THE RELATIONSHIP BETWEEN CAPITAL BUDGETING EFFICIENCY AND STOCK RETURN VARIATION AT THE NAIROBI SECURITIES EXCHANGE

BY

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REG. NO: D61/7480/2006

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER IN BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

SEPTEMBER, 2012

DECLARATION

This research project is my original work and has not been presented for a degree award or any other certificate in any other institution other than the University of Nairobi.

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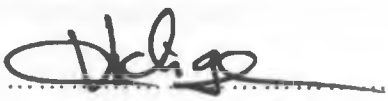
Signature:  9:11:2012

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ACKNOWLEDGEMENTS

My greatest gratitude goes to Almighty God for giving me this great opportunity to extend my learning to this level. I acknowledge with great gratitude the sacrifice my parents made in laying the foundation for my education without which it would have been difficult to progress this far.

I also wish to acknowledge the support I received from my supervisor Mr. Herick Ondigo in doing this project. His extensive knowledge was invaluable. My special thanks extend to Mr. Wisdom Kachila for his continued encouragement without which the conclusion on this project would have been difficult. Lastly, I wish to appreciate the understanding and confidence my wife Agnes accorded me especially during the times I had to stay long hours away from her studying.

DEDICATION

I dedicate this research project to my daughter Rosejoy Mkwachu. May the Lord Jesus Christ bless you all the days of your life.

ABSTRACT

The research analysed the relationship between capital budgeting efficiency and firm specific stock returns variation in firms listed in the manufacturing sector of the Nairobi Securities Exchange. The first objective was to determine how efficient firms listed in the manufacturing sector are in capital budgeting. The second objective was to find out if there was any relationship between capital budgeting efficiency and firm specific stock returns variation.

Data relating to capital budgeting efficiency was determined from analysis of financial statements. The financial statements were obtained from the Capital Markets Authority library. The data relating to stock returns variations was determined using daily equity price lists obtained from the Nairobi Securities Exchange. Capital budgeting efficiency was determined by the deviation of the Tobin's marginal q from its optimal while firm specific returns variation was determined by regressing firms returns with market and industry returns and analysing the variances into industry – market and firm specific components. Co-efficient of Correlation was used to determine the degree and nature of the relationship between capital budgeting efficiency variables and stock return variation variables.

The results show the margin of deviation of Tobin's q from optimal being quite high reflecting a mismatch between capital budgeting and market expectations. The market expectations are also captured by the high firm specific return variation which previous research has argued could be a proxy for share price information content. There is a significant positive correlation between variables of capital budgeting efficiency and variables of firm specific stock returns. This implies efficient capital

budgeting decisions have a significant impact in market value enhancement at the securities exchange.

The Capital Market Authority may adopt the use of deviation of Tobin's q from its optimal as an indicator of corporate performance to determine its investor protection intervention strategy. In this regard, where an organisation consistently reflects a big deviation of Tobin's q from its optimal, the regulator may intervene to save the firm from further decline in market value. Alternatively, the regulator may assess the relationship between capital budgeting efficiency variables and firm specific return variation.

Further research may be carried out to assess the relationship between capital budgeting efficiency and stock returns variations for all the firms at the Nairobi Securities Exchange.

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LIST OF ABBREVIATIONS

NPV – Net Present Value

IRR – Internal Rate of Return

ARR – Accounting Rate of return

PI – Profitability index

WACC – Weighted Average Cost of Capital

ROI – Return on investment

NSE – Nairobi Securities Exchange

PIN – Probability of Informed Trading

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The study analyzed the efficiency of capital budgeting among firms listed in the manufacturing segment of the Nairobi Securities Exchange for the five year period from 2007 to 2011. Firm specific stock returns variations for the same firms for the five year period were determined. The capital budgeting efficiency variables were then correlated with firm specific returns variation to assess the nature and degree of the relationship.

1.1.1 Capital Budgeting Efficiency

Capital budgeting efficiency refers to value enhancing capital budgeting. Where capital budgeting leads to increase in firm's value it is efficient, however where it does not lead to an increase or decreases a firm's value, it is inefficient. Capital budgeting is long term planning for making and financing proposed capital outlays (Horngren, Datar & Foster, 2006). This process includes the decisions to invest in new projects, reassess the amount of capital already invested in existing projects, allocate and ration capital across divisions, and acquire other firms (Fama & French, 1993). In essence, the capital budgeting process defines the set and size of a firm's real assets, which in turn generate the cash flows that ultimately determine its profitability, value, and viability (Davis, 1994). Capital budgeting involves decision by management to allocate corporate resources to activities expected to generate future cash flows to the organisation. Management allocate resources to those activities which are expected to generate aggregate future cash flows in excess of the initial cost outlay. The resource allocation is planned through a program called a

capital budget which shows what the non-current asset will cost and what cash inflows the asset is expected to generate (Drury, 2004).

Companies appraise the various projects available to be undertaken and select the ones with greatest positive contribution to its market value. Evaluation is necessary because the firm may have many projects with positive contribution but the capacity to undertake these projects is limited by available resources (La Porta, Lakonishok, Shleifer & Vishny, 1997). In assessing which project to undertake, management may use discounted and non-discounted cash flow methods. Discounted cash flow methods take into consideration the time value of money and project risk while non-discounted cash flow methods do not consider time value of money. Both discounted and non discounted methods have their merits and demerits. Non discounted cash flow methods concentrate on projects with either the shortest period to recover the initial costs or the one with highest average rate of accounting returns. Discounted cash flow methods focus on projects with the highest post net present value, highest internal rate of return or highest profitability index (Francis & Soffer, 1997).

Capital budgeting decisions involve allocation of significant corporate resources and the decisions are mostly irreversible or where reversible the company incurs significant loss (Fama et al, 1993). The impact of capital expenditure is on shareholder value addition. Efficient allocation of scarce or costly corporate resources is important to firm's management. Tying huge corporate resources inefficiently in non-productive assets could lead to collapse of the firm. Corporate managers are expected to reallocate corporate resources from the low returns assets to high return assets which are able to maintain consistent growth in rates of return. A good investment decision can boost a firm's earnings sharply and dramatically increase the

firm's value. Shareholders assess management's decisions regarding resource allocation to long term assets. Shareholders affirm management's decisions through manipulation of demand for the firms stock. Where they bid strongly for the firm's stock, demand increases and the price goes up and where they withhold their investments on the firms stock, demand decreases and stock price goes down (Francis and Soffer, 1997).

Efficiency of capital budgeting can be measured by Tobin's q. Tobin (1969) defined Tobin's q as the ratio between the market value of a firm and the replacement value of the same physical assets. The numerator is the market valuation i.e. the going price in the market for exchanging existing assets. The denominator is the replacement or production cost i.e. the price in the market for the newly produced commodities. The ratio has macroeconomic signifance as it links the financial markets with the market for goods and services.

Tobin's q can also be calculated in simplified form as the ratio relating the market value of a company's stock with the value of the company's book value although this is not the direct equivalent of Tobin's q. Tobin's q greater than 1 implies the market value reflects some unmeasured or unrecorded assets of the company. High Tobin's q value encourage companies to invest more in capital assets as they are worth more than the price paid for them. Tobin's q less than 1 implies the market is undervaluing the firm. Absolute efficiency capital budgeting is reflected by Tobin's q equal to one. Tobin's marginal q is the ratio of the change in the value of the firm's assets to the added capital cost of an increment to the capital stock. Marginal q reflects investor's estimate of the marginal project's profitability index. Ignoring taxes, value maximization implies marginal q equals one ($q^* = 1$).Tobin's marginal q has been used

to gauge the efficiency of corporate investment. The deviation of Tobin's marginal q from its optimal level is the measure of investment efficiency; the smaller the deviation of Tobin's marginal q from its optimal level, the greater the efficiency of investment decisions.

1.1.2 Stock Price Variation

According to finance theory, risk arbitrageurs gather and process information about firm's stocks so as to buy under-priced stocks, pushing their prices up, and to sell over-priced stocks, pushing their prices down. A firm's stock prices may be driven up or down by three main factors; economic, industry - market related and firm specific factors. Economic factors affect stock prices of all the firms operating within a particular economy. Investors consider various economic factors such as economic growth, impact of interest rates and currency exchange rates (La Porta, Lakonishok, Shleifer & Vishny, 1997).

Key economic indicators include employment levels, gross domestic product, retail sales, personal incomes and government fiscal and monetary policies. These signal to investors the market conditions and investors adjust their future cash flow expectations accordingly. Unexpected favourable information about the economy causes a favourable revision of a firm's expected cash flows and therefore places an upward pressure on firm's value. Where the economy is doing well, the disposable income is high which translates to high demand for the firm's products. Future cash flow prospects are revised as investors expect higher returns.

Interest rates also affect stock prices by influencing flow of resources on account of risk differential. The risk free interest rate of treasury securities acts like the bench mark for investor risk attitude. Investor will only invest in risky assets if they can offer a rate of return higher than the risk free rate. Where the risk free rate is low, investors invest in risky securities which offer a premium for the risk. Alam and Uddin (2009) found that there is significant negative relationship between interest rates and stock prices.

Exchange rate between various currencies also plays a significant role in stock pricing. Where the local currency is weak relative to foreign currencies, foreign investors enter the local stock market and bid prices upwards. Where the local currency strengthens, foreign investors dispose their stock holding bidding the price downwards. Tsai (2012) shows that there is a negative relation between stock and foreign exchange markets when exchange rates are extremely high or low.

Roll (1988) confirmed that stock prices are driven by others forces besides fundamental factors. He found out that only about a third of the variation in stock returns can be explained by systematic fundamental forces. Market related factors include regulations affecting specific industries, benefits of concentration within the same geographical area, homogeneous level of maturity of firms in the industry and investor sentiments.

Firm specific factors which might affect stock prices include announcements with regard to sales growth, earning, acquisitions, divestitures, dividend and management or key personnel changes.

Fama (1970) came up with the efficient financial market hypothesis. He defined an efficient financial market as one in which prices always reflect available information. Stock prices adjust immediately as investors capitalise on new information that is not already accounted for.

Tobin (1982) identified four types of market efficiency; information arbitrage efficiency, fundamental valuation efficiency, full insurance efficiency and functional or operational efficiency. According to information arbitrage efficiency, asset prices in financial markets fully reflect all of the privately available information as arbitrage eliminates gains of private information. This is because it involves risk free transaction and the information is obtained at no cost hence readily available. The fundamental valuation efficiency asserts that asset prices reflect the expected past flows of payments associated with holding the asset. This implies correct profit forecasts based on past performance. Full insurance efficiency provides the market has safeguards which ensure goods and services are provided at all contingencies. Functional or operational efficiency provides that products and services available at the financial markets are provided at least cost and are directly useful to the participants. Financial markets exhibit a mixture of efficiency types at different levels

1.1.3 Relationship between Capital Budgeting Efficiency and Stock Returns Variations

A firm's value reflects the present value of the future cash flows its investments are expected to generate (Easley, Hvidkjaer, & O'Hara, 2002). Capital budgeting decisions is one of the firm specific factors which market participants assess in deciding whether to buy or sale a firm's stock. Where the market views the capital budgeting decisions as efficient, share prices go up. However, where the market views the decisions as inefficient, the share prices go down. Stock returns variation measure the overall degree to which stock market views the performance of the firm. Stock price variation can be decomposed into two components; firm specific return variation and industry – market components (Roll, 1988).

