AN EMPIRICAL TESTING OF THE CAPITAL ASSET PRICING MODEL AMONG FIRMS QUOTED AT THE NAIROBI STOCK EXCHANGE

PRESENTED BY;

VICTOR OLUOCH OTIENO
D61/70076/2009

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (MBA) AT THE UNIVERSITY OF NAIROBI, SCHOOL OF BUSINESS IN THE DEPARTMENT OF ACCOUNTING AND FINANCE

DECLARATIONS

Declaration by the candidate

I hereby declare that this study is my original work, which has never been produced for a degree at The University of Nairobi or any other University. All borrowed pieces of work from various authors to back up the discussion have been duly acknowledged in the references. No part of this dissertation may be reproduced without the permission of the author and/or The University of Nairobi.

Signature: ________________________ Date:______________________

VICTOR OLUOCH OTIENO

Registration Number: D61/70076/2009

Declaration by the Supervisor

This dissertation has been submitted for examination with my approval as University Supervisor.

Signature______________________________ Date:___________________

MR. JOSEPHAT LISIOLO LISHENGA
Lecturer, University of Nairobi

ACKNOWLEDGEMENTS

I attribute the success of this study to the enormous support I got from various organizations and individuals to whom I feel highly indebted. Very special thanks go to The University of Nairobi for the resources that enabled me conduct my study including research material and literature in form of the library. I wish to in a special way express sincere gratitude to my supervisor Mr. Josephat Lisiolo Lishenga for his endless guidance, constructive criticism and patience during the period in which I was conducting this study.

I would like to acknowledge the support I received from The co-operative Bank and in particular Kingdom security Research department for enabling me obtain the data used in the study together with invaluable advice that their staff patiently offered. Special thanks to Mr. Mwenda Rama, the Kingdom Securities Ltd research analyst for the support he offered during my contact with the department

Finally, I would like to thank my beloved fiancée Caroline Wandia for her patience as I spent time away from her to attend to the Study in this period. Her support was immense and I highly appreciate every contribution she made and the advice she offered

DEDICATION

This project is dedicated to my late Dad Joel and Uncle Elly. May their soul rest in eternal peace.

ABSTRACT

The study examines the Capital Asset Pricing Model (CAPM) for the Kenyan stock market using the monthly adjusted stock returns for companies listed at the Nairobi Stock Exchange for the period of January 1998 to December 2010. The finding of this study does not show the theory's basic result that higher risk (beta) is associated with higher level of return. The study however explains the excess returns over the risk free rate of return, represented in this study by the 91 day t-bills rate of the government of Kenya. This thus supports the linear structure of CAPM equation. The theory predicts that the intercept should be equal to zero and the slope be the excess return on the market portfolio. The results of the study lead to negate the above hypotheses and offer evidence against CAPM. The tests conducted to check the non linearity of the relationship between return and betas support the hypothesis that the expected return-beta relationship is linear. Additionally, the study investigates whether CAPM adequately captures all important determinants of returns including the residual value of stocks. The results exhibit that residual risk has no effect on the expected returns of portfolios

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

1.0 INTRODUCTION

Background of the study

Modern age finance began when Markowitz (1952) showed how increasing diversification lowers portfolio's standard deviation and variance. The basis of his work was that stock returns are normally distributed and that people like returns and do not like risk which makes them want a high mean but low standard deviation portfolios. The portfolios with the highest return for a given level of risk he called the Mean Variance Efficient Frontier (MVE). When a Risk free asset is included in the model, a line can be drawn from the RF rate to the MVE we have what is called a capital allocation line (CAL). Investors obviously want to take the highest CAL. (the one with the highest return per unit of risk-also called the coefficient of variation). Thus, the optimal CAL will be just tangent to the old MVE frontier. If the CAL is tangent at the market portfolio, then the CAL is called the capital market line (CML).

From this basic step, Sharpe (1964), Lintner (1965) and Mossion (1968) helped to develop what has become known as the Capital Asset Pricing Model (CAPM) which shows the value relationship that exists between risk premium and expected return involved with a capital asset. The general idea in the model is that investors need to be compensated for their cash in two ways: first for the time value of money, which the model compensates for through the risk free rate and the additional risk the investor takes. This is compensated through a risk measure (beta) that compares the returns on the asset to the market over a period of time and to the market premium.

Capital Asset Pricing Model (CAPM) has since become very useful and famous of all financial models and is essential to evaluating the viability of investing in stocks issued by a given company. It is possible for an investor to determine what degree of risk is associated with an investment, as well as an idea of what type of return to expect from a venture within a given period of time.

Sharpe (1964) recognizes two types of risk to the prospect of an asset's return i.e. systematic (also called Market or non-diversifiable risk) and non systematic risk (Firm specific, diversifiable or unique risk). Systematic risk is common to all the stocks in the market and cannot be eliminated by diversification of securities while non-systematic risk is specific to a given firm or industry and can thus be diversified away. It can therefore be concluded that if an investor has a well diversified portfolio, then his concern will only be the systematic risk. (Wang, 2003)

In developing the asset pricing model, the scholars assumed that Investors are single period risk averse and prefer maximum utility and that they can choose portfolios solely on the basis of means and variance. He also assumed that there are no taxes or transaction costs, all investors can borrow and lend at a given risk-less rate of interest. The result is a statement which gives the relation between the expected risk premiums on individual assets and their "systematic risk." This relationship states that the expected excess return on any asset is directly proportional to its "systematic risk." This means that investors get adequately compensated to absorb risks that cannot be eliminated from a market through diversification (Biglova et al. 2004).

If this relation is empirically true, the model has wide range implications and gives solutions to problems ranging from capital budgeting, cost benefit analysis, to portfolio selection and other economic problems requiring knowledge of the relationship between risk and return. Also, CAPM is still used in applications like estimating the cost of capital for firms and evaluating the performance of managed portfolios. It is Indeed at the centre stage of the many investment and financial market courses. However, there is still a great debate among scholars and researchers as to the empirical applicability or validity of the model (Bhalla, 2005)

The capital market is a very important part of any financial system and plays a very central role in the development of an economy. This is where investors, large and small put their money with the hope to realize good returns. Reilly and Brown (2002) define investment as the current commitment of money for a period of time in order to derive future payment that will compensate the investor for the time the funds are committed, the expected rate of inflation and the uncertainty of future payments. The manner in which securities are priced is thus core and has attracted the attention of researchers for long. The risk-return relationship performs a central role in pricing securities and therefore helps in judicial investment decision making.

According to Wikipedia, The Nairobi Stock Exchange (NSE) is the principal stock exchange of Kenya. Having been in existence for over 55 years, it is now rated as Africa's fourth largest stock exchange in terms of trading volumes, and fifth in terms of Market capitalization as a percentage of GDP. The exchange works in cooperation with the Uganda Securities Exchange and the Dar es salaam Stock Exchange, including the cross listing of various equities. The indicators of performance popularly used at the exchange are the NSE-20 Share index, which measures performance of 20 blue chip companies with strong fundamentals and which have consistently returned positive financial returns, and the Nairobi Stock Exchange All Share Index (NASI) which was introduced in 2008 as an alternative index and is an overall indicator of performance. This incorporates all the traded shares of the day. The market is divided into three main segments, the Main Investment Market Segment, Alternative Markets Investment Segment and Fixed Income Security Market Segment.

The research therefore attempts to see if systematic risk beta as independent variable can explain the cross sectional variation in security returns in the Nairobi Stock exchange. This study aims to study the standard form of CAPM and is organized into parts. Part one is the introduction, part two reviews some of the empirical evidences on CAPM, part three deals with the research methodology while part four and five is the analysis of the data, results presentation, summary, conclusion and recommendations

1.1 Statement of the problem

After the General elections in Kenya in the year 2002 that saw President Kibaki take over power, the Government of Kenya began an ambitious economic reform and this led to the growth of the real GDP, Registering 2.8% in 2003, 4.3% in 2004, 5.8% in 2005, 6.1% in 2006 and 7.0% in 2007. This growth was however brought down due to the post election violence that broke out after the 2007 general elections and made worse by drought and global financial crisis. The growth slowed down to less than 2% in 2008 with a modest improvement to 2.6 in 2009.

