# THE VALIDITY OF CAPITAL ASSET PRICING MODEL: EVIDENCE FROM THE NAIROBI SECURITIES EXCHANGE

BY:

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# DECLARATION

This research project is my original work and has not been presented for award of degree in any University

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

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# DEDICATION

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# ABSTRACT

This study tests the validity CAPM in Kenyan Securities market, The Nairobi Securities Exchange. CAPM explains the links present between risk and return in efficient markets. Many investors face the challenge of determining with certainty the returns for their investments as well as choosing an efficient portfolio(s). A model such as CAPM that is capable of predicting the returns will be of great help. The objective of this study was therefore to establish if CAPM is valid at the NSE.

The study has focused on the calculation of betas and excess returns of thirty firms listed on NSE using a four year data of share prices from 1st Jan, 2009 to 31st Dec, 2012. A simple regression model was employed to analyze the data in three stages i.e. portfolio formation, initial estimation and testing periods. A significance test at 95% confidence level was also conducted to evaluate the data and regression results available within the testing period.

The data analysis revealed inapplicability of CAPM to the NSE, 20- share index, and the results confirmed that the standard CAPM is not verified in the NSE during the period of study. Using portfolio formation to diversify away most of the firm-specific part of risk thereby enhancing the beta estimates, the findings from the investigation appears inconsistent with the theory's basic hypothesis that higher beta yields higher return and vice versa. The CAPM model implies that the prediction for the intercept be equal to risk free rate and the slope of SML equals the average risk premium. The findings from the test are also inconsistent with Theory of CAPM, indicating evidence against the model. Further studies may be conducted to check the applicability of the model, by taking a larger sample of firms.

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# LIST OF ABBREVIATIONS

**AIMS** – Alternative Investment Market Segment

**APT** – Arbitrage Pricing Model

**ATS** – Automated Trading System

**CAPM** – Capital Asset Pricing Model

**CDSS** – Central Depository Settlement System

**FISM** – Fixed Income Securities Market

**FOMS** – Futures and Options Market Segment

**MIMS** - Main Investment Market Segment

**NSE** – Nairobi Securities Exchange

**SML** – Securities Market Line

**GARCH-** Generalized Auto Regressive Conditional Heteroskedasticity

# CHAPTER ONE: INTRODUCTION

## 1.1Background of the Study

A capital market where prices provide meaningful signals for capital allocation is an important component of a capitalist system. When investors choose among the securities that represent ownership of firms' activities, they can do so under the assumption that they are paying fair prices given what is known about the firm. The foundations of modern finance theory embrace such a view of capital markets. The underlying paradigm asserts that financial capital circulates to achieve those rates of return that are most attractive to its investors. In accordance with this principle, prices of securities observed at any time fully reflect all information available at that time so that it is impossible to make consistent economic profits by trading on such available information.

Modern academic finance is built on the proposition that markets are fundamentally rational. The foundational model of market rationality is the capital asset pricing model (CAPM). The implications of rejecting market rationality as encapsulated by the CAPM are very considerable. In capturing the idea that markets are inherently rational, the CAPM has made finance an appropriate subject for econometric studies. Industry has come to rely on the CAPM for determining the discount rate for valuing investments within the firm, for valuing the firm itself, and for setting sales prices in the regulation of utilities, as well as for such purposes as benchmarking fund managers and setting executive bonuses linked to adding economic value. The concept of market rationality has also been used to justify a policy of arms-length market regulation on the basis that the market knows best and that it is capable of self-correcting. Nevertheless, we consider

that in choosing to attribute CAPM-rationality to the markets, we are imposing a model of rationality that is firmly contradicted by the empirical evidence of academic research.

### 1.1.1The Capital Asset Pricing Model

One of the significant contributions to the theory of financial economics occurred during the1960s, when a number of researchers, among whom Sharpe was the leading figure, used Markowitz's portfolio theory as a basis for developing a theory of price formation for financial assets, the so-called Capital Asset Pricing Model. Markowitz's portfolio theory analyses how wealth can be optimally invested in assets, which differ in regard to their expected return and risk, and thereby also how risks can be reduced. For his contribution to CAPM, Sharpe was awarded together with Markowitz and Miller the 1990 Nobel Memorial prize in economic sciences with one third.

The foundation of the CAPM is that an investor can choose to expose himself to a considerable amount of risk through a combination of lending-borrowing and a correctly composed portfolio of risky securities. The model emphasizes that the composition of this optimal risk portfolio depends entirely on the investor's evaluation of the future prospects of different securities, and not on the investors' own attitudes towards risk. The latter is reflected exclusively in the choice of a combination of a risky portfolio and risk-free investment or borrowing. In the case of an investor who does not have any special information, that is better information than other investors, there is no reason to hold a different portfolio of shares than other investors, which can be described as the market portfolio of shares.

The CAPM incorporates a factor that is known as the "beta value" of a share. The beta of a share designates its marginal contribution to the risk of the entire market portfolio of risky securities. This implies that shares designated with high beta coefficient above 1 is expected to have over-average effect on the risk of the total portfolio while shares with a low beta coefficient less than 1 is expected to have an under-average effect on the aggregate portfolio. In efficient market according to CAPM, the risk premium and the expected return on an asset will vary in direct proportion to the beta value. The equilibrium price formation on efficient capital market generates these relations.

The model is considered as the backbone of contemporary price theory for financial markets and it also widely used in empirical investigations, so that the abundance of financial statistical data can be utilized systematically and efficiently

### 1.1.2 The Nairobi Securities Exchange

Nairobi securities exchange (NSE) formally referred to as the Nairobi stocks exchange is a securities exchange located in Nairobi, Kenya's capital. It was founded in 1954 as a voluntary association of stock brokers registered under the societies act. Until after the attainment of independence in 1963, the business of dealing in shares was confined to the resident European community.

NSEs strategic plan is to evolve into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments. The total number of listed companies at the NSE are sixty in total categorized into; growth enterprise market, energy and petroleum, construction and allied, manufacturing and allied, banking, agricultural, commercial and services,

telecommunication and technology, automobiles and accessories, insurance, and investment. The securities traded at NSE include; treasury bills, corporate common stock, corporate bonds, government bonds etc.

It is reported that the NSE 20-share index recorded an all-time high of 5030 points on 18th February 1994. During the year 2000, the NSE embarked on a major reform of the market dubbed "Market segmentation and Re-organization". The reform process involved segmenting the market into four independent segments, namely;- The Main Investment Market Segment (MIMS) which has the highest listing financial requirements with respect to net assets and share capital at Ksh.50 million and Ksh.100 million respectively; the Alternate Investment Market Segment (AIMS) where listing financial requirements on net assets and share capital are at Ksh.10 million and Ksh.20 million respectively; the Fixed Income Security Market Segment (FISMS) where Treasury Bills and Corporate Bonds are traded and the Futures and Options Market Segment (FOMS) which is still dormant to date(NSE Report,2011).

