THE RELATIONSHIP BETWEEN RISK AND GROWTH IN CORPORATE INVESTMENT FOR FIRMS LISTED IN THE NAIROBI SECURITIES EXCHANGE

BY
DAVID KIMANI KIRIRO

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DECLARATION

I declare that this is my original work and that, where other people's work has been used, this has been acknowledged. I further declare that to the best of my knowledge this work has not previously been presented for any academic award.

Name: David Kimani Kiriro **Reg No: D61/P/8391/01**

Signature: ……Date: ……

This research project has been submitted for examination with my approval as the University Supervisor

Herick Ondigo,
Lecturer,
Department of Finance and Accounting,
University of Nairobi

Signature: ……..Date: ……

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DEDICATION

To my loving family for their love and support during the development of this project. You truly sacrificed a lot to see me through.

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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
AIMS	Alternative Investment Market Segment
ARR	Accounting Rate of Return
APT	Arbitrage Pricing Theory
ATS	Automated Trading System
CAPM	Capital Asset Pricing Model
CDS	Central Depository System
CIAM	Capital Investment Appraisal Methods
CML	Capital Market Line
CBK	Central Bank of Kenya
CV	Coefficient of Variation
SML	Security Market Line
DIV	Dividends
DTA	Decision Tree Analysis
$E(R_p)$	Return on a Portfolio
$E(R_m)$	Return on the Market
FISMS	Fixed Income Securities Market Segment
GEMS	Growth Market Segment
IRR	Internal Rate of Return
MIMS	Main Investment Market Segment
MV	Market Value
NPV	Net Present Value
NSE	Nairobi Securities Exchange
REV	Revenue
R_f	Risk Free Rate
SCBP	Sophisticated Capital Budgeting Practices
SME	Small and Medium Sized Enterprises

ABSTRACT

This study on the relationship between risk and growth in corporate investment for firms listed in the NSE was carried out in Kenya. It targeted to investigate the relationship and how it affects growth of the market in general. The study was guided by the following objectives; investigate the relationship between systematic risk and growth in corporate investments within the study period. The study targeted all the listed companies from 2008 to 2012. This was therefore a census covering all the data on stock performance in the bourse. The data was subjected to various tools of analysis to establish any trend that would be used to predict future performance of the market. The finding showed there is a moderate correlation between risk and the growth in corporate investments. The researcher recommends the following: More consultations between the management and shareholders are required to balance growth in assets and the expected returns to investors. This is aimed to reduce any conflicts that might arise and provide an ideal working environment. This leads to enhancing strategic alliance among owners and management for more market growth. The researcher also suggests further studies on this relationship by targeting a larger period and by looking at major political in the country. This could be looked at based on asset growth, market return and the influence of externalities such as political referendums, elections and even terror attacks on major investments in the country.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

As firms attempt to remain competitive, it is inevitable for them to engage in investment activities aimed at enhancing their operational processes and thereby creating additional value for the investor. Though contemporary investment theory calls for a maximization of return at a given level of risk, the level of risk has a direct bearing on the returns from any project; hence no investment process can be complete without an appropriate analysis of the nature and extent of risk involved. Moreover, investment funds are usually limited and the onus is to find the best alternative investment options, one that will guarantee the growth and profitability of the firm.

Corporate investment decisions are among the most important of all management decisions. They help to build a firms future opportunities by influencing among other things its technology, processes, working practices and ultimate profitability (Gitman 1977). The field of corporate investments remains a primary concern for financial theorists and corporate managers at large. For the finance theorists, it provides a fertile ground for developing a practical positive theory based on a rational and quantitative framework. For the business managers it poses a real challenge that ultimately determines how resources are allocated to maximize on wealth creation for the owners of capital.

The nature of the decisions taken is critical since most of these projects are long-term, capital intensive and largely irreversible. They must therefore be near perfect decisions and choices must be made amidst a series of value adding alternatives that may be available. Most of the large corporations today owe their existence and sheer size to the investment decisions that have been taken by successive managers since their inception. To any firm, these decisions are responsible for shaping a firms future and constitute one of the most demanding challenges confronting corporate managers today. This is especially so because the future of any firm is determined by such decisions 3taken in today's corporate investment practices.

1.1.1 Risk

Risk refers to the probability or chance that an investment's actual return will be different than expected. Risk includes the possibility of losing some or all of the original

investment. Different versions of risk are usually measured by calculating the standard deviation of the historical returns or average returns of a specific investment. A key component of the risk management process is risk assessment, which involves the determination of the risk surrounding a business or investment.

Every investment carries an element of risk, the possibility of actually earning less than the expected return. Naturally the greater the risk of low or negative returns the riskier the investment. Risk determination is therefore a critical aspect in all investment decisions. The effective handling of risk is an important, often complex task in analyzing investment decisions (Ho and Pike, 1992). Major fluctuations in exchange rates, increasing rates of technological change and less predictability in competitor behavior have made the uncertainty problems in capital budgeting more acute in recent years.

A clear understanding of the level of risk should also permit managers to engineer better risk components within their proposals. Risk analysis provides insights, which may reduce descriptive and managerial uncertainty and provide opportunity for engineering low risk projects. In this case, the adoption of risk analysis provides management with incentives to increase investment, assuming the firm has no constraints. The effect of risk on investment decisions becomes a demanding activity, requiring proficiency and knowledge in order to make an appropriate and lasting decision. Any flaw at this point can prove disastrous for the firm's bottom line. Indeed the analysis of risks associated with future cash flows is more complex than the determination of the actual cash flows themselves. Indeed a survey of senior financial officers reports that the challenges of handling risk considerations was perceived to be a major problem in capital investment among US firms (Bierman, 1986)

However even though some managers accept the philosophy of risk analysis, the additional time and effort necessary to conduct risk analysis may reduce the output of worthwhile investment ideas (Vandell and Stonich, 1973). It is further argued that projects are reviewed at various levels. If some managers are unfamiliar with the ideas, they may disregard the works or simply ignore the risk information or the even entire proposal

1.1.2 Corporate Investments

Corporate investment decisions represent current sacrifices by firms that want to receive a return in the future. A manufacturing firm will occasionally find itself investing in a new line, while an investments firm may invest in new software. These actions are aimed at enhancing the performance of the firm with the ultimate role of increasing profitability and competitiveness in the future. They are planned and articulated by experienced managers in light of certain circumstances. The success of these decisions depends on the strength of the firm's investment policy that clearly stipulates the basis of each investment choice undertaken by the firm. Therefore, capital investment appraisal and cost of capital estimation are major decisions that the financial manager has to make. In this process, it is crucial that management use accurate methods that will result in the maximization of shareholder wealth (Ryan and Ryan, 2002).

The decision is usually what as opposed to if, as every firm has to invest in order to increase shareholders wealth, in line with the traditional goal of the firm. The decision however is not straight forward and many factors, known and unknown usually come into play in determining the direction of each investment decision. Capital investment appraisal literature is based on the assumption that the objective of a firm's manager is to maximize firm value, that is, the wealth of its shareholders. In fact, managers should undertake capital investment projects only if they add to the value of the firm, which means that managers should identify and undertake all projects that add value to the company so as to maximize shareholder value (Gilbert, 2005).

1.1.3 Relationship between Risk and Growth in Corporate Investments

The terms risk and investment are inseparable. This is largely because it is not rational to achieve meaningful investment without undertaking the appropriate risk analysis for the underlying future benefits from a project. This is based on the premise that investment decisions are meant to enhance a firms' productivity in future though the future is largely uncertain. The term risk is used interchangeable to describe investment whose profit is not known with absolute certainty but for which an array of alternative outcomes and their probabilities are known (Levy, 1993).

Beyond the choice of investment options, there has been other considerable research in financial and accounting literature aimed at depicting the theoretical as well as the

empirical relationship between systematic risk (beta) and the various finance and account ting variables such as leverage, size, earnings variability, dividends, growth in earnings and growth in assets. For instance Beaver, Kettler and Scholes (1970), Pettit and Westerfield (1972, Rosenberg and Mckibben (1973), Fewings (1975) , Boquist, Racette, Schlarbaum (1975), Hanmid, Prakashand Anderson (1994)etc. have concentrated on the theoretical and empirical examination of the relationship between beta and financial and accounting variables, of which asset growth is one component.

It should be noted that the relationship envisaged here is a departure from the tradition relationship of investment and risk. In this case the intention is to establish whether management investment decisions that lead to growth of the firm are in any way related to the firm risk (beta). This is tantamount to comparing risk with financial accounting data as regards investments. As indicated in the foregoing paragraph, this had been attempted before.

1.1.4 The Nairobi Securities Exchange

In Kenya, dealing in shares and stocks started in the 1920's when the country was still a British colony. However the market was not formal as there did not exist any rules and regulations to govern stock broking activities. Trading took place on a 'gentleman's agreement.' Standard commissions were charged with clients being obligated to honor their contractual commitments of making good delivery, and settling relevant costs. At that time, stock broking was a sideline business conducted by accountants, auctioneers, estate agents and lawyers who met to exchange prices over a cup of coffee. Because these firms were engaged in other areas of specialization, the need for association did not arise.