Over the period of improved economic recovery, risk appetite in Kenya increased tremendously as evidenced by the speculative excesses witnessed in the NSE. The number of investors increased in the NSE after the 2003 - 2007 economic growth experienced and the many IPOs that were floated in the market between the years 2006 – 2009, that unprecedented interest in the NSE therefore caused more retail investors to be interested in the stock market (CMA, 2009). Although the economic growth has since declined in 2008 due to the post election violence and started increasing at a diminishing rate, those who had experienced good returns hope that the trend would pick up and therefore still flocking the NSE.

Even though investment in the Nairobi Stock Exchange has consistently outperformed all other investment classes over the years, almost every investment has is some kind of risk in virtually all kinds of investment, including stocks and shares. According to World Bank (2006), the risk inherent in stock market investments can be adverse especially to most small retail investors who lack adequate technical investment information. Whereas most of the Kenyan markets opportunities and risk factors can be derived back to general fundamental conditions, the area of technical risk and return analysis need to be given some considerations and the returns be estimated for each security being considered with appropriate adjustments for decision making (Fischer, 2003).

Investments are made in the stock markets in expectations of returns in excess of the risk free rate. Over the years, researchers have worked to find the relationship between risk and returns. One of the most important contributions by researchers in the securities market is the establishment of the relationship between risks and returns by way of CAPM and APT. Though these models are widely used in practice, they have not been tested particularly especially in the Nairobi Stock Exchange to establish whether they are actually applicable or relevant to the requirements of the investors in the region in establishing if their investments will yield the desirable returns or not. This has resulted to lack of adequate information to Retail investors who either buy equity stocks for speculative purposes or shares purchasing being the in thing. Most of these investors have ended up being exploited by their stock brokers or the market big chips engaging in insider trading thus locking out the small investors from accessing some very profitable stocks or controlling the stock market at large.

From the foregoing background literature therefore, understanding the relationship between risk and return particularly using the Capital Asset Pricing Model (CAPM) is a key piece in building ones investment philosophy and thus the study seeks to provide useful investment information to equity stock market stakeholders, especially the small investors; through testing of the capital asset pricing model and establish if it is actually applicable or not in equity stocks trading in the NSE within the MIMS

1.2 RESEARCH OBJECTIVES

The study worked towards meeting the following objectives.

(i) To examine whether higher risk stocks yield higher expected rate of return and lower risk stocks yield lower expected rate of return in the Nairobi stock Exchange.

(ii) To examine whether the expected rate of return is linearly related with the stock beta.

(iii) To examine whether the non-systematic risk affects the portfolio returns.

1.3 SIGNIFICANCE OF THE STUDY

The main beneficiary of the research will be retail investors. Knowledge of whether or not CAPM works efficiently in the NSE will help them decide on the kind of portfolios to build. With an efficient risk transfer mechanism, investors are paid a premium to absorb risks that cannot be eliminated from a market through diversification. An investor will in this case be able to make proper decisions on how to diversify their portfolios to maximize gains while minimizing risks

Second are prospective investors. These are the people who hope to invest in the Nairobi Stock exchange. Prices in the market should reflect the amount of risk, especially the systematic risk that various securities hold. The investors will therefore be able to weigh the opportunity cost against expected returns of securities to make prudent investment decisions. Third are the Funds Managers e.g. the mutual funds managers. These people are trusted investing funds for the benefit of the owners of the funds. By knowing the applicability of CAPM, these managers will know the best tool to apply for their investment appraisal and ultimate decision making to the benefit of the owners of the funds.

The other group that will find this information useful are the Managers of the various listed companies in the Nairobi Stock Exchange. These managers are required by the share holders to ensure that the value of the firm is increased and this usually reflects on the share prices of these firms on the NSE. Knowledge of whether CAPM applies or not in the NSE will give these Managers the opportunity to choose the best model to use in determining if their shares are correctly priced or not and if so, to make necessary decisions on what to do to make the share price to rise.

Investment analysts, advisors and other market intermediaries to will also find this information useful. Being responsible for advising their customers on which stocks are best to buy, hold or dispose, they will be interested in knowing whether the tools they use for measuring risks and return actually measure them with accuracy and therefore provide professional guidance and clarification to investors importance of getting the right investments and timing through understanding both the opportunities and the risks of today's market. This research will therefore be useful to them in making such decisions.

Finally, fellow scholars who can use this study to do more research on the NSE so as to provide investors with as much information as possible in equity investment. This will be through the research gaps identified and the areas that require further research on.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction to Literature Review

The literature review is organized into three parts, 2.1 is the introduction to literature review, 2.3 deals with past studies on risk and return and 2.8 deals with Empirical Literature Review.

2.2 Review of Theoretical Literature

This section reviews the concept risk and return and how they are measured. The study will also focus on how assets are valued in the capital markets and more specifically the wider concept of risk and return, the logic of portfolio theory and the use of various equity asset valuing models, risk management and a highlight on return.

2.3 Past Studies on Risk and Return in Equity Stocks.

Markowitz (1952) began the modern age of Finance by showing how increasing diversification lowers portfolio's standard deviation and variance. His work was based on the idea that stock returns are normally distributed and that people like returns and do not like risk. Thus they want a high mean, low standard deviation portfolio. The portfolios that have the highest return for a given level of risk are called the mean-variance efficient frontier (MVE). There before, as far back as the 18th century, Bernoulli and Cramer reached the conclusion that decisions under conditions of uncertainty could not be made solely on the basis of expected return. Subsequently, various economists have tried to evaluate investments with the aid of two (or more) indicators based on the distribution of returns. Generally one index reflects the profitability of the investment while the other is based on the dispersion of distribution of returns and reflects the investment's risk. The most common profitability index used is the expected return, that is, the mean of the probability distribution of returns; the risk index is usually based on the variance of the distribution, its range and so on.

It is the development of the Markowitz portfolio theory (portfolio selection model) in the 1950s that the modern theory of investment commenced. Markowitz used mathematical programming and statistical analysis in order to arrange for the optimum allocation of assets within a portfolio. To reach this objective, Markowitz generated portfolios within a reward risk context. In so directing the focus, Markowitz, and others, recognized the function of portfolio management as one of composition, and not individual security selection as it more commonly practiced. The capital market theory is an extension of the portfolio theory of Markowitz (1952, 1959). Portfolio theory is a description of how the rational investors should build efficient portfolios and the capital market theory indicates how equities should be priced in the efficient capital market. In security analysis the concern is with those equities whose prices can be estimated. The usual notion in economics is that prices of equities are determined based on the demand for and supply of the equity. The notion is used to describe a theory that explains how equities are prices in the security market**.**

Though Markowitz infused a high degree of sophistication into portfolio analysis by developing a mean variance model for the selection of portfolios, at a time when most portfolio managers used the rule of thumb and intuitive judgment, the Markowitz model was later highly criticized as being theoretically elegant and conceptually sound. Its serious limitation was that it related each security to every other security in the portfolio, demanding the sophistication and volume of work well beyond the capacity of all but a few analysts. Consequently, its application remained severely limited until Sharpe (1964) published a model simplifying the mathematical calculations required by the Markowitz model.

Sharpe (1964) assumed that, for the sake of simplicity, the return on a security could be regarded as being linearly related to a single index like the market index. Acceptance of the idea of a market index, Sharpe argued, would obviate the need for calculating thousands of covariances between individual securities, because any movements in securities could be attributed to movements in the single underlying factor being measured by the market index. The simplification of the Markowitz Model has come to be known as the Market Model or Single Index Model (SIM).

The mechanical complexity of the Markowitz's portfolio model kept both practitioners and academics away from adopting the concept for practical use. Its intuitive logic, however spurred the creativity of a number of researchers who begun examining the stock market implications that would arise if all investors used the model. As a result, Sharpe (1964), Lintner (1965) and Mossin (1968*)* independently developed a standard form of general equilibrium model for equity returns in the security market. This model has become to be known as the Sharpe-Lintner-Mossin form of Capital Asset Pricing Model (CAPM) or standard form of CAPM. This model is based on many assumptions about capital markets; however, it has been useful in understanding the complex relationship between securities returns and risks.