This research project considered the relationship between firm specific stock return variation and efficiency of capital budgeting as measured by the deviation of Tobin's q from its optimal level. Firm specific stock return variation is used as a proxy to assess market reaction to capital budgeting decisions. It is anticipated that the magnitude of firm specific stock return variation will be the major determinant in explaining the stock price variation where the market views the firm either as efficient or inefficient in its capital budgeting decisions.

1.1.4 Manufacturing Companies Listed at the Nairobi Securities Exchange

The Nairobi Securities Exchange initially called Nairobi Stock Exchange started as an overseer branch of the London Stock in July of 1953. In 1954, the Nairobi Stock Exchange was then constituted as a voluntary association of stockbrokers registered under the Societies Act. The Nairobi stock exchange was incorporated under the companies Act of Kenya in 1991 as a company registered as a voluntary association. The first privatisation through the exchange was in 1988 when the government offloaded 20% of its shareholding in Kenya Commercial Bank. (www.nse.co.ke)
The Exchange has nineteen member firms who are the registered stock brokers.

Currently, the exchange has fifty eight listed firms grouped into ten different categories based on nature of operations. The manufacturing category has nine listed firms (www.nse.co.ke). This is only second to the banking sector which has ten listed companies. The manufacturing Segment has the second highest market capitalisation after the banking sector. It also has the second highest average share price and also share price per company when compared to the other market segments as of September 2011. (Appendix II provides the market analysis). Manufacturing sector companies require large capital investment for growth and the stock market provides an ideal funding option. The study focuses on this significant category of the Nairobi Securities Exchange because efficient resource allocation in this category has significant implication on the prosperity and continued survival of the firm. The study covers the period January 2007 to December 2011. A much longer period exposes the study to technological and managerial changes which may distort the conclusions of the study.

1.2 Research Problem

Capital budgeting is an important activity in business and needs wide information so as to make valid and concrete investment decisions because if not well coordinated, a lot of corporate financial resources can easily be wasted if the investment turns out to be wrong or uneconomic. As such, the decision makers need to have adequate information when making capital budgeting decisions. Stock markets play an important role in signifying to management the impact of their policies through the market pricing system. The stock markets through the pricing system signal to management whether the investors view management's policy as value addition or not. Investment decisions by management have a big impact on organisations. The success or failure of the organisation hinges mostly on investment decisions. It is important that firm managers know how efficient they are allocating capital expenditures to the various projects they undertake.

Initial research in capital budgeting has concentrated on surveys to determine which investment appraisal method was popular among chief finance officers. Mills and Herbert (1987) found that the investment appraisal method depended on company size. However, Sangster (1993) concluded that company size has no influence in the selection criteria for an investment appraisal method. Pike (1996) did a longitudinal survey to assess the state of the art in capital budgeting. He found that the use of discounted cash flow techniques have increased overtime. Ryan and Ryan (2002) in their study of capital budgeting techniques of fortune 1000 companies find that discounted cash flow techniques methods are the most preferred methods of evaluation of capital projects. Kadondi (2002) in his survey of capital budgeting techniques of listed companies in Kenya found that some companies use discounted

cash flow techniques while there are others which use non discounted cash flow techniques. Kadondi (2002) established that the listed companies used several techniques including: Net Present value, internal rate of return, payback method and accounting rate of return. Khakasa (2009) studied the state of capital budgeting practice in banking institution in evaluating Information Technology investments ex ante. According to his survey, the most popular investment appraisal techniques are cost benefit analysis, risk analysis, competition, payback period and return on investments.

Internationally research in the field of capital budgeting has progressed from capital budgeting techniques survey to assessing relationships between capital budgeting and stock returns. Hyunbae and Jung-Wook (2008) in their study on capital allocation, stock return volatility and productivity growth in U.S Industries found a substantial cross – industry variation in allocative efficiency in US industries. According to their research; higher allocative efficiency is in industries with lower co-movement in firm level value –added growth and higher informativeness of stock prices. Durnev et al (2004) in their study found a positive association between a measure of economic efficiency of corporate investment and the magnitude of firm specific variation in stock returns. They conclude that capital budgeting seems to be more closely aligned to market value maximisation in industries whose stocks exhibit greater firm specific return variation. Wurgler (2000) shows that countries with advanced financial system exhibit higher allocative efficiency. Morck, Yeung and Yu, (2000) who found correlation coefficient between firms returns and United States Market returns to be very low for countries with well developed financial systems like United States,

Canada and the United Kingdom but is very high for emerging markets such as China and Poland offer more credence to the previous observation.

Locally, Munyao (2009) studied the relationship between capital budgeting methods and performance of water services boards in Kenya. The study pointed a positive relationship between usage of capital budgeting techniques and organizational performance. Munyao (2010) further extended research in capital budgeting by studying the relationship between capital budgeting techniques and financial performance of companies listed at the Nairobi Securities Exchange.

Studies done in foreign financial markets show that capital budgeting efficiency is higher in firms' whose stocks have higher firm specific variation. The above studies were conducted in highly developed financial markets. Locally, there is a research gap between efficiency of capital budgeting and its relationship to the securities market. This study further extends research in capital budgeting in Kenya by studying the relationship between capital budgeting efficiency and firm specific stock return variation among companies in the manufacturing sector of the Nairobi Securities Exchange. The study seeks to answer the question: Is capital budgeting efficiency in the manufacturing sector of the Nairobi Securities Exchange related to firm specific stock price variation?

1.3 Research Objectives

The objectives of the study include:

1. To determine the Capital Budgeting Efficiency of companies listed in the Manufacturing sector of Nairobi Securities Exchange (NSE).
2. To establish the relationship between capital budgeting efficiency and firm specific stock return's variation among firms listed in the manufacturing sector at NSE.

1.4 Value of the Study

This research will be of value to chief financial officers, capital market regulators, capital market analysts, investors and academicians.

The study will be useful to Chief Financial Officers of the firms listed at the exchange. It will highlight whether the chief financial officers are efficient in making investment decisions. The study will provide them with a tool of assessing their managerial competence and where necessary take remedial action. The study will enable corporate managers assess the organisation's ability to continue in operation or change their investment strategies to align them more to market expectations. This will reduce misallocation of corporate resources.

Capital market analysts will also benefit from the study. It will provide them with an additional tool to use in assessment of corporate investment decisions. They will be able to gauge whether the decisions by the firm's managers will add value to their investments or not. This will enable them to provide more value to their clients by

improving on their knowledge base of the firms at the exchange. In turn, more investors will consult them on their investment decisions.

Investors will also benefit from this study to make better investment decisions. They may use the information to gauge between good quality firms from poor ones. Better-informed investors can better direct capital to firms with positive Net Present Value investment opportunities and away from firms lacking them. Finally, it may enhance market for corporate control. Firms with good capital resources but with poor managers may have better managers bid for them. This will eventually spur greater growth in the companies at the exchange.

The study will also provide policy makers and market regulators with guide upon which to base their intervention policies to protect investors from loss. It will enable them come up with policies for enhancement of capital markets. Timely market intervention will enhance market confidence by investors and boost the trading volumes together with new firms listing the exchange.

This will provide an opportunity for academicians to open up further research in this area considering limited local research has been done in this topic. Research in capital budgeting with regard to the Nairobi Securities exchange has been limited to surveys on capital budgeting techniques. This will lead to better understanding of the exchange with better ideas being generated for its growth.

CHAPTER TWO: LITERATURE REVIEW

2.1Introduction

This chapter reviews the theories relating to capital budgeting and studies by other researchers in the field of capital budgeting. The specific areas covered here are a review of theories upon which the study hinges, capital budgeting techniques, and the relationship between capital budgeting efficiency and stock returns' variation in firms listed in the manufacturing sector of the Nairobi Securities Exchange.

2.2Theoretical Review

Theoretical review explains the theories upon which capital budgeting decisions are based on. It also covers theories relating to stock market efficiency. The various theories are compared and circumstances upon which each is used and probable decision criteria developed.

2.2.1 The Contingency Theory

According to this theory, the method which a company selects for capital budgeting is dependent on a number of factors and also the success of capital budgeting is also not dependent on method selected. Sangster (1993) concludes that company size has no influence in the selection criteria for an investment appraisal method. However, Mills and Herbert (1987) find that the investment appraisal method depends on company size. Pike (1996) did a longitudinal survey to assess the state of the art in capital budgeting. He observes that the use of discounted cash flow techniques have increased overtime. He attributes this to the use of information technology tools which have made data collection and analysis easier. Haka, Gordon and Pinches

(1985) conclude that the adoption of sophisticated capital budgeting techniques will not per se, result in superior firm performance.

2.2.2 The Garbage Can Theory

The Garbage Can theory first developed by Cohen, March, and Olsen (1972) used the theory to explain the decision making process in a highly uncertain environment. The theory attempts to explain organizational decision-making where preferences are not clear, technology is not clear, or participation is fluid. Problems, solutions, and decision makers move from one choice to another depending on the mix of recognized problems, the choices available, the mix of solutions available for problems, and outside influences on the decision makers. Problems are addressed based on a solution choice, but choices are made based on shifting combinations of problems, solutions, and decision makers. In this sense, decision-making appears "pathological" instead of rational. The Garbage Can theory allows problems to be addressed and choices to be made, but does not necessarily following a rational process. Poorly understood and addressed problems can drift into and out of the garbage can process, depending on the situation and factors

2.2.3 The Incrementalism Theory

The incrementalism theory is a style of policy-making based on small, marginal changes from existing policies. According to the theory comprehensive rationality is impossible and therefore policy makers do not question the need to change existing policies. Therefore policies are seldom changed radically as a result of extensive reviews. According to Wildavsky (1964), budget processes were seen as stable,

predictable, changing little from year to year and based on well-defined roles that could be represented by relatively simple decision rules.

2.2.4 Real Options Theory

The real options approach applies financial options theory to real investments, such as manufacturing plants, line extensions and research and development investments. The best known form is the model developed by Black and Scholes (1973). This approach provides important insights about business and strategic investments which are very vital given the rapid pace of economic change. A financial option gives the owner the right, but not the obligation, to buy or sell a security at a given price. Analogously, companies that make strategic investments have the right but not the obligation to exploit these opportunities in the future. If real options are used as a conceptual tool, it allows management to characterize and communicate the strategic value of an investment project. The real option method represents the new state-of-the-art technique for the evaluation and management of strategic investments.

