RISK - RETURN PROFILE FOR COMPANIES QUOTED AT THE NAIROBI SECURITIES EXCHANGE

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DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

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Date ……

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This research project has been submitted for review with my/our approval as university Supervisor(s).

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Date…….

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DEDICATION

I dedicate this project to my family which has encouraged me to keep in good shape during the long hours of my studies towards successful completion. God gave you the patience to be peaceful and as you spurred me on, I knew the results would be there for all to see. Indeed this has come to pass and thank you for your great support.

ABSTRACT

The Nairobi Securities Exchange is the key exchange market for stock trading in the East and Central Africa region. Having moved from floor trading to the modern electronic trading system, the NSE was restructured to include particular sectors with respect to economic activities. The objective of the study was to establish the risk-return profiles in various sectors of NSE.

Using empirical data, forty three (43) companies were selected to comprise the sample of study for the period January 2007 to December 2011, but only 34 four were consistently participating in securities market activities. Historical monthly stock price data was used, translating into 60 sample months for use in data analysis. Dividend Growth Model by Gordon was applied while using Sharpe ratios to assess sector riskiness.

Initial analysis on the sectors riskiness based on standard deviation and beta computations indicated that the Agricultural sector was the least risky while the Industrial sector was the most risky. However, final analysis using Sharpe ratios indicated that Agricultural sector had the highest Sharpe ratio at 3.756 and thus the most risky among the 4 sectors while Industrial Sector had the lowest Sharpe ratio of 1.553 and therefore the least risky. To resolve the mixed results, a t-test was applied with mean variances per sector tested against the market variances. The analysis concluded that Standard deviations, Betas and Sharpe ratios from the 4 sectors of MIMS were not statistically different from from the market mean variations during the period under study January 2007-December 2011 implying least trade-offs.

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ABBREVIATIONS

AIMS	-	Alternative Investment Market Segment
APT	-	Arbitrage Pricing Theory
ATS	-	Automated Trading System
CAL	-	Capital Allocation Line
CAPM	-	Capital Asset Pricing Model
CDSS	-	Central Depository and Settlement System
CMA	-	Capital Markets Authority
FISM	-	Fixed Income Security Market
FOMS	-	Futures and Options Market Segment
IFC	-	International Finance Corporation
IPO	-	Initial Public Offering
MIMS	-	Main Investment Market Segment
NSE	-	Nairobi Securities Exchange
SML	-	Security Market Line

CHAPTER ONE

INTRODUCTION

1.1Background of the Study

Capital markets world over remain central avenues for mobilization of resources and efficiently allocating such resources for economic development. An important organ for capital markets is the stock exchange. A stock exchange is a market for securities such as shares and stocks, treasury bills and bonds, options and derivatives. In Kenya, the functions of the stock market are carried out by the Nairobi Securities Exchange (NSE).The NSE was constituted in 1954 as a voluntary association of stockbrokers registered under the Societies Act. The listed companies were then very few. In the recent past, the stock exchange has undergone major changes and transformations and the level of activity has tremendously increased. A lot of interest in the stock exchange was generated in the 1980s when the government embarked on a privatization programme targeting state corporations such as Kenya Commercial Bank and Kenya Airways.

1.1.1 Concept of Risk

Investing in individual stocks can be risky. Stocks are susceptible to changes in the domestic and world economy as well as changes in the company and political environment. Stocks are also somewhat illiquid. The growth of a stock or equity investment is susceptible to a number of risks; therefore, a stock's growth is not solely determined by interest rates.Stocks are susceptible to a number of risks(Harvey *et al*,

2005). These risks include; interest-rate risk, inflation risk, *c*ompany risk, financial risk, liquidity risk, political or regulatory risk,exchange-rate risk and market risk: Overall market movement may affect the price of a company's stock. Investors often monitor the way a stock responds to movement in the market. A measure of how sensitive a stock is to movements in the market is called a beta (β). A stock with a beta of one moves very closely with the market. A stock with a beta that is greater than one will be more volatile than the market. A stock with a beta of less than one will be less volatile than the market. Betas can help investors determine a stock's market risk(Sharpe, 1964).

When an investor is building and monitoring portfolio, it is important to track the beta of that portfolio, or the weighted beta of each of the individual stocks or mutual funds in that portfolio. This will tell the investor how risky the overall portfolio is in comparison to the market.

A diversified portfolio moves with the market: one company's successes or failures cannot affect it as much. In this regard it is imperative to note the principle of good investing: stay diversified. Investors are advised not to invest solely in individual stocks implying they should invest in a broad range of financial assets. Fama (1983) advised that investors should not invest solely in large-cap stocks either concluding that an investor should broaden and deepen the portfolio to include international and small-cap stocks as well.

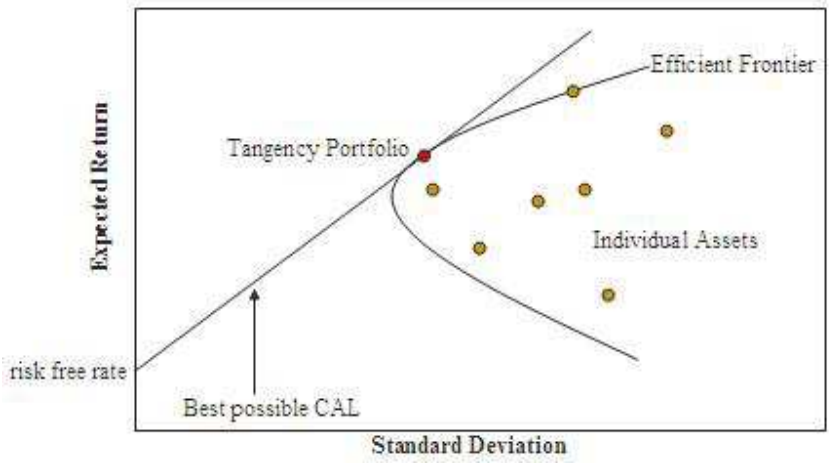
1.1.2Return on Investment

The talk of return on investment is based on Markowitz framework. The Markowitz framework is a single-period model, where an investor forms a portfolio at the beginning of the period Markowitz (1952). The investor's objective is to maximize the portfolio's expected return, subject to an acceptable level of risk (or minimize risk, subject to an acceptable expected return).