Though the CAPM was regarded as a useful tool for both analysts of financial securities and financial managers, it is not without its critics since there are a number of problems that exists in adopting the theoretical model for practical use. These factors also cause some problems when empirical tests of the model are undertaken. Work on the derivation of alternatives to CAPM began and an alternative theory was developed by Ross (1976) called Arbitrage Pricing Theory. The name Arbitrage Pricing Theory arises from the assumptions that investors will arbitrage away any differences in the expected return on the asset that have the same risks.

2.4 Portfolio Theory

Markowitz was the first to conclude that an investor expects to be rewarded for the risk he or she takes. His theory assumes that everybody is mean variance optimizer that is seeking portfolios with the lowest amount of variance for a given level of return; hence he viewed the dispersion of returns as the appropriate risk measure. He was also the first to develop a matrix from which he could exemplify the importance of diversifying a portfolio to reduce risk. (Biglova et al, 2004). Markowitz' work has been vital to portfolio managers making portfolio asset allocation decisions, trying to determine how much of the portfolio that should be invested into different asset classes such as stocks, bonds or real estate based on the risk and return trade-off (Grinblatt and Titman, 2001).

2.4.1 Definition of Risk

Without giving a too narrow definition of risk it can for most investors be perceived in three ways, to generate negative returns, underperforming a benchmark such as an index or a competing portfolio, and failing to meet one's goals. (Swisher and Kasten, 2005). Even though the average investor describes risk as something bad will happen there are almost no variables taking this fact into consideration. Markowitz risk measure and beta for example does not necessarily have to be negative as long as the market is in a positive trend (Sharpe, et. al, 1999).

According to Fabozzi (1999), in the financial field, risk means an uncertainty that can be measured in terms of variance or standard deviation, which can also be interpreted as asset volatility. This means the uncertainty in the probability distribution of returns. Forces that contribute to the variation in return can be external to the firm, uncontrolled and affect large numbers of securities. Other influences are internal to the firm and are controllable to a large degree. In investments, those forces that are uncontrollable, external, and are broad in their effects are called sources of systematic risk. Conversely, controllable, internal factors somewhat peculiar to industries and/or firms are referred to as sources of unsystematic risk.

2.4.2 Risk Propensity

As risk and return are positively correlated, i.e. a higher expected return would also mean a higher risk, an investor must do a weighing between these both. However, investors have different '**risk propensity**' and one can distinguish three different categories: risk averse investors, when faced with two investments with the same expected return but two different risks, will prefer the one with lower risk, risk neutral investors feel indifferent about choosing a higher or lower investment risk for the same expected return and risk taking investors, when faced with two investments with the same expected return but two different risks, will prefer the one with higher risk (Larsen, 2001).

Investments in stocks include some sort of risk and since investors according to theory are risk averse, here the risk premium of a stock plays an important role. If the risk premium would be zero, then no one would buy risky assets, therefore the risk premium must always be positive. This is the only means to attract investors to risky assets. (Bodie et al. 2004). An investment with no risk premium could only be expected to yield the risk free rate, which in standard finance theories means a government treasury bill with the same maturity rate as the investor's holding period (Sharpe et al. 1999). The premium itself is made up of a combination of the risk of the portfolio and the degree of risk aversion. Risk aversion myopia refers to the overemphasis on the possibility of short term losses. Human beings are by nature more aware of risks in the near term future than in the long run, this however does not harmonize very well with how a rational investor should behave.

2.5 The Central Model within Portfolio Theory - CAPM

From Markowitz' research on trying to quantify risk Treynor, Sharpe, Lintner and Mossin, in the beginning of the sixties, created the CAPM where risk for the first time was put into a formula characterized by a single variable. (Biglova et al. 2004). The CAPM has since its creation been the central idea in portfolio theory.

CAPM is aimed at predicting the relationship between the expected return and risk for traded securities. In order for the model to work it needs a few assumptions. The most important one is that it assumes that all investors are alike when it comes to risk aversion and initial wealth, leading to that all investors are looking for the highest return facing the lowest amount of risk. Hence investors are mean variance efficient in their attitudes towards risk and return. (Bodie et al. 2004). The rest of CAPM's assumptions in order for it to hold are that the capital market is efficient i.e. share prices reflect all available information thus securities are analyzed in the exact same way by all analysts and they share the same view of the economic outlooks, that all investors holding periods are the same, that all investors have the same expectations about the expected return and risk as a security, that portfolios are created from the same publicly traded assets, that taxes or transaction costs are not regarded, so gains from stocks and bonds and dividends and capital gains are not considered different for investors and finally all investors are mean variance optimizers.

The above assumptions can be described by the following statements in their logical sequence that Risk is the variance of expected return, that risk can be broken into two components: diversifiable (unsystematic) risk and non diversifiable (systematic) risk, that proper diversification can reduce unsystematic risk, that Beta is the relevant measure of risk for investors with diversifiable portfolios, that risk and return are linearly related by beta- that is they are in equilibrium that return is total return, that an investor holds two portfolios, a risk free asset and the market portfolio and finally that the return that an investor actually receives is derived from only two sources: risk proportional market return plus nonsystematic random return.

2.5.1 Beta

CAPM builds on the theory that the total risk of a stock, measured by the variance of stock returns, can be broken down into two categories; unsystematic risk and systematic risk. The systematic risk is the only risk that CAPM cares about and it is measured by the beta coefficient. The higher the beta the larger is the portfolio's volatility compared to the market, and vice versa (Suhar, 2003). The contribution of the non diversifiable risk beta, to the portfolio and its formula.

$$ß = \frac{\text{Cov (Security, Market)}}{\text{Var (Market)}}$$

Since the firm specific risk of each stock can be diversified away, the only risk investors are rewarded for is the overall portfolio risk and the more systematic risk someone is willing to take on the higher the expected return becomes. An implication of the possibility of diversifying away unsystematic risk is that a stock with a high standard deviation, hence risky on its own, could actually lower the risk of a portfolio if the stock has low correlation with the portfolio itself. Beta is the appropriate risk measure according to CAPM since it is proportional to the risk a stock contributes with to the entire portfolio. The beta of a stock shows how much it moves in relation to the market. A beta of 2 means that when the market for example increases (decreases) by 1% the stock increases (decreases) 2%. So the higher the beta the more volatile the stock is compared to the market index. Hence, the risk premium of a security is proportional to its beta, the larger the beta the higher the expected return. (Bodie et al. 2004) The way beta is used in the CAPM formula is seen in formula below and it is clear that the higher the beta of the stock the higher is the expected return.

The CAPM explains the risk return relationship with the assumption that investors are risk averse and they will only take risk only if they are compensated for the risk which they bear. Since unsystematic risks can be eliminated through diversification, investors will be compensated for assuming systematic risks. The market prices securities in a manner that yield expected returns than the risk free security. Investors can thus be induced to hold risky securities when they are offered a risk premium. This relationship is defined as the Capital Market Line (CML). The equation for the CML is:

$$\mathbf{E\,(Rp) \quad = \quad (Rf) \quad + \left[\frac{\mathit{E}\,(Rm) - (Rf)}{¢m}\right] ¢p}$$

Where: E (R_p) is portfolio return, (R_f) is risk free return E (R_m) is return on market portfolio, $¢_m$ is standard deviation of market portfolio and $¢_p$ is Standard Deviation of the portfolio

The CAPM provides that in well functioning capital markets, the risk premium varies in direct proportion to risk. The CAPM provides a measure of risk and a method of estimating the markets risk return line. The market (systematic) risk line is measured in terms of its sensitivity to the market movements. This sensitivity is referred to as the security's beta (ß). Beta reflects the systematic risk which cannot be reduced. Investors can eliminate their risks if they invest their wealth in well diverse market portfolios. A beta of 1.0 indicates average level of risk while a beta of more than 1.0 means that the security's return fluctuates more than that of the market portfolio. A zero beta means no risk. Thus the expected return on a security is given by the following equation.

$$\mathbf{E\,(R_j) \quad = \quad (R_f) \quad + E\,(R_m - R_f)\, ß_j}$$

Where E (R_j) is the expected return on security j, R_f is the Risk free rate, R_m is Market portfolio return and $ß_j$ is the measure of the security's systematic risk (undiversifiable risk) relative to the returns of a market portfolio. This equation gives a line called the Security Market Line (SML).