This research study is concerned with Kenyan companies listed in the NSE covering four year period from (2009 to 2012). The study basically aims to investigate and test the validity of the capital asset pricing model in Kenyan context with special reference to NSE

## 1.2 Research Problem

Market investors wish to make optimal investment decisions that would guarantee them a desirable level of return commensurate with the magnitude of risk taken. Unfortunately, the profile information is not easy to obtain, and if obtained, the cost could be so high

leading to reduction in the level of expected returns or negative returns. Some studies have been carried out on the NSE concerning risk and return relationship. Akwimbi (2003) found that arbitrage pricing theory as a linear model successfully explains the expected return at the NSE. The scholars ascertained that APT holds true for the emerging markets.

Kamau (2002) examines the profile relationship of companies listed on the MIMS and the AIMS. The study utilized historical market data from the NSE for the period between January 1996 and December 2000. The research found out that there was no significant difference in terms of return and risk between those companies listed under the MIMS and the AIMS. Similar studies by Apuoyo (2010) and Nyaata (2009) however indicated mild contradiction between prediction using APT and CAPM approaches.

Gichana (2009), in his comparison of linear and non-linear models applicability on the securities exchange concluded that non-linear models are better predictors of return with risk. Similarly Omogo (2011) in seeking to establish the trade-off between risk and return used linear model to conclude that a relationship existed between risk and return on the NSE.

The current study seeks to improve on other scholar's findings by using more recent data (2007-2012) and focusing on the segmentation of the MIMS of the NSE. Several changes have taken place since the introduction of Central Depository System and the launch of live trading on the NSE in 2006. As found out by previous scholars, these changes could have an adverse effect in the risk return calculations and hence creating a gap for study.

The research gap in Kenya as alluded by the studies cited above and other studies abroad reviewed has been lack of industry on risk- return relationships. In most of the cases the non-linear APT models have been applied to make conclusions and recommendations. This study addresses the gap by establishing whether there are industry risk-return patterns for listed firms at the NSE by the use of linear model of the CAPM theory. The research also tests if results of previous scholars can hold for different period. The problem of stock portfolio valuation, therefore leads to the following research question(s); Does CAPM provide correct results when used for study involving pricing of securities at the securities market?, and does it prove to be helpful to the investors while pricing the securities and assessing the risk.

## 1.3 Objective of the study

To establish the validity of Capital Asset Pricing Model at the Nairobi Securities Exchange

## 1.4 Value of the Study

**Listed firms**; the knowledge of what factors determine the expected rate of return on a company's stock is a vital decision making component. It is hoped that this study will try to establish such factors which will be of great importance to managers of these firms in decision making. Several of studies have been carried out in other securities exchange throughout the globe, some have been consistent with what CAPM stipulates while others have differed, the findings of this study will justify whether CAPM holds true for firms listed in the NSE

**Investors**; sometimes managers fail to make certain disclosures of important information to the market. This coupled with the separation of ownership and management; investors are not able to make fair judgment when investing. This study will provide insight on CAPM which stipulates clearly the formula that investor could use to calculate their expected rate of return on their investments thus help them make better decisions. They are therefore more enlightened when it comes to making investment decisions.

**Academicians;** the study contributes to the literature of Capital Asset Pricing Model for firms listed in the Nairobi Securities exchange. It is hoped that the findings of this study will be valuable to the academicians who may find useful gaps that may stimulate interest in future research in this area of CAPM. Recommendations will be made on possible areas of future studies

# CHAPTER TWO: LITRATURE REVIEW

## 2.1 Introduction

Chapter two examines various theories and empirical studies that have been conducted in the area of investment risk and return. The portfolio theory as advanced by Markowitz (1952) has been reviewed. Subsequent asset pricing models such as the Capital Asset Pricing Model and Arbitrage Pricing Theory have been reviewed. Empirical studies, both local and foreign in the area of stock returns have also been reviewed. The chapter is concluded by summarizing the research gaps identified.

## 2.2 Theoretical Review

This section addresses the main theories included in this study for profile relationship and will include portfolio theory, Systematic risk, APT and CAPM theories.

### 2.2.1 Portfolio Theory

A portfolio is a collection of securities. As most securities available for investment have uncertain returns and thus risky, one needs to establish which portfolio to own. This problem has been referred to as portfolio selection problem. In an attempt to solve this problem, Markowitz (1952) published a landmark paper that is generally viewed as the origin of modern portfolio theory to investing.

Markowitz asserts investors should base their portfolio decisions only on expected returns and standard deviations. Investors should estimate the expected return and standard deviation of each portfolio and then choose the best one on the basis of these two parameters. Expected return can be viewed as a measure of potential reward

associated with any portfolio over the holding period and standard deviation can be viewed as a measure of the risk associated with the portfolio.

The assumptions of non-satiation and risk aversion are made in the Markowitz approach. Under non-satiation, investors are assumed to always prefer higher levels of end of period wealth to lower levels of terminal wealth. The reason is that higher levels of terminal wealth allow the investor to spend more on consumption at t=1(or in the more distant future). Thus given two portfolios which have the same standard deviation, the investor will choose the portfolio with the higher expected return. However, it is not quite so obvious what the investor will do when having to choose between two portfolios having the same level of expected return but different levels of standard deviation. This is solved by assuming that the investor is risk-averse meaning that he will choose the portfolio with the smaller standard deviation.

The Markowitz portfolio selection problem can be viewed as an effort to maximize the expected utility associated with the investor's terminal wealth. The relationship between utility and wealth is the investor's utility of wealth function. Under the assumption of non-satiation, all investors prefer more wealth to less wealth. Each investor may derive a unique increment of utility from an extra shilling of wealth (marginal utility). A common assumption is that investors experience diminishing marginal utility of wealth. An extra shilling of wealth provides positive additional utility, but added utility produced by each extra shilling becomes successively smaller. An investor with diminishing marginal utility is necessarily risk-averse.

The Markowitz approach also makes use of indifference curve analysis in solution of the portfolio selection problem. An indifference curve represents a set of risk and expected return combinations that provide an investor with the same amount of utility. Because indifference curves indicate an investor's preferences for risk and expected return, they can be put on a graph where the horizontal axis indicate risk as measured by standard deviation and the vertical axis indicates reward as measured by expected return. The investor is said to be indifferent return between any of the risk-expected combination on the same indifference curve. And investor has an infinite number of indifference curves. Risk-averse investors are assumed to consider any portfolio lying on an indifference curve farther to the northwest to the more desirable than any portfolio lying on an indifference curve that is not as far northwest.