The assumption of a single time period, coupled with assumptions about the investor's attitude toward risk, allows risk to be measured by the variance (or standard deviation) of the portfolio's return. As securities are added to a portfolio, the expected return and standard deviation change in very specific ways, based on the way in which the added securities co-vary with the other securities in the portfolio. The best that aninvestor can do is bounded by a curve that is the upper half of a hyperbola. This curve is known as the efficient frontier. According to the Markowitz model, investors select portfolios along this curve, according to their tolerance for risk. An investor who can live with a lot of risk might choose portfolio A, while a more risk-averse investor would be more likely to choose portfolio B. One of the major insights of the Markowitz model is that it is a security's expected return, coupled with how it co-varies with other securities, that determines how it is added to investor portfolios.Building on the Markowitz framework, Sharpe (1964), Lintner (1965) and Mossin (1966) independently developed what has come to be known as the Capital Asset Pricing Model (CAPM).

This model assumes that investors use the logic of Markowitz in forming portfolios. It further assumes that there is an asset (the risk-free asset) that has a certain return. This study will discuss model and contradict it with other models of financial investment.

Figure 1: Markowitz Portfolio Model



Source: Adopted from Markowitz (1959)

1.1.3Risk–ReturnProfile

The concept of profile tradeoff is based on two realities of investments and investment performance.First, all investments carry some degree of risk – the reality that you could lose some or all of your money when you buy stocks, bonds, mutual funds or other investments. Second, not only do different types of investments carry different levels of risk, but the more risk you assume, the greater the investment return you are likely to achieve.

As indicated earlier, risk comes in many forms, but when talking about the profile tradeoff, the primary measure of risk is volatility, or the degree to which an investment fluctuates in price. Different asset categories are subject to different levels of price fluctuation. For instance, stocks can fluctuate widely from one year to the next (or even from one day to the next), whereas the swing in bond prices tends to be less dramatic, and price fluctuations for money market or so-called capital preservation investments are even lower(Harvey *et al*, 2005).Unsystematic risks arelikely to have an effect on at most a small number of assets. Unsystematic risk can be diversified away to smaller levels by including a greater number of assets in the portfolio (specific risks "average out").The amount of systematic risk present in a particular asset relative to that in an average risky asset can be measured using beta coefficient (Scholes and Williams, 1997).

The gain or loss from investments is known as the return. The return will usually have two components. The income component of return that entails receiving cash directly as a result of owning the investment and secondly the value of the asset held will often change leading to a capital gain or capital loss (Sharpe, 1964).

Capital gains yield is calculated as $\frac{(P_1 - P_0)}{P_0}$

Where:

P_0= initial stock price

P_1=stock price after 1st Period

Total returns can be viewed as the sum of expected and unexpected return s (Ross *et al*, 2009) i.e.R=E(R)+Systematic Risk+Unsystematic Risk

Where:

R = total return

E(R) =expected return

1.1.4The Nairobi Securities Exchange

The NSE was constituted in 1954 as a voluntary association of stockbrokers registered under the Societies Act. The listed companies were then very few. In the recent past, the stock exchange has undergone major changes and transformations and the level of activity has tremendously increased. A lot of interest in the stock exchange was generated in the 1980s when the government embarked on a privatization program targeting state corporations such as Kenya Commercial Bank and Kenya Airways.

The performance of stocks on the international market is determined by many factors but the risk of speculation and instability of any kind is always viewed as the main cause of the disruption of stock exchange markets. This is experienced from major stock exchange markets of the world including New York Stock Exchange (NYSE), the London Stock Exchange and the Tokyo Stock Exchange in Japan. In each of the mentioned exchanges or securities markets, there is always a major stock to indicate the strength of the market. These include the FTSE and Dow Jones which determine for the investors how to help judge that stock exchange.

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 Nairobi Stock Exchange embarked on a major reform of the market dubbed "Market Segmentation and Re-organisation". The reform process involved segmenting the market into four independent segments, namely:- The Main Investments Market Segment (MIMS) which has the highest listing financial requirements with respect to net assets and share capital at Kshs. 50 million and Kshs. 100 million respectively; the Alternative Investment Market Segment (AIMS) where listing financial requirements on net assets and share capital are at Kshs. 10 million and Kshs. 20 million respectively; the Fixed Income Security Market Segment (FISMS) where Treasury Bills & Bonds and Corporate Bonds are traded and the Futures and Options Market Segment (FOMS) which is still dormant to- date (NSE Report, 2011).

1.2 Statement of the Problem

Market investors wish to make an optimal investment decision 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 of such information 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 emerging markets.

Kamau (2002) examines the profile relationship of companies quoted on the Main Investment Market Segment (MIMS) and the Alternative Investment Market Segment (AIMS). The study utilized historical market data from the Nairobi Stock Exchange 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 Main Investment Market Segment and the Alternative Investment Market Segment.Similar studies by Apuoyo (2010) and Nyaata (2009) however indicate 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 scholars' findings by using more recent data (2007-2011) and focusing on the segmentation of the Main Investment Market Segment 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 the 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 intends to address this gap by establishing whether there are industry risk - return patterns for companies quoted at the NSE by the use of a non-linear model of the CAPM theory. The research will also test if results of previous scholars can hold for different period. In effect, this study is set to contradict or support previous scholars who have either used linear on non-linear models to test the profile trade-off on the NSE.

1.3 Objective of the Study

To establishwhether there are sectors that exhibit superiorrisk - return profilesforcompanies operating in the Main Investment Market Segment(MIMS) of the Nairobi Securities Exchange(NSE).

1.4 Importance of the Study

This study would benefit market investors to make informed investment decisions based on the relative risk - return characteristics of companies quoted on the MIMS. This would avert losses that many Kenyan investors may suffer because of decisions that were previously based on euphoria, gut feeling, rumors and hearsay. In the same vein, investment professionals including licensed stockbrokers, investment advisers, investment bankers and fund will improve decisions in a bid to maximize value for their clients.