In 1951, an Estate Agent by the name of Francis Drummond established the first professional stock broking firm. He also approached the then Finance Minister of Kenya, Sir Ernest Vasey and impressed upon him the idea of setting up a stock exchange in East Africa. The two approached London Stock Exchange officials in July of 1953 and the London officials accepted to recognize the setting up of the Nairobi Stock Exchange as an overseas stock exchange.

In 1954 the NSE was then constituted as a voluntary association of stockbrokers registered under the Societies Act. Since Africans and Asians were not permitted to trade in securities, until after the attainment of independence in 1963, the business of dealing in shares was confined to the resident European community. At the dawn of independence, stock market activity slumped, due to uncertainty about the future of independent Kenya. 1988 saw the first privatization through the NSE, of the successful sale of a 20% government stake in Kenya Commercial Bank. The sale left the Government of Kenya and affiliated institutions retaining 80% ownership of the bank.

In July 2011, the Nairobi Stock Exchange Limited changed its name to the Nairobi Securities Exchange Limited. The change of name reflected the strategic plan of the Nairobi Securities Exchange to evolve into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments.

Initially players in the NSE were categorized into various market segments. Recently however, the categorization has been directed more to industry sectors. Currently the NSE is divided into the following market sectors: Agricultural, Commercial and Services, Telecommunication and Technology, Automobiles and Accessories, Banking, Insurance, Investment, Manufacturing and Allied, Construction and Allied as well as the Energy and Petroleum sectors. For the purpose of this study, an industry based classification is expected to yield better results since each industry has its own set of homogenous factors to contend with, and this is expected to manifest in the outcome of the study.

1.2 Research Problem

Corporate managers routinely have to face important decisions regarding the allocation of scarce resources among investments that are characterized by substantial financial risk and uncertainty (Clyman et al, 1998). The search for a reliable method of project appraisal dates back for decades. This issue not only continues to dominate scholars and managers alike, but it is also becoming more important to investors and shareholders alike. A number of tools are available for this purpose and their application continues to expose their weaknesses in their capacity to accommodate changes in the business environment.

In the discussion of investment problems, it is often argued that risk is a major factor in determining the decision. It has been customary to let risk enter into the discussion after a solution is obtained to the problem using some measure like the expected return, then various methods may be discussed which can take risk into account (Naslund, 1966). It is still often unclear how these methods are related to the risk under consideration. Nyariji (2001) found out that many managers tend to choose riskier investments since they have higher returns. Therefore it would be expected that companies with a higher level of investment growth would have a higher risk profile (beta) and vice versa. It is worth noting that a firm's *beta* is a good indication of the effectiveness of the funding and investment decisions taken by those charged with the responsibility, as these have a direct impact on the earnings of the firm and its subsequent valuation.

Finance theory has provided a huge body of knowledge in the area of investment analysis, selection and portfolio building. Empirically, a lot of research has gone into the determination of optimal choices based on the desired mix of risk and return. More research has also tended to focus the effect of various macro economic factors and their impact on the uncertainty surrounding the day to day investment decisions. For instance studies by Health(1999), Dixit and Pindyck (1994) as well as by Haldma and Laats(2002) all concentrated on the choice of investment opportunities through various capital budgeting techniques.

Other studies by Haka (1987), Ho and Pike (1998), and Galbraith, 1973) focused on the uncertainties presented by macro economic factors and their effect on investment choices and outcomes. Others like Tricker (1976) focused on the impact of managerial characteristics on investment practices. Other studies by Trigeorgis (1993), Brennan and Schwartz (1992) looked at the real impact of discounted cash flow methods to investment choice. Smit and Ankum (1993) found out that the application of Real Options Reasoning (ROR) and Game Theory (GT) principles can be used as analytical tools in dealing with investment related uncertainty. Bowman and Moskowitz (2001) went ahead to study the adoption of sophisticated capital budgeting practices (SCBP) and found its application complicated and conceptually difficult to understand. More studies on the effects of uncertainty have been presented Bowman and Hurry (1993) as well as by Schall and Sundem (1980). Bowman (1979) points out that empirical study investigating the relationship between systematic risk and financial accounting variables have generally

hypothesized and observed a positive correlation between risk and growth. This has been true for growth measured in earnings or total assets.

Except for the study by Bowman (1979), many of the studies listed above are biased towards risk management practices by firms. However, there is still a glaring empirical gap as far as the relationship between risk and growth in investments is concerned. As a matter of fact, the impact of the investment decisions in the overall risk profile of the firm, as well as the relationship between firm risk and financial variables of which growth is one component has not been studied in Kenya. This work is an attempt to fill this empirical gap.

This study was meant to find out if indeed such a relationship exists. Were such a relationship to exist it could provide an avenue for managers to predict the impact of their investment choices by the simple application of a statistically proven and predictable formulae. The study therefore sought to answer the following research question: ***Is there a relationship between risk and growth in corporate investments?***

1.3 Research Objective

The objective of the study was to determine the relationship between risk and growth in corporate investment for firms listed in the NSE.

1.4 Values of the Study

This study is important in various ways. For academia, the study will give a good insight to scholars who want to do further research on the subject. It will serve as a good basis from which future research can be launched with a view to expanding the empirical knowledge in this area. In this regard, it will also serve to strengthen some of the existing theoretical concepts regarding risk and investment.

For the institutional investors, it serves as a practical reference to assist them in determining whether they are directing the appropriate emphasis on risk analysis and the areas to improve in their investment practices. The results will provide additional insights into the impact of managerial investment choice to the future risk profile of the organization.

Finally for asset and fund managers, the study provides guidance on how to best choose long term corporate investments for the firm, with a view to maximize the return and valuation of the firm.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Investment decisions are the core to a firm's long-term profitability. A firm may not be able to continually perform profitably without having to make critical decisions regarding the acquisition of income generating assets. These decisions need therefore to be rational rather than ad hoc and must be supported by finance theory and practice. This chapter is dedicated to a review of the major investment theories and their relevance to this study.

2.2 Theoretical Review

The choice of an appropriate investment is a critical part of today's management function. Investment funds are by nature limited and must be directed at the best available option. Investment funds are committed to various ventures that promise better and attractive returns at the price of risking a partial or total loss of the funds and without absolute guarantee of the size of the return. The fact that the future is involved makes the entire process risky, and the choice difficult. A number of theories have been put forward over the years for this purpose.

2.2.1 Portfolio Theory

Markowitz (1952) introduced the analysis of the portfolios of investments in his article "Portfolio Selection" published in the Journal of Finance in 1952. The theory presents portfolio formation by considering the expected rate of return and risk of individual stocks and, crucially, their interrelationship as measured by correlation. Prior to this, investors would examine investments individually, build up portfolios of attractive stocks, and not consider how they related to each other. Markowitz showed how it might be possible to better of these simplistic portfolios by taking into account the correlation between the returns on these stocks.

The diversification plays a very important role in the modern portfolio theory. Markowitz approach is viewed as a single period approach: at the beginning of the period the investor must make a decision in what particular securities to invest and hold these securities until the end of the period. Because a portfolio is a collection of securities, this decision is equivalent to selecting an optimal portfolio from a set of possible portfolios. The essentiality of the Markowitz portfolio theory is the problem of

optimal portfolio selection. The method that should be used in selecting the most desirable portfolio involves the use of indifference curves. Indifference curves represent an investor's preferences for risk and return. These curves should be drawn, putting the investment return on the vertical axis and the risk on the horizontal axis.

The major aim of this theory is to reduce risk without reducing returns by generating a portfolio that provides the highest return at any given level of risk. An analysis of each indifference curve leads to the tangential line called the Capital Market Line (CML). The CML indicates that the expected return of a portfolio equal to the risk free rate plus the risk premium, equal to the price of risk (as measured by the difference between the expected return and the risk free rate) times the quantity of market risk for the portfolio (as measured by the standard deviation of the portfolio)

$$E(Rp) = R_f + \frac{E(Rm) - Rf}{\sigma(Rm)}\ \sigma(Rp)$$

E(Rp) = Rf + Market Risk x Quantity of Market risk

For the study in hand, the theory is relevant to the extent of the determination of market risk, a concept that is crucial in the determination of individual firm *beta.*

2.2.2 Capital Asset Pricing Model

CAPM was developed by Sharpe (1964), Lintner (1965) and Mossin (1966). CAPM simplified Markowitz's Modern Portfolio theory, made it more practical. Markowitz showed that for a given level of expected return and for a given feasible set of securities, finding the optimal portfolio with the lowest total risk, measured as variance or standard deviation of portfolio returns, requires knowledge of the covariance or correlation between all possible security combinations. When forming the diversified portfolios consisting large number of securities investors found the calculation of the portfolio risk using standard deviation technically complicated. Measuring Risk in CAPM is based on the identification of two key components of total risk (as measured by variance or standard deviation of return): systematic risk and unsystematic risk

Systematic risk is that associated with the market (purchasing power risk, interest

rate risk, liquidity risk, etc.) Unsystematic risk is unique to an individual asset (business risk, financial risk and other risks, related to investment into particular asset). Unsystematic risk can be diversified away by holding many different assets in the portfolio, however systematic risk can't be diversified. In CAPM investors are compensated for taking only systematic risk. Though, CAPM only links investments via the market as a whole.. The essence of the CAPM is that the more systematic risk the investor carry, the greater the expected return.