The real option method enables corporate decision makers to leverage uncertainty and limit downside risk. The Black-Scholes model applies when the limiting distribution is the normal distribution, and it explicitly assumes that the price process is continuous and that there are no jumps in asset prices. The version of the model presented by Black and Scholes was designed to value European options, which were dividend-protected. Thus, neither the possibility of early exercise nor the payment of dividends affects the value of options in this model. Its advantages are: Projects can be viewed as real options can be valued using financial option pricing techniques; technically, it allows managers to bundle a number of possible outcomes into a single

investment; and a decision maker has greater flexibility and improved method to value opportunities. The disadvantages include: when applied to stock evaluation real options technique is complicated; value in simple situations, the approach is probably better suited to a company deciding on its strategy than to an investor picking stocks; and the company must have the management skills and the wherewithal to exploit options; moreover, an option doesn't have much value if it cannot be funded effectively.

2.2.5 The Signaling Theory

Signaling is the process by which one party in-explicitly conveys information to another. It is based on the assumption that one party in a transaction has more or better information than the other. Signaling took root in the idea of asymmetric information (a deviation from perfect information), which says that in some economic transactions, inequalities in access to information upset the normal market for the exchange of goods and services. Spence (1973) proposed that two parties could get around the problem of asymmetric information by having one party send a signal that would reveal some piece of relevant information to the other party. Leland and Pyle (1977) analyse the role of signals within the process of initial Public Offer. They show that companies with good future perspectives and higher possibilities of success ("good companies") should always send clear signals to the market when going public (e.g. the owner should keep control of a significant percentage of the company). To be reliable, the signal must be too costly to be imitated by "bad companies". If no signal is sent to the market, asymmetric information will result in adverse selection in the Initial Public Offer market. Stock prices play critical signaling and incentive alignment roles in many corporate governance mechanisms that can curb the sorts of

self-serving or inept managerial behavior that lead to non-value-maximizing capital budgeting decisions. For example, shareholder derivative lawsuits, executive stock options, and the market for corporate control all depend upon the efficiency of the stock market as an information processor. Second, stock prices convey information about investors' perceptions to managers. Third, the more informed investors are, the easier it is for managers to raise external financing to fund value-enhancing projects.

2.3 Capital Budgeting Techniques

Stenzel and Stenzel (2003) defined capital budgeting as the best option and financing decision for long-term investment proposals. Brewer, Garrison and Noreen (2005) further define capital budgeting as an investment analysis done by managers to determine which proposal has the best return in future cash flows. According to Peterson and Fabozzi (2002) the capital budgeting process consists of the following stages: investment screening and selection; capital budget proposal; budgeting approval and authorization; project tracking; and post completion audit.

Drury (2004) is of the opinion that the investment, financing and dividend decisions are considered by the capital budgeting process as follow: determining which specific projects a firm should accept; determining the total amount of capital expenditure which the firm should undertake; and determining how the total amount of capital expenditure should be financed. Capital budgeting evaluation techniques are categorized into two groups, namely sophisticated techniques and unsophisticated techniques. Both techniques use cash flows as their starting point in order to get to the result from which a final decision can be taken. The main difference between sophisticated techniques and unsophisticated techniques is the time value of money.

Sophisticated techniques take the time value of money into consideration, whereas unsophisticated techniques ignore the time value of money.

Financial managers can make use of sophisticated capital budgeting techniques to see which investment proposal will have a profitable return. There are four sophisticated capital budgeting evaluation techniques (discounted cash flow methods) involving the time value of money, namely: Net present value; internal rate of return; discounted payback; and Profitability index. (Horngren, Datar & Foster, 2003)

2.3.1 Net Present Value (NPV)

Garrison, Noreen and Seal (2003) and Horngren, Datar and Foster (2003) define net present value as the net projected future cash flows, discounted back to the present value by using the minimum required rate of return (discount rate, hurdle rate or cost of capital). The cost of the initial investment is then subtracted from the sum of the discounted future cash flows (gross present value), to arrive at the net present value figure.

This valuation requires estimating the size and timing of all of the incremental cash flows from the project. These future cash flows are then discounted to determine their present value. These present values are then summed, to get the Net Present Value. The Net Present Value decision rule is to accept all positive Net Present Value projects in an unconstrained environment, or if projects are mutually exclusive, accept the one with the highest Net Present Value. In the case of independent projects, all projects with a positive Net Present Value must be accepted, but when it comes to mutually exclusive projects, only the specific project with the highest positive Net

Present Value should be accepted. In all cases, projects with a negative Net Present Value will not be accepted. The positive Net Present Value that can result from the Net Present Value technique helps to identify the investment projects that will increase shareholders' wealth. When the Net Present Value equals zero, only the cost of capital is met, therefore the shareholders earn no interest and shareholder's wealth is not increased. The Net Present Value is greatly affected by the discount rate, so selecting the proper rate - sometimes called the hurdle rate - is critical to making the right decision. The hurdle rate is the minimum acceptable return on an investment. It should reflect the riskiness of the investment, typically measured by the volatility of cash flows, and must take into account the financing mix.

2.3.2 Internal Rate of Return (IRR)

According to Maher, Stickney and Weil (1997) and McWatters, Morse and Zimmerman (2001) the internal rate of return is the discount rate at which the present values of the net projected future cash flow calculated for each project, equals the present value of the initial investment, causing the net present value of the project to equal zero. This discount rate is the highest rate of return that will cause no harm to the shareholders' wealth.

Garrison and Noreen (2003) state that when the IRR exceeds the required rate of return (hurdle rate or cost of capital), the project must be accepted, because the project is expected to return more than the required rate of return and will yield a positive NPV. If the IRR is less than the required rate of return, the project must be rejected, because the expected return from the project will be less than the required rate of return and will yield a negative NPV. In the case of independent projects, all the projects with IRR's which exceed the required rate of return, must be accepted; but

when it comes to mutually exclusive projects; only the specific project, with the highest IRR (and the IRR exceeds the required rate of return) must be accepted and the others should be rejected. The aim of the IRR technique is to identify the investment projects that will maximize shareholders' wealth. When the IRR equals the required rate of return, the project only returns what is required, and the shareholders' earn no interest.

Accordingly, a measure called Modified Internal Rate of Return (MIRR) is often used. Despite a strong academic preference for NPV, surveys indicate that executives prefer IRR over NPV although they should be used in concert. (Lawrence, 2000).

2.3.3 Discounted Payback

Hirsch (1994) and Peterson and Fabozzi (2002) defined discounted payback as the time period taken for the initial investment to be recovered (paid back) in terms of discounted future cash flows. Each investment's annual cash flow should be discounted back to its present value. Each year's discounted present value should be added until it equals the initial investment. The time period should then be determined and compared with the predetermined time period.

Firer, Ross, Westerfield and Jordan (2004) and Drury (2004) state that the sum of the discounted future cash flows must equal the initial investment; therefore time period taken for the cash flows to equal the initial investment should be compared with the randomly predetermined cut-off time period. If the time period is less than the cut-off period, the project should be accepted; but if it exceeds the cut-off point, the project should be ejected. In the case of independent projects, all the projects with a lesser time period than the predetermined cut-off period must be accepted; but when it

comes to mutually exclusive projects, only the specific project with the shortest payback period should be accepted and the others should be rejected.

2.3.4 Profitability Index (PI)

According to Correia et al (2001) and (Peterson & Fabozzi, 2002) the PI is defined as the change in the net projected future cash inflows, discounting back to the present value by using the required rate of return, and dividing the sum of the discounted cash inflows by the cost of the initial investment. If the PI is equal to one, then the NPV is equal to zero. Therefore, if the NPV is positive, the PI will be more than one, but if the NPV is negative, the PI will be less than one.

Garrison and Noreen (2003) and Seitz & Ellison, (2005) state that the PI should be greater or equal to one for the project to be acceptable; If the PI is less than one the project should be rejected. In the case of independent projects, all the projects with an outcome greater or equal to one, should be accepted; but when it comes to mutually exclusive projects, only the specific project with the largest outcome (provided it is greater or equal to one), must be accepted and the others should be rejected. In most cases, the PI that is less than one will not be accepted. The PI technique helps to identify the investment projects that will maximize shareholders' wealth. When the PI equals one, only the cost of capital is met, and the shareholders earn no interest.

2.3. 5 Accounting Rate of Return (ARR)

According to Correia, Flynn, Uliana and Wormald, (2001) and Upchurch (2002) the ARR technique is similar to the financial accounting ratio called the return on investment ratio (ROI). The ARR results by dividing the average net profit after tax into the average investment. If the ARR is higher than the predetermined ARR this

project will have an acceptable effect on the firms ROI. The main advantages of the accounting rate of return are as follows: considers profitability; considers the full useful life of the project; and easy to understand and to calculate. The main disadvantages of the accounting rate of return are as follows: requires a predetermined set cut-off ARR (ROI); based on accounting (book) values, not cash flows and market values and ignores the time value of money.

Correia et al (2001) (and Horngren et al, (2003) state that the ARR should be compared with the predetermined cut-off ARR; If the ARR exceeds the predetermined set cut-off ARR, the project should be accepted, but if it is less than the predetermined cut-off rate, the project should be rejected. In the case of independent projects, all the projects with a higher ARR rate than the predetermined set cut-off ARR must be accepted; but when it comes to mutually exclusive projects, only the specific project with the highest ARR should be accepted and the others should be rejected.

2.4 Capital Budgeting Efficiency and Stock Returns Variations

Capital budgeting efficiency refers to the extent to which the allocation of organizational resources to revenue generating assets contributes to firm's market value addition. Efficiency of capital budgeting decisions can be assessed by the use of Tobin's marginal q. This is the ratio of the market value of an additional unit of capital to its replacement cost i.e. the change in market value of the firm associated with an unexpected unit increase in the stock of capital. In instances of absolute efficiency the ratio will be a unity. Marginal q ratios above one reflect over – valuation by the market. This implies the firms can issue more equity to acquire

additional capital assets. However, in cases where marginal q is lower than one, the market is undervaluing the firm. The deviation of a firm's estimated marginal Tobin's q from a benchmark is used as an indicator of effective resource allocation. Where the magnitude of the deviation is big, the firm is considered as inefficient. However, where the magnitude of deviation is small, the firm is efficient in capital resource allocation.

Stock price variation refers to the change in a firm's stock price at the equity market between two specific time periods. The time periods could be daily, monthly or annually. The variation could be considered in absolute amount or squared deviations. Stock price deviations are caused by economic, industry – market and firm specific factors. Stock price deviation can be decomposed into its two categories as systematic and non-systematic. Systematic stock price variation is caused by economic and industry – market factors while non-systematic is caused by firm specific factors.