2.6 Risk Management

Risk management deals with strategies to cope with risk in a portfolio, it tries to quantify the potential for losses and then take suitable actions to minimize these depending on the investment objectives. (Bodie et al, 2004). Mainly the idea of managing risk has come from the increased volatility of the market interest rate and exchange rate (Grinblatt and Titman, 2001). Within the risk management field, any type of procedure used to control or manage risk aims at limiting the investors' exposure to risk. Damodaran (2005) however believes risk management today is focusing too much on the risk reduction part, and disregards the fact that risk management is also about increasing the exposure to risk when appropriate to do so.

MacQueen (2002) says that the practice of risk management is slowly coming into play in portfolio management even though it has been around for decades. He believes however that risk management is currently considering the portfolio risk after the portfolio has been put together instead of during the portfolio composition. This is in contrary to Markowitz' theories that return and risk should be considered together when designing a portfolio and Macqueen believes more work is needed in this area even though the growing popularity of risk management is a positive step.

2.6.1 Hedging

One option investors have within risk management is using hedging. Risk Hedging encapsulates all the activities required to ensure that the exposure, one is having, on account of the risk, doesn't transform into loss. That is, the exposure is only a notional loss, which might transform into actual loss on happening of a particular event, but if necessary steps are taken to control, manage and diversify away the risk, this exposure can be controlled. It can be used in any type of investment where risk is judged to be great and a procedure is needed for managing this. Hedging can work as insurance to the investor, making sure he/she is covered if the market moves opposite to the planned future. This way the investor is covered if potential declines occur (Bodie et al. 2004). Hedging does not provide an ultimate risk management since it only can combat market risk and not firm specific risk through derivative contracts, these are according to Grinblatt and Titman (2001) best covered by regular insurances.

2.6.2 Risk Diversification

The classical expression “Don’t put all your eggs in one basket” is exactly what diversification is all about, i.e. reducing the portfolio risk without necessarily sacrificing return by investing in different assets that are behaving differently in different market conditions. The reasoning behind this is that if some assets are performing poorly some other assets will counteract and perform well instead. Diversification eliminates the unsystematic risk and lowers the total risk down to the market risk or the systematic risk which cannot be diversified away (Grinblatt and Titman, 2001). Accordingly Alexander and Chervany (1980) found that beta was more stable in more diversified portfolios and beta stability occurred by the point where there more securities in the portfolio.

The idea behind diversification is that the diversifiable risk, which is the company specific risk, decreases as we increase the number of holdings. However, the market related risk depends on general market conditions that apply to all companies and may therefore not be reduced by purchasing assets in different companies. Despite this, the diversification strategy is still meaningful as the total risk (standard deviation) decreases as well.

2.7 Return

Since risk is something an investor has to face when investing it is impossible to talk about risk without talking about the return as well. According to standard portfolio theory, these two are connected in any decision that one make, a higher risk must mean a potential higher return. If this does not hold no one would purchase a risky security if it would not offer a higher reward. What most market participants try to do is to minimize the risk in a portfolio while increasing the expected return. (Biglova et al. 2004). To understand the concept of risk the expected return must be understood.

The return depends on the increase/decrease in the price of the share over the investment horizon as well as dividend income the share has provided. This is called the holding period return (HPR) and can also be explained by the following formula.

$$\text{HRD} = \frac{\text{Ending Price} - \text{Beginning Price}}{\text{Beginning Price}} + \text{Dividend Yield}$$

2.8 Empirical Literature Review

2.8.1 Empirical tests and extensions to CAPM and beta

Lintner (1965) using asset prices and Mossin (1966) explicitly specifying quadratic utility functions independently derived the Capital Asset Pricing Model. Lintner (1965) performed the first empirical test of the CAPM using a two-stage regression. He rejected the CAPM based on his tests; however, his two stage regression procedure was performed on individual stocks rather than portfolios. This enables beta estimation errors to cloud his results.

In their classic 1972 study titled, “The Capital Asset Pricing Empirical Tests”, financial economists Fischer Black et. al confirmed a linear relationship between the financial returns of stock portfolios and their betas. They studied the price movements of the stock in the New York Stock Exchange (NYSE) between 1931 and 1965. This evidence supported the CAPM.

The CAPM required rather stringent assumptions, many of which seemed rather unrealistic. A number of non-standard versions of the CAPM were derived to contend with these unrealistic assumptions. For example, Black (1972) derived the so-called Zero Beta CAPM which instead of relying on the existence of a perfectly risk less asset, required only an asset or portfolio with zero covariance with the market portfolio. Mayers

(1972) derives a form of the CAPM which assumes that some assets such as human capital may be non-marketable

Brennan (1970) and Litzenberger and Ramaswamy (1979) derive versions of the CAPM where capital gains and dividends were taxed differently. French et al., (1976) generate a version of CAPM where there exist uncertain inflation rates. The model assumes just two dates, so that there is no opportunity to consume and rebalance portfolios repeatedly over time. The basic insights of the model are extended and generalized in the intertemporal CAPM (ICAPM) of Robert Merton and the consumption CAPM (CCAPM) of Douglas Breeden and Mark Rubinstein.

Ross (1976) published the seminar paper on Arbitrage Pricing Theory (APT). This model does not require as restrictive assumptions as CAPM does. The APT states that security returns will be linearly related to a series of factors but does what those factors are. Roll (1977) represents an important criticism of the earlier CAPM tests. Essentially he concludes that CAPM earlier tests are all flawed in that the market portfolios have not been properly specified. The market portfolio should in theory include all types of assets that are held by anyone as an investment (including works of art, real estate, human capital etc). In practice, such market portfolio is unobservable and people usually substitute a stock index as a proxy for the true market portfolio. Market indices which have been used in the tests are not identical to the actual market portfolio and CAPM tests are very sensitive to the selected index. Furthermore, the linear relationship between security returns predicted by CAPM must hold if the selected index is mean –variance efficient. Hence according to roll, the only valid CAPM test is whether the market portfolio is efficient; though constructing such a test is most difficult without being able to properly specify the market.

When Professor Eugene Fama et al looked at share returns on the New York Stock exchange, the American Exchange (AMEX) and NASDAQ between 1963 and 1990; they found that differences in beta over that lengthy period did not explain the performance of different stocks. The linear relationship between beta and individual stock returns also breaks down over a shorter period of time. These findings suggest that CAPM may be wrong.

The model assumes that the probability beliefs of investors match the true distribution of returns. A different possibility is that investors' expectations are biased, causing market prices to be informational inefficient. This possibility is studied in the field of behavioral finance, which uses psychological assumptions to provide alternatives to the CAPM such as the overconfidence- based asset pricing model of Daniel, Hirshleifer, and Subrahmanyam (2001).

While some studies raise doubt about CAPM's validity, the model is widely used in the investment community. Although it is difficult to predict from beta how individual stocks movements react to particular movements, investors can probably safely deduce that a portfolio of high beta stocks will move more than the market in either direction, or a portfolio of low beta stocks will move less than the market portfolio

In her study 2001 entitled, 'business risk and systematic: a case of companies listed at the Nairobi stock exchange" Ndegwa (2001) found out that the relationship between business risk and market risk holds for selected companies and not all companies. For the market as a whole the study revealed that there is a relation between systematic risk and business risk. Also the study revealed that only a small number (30%) of companies with high risk are compensated with a high return. The study used secondary data covering years 1996 to 2000 derived from the financial statements of the selected companies. Regression method was used to analyze the data.

Muriuki' (2006) did an investigation on Beta, Firm size, book –to-value-market equity and stock returns evidence from the National Securities. The paper sought to compare the explanatory power of a single index model with the multi-factor asset pricing model of Fama and French (FF) (1996) for companies listed in the main investment market segment at the NSE over the years 1999-2005. According to CAPM the market beta alone is sufficient to explain security returns and that there is a positive expected premium investing in risky securities. The current consensus is that the firm size and book-market-equity factors are pervasive risk factors besides the overall market factor.