To make it practical, CAPM makes some assumptions. It assumes that all investors look only one-period expectations about the future, that investors are price takers and they cannot influence the market individually, there is risk free rate at which an investors may either lend (invest) or borrow money, investors are risk-averse, taxes and transaction costs are irrelevant and information is freely and instantly available to all investors. CAPM predicts what an expected rate of return for the investor should be, given other statistics about the expected rate of return in the market and market risk (systematic risk):

$$E(Rj) = Rf + Bj(E(Rm) - Rf)$$

where: E(R j) - expected return on tock

Rf - risk free rate of return;

E(Rm) - expected rate of return on the market

β(j) - coefficient Beta, measuring undiversified risk of security j.

Coefficient Beta (β). Each security has it's individual systematic - undiversified risk, measured using coefficient Beta. Coefficient Beta (β) indicates how the price of security and return on security depends upon the market forces. Thus Beta coefficient for any security can be calculated using formula

$$Bj = \frac{Cov(Rj, Rm)}{\delta^2(\mathrm{Rm})}$$

This study seeks to borrow heavily from CAPM in the determination of individual beta. However the weight of the assumptions still weighs heavily on the credibility of the expected outcome of this study.

2.2.3 Arbitrage Pricing Theory

APT was proposed by Ross (1976) and presented in his article "The arbitrage theory of Capital Asset Pricing", published in Journal of Economic Theory in 1976. Unlike in

CAPM where the returns on individual assets are related to returns on the market as a whole, the key point behind APT is the rational statement that the market return is determined by a number of different factors. These factors can be fundamental factors or statistical. If these factors are essential, there would be no arbitrage opportunities, and therefore restrictions on the investment process. Here arbitrage means the earning of riskless profit by taking advantage of differential pricing for the same assets or security.

APT states, that the expected rate of return of security J is the linear function from the complex economic factors common to all securities and can be estimated using formula:

$$\mathbf{E(rJ) = E(ŕJ) + \beta 1J\ I1J + \beta 2J\ I2J + ... + \beta nJ\ InJ + \varepsilon J},$$

Where:

E(rJ) - expected return on stock J;

E(ŕJ) - expected rate of return for security J, if the influence of all factors is 0;

IiJ - the change in the rate of return for security J, influenced by economic factor i (i = 1, ..., n);

βiJ - coefficient Beta, showing sensitivity of security's J rate of return upon the factor i (this influence could be both positive or negative);

εJ - error of rounding for the security J (expected value – 0).

The CAPM and APT are not really essentially different, because they are developed for determining an expected rate of return based on one factor (market portfolio – CAPM) or a number of macroeconomic factors (APT). But both models predict how the return on asset will result from factor sensitivities and this is of great importance to the investor.

Due to the nature of this theory, it is impractical to model it for the kind of study in hand, as we would have to come up with arbitrage factors for each distinct sector. This would require more in depth research that would be outside the limits of this study.

2.2.4 Market Efficiency Theory

The concept of market efficiency was proposed by Fama (1965), when his article "Random Walks in Stock Prices" was published in Financial Analyst Journal.

Market efficiency means that the price which investor is paying for financial asset (stock, bond, other security) fully reflects fair or true information about the intrinsic value of this specific asset or fairly describes the value of the company – the issuer of this security.

The key term in the concept of the market efficiency is the information available for investors trading in the market. It is stated that the market price of stock reflects; All known information, including: Past information, e.g., last year's or last quarter's, month's earnings and Current information as well as events, that have been announced but are still forthcoming, e.g. shareholders' meeting and; Information that can reasonably be inferred, for example, if many investors believe that the CBK will increase interest rate in the nearest future or the government deficit increases, prices will reflect this belief before the actual event occurs.

Capital market is efficient if the prices of securities which are traded in the market react to the changes of situation immediately, fully and credibly reflect all the important information about the security's future income and risk related with generating this income. From economic point of view the important information is defined as such information which has direct influence to the investor's decisions seeking for his defined financial goals. Example, the essential events in the joint stock company, published in the newspaper, etc. Market efficiency requires that the adjustment to new information occurs very quickly as the information becomes known. Obvious, that Internet has made the markets more efficient in the sense of how widely and quickly information is disseminated.

The validity of the market efficiency hypothesis whichever form is of great importance to the investors because it determines whether anyone can outperform the market, or whether the successful investing is all about luck. Efficient market hypothesis does not require the market to behave rationally only that in response to information there will be a sufficiently large random reaction that an excess profit cannot be made. For the purpose of this study this theory would not be applicable, since the study seeks to establish a statistical relationship between two variables; risk and growth in investments, and not establish the impact of efficiency or lack of it in the NSE.

2.3 Review of the Variables

In this section we demonstrate how each of the two variables in this study affects the day to day management decisions in a firm, and the findings of previous research in this regards.

2.3.1 Risk Analysis

The goal of a firm and that of capital budgeting is the same, the maximization of the market value of the firm's underlying shareholding. Profitable capital investment leads to the growth and prosperity. If profitability is low, investment will shrink. The investor needs tools to predict the profitability of proposed investments (Remer and Nieto, 1995a). Over the last four decades, the academic community has been proposing several methods that can improve the capital investment decision making process of companies (Farragher et al., 2001). Some of the major methods include the Payback method, accounting rate of return, Net Present Value method and the Internal Rate of Return. These methods are applicable under conditions of no risk, with each taking into account a set of assumptions necessary for practical application.

Investment decisions have to do with the future. As a result management rarely has precise expectations regarding the future profit to be derived from a particular investment. In fact the best a firm can do is to have some reasonable estimate of possible future costs and benefits. This makes risk analysis critical during this process. With rising competition, investment options are becoming more and more limited. Even companies willing to take on some additional risk in pursuit of better returns have limited options in today's environment. Consequently a firm's investment policy will come in handy in ensuring continuous delivery of value adding investments into the company's portfolio.

The performance of any firm depends on the maximization of resource utilization through value creating activities. These will be subject to uncertainties associated with risk. A firms risk management techniques determines how much it can reap amidst challenges posed by various forms of risk. One such way is diversification. Diversification is responsible for the elimination of unique risk also called business risk. This refers to that risk that is peculiar to a firm that does not pose a challenge to the other players. On the other hand there is an element of risk that may not be wished away through diversification. This is referred to as systematic or market risk.

A projects return should be looked at in the context of market risk, the assumption being that all business risk is diversified away. This can only happen if the nature and extent of risk associated with a project is known, hence the essence of risk analysis. Risk, no matter how slight is a element of virtually every capital budgeting and indeed investment procedure. The relative performance of these decision procedures is the attainment of the decision makers' financial objective of minimizing risk and maximizing return. (Lohmann et al, 1993).

In practice, risk analysis falls broadly into two major categories, simple risk adjustment and risk analysis (Pike and Ho, 1992). Risk analysis (also known as probabilistic analysis in the literature techniques), emphasizes a comprehensive awareness of the uncertainties associated with critical project variables and usually involve evaluation of the associated expected variables before any risk return trade-off can be undertaken. Commonly prescribed risk analysis techniques for strategic long term investment decisions include: Sensitivity analysis, Probability analysis, Decision tree analysis, Simulation, Option pricing and the Capital asset pricing model. According to Schall (1983), all the above measures of risk analysis have three things in common namely a framework for analysis, assessment of risk involved and adjustment for the degree of risk.

Empirical capital budgeting literature suggests that the use of project based risk analysis techniques are on the increase (Seila, 1990, Zinkhan, 1994). These methods are in contrast to the simple risk adjustment techniques that are mainly based on deterministic estimation and intuitive adjustments to the discounted cash flows evaluation model such as increasing the cash flow or reducing the payback criterion from higher risk projects. Long before the development of modern theories linking risk and expected return, smart financial mangers adjusted for risk in capital budgeting (Brealy, 1991). They realized that other things being equal, risky projects are less desirable than safe ones. Various rules of thumb are often used to make these risk adjustments.

For example many companies estimate the rate of return required by investors and use the company's cost of capital to discount cash flows on all new projects. Since investors require a higher rate of return form a very risky project, such a firm will have a higher company cost of capital and will set a higher discount rate for its new investment

opportunities. However a company's cost of capital can also get the firm into trouble if the new projects are more or less risky than existing ones. Each project should therefore be evaluated at its own opportunity cost of capital.

Project risk is the uncertainty associated with a project's expected cash flows. Any firm investing in a project would expect to reap economical benefits. However this may not always happen. Smithson (1998) asserts that unpredictable movements in parameters associated with investments such as exchange rates, Interest rates etc can not only affect a firms expected earnings from a project, but can also undermine its survival. This goes further to underscore the importance of risk analysis in any project before a firm commits its resources.

2.3.2 Corporate Investments

In their quest to expand, firms engage in different types of corporate investments ranging from financial assets such as short term and long term commercial paper to capital investments in tangible assets such as machinery and equipment. Commercial paper is seen as a less troublesome form of investment as many of the variables involved can be estimated with a degree of certainty, a fact that cannot be said for other forms of capital investments. It is this category that poses major problems for managers, and which has been a major topic of research in the recent past and the nature and diversity of these investments does not make things any easier.

