	8	6	3	1	92
Internal criteria	10	4	2	4	1	82
Internal rate of return	6	8	3	4	2	81
Profitability Index	5	4	6	4	2	69
Accounting rate of return	1	4	9	6	2	62

Source: Field Data (2010)