The expected return on a portfolio is a weighted average of the expected returns of its component securities, with relative portfolio proportions of the component securities serving as weights. The standard deviation of a portfolio depends on the standard deviations and proportions of the component securities as well as their covariance with one another. Since an infinite number of portfolios can be constructed from a set of securities, the problem is to determine the most desirable portfolio. The Efficient Set theorem states that an investor will choose his or her optimal portfolio from the set of portfolios that; offer maximum expected return for varying degrees of risk, and offer minimum risk for varying levels of expected return. The set of portfolios meeting these two conditions is known as the efficient set (also known as efficient frontier). The process will first involve identification of the feasible set which represents all portfolios that can be formed from a given number of securities. The investor will then select an

optimal portfolio by plotting his or her indifference curve on the same figure as the efficient and then proceed to choose the portfolio that is on the indifference curve that is farthest northwest. This portfolio will correspond to the point at which an indifference curve is just tangent to the efficient set. An investor's optimal portfolio is located at the tangency point between the investor's indifference curves and the efficient set.

### 2.2.2 Capital Asset Pricing Model

Although mean variance analysis has been advocated as a framework for making investment decisions, a major problem of investment has been hoe to determine expected rates of return. Assets pricing theories attempt to provide a solution. Asset pricing theories try to explain why certain capital assets have higher expected returns than others and why the expected returns are at different points in time.

CAPM is considered the most basic asset pricing model. The model often expressed as CAPM of Sharpe (1964) and Lintner (1965) points the birth of asset pricing theory. It describes the relationship between risk and expected return and is used in the pricing of risky securities. The CAPM is still widely used in evaluating the performance of managed portfolio and estimating the cost of capital for firms even though, it is about five decades old. The CAPM emphasizes that to calculate the expected return of a security; two important things need to be known by the investor; the risk premium of the overall equity/portfolio, and the security's beta versus the market.

The security's premium is determined by the component of its return that is perfectly correlated with the market, thus the extent to which the security is a substitute for investing in the market. In other words, the component of the security's return that is

uncorrelated with the market can be diversified away and does not demand a risk premium.

The CAPM model states that the return to investors has to be equal to; the risk free rate, Plus a premium for the stocks as a whole that is higher than the risk free rate, Multiplied by the risk factor for the individual company.

This can be expressed mathematically as;

$E(R_i) = R_f+\beta_i(R_m)-R_f)$

Where; $E(R_i)$= Expected return of security I, $R_f$ = Risk free rate $\beta_i$ = Beta of the security I,$E(R_m)$ = Expected return on the market, $E(R_M)-R_f$= Market premium.

Equation above shows that the expected return on security I, is a linear combination of the risk free return on portfolio M. This relationship is a consequence of efficient set mathematics. The coefficient beta, β measures the risk of security I, and is related to covariance of security i with the tangency portfolio, M. therefore, the expected return will equal the risk-free asset plus a risk premium, where the risk premium depends on the risk of the security. The equation describing the expected return for security is referred to as the security market line (SML)

In the SML equation, expected returns are linear and the coefficient beta is;

$\beta_i = \sigma_{i\,m}/\sigma^2_m$

The SML is sometimes called the capital asset pricing model equation. It states the relationships that must be satisfied among the security's return, the security's beta and the return from portfolio M.

The CAPM model introduces simple mechanism for investors and corporate managers to evaluate their in investments. The model indicates that all investors and managers need to do is an evaluation and comparison between expected return and required return. If the expected results are otherwise unfavorable, it is necessary to abort intentions for potential investments in the particular security.

The CAPM is associated with a set of important implications which are often the basis of establishing the volatility of the model. These are; Investors calculating the required rate of return of a share will only consider systematic risk to be relevant, Share that exhibit high level of systematic risk are expected to yield a higher rate of return, and on average, there is a linear relationship between systematic risk and return, securities that are correctly priced should plot on the SML.

Generally it is accepted that validity of a theory depends on the empirical accuracy of its predictions rather than on the realism of its assumptions. CAPM assumes that all investors; Aim to maximize economic utilities, Are rational and risk averse, Are broadly diversified across a range of investments, Are price takers (i.e. they cannot influence prices), Can lend and borrow unlimited amount under the risk free rate of interest, Trade without transactions or taxation cost, Deal with securities that are all highly divisible into small parcels, Assume all information is available at the same time to all investors

### 2.2.3 Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) was developed primarily by Ross (1976a, 1976b). It is a one-period model in which every investor believes that the stochastic properties of returns of capital assets are consistent with a factor structure. Ross argues that if

equilibrium prices offer no arbitrage opportunities over static portfolios of the assets, then the expected returns on the assets are approximately linearly related to the factor loadings. The factor loadings, or betas, are proportional to the returns co-variances with the factors. Ross' (1976a) heuristic argument for the theory is based on the preclusion of arbitrage. Ross' formal proof shows that the linear pricing relation is a necessary condition for equilibrium in a market where agents maximize certain types of utility.

The APT is a substitute for the Capital Asset Pricing Model (CAPM) in that both assert a linear relation between assets' expected returns and their covariance with other random variables. (In the CAPM, the covariance is with the market portfolio's return.) The covariance is interpreted as a measure of risk that investors cannot avoid by diversification. The slope coefficient in the linear relation between the expected returns and the covariance is interpreted as a risk premium. Such a relation is closely tied to mean-variance efficiency.

Some collection of portfolios (or even a single portfolio) is mean-variance efficient relative to the mean-variance frontier spanned by the existing assets does not constitute a test of the APT, because one can always find a mean-variance efficient portfolio. Consequently, as a test of the APT it is not sufficient to merely show that a set of factor portfolios satisfies the linear relation between the expected return and its covariance with the factors portfolios.

### 2.2.4 Systematic Risk

Systematic risk, also known as "market risk" or "un-diversifiable risk", is the uncertainty inherent to the entire market or entire market segment. Also referred to as volatility,

systematic risk consists of the day-to-day fluctuations in a stock's price. Volatility is a measure of risk because it refers to the behavior, or "temperament," of your investment rather than the reason for this behavior. Because market movement is the reason why people can make money from stocks, volatility is essential for returns, and the more unstable the investment the more chance there is that it will experience a dramatic change in either direction. Interest rates, recession and wars all represent sources of systematic risk because they affect the entire market and cannot be avoided through diversification. Systematic risk can be mitigated only by being hedged.

Systematic risk underlies all other investment risks. If there is inflation, you can invest in securities in inflation-resistant economic sectors. If interest rates are high, you can sell your utility stocks and move into newly issued bonds. However, if the entire economy underperforms, then the best you can do is to attempt to find investments that will weather the storm better than the broader market. Popular examples are defensive industry stocks, for example, or bearish options strategies.