Investment in financial assets differs from investment in physical assets in several aspects. Financial assets are divisible, whereas most physical assets are not. An asset is divisible if investor can buy or sell small portion of it. In case of financial assets it means, that investor, for example, can buy or sell a small fraction of the whole company as investment object buying or selling a number of common stocks. Marketability (or Liquidity) is a characteristic of financial assets that is not shared by physical assets, which usually have low liquidity. Marketability (or liquidity) reflects the feasibility of converting of the asset into cash quickly and without affecting its price significantly. Most of financial assets are easy to buy or to sell in the financial markets.

The planned holding period of financial assets can be much shorter than the holding period of most physical assets. The holding period for investments is defined as the time between signing a purchasing order for asset and selling the asset. Investors acquiring

physical asset usually plan to hold it for a long period, but investing in financial assets, such as securities, even for some months or a year can be reasonable. Holding period for investing in financial assets vary in very wide interval and depends on the investor's goals and investment strategy.

Information about financial assets is often more abundant and less costly to obtain, than information about physical assets. Information availability shows the real possibility of the investors to receive the necessary information which could influence their investment decisions and investment results. Since a big portion of information important for investors in such financial assets as stocks, bonds is publicly available, the impact of many disclosed factors having influence on value of these securities can be included in the analysis and the decisions made by investors. Many models exist to analyze and determine the right short term investments to adopt for the firm. However long term investments and especially those of capital nature, present unique challenges (Alfonso et al, 2009).

The biggest hurdle for the modern manager lies in the management of uncertainty associated with such investments. Uncertainty is defined as the gap between the information currently available and the information required to make the decision (Galbraith, 1973). With rising competition, investment options are becoming more limited. Even companies willing to take on some additional risk in pursuit of better returns have limited options in today's environment. Consequently a firm's investment policy will come in handy in ensuring continuous delivery of value adding investments into the company's portfolio

Corporate investments come with a lot of constraints because they are usually related to the source of the investment funds. The impact of past corporate investment decisions also comes into play in determining future investments. Research has shown that the more tangible a firms assets are, the more likely the firm is to raise cheaper capital for future investments (Ameida, 2007) and the concept of financing restrictions. Whether financing frictions influence real investment decisions is an important matter in corporate investment decisions. Unfortunately, identifying financing–investment interactions is not an easy task. The standard identification strategy is based on the work of Fazzari et al.

(1988), who argue that the sensitivity of investment to internal funds should increase with the wedge between the costs of internal and external funds.

An investment plan or strategy is a systematic plan to allocate investable assets among investment choices such as bonds, certificates of deposit, commodities, real estate, stocks (shares). These plans take into account factors such as economic trends, inflation, and interest rates and cost of capital. Other factors include the investor's age, risk tolerance level, and short- or long-term growth objectives. Corporate investment strategies specify funds required to achieve competitive advantage, and the monetary results (profits) expected from such decisions (Fazzari et al, 1987)

Inputs into corporate investment strategy need to be linked to the objectives of the business. It provides the basis for establishing a clear strategic direction for the business, and demonstrates both the strategic awareness and strategic willingness, which are essential to corporate success. It will also define the boundaries and mark the parameters against which the various inputs can be measured and consistency established, thus providing the hallmarks of a coherent corporate plan. For each company, the objectives will be different in nature and emphasis will reflect the nature of the economy, markets, opportunity and preferences of those involved.

Tactical considerations also need to be considered. In this regards, resources are identified and as such there is a need to establish ‘tactical’ critical success factors (CSFs). These should be project specific, and are requirements, which must be fulfilled by isolating detailed tasks, processes and resources, to ensure medium/short-term tactical success. If these CSFs are not achieved, they will become an obstacle to corporate progress, and may ultimately result in a loss of business, and failure in the achievement of project deliverables (Hochstrasser & Griffiths, 1991; Swamidass & Waller, 1991).

According to Zhu and Weyant (2003), the choice of an appropriate investment strategy should take into account a variety of factors that are likely to affect the performance of chosen projects. Of primary concern should be the capacity to handle uncertainty that usually exists in capital budgeting because investment decisions, by definition, involve uncertain outcomes that in the long run are important to firm survival and about which complete information is unavailable

2.4 Review of Empirical Studies

Tricker (1976) found that in the past, there was a universalistic approach to management control derivate directly from the scientific management theory, which advocated that it is possible to maximize efficiency through the best one way design of organizational structures and procedures. However, this idea of universal solutions for management practices which can be applied to all organizations, in all contexts, has been contradicted by several studies during the 1970s and there is no longer a universal satisfactory management control system for there are too many interacting variables.

Eskew (1979) did the study on Capability to Foresee Risk Criteria. He used the ratio of accounting variables to profit distribution, growth, lever, liquidity, size and changeability and accounting beta. The findings indicated that of above variables the profit growth, size and changeability have significant correlation with the systematic risk. In his study According to Hertz (1979), the choice of investment decisions is quite demanding, not because of the problem of projecting return on investment under any given set of assumptions, but due to the difficulty is in the assumptions and in their impact. Each assumption involves its own degree—often a high degree—of uncertainty; and, taken together, these combined uncertainties can multiply into a total uncertainty of critical proportions. This is where the element of risk enters, and it is in the evaluation of risk that the executive has been able to get little help from currently available tools and techniques.

In an article Bowman (1979) examined the theoretic relation between risk and firm growth, leverage and profit changes. The findings showed that theoretically there is a relation between risk and firm lever and company growth variables and profit changes may not have any relation with risk. Bowman defined growth variable as two forms: 1–Growth as the investment in the projects with expected output more than actual output of the firm. 2–Growth as some opportunities for investment in the projects led to additional output and he stated the relation between growth variable and risk by such definitions.

Elgers and Murray (1982) studied the relation between accounting variables (Growth, financial leverage and size) and systematic risk. The findings showed that there is a significant relation between growth, financial lever, size and systematic risk.

Hertz and Thomas (1983) advocate that the use of risk analysis provides a systematic and logical approach to investments in decision-making helps communication within the organization and allows managerial judgment to be presented in a meaningful way. Davey (1985) found that simple risk adjustment techniques contain assumptions that may not be clearly understood and could lead decision makers to accept decisions against their original intentions. In contrast, risk analysis techniques improve management's understanding of the nature of risks, helps identify the major threats to project profitability and reduces forecasting errors. This in turn could lead to better outcomes and ultimately enhanced corporate performance.

According to Haka et al (1985), capital budgeting practices are defined as the methods and techniques used to evaluate and select an investment project (i.e., the decision making role of the accounting system). Capital budgeting practices help managers to select *n* out of *N* investment projects with the highest profits at an acceptable 'risk of ruin'. Literature has generally distinguished among advanced and simple (or naive) capital budgeting practices. But executives also know that behind the estimates and calculations are data which are not that precise. At best, the rate-of-return information they are provided with is based on an average of different opinions with varying reliabilities and different ranges of probability. When the expected returns on two investments are close, executives are likely to be influenced by intangibles—a precarious pursuit at best.

Empirical studies cited by Kim, et al (1986) indicate that most managers use subjective risk assessment in adjusting their discount rates, a point that supports findings by Schall et al (1978). Haka (1987) empirically investigated the impact of specific uncertainties on capital budgeting practices and concluded that the more predictable a firm's financial markets and competitors are, the more likely that the firm using NPV-methods will outperform a matching firm not using NPV-methods. The predictability of government regulations and the actions of labor unions, customers or suppliers did not have an impact on capital budgeting practices in her study.

Shahidi et al. (1994) studied the relation between systematic risk and growth. First they supposed that the investors who avoid risk in a period expect the value maximization and defined growth as the growth rate in the dividable profit. Theoretically they proved that

systematic risk has positive relation with growth. Also having examined 651 firms they found some experimental evidences indicating some relation between systematic risk and operational profit.

Dixit and Pindyck (1994) contend that as far as risk analysis tools are concerned, there is no standard yardstick for selecting the best method. Rather managers must identify the best method applicable under the prevailing circumstances. Even then the rule of the thumb usually comes into play in making these choices. These more sophisticated methods for project evaluation are known as real options models. In this context, an investment can be seen as a future option, which entails rights but not obligations to take some action in the future. In spite of these theoretical developments, there is, however, a small usage of these more sophisticated methods by firms.

Luthans and Stewart (1997) state that an organization should be defined as "a social system consisting of subsystems of resource variables interrelated by various management policies, practices and techniques which interact with variables in the environment to achieve a set of goals or objectives. Therefore there is a need to clearly identify the potential internal and external drivers of the adoption of risk analysis in the choice of capital investments.

Ho and Pike (1998) found a positive relation between socio-economic uncertainty (governmental regulations, actions of trade unions and behavior of financial/capital markets) and the application of risk analysis techniques in capital budgeting practices, and no relation with actions of competitors and customer preferences. The predictability of government regulations and the actions of labor unions, customers or suppliers did not have an impact on capital budgeting practices in her study. Pike and Ho (1998) also find out that the risk analysis approach also provides useful insights into the project, improves decision-making and increases decision confidence and that risk analysis offers many qualitative benefits to managers and to firms as a whole.