The results of the study suggest the CAPM beta alone is not sufficient to describe the cross section of expected returns. The study finds that the market size and book-to-market equity help to explain the variations in average stock returns in a reasonable manner.

Other researchers who have had a say on the subject of risk and return in the stock market and performed tests to show that the most popular theoretical risk measure beta is dead and not practically useful and vice versa include.

Basu (1977) conducted a study between 1957 and 1971 where he determined the relationship between investment performance of US stocks and their P/E ratios. As many other researchers Basu rejected the CAPM theories since he found an inverse relationship between beta and returns, i.e. the lower the beta the higher the returns. Instead he found that “Price to earnings ratios (P/E) seem to be a proxy for some omitted risk variable“(Basu, 1977). He concluded that investors are able to profit from strategies based on buying low P/E companies since they posted the highest returns not due to levels of systematic risk.

Shukla and Trzcinka (1991) conducted a twenty year test on the US stock market and found that the residual variance, better known as the unsystematic risk, is highly significant. They conducted the tests by using regressions with different kinds of variables; using both CAPM with its beta and the Arbitrage Pricing Theory with several variables. Their conclusions were that the APT could explain 40% of the variation of the 20 year period return and CAPM was not too far behind this number.

Fama and French (1992) made a study on the US stock market between 1963 and 1990. They described the relations between, beta, market capitalization, P/E ratio, leverage and price to book (P/B) ratio with average returns. They could immediately reject CAPM since beta was not able to explain differences in average returns, meaning that the high beta stocks (risky according to CAPM) did not generate the highest returns. The market capitalization and the P/B ratio on the other hand did the best job at describing stock returns, where P/B was the most powerful explanatory variable of the two. The average returns 2 A normal distribution function (a bell-shaped form) that is received after taking the log of the random variables (Aczel & Sounderpandian, 2002). Grouping companies by their P/B ratios showed a clear trend that the lower the P/B, the higher the average returns.

Grundy and Malkiel (1996) believe beta is a good risk measure for short-term risk in declining markets. This since higher beta stocks experience a lot higher losses in declining markets than lower beta stocks do. They believe that a well working beta in bear markets works fine since risk for most people is perceived as experiencing negative returns. Their study however does not explain why low beta companies in contradiction to the theories outperform the high beta stocks.

Fama and French (1998) also conducted an international study where they in 13 countries from 1974 to 1994 evaluated why the so called value stocks beat growth stocks. They found that value stocks, i.e. shares with low P/B, P/E and price to cash flow (P/CF) ratios, experienced higher returns than growth stocks. The result could not be explained by CAPM's beta either.

2.9 Arguments against CAPM and beta

CAPM has been around since the early 1960s and with support from the empirical results explained above the critique against it as a good model for the risk return relationship has increased. Wagner (1994) criticized the CAPM's assumption that everybody should hold the same portfolio the market portfolio. If that is the case then a market place is unnecessary because everyone would hold the exact same shares with the exact same amount. He is also critical to the model's way of looking at companies' change in value, he says "There is no room in the theory for people to buy and sell what they value" (Wagner, 1994) because the models only take into consideration changes in risk profile which in turn lead to shift between the risk-free and risky assets.

CAPM builds on the assumption that the return distribution is normally distributed. As a matter of fact the distribution is not normal but rather lognormal, meaning that return distribution becomes a bad representation of risk (Swisher and Kasten, 2005). Downe (2000) argues that the major flaw of using beta is that it is derived from a market theory where successful firms eventually face rising costs and increased competition and therefore these companies' earnings will be lowered back to a normal return. Downe himself believes that successful firms will stay successful and vice versa. So the risk analysis must take into consideration the type of firm and the industry characteristics it operates in. Therefore systematic risk becomes irrelevant because firm characteristics may be more important than global factors, hence the systematic risk becomes insignificant and thus beta as well. Downe further explains that prosperous firms have historically been able to successfully adapt to the complexities of increasing returns and therefore have different risk profile compared to its weaker competitors, and in this environment an investor will not be able to eliminate unsystematic risk by diversification.

Dreman (1992) thinks the reason why beta is a bad risk measure is because it is based on past volatility, and he believes that the past will not be the best predictor for the future. The correlation for a stock with an index might also be coincidence and therefore beta is useless. Dreman does not come up with another risk measure but argues that one should in order to minimize risk diversify its portfolio between sectors, look for higher than average earnings and invest in companies with a reasonable debt to equity ratio.

Bhardwaj and Brooks (1992) argue that the use of a constant beta in CAPM does not capture the fluctuations of systematic risk which they found in their research on bull and bear markets. Bhardwaj and Brooks are not ready to disregard beta but suggest changes such as a risk measure that accounts for these changes (changes in systematic risk due to market changes). If the beta value was made changeable depending on market conditions it is likely it would have a higher explanatory power of actual return. Howton and Peterson (1998) use a dual beta for greater accuracy value to solve the problem with beta's variation in bull and bear markets. The dual beta model is a regression of equally weighted monthly portfolio re-turns on the market return.

Treynor (1993) defends CAPM and thereby indirectly beta as a single risk variable. This model is based on Sharpe's research which suggests that systematic risk is adequately accounted for by a single risk variable. This contradicts the most common critique towards CAPM and beta which claims that systematic risk cannot be explained by a single variable (Treynor, 1993). According to Ross (1976), there are various types of risk factors associated with a security such as changes in interest rates, inflation and productivity with the expected return of that same security.

Behavioral finance researches have also criticized the basic CAPM assumptions. In behavioral finance not all investors are mean variance optimizers and securities are not all analyzed by the same opinion about the economic outlook. Statman (1999) argues in his article that there are two different kinds of investors, the mean variance and the noise traders which do not follow the CAPM assumptions. The noise traders' trade on other foundations than the rational CAPM traders and one can therefore not assume that all stocks are analyzed with the same outlook as basis.

2.9.1 Alternatives to CAPM

Sharpe et al. (1999) believe the reason why few other variables have got any attention in the financial world as relevant risk factors is because they become too complex. Beta is built on the variability of returns and does not take into consideration that a large beta might be good when the overall stock market is increasing in value, (this stock's return will in this case increase more than the market). Sharpe et al. (1999) argue that even though beta has this flaw of discriminating upside volatility it has become popular because it is computed with such ease. Below however are some alternatives to CAPM's beta presented. Specifically, whereas the CAPM designated a single risk factor to account for the volatility inherent in an individual security or portfolio of securities, the study will focus on the intuition and application of multifactor explanations of risk and return. The chief difference between the CAPM and the multifactor models is that the latter specifies several risk factors, thereby allowing for a more expansive definition of systematic investment risk than that implied by the CAPM's single market portfolio (Ross, 1976).

2.9.2 Arbitrage Pricing Theory

The Arbitrage Pricing Theory was developed by Ross in 1976. In contradiction to CAPM, which has beta as solely risk variable, the APT relates the various types of risk associated with a security such as changes in interest rates, inflation and productivity with the expected return of that same security. The APT is less restrictive compared to CAPM, and has three major assumptions including that Capital markets are perfectly competitive, that investors always prefer more wealth to less wealth with certainty and that the stochastic process generating asset returns can be expressed as a linear function of a set of *K* risk factors (or indexes).

Equally important, the following major assumptions which were used in the development of the CAPM are not required: (1) Investors possess quadratic utility functions, (2) normally distributed security returns, and (3) a market portfolio that contains all risky assets and is mean-variance efficient. The model is both simpler and can explain differential security prices, and it is considered a superior theory to the CAPM.