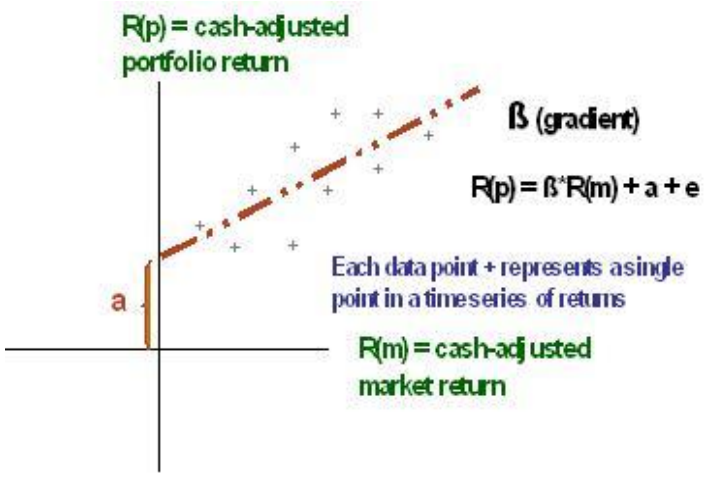
Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. In other words, beta gives a sense of a stock's market risk compared to the greater market. Beta is also used to compare a stock's market risk to that of other stocks. Investment analysts use the Greek letter 'ß' to represent beta. Beta is used in the capital asset pricing model (CAPM), as we described in the previous section.

Beta is calculated using regression analysis, and you can think of beta as the tendency of a security's returns to respond to swings in the market. A beta of 1 indicates that the

security's price will move with the market. A beta of less than 1, means that the security will be less volatile than the market. A beta of greater than 1 indicates that the security's price will be more volatile than the market. For example, if a stock's beta is 1.2, it's theoretically 20% more volatile than the market.

Many utility stocks have a beta of less than 1. Conversely, most high-tech Nasdaq-based stocks have a beta greater than 1, offering the possibility of a higher rate of return, but also posing more risk.

Beta helps us to understand the concepts of passive and active risk. The graph below shows a time series of returns (each data point labeled "+") for a particular portfolio R(p) versus the market return R(m). The returns are cash-adjusted, so the point at which the x and y axes intersect is the cash-equivalent return. Drawing a line of best fit through the data points allows us to quantify the passive, or beta, risk and the active risk, which we refer to as alpha.



The gradient of the line is its beta. For example, a gradient of 1.0 indicates that for every unit increase of market return, the portfolio return also increases by one unit. A manager employing a passive management strategy can attempt to increase the portfolio return by taking on more market risk (i.e., a beta greater than 1) or alternatively decrease portfolio risk (and return) by reducing the portfolio beta below 1. Essentially, beta expresses the fundamental tradeoff between minimizing risk and maximizing return. Let's give an illustration. Say a company has a beta of 2. This means it is two times as volatile as the overall market. Let's say we expect the market to provide a return of 10% on an investment. We would expect the company to return 20%. On the other hand, if the market were to decline and provide a return of -6%, investors in that company could expect a return of -12% (a loss of 12%). If a stock had a beta of 0.5, we would expect it to be half as volatile as the market: a market return of 10% would mean a 5% gain for the company.

Investors expecting the market to be bullish may choose funds exhibiting high betas, which increase investors' chances of beating the market. If an investor expects the market to be bearish in the near future, the funds that have betas less than 1 are a good choice because they would be expected to decline less in value than the index. For example, if a fund had a beta of 0.5 and the S&P 500 declined 6%, the fund would be expected to decline only 3%.

## 2.3 Empirical Review

Various studies have been undertaken both locally and internationally to explore the profile relationship of quoted firms. Kamau (2002) reviews the profile relationship of

firms quoted on the Main Investment Market Segment (MIMS) and the Alternative Investment Market Segment (AIMS). The study utilized historical market data from the NSE for the period between January 1996 and December 2000. Individual firms Sharpe Ratios fort the entire period were computed and analyzed. Differences between Sharpe Ratios of firms listed under the MIMS and those of firms listed under AIMS were analyzed using Wilcoxon Rank Sum Test. The research found out that there was no significant difference in terms of return and risk between those firms listed under the MIMS and AIMS.

Gitari (1990) established that quoted firms in Kenya display a positive relationship between risk and return. The relationship was however not significant hence implying investors may end up being under or over compensated for taking high risks. Munywoki(1998) in a study conducted at the NSE to estimate systematic risk approximated the systematic risk to be at 3.5% and market returns to be 14.8%. The study also estimated the NSE beta to be 0.9002 attributing the difference between his estimated beta and the beta of 1.0 to sampling. Ombajo (2006) carried out a study to determine the extent to which NSE market segmentation affected the share prices of listed firms, liquidity and investor recognition. The event study methodology pioneered by Fama et al. (1969) was employed in carrying out the study. The study focused on the MIMS and the AIMS.

Akwimbi (2003) studied the NSE on the application of APT for predicting stock returns concluded that APT model had more success in explaining the expected return on the NSE and asserted that the APT model holds true for emerging markets. Gichana (2009)

in his empirical study on linear and non-linear models deduced that non-linear models are better than linear ones in predicting stock returns. Gichana's findings further emphasized that stock returns in this market is non-linear with risk.

The results of the study did not support Jacque (2004) assertion that segmentation is a form of financial innovation which could lead to efficiency and thus a reduction in the cost of capital without commensurate increase in systematic risk. No new listings were seen during the period of study after segmentation of the market implying that segmentation did not have an immediate impact on the cost of capital. The same result on the NSE was also found to be true by Nkonge(2010) and Mogunde(2011) who both concluded that profile is a factor of several functions. Kiptoo (2010) had earlier attributed this to selected macroeconomic variables and stock prices.

International studies on industry dynamics in stock studies have also been reviewed. Some of the most important findings of Sharpe-Lintner-Black model are anomalies. The empirical attack on this model has begun with the studies that have identified variables other than market β to explain cross-section of expected returns. Basu (1977) have showed that earning-to-price ratio have marginal explanatory power after controlling for β, expected returns are positively related to E/P. Banz (1981) has found that a stock size (price times share) could help explain expected returns, given these market β, expected returns on small stocks are too high and expected returns on large stocks are too low. Bhandari (1988) has explored that leverage is positively related to expected stock returns, Fama and French (1992) have found that higher book-to-market ratios are associated with higher expected return, in their tests that also include market β.