Second, the study would benefit regulatory authorities such as the Capital Markets Authority and government policy makers at the Treasury and Central Bank in understanding whether the segmentation of the NSE equity market influences the

perception of riskiness associated with a certain sector and the observed returns. This will be useful in formulating an improved segmentation criterion for the NSE market.

Finally, the study would be a boost to the body of knowledge and field of scholars dealing with profile, securities markets and segmentation in both the developing and developed world. The study will add to the contribution of other scholars who have carried out similar studies to support or oppose theories of profile.

CHAPTER TWO

LITERATURE 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 (CAPM) and Arbitrage Pricing Theory (APT) have 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.

2.2.1Portfolio 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 the 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 approach to investing.

Markowitz asserts investors should base their portfolio decisions solely 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 nonsatiation and risk aversion are made in the Markowitz approach. Under nonsatiation, investors are assumed to always prefer higher levels of terminal wealth (end –of –period) 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 the investor 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 (satisfaction) associated with the investor's terminal wealth. The relationship between utility and wealth is the investor's utility of wealth function. Under the assumption on nonsatiation, all investors prefer more wealth to less wealth. Each investor may derive a unique increment of utility from an extra shilling of wealth i.e. marginal utility. A common assumption is that investors experience diminishing marginal utility of wealth. An extra shilling of wealth of wealth provides positive additional utility,

but the 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 between any of the risk-expected return combination on the same indifference curve. An 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 be 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 the 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 covariances 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; (i) Offer maximum expected return for varying degrees of risk ; and (ii)

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 set 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.

2.2.2Capital Asset Pricing Model

Although mean-variance analysis has been advocated as a framework for making investment decisions, a major problem of investment has been how to determine expected rates of return. Asset -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 different at different points in time.

Capital asset-pricing model (CAPM) is considered the most basic asset-pricing model. The model was developed independently by Sharpe (1964), Lintner (1965) and Mossin (1966). Basically the theory asks the question: What are the equilibrium rates of return if all investors apply the mean- variance criterion to an identical mean-variance efficient set? There is an ongoing debate as to whether this theory gives an accurate description of

equilibrium rates of return and whether alternative theories are more appropriate. Nevertheless, the CAPM is still widely used in practice.

CAPM is known to have three most important implications. Firstly, in equilibrium, all investors irrespective of their risk preferences hold the market portfolio of risky assets. Still, different investors hold different combinations of the market portfolio and the riskless asset. This property is known as the separation principle. Secondly, since everybody holds the market portfolio, the risk of an individual asset is characterized by its covariance with respect to the market; the remaining risk is diversified away. A standardized measure of the covariance with the market is known as the market beta. Lastly, since non systematic risk is diversified away, investors need to be compensated for bearing systematic risk (as measured by market beta) but not for non-systematic risk. The security market line (SML) formalizes this principle by linking the expected return of an asset to its market beta.

There are various assumptions behind the capital asset pricing model as explained below;

It is assumed that the capital market is characterized by perfect competition. There are a large number of investors, each with wealth that is small relative to the total market value of all capital assets. Hence the portfolio choice of individual investors has no noticeable effect on the prices of securities; investors take the price as given. It is also assumed that all investors choose their portfolio according to the mean variance criterion. It is important to note that the mean-variance criterion ignores practical considerations such as transaction costs and taxes.

Also assumed is that all investors have the same expectations regarding the future in terms of means, variances and covariances. Further, it is assumed that investors have homogeneous expectations. This assumption requires that all investors have the same investment horizon and access to the same information.The model finally assumes that investors can borrow and lend at a risk- free interest rate. Again, the variance of the risk free asset, as well as the covariance with other assets is zero.

Under the assumptions above, all investors face an identical efficient frontier. The only difference between investors is the amount of wealth they must invest and the personal trade –off they make between portfolio mean and portfolio variance.

2.2.3Systematic Risk (Estimating Beta)

Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole. Harvey et al (2005) point out that are two ways of estimating beta i.e. regression analysis and capital asset pricing model (CAPM). They suggested that CAPM is used more commonly in academic finance. Investment practitioners on the other hand more often use the regression technique as it allows for a better explanation of returns pertaining to the market rather than a theoretical explanation of the overall return of an asset, which takes interest rates as well as market returns into account.

Customarily, beta is estimated from past data by least – squares regression procedures. This involves fitting a linear relationship between the rates of return on a security and the

rates of return on a market index so that the sum of the squared differences between the security's actual return and those implied by the relationship is minimized.

For example, to estimate beta of a stock, a 60 month historical regression of the return on the stock (the dependent or Y variable) could regressed against the return on the market (the independent or X variable) as proxied by the return on the capital appreciation portion of the NSE 20 Share Index .

Capital Asset Pricing Model (CAPM) on the other hand is a model that describes the relationship between risk and expected return and that is used in the pricing of risky securities.

The general idea behind CAPM is that investors need to be compensated in two ways: time value of money and risk. The time value of money is represented by the risk-free (r_f) rate in the formula and compensates the investors for placing money in any investment over a period of time. The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk (risk premium). This is calculated by taking a risk measure (beta) that compares the returns of the asset to the market over a period of time and to the market premium (r_m-r_f). The security market line plots the results of the CAPM for all different risks

In conclusion, CAPM is applied widely in practice for purposes of portfolio selection, performance evaluations, risk management and capital budgeting. However, it is argued by practitioners that it is difficult to obtain reliable estimates of alpha as a measure of

excess return and beta as a measure of risk making CAPM a simple model that excludes many real –life considerations. Thus in addition to CAPM, practitioners use additional tools in choosing, monitoring and managing their investment portfolios.

2.2.4Arbitrage Pricing Theory

Arbitrage Pricing Model (APT) like Capital Asset Pricing Model (CAPM) is an equilibrium pricing model. APT was developed by Ross (1976). However, CAPM is based on a different set of assumptions. In CAPM, it is assumed that all investors make investment decisions by a mean-variance rule. In APT, Ross does not assume risk-aversion or reliance on the mean- variance rule. Rather, APT explains the relationship between expected return and risk as arising because there are no arbitrage opportunities in security markets. It is based on the law of one price i.e. two items that are the same cannot sale at different prices.