The extent to which stock prices approximate fundamental values is related to the extent to which corporate capital budgeting decisions enhance firm market value. An informed market responds to firm's capital budgeting decisions.

2.5 Empirical Review

Baker, Stein and Wurgler (2003) found that corporate investment and the stock market are positively correlated, in both the time series and the cross section. The traditional explanation for this relationship is that stock prices reflect the marginal product of capital. This is the interpretation given to the relationship between

investment and Tobin's Q, (Tobin, 1969) and von Furstenberg (1977). Wurgler (2000) shows that capital flows are more responsive to value added in countries with less synchronous stock returns i.e. stock markets in which firm specific stock variation is a larger fraction of total variation. According to Tobin (1982) such a market is functionally efficient.

According to Durnev et al (2004) corporate capital investment should be more efficient where stock prices are more informative. They conclude that capital budgeting seems to be more aligned to market value maximization in industries whose stocks exhibit greater firm specific return variation. They argue that informed stock prices convey meaningful signals to management about the quality of their decisions. Durnev, Morck, and Yeung (2003) argue that stock prices play critical signaling and incentive alignment roles in many corporate governance mechanisms that can curb the sorts of self-serving or inept managerial behavior that lead to non-value-maximizing capital budgeting decisions. They provide an example of shareholder derivative lawsuits, executive stock options, and the market for corporate control all depend upon the efficiency of the stock market as an information processor. Stock prices convey information about investors' perceptions to managers. Stock price reactions to managers' decisions can provide useful feedback that improves corporate governance (and so capital budgeting) if shareholders are well informed. Third, the more informed investors are, the easier it is for managers to raise external financing to fund value-enhancing projects. One of the main roles of financial markets is the production and aggregation of information. Grossman and Stiglitz, (1980) and Glosten and Milgrom, (1985) observed that this occurs via the trading process that transmits information produced by traders for their own speculative trading into market prices

Dow and Gorton (1997) and Subrahmanyam and Titman (1999) argued that managers can learn from the information in stock price about the prospects of their own firms. The idea behind the theory is that stock prices aggregate information from many different participants who do not have channels for communication with the firm outside the trading process. Thus, stock prices may contain some information that managers do not have; this information, in turn, can guide managers in making corporate decisions, such as the decision on corporate investments. Stein (2003) noted that this theory has far-reaching implications for the role of financial markets as it implies that financial markets affect the real economy.

Managers learn from the private information in stock price when they make corporate investment decisions by examining the relation between measures of the amount of private information in stock price and the sensitivity of corporate investment to price. It is commonly believed that stock prices reflect public information and private information about firms' fundamentals. The private information gets into the price via speculators' trading activities. If, at a given point in time, managers decide on the level of investment attempting to maximize the expected value of the firm, they will use all information available to them at that point. This includes both the information in the stock price and other information that managers have and that has not found its way to the price yet. In this environment, investment will be more sensitive to stock price when the price provides more information that is new to managers. Information that managers already had will move the price but not affect the investment decision and thus will decrease the sensitivity of investment to price. Based on this reasoning, an empirical finding of a positive relation between the investment sensitivity to stock

price and the amount of private information incorporated into the price by speculators would imply that the private information in price is new to managers and that manager's look at the price to learn this information and use it in their investment decisions (Dow et al, 1997 & Subrahmanyam et al, 1999).

In equilibrium, different stocks may have different amounts of private information in their prices due to different costs of private information production (Grossman et al, 1980). While such costs are difficult to measure directly, two strands of the finance literature have come up with measures to assess the equilibrium level of private information in price based on the resulting price and trading behaviors. The first measure is price non-synchronicity which was first proposed by Roll (1988) and recently developed by Morck, Yeung, and Yu (2000), Durnev et al. (2003), and Durnev et al (2004). It is computed on the basis of the correlation between the stock's return and the return of the corresponding industry and of the market. The idea is that if a firm's stock return is strongly correlated with the market and industry returns, then the firm's stock price is less likely to convey firm specific information, which is useful for managerial investment decisions. Thus, the measure will be higher when the return on the stock is less correlated with the market and industry returns. There is a large body of empirical work demonstrating the information content captured by this measure; the seminal paper by Roll (1988) showed unambiguously that this measure has very little correlation with public news, and thus, it seems to capture private information. In Roll's own words, he suggests that, based on his results, it seems that "the financial press misses a great deal of relevant information generated privately."

The second measure of determining stock price information content is the Probability of informed trading. This utilizes information from the trading process and was developed in Easley, Kiefer, and O'Hara (1996 1997a, b). Based on a structural market microstructure model, this measure directly captures the probability of informed trading in a stock. Thus, the composition of information for stocks with high PIN is coming more from private sources than from public sources. This idea is consistent with the finding of Easley, Hvidkjaer, and O'Hara (2002) that stocks with high PIN earn higher returns that compensate investors for the high risk of private information. Both measures are strongly positively correlated with the sensitivity of investment to price, consistent with the hypothesis that stock prices with large content of private information provide managers with more new information, which, in turn, affects managers' investment decisions.

Literature in economics and finance documents a strong positive correlation between stock prices and corporate investments. Barro (1990), Morck, Shleifer, and Vishny (1990), Blanchard, Rhee, and Summers (1993), findings suggest that an important factor contributing to the correlation between stock price and corporate investment is that managers incorporate what they learn from the private information in price in their investment decisions. Baker, et al (2003) has shown that the sensitivity of investment to price increases in the level of capital constraints faced by the firm.

According to Wurgler (2000) financial markets appear to improve the allocation of capital. Across 65 countries, those with developed financial sectors increase investment more in their growing industries, and decrease investment more in their declining industries, than those with undeveloped financial sectors. Wurgler (2000)

found that the efficiency of capital allocation is negatively correlated with the extent of state ownership in the economy, positively correlated with the amount of firm-specific information in domestic stock returns, and positively correlated with the legal protection of minority investors

Hyunbae and Jung-Wook (2008) in their study on capital allocation, stock return volatility and productivity growth in U.S Industries found a substantial cross – industry variation in allocative efficiency in U.S industries. According to their research; higher allocative efficiency is in industries with lower co-movement in firm level value –added growth and higher informativeness of stock prices. Durnev et al (2004) found a positive association between a measure of economic efficiency of corporate investment and the magnitude of firm specific variation in stock returns. They conclude that capital budgeting seems to be more closely aligned to market value maximisation in industries whose stocks exhibit greater firm specific return variation. Green, William and Hornstein (2009) in their study on capital budgeting efficiency in multinational corporations found that multinationals make more efficient capital budgeting decisions than do purely domestic firms. They attribute this to multinational enterprises' exercising greater restraint on over-investment and not on looser liquidity constraints.

Research in capital budgeting in Kenya has steadily progressed from capital budgeting techniques surveys to interaction between capital budgeting techniques and corporate performance. Kadondi (2002) in his survey of capital budgeting techniques of listed companies in Kenya found that some companies use discounted cash flow techniques while there are others which use non-discounted cash flow techniques.

Kadondi (2002) established that the listed companies used several techniques including: Net Present value, internal rate of return, payback method and accounting rate of return. Khakasa (2009) studied the state of capital budgeting practice in banking institution in evaluating Information Technology investments ex ante. According to Khakasa (2009) survey, the most popular investment appraisal techniques are cost benefit analysis, risk analysis, competition, payback period and return on investments.

Munyao (2009) studied the relationship between capital budgeting methods and performance of water services boards in Kenya. The study pointed a positive relationship between usage of capital budgeting techniques and organizational performance. Munyao (2010) further extended research in capital budgeting by studying the relationship between capital budgeting techniques and financial performance of companies listed at the Nairobi Securities Exchange. He found that companies which use discounted cash flow techniques had better financial performance.

2.6 Summary

This chapter looked at past literature relevant to the study. It looked at the theoretical framework where it considered the various theories of capital of capital budgeting. The chapter further looked at the capital budgeting techniques used in firms, the relationship between capital budgeting and stock returns variations. Lastly, studies on capital budgeting were reviewed and the conclusions of the studies analyzed.

The above literature review shows that studies in capital budgeting initially mainly focused on the state of the art in capital budgeting techniques. Internationally, research in the field of capital budgeting has progressed to assess impact of capital budgeting on firm performance and valuation. Locally, Munyao (2010) extended the study on capital budgeting further by assessing the relationship between capital budgeting techniques and corporate performance. However, there is still a knowledge gap with regard to studies analyzing capital budgeting efficiency and interaction with capital market in Kenya. This study enriches capital budgeting by analyzing the relationship between capital budgeting efficiency and stock returns variations. Capital budgeting efficiency being measured by the difference between one and Tobin's marginal q and stock returns variation being measured by firm specific returns variation.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed the methodology that was used in gathering the data, analyzing the data and reporting the results. The chapter explains the type of research design used, the population of study and scope of study, methods and tools used to collect data and how the data collected was analysed to get proper and maximum information to enable answering the research question.

3.2 Research Design

Research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2004). The study adopted a regression and correlation research design aimed at establishing the relationship between capital budgeting and firm specific stock return's variation among firms in the manufacturing sector of the Nairobi Securities Exchange. Regression and correlation analysis were used to analyse the data collected.

3.3 Population

Mugenda and Mugenda (2003) define population as the entire group of individual's, events or objects having a common observable characteristic. The study population is the nine firms in the manufacturing sector of firms listed at the Nairobi Securities Exchange as at September 2011. These firms are A Bauman & Company Ltd; BOC Kenya Ltd; BAT Kenya Ltd; Carbacid Investments Ltd; East African Breweries Ltd; Eveready East Africa Ltd; Kenya Orchards ; Mumias Sugar Ltd; and Unga Ltd. As

earlier explained, this segment had the highest average market share price. Also, it has the second highest number of firms in all segments with the exception of the banking segment.

3.4 Data Collection

The study used secondary data. Secondary data on share prices for period January 2007 to December 2011 was obtained from the Nairobi Securities Exchange. The data on capital expenditure, assets and liability was extracted from analysis of the published financial statements of the firms under study for the same period. The published financial statements will be obtained from Capital Markets Authority and the companies under study. Data on rates of inflation was obtained from the Central Bank of Kenya.

3.5 Data Analysis

Measures of capital budgeting efficiency were computed for the five (5) years of study (2007- 2011) for all the firms in the study and for the sector. Similarly, firm specific stock return variation was computed for the same five year period of study for all the firms in the study and for the industry. The measures of capital budgeting efficiency were then correlated to the firm specific returns variations to determine whether any relationship exists. Statistical package for social sciences (SPSS version 17) was used to analyse the data.