These anomalies are now stylized facts to be explained by multifactor asset pricing models of Merton (1973) and Ross (1976). For example Ball (1978) have argued that E/P is a catch-all proxy for omitted factors in asset pricing tests and one can expect it to have explanatory power when asset pricing follow a multifactor model and all relevant factors are not included. Chan and Chen (1991) have argued that size effect is due to the fact that small stocks include many martingale or depressed firms whose performance is sensitive to business conditions. Fama and French (1992) have shown that since leverage and book-to-market equity are also largely driven by market value of equity, they also may proxy for risk factors; in return that are related to market judgments about the relative prospects of firms. One can expect when asset pricing follow a multifactor models and all relevant factors included in the asset pricing tests to explain these anomalies. There are some other research works, which have shown that there is indeed spillover effect among Sharpe-Lintner anomalies. Basu (1983) have found that size and E/P are related; Fama and French (1992) have found that size and book to market equity are related and again leverage and book in market equity are highly correlated.

These multifactor asset pricing models generalize the result of SLB model. In these models, the return generating models involve multiple factors and the cross section of expected returns is explained by the cross section of factor loadings or sensitivities. One approach suggested by Ross (1976) arbitrage pricing theory (APT) uses factor analysis to extract the common factors and then tests whether expected returns are explained by the cross section of the loading of asset returns on the factor [Roll and Ross (1980); Chen (1983); Lehmann and Modest (1988)] have tested this approach in detail. The factor analysis approach to test of the APT leads to unreasonable conflict about the number of

common factors and what these factors are. The factor analysis approach is limited, but it confirms that there is more than one common factor in explaining expected returns.

Now as regards the empirical testing of selected stock exchanges, Green (1990) have tested CAPM on UK private sectors data and found that SLB model do not hold. But Sauer and Murphy (1992) have investigated this model in German stock market data and confirmed CAPM as the best model describing stock returns. Contradictory evidence has been found by Hawawini(1993) in equity markets in Belgium, Canada, France, Japan, Spain, UK and USA. The other studies, which tested CAPM for emerging markets are Lau *et al.* (1975) for Tokyo Stock Exchange, Sareewiwathana and Malone (1985) for Thailand stock exchange, Bark (1991) for Korean Stock Exchange and Gupta and Sehgal (1993) for Indian stock Exchange. Badar (1997) has estimated CAPM for Pakistan.

## 2.4 Summary of the Literature Review

Most of the previous studies, especially local ones such as by Kamau (2002), Gitari (1990), and Ombajo (2006) looked into the profile dynamics of firms listed in the NSE in a very broad way based on the segmentation of the NSE equity market into MIMS and AIMS which does not explicitly capture the industry characteristics of the listed firms. Other studies including Apuoyo (2010), Kiptoo (2010), Otieno (2010), Gichana (2009) and Mogunde (2011) have all tried to indicate various forms of risk on the securities exchange without focusing on MIMS. The current study addresses this gap by examining the risk- return patterns of listed companies operating in the different industries as defined by the sectorial classification in the MIMS. Also most of the studies were done in the late 1990s and 2000s. This period was characterized by political activism and a depressed Kenyan Economy. The result of the studies may not hold true today given

positive changes in the economic environments as well as the relative political maturity that the country has lately achieved. In addition, the trading systems, such as the open outcry system, that was in operation during the time of the previous studies were largely manual. This could have affected the efficiency of operations, the flow of information as well as pricing of assets, all of which affect stock returns replaced by adoption of the Automated Trading System (ATS) in 2005 and the full implementation of the Central Depository and Settlement System (CDSS) in 2006. The current study therefore seeks to understand whether the results of previous studies still hold in the improved trading environment in the period 2009-2012 using a CAPM model to support or contradict the scholars mentioned.

# CHAPTER THREE: RESEARCH METHODOLOGY

## 3.1 Introduction

Chapter three focuses on the methodology of the study. It identifies the research design, the population of study, the sample, the sampling technique, data collection and source. It further explains the measurement and operationalization of variables to be used and finally the analysis of data to be collected.

## 3.2 Research Design

This study is quantitative and explanatory and uses available data to investigate correlations and examine regressions among variables. Therefore the research design in this study is casual comparative. The reason for this design is that the independent variables of the study cannot be manipulated experimentally and thus it is not possible to investigate the relationship between dependent and independent variables through experimental design.

## 3.3 Population of Study

The target population of study was all listed companies operating in Kenya under the MIMS division. The source of this population was the Nairobi Securities Exchange where a list of thirty quoted companies was obtained as at 31$^{st}$ December 2012. This date was identified as the cut-off date for the purpose of carrying out this study.

## 3.4 Sampling

A sample of thirty listed firms was selected to form the sample for this study analysis after surveying the listed firms as at 2009 using Wednesday averages as recommended by

Fama and French (1983). These thirty firms were those that are constantly active in the market.

## 3.5 Data Collection

This study used average monthly stocks returns from 30 companies listed on the NSE for the period of 4years. The stocks were the most active on the NSE and their data was obtained from the NSE offices in the form of daily prices. The data used was therefore purely secondary data purchased from NSE.

This study used the average monthly prices for a stock to represent monthly data and NSE 20 share index as the proxy of the market index. The index is a valued weighted index comprising of 20 most traded stocks and reflects the trend of the market. The existing 91days Treasury bill was used as a proxy for the risk free rate. All stock returns used for the purpose of this paper were not adjusted for dividends.

## 3.6 Data Analysis

To test the CAPM for the Nairobi securities exchange, a four year period was used as well as methods introduced by *Black et.al* (1972) and Fema-MacBeth (1973). The investigation is divided into three main periods. These are the portfolio formation period, estimation period, and testing period.

### 3.6.1 Portfolio Formation Period

The portfolio formation period is the first step of the test. The study used this period to estimate beta coefficient for individual stocks using average monthly returns for the four year period. The estimation was conducted by regression using the following time series formula:

$Rit - Rft = ai + \beta i(Rmt - Rft) + eit$……(1)

Where

Rit = rate of return on stock i (i = 1 . . . 30)

Rft = risk free rate at time t

βi = estimate of beta for stock i

Rmt = rate of return on the market index at time t

eit = random disturbance term in the regression equation at time t

The above equation is also expressible as

$rit = ai + \beta i.rmt + eit$

Where

rit = Rit – Rft = excess return of stock i (i = 1 . . . 30)

rmt = Rmt – Rft = average risk premium.

$a_i$ = the intercept.

The intercept $\mathbf{a_i}$ is supposed to be the difference between estimated return produced by time series and the expected return predicted by CAPM. The intercept $\mathbf{a_i}$ of a stock is equivalent to zero if CAPM's description of expected return is accurate. The individual stock's beta once obtained after series of estimation are used to create equally weighted average portfolios. The equally weighted average portfolios are created according to high-low beta criteria. Portfolio one contains a set of securities with the highest betas while the last portfolio contains a set of low beta securities. Organizing and grouping securities into portfolios is considered a strategy of partially diversifying away a portion of risk whereby increasing the chances of a better estimation of beta and expected return of the portfolio containing the securities.