Arbitrage is a strategy that makes positive return without requiring an initial investment. For example, opportunities for arbitrage arise from differences in an asset's price when this asset is traded on two or more markets. A profit with zero investment is made by buying the asset at the low price and simultaneously selling the asset at the high price. All investors would prefer such a strategy irrespective of their risk attitude (risk averse, risk-neutral or risk seeker). If investors can find a strategy that earns a positive return with a zero net initial investment, then all investors will investors will follow this strategy. As a result, the price of assets will change until, in equilibrium, the positive return drops to

zero and the arbitrage opportunity vanishes from the market. The APT is the profile relationship that applies in the equilibrium situation with no arbitrage opportunities.

In the capital markets, arbitrage could be exercised in short-selling of risky securities, where investors can sale shares they do not own. The investor borrows the shares from a broker and then sells the shares in the market to receive the proceeds from the sale. At some future date, the investor must buy the stocks in the market to replace the shares borrowed. When arbitrage opportunities are available, the economy is not in equilibrium. That is why APT is an equilibrium pricing model.

There are various assumptions underlying the APT. Firstly, it is assumed that the capital market is characterized by perfect competition. This implies there are a large number of investors, each with wealth that is small relative to the total market value of all capital assets. Hence the portfolio choice of individual investors has no noticeable effect on the price of the securities; investors take the price as given. Capital market imperfections such as transaction costs and taxes are assumed not to exist. It is secondly assumed that all investors have the same expectations regarding the future in terms of mean, variance and covariance terms (homogeneous expectations). Investors are also assumed to prefer more wealth to less wealth. No assumptions are made regarding risk attitude; investors may be risk - averse, risk-neutral or risk-seekers. APT also assumes existence of a very large number of capital assets exist in the economy. The number of assets is sufficiently large to create portfolios with no non-systematic risk and with any desired values for the

factor sensitivity coefficients (betas). Finally, the theory assumes that short-sales are allowed, and that the proceeds are available to the short-sellers.

2.3EmpiricalStudies on Industry ProfileDynamics

Various studies have been undertaken both locally and internationally to explore the profile relationship of quoted companies.Kamau (2002) reviews the profile relationship of companies quoted on the Main Investment Market Segment (MIMS) and the Alternative Investment Market Segment (AIMS). The study utilized historical market data from the Nairobi Stock Exchange for the period between January 1996 and December 2000. Individual companies Sharpe Ratios for the entire period were computed and analyzed. Differences between Sharpe Ratios of companies listed under the Main Investment Market Segment and those of companies listed under the Alternative Investment Market Segment were analyzed using Wilcoxon Rank Sum Test. The research found out that there existed no significant difference in terms of return and risk between those companies listed under the Main Investment Market Segment and the Alternative Investment Market Segment.

Gitari (1990) established that quoted companies 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 overcompensated 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 Main Investment Market Segment (MIMS) and the Alternative Investment Market Segment (AIMS).

Akwimbi (2003) studied the NSE on the application of APT models 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 and 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 a 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 variablesand stock prices.

International studies on industry dynamics in stock studies have also been reviewed.Christen et al (2004) of the UK Department of International Development examine risks that agricultural ventures are exposed to and the various risk management models. The paper cites weather, pests and disease as some of the calamities affecting the yield of crops. Risk in agriculture is also traced to farmers seeking to increase their incomes through higher-risk, higher-return cropping strategies. Markets and prices are additional risks associated with agriculture. Many agricultural markets are imperfect, lacking information and communications infrastructure. The prices that crops will sell for are unknown at the time of planting, and vary with levels of production (locally and globally) and demand at the time of sale. Prices are also affected by access to markets. As state-owned marketing organizations are phased out, small farmers face much higher price risks in many countries. And inelastic demand for many agricultural products causes small increases in production to result in large price swings.

Hou*et al* (2003) explore the link between industry product market characteristics and average stock returns. Their paper is part of a larger literature that links industrial organization to issues in financial economics. The sample used by in their study includes all NYSE, AMEX, and NASDAQ listed securities with share codes 10 or 11 for the sample period 1973-2001. Industry concentration was measured using the Herfindahl index, which is defined as

$$\text{Herfindahl}j = \sum_{i=1}^{I} s_{ij}^2$$

where s^2_{ij}

is the market share of firm *i* in industry *j*. The calculations were performed each year for each industry, and then the values over the past three years are averaged to ensure that potential data errors do not have undue influence on the Herfindahl measure. Hou*et al* (2003) argue that the structure of product markets helps to determine a firm's risk by affecting the equilibrium operating decisions it makes. They link industry concentration to stock returns through innovation and distress risk. Industries in which innovation risk and distress risk are higher are expected to command higher expected returns.

2.4Conclusions and Knowledge Gaps

Most of the previous studies , especially local studies such as by Gitari(1990), Kamau (2002), and Ombajo (2006) looked into the profile dynamics of companies quoted 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 characteristic of the quoted companies. Other studies including Apuoyo (2010), Kiptoo (2010), Gichana (2009) and Mogunde (2011) have all tried to indicate various forms of risks on the securities exchange without focusing on MIMS. The current study addresses this gap by examining the risk - return patterns of quoted companies operating in the different industries as defined by the sectoral classification inthe MIMS. Also, most of the studies were carried out in late 1990s and 2000s. This period was characterized by political activism and a depressed Kenyan economy. The results of the studies may not hold true today given positive changes in the economic environment 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 were 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 the 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 (CDSC) in 2006. The current study will therefore seek to understand whether the results of previous studies still hold in the improved trading environment in the period 2007-2011 using a CAPM model to support or contradict the other 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 operationalisation of variables to be used and finally the analysis of the data to be collected.

3.2 Research Design

The study was carried out on an empiricalbasis to establish whether there exist any trade-offsin the sectoral risk- return patterns of quoted companies in the Agricultural Sector, Commercial & Services Sector, Finance& Investment Sector and the Industrial & Allied. The statistical model used was ordinary linear regression analysis that quantified the strengths of the trade-off between the stock returns and beta. The differences found to exist were significantly evaluated and the reasons underlying those differences established.

Due to the historical nature of stock prices, data collected was treated and analysed as secondary source. Previous researchers in Kenya such as Kamau (2002), Gichana (2009) and Ombajo (2006) in related research topics have used a similar design. Use of the similar research design therefore enhanced consistency and comparability of the studies to the current study.