According to Health (1999), capital budgeting theory says that company-wide cost of capital is relevant only if the project under consideration is as risky as the existing projects. If the project risk is different, the cost of capital should be adjusted accordingly

Haldma and Laats (2002) conclude that the adoption and use of management practices are influenced by the specific circumstances in which the organization finds itself, i.e. the organizational internal and external context of each company. Thus, CIAM are sensitive to the milieu where they are implemented and their design and implementation must attend the organizational context specificities to improve their effectiveness, and the impact on the overall firm profitability and growth. Contrasting to the classical scientific and universalistic theories that support "one best way" of managing, empirical evidence has been suggesting that the best management practices are dependent upon a set of internal and external elements that describe the context in which management control practices are applied. Consequently organizational structures and procedures should be appropriate to the internal and external characteristics facing the organization.

Brimble (2003) examined the accounting role in estimating systematic risk. The accounting variables include profit growth, size and changes, proportion payment and financial and operational risks. The findings supported that above accounting variables secure more than 57 percent of systematic risk changes.

2.5 Summary of Literature Review

From the foregoing chapter, it is clear that a lot of literature exists in support of risk and investments. A lot of work has also been invested in research in these two areas. This study is meant to add into this wealth of research and make the future a better place. In the next chapter, we examine the proposed research methodology that was applied in this study.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter details the proposed research methodology for this study. It describes the population of interest, data collection methods as well as the data analysis and presentation methods that were applied in arriving at the conclusions. The methods detailed in this chapter have been borrowed from past studies and are supported by the existing literature.

3.2 Research Design

Research design refers to the structure of an enquiry. It is a logical matter rather than a logistical one (Yin, 1989). The function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible. The research design applied in this study is descriptive design of the correlation nature and seeks to establish or reinforce a certain phenomena, and in this case the correlation between two variables. Under this design, the appropriate techniques involve hypothesis testing, data collection statistical treatment of data and validation or rejection of results. This is the exact methodology that is proposed for this research.

3.3 Population

The population consisted of all the 60 companies quoted on the NSE as at 31.12.2008. These companies are chosen because they are considered as adequate representatives of the Kenyan economy. They are also publicly quoted and it's therefore easier to get information from them. In addition, data for listed companies is considered relatively free of errors and misrepresentations, as standard reporting methods are usually applied (see appendix 1 of the listed companies in the NSE). All the 60 companies listed in the NSE for the five year period between 1/1/2008 to 31/12/2012 was studied. The period of study has been chosen because it is considered fairly recent and hence relevant. The five year period is also sufficient in establishing a correlation between two variables.

3.4 Data Collection

The study focused on secondary data that was collected from the NSE databases and additional information was also collected from past financial statements of listed companies. The weekly data focused on Wednesday figures which have been proven to

have a smaller degree of inaccuracies like the Monday effect (Fama, 1965) and weekend effect (French, 1980). Fama (1965) found a higher variation in returns on Mondays while French (1980) found some significantly different variation in return on Friday. Wednesday therefore represents normal behavior of stocks.

Tier 1: Data required for the determination of individual company beta

Weekly prices of each stock covering a total of 52 weeks per year times 5 years equals 260 weeks

Weekly volume of stock movements for the 260 weeks

Annual dividend for each stock

Tier 2: Data required for the determination of individual company growth in investments.

Gross non-current assets. The data was collected for the beginning and end of each calendar year.

All the 60 companies listed as at 31.12.2012 were surveyed. The data was collected and organized in Microsoft Excel 2007 for purposes of analysis as described in section 3.5 below.

3.5 Data Analysis

Tier 1 Data:

The analysis was based on weekly returns calculated using the Modigliani and Miller (1961) model. The annual dividend was reduced to a weekly dividend by use of the factor 1/52 to get the Di,w. The weekly return was then calculated using the model:

$$Ri,w = \frac{Di,w}{Po} + \frac{P1 - P0}{P0}$$

Where:

Ri,w is the weekly return of company *i* in week *w*,

Di,w is the dividend of company *i* in the week *w*,

P_o is the price of the stock in the week in reference

P_1 is the price of the stock one week later.

This was done for the 260 weeks. The market return was found by calculating the weighted average return for all the trading firms on every one of the 260 Wednesdays.

The model used was:

$$Ri,m = \sum_{i=1}^{i=48} Wi - Ri$$

Where:

R*i*,m is the market return on every Wednesday,

W*i* is the weight of company *i* based on the company stock sold

Hence:

$$Wi = \frac{Si}{\sum_{i=1}^{i=48} Si}$$

The result of the market return enabled the calculation of annual beta B. The resulting data was arranged by company, sector and year. The beta acts as the independent variable, x

$$Bi,n = \frac{Cov(Rin, Rmn)}{Var\ Rm}$$

Where:

Bi,n is the beta of the company *i* in the year *n*,

Cov(Ri,n, Rm,n) is the covariance between the weekly return of the company *i* in the year *n*,

Rm,n are the return of the market in the same year, Var Rm is the variance of the market return in the year in reference.

Tier 2 Data

The growth in annual investment was computed for each company as follows:

$$Gi, n = \frac{(V1 - V0)}{Vo}$$

Where:

Gi is the rate of growth of noncurrent assets for company i in the near n,

V1 is the volume of assets for the same company at the end of the year

Vo is the volume at the beginning of the year.

The growth rates were summarized by company, sector and year and matched with the tier 1 data above.

3.5.1 Analytical Model

Since the study seeks to establish the relationship if any between the volume of investment and systematic risk (beta), we analyzed the two sets of data for correlation.

The following model was applied:

$$Y = A + BX + e$$

Where

y is the growth in volume investment in assets, considered to be the dependent variable.

x is the systematic risk variable

e is the error term

This relationship was established and tested for each market segment and conclusions drawn separately. The same was repeated for the overall market and the results compared, analyzed and final conclusions drawn. This is expected to bring out the levels of efficiencies between segments and could form the basis of future studies.

For significance testing, the coefficient of determination (R^2) was used to measure the degree of fit between the two variables. The F-test and ANOVA was then be applied to decompose the variance and further determine the strength of the regression analysis.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study tabulated and presented in narratives and tables for ease of explanation and understanding for the reader. The main objective of the study is to determine the relationship between risk and growth in corporate investment for firms listed in the NSE. This is well elaborated in this chapter first by looking at each market segment and an overall analysis for the whole stock exchange.

4.2 Findings

4.2.1. Weekly Return

The analysis was based on weekly returns calculated using the Modigliani and Miller (1961) model. The weekly return (Ri, w) was calculated using the model:

$$Ri,w = \frac{Di,w}{Po} + \frac{P1 - P0}{P0}$$

Where; Ri,w is the weekly return of company *i* in week *w*; Di,w is the dividend of company i in the week *w*; Po is the price of the stock in the week in reference; P1 is the price of the stock one week later.

The weekly returns were tabulated and annualized using geometric mean. This was later tabulated on an annual basis. The objective is to enable more concrete analysis to come up with conclusions for the study. The weekly returns were picked from the trading results for Wednesday. This has been identified as the most preferred day in the week when prices are not affected by non-market forces. The Wednesday's trading results can be relied upon to draw conclusions regarding the pricing of stocks at the Nairobi Securities Exchange. The results of this calculation has been summarized in table 4.1

Table 4.1 : Weekly Return

SECTOR	2008	2009	2010	2011	2012
AGRICULTURE	0.45415937	1.17599802	0.26346404	2.53562848	0.18070784
AUTOMOBILE & ACCESSORIES	(0.06591602)	(0.00724934)	(1.07000531)	(0.34165747)	5.01046191
COMMERCIAL & SERVICES	1.10234134	8.32142979	(0.08081971)	1.21897789	0.71275789
BANKING	2.63910946	1.58468410	0.99893423	1.29464607	1.19743000
CONSTRUCTION & ALLIED	1.40968194	2.93159920	1.38577137	2.50530393	2.46677418
MANUFACTURING & ALL	5.13249394	4.19169645	6.41406166	6.23739604	5.95066761
PETROLEUM & ENERGY	2.39512256	2.32855434	(0.22919512)	0.04653628	(0.61075635)
TELLECOM	0.56120337	0.32128842	(0.94544662)	(0.43916942)	(0.56871707)
INVESTMENT	0.60943775	(0.11365164)	-	(0.48944661)	(1.03135397)
INSURANCE	0.20861572	2.45501425	(0.69598370)	0.71621578	0.19027601
AGGREGATE	1.44462494	2.31893636	0.60407808	1.32844310	1.34982480

Source: Research Findings

4.2.2 Market Return

The market return was found by calculating the weighted average return for all the trading firms on every one of the 260 Wednesdays. The model used is;

$$Ri, m=\sum Wi \times Ri, w$$

Where:

- R*i*,m is the market return on every Wednesday,
- W*i* is the weight of company *i* based on the company stock sold

The objective was to establish the market returns on an aggregate basis. This was achieved by taking the annualized weekly returns and applying a weight. The weight was obtained by taking the aggregate value of each stock and dividing with the total value of all securities at the securities exchange. Using the above formula, the market return for each Wednesday was calculated. The resultant figures were aggregated to obtain the final market return for the whole market with the period under study. These resultant statistics are presented on table 4.2

Table 4.2 : Market Return

Segment	2008	2009	2010	2011	2012
Agriculture	22.564582	0.804457	0.000002	5.465751	82.345452
Automobiles	0.918201	1.954203	25.073751	86.315805	25.613230
Construction	0.753999	40.824965	92.351976	34.719734	7.791040
Banking	0.863525	71.456285	291.075836	208.012515	16.826542
Commercial	0.835739	1.259963	71.604297	56.261102	81.893713
Manufacturing	0.135793	0.811618	43.239426	52.039815	3.200529
Insurance	0.323647	1.836829	47.123371	69.957579	111.831227
Petroleum & Energy	0.034336	-	12.520901	14.812003	27.579772
Telecom	-	-	-	-	58.875008
Ri,m	**2.654295**	(6.672745)	49.267403	21.421333	7.178854

Source: Research Findings

4.2.3 Annual Beta by Sector

The result of the market return enabled the calculation of annual beta B. The data resulting was arranged by company, sector and year. The beta acts as the independent variable, x. The calculation is thus;

$$Bi,n = \frac{Cov(Rin, Rmn)}{Var\ Rm}$$

Where:

Bi,n is the beta of the company *i* in the year *n*,

Cov (Ri,n, Rm,n) is the covariance between the return of the company *i* in the year and the return of the market in the same year,

Var Rm is the variance of the market return in the year in reference.