3.5.1 Estimation of the Measures of Capital Budgeting Efficiency

Tobin's marginal q was used as a measure of the efficiency of capital budgeting decisions. Marginal q is defined as the unexpected change in firm value during period t divided by the unexpected increase in capital goods during period t. This can be written as:

$$q \cdot = \frac{V_{j,t} - E_{t-i}\, V_{j,t}}{A_{j,t} - E_{t-I}\, A_{j,t}} = \frac{V_{j,t} - V_{j,t-1}\,(1+\hat{r}_{j,t} - \hat{d}_{j,t})}{A_{j,t} - A_{j,t-1}(1+\hat{g}_{j,t} - \hat{\delta}_{j,t})} \qquad [A1]$$

where $V_{j,t}$ and $A_{j,t}$ are the market value (equity plus debt) and stock of capital goods, respectively, of firm j at time t, and E_t is the expectations operator using all formation extant at time t. The expected market value of the firm in t is its market value in t-1 augmented by both the expected return from owning the firm, $\hat{r}_{j,t}$ and its disbursements to investors, $\hat{d}_{j,t}$, which includes cash dividends, share repurchases, and interest expenses. The expected value of the firm's capital assets in period t is the value of its capital assets in period t-1 augmented by both its expected rate of spending on capital goods, $\hat{g}_{j,t}$,, and the expected depreciation rate on those capital goods, $\hat{\delta}_{j,t}$.

The above equation by normalizing by $A_{j,t-1}$ can be rewritten as shown below:

$$V_{j,t} - V_{j,t-1} = q \cdot [\, A_{j,t} - A_{j,t-1}\ (1+\hat{g}_{j,t} - \hat{\delta}_{j,t})] + V_{j,t-1}\ (\hat{r}_{j,t} - \hat{d}_{j,t}) \qquad [A2]$$

The above formulae can be rewritten in simple terms as follows:

$$A = qB + C \qquad [A3]$$

Where: A = Change in market value between time period t and t-1
B = Change in value of capital goods between time period t and t-1
q = Cost of capital
C = Net disbursements

Where divj,t-1 is the disbursements in Kenya shillings. Note that the intercept in [A3] is an estimate of - q& j (gj - δj), where the j subscript indicates a time average. The coefficients of lagged disbursements and lagged average q can be loosely interpreted as a tax correction factor and an estimate of the firm's weighted-average cost of capital.

$V_{j,t}$ and $A_{j,t}$ are estimated as:

$V_{j,t} = P_t(CS_{j,t} + PS_{j,t} + LTD_{j,t} + SD_{j,t} - STA_{j,t})$,Where

$A_{j,t} \equiv K_{j,t} + INV_{j,t}$

$CS_{j,t}$= The end of fiscal year t market value of outstanding common shares of firm j

$PS_{j,t}$= the estimated market value of preferred dividends

$LTD_{j,t}$= The estimated market value of long time debt

$SD_{j,t}$ = Book value of short term debt

$STA_{j,t}$ = Book value of short term assets

P_t = inflation adjustment

$K_{j,t}$= estimated market value of firm j's Property Plant & Equipment (PPE)

$INV_{j,t}$= Estimated market value of inventories.

The market value of long-term debt is estimated recursively. A fifteen-year age profile of each firm's debt each year based on changes in book values. We estimate the market value of each vintage of each firm's debt in each year assuming all bonds to be fifteen-year coupon bonds issued at par. We use Moody's Baa bond rates to proxy for all bond yields.

The value of Property Plant and Equipment (PP&E) denoted by $K_{j,t}$ is estimated using a recursive algorithm. This is necessary because historical cost accounting

makes simple deflators questionable in adjusting for inflation. We begin by converting all figures to 2006 Kenya shillings. We assume that physical assets depreciate by ten percent per year. Let $K_{j,t-5}$ be the book value of net PP&E (in 2006 Kenya shillings) for firm j in year t.

The firms and industry average marginal q is obtained as coefficient β_0 of the regression across all firms j in industry i at times t as shown below:

$$\frac{\Delta V^{i}_{j,t}}{A^{i}_{j,t-1}} = \alpha^{i} + \beta^{i}_{0}\frac{\Delta A^{i}_{j,t}}{A^{i}_{j,t-1}} + \beta^{i}_{1}\frac{V^{i}_{j,t}}{A^{i}_{j,t-1}} + \beta^{i}_{2}\frac{D^{i}_{j,t}}{A^{i}_{j,t-1}} + u^{i}_{j,t} \qquad [A4]$$

to obtain a marginal q estimate, $q^{\cdot} = \beta^{i}_{0}$, for that industry; Dj,t, −1 is defined as dividends for common shares plus repurchases of common shares plus interest expenses. A4 is estimated using the Generalized Least Squares method to allow error correlation across time for each firm and across firms in each period.

3.5.2 Determination of Firm Specific Stock Returns Variation

Firm specific return variation is obtained by regressing firm j's return in industry i ($r_{i,j,t}$) on market and industry returns ($r_{m,t}$; $r_{i,t}$ respectivelly) .

$$r_{i,j,t} = \beta_{j,0} + \beta_{j,m} r_{m,t} + \beta_{j,i} r_{i,t} + \varepsilon_{i,j,t} \qquad [A5]$$

Where:

$\beta_{j,0}$ is the constant, $\beta_{j,m}$ and $\beta_{j,i}$ are regression coefficients and $\varepsilon_{i,j,t}$ is the noise term. The market index and industry indices are value weighted excluding the firm in question. $r_{m,t}$ and ; $r_{i,t}$ represents market and industry returns respectively.

Following Roll (1988) firm specific return variation can be distinguished into the market and industry components as shown below:

$$R^2 = \frac{\sigma^2_{m,i}}{\sigma_{\varepsilon}{}^2_i + \sigma^2_{m,i}} \qquad [A6]$$

$$\text{Where: } \sigma_{\varepsilon}{}^2_i = \frac{\Sigma_{j \varepsilon i} SSR_{i,j}}{\Sigma_{j \varepsilon i} T_j} \quad \text{and} \quad \sigma^2_{m,i} = \frac{\Sigma_{j \varepsilon i} SSM_{i,j}}{\Sigma_{j \varepsilon i} T_j} \qquad [A7]$$

$SSR_{i,j}$ and $SSM_{i,j}$ are the unexplained and explained variations of [1] above and are scaled by $\Sigma_{j \varepsilon i} T_j$ the number of observations in industry i. $[1- R^2]$ for all firms in the industry measures the importance of firm specific return variation in the industry.

$1- R^2$ can be rewritten using a logistic transformation as $1- R_i{}^2 \epsilon [0,1]$ to $\Psi_i \epsilon R$

The Greek letter *psi* (Ψ) is used to denote firm-specific stock return variation measured relative to variations due to industry- and market-wide variation

$$\Psi_i = \ln [(1- R_i{}^2)/R_i{}^2] = \ln \left[\frac{(1-R_i{}^2)}{R_i{}^2}\right] = \ln \left[\frac{\sigma_{\varepsilon}{}^2_i}{\sigma^2_{m,i}}\right] = \ln(\sigma_{\varepsilon}{}^2_i) - \ln(\sigma_m{}^2_i) \qquad [A8]$$

From the above, a higher Ψ_i means a greater power of firm specific return variation ($\sigma_{\varepsilon}{}^2_i$) in explaining stock price movements.

3.5.3 Correlation of the Variables

The variables developed above were then correlated to determine whether the firm specific return variation and the capital expenditure were aligned to market value maximisation. $(q^{\cdot} - 1)^2$ and $|q^{\cdot} - 1|$ were the measures of capital expenditure alignment to value maximisation while $\ln(\sigma_{\varepsilon}^{2}{}_{i})$ absolute firm specific return variation and $\ln(\sigma_{m}^{2}{}_{i})$ absolute systematic stock return variation and Ψ_i relative firm specific stock return variation were measures relating to firm's returns.

3.5.4 Test of Significance

The relationship between capital budgeting and stock return variation variables was determined by means of correlation and tested using Pearson statistic at 10% level of significance based on a two tail test. Higher firm specific return variation was statistically significant where marginal q is nearer one where implying that greater firm specific firm return variation is associated with higher quality capital budgeting. The significance could also be determined where marginal q is low and firm specific variation is high reflecting inefficient capital budgeting.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of data analysis and an interpretation of the results. It also provides a discussion implication of the results of analysis of the data. However, the analysis could not be done for two firms which had been suspended from the Nairobi securities exchange. These are BOC Kenya Limited and Carbacid investments Limited. The market valuation could therefore not be determined for these firms. Two other firms; A. Baumann Limited and Kenya Orchards Limited were also omitted from the analysis as they had limited trading at the securities market during the analysis window and their inclusion would have biased the results.

4.2 Results of Analysis of Capital Budgeting Efficiency Variables

Results of analysis of capital budgeting efficiency variables are as tabulated in table 1 below:

Table 4.1: Measures of Capital Budgeting Efficiency

		EABL	MUMIAS	EVEREADY	BAT	UNGA	SECTOR
Marginal q	q	0.299	0.520	-0.079	-0.072	0.338	0.06
Squared deviation of marginal q from 1	$(1 - q)^2$	0.491	0.230	1.164	1.149	0.438	0.88
Absolute deviation of marginal q from 1	$\|1 - q\|$	0.701	0.480	1.079	1.072	0.662	0.93

Source: Research Findings

The above results show that the deviation of marginal q from the optimum is quite high. The degree of corporate investment efficiency varies across firms. 20% of the analysed firms reflect over investment in capital allocation.

4.3 Results of Analysis of Firm Specific Return Variation

Results of analysis of firm specific return variation are as tabulated in table 2 below:

Table 4.2: Stock Returns Variation Variables

		EABL	MUMIAS	EVEREADY	BAT (K)	UNGA
Firm-specific stock return variation	σ^2_ε	0.037	0.062	0.173	0.022	0.139
Systematic stock return variation	σ^2_m	0.001	0.003	0.003	0.001	0.006
Systematic relative to firm-specific stock return variation	R^2	0.03	0.045	0.02	0.007	0.039
Absolute firm-specific stock return variation	$\ln(\sigma^2_\varepsilon)$	- 3.2968	-2.7806	-1.7545	-3.8167	-1.9733
Absolute systematic stock return variation	$\ln(\sigma^2_m)$	-6.9078	-5.8091	-5.8091	-6.9078	-5.1159
Relative firm-specific stock return variation	Ψ	3.611	3.0285	4.0546	3.091	3.1426

Source: Research Findings

It can be observed from the above table that in all the five firms analysed, the variation in stock returns is mainly explained by firm specific factors.

4.4 Correlation and Test of Significance

Correlation analysis on capital budgeting efficiency and stock return variation variables was done to determine the relationship if any and at what level will is the relationship significant. Results of the analysis are tabulated in table 3 below.