3.3Populationof 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 the quoted companies will be obtained as at 31st December 2011. This date was identified as the cut-off date for the purpose of carrying out this study. A total of 43 companies listed on the NSE since 2007 were surveyed using Wednesday averages as recommended by Fama and French (1983). However, only 34 were found to be consistently active on the market and they formed the database for study analysis.

3.4Data Collection

Average daily stock price data as well data on traded volumes was obtained from the NSE daily price lists maintained by the NSE. The daily price lists are historical in nature and were used as a secondary data source for this study. Reference was also be made to periodic statistical reports generated by the NSE such as the weekly reports on the overall stock market performance. Commentaries made on the annual reports of the sampled companies were also reviewed to obtain information on the performance of the various sectors in which sampled companies operate in. This enabled the study to obtain additional information that assisted in making inferences towards the risk- return patterns observed from the statistical analysis of sectoral data. Stock beta was computed for the research period to get the risk with dividend paid captured and data analysed using MS EXCEL through Dividend Growth Model by Gordon (1959).

3.5Data Analysis

Empirical analysiswas used in thestudy as most of the data collected was numeric in nature. Using Gordon (1959) model, weekly prices changes and weekly dividends were collected for the period 2007-2011. The model was of the form:

$$\boldsymbol{R_a} = \frac{D}{P_0} + \frac{P_1 - P_0}{P_0}$$

Where: $\boldsymbol{R_a}$is the weighted average rate of return per week, **D** is the dividend per share per week, $\mathbf{P_0}$ is the price of share at the beginning of the week and $\mathbf{P_1}$ is the closing share price at the end of the week. The weighted average returns and average betas were calculated for each Wednesday during the period with daily stocks sold forming the weights.

This created the following linear relationship to determine constants **A** and **B**and establish relationship between $\mathbf{R_a}$ and **β** as follows:

$$\boldsymbol{R_A} = A + B * \beta_A + \in_A$$

Where $\mathbf{R_A}$ is the weekly weighted stock return and β is the weekly weighted beta or risk; **B** is the excess return per unit of beta and **A** is not associated with beta. The regression assumed linearity with error term of mean **0** although the $\in_{\boldsymbol{i}}$ are statistically independent of each other. The t-test was used to determine linearity by testing significance of the slope (**B**) of the regression line at 95% confidence using F-test.

3.6Variable Operationalization

The study used key measures of risk as standard deviation and beta while applying Sharpe ratios and t-tests for verification of the results. Accordingly, if the standard deviations were high it indicated least risk while very low percentages indicated high risk. This was then compared with beta results in which the lower the beta value the lesser the risk.

The two results for standard deviation and Sharpe ratios were bound to contradict with one indicating a different risk direction from the other. To have a conclusive finding on the risk level a final resolution involved a t-test applied for mean variances per class of MIMS tested against the market variances. From the preceding results, the analysis concluded how strong each sector was compared to the main market for MIMS.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

The main objective of the study was to establish whether there existed anysuperior trade-offsin the sectoral risk- return patterns of quoted companies in the Agricultural Sector, Commercial & Services Sector, Finance & Investment Sector and the Industrial & Allied. The selected companies had consistently operated in the same market under similar conditions as highlighted in the period between January 2007 and December 2011. The monthly security returns are given in Appendix 1 in which the classification and various statistics of the MIMS sector are highlighted according to the sectors Agricultural, Commercial, Finance and Industrial. For purposes of grammar, these four names will be use to represent Agricultural services, Commerce & Allied, Finance & Investment and Industrial & Allied respectively.

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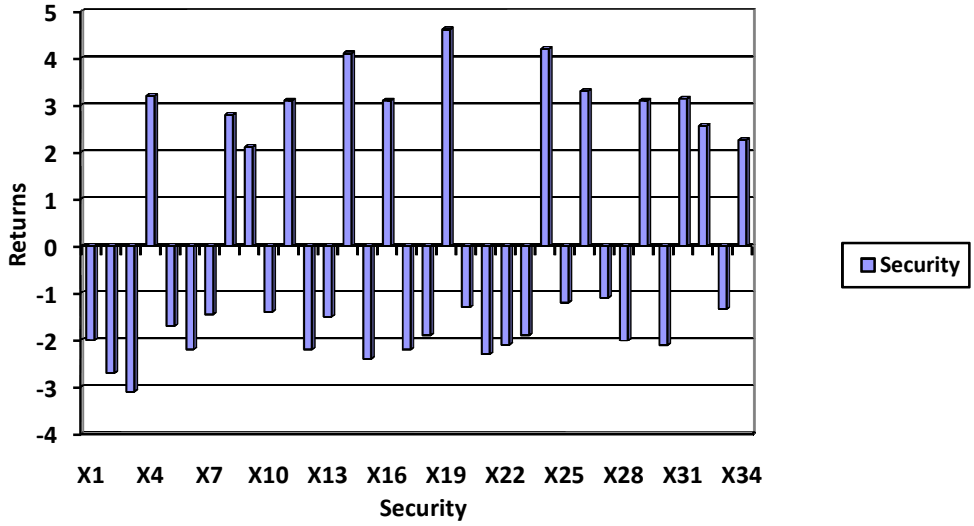
4.2 Returns of Securities

From figure 1, the average monthly returns of securities listed under MIMS show a positive average returns for some sectors. Thirteen companies including, X4, X8, X9, X11, X14, X16, X19, X24, X26, X29, X31, X32, and X34 had positive returns. The average returns for the rest of the companies are negative. The security with the highest average monthly return is X19 with an average return of 4.612 percent while the security with the lowest average monthly return is X6 with an average return of -2.604 percent. The MIMS had most of the average returns for the companies at around 2 percent or

below. The sector exhibited low average returns a performance that could be attributed to uncertainties in investment environment with increased risk assumption following the massive political upheavals the country has had during the period. It is during the period that Kenya was heading towards their general elections in 2007. This built the mood that brought tension in all trade sectors and affecting the returns of all securities. Further, the economy was badly affected during the post-election period from 2008. All activities towards the stock markets took a downturn in the immediate aftermath of the violence in 2008. According to the survey in 2009 (GoK, 2009), all economic development indicators were in a declining trend during these period.

