

**DETERMINANTS OF CAPITAL BUDGETING TECHNIQUES ADOPTED BY CITY
COUNCIL OF NAIROBI IN SOLID WASTE MANAGEMENT**

BY

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DECLARATION

This project is my original work and has not been presented to any other university.

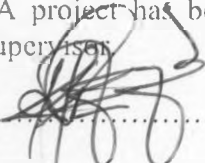
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DEDICATION

I dedicate this project to my dad Mr R. Khambo Kariuki for his financial and moral support throughout my academic life. Your words of encouragement enabled me to strive for success in my studies.

ABSTRACT

This study sought to identify the determination of the capital investment appraisal technique used and determine the most commonly used capital investment appraisal technique by City Council of Nairobi in solid waste management. Data was collected using structured questionnaires circulated to the departments of finance, treasury and environment. Thirty (30) questionnaires were circulated but only nineteen (19) questionnaires were responded.

The analysis revealed that solid waste quantity, funds available and interest rates are the most common factors influencing the capital budgeting technique adopted by City Council of Nairobi. All the respondents indicated that City Council of Nairobi has a capital investment policy which is followed most of the time. Further the identification of investment opportunity was identified as the first stage in capital investment process, followed by approval of the budgets. Authorization of expenditure and control and monitoring of the projects were ranked fourth and fifth stage respectively in the capital investment process.

The main capital investment appraisal techniques used by City Council of Nairobi are the net present value (58%), the internal rate of return (26%) and the payback period (11%). The discounted cashflow techniques are the most used capital budgeting investment appraisal techniques (75%) while the non-discounted cash flow techniques are used 25% of the time.

The results further indicated that determining the project period, cash outflow determination, length of time the decision is made and quantification of the solid waste were the most serious challenges the City Council of Nairobi faces in capital budgeting. The management skills and knowledge, interest rate determination and quantification of the solid waste were reported to be the least challenges faced in capital budgeting. The implication of these results is that the City Councils should endeavour to continuously assess whether they are receiving the appropriate return on their investment besides their goal of offering a clean and safe environment.

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LIST OF ABBREVIATIONS

ARR	Average Rate of Return
CCN	City Council of Nairobi
DCF	Discounted Cash Flow
IRR	Internal Rate of Return
MIRR	Modified Internal Rate of Return
MM	Modigliani and Miller
NPV	Net Present Value
NSE	Nairobi Securities Exchange
PP	Payback Period
SPSS	Statistical Package for Social Sciences

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Capital budgeting process remains as one of the key decision area confronting decision maker in any organisation since capital expenditures shape future performance. The capital budgeting decision is an important decision for the firm since the firms' survival and profitability relies on capital expenditures. Pandey (1995) observed that capital budgeting decisions are crucial to a firm's success for several reasons. Capital expenditures require large outlays of funds. The firm must ascertain the best way to raise and repay these funds. Most capital budgeting decisions require a long-term commitment financially and therefore the timing of capital budgeting decisions is important. When large amounts of funds are raised, firms must pay attention to the financial markets because the cost of capital is directly related to the current interest rate.

A number of stages, calculations, evaluation methods and refinements to the capital budgeting process are carried out. The capital budgeting process takes into consideration the cost of particular project, estimating the expected cash outflow from the project including residual value of the asset at the end of the useful life and estimation of the riskiness of the cash flows. The management considers the cost of capital at which the cash outflows should be discounted and determines the present value of expected cash outflows which would be compared with the present value of the cash inflows.

There are various factors which affect the capital budgeting techniques. Kadondi (2002) noted that smaller firms prefer to use payback period and internal rate of return. Ryan (2002), reported that the payback technique to be the preferred method and discounted cash flow models to be the least popular. This may be attributed to lack of financial sophistication and limited use of computer technology in that era.

1.1.1 City Council of Nairobi

City Council of Nairobi (CCN) was set up in 1952 and its function is to deliver services to the residents of Nairobi and maintain the City status of Nairobi. CCN derives its legal mandate from the Local Government Act (Cap 265) of the Laws of Kenya amongst other Acts of Parliament that augment its diverse core functions and priorities. CCN is organised into various departments such as planning, engineering, inspectorate, treasury, education, environment, information and communication, human resources, legal, procurement, public health and social services and housing. The Department of Environment was formed on 6th February 1996 to primarily plan and manage the environment in Nairobi. Its mandate is to carry out operations and activities aimed at creating a healthy, clean and aesthetically pleasant environment to the residents of Nairobi and to formulate and/or advocate for formulation and implementation of suitable policies and tools for effective management of the environment. CCN is one of the local authorities in Kenya which is governed by Local Government Act Cap 265 Laws of Kenya. Kenya has over 175 local authorities which are categorised into city councils, town council, municipal council and county councils (Kilika, 2010). The Local Government Act spells out wide ranging services and functions offered by the local government where most of these functions are undertaken by local authorities related to provision of public services, promotion of good governance and stimulation of good economic growth. The functions and responsibilities cover basic services such as markets, garbage collection, street lighting, maintenance, development planning roads, sewerage, community welfare, health services, housing, schools and recreation facilities and maintenance of park (Kilika, 2010).

The environment department maintains a public/private sector partnership policy in various environmental management issues. This enables the private sector to participate in improving the aesthetic value of the environment by sponsoring beautification programmes on roundabouts and other open spaces within Nairobi.

The services are regulated through the City's By-laws on solid waste management as well as other administrative procedures and policies adopted by the Council. The Department of Environment provides most aspects of solid waste management to

residents directly through its own workforce and equipment, or indirectly through contractors. The Council in addition, licenses private companies to provide waste collection and transportation services in selected areas of the city. In creating legal and operational frameworks for solid waste management, many countries set a hierarchy of goals with the highest being avoidance of the generation of waste, followed by minimization, then recovery which involves recycling, re-use as well as energy generation and thereafter treatment and disposal. There are several solid waste dump sites used by City Council of Nairobi, chief among them the Dandora dump site. Uncontrolled disposal of waste in open dumps though the cheapest and most convenient way to get rid of waste in the short term is regarded as the most undesirable due to the risks that it causes to the environment and public health.

According to Ulbrich (2003), no function of government impacts as many people on a daily basis as the infrastructure of water building, sewer system. Infrastructure refers to public sector physical capital. There has been an increase in the population in the urban areas in Kenya and therefore there is increased waste which would require proper disposal. The vision of the City Council of Nairobi is to be recognized as one of the most attractive cities in the world.

1.1.2 Capital Budgeting Techniques

There are several capital budgeting techniques which are available for use in evaluation of capital projects. Bringham and Besley (2000) identified several basic methods used by businesses to evaluate projects and to decide whether they should be accepted for inclusion in the capital budget. These methods are the payback period, net present value and internal rate of return. The payback period method is a non discounting technique since it does not consider the time value of money. NPV and IRR are referred to as discounting techniques since they take into account time value of money. Bringham and Besley (2000) define payback period as the number of years required to recover the original investment. It's the simplest and the oldest formal method used to evaluate capital budgeting method. Using the pay back to make capital budgeting decisions is based on the concept that it's better to recover the cost of a project sooner rather than later. As a general rule a project is considered acceptable if it's payback period is less than the maximum cost recovery time established by the

firm. The major limitations of this method are the failure to recognize the time value of money and cash flows beyond the payback period. A project would be accepted if it meets the criteria set by management.

Pay back period = Initial cash outlay/Annual cash inflows

Brigham and Besley (2000), defines Net Present Value (NPV) as a method of evaluating capital investment proposals by finding the present value of future net cash flows discounted at a rate of return required by the firm. To implement this approach, the present value of all future cash flows a project is expected to generate is obtained and then reduced by the net present value of the initial investment to find the net benefit the firm will realize from investing in the project. If the net benefit computed on a present value basis is positive, then the project is considered an acceptable investment. The advantage of this method is that it recognizes the time value of money.