Table 4.3: Correlation and Test of Significance

Capital budgeting efficiency variable	Stock return variation variable	Correlation co-efficient	Significance level based on 2 tail test
$(1-\dot{q})^2$	$\ln(\sigma^2_\varepsilon)$	0.779	0.121
$\dot{q}$	$\ln(\sigma^2_\varepsilon)$	0.06	0.924
$(1-\dot{q})^2$	Ψ	0.705	0.184

Source: Research Findings

It can be observed from the table above that there is a strong positive correlation between capital budgeting efficiency variable [(1-˙q)2] and stock return variation variable measuring absolute firm specific variation [ln(σ2ε)] and relative firm specific variation [Ψ] and the relationship is highly significant. This implies that investment decisions efficiency plays a significant role in market valuation.

4.5 Interpretation of Findings

The above results show that a bigger proportion of variation in returns of the firms in the manufacturing segment of the Nairobi securities exchange is explained by firm specific factors with market and industry factors having an insignificant influence. This observation though similar to Durnev et al (2004) has a totally different explanation. The above observation is explained by the fact that the firms analysed, although all are in manufacturing they are not in the same industry. The market perception for each firm is therefore influenced by independent factors which do not affect other firms in the sector. The Nairobi securities exchange has relatively fewer listed firms compared to the developed securities with more listed firms. In Durnev et

al (2004) the firms strictly belonged to similar industry while in this case are in dissimilar industries.

It is interesting to note that the results of the analysis reflect a high positive correlation between measures of capital budgeting efficiency and stock return variations even though the measures of capital budgeting efficiency do not reflect efficient alignment of investment decisions to corporate value enhancement. This is mainly attributed to the fact that during the research period the firms analysed experienced negative mean returns.

Considering firm specific return variation as a proxy for informed trading (Roll, 1988) explains the limited trading on the securities analysed. The high firm specific return variation reflects an informed market, however, the information influenced the market negatively hence resulting in limited trading and negative mean returns.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the research project, conclusions from research results, limitations of study and Recommendations for further research.

5.2 Summary

The study sought to find out the relationship between capital budgeting efficiency and stock returns variation with focus on firm specific returns variation among firms at the Nairobi securities exchange with focus on the manufacturing sector. The study has established that there exists a significant positive relationship between measures of capital budgeting efficiency and stock return variation variables.

This study has also shown that there is a mismatch between capital budgeting and market value maximisation as reflected by the magnitude of deviation of marginal q from its optimal in the firm listed in the manufacturing sector of the Nairobi Securities Exchange. The market sentiments were aptly reflected by the magnitude of firm specific return variation which has been used in prior studies as the proxy for trading with private information. The magnitude of firm specific variation varied among the firms reflecting that the private information varied from firm to firm. This is mainly because though the firms are all in manufacturing, they are in different industries where each firm's market performance was impacted differently. This may also imply that the cost of obtaining private information varied among the firms in the study.

Measures of capital budgeting efficiency and stock returns variation had a statistically significant positive correlation. This reflects the importance of efficient allocation of capital resources in enhancing firm value.

5.3 Conclusions

The research has shown that firms in the manufacturing sector of the Nairobi Securities Exchange were not efficient in capital budgeting during the period of study. The research has also shown that there is a statistically significant positive relationship between capital budgeting efficiency and firm specific stock return variation.

5.4 Recommendations for Policy

The research findings show that marginal q could be adopted by organizations in assessing the impact of their investment decisions. This could help corporate managers take corrective action early before to avoid wasting corporate resources or avert take-over bids. Firms could set a margin of tolerance within which they expect their investment decisions to perform

Market regulators such as Capital Markets Authority and Nairobi Securities Exchange could use the above research to base their intervention actions. This will enable them maintain investor confidence and spur further market growth

Stock market analysts may also adopt the above research as an additional tool in the evaluating stocks to advise their clients on which stock to invest in.

5.5 Limitations of Study

The research findings were limited by the fact that two firms in the manufacturing sector of the Nairobi Securities Exchange had been suspended from trading during the research period. These had to be omitted from the study because their market values could not be determined objectively. These firms did not submit their financial

statements to the market regulators during this period. During the study period, two firms were inactive from trading for long periods. These firms were omitted from the analysis to reduce outlier effect.

5.6 Areas for Further Research

This research focussed on the manufacturing sector of the Nairobi securities exchange, it is recommended that further research be carried out on all sectors to assess the capital allocation efficiency and information efficiency of the exchange. This will enable conclusions to be drawn on the whole market and facilitate better decision making by all stakeholders.

This research was limited to a five year period. Research covering longer periods may also be carried out to assess if the situation revealed in the current research will prevail for a much longer period.

The research may also be performed with introduction of control variables for interdependency.

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APPENDICES

APPENDIX I: LISTED COMPANIES AT THE NAIROBI SECURITIESEXCHANGE AS SEPTEMBER 2011

AGRICULTURAL

1. Eaagads Limited
2. Kapchorua Tea Co. Ltd
3. Limuru Tea Co. Ltd
4. Rea Vipingo Plantations Ltd
5. Sasini Ltd
6. Willamson Tea Kenya Ltd
7. Kakuzi Ltd

COMMERCIAL AND SERVICES

1. Express Ltd
2. Kenya Airways Ltd
3. Nation Media Group
4. Standard Group Ltd
5. TPS East Africa (Serena) Ltd
6. Scan group Ltd
7. Uchumi Supermarkets Ltd
8. Hutchings Biemer Ltd

MANUFACTURING AND ALLIED

1. BOC Kenya Ltd
2. BAT Kenya Ltd
3. Carbacid Investments Ltd
4. East African Breweries Ltd
5. Eveready East Africa Ltd
6. Kenya Orchards
7. Mumias Sugar Co. Ltd
8. Unga Ltd
9. A Bauman & Company Ltd

TELECOMMUNICATION AND TECHNOLOGY

1. Access Kenya Group Ltd
2. Safaricom Ltd

AUTOMOBILES AND ACCESSORIES

1. Car and General (K) Ltd
2. CMC Holdings Ltd
3. Sameer Africa Ltd
4. Marshalls (EA) Ltd

BANKING

1. Barclays Bank Ltd
2. CFC Stanbic Holding Ltd
3. Diamond Trust Bank Kenya Ltd
4. Kenya Commercial Bank Ltd
5. National Bank of Kenya Ltd
6. NIC Bank Ltd
7. Standard Chartered Bank Ltd
8. Equity Bank Ltd
9. The Co- operative Bank of Kenya Ltd
10. Housing Finance Co. Ltd

INSURANCE

1. Jubilee Holdings Ltd
2. Pan Africa Insurance Holdings Ltd
3. Kenya Re-Insurance Corporation Ltd
4. CFC Insurance Holdings Ltd
5. British – American Investments Company (Kenya) Ltd

INVESTMENT

1. City Trust Ltd
2. Olympia Capital Holdings Ltd
3. Centum Investment Co. Ltd
4. Trans – Century Ltd

CONSTURUCTION AND ALLIED

1. Athi River Mining
2. Bamburi Cement Ltd
3. Crown Berger Ltd
4. East African Cables Ltd
5. E.A. Portland Cement Ltd

ENERGY AND PETROLEUM

1. KenolKobil Ltd
2. Total Kenya Ltd
3. KenGen Ltd
4. Kenya Power and Lighting Co. Ltd

Source: Nairobi Securities Exchange

Appendix II: NAIROBI SECURITIES EXCHANGE STATISTICS AS AT 15 SEPTEMBER 2011

No.	Sector	No. firms	Issued share capital	Market Capitalization (Kshs " 000 ")	Average Market Value per company (Kshs)	Average Market Value per share (Kshs)
1.	Agricultural	7	337,602,319	8,144,741.91	1,163,534.56	2.4
2.	Automobiles & Accessories	4	908,864,363	10,110,353.28	2,527,588.32	11.12
3.	Banking	10	17,262,392,837	354,681,539.16	35,468,153.92	20.54
4.	Commercial & Services	8	1,426,983,254	61,593,945.36	7,699,243.17	43.16
5.	Construction & Allied	5	828,866,275	83,548,687.25	16,709,737.45	100.80
6.	Energy & Petroleum	4	5,579,788,736	73,583,120.48	18,395,780.12	13.19
7.	Insurance	5	1,656,287,364	23,839,307.45	4,767,861.49	14.39
8.	Investment	4	924,625,666	19,739,916.50	4,934,979.12	21.35
9.	Manufacturing & Allied	9	2,776,697,130	187,078,321.35	20,786,480.15	67.37
10.	Telecommunication & Technology	2	40,208,084,296	127,175,676.27	63,587,838.14	3.16

Source: Research Findings

APPENDIX III: STOCK PRICE OBSERVATION SHEET

Firm: .....