Figure 4.1: Returns per Individual Company in MIMS



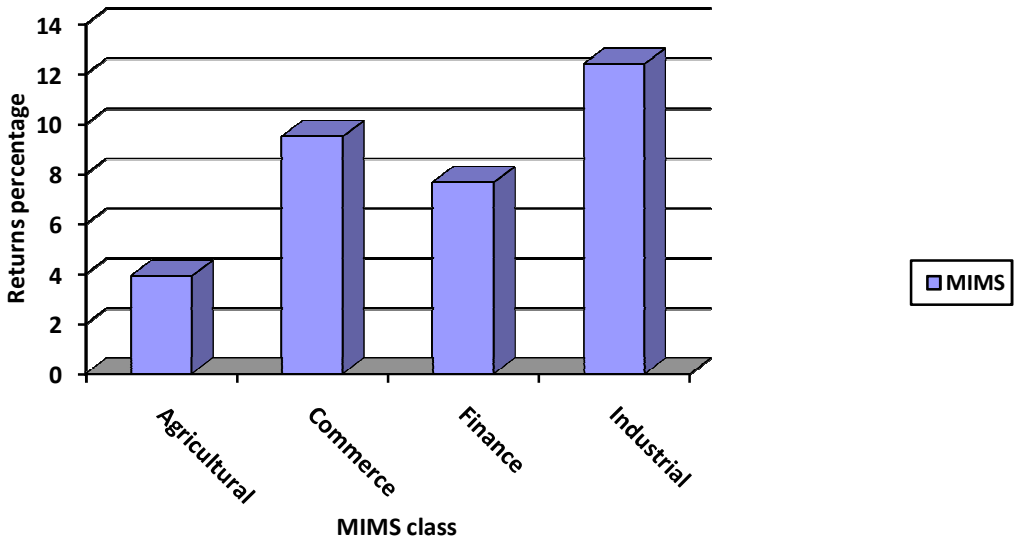
4.2.1 Returns of Securities per MIMS sector

From figure 2, the five year under study was characterized by low treasury bills rates due the vibrant economy mixed with growing fear of post election violence repercussions. The period also experienced high bank lending rates (on average, above 16% over the

2007-2011 period) an indication that the banks preferred investing in Treasury Bills to other risky investments such as loans or stocks thereby proving that Treasury Bills were better investments than stocks.

The four individual sectors of the MIMS including agricultural, commercial, finance and investment and industrial and allied posted different average returns in fluctuating manner over the period 2007-2011. The industrial and allied class had the highest positive returns at 12.4 percent for the period followed by commercial and services with 9.5 percent, finance and investment with 7.67 percent and finally the agricultural class with a low of 3.92 percent. This implies that the agricultural sector was a risky sector to invest in the MIMS followed by finance and investment, then commercial services and allied.

Figure 4.2: MIMS Returns per Sector



4.2.2 Summary of Statistics

The summary statistics in Appendix 2 provide information on the average returns, the standard deviations and betas as used in the intra-sector analysis. The class yearly returns were summed up then divided by 5 which is the total number of years under consideration for the study. The average returns were then used to derive other statistical measures including standard deviation, correlation, beta and Sharpe ratios. The highest beta was 2.50039 for Kenya Power with the lowest coming from Kenya Airways at 0.05053.

4.3 Risk Indicators

The study used key measures of risk as standard deviation and beta while applying Sharpe ratios and t-tests for verification of the results. According to table 3, the standard deviations ranged from 14.72% to 19.29%. The agricultural sector was the least risky

with a standard deviation of 14.72%. This was followed by Commercial sector which had a standard deviation of 16.51% while Finance sector had a standard deviation of 18.28%. The industrial sector was the most risky with a standard deviation of 19.29%.Using the results of beta, Agricultural sector had a beta of 0.6686 followed by Commercial sector with a beta of 0.9324, Finance sector with a beta of 1.0004 and finally Industrial sector had a beta of 1.1786. This now confirms that Agriculture was the least risky class while industrial was the most risky.

Table 4.3: Summary of Class Risk Indicators

MIMS SECTOR	**μ MEAN RETURNS**	**α STANDARD DEVIATION**	**β BETA**
AGRICULTURAL	0.0392	0.14723	0.6686
COMMERCIAL	0.0767	0.16513	0.9324
FINANCE	0.0950	0.18280	1.0004
INDUSTRIAL	0.1242	0.19294	1.1786

Source: NSE Data (2011)

4.4 Return versus Risk

According to Sharpe (2004), most people would choose an investment with a lower standard deviation with a lower risk if given a choice between investments with same expected returns but with different standard. However in a scenario where we have a higher return and a lower standard deviation between the two investments, the problem is best solved using Sharpe ratios which are a covariance of the standard deviations as shown in Table 4.4.

The results in section 4.4 appear to contradict the results of section 4.3 which standard deviations appear to indicate Agricultural sector was the least risky while Industrial was the most risky and this required further resolution in the next section.

Table 4.4: The Sharpe Ratios for MIMS Sectors

MIMS Sector	Mean Returns	Standard Deviations	Sharpe Ratio
Agricultural	0.0392	0.14723	0.2663
Commercial	0.0767	0.16513	0.4645
Financial	0.0950	0.18280	0.5197
Industrial	0.1242	0.19294	0.6437

Source: NSE Data, 2011

4.5 T-test for MIMS Sectors against Market Variances

To finally resolve the contradiction, a t-test was applied in section 4.5 with mean variances per class of MIMS tested against the market variances.

4.5.1T-test for Agricultural Sector against Market Variances

From table 4.5 the computed value t of 0.284 is far much less than the critical t value 2-tailed of 2.013. This is a clear indication that the mean return of the Agricultural sector is not statistically different from the market return.

Table 4.5: T-test for Agricultural Sector versus the Market

t-test: Two-sample assuming unequal variance		
	Agricultural	**Market**
Mean	0.039	0.500
Variance	0.022	0.019
Observations	34	34
Df	43	
t-test	-0.284	
P(T<=t) one tail	0.389	
t Critical one tail	1.679	
P(T<=t) two tail	0.778	
t Critical two tail	2.013	

Source: NSE Data, 2011

4.5.2 T-test for Commercial sector against Market Variances

From table 4.6, the computed value t of 0.588 is less than the t value of 2.104 implying that mean variation of commercial sector at 0.076that is not statistically different from market mean return at 0.05.