Brigham & Besley (2000) define the Modified Internal Rate of Return (MIRR) as the discount rate at which the present value of a project's cost is equal to the present value of its terminal value, in which the terminal value is found as the sum of the future values of the cash flows, compounded at the firm's required rate of return. The use of the technique helps overcome the IRRs limitation resulting from the reinvestment rate assumption.

Internal Rate of Return (IRR) is the discount rate that equates the present value of the cash inflows with initial investment associated with the project (Gitman, 2002). As long as the project's IRR, is greater than the rate of return required by the firm for such an investment, the project is accepted. The technique has two major limitations. First, when a project has unconventional cash flow patterns, there is a likelihood of getting multiple IRRs. This is because there exist an IRR solution for each time the direction of the cash flows associated with a project changes. Secondly, in the case of mutually exclusive projects, the technique can result in the acceptance of the lesser viable project. This is because the IRR method assumes that the interim cash flows are reinvested at the projects' discount rate (Brigham & Besley,2000).

1.2 Problem Statement

It is important for finance managers to apply an appropriate capital investment appraisal technique consistent with the objective of maximising shareholders wealth in their capital investment process (Njiru, 2008). Andrew and Butler (1986) researched on capital budgeting techniques on companies based in South Africa. They used questionnaires in data collection which were sent to 500 companies. They received responses from 132 countries and they found out that larger firms tended to employ more sophisticated capital budgeting techniques in evaluating their investments.

Suk and Ulferts (1996) summarised the results of five studies done in the United States from 1980 through 1993. The results of these five empirical studies revealed that discounted cash flow techniques were more popular than other techniques and that the IRR was the most popular capital budgeting technique. At least half of the respondent in the studies they summarised used discounted cash flow techniques. In one study 81 percent of the respondent used either NPV or IRR.

A study by Ryan and Ryan (2002) indicated that finance managers have never been in full agreement as to the choice of the best capital budgeting method. According to Ryan and Ryan (2002), earlier studies by Miller in 1970s, by Shall, Sandam and Geijsbeek in 1978 and by Pike in 1996 reported that the payback technique to be the preferred method and discounted cash flow models to be the least popular. This may be attributed to lack of financial sophistication and limited use of computer technology in that era.

Kadondi (2002) carried out a survey on capital budgeting techniques used by companies listed at Nairobi Stock Exchange (NSE). The objectives were to document the capital budgeting techniques used in investment appraisal by corporations in Kenya, to determine whether the techniques used were consistent with the theories and practices of organizations in developed countries and to determine how firms and CEO characteristics influence the use of a particular technique. The finding of the study was that small companies use IRR and payback period methods while large companies with high net profit margins use NPV, IRR and payback period methods.

Pradeep and Quesada (2008) in a study on the use of capital budgeting techniques in businesses in the Western Cape Province of South Africa, investigated a number of variables and associations relating to capital budgeting practices. The sample consisted of 600 firms with 35% response rate. A descriptive approach to the research finding was adopted. Chi-square test technique was used to measure association between variables. Data analysis was done using SPSS software. The results revealed that payback period followed by NPV appear to be the most used method across the different sizes and sectors of businesses.

From the knowledge available, there have been limited studies on capital budgeting techniques adopted by the local governments in the provision of solid waste disposal services. The study will seek to identify the extent of application of capital budgeting techniques by CCN in solid waste management projects.

Capital investment appraisal technique used may vary from one firm to another based on factors such as size of the company, industry, purpose and mandate of the firm, government policy, size of annual capital budget, investment duration and other factors. The problem in this research is to identify the most commonly used capital budgeting technique by CCN and also identify the factors that influence the parastatals in making the choice.

1.3 Objective of the Study

The objective of the study will be to find out the determinants of capital budgeting techniques applied by CCN in the solid waste management projects. The study will seek to find out the reasons why certain capital budgeting techniques are adopted and not others.

1.4 Importance of the Study

In order to ensure that the local government is getting returns for its investment it is important to understand the various capital budgeting evaluation techniques to assist in the evaluation of the investments in the solid waste management. Recently there has been an increased need for an appropriate solid waste management due to increased rural to urban migration. As the urban population grows, it is important for CCN to

identify and develop the efficient and effective solid waste management plan if it is to provide the residents with a clean and safe environment.

This study is timely in that it will provide the new county governors with important information on the capital budgeting with the devolved system of governance hence improving the competitiveness of the local government. This will improve decision making process by allowing the local government to continuously monitor its performance through the evaluation of the waste management projects over time. To the investors in the waste management sector this study will go a long way in assisting in the evaluation of their investments.

1.5 Justification of the Study

Several scholars have surveyed the various capital budgeting techniques adopted by various institutions both in and outside Kenya. This study will attempt to survey the determinants of capital budgeting techniques adopted by CCN in solid waste management. There has been no studies am aware of which have been done on determinants of capital budgeting techniques adopted by CCN in the solid waste management projects.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter tries to look at some of the previous work done on the evaluation of capital budgeting techniques, their findings and conclusions made. This chapter is organized into various sections. Section 2.2 provides a detailed review of the theoretical literature setting out the theories in place to explain the capital budgeting techniques. Section 2.3 provides a review of empirical literature carried out in various parts of the world. Section 2.4 looks at the capital budgeting techniques in local authorities in developing countries.

2.2 Theoretical Literature

There are various theories that have been articulated to explain the capital budgeting techniques. The main theories which have been advanced to explain the capital budgeting techniques are Modigliani and Miller Theory, Contemporary Capital Budgeting Theory, Real Option Theory, Irving Fisher Theory and the Theory of Interest.

2.2.1 Modigliani and Miller Theory

Modigliani and Miller theory of 1958 pursues value maximization to increase the combined market values of debt and equity. In MM's theory the two sources of financing used are permanent and equity is a form of permanent financing. Since permanent financing is employed, the payment of principal is unnecessary so unlike in normal capital budgeting depreciation is set aside each year to replace the obsolete capital and investors do not recover the initial investment at all. According to MM the cost of capital is the weighted average cost of capital. The value of a levered firm is the after-tax cash flows for the stockholders discounted at the cost of equity plus the after tax flows from bondholders discounted at the cost of debt or identically its value is the Net Operating Income discounted at the WACC. Therefore MM maximized the combined value of equity and debt or equivalently the combined wealth of the stockholders and bond holders.

Value of a levered firm = Discounted after tax cash flow for stockholders + Discounted after tax cash flow from the bond holders.

Modigliani and Miller (MM) made several propositions in relation to the value of the firm. In their first proposition, the value of the firm is the same regardless of whether it finances itself with debt or equity. In this proposition MM assumed perfect and frictionless market, no transaction cost, no default risk, no transaction costs, no taxation and both the firm and investors can borrow at the same rate.

The weighted average cost of capital is constant and is given by:

Weighted average cost = Weight of cost of debt * cost of debt + Weight of cost of capital * cost of capital

2.2.2 Contemporary Capital Budgeting Theory

The contemporary capital budgeting theory is deeply rooted in the above MM's theory. The difference is that in MM's permanent cash flows, investment projects have limited useful lives in the real world. In making capital budgeting decisions, five important elements are to be considered which include the initial investment, the operating cash flow, the useful life of the project, the salvage value, and the cost of capital. Since the limited project life differs between MM's and contemporary theory, it is discussed before the other four components. The implication is that, upon the close of the project, the venture is to be dissolved, so the company must pay back the par value of bonds to bondholders and the par value of common shares to stockholders. Therefore, unlike in MM's Theory, depreciation is not accumulated from year to year to replace the capital asset. Instead it is added back to the net operating income to increase the operating cash flow for the investors. The initial investment is the amount of capital required upfront to start a project which includes, but is not limited to, the purchase price of the capital asset, installation cost, and the working capital needs. In MM, the investors never recapture the initial investment because the project will go on forever. Under the contemporary capital budgeting theory this amount is recovered through the operating cash flows from the project. The operating cash flow in current theory is the cash inflow to the investors from the project.