DAY	Day price	Day volume
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	31.05.2011		30.05.2011		7.05.201		26.05.2011	
	VWAP	RETURNS	VWAP	RETURNS	VWAP	RETURNS	VWAP	RETURNS
AGRICULTURAL								
Kakuzi Ord.5.00	74.50	4.930%	71	-0.699%	71.5	0.704%	71	4.412%
Rea Vipingo Plantations Ltd Ord 5.00	14.10	0.356%	14.05	0.357%	14	-0.356%	14.05	-0.355%
Sasini Ltd Ord 1.00	12.50	-0.398%	12.55	0.400%	12.5	0.000%	12.5	0.402%
COMMERCIAL AND SERVICES								
AccessKenya Group Ltd Ord. 1.00	7.95	-4.217%	8.3	-1.775%	8.45	0.000%	8.45	-0.588%
Car & General (K) Ltd Ord 5.00	32	-0.775%	32.25	0.000%	32.25	7.500%	30	-6.977%
CMC Holdings Ltd Ord 0.50	12	2.128%	11.75	0.000%	11.75	0.427%	11.7	8.333%
Hutchings Biemer Ltd Ord 5.00		0.000%		0.000%		0.000%		0.000%
Kenya Airways Ltd Ord 5.00	40.75	-0.610%	41	-0.606%	41.25	0.610%	41	0.000%
Marshalls (E.A.) Ltd Ord 5.00		0.000%		0.000%	12.75	0.000%		0.000%
Nation Media Group Ord. 2.50	182	-1.622%	185	0.000%	185	0.000%	185	0.543%
Safaricom Ltd Ord 0.05	3.85	-1.282%	3.9	1.299%	3.85	0.000%	3.85	-1.282%
Scangroup Ltd Ord 1.00	51	-1.923%	52	4.523%	49.75	-1.970%	50.75	-8.559%
Standard Group Ltd Ord 5.00	35	0.000%	35	-0.709%	35.25	0.000%		0.000%
TPS Eastern Africa (Serena) Ltd Ord 1.00	67.5	1.504%	66.5	0.758%	66	-1.493%	67	1.515%
Uchumi Supermarket Ltd Ord 5.00	12.5	0.000%		0.000%				
FINANCE AND INVESTMENT								
Barclays Bank Ltd Ord 0.50	17.85	-73.750%	68	-1.449%	69	-0.719%	69.5	0.000%
Centum Investment Co Ltd Ord 0.50	22.5	1.124%	22.25	0.000%	22.25	-1.111%	22.5	-1.099%
CFC Insurance Holdings Ltd ord.1.00	15.8	-4.242%	16.5	0.610%	16.4	-3.245%	16.95	0.296%
CFC Stanbic Holdings Ltd ord.5.00	53.5	-0.926%	54	-1.818%	55	0.917%	54.5	-1.802%
Diamond Trust Bank Kenya Ltd Ord 4.00	124	0.000%	124	-2.362%	127	0.794%	126	0.000%
Equity Bank Ltd Ord 0.50	25	1.010%	24.75	1.020%	24.5	0.000%	24.5	0.000%
Housing Finance Co Ltd Ord 5.00	25.25	-0.980%	25.5	-0.971%	25.75	-0.962%	26	-1.887%
Jubilee Holdings Ltd Ord 5.00	189	0.000%	189	-1.563%	192	-9.859%	213	1.914%
Kenya Commercial Bank Ltd Ord 1.00	25.25	0.000%	25.25	-0.980%	25.5	0.000%	25.5	-0.971%
Kenya Re-Insurance Corporation Ltd Ord 2.50	10	0.000%	10	1.010%	9.9	-0.503%	9.95	2.051%
National Bank of Kenya Ltd Ord 5.00	35.5	1.429%	35	-1.408%	35.5	1.429%	35	1.449%
NIC Bank Ltd Ord 5.00	44	0.000%	44	-1.676%	44.75	-0.556%	45	0.000%
Olympia Capital Holdings ltd Ord 5.00	4.85	0.000%	4.85	-2.020%	4.95	0.000%	4.95	2.062%
Pan Africa Insurance Holdings Ltd Ord 5.00	40.25	-6.395%	43	-3.911%	44.75	-4.278%	46.75	-6.030%
Standard Chartered Bank Ltd Ord 5.00	246	0.408%	245	-0.407%	246	0.820%	244	-1.215%
The Co-operative Bank of Kenya Ltd Ord 1.00	17.4	-0.571%	17.5	-1.961%	17.85	0.281%	17.8	0.000%
INDUSTRIAL AND ALLIED								
Athi River Mining Ord 5.00	186	1.087%	184	0.000%	184	3.371%	178	-2.732%
B.O.C Kenya Ltd Ord 5.00		0.000%	119	1.709%	117	0.000%	117	0.000%
Bamburi Cement Ltd Ord 5.00	170	-2.857%	175	0.000%		0.000%		0.000%
British American Tobacco Kenya Ltd Ord 10.00	249	-2.353%	255	2.000%	250	-2.344%	256	0.787%
Carbacid Investments Ltd Ord 5.00	121	0.000%	121	0.000%		0.000%		0.000%
Crown Berger Ltd Ord 5.00	31.75	0.000%		0.000%	31.75	0.000%	31.75	2.419%
E.A.Cables Ltd Ord 0.50	13.55	1.119%	13.4	-0.741%	13.5	0.372%	13.45	-0.738%
E.A.Portland Cement Ltd Ord 5.00		0.000%	85	0.000%		0.000%		0.000%
East African Breweries Ltd Ord 2.00	209	0.481%	208	0.000%	208	0.483%	207	1.970%
Eveready East Africa Ltd Ord.1.00	2.1	-2.326%	2.15	-2.273%	2.2	2.326%	2.15	0.000%
KenGen Ltd Ord. 2.50	15.6	-0.952%	15.75	0.639%	15.65	0.643%	15.55	0.000%
KenolKobil Ltd Ord 0.05	9.7	1.571%	9.55	-2.051%	9.75	-0.510%	9.8	0.513%
Kenya Power & Lighting Co Ltd Ord 2.50	21.5	1.176%	21.25	0.000%	21.25	-1.163%	21.5	0.000%
Mumias Sugar Co. Ltd Ord 2.00	7.45	-0.667%	7.5	-2.597%	7.7	-0.645%	7.75	-0.641%
Sameer Africa Ltd Ord 5.00	5.75	-2.542%	5.9	-1.667%	6	7.143%	5.6	0.000%
Total Kenya Ltd Ord 5.00	25.5	-0.971%	25.75	0.000%	25.75	0.000%	25.75	0.000%
Unga Group Ltd Ord 5.00	9.45	-5.025%	9.95	-1.970%	10.15	0.000%	10.15	2.525%
A.Baumann & Co Ltd Ord 5.00		0.000%		0.000%		0.000%		0.000%
City Trust Ltd Ord 5.00	215	0.000%		0.000%		0.000%		0.000%
Eaagads Ltd Ord 1.25		0.000%		0.000%	45	0.000%		0.000%
Express Ltd Ord 5.00	4.85	3.191%	4.7	-1.053%	4.75	9.195%	4.35	-5.435%
Williamson Tea Kenya Ltd Ord 5.00		0.000%		0.000%	185	0.000%		0.000%
Kapchorua Tea Co. Ltd Ord Ord 5.00		0.000%		0.000%		0.000%	103	0.000%
Kenya Orchards Ltd Ord 5.00		0.000%		0.000%		0.000%		0.000%
Limuru Tea Co. Ltd Ord 20.00		0.000%		0.000%		0.000%		0.000%
BAT - Market		-1.760%		-0.468%		0.185%		-0.190%
BAT- Industry		-1.507%		-1.368%		0.433%		0.771%
EABL - Market		-1.814%		-0.430%		0.131%		-0.213%
EABL - Industry		-2.074%		-0.968%		-0.133%		0.534%
CARBACID - Market		-1.805%		-0.430%		0.140%		-0.175%
CARBACID - Industry		-1.978%		-0.968%		-0.036%		0.928%
EVEREADY - Market		-1.761%		-0.386%		0.096%		-0.175%
EVEREADY - Industry		-1.609%		-0.514%		-0.598%		0.534%
UNGA - Market		-1.709%		-0.392%		0.140%		-0.224%
UNGA - Industry		-0.973%		-0.574%		-0.036%		0.423%
Mumias - Market		-1.792%		-0.380%		0.153%		-0.163%
Mumias - Industry		-1.845%		-0.449%		0.093%		1.057%

APPENDIX V (a)

EAST AFRICAN BREWERIES LIMITED

Year	P t	CS j,t	PS j,t,	LTD j,t	SD j,t	STA j,t	V_{it}	K_{it}	INV	$A_{it} = K_{it} + INV$	D_{it}	V_{it-1}	ΔV_{it}	A_{it-1}	ΔA_{it}	$\Delta V_{it} / A_{it-1}$	$\Delta A_{it} / A_{it-1}$	V_{it-1} / A_{it-1}	D_{it} / A_{it-1}
2006	0.94	120,593,157,000	0	1,905,700,000	4,290,427,000	13,873,011,000	106,141,296,620	26,513,576,479	4,048,068,000	30,561,644,479	4,023,031,000								
2007	0.957	101,482,766,000	0	2,051,597,000	8,203,822,000	18,103,247,000	89,608,635,666	25,725,091,069	5,438,580,000	31,163,671,069	5,144,119,000	106,141,296,620	(16,532,660,954)	30,561,644,479	602,026,590	-0.54096	0.01970	-6.42010	0.16832
2008	0.838	157,364,026,000	0	2,269,487,000	8,867,918,000	17,534,514,000	126,510,276,446	25,758,378,864	5,934,152,000	31,196,958,864	7,726,950,000	89,608,635,666	36,901,640,780	31,163,671,069	33,287,795	1.18412	0.00107	2.42831	0.24795
2009	0.895	118,616,100,000	0	3,031,849,000	9,432,296,000	18,941,137,000	100,364,501,660	24,242,738,263	6,946,357,000	30,176,890,263	7,194,697,000	126,510,276,446	(26,145,774,786)	31,196,958,864	(1,020,068,601)	-0.83809	-0.03270	-4.83865	0.23062
2010	0.959	143,130,158,436	0	2,783,675,000	11,684,390,000	17,456,435,000	134,395,975,110	25,455,985,090	3,465,054,000	32,402,342,090	7,560,278,000	100,364,501,660	34,031,473,450	30,176,890,263	2,225,451,827	1.12773	0.07375	2.94917	0.25053
2011	0.86	154,200,999,420	0	7,314,817,000	15,509,186,000	13,855,244,000	140,325,992,241	28,500,663,774	4,399,365,000	31,965,717,774	8,428,671,000	134,395,975,110	5,930,017,131	32,402,342,090	(436,624,316)	0.18301	-0.01346	11.66367	0.26013

MUMIAS SUGAR COMPANY

Year	P_t	CS_{jt}	PB_{jt}	LTD_{jt}	SD_{jt}	STA_{jt}	V_{jt}	K_{jt}	INV	$A_{jt} = K_{jt} + INV$	D_{jt}	ΔV_{jt}	A_{jt-1}	ΔA_{jt}	$\Delta V_{jt}/A_{jt-1}$	$\Delta A_{jt}/A_{jt-1}$	V_{jt}/A_{jt}	D_{jt}/A_{jt-1}
2006	0.91	20,919,[illegible]	0	2,155,414,000	2,097,013,000	4,273,846,000	24,250,604,340	15,273,297,358	689,842,000	15,963,140,358	795,449,000							
2007	0.957	14,[illegible]	0	1,965,832,000	1,613,224,000	3,676,000,000	14,061,389,141	15,103,075,311	518,679,000	15,621,754,311	664,584,000	(10,189,295,199)	15,963,140,358	(341,386,147)	-0.63831	-0.02139	0.00006	0.04161
2008	0.935	10,151,[illegible],000	0	2,360,107,000	2,200,800,000	4,561,3[illegible]	17,193,444,606	15,183,505,211	1,084,254,000	16,268,759,211	548,871,000	3,132,135,465	15,621,754,311	647,005,000	0.20050	0.04142	1.10061	0.03299
2009	[illegible]	9,3[illegible]	0	3,475,807,000	2,212,0[illegible]	5,099,837,000	8,474,802,435	16,526,309,834	796,006,000	17,322,395,834	833,0[illegible]	(8,718,642,171)	16,268,759,211	1,053,635,823	-0.53591	0.06476	0.52092	0.05058
2010	0.932	[illegible]	0	4,084,287,000	2,350,811,000	6,495,034,000	19,658,468,116	15,197,054,256	[illegible]	18,662,110,256	848,763,000	11,203,665,681	17,322,395,834	1,339,715,222	0.64562	0.07734	1.13486	0.04888
2011	0.86	10,920,[illegible]	0	5,7[illegible]	2,961,[illegible]	6,511,659,000	11,290,381,000	15,964,76[illegible]	4,399,365,000	20,364,129,665	819,898,000	(8,368,607,116)	18,662,110,256	1,702,019,410	-0.44840	0.09120	0.60497	0.04393