Table 4.6: T-test for Commercial Sector versus Market Variances

t-test: Two-sample assuming unequal variance		
	Commercial	**Market**
Mean	0.076	0.0500
Variance	0.027	0.019
Observations	34	34
Df	43	
t-test	0.588	
P(T<=t) one tail	0.280	
t Critical one tail	1.679	
P(T<=t) two tail	0.560	
t Critical two tail	2.014	

Source: NSE Data, 2011

4.5.3 T-test for Financial Sector against Market Variances

From the results of table 4.7, the computed t value of 0.944 is less than the critical t-value of 2.107 which indicate that the mean variation of the financial sector at 0.095that is not statistically different from the market rate at 0.05.

Table 4.7: T-test for Financial Sector versus Market Mean Variances

t-test: Two-sample assuming unequal variance		
	Financial	**Market**
Mean	0.095	0.0500
Variance	0.03434	0.019
Observations	34	34
Df	43	
t-test	0.944	
P(T<=t) one tail	0.175	
t Critical one tail	1.681	
P(T<=t) two tail	0.350	
t Critical two tail	2.017	

Source: NSE Data, 2011

4.5.4 T-test for Industrial Sector against Market Variances

From the results of table 4.8, the computed t value of 1.528 is less than the critical t value of 2.018 which implies that the mean return variation at 0.012that is not statistically different from the market mean returns variance at 0.05.

Table 4.8: T-test for Industrial Sector versus Market Mean Variances

t-test: Two-sample assuming unequal variance		
	Industrial	**Market**
Mean	0.124	0.0504
Variance	0.037	0.0193
Observations	34	34
Df	43	
t-test	1.528	
P(T<=t) one tail	0.067	
t Critical one tail	1.682	
P(T<=t) two tail	0.134	
t Critical two tail	2.018	

Source: NSE Data, 2011

4.6 Summary of Findings and Interpretations

The best class to invest in the MIMS as indicated in Figure 1 was definitely the industrial and allied class but the class requires heavy capital investment since the price of stocks in the class is generally very high. The high risk in agriculture class can be explained away as the period involved had many turbulences that affected farming activities including the approach to general elections in 2007 and post election violence after 2007-2008 that greatly affected the rift valley which is the bedrock of agriculture in the country.

In terms of risk indicators for individual companies, results of Table 3 indicate that Kenya Power and Lighting from the industrial sector was the most risky security with a standard deviation of 47.56% and a beta of 2.50039. The least risky security was Unilever Brooke Bond's from Agricultural sector with a standard deviation of 13.08% and a beta of 0.453.

However, comparing return versus risk from table 4, the results indicate that Agriculture with the least standard deviation of 0.14723 had the highest Sharpe ratio at 3.756. This indicated clearly that Agricultural class was the riskiest among the 4 classes. Commercial sector had a Sharpe ratio of 2.513, Finance had 1.924 while Industrial had the least Sharpe ratio of 1.553.

From the preceding results, the analysis concludes that Standard deviations, betas and Sharpe ratios from the 4 sectors of MIMS were not very much different from the market mean variations during the period under study (2007-2011).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter 5 gives a summary of the entire research highlighting the conclusions, recommendations and suggestions for further research. The recommendations and suggestions are based on the findings in the previous chapter and the study objective.

5.2Conclusions

The study objective was to establish whether there exists superiorsectoralrisk - return profile for companies operating in the sectors of the Main Investment Market Segment of the Nairobi Stock Exchange with a use of historical data for the period 2007-2011 which constituted 60 months. Accordingly, the study viewed profiles in terms of the ratios and returns as per the sectors in the MIMS. The MIMS has four sectors namely agricultural, commercial& services, finance & investment and industrial sector. The initial analysis showed that there is a link between the sectors of MIMS in which for every period when one sector is having poor returns, another sector will either benefit immensely or be adversely affected. However, the difference in returns for the various sectors seems to be insignificant. This implies that the assumed risks by policy makers might not have existed. Measuring the profiles using different variables indicated reverse results with one measure indicating Agricultural sector to be the riskiest while the other measure indicated Industrial sector to be the riskiest.

With the above findings, investment decisions should be based on company specific information as opposed to the sector in which the company is categorized in the NSE market. Use of company Net Present Value towards making investment decisions may be a better approach that use of historical risk – return patterns displayed by the various sectors.

In view of this, a policy of full disclosure by all players in the NSE Market is required to ensure information is available for sound investment decisions, avoid any insider trading that might lead to distortion of returns since tests have shown that all the sectors of MIMS can be shown to be either risky or not risky with differing measurement variables.

5.3 Recommendations

Policy makers such as the CMA, Central Bank of Kenya and the Ministry of Finance should review the impact of sectoral segmentation on the NSE market development. This is important since the Kenyan economy is growing and matters to do with financial management are key in economic growth.

It is also important that surveys are conducted to establish if investors purely make investment decisions based on risk – return profiles. This is more so after the study established that there was very little difference in the profile trade-offs amongst the various sectors.Finally, the study recommendedto establish the extent to which insider trading happens at the NSE and its impact on risk and returnprofiles.

5.4 Limitations

As the study is based on historical data, it is always going to be difficult to make a conclusion from the findings which are usable to the future. The fact that data has been fully used and archived means that policy makers and academicians will always use projections in making any decisions for the future.

Data collection for such secondary data was carried out through a second party since an individual cannot collect data directly from the NSE trading floor nor gain access to the NSE database which contains the data. Price changes do not always indicate all facts or issues concerning a company. At the same time, most stocks appeared not to be traded consistently making it difficult to make reliable generalizations over the NSE market.

Some of the stocks under consideration were not consistently trading over the period of study. Indeed some were suspended over this period. These erratic trading patterns could have distorted stock prices and thus the results of the study.

5.5 Suggestions for Further Research

There is need to have a further study in the MIMS sector to establish the relationships among the sectors using another measurement of variables apart from profile. Another area of recommended study is the use of multiple factors instead of using singular variable measures in this case the price of stock and dividends were the only ones used.