2.2.3 Real Option Theory

Corporate decision making has greatly improved through the increased prevalence of real options analysis. Myres (1977) coined the term real option and incorporated three factors into the real option analysis such as the uncertainty about the future cashflows, irreversibility of investments and the timing of project initiation. The real option

theory is fairly recent. The name real option is taken from the fact that real assets got options on them which can be exercised by the decision makers which are much similar to financial assets. There are many real options and each investment opportunity uses one or some of these options. Some important real options include option to wait, option to abandon, option to switch, growth options, time to build option and option to alter operating scale.

Among these options option to wait and option to abandon are recognised as the most important real options which are embedded in most investment opportunities. The Net present Value (NPV) rule is traditionally used to accept or reject investment opportunities. Implicitly the NPV rule assumes that the decision setting is to invest now or never. Thus the simple NPV rule neglects one important characteristic and timing which is common in most investment opportunities. When irreversibility and uncertainty are present, investment expenditure involves the exercise of killing an option which is the option to productively invest at any time in the future. If the investment is undertaken, the option to invest is exercised or killed. If the decision to invest is postponed the time that new information arrives and justifies the investment, then the option to wait is kept open. The possibility to postpone investment project as sunk costs has been considered in some circumstances. Investment should not be immediately undertaken just because it has positive NPV. If the investment is delayed it might be more valuable in the future (Pindyck, 1988). Pindyck (1988) uses stochastic and dynamic programming to value projects under further conditions of risk and irreversibility.

Clearly as decision maker is faced with an irreversible and uncertain investment opportunity, he has the flexibility to invest now or wait until sometime in the future when new information arrives and paves the way for undertaking or rejecting the investment opportunity hence the option to wait has a positive value that should be included in the evaluation of investment opportunity.

2.2.4 Irving Fisher's Theory of Interest

Fisher (1930) articulated the concept of NPV as the market value of securities minus cost of resources. Fisher (1930) advanced the Theory of Interest in which he suggested that NPV is the key part in theory of optimal resource allocation. Fisher (1930)

labelled his theory of interest the “impatience and opportunity” theory. He put forward that interest rates, were as a result of the interaction of two forces which are the “time preference” people have for capital now and the investment opportunity principle (that income invested now will yield greater income in the future). The interest rate, or what is called cost of Capital, forms the basis of the Internal Rate of Return (IRR) defined as the discount rate that will equate the present value of future cash flows to the resources employed now. Capital is defined as any asset that produces a flow of income over time (Fisher, 1930). A flow of income is distinct from the stock of capital that generated it, although the two are linked by the interest rate. He explained that value of capital is the present value of the net income that the asset generates. In the period between 1930s and 1950s non owner managed firms put in place capital budgeting control systems that identified planned capital investments. The size of non financial investments and the number of non owner managed firms increased during the industrial revolution.

According to Chapman & Hopwood (2007) these simultaneous changes created fertile ground for use of more sophisticated evaluation techniques and for the capital budgeting processes. During the 1950s, practicing financial controllers began to network with academicians to develop models for capital budgeting (Chapman & Hopwood, 2007). Dean (1951), in his book Capital Budgeting, advanced the implementation of Discounted Cash flows (DCF) methodology in its current form.

The present value of the future cash flow is given by:

$$PVfc = \sum FVt / (1+i)^t$$

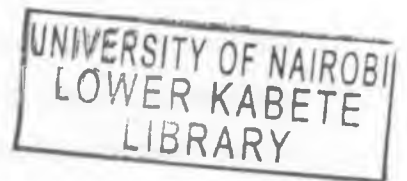
Where:

FV is the future cash flow arising at a given period in the future

T is the time usually expressed in years

I is the discount rate given as a percentage

N is the time in years before the future cash flows occur



Managers are required to maximize return on investment at a given level of risk. However capital budgeting models only consider the return on investment. As a result, managers don't usually have all the information to make the right decisions as far as risk is concerned. To address this flaw, Hertz (1964) provided a discussion on how computer simulation can be used to provide managers with a measure of risk on a

capital Investment Project. Agency theory that developed in the late 1970s and early 1980s gave rise to analytical models of capital investment process. These models suggest that current capital budgeting procedures are a means of reducing agency costs that emanate from the conflict of interest between owners of firms and management. The internal rate of return (IRR) and the NPV have long been the accepted capital budgeting measures preferred by corporate management and financial theorists, respectively. The debate between NPV and IRR methods dates from the inception of modern interest theory.

The introduction of the NPV as a more superior model created the impetus for conflict between the two methods. However, both methods suffer from inconsistencies when ranking potential investment projects based on the assumption of wealth maximization. Therefore, a consistent capital budgeting method must be robust when correctly ranking and selecting superior investments in varying investment environments, remain theoretically sound by maintaining the assumption of wealth maximization, and be expressed as a yield based measure as preferred by corporate management Chapman & Hopwood (2007).

2.3 Empirical Literature

2.3.1 Studies Done in Kenya

Several scholars have tried to evaluate various capital budgeting techniques in various sectors of investment environments. Kadondi (2002) carried out a survey on capital budgeting techniques used by companies listed at Nairobi Stock Exchange (NSE). The objectives were to document the capital budgeting techniques used in investment appraisal by corporations in Kenya, to determine whether the techniques used were consistent with the theories and practices of organizations in developed countries and to determine how firms and CEO characteristics influence the use of a particular technique. Kadondi (2002) used the survey method where questionnaires were sent to respondent. Statistical Package for social sciences was used to analyse data. Chi square test was used to determine the correlation between the firm and project sizes with the capital investment appraisal technique adopted. The finding of the study was that small companies use IRR and payback period methods while large companies with high net profit margins use NPV, IRR and payback period methods.

Njiru (2008) carried out a survey with the objective of identifying the most commonly used capital investment appraisal technique by commercial parastatals and determine the factors that influence the choice of capital investment appraisal technique. The survey covered all commercial parastatals with headquarters in Nairobi and was for the period of 5 years between 2003 and 2008. The researcher used the survey method using questionnaires consisting of both closed and open-ended questions. Interpretation and analysis of data was done using the statistical package for social science (SPSS). Out of the 30 parastatals targeted, only 20 responded giving a response rate of 67%. Descriptive statistics, in particular, arithmetic mean and standard deviation were used to interpret responses to the questionnaires. The analysis revealed that on average, the annual size of capital budget is 1.4% of the total asset base of the organizations studied. This implies a low intensive capital investment during the study period (2003-2008). The study also found that the parastatals had a capital investment policy. The results showed that incorporating risk, determination of the appropriate discount rate and incorporating inflation in the capital investment analysis were the three main challenges that parastatals faced in the capital investment appraisal process. According to the study, the three main capital investment appraisal techniques used by commercial parastatals are IRR (65%), NPV (25%) and pay-back period technique (10%). Further the study found that 75% of the respondents preferred discounted cash flow (DCF), 10% non-discounted cash flow (DCF) technique whereas 15% did not respond.