### 3.6.2 Initial Estimation Period

Within this estimation period, regression is run using the beta information obtained from the previous period. The purpose of this period is to estimate individual portfolio betas. Fama- MacBeth applied crossed-sectional regression on its data and regress average excess return on market beta of portfolios. The formula used to calculate portfolios' beta is;

$rpt = ap + \beta p.rmt + ept$……(2)

Where

rp = average excess portfolio return

βp= portfolio beta

### 3.6.3Testing Period

After estimating the portfolios' betas in the previous period, the next step is estimating the ex-post Security Market Line (SML) by regressing the portfolio returns against portfolio betas. To estimate the ex-post Security Market Line, the following equation is examined:

$rp = y0 + y1\beta p + ep$……(3)

Where

rp = average excess portfolio return

βp = estimate of beta portfolio p

y0 = zero-beta rate

y1 = market price of risk and

ep = random disturbance term in the regression equation

The hypothesis presented by CAPM is that the values of y0 and y1 after regression should respectively be equivalent to zero and market price of risk, the average risk premium. Finally, the test for non-linearity is conducted between total portfolio returns and portfolio beta. The equation used is similar to equation above but this time, a beta square factor is added to the equation as shown below:

$$rp = y0 + y1\beta p + y2\beta p^2 + ep \quad \ldots\ldots(4)$$

To provide an evidence for CAPM, y2 should equal zero and y0 should equal average risk free rate. The value of y1 could be negative but different from zero.

### 3.6.4 Significance Testing

To evaluate the data and regression result available within the testing period, the study will conduct as a statistical test referred to as significance testing. It is the test of important null hypothesis, which states that the independent variable has no effect upon the dependent variable. The test is often conducted using P-values or t-values. For the purpose of this paper, the study chooses the t-values criteria since it is easier in application. The study also using null hypothesis in referring to H0: $X = 0$ and alternative hypothesis in referring to Ha: $X \neq 0$ where will be the coefficient under investigation. Basically, a significance test is conducted to determine if the coefficients are significantly different from zero. In defining the data significant to conclude with 95% confidence, the study selected a 5% level of significance. The critical value $\mathbf{t_c}$ is 2,056 for a t-distribution with 26 degrees of freedom. However, the rejection region for the null hypothesis becomes $/ t / \geq 2{,}056$. This means that the study will reject the null hypothesis, in favor of the alternative, if $/ t / \geq 2{,}056$

# CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

## 4.1 Introduction

In this part, results obtained from the application of the empirical methods discussed in the previous chapter are presented. The methods are the basis for the test of CAPM. Equally, analysis of the results obtained will be made within this section

## 4.2 Portfolio Formation

At this initial stage, beta values of the individual stocks are estimated using equation (1). A detailed table containing stocks, betas and their average access returns is included in appendix

### 4.2.1 Initial Estimation

With a condition that the relationship between stocks and betas is established, the next stage is to form portfolios using the sizes of the individual betas. Using this information, three portfolios were formed each consisting of ten stocks and regressed using equation 2. The individual portfolio beta estimate along with its average access return is given in table one

| Portfolio no | Portfolio beta | Average excess return |
|---|---|---|
| 1 | 1.2012 | -0.0304 |
| 2 | 1.1510 | -0.0131 |
| 3 | 0.9122 | 0.0739 |

Table one. Portfolio beta estimates

### 4.2.2 Testing

The SML coefficients are estimated using equation (3) since the values of the portfolio betas are known. The results are summarized in the table below;

| | Coefficients | Std. Error | t-statistic | probability |
|---|---|---|---|---|
| Y0 | 0.2415 | 0.07300 | 2.9684 | 0.0428 |
| Y1 | -0.1387 | 0.6141 | -2.0533 | 0.1139 |

Table two. Statistic SML estimation

The last step is to test for non-linearity between average excess portfolio returns and betas. To do this, equation (4) is used in regression using a beta square factor. The result is summarized below;

| | Coefficients | Std. Error | t-statistic | Probability |
|---|---|---|---|---|
| *Y0* | 0.2859 | 0.3815 | 0.6947 | 0.6133 |
| *Y1* | -0.2518 | 0.5413 | -0.3815 | 0.8042 |
| *Y2* | 0.04013 | 0.2135 | 0.2243 | 0.9215 |

Table three. Statistic for non-linearity test

## 4.3 Discussions and Interpretations of Findings

The result in table one containing portfolio betas and their average excess returns, presents the nature of high beta/ high return and low beta/low return criteria described by the CAPM. The characteristics of the result do not provide support of the hypothesis. That is, portfolio one with the highest beta does not have a high return in comparison to portfolio three, which has a lower beta but is associated with the highest return amongst all the portfolios. To support the theory, returns on portfolios should match their betas.

Table two shows statistic SML estimation, the hypothesis presented by CAPM is that the values of *y0* and *y1* after regression should respectively be equivalent to zero and market

price of risk, the average risk premium. The null hypothesis that the intercept *y0* is zero, is rejected at 5% level of significance since the t-value is larger than 2.056. This actually means that the coefficient is significantly different from zero, which is a contradiction to the theory of CAPM.

Conducting a test for the second coefficient *y1* indicates that the value of the coefficient is significantly different from zero at 5% significance level since its t-value is larger than 2.056.The calculated value is 0.00213 while the estimated value is –0.1387, which appears to be a contradiction to CAPM.

To provide an evidence for CAPM, *y2* should equal zero and *y0* should equal average risk free rate. The value of *y1* must equal the average risk premium. The nature of *y2* shall determine the linearity condition between risk and return. The test indicates that the value of the intercept *y0*is not significantly different from zero since its t-value is greater than 2.056. However, this value is not equal to the average risk free rate, 0.05385 and is thus evidence against CAPM.

Though the coefficient of *y1* is negative as per table three, the test indicates that it is also not significantly different from zero since its absolute t-value is smaller than 2.056. As well, the coefficient is not equal to the average market premium as described by CAPM. The test conducted for *y2* indicates that the coefficient is not significantly different from zero and provides an evidence for CAPM. Well, having the coefficient not significantly different from zero signifies that the expected rate of returns and betas are linearly related to each other.

# CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This study has been established to investigate the validity of CAPM on Nairobi Securities Exchange. It uses average monthly stock returns from 30 firms listed on the NSE ranging from 1st Jan, 2009 to 31st Dec, 2012. The stocks used in the study are considered the most traded on the NSE.

## 5.2 Summary

Using portfolio formation to diversify away most of the firm-specific part of risk thereby enhancing the beta estimates, the findings from the investigation appears inconsistent with the theory's basic hypothesis that higher beta yields higher return and vice versa. The CAPM model implies that the prediction for the intercept be zero and the slope of SML equals the average risk premium. The findings from the test are also inconsistent with Theory of CAPM, indicating evidence against the model.