Table 4.3: Annual Beta by sector

	2008	2009	2010	2011	2012
AGRICULTURE	22.564582	0.804457	0.000002	5.465751	82.345452
AUTOMOBILE & ACCESSORIES	0.918201	1.954203	25.073751	86.315805	25.613230
COMMERCIAL & SERVICES	0.753999	40.824965	92.351976	34.719734	7.791040
BANKING	0.863525	71.456285	291.075836	208.012515	16.826542
CONSTRUCTION & ALLIED	0.835739	1.259963	71.604297	56.261102	81.893713
MANUFACTURING & ALL	0.135793	0.811618	43.239426	52.039815	3.200529
PETROLEUM & ENERGY	0.323647	1.836829	47.123371	69.957579	111.831227
TELLECOM	0.034336	-	12.520901	14.812003	27.579772
INVESTMENT	-	-	-	-	58.875008
INSURANCE	0.113132	(6.672745)	49.267403	21.421333	7.178854
AGGREGATE	**2.654295**	**11.227557**	**63.225696**	**54.900564**	**42.313537**

Source: Research Findings

4.2.4 Growth in Annual Corporate Investment

The growth in annual investment was computed for each segment as follows:

$$Gi,n = \frac{(V1 - V0)}{Vo}$$

Where:

Gi is the rate of growth of noncurrent assets for segment i in the year n,

V1 is the volume of assets for the same segment at the end of the year

Vo is the volume at the beginning of the year.

The growth rates were then summarized for the market for the four years by calculating the geometric mean. It's clearly evident that insurance is the segment recording the highest growth rate. This is followed by banking, construction and allied segments. Agriculture records the lowest growth rate owing the huge capital nature of agricultural machinery and the fact that they last longer than other industrial inputs in other sectors. It's interesting to note that automobile and accessories sector is in the lower end of the growth in assets perhaps because the industry does not require growth of assets to thrive. The insurance sector due to its nature of pooling resources has been recording growth in assets over the years. This is crucial if they have to meets if and when they fall due as per client requirements. The banking sector also needs to grow assets as they expand to meet growth in customers. The results are shown on table 4.4.

Table 4.4: Assets growth per sector and year

	2008	2009	2010	2011	2012
Agriculture	0.21097000	0.06446071	0.01417739	0.14745704	0.06498188
Automobile & accessories	0.18808971	0.14908267	0.08789321	0.18850834	0.12636346
Construction & Allied	0.20937367	0.26029712	0.11537845	0.10278777	0.13273457
Banking	0.18506750	0.17200013	0.20754834	0.14937222	0.12590239
Commercial and Services	0.13587436	0.04043693	0.08676540	0.07050136	0.06676323
Manufacturing & Allied	0.12039561	0.05687874	0.04587412	0.12677282	0.07067939
Insurance	0.21809712	0.16445744	0.25733965	0.12669572	0.29658588
Petroleum and Energy	0.26813786	0.17378897	0.07063073	0.18320467	0.04446494

Source: Research Findings

4.3 Descriptive Analysis

Since the study seeks to establish the relationship if any between the volume of investment and systematic risk (beta), we analyzed the two sets of data for correlation.

The following model was applied:

$$Y = A + BX + e$$

Where

y is the growth in volume investment in assets, considered to be the dependent variable.

x is the systematic risk variable.

e is the error term. This was taken as zero.

This relationship was established and tested for each market segment. The same was repeated for the overall market and the results compared, analyzed and final conclusions drawn. This brought out the levels of efficiencies between segments and forms the basis of future studies. The results of the analytical model are presented below for each sector

4.3.1 Agriculture Sector

The results for this sector show insignificant relationship between growth and risk. The level of investment growth was also extremely low for this sector, during the period under review.

Table 4.5: Agriculture Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.21097	22.56458						
2009	0.064461	0.804457						
2010	0.014177	2.07E-06						
2011	0.147457	5.465751						
2012	0.064982	82.34545						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.017858							
R Square	0.000319							
Adjusted R Square	-0.33291							
Standard Error	0.090208							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	7.79E-06	7.79E-06	0.000957	0.97726398			
Residual	3	0.024413	0.008138					
Total	4	0.024421						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.101301	0.049572	2.043492	0.133597	-0.056460615	0.2590618	-0.056460615	0.2590618
X Variable 1	-4E-05	0.001296	-0.03094	0.977264	-0.004163106	0.004082948	-0.004163106	0.004082948

Source: Research Findings

As the table shows, the investment growth values are quite low, while the *beta* values are erratic across the five year period. This is likely to have impacted on the outcome of the descriptive statistics.

4.3.2 Automobile and Accessories Sector

The regression results below indicate a very weak relationship between growth in investments and systematic risk.

Table 4.6: Automobile and Accessories Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.18809	0.918201						
2009	0.149083	1.954203						
2010	0.087893	25.07375						
2011	0.188508	86.3158						
2012	0.126363	25.61323						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.248124							
R Square	0.061566							
Adjusted R Square	-0.25125							
Standard Error	0.047885							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.000451	0.000451	0.196814	0.687350738			
Residual	3	0.006879	0.002293					
Total	4	0.00733						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.139433	0.028816	4.838713	0.016836	0.047727362	0.231139578	0.047727362	0.231139578
X Variable 1	0.000306	0.000689	0.443637	0.687351	-0.0018877	0.002499246	-0.0018877	0.002499246

Source: Research Findings

As the table shows, the investment growth values consistent, while the *beta* values are erratic across the five year period. This is likely to have impacted on the outcome of the descriptive statistics.

4.3.3 Construction Sector

The results show a fairly good relationship between risk and growth in investments.

Table 4.7: Construction Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.209374	0.835739						
2009	0.260297	1.259963						
2010	0.115378	71.6043						
2011	0.102788	56.2611						
2012	0.132735	81.89371						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.887617							
R Square	0.787864							
Adjusted R Square	0.717152							
Standard Error	0.036091							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.014513	0.014513	11.14189	0.044455338			
Residual	3	0.003908	0.001303					
Total	4	0.01842						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.229875	0.025468	9.025902	0.002872	0.1488236	0.310927382	0.1488236	0.310927382
X Variable 1	-0.00155	0.000465	-3.33795	0.044455	-0.003031766	-7.23024E-05	-0.003031766	-7.23024E-05

Source: Research Findings

The result is partly attributable to a fairly consistent pattern of inputs, among other sector specific factors.

4.3.4 Banking Sector

The regression results indicate that a mild relationship exists between risk and growth in investments for the period under review.

Table 4.8 – Banking Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.185068	0.863525						
2009	0.172	71.45629						
2010	0.207548	291.0758						
2011	0.149372	208.0125						
2012	0.125902	16.82654						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.452513							
R Square	0.204768							
Adjusted R Square	-0.06031							
Standard Error	0.032524							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.000817	0.000817	0.772484	0.444158912			
Residual	3	0.003173	0.001058					
Total	4	0.003991						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.154703	0.020969	7.377837	0.005149	0.087971686	0.221434914	0.087971686	0.221434914
X Variable 1	0.000113	0.000128	0.87891	0.444159	-0.000295732	0.000521404	-0.000295732	0.000521404

Source: Research Findings

As the table shows, the investment growth values are consistent, but the *beta* values are significantly erratic across the five year period. This is likely to have impacted on the outcome of the descriptive statistics.

4.3.5 Commercial and Services Sector

The regression results depict a very weak relationship between risk and growth in investments. The sector also had very low growth in investments over the period.

Table 4.9 – Commercial and Services Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.135874	0.753999						
2009	0.040437	40.82496						
2010	0.086765	92.35198						
2011	0.070501	34.71973						
2012	0.066763	7.79104						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.272333							
R Square	0.074165							
Adjusted R Square	-0.23445							
Standard Error	0.039275							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.000371	0.000371	0.240319	0.657590173			
Residual	3	0.004628	0.001543					
Total	4	0.004998						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.089458	0.025988	3.442276	0.041168	0.006752459	0.172163255	0.006752459	0.172163255
X Variable 1	-0.00027	0.000543	-0.49022	0.65759	-0.001993443	0.001461279	-0.001993443	0.001461279

Source: Research Findings

As the table shows, the investment growth values are quite low, while the *beta* values are erratic, but significant across the five year period. This is likely to have impacted on the outcome of the descriptive statistics.