As noted, the theory assumes that the stochastic process generating asset returns can be represented as a *K* factor model of the form:

$$\boldsymbol{R_i = E(R_i) + b_{i1}\delta_1 + b_{i2}\delta_2 + \ldots + b_{ik}\delta_k + \varepsilon_i \ \ \text{for } i = 1 \text{ to } n}$$

Where Ri = the actual return on asset i during a specified time period, $i = 1, 2, 3, \ldots n$, $E(Ri)$ is the expected return for asset i if all the risk factors have zero changes, bij is the reaction in asset i's returns to movements in a common risk factor j, δk is a set of common factors or indexes with a zero mean that influences the returns on all assets and εi is a unique effect on asset i's return (i.e., a random error term that, by assumption, is completely diversifiable in large portfolios and has a mean of zero) and n is number of assets

Similar to the CAPM model, the APT assumes that the unique effects (εi) are independent and will be diversified away in a large portfolio. Specifically, the APT requires that in equilibrium he return on a zero-investment, zero-systematic-risk portfolio is zero when the unique effects are diversified away. This assumption (and some theoretical manipulation using linear algebra) implies that the expected return on any asset *i* (i.e., *E*(*Ri*)), can be expressed as:

$$E(Ri) = \lambda 0 + \lambda 1 bi1 + \lambda 2 bi2 + \ldots + \lambda k bik \qquad \textbf{(APT)}$$

Where λ0 is the expected return on an asset with zero systematic risk, λ *j* is the risk premium related to the *j*th common risk factor and *bij* = the pricing relationship between the risk premium and the asset; that is, how responsive asset *i* is to the *j*th common factor. (These are called factor betas or factor loadings.)

In contrast to the CAPM, the primary practical problem associated with implementing the APT is that neither the identity nor the exact number of the underlying risk factors are developed by theory and therefore must be specified in an ad hoc manner (Shanken, 1982)

2.9.3 The Multiple Factor Models

A different approach to developing an empirical model that captures the essence of the APT relies on the direct specification of the form of the relationship to be estimated is, in a **multifactor model**, the investor chooses the exact number and identity of risk factors. The model is a generalization of the single index market model. Due to the fact that returns of securities in such a model are influenced by factors other than just the movement in the market as a whole as in the case of the single index model, this model may yield better predictions of future performance of the securities. Returns on securities are expressed as:

$$R_{jt} = a_{jt} + (b_{jt,1} I_1 + b_{jt,2} I_2 + \ldots + b_{jt,k} I_k) + C_{jt}$$

Where J is the j^{th} Security (j= 1,2,…n), R_{jt} is the return on security *j* at time *t*, a_{jt} & C_{jt} are the constants and random parts respectively of the components of the return unique to security , $I_{1 \ldots\ldots}$ I_L are the changes in a set of L factors which explain the variation of R_{jt} about expected return a_{jt} and $b_{jt,k}$ is the sensitivity of the security *I* to factor *k* at time *t.*

Two general approaches have been employed in this factor identification process. First, risk factors can be macroeconomic in nature; that is, they can attempt to capture variations in the underlying reasons an asset's cash flows and investment returns might change over time (e.g., changes in inflation or real GDP growth (Chen, Roll, and Ross, 1986) and (Burmeister, Roll, and Ross, 1994). On the other hand, risk factors can also be identified at a **microeconomic** level by focusing on relevant characteristics of the securities themselves, such as the size of the firm in question or some of its financial ratios (Fama and French, 1993).

The advantage of this approach, is that the investor knows precisely how many and what things need to be estimated to fit the regression equation. On the other hand, the major disadvantage of a multifactor model is that it is developed with little theoretical guidance as to the true nature of the risk return relationship. In this sense, developing a useful factor model is as much an art form as it is a theoretical exercise.

2.9.4 The Single Index Market Model

When it comes to putting theory into practice, one advantage of the CAPM framework is that the identity of the single risk factor (i.e., the excess return to the market portfolio) is well specified. Thus, the empirical challenge in implementing the CAPM successfully is to accurately estimate the market portfolio, a process that first requires identifying the relevant investment universe. However this is not a trivial problem as an improperly chosen proxy for the market portfolio (e.g., using the NSE 20 Share Index and the NSE All Share Index (NASI) to represent the market) can lead to erroneous judgments. However, once the returns to an acceptable surrogate for the market portfolio are identified (i.e., *Rm*), the process for estimating the parameters of the CAPM is straight forward and can be accomplished by a security or portfolio's **characteristic line** that can be estimated via regression techniques using a special case of a multiple index model that expresses the return of a security as: **(**Reilly and Brown, 2002).

$$R_{jt} = \alpha_{jt} + \beta_{jt} R_{mt} + \varepsilon_{jt}$$

Where J is the j^{th} Security (j= 1,2,…n), R_{jt} is the rate of return on security *j* at time *t*, $ß_{jt}$ is the systematic risk (beta) of security *j* at time *t*, ε_{jt} the error term, R_{mt} the market return at time *t* and α_{jt} the constant term, or intercept, of the regression, which equals $R_{jt} - ß_{jt} R_{mt}$. This produces an expected return on any security as;

$$\acute{R} = \alpha_j + ß_j \acute{R}_m$$

Beta being the systematic risk of security will be the ration of the covariance of the returns on security *j* and the market portfolio *m* to the covariance of the returns on the market portfolio. That is:

$$ß\mathrm{j} = \frac{\mathrm{Covjm}}{\mathrm{Varm}} = \frac{\mathrm{Corjm}\ \sigma\,\mathrm{m}\ \ \sigma\mathrm{j}}{\sigma 2\ \ \mathrm{m}} = \frac{\mathrm{Corjm}\ \ \sigma\mathrm{j}}{\sigma\,\mathrm{m}}$$

Where σ_j is the standard deviation of return of security *j*, σ_m the standard Deviation of return of the market portfolio *m*, $\sigma^2{}_m$ the variance of returns of the market portfolio m and Cor_{jm} the Correlation coefficient between the returns of the security *j* and the market portfolio *m*

Returns on the security and market index will be measured on a monthly basis and will be computed as

$$\text{Returns} = \frac{\text{Share price in the End} - \text{ Share price at the Beginning}}{\text{Share price in the beginning}}$$

Beta will be obtained by regressing the returns on the security with the returns on a market index. The characteristic line is the regression line of best fit through a scatter plot of rates of return for the individual risky asset and for the market portfolio of risky assets over some designated past period. This study will use this model to estimate the risk parameters.

2.9.5 Value at Risk

An increasingly popular and understandable way of measuring risk is by using the Value at Risk method or VaR. It defines risk as the worst possible loss under normal market conditions for a given time horizon (Grinblatt and Titman, 2001). According to Biglova et al. (2004) this risk measurement technique is simple to handle since it provides a risk measure by a single variable. This variable provides the investor with the possibility of losses given a probability (1-p) in a given time horizon and offers a comprehensible understanding of the likelihood of losing money on the investment.

VaR can also measure risk to lose money within a time period and not just at the terminal date. According to Kritzman and Rich (2002) investors are generally exposed to far greater risks during the investment than on the actual end date. Investors often measure the outcome, positive or negative, on the expiring date of the investment. Continuous VaR however allows them to measure risk during the time period instead since the investment might not last the duration of the expected time. Focus should therefore shift from the end period measurement and focus on the risk during the whole holding period, so that losses during time will not affect the terminal investment. This is important since an asset manager for examples might get penalized by the investor if the portfolio drops below a certain value even though the termination date is set in the future (Kritzman and Rich, 2002).

2.9.6 Tracking error

Tracking error is a measurement of how much the return of a portfolio differs from a benchmark like an index. A high tracking error means that the portfolio has not followed the benchmark very closely. An index fund for example aim at minimizing the tracking error by following the index closely while an actively managed fund tries to generate a positive return with as low tracking error as possible (Lhabitant, 2004). Some argues that tracking error is not a very good risk measure since it measures risk compared to a benchmark rather than the variability of the portfolios return. (Sharpe et al. 1999)

2.9.7 BAPM and behavioral beta

Statman (1999) suggests a truce between standard finance and behavioral finance. He suggests that standard finance should accept the thought of rejecting the concept of security prices being rational. This since behavioral finance has showed that value characteristics matter both to investors' choice and asset pricing. Standard finance can only accept that asset pricing is a product of rational reflection of fundamental characteristics such as risk, while they leave out value expressive features such as psychology.

As a simple evidence of the limitations to the rational thought and the need for rethinking he discusses the idea of two watches with the same characteristics. However one costs twice as much as the other. By applying the CAPM thought, the cheaper watch would be an obvious rational purchase. Still, few investors would be rational here and instead buy the less rational choice (Statman,1999). BAPM tries to quantify risk into a behavioral beta. Behavioral betas should include both the value and the regular characteristics of a stock. This since it is much closer to the reality of traders instead of hoping for strict rational traders which are hard to find. Shefrin and Statman (1994) conclude in a survey that preferred stocks amongst investors are those from which the company is admired. Now, if these tend to be preferred it will yield a higher return, yet this preference is nowhere reflected in the CAPM model.