Muthomi, M. (2010) surveyed the application of real options in capital budgeting on oil companies in Kenya. In this research questionnaire were distributed to various oil companies registered under the petroleum institute of East Africa. Data collected was analysed using SPSS. Descriptive statistics which included percentages and frequencies were used to summarise the data. Scales were used to test the factors. She found out that most oil companies use real options since they provide long term competitive advantage through better decision making and that they provide an analytical tool to deal with uncertainty.

2.3.2 Studies Done in United States of America

Hatfield, Horvath, and Webster (1998) as cited by Pradcep (2008) investigated the importance of payback period (PP), average rate of return (ARR), internal rate of

return (IRR) and net present value (NPV) capital budgeting techniques on the performance and value measures of businesses. They found out that businesses analyzing all projects had higher share prices on average as compared to those that did not. In addition to this, they also found, in contrast to the theory of finance, that the NPV technique did not maximize the value of the business. Their results thus suggested that businesses should not use single capital budgeting technique but instead should apply as many methods as possible for a project evaluation.

Graham and Harvey (2001) surveyed 392 CFOs of US firms regarding the practice of corporate finance issues such as cost of capital, capital budgeting, and capital structure. Their survey results showed that IRR approach was most frequently used in capital budgeting. 75.61% of respondents always or almost used IRR technique. A slightly lower percentage than IRR technique, NPV method was always or almost used by 74.93% of CFOs. In addition, the firm's size affects the approach utilized. IRR and NPV are relatively likely to be utilized by large companies, while payback period is relatively preferred by small companies.

Baker et al. (2011) surveyed CFOs of 214 Canadian companies to know how they think of real options technique in capital budgeting. However, real options method is least used since only 10.4% of surveyed firms always or often used real options and 80.9% of surveyed firms never used real options method in capital budgeting. For those firms who did not use real options in capital budgeting, the main reason was lack of expertise or knowledge. They also found that real options approach is less popular in the firms managed by chief executive officers (CEOs) with the MBA degrees. This finding implies that CEOs with MBAs are less likely to support the approach they are not familiar with.

Block (2007) surveyed top-ranking financial officers of Fortune 1,000 companies to confirm whether they used real options method to complement NPV criterion in decision making. For 279 respondents, 40 companies (14.3% of them) were using real options and 239 companies (85.7% of them) were not using real options techniques. For non-users of real options, the top one reason is lack of top management support.

Further comments indicate that top managers of many companies hesitate to accept an approach they cannot follow step-by-step. He noted that 43.5% of non-users of real options indicate that if there is a good opportunity to use real options approach, they will consider using it in the future.

2.3.3 Studies Done in Pacific ASIA

Bjerksund and Ekern (1990) suggests that not taking values and break even prices from traditional discounted cash flow analysis at face value, when price uncertainty and decision flexibility are present. They gave this advice as a result of studying investment decisions under price uncertainty. They calculated that the projects present value and the associated breakeven price for triggering acceptance of the project have to be adjusted upwards. How upward depends on actual parameters of the problem at hand and on the degree of flexibility present for postponing the decision. Government policy and industrial practices are the main factors that influence the choice of the capital investment appraisal technique. Further the study found that 75% of the respondents preferred discounted cash flow (DCF), 10% non-discounted cash flow (DCF) technique whereas 15% did not respond.

Kamal et al (2010) surveyed the capital budgeting techniques of companies in Hong Kong, Indonesia, Malysis and Philipinnes. Twenty-five companies were contacted and asked to fill out a survey concerning their firm's capital budgeting practices. The respondents were most often high level managers in the financial area and included CFO's and controllers of the firm. The managers had been employed on average about seven and one-half years with the current company. The survey covered a broad range of industries, however there were a larger percentage of firms in the electronics/communication (22%), service (22%), and non-bank financial (17 %) industries. .In their study firms were asked to score how often they used the different capital budgeting project evaluation techniques on a scale of 0 to 4 with 0 meaning never and 4 meaning always. A response of 3 or 4 was classified as "always or almost always." This question was the same question as the one posed by Graham and Harvey (2002) in their relatively recent study of U.S. firms. The results showed that payback method is used more often, and the NPV technique is always or almost always used by a relatively small percentage of firms.

2.3.4 Studies Done in Europe

Gyorgy et al (2011) carried out a survey of capital budgeting practices adopted by central and eastern European firms. The survey covered results from executives of companies in ten countries in Central and Eastern Europe. Their survey results were grouped based on geographical coverage, size and income levels of a company. The survey findings suggested that corporate finance practice is influenced mostly by firm size and multinational management culture, and to a lesser extent by insider ownership.

Small and medium firms were found to use one discount rate (49%) for the firm than large firms (27%). Large firms were found to use different values of cost capital for different projects (73%) than small and medium firms (51%). It was found that large firms are more diversified and undertake different types of projects with varying degrees of risk compared to small-medium firms. Therefore, large firms are more likely to use a different cost of capital for different projects than small-medium firms. Further the survey results showed that the use and methods of cost capital estimation vary significantly across firm size, management culture, and executive ownership. The survey responses indicate that most firms do not calculate directly the cost of capital for the firm, they tend to use a general discount rate instead. 80% of small medium firms and 64% of large firms use a general discount rate instead of estimating the cost of capital for the firm. In the same study, Gyorgy (2011) examined whether the executives used either discounted or non-discounted cash flow techniques. The survey responses related to the use of different costs of capital for different projects. A project can be rejected by top management despite being supported by either a discounted cash flow technique or non discounted cash flow technique. There are several reasons why a project is rejected, including lack of financial resources, strategic considerations, ethical (moral) reasons, distrust for analysts, unreliable data used by analysts, lack of availability of appropriate indices, or expected rates of return.

Pradeep and Quesada (2008), in a study on the use of capital budgeting techniques in businesses in the Western Cape Province of South Africa, investigated a number of variables and associations relating to capital budgeting practices. The sample consisted of 600 firms but only 211 interviews were conducted successfully giving a response rate of 35%. A descriptive approach to the research finding was adopted. Chi-

square test technique was used to measure association between variables. Data analysis was carried out using SPSS software. The results revealed that payback period followed by NPV appear to be the most used method across the different sizes and sectors of businesses. 39% of respondents used Payback period technique while 36% used NPV. 28% of respondents used internal rate of return and profitability index. 22% of respondents used accounting rate of return while 10% did not use any capital budgeting technique. The study also revealed that 64% of the business surveyed used only one method of capital budgeting while 32% used between two and three different techniques to evaluate capital budgeting decisions. The more complicated methods such as NPV and IRR were favoured by large businesses compared to small businesses. The findings of this study are contrary to earlier studies by Graham and Harvey (2001). The finding that most firms prefer payback period to NPV is a pointer to other behavioural factors like use of intuition, fear of failure and resistant to change.

2.4 Critique of the Capital Budgeting Techniques

Weston and Bringham (1981) suggest that it may be rational for cash constrained firms to use this method. According to Andrews and Butler (1986) other suggested explanations for the use of the Payback method are that it may be used by managers to approximate the riskiness of a project. The traditional DCF methods are popular; however, financial economists have long acknowledged that its universal application is not strictly appropriate. The problem arises because the simple DCF approach ignores management's ability to alter decisions and outcomes once a project is undertaken. This managerial flexibility is referred to as "real options" in the academic literature.

In Brealey & Myers (2007), NPV is professed as the more superior method to all others. However, the NPV method has deficiencies and is inconsistent in some investment environments. Specifically, the NPV has been shown to be inconsistent in selecting superior investments and ambiguous in maintaining the goal of wealth maximization in environments when investments have different economic lives. Alternative methods, such as the Payback method and the use of earnings multiples, are also common (Graham and Harvey, 2001). The payback is seen as possibly the most seriously flawed method, because it ignores the time value of money and cash flows beyond an arbitrary cut-off date.