4.3.6 Manufacturing and Allied Sector

The regression results show a weak relationship between risk and growth in investments. This sector was also characterized by very low levels of corporate investment growth during the period under study.

Table 4.10 – Manufacturing and Allied Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.120396	0.135793						
2009	0.056879	0.811618						
2010	0.045874	43.23943						
2011	0.126773	52.03981						
2012	0.070679	3.200529						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.133183							
R Square	0.017738							
Adjusted R Square	-0.30968							
Standard Error	0.042516							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	9.79E-05	9.79E-05	0.054174	0.830929144			
Residual	3	0.005423	0.001808					
Total	4	0.005521						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.08027	0.025203	3.184867	0.049907	6.10174E-05	0.160478044	6.10174E-05	0.160478044
X Variable 1	0.000194	0.000832	0.232753	0.830929	-0.002454008	0.002841287	-0.002454008	0.002841287

Source: Research Findings

As the table shows, both the investment growth values and *beta* values are erratic across the five year period. This is likely to have impacted on the outcome of the descriptive statistics.

4.3.7 Insurance Sector

The results show a very weak relationship between the two variables under the study. The sector also shows gross under investment and extremely low return.

Table 4.11: Insurance Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.218097	0.113132						
2009	0.164457	-6.67274						
2010	0.25734	49.2674						
2011	0.126696	21.42133						
2012	0.296586	7.178854						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.211716							
R Square	0.044824							
Adjusted R Square	-0.27357							
Standard Error	0.077332							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.000842	0.000842	0.140781	0.732462417			
Residual	3	0.017941	0.00598					
Total	4	0.018783						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.203301	0.042603	4.772029	0.017484	0.067720287	0.338881033	0.067720287	0.338881033
X Variable 1	0.000655	0.001744	0.375208	0.732462	-0.004896996	0.006206037	-0.004896996	0.006206037

Source: Research Findings

As the table shows, the investment growth values are consistent, while the *beta* values are erratic across the five year period. This, among other factors, is likely to have impacted on the outcome of the descriptive statistics.

4.3.8 Petroleum and Energy Sector

The results below show a fairly good relationship between risk and growth in investments.

Table 4.12: Petroleum and Energy Sector Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.268138	0.323647						
2009	0.173789	1.836829						
2010	0.070631	47.12337						
2011	0.183205	69.95758						
2012	0.044465	111.8312						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.737862							
R Square	0.544441							
Adjusted R Square	0.392588							
Standard Error	0.070836							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.01799	0.01799	3.585311	0.154620744			
Residual	3	0.015053	0.005018					
Total	4	0.033043						
	Coefficient	*andard Err*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.213583	0.046921	4.552017	0.019866	0.064261074	0.362905568	0.064261074	0.362905568
X Variable 1	-0.00142	0.000749	-1.89349	0.154621	-0.003801603	0.000965357	-0.003801603	0.000965357

Source: Research Findings

4.3.9 Telecommunications and Investment Sectors

The data for these two sectors was incomplete; hence we could not carry out the descriptive analysis. The missing values are attributable under investment, lack of stock movements and nonexistent dividend payments in several of the years under study.

4.3.10 Aggregate Results for all Sectors

The results for the all the sectors depict a fairly strong relationship between the two variables as indicated in the tabulations below.

Table 4.13: Overall Industry Aggregate Results

INPUTS								
	Gi,N	*Bi,N*						
2008	0.19200073	2.654295303						
2009	0.135175338	11.22755745						
2010	0.110700911	63.22569643						
2011	0.136912494	54.9005636						
2012	0.116059467	42.31353671						
SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.764170758							
R Square	0.583956948							
Adjusted R Square	0.44527593							
Standard Error	0.023995108							
Observations	5							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.002424428	0.002424428	4.210792212	0.132506525			
Residual	3	0.001727296	0.000575765					
Total	4	0.004151723						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.170283717	0.018975573	8.973837857	0.002920481	0.109894974	0.23067246	0.109894974	0.23067246
X Variable 1	-0.000921111	0.00044888	-2.052021494	0.132506525	-0.002349648	0.000507425	-0.002349648	0.000507425

Source: Research Findings

With an R^2 of 58%, the relationship is of average strength. This indicates that there is some fairly predictive quality in this relationship.

4.4 Interpretation of Findings

This study had one objective to establish the relationship between risk and growth of investments among firms listed at the NSE. This was through an in-depth analysis of the performance of the stocks and the growth in assets over the study period. The following table shows the summary of the regression results by sector, as well as the overall industry

Table 4.14 – Summary of Regression Results

No	Sector	R- Squared	Nature of relationship
1	Agriculture	0.000319	Very Weak
2	Automobile and Accessories	0.061566	Very Weak
3	Construction	0.787864	Very Strong
4	Banking	0.204768	Weak
5	Commercial	0.074165	Very Weak
6	Manufacturing and Allied	0.017738	Very Weak
7	Insurance	0.044827	Very Weak
8	Petroleum	0.544441	Fairly Strong
9	Investment	N/A	N/A
10	Telecommunications	N/A	N/A
	Industry Overall	**0.582956**	**Moderate**

Source: Research findings

As indicated in the table 4.14 above, the overall results for the model is a moderate relationship between risk and growth in corporate investments. The commercial, banking and petroleum sectors have returned some fairly good relationship while the rest of the sectors depict weak or nonexistent relationship, with the overall industry returning a moderate relationship.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter is dedicated to a review of the findings of this research. It presents an overview of the findings and conclusions, and presents a suggested way forward in expanding the knowledge whose foundation has been laid by this research.

5.2 Summary

Studies on the relationship between risk and asset growth have tended to concentrate on the possibility of foreseeing risk through the use of accounting variables and this relationship has been successfully proven in similar studies. From the results of this study, and looking at the industry wide results, it is evident that this may be the case with the Kenyan situation especially considering these results that are clearly divergent.

From the analysis it is clear that there are a lot of inefficiencies in the market, and that industry wide practices are far from uniform. For instance, the levels of corporate investment growth as well as returns tend to vary quite significantly from industry to industry. Some sectors have extremely low returns, while others have very low investment and vice versa. Macroeconomic and environmental factors that are specific to each sector may also be responsible for some of the unique and divergent results exhibited by this study.

5.3 Conclusion

The study has shown that there is a fairly strong relationship between risk and growth in corporate investments. However, the results for the individual sectors have returned a mixture of results. The study clearly brings into focus the unique differences that exist between different sectors of the industry. Other studies have shown that the operating environment, the kind of investors each sector attracts as well as the effect of government policy on each sector can impact significantly on this kind of relationship, and the same can be concluded from these results.

5.4 Recommendation for Policy

A lot more therefore needs to be done to identify why there is such a divergent array of results across sectors. Specifically there is a need to isolate peculiar sector inefficiencies that could be responsible for the results seen in this study. These could include but may not be limited to fiscal policies, government controls, sector specific board decisions and political factors such as elections among others. More consultations between the management and shareholders are required to balance growth in assets and the expected returns to investors. This is aimed to reduce any conflicts that might arise and provide an ideal working environment.

In addition the effect of macroeconomic factors on the various industry sectors may not be universal and some sectors could be affected more than others. Government policy makers should be sensitive to unique sector needs to avoid impacting negatively on such sectors. Executives should also be wary of the consequences of their actions in the wake of certain economic conditions and circumstances

5.5 Limitations of the Study

One of the limitations of this study was the time engaged in the collection, analysis and interpretation of data. The voluminous data required plenty of time to collate and check for quality. This is especially so because the required data was not available in one file, format or location and had to be collated from several different sources.

The cost of obtaining some of the data was also inhibitive with each yearly data set being sold separately. For some of the inputs, the data had to be purchased on a month by month basis making the cost even more prohibitive.

Some sectors such as Investment and Telecommunications also lacked some of the required inputs, such as dividend payments over time as well as investment growth figures and this inevitably led to the collapse of the descriptive analysis as far as these two sectors were concerned.

5.6 Suggestions for Further Research

From the research findings, it would be helpful to replicate the study in another setting particularly taking a longer period than what was taken. For instance a ten year period under a different set of economic circumstances could produce a surprising set of results that could point to a totally new direction as far as the ability to foresee risk is concerned. This may also shed more light on the discriminative impact of such economic factors on different sectors

Further research on this might also be necessary taking into account some industry specific peculiarities and adjustments that could allow a more refined outcome.

There might also be a need to look at the relationship between risk and other accounting variables such as liabilities, with a view to establishing a method of using accounting variables to predict risk.

REFERENCES

Aggarwal R. (1993). A Brief Overview of Capital Budgeting Under Uncertainty: *Capital Budgeting Under Uncertainty*, Prentice Hall, 9-41

Bierman H. (1986). Implementation of Capital budgeting Techniques, Survey and Synthesis: *Tampa FL, Financial Management Association*

Bowman E. H. & Maskorwitz G. T. (2001). Real option analysis and Strategic Decision Making. *Organizational science* 12(6), 772-77

Bowman R. G. (1979). The Theoretical Relationship Between Systematic Risk and Financial (Accounting) Variables, *The Journal of Finance* Volume 34 (3), 617–30

Brealy R. & Myers C. (1991). *Principles Of Corporate Finance*, 3rd Edition, 7 McGraw Hill, 173-194

Brookfield D. (1995). Risk and Capital Budgeting, Avoiding the Pitfalls in Using NPV When Risk Arises, *Management Decision*, Vol 33, No 8, 56-59

Chai T. (2009). The impact of Capital Budgeting Techniques on the performance of courier companies.