The hypothesis and implications of CAPM predicts that there exist a linear relationship between expected return and beta. It occurred that the findings from the test are consistent with the implications and provide evidence in favor of CAPM.

Given the above, it turns out that each of the investigation conducted is a confirmation of the other that the empirical investigation carried out does not fully hold up with CAPM. Well, the consequence of the tests conducted on the data with period 1st Jan,2009 to 31st Dec, 2013 from the Nairobi Securities Exchange do not appear to absolutely reject CAPM.

There are some procedures which could improve upon this study and bring further depth to this experiment. While compiling any portfolio, diversification is always a necessary precaution. Complete diversification among stocks in any given portfolio is difficult to obtain, and in this study it is possible that our portfolios were not as diversified as they could have been. Therefore, to expand upon this study, it would be beneficial to ensure that much diversified stocks were collected.

Also, this study only used publicly traded stocks to be the component of a portfolio instead of using bonds, real estate, foreign exchange, or a hybrid of the above. With a hybrid of investments, it is possible to expose different results and provide more insights for the validity of using CAPM in approximating expected return with beta risk.

## 5.3 Conclusions

The basic aim of this study was to check the applicability of CAPM to NSE, whether it gives accurate results. After the analysis of thirty different companies listed on NSE, for the period of four years (2009-2012), it was found that the Capital Asset Pricing Model, failed to give accurate results. Though very slight evidence was seen, regarding the applicability of CAPM, but it was only in traces. These findings help in concluding that CAPM is not fully applicable to the NSE. A strong rejection has been seen, regarding the acceptance and applicability of CAPM (Levy, 1997). Even though significant evidence has been put forward against the use of CAPM, still it remains a good tool for finding out the cost of capital, investment performance evaluation, and studies of efficient market events (Moyer et al, 2001; Campbell et al, 1997). CAPM has provided knowledge, about the capital market and market conditions (Karnosky, 1993).

In short, CAPM is not an effective model to measure risk and required return, and investors, therefore may not depend or rely on it in their investment decisions.

## 5.4 Limitations of the Study

I cannot state that the data do not support CAPM since there are other factors available and capable of affecting the results such as measurement and model specification errors. These errors, however, arises because of the usage of a proxy and not the real market portfolio and leads to biasing the estimated slope towards zero as well as estimating the intercept away from zero.

This project has only evaluated CAPM in combination with historical data of stocks obtained from Nairobi Securities Exchange. This study does not present an evidence for any other model even though it may present inconsistency with CAPM.

The results confirmed that the standard CAPM is not verified in the NSE during the period of study. The evidence discussed above does not prove that the CAPM is invalid since only stocks were included in the analyses. The market portfolio contains all of the capital assets. We will never be able to observe the returns on the "true" market portfolio. Therefore, the CAPM is simply not a testable theory. The estimated betas are very sensitive to the market index being used. In risk-return space, indices can be close to each other and close to the efficient set, and still produce different relationships (positive and negative) between return and beta.

It is important to know that the main reason that we test the CAPM is to analyze the relation between the risk and return of the securities and - in our case - the risk and return of the portfolios. The testable implications of the CAPM show that all investors hold

risky assets in the same proportion and, in particular, every investor hold the same proportion of stocks. In order to achieve the desired balance of risk and return, investors simply vary the fraction of their portfolios made up of the riskless assets.

## 5.5 Recommendations

There is need to understand that there were enough drawbacks during the data analysis. And the results showed that the CAPM is rejected in the Nairobi Securities Exchange. That is why more empirical tests on the NSE should be applied, using alternative financial models. In my opinion, a test on the NSE using the APT model, would give more complete results, as it could include different variables like the inflation rate and the market value of securities. Thus, further researches and more tests on the APT should be applied, in order for the researchers, the managers of firms and investors - to have more accurate results and understand the risk-return trade off of the NSE securities. Another project would be to release other assumptions and to tests the models based on different hypotheses. In this way we might have results that would lead to new theories on asset pricing models.

### 5.5.1 Suggestions for further Research

Future studies, may consider a detailed comparison of results from CAPM for NSE, and other stock markets of developing and developed states. These studies may also consider the use of more sophisticated tools (i.e. GARCH), and models like the multifactor models, Arbitrage Pricing Theory (APT). It is suggested that in future studies, CAPM should be tested individually and along with the multi-factor model (APT), for the better understanding of the risk/return relationship and pricing mechanisms.

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# APPENDIX I: LISTED COMPANIES AT NSE

**Agricultural**

| Symbol | Listing | Notes |
|---|---|---|
| EGAD | Eaagads Limited | Coffee growing and sales |
| KAZU | Kakuzi Limited | *Coffee, tea, passionfruit, avocados, citrus, pineapple, others* |
| KAPC | Kapchorua Tea Company Limited | *Tea growing, processing and marketing* |
| LIMR | Limuru Tea Company Limited | *Tea growing* |
| RVP | Rea Vipingo Sisal Estate | *Sisal* |
| STC | Sasini Tea and Coffee | *Tea, coffee* |
| GWKL | Williamson Tea Kenya Limited | *Tea growing, processing and distribution* |

**Automobiles and Accessories**

| Symbol | Listing | Notes |
|---|---|---|
| CARG | Car & General Kenya | *Automobiles, engineering, agriculture* |
| CMC | CMC Holdings | *Automobile distribution* |
| MSHA | Marshalls East Africa | *Automobile assembly* |
| FEAL | Sameer Africa Limited | *Tires* |

**Banking**

| Symbol | Listing | Notes |
|---|---|---|
| BARC | Barclays Bank (Kenya) | *Banking, finance* |
| CFCO | CFC Stanbic Holdings | *Banking, finance* |
| DTK | Diamond Trust Bank Group | *Banking, finance* |
| EQTY | Equity Bank Group | *Banking, finance; crosslisted at the Uganda Securities Exchange* |
| HOUS | Housing Finance Company of Kenya | *Mortgage financing* |

| | | |
|---|---|---|
| KCBK | Kenya Commercial Bank Group | *Banking & finance*. Crosslisted on the Uganda Securities Exchange, the Dar es Salaam Stock Exchange and the Rwanda Over The Counter Exchange |
| NABK | National Bank of Kenya | *Banking, finance* |
| NINC | National Industrial Credit Bank | *Banking, finance* |
| SCBK | Standard Chartered Kenya | *Banking, finance* |
| COOP | Cooperative Bank of Kenya | *Banking, finance* |