2.9.8 Other Risk Models

Swisher and Kasten (2005) believe that risk should incorporate humans' fear of bad outcomes. They do not believe standard deviation of returns describe risk in a good way since it for example is not normally distributed. They believe instead that what they call Downside Risk Optimization (DRO) defines risk better since it uses downside risk as the definition of risk. What DRO does is (simply put) measuring three factors; how often you have negative returns, the size of the negative return and the mean of the frequency of negative returns. These values are then used to create a portfolio with as low DRO as possible. According to Swisher & Kasten (2005) a DRO portfolio will avoid the most common mistakes of the mean variance portfolio theory.

Value Line is the world's largest investment advisory organization, located in the US. It as-signs safety rankings to the stocks it analyzes. The safety rankings take into account the stock's standard deviation plus its financial strength in terms of firm size, debt coverage and quick ratio, also known as fundamental variables (Value Line, 2006). Fuller and Wong (1988) tested the validity of incorporating both standard deviation and fundamental variables came up with the conclusion that Value Line's method is far more reliable compared to the ordinary beta measure. In their test conducted between 1974-1985 they got strong positive relation between risk and return for the Value Line method.

Bernstein (2001) suggests a risk measure which deals with probability of a nominal loss or the probability of underperforming an index or the risk free rate. This measure can be calculated by using a standard normal cumulative distribution function, which lists the probabilities of something to happen for a random variable such as the risk of ending up with a loss. The sum of all probabilities is less or equal to one (Aczel and Sounderpandian 2002).

Byrne and Lee (2004) argue that the best risk measure to use is the one that fits the portfolio manager's attitude towards risk and not the measurements' theoretical or practical advantages. The reason for this is that Byrne and Lee's study illustrated that different risk measures creates portfolios with great variations in asset allocation and since two risk measures will not create the same portfolio it is up to the portfolio manager to match his or her risk preferences to the variables used and portfolio created.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will describe the procedure used to conduct the empirical research. This includes how the data was collected, assumptions made, determination of the sample used and how the information was interpreted i.e. research design, the target population, sampling size and strategy, data collection instruments and procedures, and methods of data analysis. The chapter ends with a discussion on the reliability and validity of the chosen methods.

3.2 Research Design

According to Cooper and Emory (1995), a research design is a framework of specifying the relationship among the study's variables and it starts with a plan for selecting the sources and types of information used to answer the research question. This study adopted a historical correlation method of research design as it intended to estimate the risk and returns in equity stocks trading in the NSE and thus test CAPM.

Nyandemo (2007) stated that correlation method describes in quantitative terms the degree to which variables are related and explores the relationships between variables as well as predicting a subject's score on one variable given the score on another variable. Quantitative historical research design was therefore considered suitable for this study due to the nature of the investigation since the researcher is using historical unbiased quantitative data retrieved from independent sources, and the conclusion is supposed to be true for all the observations, thus a generalization although specific to the MIMS. Secondary data was used in the study by means of NSE stocks price and equity turn over hand book and other stakeholder's reports.

3.3 Target Population

The target population was the stocks traded at the Nairobi Stock Exchange. As at December 2010, the NSE was trading a total of 56 equity stocks in four market segments.

The MIMS had 48 stocks in its four sectors; agriculture 4, commercial and services 13, finance and investment 13, industrial and allied 18 while the AIMS had 8 stocks.

3.4 Sampling Design

The study used monthly adjusted closing stock prices for all the 48 companies listed on the Main Investment Market Segment (MIMS) of the Nairobi Stock exchange (NSE) for the period January 1998 to December 2010. This is because the MIMS is the main quotation market supported by stringent listing requirements as opposed to the AIMS which holds stocks of small, medium sized and young companies that find it difficult to meet the more stringent listing requirements of the MIMS with an alternative method of raising capital. The data was obtained from Kingdom Securites Ltd, a subsidiary of the co-operative Bank. The monthly closing values of the NSE 20 share index were used as a proxy for the market portfolio. Further, the yield on 91-day Treasury bills of the government of Kenya was used as the risk free return. The return on the sample and market index were calculated using the formulae below

$$Ri = \frac{\mathrm{Rt}}{\mathrm{R(t-1)}}$$

$$Rm = \frac{\mathrm{Rt}}{\mathrm{R(t-1)}}$$

Where R_i is the Return on share, R_t is the Current price of share, R_{t-1} is the previous price of share, R_m is the Return on market index, R_t is the Current level of index and R_{t-1} is the Previous level index

3.5 Procedure of CAPM testing

The study covered the period from January 1998 to December 2010. Since the purpose of the study is to test CAPM, the methodology of black et al (1972) was employed. Starting with the first portfolio formation period, 1998-2000 (36 months) the betas of the individual securities were estimated and the securities ranked by beta then 1-10 portfolios were constructed. In initial estimation period the monthly returns of each of 12 months of 2001 were calculated for 10 portfolios estimated. The same procedure was adopted for next portfolio formation period as shown in the table below.

Black, Jensen and Scholes introduced a time series test of the CAPM. This test is based on the time series regression of excess portfolio return on excess market return which can be expressed by the equation below;

$$R_{it}-R_{ft} = \alpha_t + \beta_t (R_{mt}-R_{ft}) + \varepsilon_{tt}$$

Where R_{it} is the rate of return on asset i (or portfolio) at time t, R_{ft} is the risk free rate t, R_{mt} is the rate of return on the market portfolio at time t, β_t is the beta of stock I and ε_{it} is the random disturbance term in the regression equation.

This equation can be expressed by.

$$r_{it} = \alpha_{it} + \beta_{it} r_{mt} + \varepsilon_{it}$$

Where $R_{it}-R_{ft} = r_{it}$ and $R_{mt}-R_{ft} = r_{mt}$

The intercept α_t is the difference between the estimated expected return by time series average and the expected return predicted by CAPM. If CAPM describes expected returns and a correct market portfolio proxy is selected, the regression intercepts of all portfolios (or assets) are zero.