Clyman D. & Walls M. (1999). Too Much of a Good Thing: *Operations Research*, Vol 47, No 6, 957-960

Davey P. (1985). Consideration in Capital Expenditure Analysis: *The Conference Board Record* 7-8

Dixit, R. K. & Pindyck, R.S. (1994). Investment Under Uncertainty, *Princeton University Pres*s, Princeton NJ

Fama E. (1965). The Behavior of Stock-Market Prices. Eugene F. Fama, *The Journal of Business*, Vol. 38, No. 1. 34-105

Fazzari S. M, Hubbard G R & Bruce C. Petersen B C (1987). Financing Constraints and Corporate Investment

French, R (1980). Stock Returns and the Weekend Effect, *Journal of Financial Economics*, Volume 8, Issue 1, 55-69

Gary E. C. *Principles and Practice Of Corporate Finance*, 2nd Edition, Addison Wesley, 363 – 390

Gilbert E. (2005). Capital budgeting: A case study analysis of the role of formal evaluation techniques in the decision making process: *SA Journal of Accounting Research* 19(1): 19-36

Gitman, L. & Forrester J.R. (1977). A Survey of Capital Budgeting Techniques Used By Major US Firms, *Financial Management*, 66-71

Golden M. (1987). Beyond What if: A risk oriented Capital budgeting model, *Journal of Information Systems*, 53-54

Harvey K. (1967). A portfolio Model of Capital Budgeting under Risk: *Journal of Finance*, 893-894

Hertz D. (1964). Risk Analysis In Capital Investment", Harvard Business Review, 95-106

Ho S. M. & Pike R. H. (1992). Adoption Of Probabilistic Risk Analysis In Capital Budgeting And Corporate Investment, *Journal of Business Finance and Accounting* 19(3), 387-390

Ho S. M. & Pike R. H (1998). Organizational Characteristics Influencing the Use of Risk Analysis in Strategic Capital Investments*: The Engineering Economist*, Volume 43, 247 -250

Hochstrasser B.& Griffiths C. (1991). Controlling It Investment : Strategy and Management

Imbenzi H. (2009). An Analysis of risk in the four segments of the NSE.

Kadondi E. (2002). A Survey Of Capital Budgeting Techniques used by companies listed at the NSE.

Kenneth A. F, Scharfstein D. S. & Stein J. C. (1993),. Risk Management, Coordinating Corporate Investment and Financing Policies, *Journal of finance*, Volume XLVIII No.5

Kim S. H & Crick T. (1986). Do Executives Practice what Academics preach, *Management Accountant*, Vol 23 (1), 49-52

Sarnat M..S., Haim L. & Sarnat L(1993). *Capital Investment and Financial Decisions* 5th Edition, Prentice Hall, 215 – 235

Lintner J. (1965a). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *Review of Economics and Statistics*, 73

, 13-37.

Lintner J. (1965b). Security Prices, Risk and Maximal Gains from Diversification. *Journal of Finance*, 20 , 587-615.

Madura J. & Theodore E. (1988). *Introduction to Financial Management*, 1st Edition, 1988, West Publishing company, 314-320

Markowitz H. (1952). Portfolio Selection, Journal of Finance .Volume 7:1, 77

Moheb A. et al (2013). Sustainable Growth and Firm Risk from The Signaling Perspective, *Asian Economic and Financial Review*, 2013, 3(5):660-667

Myers S. (1977). Determinants of Corporate Borrowing, *Journal Of Financial Economics* No 5, 1977, 147-175

Nairobi Stock Exchange (May 2013) - Official, history and organization official. https://www.nse.co.ke/about-nse/history-of-organisation.html

Naslund B. (1966). A Model of Capital Budgeting, *The Journal Of Business, Graduate School Of Business Of The University Of Chicago*, Volume XXXIX, No 2, 257-260

Neuhauser J.& Viscione J. (1973). How Managers Feel about Modern Capital Budgeting, *Management Review*, 16-22

Afonso P & Cunha J. (2009). Determinants of the use of capital investment appraisal methods: Evidence from the field

Payne J.D., Heath W. C and Gale L. R. (1999). Comparative Financial Practice in US and Canada, *Financial Practice and Education,* 16-20

Ross S. (1976). The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory* Volume. 13:3, 341

Ross S (1990). *Corporate Finance*, 2nd Edition, Mosby College Publishing, 453 – 477

Ryan, P. & Ryan G. (2002). Capital budgeting practices of the Fortune 1000, How have things changed? *Journal of Business and Management* 8(4): 355-364.

Schall L. (1978). Survey and Analysis of Capital Budgeting Methods. *Journal of finance,* Vol 33 no.1 , 281-287

Schall L. (1983). *Introduction to financial Management*, 3rd Edition, McGraw hill,

283-290

Scott D. F. & Petty J. W. (1984). Capital budgeting Practices in Large American Firms, a retrospective analysis and synthesis, *Financial Review*, 111-123

Seila A. F. & Banks, J. (1990). Spreadsheet Risk Analysis using Simulation, *Simulation*, Vol 55 No 3, 163-170

Sharpe, W.F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance*, 19 (3), 425-42.

Smith D. (1994). Incorporating Risk Into Capital Budgeting Decisions Using Simulation, *Management Decision*, Volume 32, No 9, 20-26

Smithson S. (1998). Managing Financial Risk, *A guide to derivative products, financial engineering and value maximization*, 3rd Edition, McGraw hill 1-3

Solomon E. (1963). *The Theory of financial Management*, Columbia University Press

Stulz R. (1999). What's Wrong with Modern Capital Budgeting, *Financial Practice and Educatio*n, 7-11,

Tuttle D. L. & Robert H. Litzenberger R. H. (1968). Leverage, Diversification and Capital Markets - Effects on Risk Adjusted Capital Budgeting Framework, *Journal Of Finance* Vol XXIII, No 3, 427-440

Van H. (1983). *Financial Management Policy*, 6th Edition, Prentice Hall, 200 – 220

Vandell R. F. & Stonich R. D. (1973). Capital Budgeting: Theory or Results, *Financial Executive*, 46-56

Weston F. J. & Copeland T. E. (1992). *Managerial Finance*, 7th Edition, the Dryden Press, NY

Zinkhan G. (1994). Emerging Issues and Trends, *Managerial Finance*, Vol20, 1994, 2-7

APPENDIX ONE – COMPANIES LISTED ON THE NSE AS AT DECEMBER 31, 2012

	Agricultural
1	Eaagads Ltd
2	Kapchorua Tea Co. Ltd
3	Kakuzi Ord
4	Limuru Tea Co. Ltd
5	Rea Vipingo Plantations Ltd
6	Sasini Ltd
7	Williamson Tea Kenya Ltd
	Commercial and Services
8	Express Ltd
9	Kenya Airways Ltd
10	Nation Media Group
11	Standard Group Ltd
12	TPS Eastern Africa (Serena) Ltd
13	Scangroup Ltd
14	Uchumi Supermarket Ltd
15	Hutchings Biemer Ltd
16	Longhorn Kenya Ltd
	Telecommunication and Technology
17	Accesskenya Group Ltd
18	Safaricom Ltd
	Automobiles and Accessories
19	Car And General (K) Ltd
20	CMC Holdings Ltd
21	Sameer Africa Ltd
22	Marshalls (E.A.) Ltd
	Banking
23	Barclays Bank Ltd
24	CFC Stanbic Holdings Ltd
25	Diamond Trust Bank Kenya Ltd

26	Housing Finance Co Ltd
27	Kenya Commercial Bank Ltd
28	National Bank Of Kenya Ltd
29	NIC Bank Ltd
30	Standard Chartered Bank Ltd
31	Equity Bank Ltd
32	The Co-Operative Bank Of Kenya Ltd
	Insurance
33	Jubilee Holdings Ltd
34	Pan Africa Insurance Holdings Ltd
35	Kenya Re-Insurance Corporation Ltd
36	CFC Insurance Holdings
37	British-American Investments Company (Kenya) Ltd
38	CIC Insurance Group Ltd
	Investment
39	City Trust Ltd
40	Olympia Capital Holdings Ltd
41	Centum Investment Co Ltd
42	Trans-Century Ltd
	Manufacturing and Allied
43	B.O.C Kenya Ltd
44	British American Tobacco Kenya Ltd
45	Carbacid Investments Ltd
46	East African Breweries Ltd
47	Mumias Sugar Co. Ltd
48	Unga Group Ltd
49	Eveready East Africa Ltd
50	Kenya Orchards Ltd
51	A.Baumann Co Ltd
	Construction and Allied
52	Athi River Mining
53	Bamburi Cement Ltd
54	Crown Berger Ltd
55	E.A.Cables Ltd

56	E.A.Portland Cement Ltd
	Energy and Petroleum
57	Kenolkobil Ltd
58	Total Kenya Ltd
59	Kengen Ltd
60	Kenya Power & Lighting Co Ltd

Source:

NSE List of listed companies, website https://www.nse.co.ke/listed-companies/list.html