2.5 Summary

A closer reviews of major researches show that the studies were done for large commercial enterprises. However, there have been relatively fewer studies determining capital budgeting techniques in local government. Kadondi (2002) surveyed on capital budgeting techniques used by companies listed at Nairobi Stock Exchange (NSE). The objectives were to document the capital budgeting techniques used in investment appraisal by corporations in Kenya, to determine whether the techniques used were consistent with the theories and practices of organizations in developed countries and to determine how firms and CEO characteristics influence the use of a particular technique. The finding of the study was that small companies use IRR and payback period methods while large companies with high net profit margins use NPV, IRR and payback period methods. Muthomi, M. (2010) surveyed the application of real options in capital budgeting on oil companies in Kenya. She found that most oil companies use real options since they provide long term competitive advantage through better decision making and that they provide an analytical tool to deal with uncertainty.

Pradeep and Quaeseda (2008) found that payback period followed by NPV appear to be the most used method across the different sizes and sectors of businesses. Graham and Harvey (2001) found out that IRR was more preferred than the NPV method of project evaluation by various companies studied. Block (2007) found out that very few finance managers used Real options method to substitute the NPV method of project evaluation.

From the above analysis, it appears that academics and senior finance managers prefer discounted capital budgeting methods over non-discounted techniques. Generally the net present value is the most frequently used and cited as the capital budgeting tool of choice followed closely by IRR. The survey results of Block (2007) and Baker et al (2011) indicate that firms rarely use real options method in capital budgeting due to lack of knowledge and lack of support from the top executives. Gyorgy (2011) found out that in evaluation of a project, it can be rejected due to other reasons other than based on the results of either discounted or non-discounted capital budgeting techniques. The point of departure from other researches is that this research covers the

local government in a Kenyan context. Njiru (2008) surveyed parastatals with head quarters in Nairobi and noted that they used various capital budgeting techniques with NPV being the most widely used technique. A closer reviews of major researches show that the studies were done for large commercial enterprises. However, there have been relatively fewer studies determining capital budgeting techniques in local government.

Most of the researchers have studies capital budgeting techniques adopted in particular industries collectively. Given that there are limited studies done in local government arena, it will be very interesting to survey the factors that determine the capital budgeting techniques adopted in the evaluation of the solid waste management projects by CCN Nairobi.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology refers to the analysis of principles of methods, rules and techniques. It involves the systematic study of methods which are to analyze a specific study. Section 3.2 explains the research design followed in carrying out the study, section 3.3 gives the target population, section 3.4 sets out the sampling design. Section 3.5 provides the method the data was collected, section 3.6 and 3.7 explains methods used to analyze the data, data reliability and validity respectively.

3.2 Research Design

The study is regarded as an exploratory study since it focuses on identifying the determinants of capital budgeting techniques adopted by the City Council of Nairobi in the evaluation of the solid waste projects. (Kathuri and Pals, 1993) asserts that survey research usually uses questionnaires in order to determine the opinions, attitudes, preferences and perceptions of groups of people of interest in the study. The survey approach had been found to be successful since it provides an opportunity to ask very specific and qualitative capital budgeting techniques. It is worth noting that all studies reviewed by Graham and Harvey, (2001), Kadondi (2002) and Njiru (2008) used the survey approach. It would therefore beat the purpose of comparative analysis if a different approach will be adopted. This method has been found to save time and previous researchers have been able to extract more information through the use of questionnaires.

3.3 Population

The population of interest will be the staff working on solid waste management projects within the City Council of Nairobi drawn from finance, treasury and environment departments.

3.4 Sampling Design

Stratified sampling will be used in the selection of the candidates to be targeted. The finance, treasury and environment department will be selected and staff within those departments will be selected to complete the questionnaires.

3.4 Data Collection

For the purposes of this research primary data was used. The data was collected through the use of structured questionnaires. The questionnaires were structured in a manner to cover most capital budgeting aspects in solid waste management. The questionnaires were administered to the respondents who will consist of heads of the departments of finance, treasury and environment in the CCN. The questionnaires consisted of both open ended and closed ended questions covering the factors considered in capital budgeting and the capital budgeting techniques adopted in evaluation of the solid waste management.

3.5 Data Analysis

Gay (1992) observed that data analysis involves organising, accounting for and explaining the data, that is making sense of data in terms of respondents interpretation of the situation noting the patterns, themes and regularities. Data was analysed using multiple regression analysis and descriptive analysis which was in accordance with the objectives of the study. Independent variables were ranked in the order of importance. Multiple regression analysis models will be used and will attempt to bring inter-correlated variables together under more general underlying variables.

Factor analysis was used where the goal was to reduce the dimensionality of the original space and to give an interpretation to the new space spanned by a reduced number of new dimensions which are supposed to underlie the old ones (Rietveld and Hout 1993). The determinants were tested in the questionnaire using likert scale. The data captured was analysed using the Statistical Package for Social Science (SPSS) and coded to enable responses be grouped in various categories. The model below was used in testing the determinant of capital budgeting techniques:

$$Y = f(X1, X2, X3, X4.....)$$

Where:

Y is the capital budgeting technique used such as net present value, internal rate of return, modified internal rate of return and the payback period.

X is the determinant of the capital budgeting technique adopted such as the funds available, interest rates, government policies and influence, management of the CCN and quantity of the solid waste.

Descriptive statistics was used to summarise the data. This included the use of percentages and frequencies. Tables and other graphical presentations as appropriate were used to present the data collected for ease of understanding, analysis and interpretation.

3.6 Data Reliability and Validity

The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability. The extent to which the results of a study can be reproduced under similar methodology is considered to be reliable (Kirk and Miller, 1986). According to Kirk and Killer (1986), there are three types of reliability which relates to the degree to which a measurement given repeatedly remains the same, the stability of a measurement over time and the similarity of a measurement within a given period. The consistency within which a questionnaire is answered remains relatively the same can be determined through test method at two different times.

Validity determines whether the research truly measures that which it was intended to measure and how truthful the research results are. Muthoni (2010) reference from Wainer and Braun, describes the validity in quantitative research as construct validity. The construct is the initial concept, notion, question or hypothesis that determines which data is to be gathered and how it is to be gathered.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

Data analysis is the process of inspecting, cleaning, transforming and modelling data with the aim of obtaining useful information to support decision making. Section 4.2 sets out the summary statistics, section 4.3 provides the estimated or empirical model while section 4.4 provides a discussion of the data analysed. Section 4.5 provides a summary of the data collected.

4.2 Summary Statistics

The main objective of this study was to identify the determinants of capital investment appraisal techniques adopted by CCN in the solid waste management. In addition the study sought to identify the capital budgeting techniques adopted by the CCN. To achieve these objectives questionnaires were distributed to staff in finance department, treasury department and environment department. Thirty questionnaires were distributed where each department got ten questionnaires. Out of the thirty (30) questionnaires distributed nineteen (19) questionnaires were responded. This study therefore achieved a response rate of 63%. Below are the results of our study.

4.2.1 Factors Influencing the Choice of Capital Investment Appraisal Techniques

To ascertain the factors influencing the choice of the capital investment appraisal technique the respondents were asked to rank several factors affect their choices of capital investment appraisal techniques. Their opinion were rated using the four Likert scale (i.e. 1 very important, 2 important, 3 Less important and 4 not important). Their responses were analysed through calculating their mean and respective standard deviations. The responses are tabulated in table 4.1.