Similarly, the periods in which stocks experience persistent fluctuations need to be established in order to enable policy makers have clarity on how to restore such stocks on the NSE market.

It is also recommended that a further study is done to establish if the NSE market segmentation has any influence on the Kenyan Investor decision making process.

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APPENDICES

Appendix I: Letter of Authority – University of Nairobi

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
MBA PROGRAMME

Telephone: 020-2059162
Telegrams: "Varsity", Nairobi
Telex: 22095 Varsity

P.O. Box 30197
Nairobi, Kenya

DATE 27th SEPT. 2012

TO WHOM IT MAY CONCERN

The bearer of this letter MICHELLE KERUBO ONDARI

Registration No. D61/61806/2012

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
27 SEP 2012
MBA OFFICE
P.O. Box 30197 00100, NAIROBI

IMMACULATE OMANO
MBA ADMINISTRATOR
MBA OFFICE, AMBANK HOUSE

Appendix II: Letter from NSE Data Collection

Nairobi Stock Exchange Ltd, 1st Floor, Nation Centre,
Kimathi Street, P.O. Box 43633-00100 Nairobi, Kenya
Tel: +254 20 2831000, Fax: +254 20 224200
Web: info@nse.co.ke

5th /10/2012

To Whom It May Concern

RE: Michelle Kerubo Ondari – D61/61806/2010

This is to confirm that Michele Ondari of University of Nairobi has conducted a data collection exercise from the NSE as requested through her letter of introduction from the University dated 27th /09/2012.

Signed
M. Lutta
For: **Corporate Affairs Manager**

Appendix III

LISTED COMPANIES AT NSE (2007-2011)

S/No.	Listed Company
1	Athi River Mining Company
2	BOC Kenya Ltd
3	Bamburi Cement Ltd
4	Barclays Bank Ltd
5	BAT Kenya Ltd
6	Car & General Ltd
7	Carbacid Investment Ltd
8	CFC Stanbic Holdings Ltd
9	City Trust Ltd
10	CMC Holdings Ltd
11	Crown Berger Ltd
12	Diamond Trust Bank Kenya Ltd
13	E.A. Cables Ltd
14	E.A. Portland Cement Ltd
15	EAA GARD
16	East African Breweries Ltd
17	Equity Bank Ltd
18	Eveready East Africa Ltd
19	Express Ltd
20	Housing Finance Corporation Kenya Ltd
21	Jubilee Holdings Ltd

22	Kapchorua Farms Ltd
23	KenGen Ltd
24	Kenya Airways Ltd
25	Kenya Commercial Bank Ltd
26	Kenya Power
27	Limuru Tea
28	Marshalls E.A. Ltd
29	Mumias Sugar Company
30	Nation Media Group
31	National Bank of Kenya Ltd
32	NIC Bank Ltd
33	Olympia Capital Holdings
34	Pan African insurance Holdings
35	Rea Vipingo Plantations Ltd
36	Sameer Africa Ltd
37	Sasini Ltd
38	Scangroup Ltd
39	Standards Chartered Bank
40	The Cooperative Bank
41	Total Kenya Ltd
42	TPS (Serena) Ltd
43	Unga Group Ltd

Source: NSE market report (2012)

Appendix IV: Consistently Active Companies on the NSE

Summary of Individual Firm Securities – 2007-2011Period

Code	Firm	Mean Returns	Mean STDV	Mean β
X1	Unilever Brooke Bond Ltd	0.02	0.13805	0.45330
X2	Kakuzi	0.0196	0.22801	0.86744
X3	Rea Vipingo Plantations Ltd	0.1071	0.23291	0.85613
X4	Sasini Tea & Coffee Ltd	0.0071	0.14306	0.49761
X5	Car & General (K) Ltd	0.0517	0.21854	0.42898
X6	CMC Holdings Ltd	0.0971	0.30298	0.06687
X7	Kenya Airways Ltd	0.61	0.36443	1.05053
X8	Nation Media Group	0.0833	0.31568	0.83398
X9	Tourism Promotion Services Ltd (Serena)	0.0997	0.28207	1.10750
X10	Barclays Bank Ltd	0.0896	0.20688	0.76181
X11	C.F.C Bank Ltd	0.1279	0.26144	0.85304
X12	Diamond Trust Bank Kenya Ltd	0.0746	0.17236	0.72889
X13	Housing Finance Co Ltd	0.0767	0.26585	1.54174
X14	I.C.D.C Investments Co Ltd	0.0479	0.19381	0.77783
X15	Jubilee Insurance Co. Ltd	0.1096	0.28079	0.90506
X16	Kenya Commercial Bank Ltd	0.0988	0.29842	1.47221

X17	National Bank of Kenya Ltd	0.0124	0.40865	1.30642
X18	NIC Bank Ltd	0.1463	0.24517	1.18742
X19	Pan Africa Insurance Ltd	0.0888	0.22557	1.18431
X20	Standard Chartered Bank Ltd	0.0966	0.32456	0.96224
X21	Athi River Mining	0.0829	0.18626	0.54912
X22	Bamburi Cement Ltd	0.0892	0.35474	1.05775
X23	British American Tobacco Kenya Ltd	0.1025	0.27517	1.23732
X24	Crown Berger Ltd	0.1067	0.25498	1.23783
X25	Olympia Capital (Dunlop)	0.1054	0.31169	1.03745
X26	E.A.Cables Ltd	0.0738	0.28271	0.92103
X27	E.A.Portland Cement Ltd	0.1904	0.36869	1.24092
X28	East African Breweries Ltd	0.1638	0.39531	1.14768
X29	Firestone East Africa Ltd (Sameer)	0.1913	0.22140	1.01736
X30	Kenya Oil Co Ltd	0.3083	0.31504	0.66193
X31	Mumias Sugar Co. Ltd.	0.0617	0.18305	1.01066
X32	Kenya Power & Lighting Ltd	0.1309	0.47557	2.50039
X33	Total Kenya Ltd	0.0188	0.22943	0.89837
X34	Unga Group Ltd	0.0717	0.37071	1.51084

Source: Nairobi Securities Exchange Report (2011)