APPENDIX V (c)

EVEREADY EAST AFRICA LIMITED

	P_t	$CS_{j,t}$	$PS_{j,t}$	$LTD_{j,t}$	$SD_{j,t}$	$STA_{j,t}$	$V_{j,t}$	$K_{j,t}$	INV	$A_{j,t} = K_{j,t} + INV$	$D_{j,t}$	ΔV_{jt}	A_{t-1}	ΔA_{jt}	$\Delta V_{jt} / A_{t-1}$	$\Delta A_{jt} / A_{t-1}$	$V_{j,t} / A_{t-1}$	$D_{j,t} / A_{t-1}$
2006	0.94	1,512,000,000	0	82,900,000	393,429,000	743,538,000	1,170,103,540	187,277,633	500,758,000	688,035,633	23,913,000							
2007	0.957	1,617,000,000	0	101,757,000	644,475,000	1,005,279,000	1,299,561,021	207,687,563	793,647,000	1,001,334,563	156,020 000	129,457,481	688,035,633	313,298,930	0.18816	0.45535	1.88808	0.22676
2008	0.838	976,500,000	0	86,765,000	384,139,000	638,114,000	678,185,020	224,822,421	480,049,000	634,871,421	129,393,000	(621,376,001)	1,001,334,563	(376,463,141)	-0.62055	-0.37596	0.67728	0.12922
2009	0.895	546,000,000	0	74,800,000	528,176,000	795,254,000	316,581,190	238,723,889	497,211,000	735,934,889	34,151,000	(361,403,830)	624,871,421	111,063,468	-0.57869	0.17774	0.50663	0.05465
2010	0.959	798,000,000	0	123,592,000	792,425,000	943,397,000	739,024,580	267,628,637	685,669,000	953,297,637	37,372,000	422,443,390	735,934,889	188,458,000	0.57401	0.25608	1.00410	0.08078
2011	0.86	420,000,000	0	79,076,000	731,459,000	727,664,000	432,469,060	250,839,808	500,131,000	750,968,808	129,501,000	(305,555,520)	953,297,637	(193,336,829)	-0.32157	-0.20281	0.45366	0.13585

BRITISH AMERICAN TOBACCO KENYA LIMITED

	P t	CS$_{j,t}$	PS$_{j,t,}$	LTD j,t	SD j,t	STA j,t	V j,t,	K j,t	INV	Aj,t = Kj,t+ INV	$D_{j,t}$	ΔVjt	Ajt-1	ΔAjt	$\Delta V_{j,t} / A_{j,t-1}$	$\Delta A_{jt}/A_{j,t-1}$	$V_{j,t}/A_{j,t-1}$	$D_{j,t} / A_{j,t-1}$
2006	0.94	20,200,000,000	0	760,959,000	2,820,597,000	3,565,764,000	19,002,844,480	187,277,633	1,793,477,000	1,980,754,633	939,379,000							
2007	0.957	18,400,000,000	0	1,032,190,000	3,544,446,000	3,993,253,000	18,167,097,531	826,251,247	1,996,969,000	2,823,220,247	1,424,416,000	(835,746,949)	1,980,754,633	842,465,614	-0.42193	0.42533	9.17181	0.71913
2008	0.838	16,700,000,000	0	1,013,524,000	4,400,433,000	4,623,268,000	14,657,197,382	998,982,490	2,085,678,000	3,084,660,490	1,605,617,000	(3,509,900,149)	2,823,220,247	261,440,243	-1.24323	0.09260	5.19166	0.56872
2009	0.895	17,200,000,000	0	1,238,847,000	4,633,075,000	4,244,326,000	16,850,698,420	1,264,828,867	2,299,571,000	3,564,399,867	1,865,777,000	2,193,501,038	3,084,660,490	479,739,377	0.71110	0.15552	5.46274	0.60486
2010	0.959	21,500,000,000	0	1,900,596,000	4,106,653,000	4,804,289,000	21,772,138,640	1,876,225,903	2,972,758,000	4,848,983,903	1,494,899,000	4,921,440,220	3,564,399,867	1,284,584,037	1.38072	0.36039	6.10822	0.41940
2011	0.86	26,400,000,000	0	1,997,849,000	5,340,629,000	6,979,714,000	23,012,537,040	2,571,200,681	4,374,777,000	6,945,977,681	1,972,675,000	1,240,398,400	4,848,983,903	2,096,993,778	0.25581	0.43246	4.74585	0.40682

APPENDIX V (e)

CARBACID INVESTMENTS KENYA LIMITED

Year	P t	CS,j,t	PS,j,t,	LTD j,t	SD j,t	STA j,t	V j,t,	K j,t	INV	Aj,t = Kj,t+ INV	ΔVjt	Ajt-1	ΔAjt	$\Delta V_{j,t} / A_{j,t-1}$	$\Delta A_{j,t} / A_{j,t-1}$	$V_{j,t} / A_{j,t-1}$	$D_{j,t} / A_{j,t-1}$
2006	0.94	1,551,765,435	0	134,704,000	31,332,000	459,977,000	1,182,354,969	187,277,633	13,593,000	200,870,633							
2007	0.96	1,551,765,435	0	127,951,000	39,875,000	517,794,000	1,150,120,145	176,838,166	13,378,000	190,216,166	(32,234,824)	200,870,633	(10,654,467)	-0.16048	-0.05304	2.57775	0.94696
2008	0.84	1,551,765,435	0	146,750,000	38,389,000	545,165,000	998,610,607	230,683,006	26,533,000	244,061,006	(151,509,539)	190,216,166	53,844,841	-0.79651	0.28307	2.86603	1.28307
2009	0.9	4,655,296,305	0	142,237,000	66,549,000	707,107,000	3,720,492,898	252,113,030	34,833,000	278,646,030	2,721,882,291	244,061,006	34,585,023	11.15247	0.14171	2.89726	1.14171
2010	0.96	4,927,138,425	0	151,851,000	66,558,000	385,105,000	4,565,264,286	444,797,706	58,316,000	479,630,706	844,771,388	278,646,030	200,984,676	3.03170	0.72129	1.38206	1.72129
2011	0.86	4,383,454,185	0	79,076,000	731,459,000	727,664,000	3,841,039,659	250,829,808	509,131,000	309,145,808	(724,224,626)	479,630,706	(170,484,897)	-1.50996	-0.35545	1.51713	0.64455

APPENDIX V (f)

UNGA LIMITED

Year	Pt	CE t	PS t	LTD t	SD t	STA t	V t	K t	INV	A t = K t + INV	D t	V t-1	ΔV t	A t-1	D...	ΔA t	ΔV t / A t-1	ΔA t / A t-1	V t-1 / A t-1	D t-1 / A t-1
2006	0.24	1,258,[illegible]	0	89,898,000	1,304,461,000	1,839,693,000	763,774,462	1,392,064,336	834,754,000	2,226,[illegible],336	81,812,000									
2007	[illegible]	[illegible]	0	99,517,000	1,347,000,000	2,11[illegible]	303,214,323	1,285,[illegible],336	[illegible]	2,2[illegible],336	68,990,000	763,774,462	(540,560,139)	2,226,[illegible],336	81,812,000	41,[illegible]	-0.25173	0.01866	0.34795	0.03719
2008	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	(220,012,487)	[illegible]	1,197,245,000	2,17[illegible]	81,968,000	303,214,323	(432,241,810)	2,2[illegible],336	68,990,000	([illegible])	[illegible]	[illegible]	[illegible]	0.03041
2009	[illegible]	757,069,860	0	334,142,000	2,085,012,000	[illegible]	([illegible])	[illegible]	2,270,794,000	[illegible]	[illegible]	-220,012,487	([illegible])	2,179,5[illegible]	81,968,000	129,247,979	-0.16294	0.05936	0.10509	0.03763
2010	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	(756,441,383)	1,851,5[illegible],640	[illegible]	3,315,[illegible],726	27,530,000	-884,171,100	(172,270,283)	[illegible]	[illegible]	1,0[illegible]	-0.07461	0.43604	-0.75303	0.07158
2011	[illegible]	[illegible]	0	345,150,000	1,618,800,000	[illegible]	([illegible])	[illegible]	[illegible]	2,990,045,673	12,270,000	-756,441,383	(487,974,737)	3,315,931,716	27,530,000	(325,458,053)	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX V (g)

INDUSTRY

Year	CS_{jt}	PS_{jt}	LTD_{jt}	SD_{jt}	STA_{jt}	V_{jt}	K_{jt}	INV	$A_{jt} = K_{jt} + INV$	D_{jt}	V_{jt-1}	ΔV_{jt}	A_{jt-1}	ΔA_{jt}	$\Delta V_{jt} / A_{jt-1}$	$\Delta A_{jt} / A_{jt-1}$	V_{jt-1} / A_{jt-1}	D_{jt} / A_{jt-1}
2006	169,573,817,824	0	4,994,871,000	18,815,957,000	24,395,852,000	151,328,713,442	43,553,483,439	7,866,900,000	51,420,383,439	5,863,984,000								
2007	137,214,045,165	0	9,201,894,000	15,353,928,000	28,888,135,000	123,339,817,682	43,147,943,426	9,730,397,000	52,878,340,426	7,458,131,000	151,328,713,442	-27,988,895,760	51,420,383,439	1,457,956,987	-5.4067	-0.0521	-0.2665	-1.8372
2008	195,339,823,510	0	5,895,701,000	18,588,630,000	30,315,524,000	158,810,075,967	43,361,719,737	10,783,378,000	53,354,802,737	10,091,998,000	123,339,817,682	35,470,258,285	52,878,340,426	476,462,310	3.4773	0.0134	0.2845	1.4908
2009	146,299,169,868	0	8,355,545,000	18,391,542,000	32,909,483,000	125,422,412,605	43,384,145,782	12,810,029,000	54,108,420,781	9,967,325,000	158,810,075,967	-33,387,663,363	53,354,802,737	753,618,045	-4.7565	-0.0226	-0.2985	-1.5980
2010	186,016,069,015	0	9,247,454,000	21,177,852,000	33,115,864,000	175,809,165,063	43,848,402,527	12,546,736,000	60,182,255,612	9,966,849,000	125,422,412,605	50,386,752,458	54,108,420,781	6,073,834,831	2.4892	0.1205	0.1978	1.0739
2011	192,717,569,380	0	15,475,710,000	26,161,765,000	32,168,901,000	173,886,963,221	48,325,402,624	15,608,858,000	63,825,839,602	11,363,015,000	175,809,165,063	-1,922,201,842	60,182,255,612	2,843,573,989	-91.4624	-1.4793	-5.9115	-31.3090