Table 4.1 Factors Influencing Choice of capital Investment Appraisal Techniques

	Minimum	Maximum	Mean	Standard deviation
Government policies	1	4	3.21	.918
CCN management	1	3	2.32	.749
Amount of funds	3	4	2.68	.946
Interest rates	1	2	1.26	.452
Solid waste	1	2	1.11	.315

Source: Research Data

Since the rating very important was assigned 1 and not important was assigned 4, a mean close to 1 indicated that the response was in the positive to the factor shown. Any mean close to 4 indicates that the respondents do not perceive that factor to be important in determining the capital investment appraisal technique adopted. Therefore from the above table 4.1, the amount of waste, the prevailing market interest rate and the amount of funds are the main factors that influence the choice of capital investment appraisal techniques. The government policies and CCN management have very minimal influence.

4.2.2 Procedures Followed by CCN in the Capital Investment Appraisal Technique

To ascertain whether there were procedures followed by CCN in capital budgeting process the respondents were asked whether the policies were followed in the investment appraisal techniques. All the respondents indicated that they have a capital investment policy. The results are tabulated below.

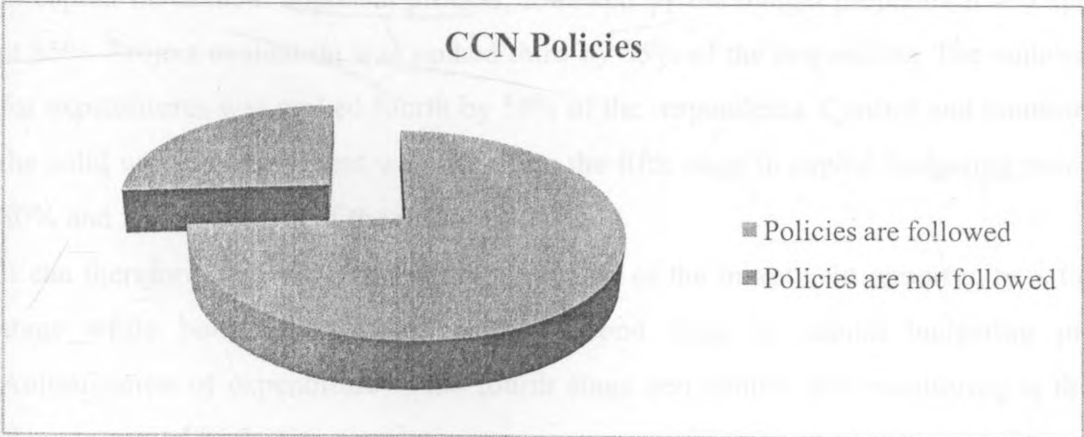
Table 4.2 Respondent Opinion on Whether CCN Follows Capital Investment Policy

	Frequency	Percentage	Cumulative
The policies are followed	14	74	74
The policies are not followed	5	26	100
Total	19	100	

Source: Research Data

Table 4.2 indicate that 74% of the time CCN follows the procedures set out in the CCN’s capital investment policy while 26% indicated that they do not follow the procedures.

Figure 4.1 Proportion of Respondents Showing Whether Policies are Followed



Source: Research Data

The pie chart (Fig. 4.1) shows a diagrammatic representation of how the policies are followed by CCN in the solid waste management projects.

4.2.3 Stages Followed by CCN in the Capital Investment Appraisal Process

In order to understand the process of capital budgeting within the CCN, the respondents were asked to rank the stages which were followed in the capital budgeting process. The research sort to identify important factors considered in the budgeting process.

Table 4.3 below ranks the stages of the capital investments appraisal process in which they are applied by CCN.

Table 4.3 Stages Followed in the Capital Budgeting Process

Step	1	2	3	4	5
Identification of investment opportunities	85%				
Project evaluation and cash flow estimates			65%		
Budget preparation and approval		85%			
procurement plans and approval			45%		
Authorization of expenditures			10%	65%	
Control and monitoring				15%	80%

Source: Research Data

85% of the respondent ranked identification of the investment opportunity as the first step in capital investment appraisal process, followed by the budget preparation and approval at 85%. Project evaluation was ranked third by 65% of the respondent. The authorisation for expenditures was ranked fourth by 55% of the respondents. Control and monitoring of the solid waste management was ranked as the fifth stage in capital budgeting process by 80% and fourth by 15% of the respondents.

It can therefore be concluded that identification of the investment opportunity is the first stage while budget preparation is the second stage in capital budgeting process. Authorisation of expenditure is the fourth stage and control and monitoring is the fifth stage in capital budgeting process.

4.2.4 Capital Investment Appraisal Techniques

Respondents were asked to state the type of investment appraisal techniques they have been using. Their responses are tabulated in table 4.4 below.

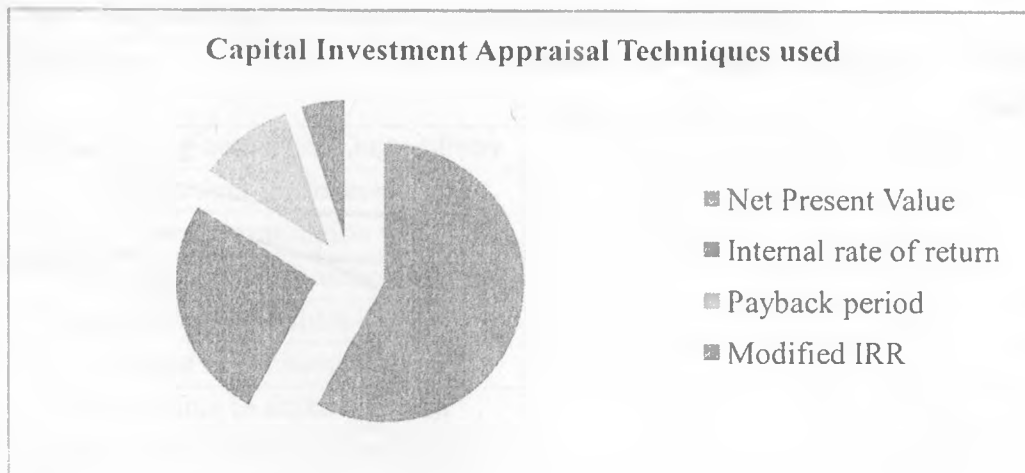
Table 4.4 Type of Investment Appraisal Technique applied

	Frequency	Percentage	Cumulative
Net Present Value	11	58%	58.0
Internal rate of return	5	26%	84.0
Payback period	2	11%	95.0
Modified IRR	1	5%	100.0
Total	19		

Source: Research Data

Table 4.4 shows that there are three main capital investment appraisal techniques used by CCN. NPV is the most used capital budgeting appraisal technique as reported by 58% of the respondent followed by IRR reported by 26% of the respondent. Only 11% indicated that they use payback period while 5% indicated that they use modified internal rate of return. It can therefore be concluded that NPV is the most commonly used capital budgeting technique.

Figure 4.2 Proportion of Respondents Showing Whether Policies are Followed



Source: Research Data

In general, the responded were asked to state which category of capital investment appraisal techniques they prefer between discounted and non-discounted techniques. In addition to this the respondents were asked whether they considered risk in the capital

investment appraisal process in solid waste management. Their results are tabulated in table 4.5 below.

Table 4.5 Capital Investment Appraisal Techniques Generally Used

Technique	Count	Percentage	Cumulative
Discounted cash-flow	15	75%	75.0
Non discounted cash-flow	4	25%	100.0
Total	19	100%	

Source: Research Data

From table 4.5, 75% of the respondents indicated that they used discounted cashflow techniques while 25% indicated that they used non-discounted cashflow techniques. This statistical observation reinforces the fact that net present value as a discounted cashflow technique is preferred than payback period as shown in table 4.4 above.