**Commercial and Services**

| Symbol | Listing | Notes |
|---|---|---|
| EXPK | Express Kenya Limited | *Logistics* |
| HBL | Hutchings Biemer Limited | *Furniture* |
| KAL | Kenya Airways | *Kenya's flagship airline; crosslisted at Uganda Securities Exchange and Dar es Salaam Stock Exchange* |
| LKL | Longhorn Kenya Limited | *Publishing* |
| NMG | Nation Media Group | *Newspapers, magazines, radio stations, television stations* |
| SCAN | Scangroup | *Advertising and marketing* |
| STDN | Standard Group Limited | *Publishing* |
| TPS | TPS Serena | *Hotels &resorts* |
| UCHU | Uchumi Supermarkets | *Supermarkets* |

**Construction and Allied**

| Symbol | Listing | Notes |
|---|---|---|
| ARM | Athi River Mining Limited | *Cement, fertilizers, minerals; mining and manufacturing* |
| BAMB | Bamburi Cement Limited | *Cement* |
| CRWN | Crown-Berger (Kenya) | *Paint manufacturing* |

| | | |
|---|---|---|
| CABL | East African Cables Limited | *Cable manufacture* |
| EAPC | East African Portland Cement Company | *Cement manufacture and marketing* |

**Energy and Petroleum**

| Symbol | Listing | Notes |
|---|---|---|
| KGEN | Kengen | *Electricity generation* |
| KOCL | KenolKobil | *Petroleum importation, refining, storage & distribution* |
| KPLA | Kenya Power and Lighting Company | *Electricity transmission, distribution and retail sale* |
| TOPL | Total Kenya Limited | *Petroleum importation and distribution* |
| UMEME | Umeme | *Electric power distribution*. Crosslisting from Uganda Securities Exchange[1] |

**Insurance**

| Symbol | Listing | Notes |
|---|---|---|
| BAI | British-American Investments Co.(Kenya) | *Insurance* |
| CIHL | Liberty Kenya Holdings Limited (formally CFC Insurance) | *Insurance* |
| JHL | Jubilee Holdings Limited | *Insurance, investments; crosslisted at the Uganda Securities Exchange* |
| KRIN | Kenya Re-Insurance Corporation | *Reinsurance* |
| PAIC | Pan Africa Insurance Holdings | *Insurance* |

**Investment**

| Symbol | Listing | Notes |
|---|---|---|
| CENTUM | Centum Investment Company | *Investments* |
| CITY[2] | City Trust[3] | *Financial services* |
| OLYM | Olympia Capital Holdings | *Construction and building materials* |
| TRCY | TransCentury Investments | *Investments* |

**Manufacturing and Allied**

| Symbol | Listing | Notes |
|---|---|---|
| BAUM | A Baumann and Company | *Machinery distribution and marketing, investments* |
| BOC | BOC Kenya | *Industrial gases, welding products* |
| BAT | British American Tobacco Limited | *Tobacco products* |
| CARB | Carbacid Investments Limited | *Carbon dioxide manufacturing* |
| EABL | East African Breweries | *Beer, spirits; crosslisted at Uganda Securities Exchange and Dar es Salaam Stock Exchange* |
| EVRD | Eveready East Africa | *batteries* |
| KOL | Kenya Orchards Limited | *Fruit growing, preservation and distribution, fruit-juice manufacture and marketing* |
| MSCL | Mumias Sugar Company Limited | *Sugar cane growing, sugar manufacture & marketing* |
| UNGA | Unga Group | *Flour milling* |

**Telecommunication and Technology**

| Symbol | Listing | Notes |
|---|---|---|
| ACES | Access Kenya Group | *Internet service provider* |
| SCOM | Safaricom | *Mobile telephony* |

## APPENDIX I: A list of sample firms Betas and Excess return

| Number | Stock | Beta | Excess Return |
|---|---|---|---|
| 1 | Crown Berger Ltd 0rd 5.00 | 1.137 | 0.3887 |
| 2 | Scangroup Ltd Ord 1.00 | 1.255 | 0.8997 |
| 3 | Barclays Bank Ltd Ord 2.00 | 1.029 | -0.7837 |
| 4 | E.A.Portland Cement Ltd Ord 5.00 | 1.116 | -0.4247 |
| 5 | East African Breweries Ltd Ord 2.00 | 1.224 | 0.4618 |
| 6 | KenGen Ltd. Ord. 2.50 | 1.097 | 0.1078 |
| 7 | Sasini Ltd Ord 1.00 | 1.249 | 1.2441 |
| 8 | Sameer Africa Ltd Ord 5.00 | 1.227 | 0.0653 |
| 9 | Total Kenya Ltd Ord 5.00 | 1.093 | -0.6967 |
| 10 | Kenya Power & Lighting Ltd Ord 20.00 | 1.061 | -0.2276 |
| 11 | Diamond Trust Bank Kenya Ltd Ord 4.00 | 0.787 | 0.5423 |
| 12 | National Bank of Kenya Ltd Ord 5.00 | 1.0054 | -0.4847 |
| 13 | Equity Bank Ltd Ord 5.00 | 1.028 | -0.0467 |
| 14 | Housing Finance Co Ltd Ord 5.00 | 0.1045 | 0.5192 |
| 15 | Jubilee Holdings Ltd Ord 5.00 | 0.1797 | 0.2225 |
| 16 | NIC Bank Ltd 0rd 5.00 | -0.034 | -0.4527 |
| 17 | Standard Chartered Bank Ltd Ord 5.00 | 1.002 | 0.0102 |
| 18 | The Co-operative Bank of Kenya Ltd Ord 1.00 | 0.912 | 0.4036 |
| 19 | Safaricom limited Ord 0.05 | 0.951 | 0.4460 |
| 20 | TPS Eastern Africa (Serena) Ltd Ord 1.00 | 0.943 | 1.2325 |
| 21 | Rea Vipingo Plantations Ltd Ord 5.00 | 0.831 | 1.4258 |
| 22 | AccessKenya Group Ltd Ord. 1.00 | 0.116 | 0.4920 |
| 23 | Kenya Airways Ltd Ord 5.00 | 0.245 | -0.4870 |
| 24 | Nation Media Group Ord. 2.50 | 0.877 | -0.3452 |
| 25 | Kenya Commercial Bank Ltd Ord 1.00 | 0.803 | 0.6833 |
| 26 | CFC Stanbic Holdings Ltd ord.5.00 | 0.617 | -0.3257 |
| 27 | British American Tobacco Kenya Ltd Ord 10.00 | 0.562 | -0.2387 |
| 28 | E.A.Cables Ltd Ord 0.50 | 0.563 | -0.4997 |
| 29 | Kenya Oil Co Ltd Ord 0.50 | 0.892 | -0.0141 |
| 30 | Athi River Mining Ord 5.00 | 0.907 | 0.9870 |