4.2.5 Challenges Faced in Capital Budgeting Process

In the capital investment appraisal process, CCN respondents were asked the challenges they face in the capital budgeting process. To ascertain these difficulties, respondents were asked to highlight some of the difficulties and challenges they face. Their responses were assigned some weights in a five (5) Likert scale to measure their strength where 5 indicated the least extent and 1 represented the greatest extent. These responses are tabulated in the table 4.6 below.

Table 4.6 Challenges Faced in Capital Budgeting Process

Difficulty	Min	Max	Mean	Standard deviation
Determining actual cash expenditure period to recover initial cost	1	3	1.73684	0.87191
Interest rate determination	4	5	4.26316	0.73349
Project period determination	1	2	1.94737	0.52427
Quantification of solid waste	3	5	3.8421	0.62126
Involvement in decision making	1	4	2.05263	0.40465
Length of time to make decision	1	3	1.7894	0.8549
Management skill and knowledge	4	5	4.4319	0.5072

Source: Research Data

A mean of close to one (1) shows that the factor has a greater extent while a mean closer to five (5) indicates that the factor does not pose more difficulty in the budgeting process, Table 4.6 showed that determination of actual cash expenditure, project period and the length of time to make the decisions are most challenging areas in capital budgeting process. Interest rate determination, the management skills and knowledge and

quantification of solid waste have a mean of more than three (3) showing that they are the least challenges faced in the capital budgeting process.

4.3 Estimated or Empirical Model

Multiple regressions were performed to explain the determinants of the capital budgeting techniques applied. Y is the dependent variable. The regression results are shown below.

Regression 1

Table 4.3.1 below shows the summary of regression results which was used to find out the relationship between used of NPV and the variables above. After running the regression on SPSS, the results were as shown below.

Table 4.3.1 Co-efficient of NPV

	B	R Squared
Constant	0.406	.165
Government influence	-.201	
Management of city council	-.077	
Fund –the budget size	.177	
Interest rates in the market	-.025	
Solid waste quantity	.055	

Analysis of variance (ANOVA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.406(a)	.165	-.157	.546	1.153

Source: SPSS output

$$Y = 0.406 + (-.201) \text{ Govt} + (-.077) \text{ Mgt} + 0.177(\text{fund}) + .055 (\text{waste}) + .546$$

From the above solid waste and the funds available have a positive correlation to the use of NPV while government policies and CCN management have a negative correlation.

Regression 2

Table 4.3.2 below shows the summary of regression results which was used to find out the relationship between used of IRR and the variables above. After running the regression on SPSS, the results were as shown below.

Table 4.3.2 Co-efficient of IRR

	B	R Squared
Constant	0.747	.558
Gov	-.275	
Mgt	-.095	
Fund	-.574	
Intrst	.457	
Waste	.574	

Analysis of Variance (ANOVA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.747(a)	.558	.388	.354	1.786

Source: SPSS output

$$Y = 0.747 + (-.275) \text{Govt} + (-.095) \text{Mgt} + (-.574) \text{fund} + .457 (\text{intrst}) + .574 (\text{Waste}) + .354$$

From the above data analysis the quantity of waste and interest rate in the market have a positive correlation to the use of IRR. Government policy and the amount of fund available have the strongest negative correlation to the use of IRR. R squared is .558 meaning 56% of the determinants of the payback period are explained by the independent variables used. The Dubin-Watson value is 1.786 meaning that that there is limited autocorrelation between the independent variables.

Regression 3

Table 4.3.3 below shows the summary of regression results which was used to find out the relationship between used of payback period and the variables identified below. After running the regression on SPSS, the results were as shown below.

Table 4.3.3 Co-efficient of Payback period

	B	R Squared
Constant	0.787	0.62
Gov	.657	
Mgt	-.322	
Fund	.441	
Intrst	.205	
Waste	.118	

Analysis of variance (ANOVA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.787(a)	.620	.474	.229	1.663

Source: SPSS output

$$Y = 0.787 + (.657) \text{Govt} + (-.322) \text{Mgt} + (.441) \text{fund} + .205 (\text{intrst}) + .316(\text{Waste}) + .229$$

From the above analysis government policies and quantity of solid waste have the highest influence on use of payback period since they have positive correlation. CCN management has negative relationship on the use of payback period. R squared is .62 meaning 62% of the determinants of the payback period are explained by the independent variables in use. The Durbin-Watson value is 1.663 meaning that that there is limited autocorrelation between the independent variables.

Regression 4

Table 4.3.4 below shows the summary of regression results which was used to find out the relationship between used of MIRR and the variables identified below. After running the regression on SPSS, the results were as shown below.

Table 4.3.4 Co-efficient of MIRR period

	B	R Squared
Constant	.536	.287
Gov	-.208	
Mgt	-.221	
Fund	.175	
Intrst	.141	
Waste	.081	

Analysis of Variance (ANOVA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.536(a)	.287	.013	.228	1.822

Source: SPSS output

$$Y = 0.536 + (-.208) \text{Govt} + (-.221) \text{Mgt} + (.175) \text{fund} + .141 (\text{intrst}) + .081(\text{Waste}) + .228$$

From the above analysis the funds availability and interest rates have the positive relationship on the use of MIRR capital budgeting technique. The government policies and the CCN management have negative correlation and therefore would not have an influence in the use of MIRR. R squared for MIRR is .287 meaning that 28% of MIRR is explained by the independent variables shown. The Durbin-Watson value is 1.822 meaning that that there is limited autocorrelation between the independent variables.

From the SPSS analysis above, it is clear that solid waste quantity, funds available and interest rates have the highest influence on the capital budgeting technique adopted by CCN. The results show that government policy and CCN management have minimal influence on the capital budgeting technique adopted in solid waste management.

4.4 Discussion

The City Council of Nairobi was found to use the discounted cash flow techniques in evaluating the suitability of the particular investments. Respondent indicated that CCN has a capital investment policy which is followed 74% of the time. Identification of investment opportunities was noted as the first step in the capital budgeting process as indicated by 85% of the respondents. Budget preparation and evaluation and estimation of the cash flows were identified to be the second and third steps in the process as reported by 85% and 65% of the respondents respectively. Although project monitoring was

identified as the last stage in the capital budgeting process, most respondents commented that project performance was rarely monitored.

Respondent indicated that they frequently applied net present value (NPV) in solid waste management as reported by 58%. These results are consistent with those of Njiiru (2008) who found that most parastatals in Kenya preferred to use NPV in capital investment evaluation. Payback period and modified IRR were the least used capital investment appraisal techniques. Respondent indicated that determination of actual cash expenditures and period to recover initial investment were the most important challenges that they faced in the application of capital investment and evaluation techniques. Management skills and quantification of the solid waste were identified to be the least challenging issues in capital investment appraisal process.

4.5 Summary

From the analysis above solid waste quantity, funds available and interest rates are key determinants of capital budgeting techniques adopted by the City Council of Nairobi. The government policies and CCN management were found to be the least determinant of the capital budgeting technique adopted. Discounted cashflow techniques are the more preferred than non-discounted cashflow techniques with NPV being the most preferred discounted cashflow technique.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1 Introduction

This Chapter presents a summary of findings of the study, conclusion and recommended areas of further research. Section 5.2 provides a summary of the study, section 5.3 provides the conclusion. Section 5.4 provides the limitations to the study and section 5.5 provides recommendations for further research.

5.2 Summary of the Study

The objective of the study was to carry out a survey of the determinants of the capital budgeting techniques adopted by CCN in the solid waste management. The study also sought to understand the capital budgeting techniques adopted by the CCN. To achieve this objective, 30 questionnaires were distributed to finance, treasury and environment departments where each department got 10 questionnaires. Only 19 questionnaires were returned. From the respondents and data analysis, the research established that solid waste quantity, funds available and interest rates are the most common factor influencing the capital budgeting. All the respondents indicated that the city council has a capital investment policy with is followed most of the time. The respondent indicates that they used discounted cashflow techniques more often than non discounted cashflow techniques. The determination of cash outflow required, the solid waste project period and the length of time for decision making were identified to be the main challenges in capital budgeting process.

Respondents were asked for their opinion on several factors thought to influence the choice of capital investment appraisal techniques. The findings showed that the solid waste quantity, funds available and interest rates are the main factors that influence the choice of capital investment appraisal techniques. Government policies and CCN's management were found to have very minimal influence in the choice of capital investment appraisal technique.

From the analysis of the data collected the discounted cash flow techniques were found to be commonly used in the evaluation of the solid waste management projects as reported by 75% of the respondents. The net present value technique was the most commonly used capital budgeting technique in the project evaluation as reported by 58% of the

respondents followed by Internal Rate of return (IRR) as reported by 26% of the respondents. 11% of the respondents mentioned that they consider payback period as their preferred capital investment appraisal technique. From the analysis modified IRR was the least used discounted cash flow technique.

The identification of investment opportunities, preparation of the budgets and approvals and development of procurement plans were found to be the first, second and third stages in the capital budgeting process as reported by 85%, 65% and 85% of the respondents respectively. Controlling and monitoring of capital expenditure was found to be the last stage in capital budgeting process. In addition to the above, the research findings showed that the capital investment policies is followed as indicated by 74% of the respondents, while only 26% of the respondent said the capital investment policies was not followed.

The respondents indicated that the determination of the project period, determination of the actual cost of the project and the lengthy decision making time were the most serious challenges in the capital budgeting process. The management skill level was identified to be the least challenge in the capital budgeting process. This reinforces the finding that discounted cashflow techniques are widely used.

5.3 Conclusion

From the research finding, it can be concluded that solid waste quantity, funds available and interest rates are the main determinant of the capital budgeting techniques applied by CCN. Government policies and CCN management had limited influence on the capital budgeting technique. The CCN management education level was found to have played a key role in the evaluation of the appropriate capital investment appraisal technique to be used. Discounted cash flow techniques are mainly used in the capital investment appraisal techniques with NPV being used most of the time. Payback period and modified IRR techniques were rarely used in the evaluation of the projects. Determination of the project period, cash outflow and length of time to make decisions were identified as the most serious challenges in capital budgeting. It is worthwhile noting that management level of skills and appropriateness of information do not affect capital budgeting techniques.

5.4 Limitations of the Study

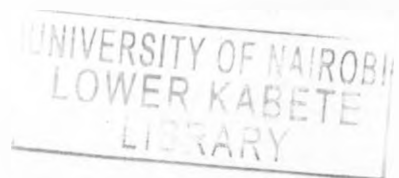
There are several limitations encountered in the course of carrying out the research. Due to the confidential nature of the information, the respondents were hesitant to provide responses to some of the questions. During data collection, a batch of questionnaires distributed to the environment department was misplaced and therefore the researcher had to redistribute the questionnaires. Most of the respondents with key information were considered to be out of the office most of the time while those who were available were too busy to respond to the questionnaires in details. This made it difficult to get the responses in good time. The researcher had to make several visit to the treasury, finance and environment departments to pursue the completion of the questionnaires.

Considering the financial obligation required to carry out this research, it was not possible for the researcher to carry out this research with a very detailed coverage. There was also limited time to engage with the technocrats who were identified to be in the fieldwork for most of the time.

5.5 Recommendation for Further Research

From the finding of this research, we recommend that a review be done to assess whether there the CCN receive sufficient returns on investments to continuously run these investments. Some of the solid waste projects were found to have been abandoned but no immediate reason was given. Research can be undertaken to determine the causes of abandonment of such projects. In addition to this, further research needs to be carried out to identify whether CCN sets defined periods for the solid waste project.

It is recommended that research be carried out to identify whether the key mandate of public sanity overrides the commercial objective of the city council in solid waste management. Research need to be undertaken to assess the impact of education and public awareness on the disposal of solid waste management. Research should be undertaken to assess the impact of privatization of solid waste management within the Nairobi city on the performance of the CCN.



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Appendix I. Questionnaire

This questionnaire is meant to collect information on the Capital Budgeting Techniques Adopted by Nairobi City Council in the management of solid waste in Nairobi. Kindly answer the following questions by writing a brief answer statement or ticking in the space provided as will be applicable

SECTION A: INFORMATION RELATING TO CAPITAL INVESTMENT PROCESS

1. Name and objectives of the department
2. Do the CCN have a capital investment policy?
Yes No
3. Does CCN have an annual budget allocation in solid waste management projects?
Yes No
4. Do you have an in-house project investment analyst handing capital projects
Yes No
5. When deciding on an investment opportunity in solid waste management, does the CCN follow various capital budgeting process stages as outlined in the policy?
Yes No
6. If yes to 8 above, rank numerically the following stages of the capital investment process in the order in which you apply them
Identification of investment opportunities
Project evaluation
Authorization for progressing and spending of capital expenditure
Controlling and monitoring of capital investment
Others (please specify)

8. What capital budgeting techniques are used by CCN in evaluation of solid waste management?

Discounted cash flow techniques

Non-discounted cash flow techniques

9. Among the following investment evaluation techniques which ones are normally in use in a scale of 0 to 4 (0 being never and 4 being always)

	1	2	3	4
Non- discounted capital budgeting techniques				
a) Payback period				
b) Accounting rate of return				
Discounted cash flow techniques				
c) Net present value				
d) Internal rate of return				
e) Modified internal rate of return				
f) Profitability index				

10. Is there a policy to use any of the above selected techniques?

Yes No

11. If yes, is the policy adopted in the evaluation of capital budgeting techniques?

Yes No

12. What factors affect the procedures being undertaken in choosing the above techniques?

13. Fluctuations of any kind or quantity, (financial, economic and political variables ranging from exchange rates, interest rates, commodity prices or political turmoil) have always had destabilizing effects on investment strategies and performance of CCN.

Yes No

14. What factors cause a change in the capital project evaluation and review technique from project to project?

15. Please indicate to what extent the following factors affect the capital budgeting technique adopted by CCN. (where 1 =high, 2= Medium, 3 = Low, and 4 = No effect)

Factors	High (1)	Medium (2)	Low (3)	No effect (4)
Interest rates				
Costs of the project				
Collateral required				
Revenue from waste collection				
Time to clear up the waste				
Management education level				
Current debt level				
Liquidity risk				
Budget allocations from the fund				
Others (specify)				

16. Does the budgeting process involve negotiation between higher management and the department heads

Yes No

17. What information do you communicate to the department heads in the budgeting process?

	Yes	No
Target for the budget period	()	()
Environmental expectations	()	()
Strategic plan details for implementation	()	()
Prior projects performance	()	()
Internal policies and guidelines	()	()

18. In your opinion is the capital budgeting process necessary to CCN?

strongly agree		strongly disagree	
1	2	3	4
()	()	()	()

SECTION B: CHALLENGES FACED IN CAPITAL BUDGETING PROCESS

19. Please tick to what extent the following challenges affect the capital budgeting technique adopted by the City Council of Nairobi. Response is on a scale of 1-4 with Great Extent being 1, Some extent being 2, Average being 3 and No extent being 4.

	1	2	3	4	5
Determine actual cash expenditure					
Period to recover initial cost					
Interest rate determination					
Project period					
Quantification of the solid waste					
Involvement in decision making					
Level of knowledge of capital budgeting techniques					
Lack of appropriate information					
Length of time for decision making					
Others(specify)					

THANK YOU FOR THE RESPONSES