3.6 Conceptual Framework

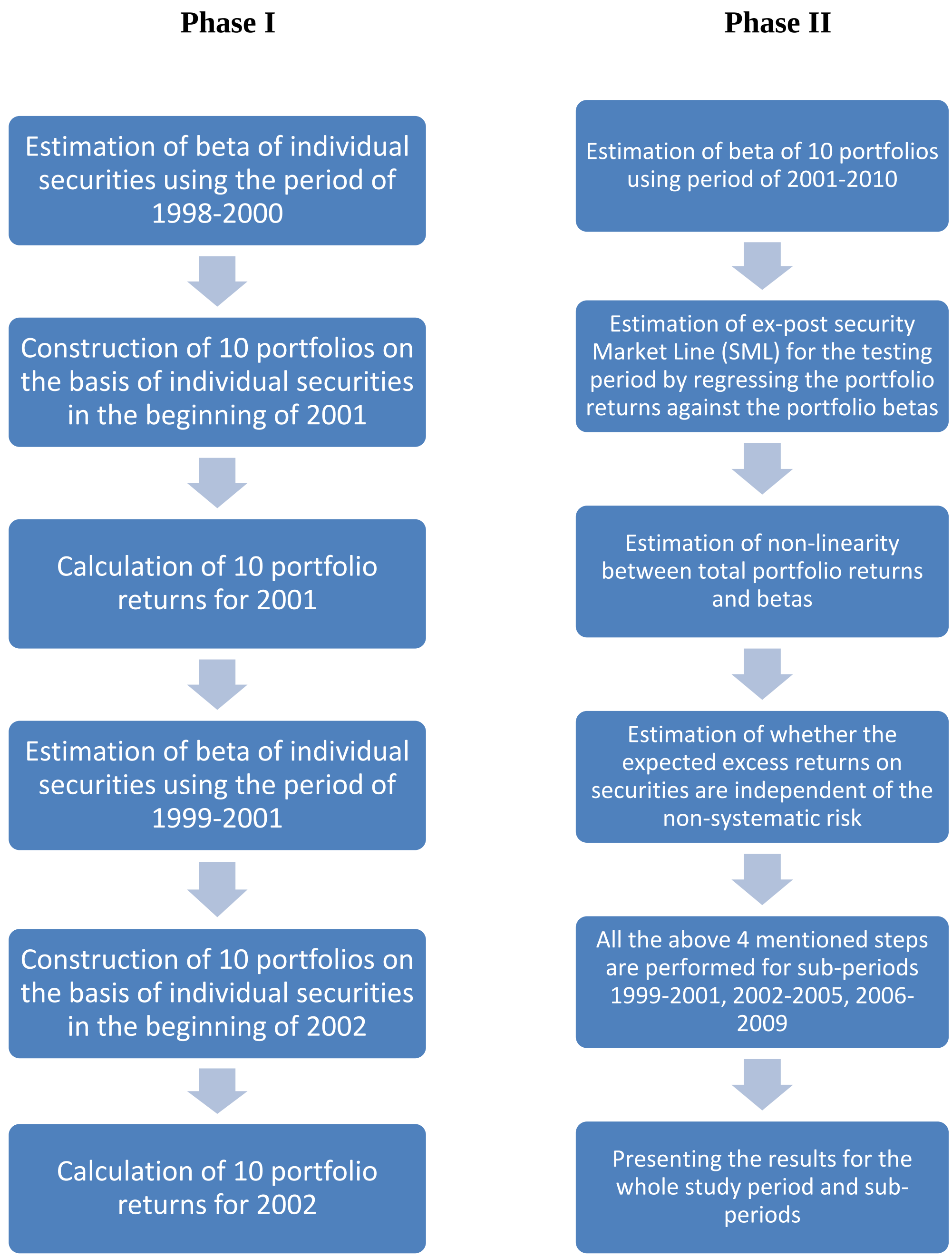

Fig 3.1: Conceptual framework

Table 3.1: Schedule of Beta estimation, portfolio formation period and testing period

	1	2	3	4	5	6	7	8	9	10	11
Beta estimation period	1998-2000	1999-2001	2000-2002	2001-2003	2002-2004	2003-2005	2004-2006	2005-2007	2006-2008	2007-2009	2008-2010
Portfolio formation period	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2010
Testing period	2001-2010	2001-2003	2004-2007	2008-2010	2001-2010	2001-2010	2001-2003	2004-2007	2008-2010	2001-2010	200
Number of securities	48	48	48	48	48	48	48	48	48	48	48

Beta coefficients for each stock were estimated using their monthly returns. The beta was estimated by regressing each stock's monthly return against the market index, according to equation above. Based on the estimated betas the sample 48 stocks were divided into 10 portfolios. Each comprised 4 stocks based on their betas. The first portfolio (portfolio number 1) was to have the 4 highest betas and the last portfolio (portfolio 10) had the 4 lowest betas. Combining these simple scripts into portfolios was to diversify away most of the firm specific part of the returns thereby enhancing the precision of the estimates of beta and the expected rate of return on the portfolios. This was followed by the calculation of portfolios betas using the following equation

$$r_{pt} = \alpha_p + \beta_p r_{mt} + \varepsilon_{pt}$$

Where r_{pt} is the average excess portfolio return at the time t, β_p is the estimated portfolio beta and ε_{pt} is the random disturbance term

The next step is to estimate the ex-post Security Market Line (SML) for testing period by regressing the portfolio returns against the portfolio betas.

If we view E (Rt) = R_f +βt (E (R_m) – R_f) as the security market line, we can estimate γ_0, γ_1 in the following equation and use the estimated beta from the last step.

$$r_p = \gamma_0 + \gamma_1\beta_p + \varepsilon_p$$

Where r_p is the average excess return on a portfolio p, β_p is beta of portfolio p and ε_p is the random disturbance term.

If CAPM is true, γ_0 should be equal to zero and the slope of the SML γ_1, is the market portfolio's average risk premium.

To test for nonlinearity between total portfolio returns and betas, the following equation is to be used;

$$r_p = \gamma_0 + \gamma_1\beta_p + \gamma_2\beta_p^{\;2} + \varepsilon_p$$

If the CAPM hypothesis is true i.e. portfolios returns and its betas are linear related with each other, γ_2 should be equal to zero.

Finally, the research is to examine whether the expected excess return on the securities are determined only by systematic risk and are independent of the non-systematic risk, as measured by the residuals variance $\delta^2 (\varepsilon_p)$

$$r_p = \gamma_0 + \gamma_1\beta_p + \gamma_2\ \beta_p^{\;2} + \gamma_3\delta^2 (\varepsilon_p) + \varepsilon_p$$

Where γ_2 measures the potential nonlinearity of the return, γ_0 measures the explanatory power of the non-systematic risk, and $\delta^2 (\varepsilon_p)$ Measures the residual variance of portfolio return. If the CAPM hypothesis is true, γ_3 should be zero.

3.7 Instruments Validity and Reliability

Reliability and validity of any research is very important. Reliability tells us whether a result is replicable or not and validity deals with whether the conclusions drawn from the data are valid (Bryman and Bell 2003). Since the data required from the NSE is already available, the researcher is limited to use data which is already compiled. This is the only source of information for the historical quantitative raw data, preferably it consists of objectively gathered data collected and all companies are presented in an equal and consistent manner, hence there is no need to doubt the reliability of this information source.

Even though the NSE equity stocks had fairly grown to 56 companies by 2010, the researcher will not use the entire population for this project. This could cause a statistical problem called order statistics. The problem connected to order statistics is present since the population on the NSE is fairly small, and since only a sample of this population is used in this project, one cannot be 100% certain whether another sample would yield the same result or not. However, since this project is only focused on the MIMS equity stocks and the sample taken each year from these observations or stocks is close to the entire population of applicable companies, the problem of order statistics is minimized.

Due to the amount of historical data that will be collected from our sample of the 48 MIMS stocks for a period of 10 years, the researcher realizes that there is a possibility of error due to human mistakes. Countless numbers and calculations will be used and there is of course the risk of error. To limit this, each calculation and historical data will be checked thoroughly. By reading and repeating each figure, the researcher believes that this error will possible be minimized and therefore will not affect the research.

CHAPTER FOUR

4.0 DATA ANALYSIS, RESULTS AND DISCUSSION

In the conduct of the research, the data was divided or categorized into 10 testing periods. Each of these periods was tested for the applicability of capital asset pricing model. The results of the analysis for the different testing periods were as follows

4.1 PERIOD 1

Table 4.1: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return, alpha values and test for linearity for period 1

	BETA	RETURNS	Excess Returns over risk free return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.3026	0.0608	-0.0122	-0.0196	0.0196	0.4662	-6.16
PORTFOLIO 2	0.1716	0.0338	-0.0391	-0.0111	0.0111	0.7995	-6.41
PORTFOLIO 3	0.3281	0.0573	-0.0156	-0.0212	0.0212	0.3504	-4.93
PORTFOLIO 4	0.1867	0.0726	-0.0003	-0.0121	0.0121	1.7645	-9.63
PORTFOLIO 5	0.2983	0.0709	-0.0020	-0.0193	0.0193	0.5967	-3.16
PORTFOLIO 6	0.1032	0.0642	-0.0087	-0.0067	0.0067	5.4564	-5.60
PORTFOLIO 7	0.1947	0.0609	-0.0120	-0.0126	0.0126	1.2994	-4.08
PORTFOLIO 8	0.2850	0.0572	-0.0157	-0.0184	0.0184	0.4948	-5.27
PORTFOLIO 9	0.1991	0.0680	-0.0050	-0.0129	0.0129	1.4133	-4.20
PORTFOLIO 10	0.2758	0.0422	-0.0308	-0.0178	0.0178	0.3377	-6.39

From the table 4.1 above, none of the alpha values are actually zero as should be the case if CAPM was true. Also, the measure of linearity γ_2 none is zero as had been the case if CAPM was true. If the portfolio betas are plotted against their returns, the graph below is obtained.

Fig. 4.1: Security Market Line for Testing Period 1

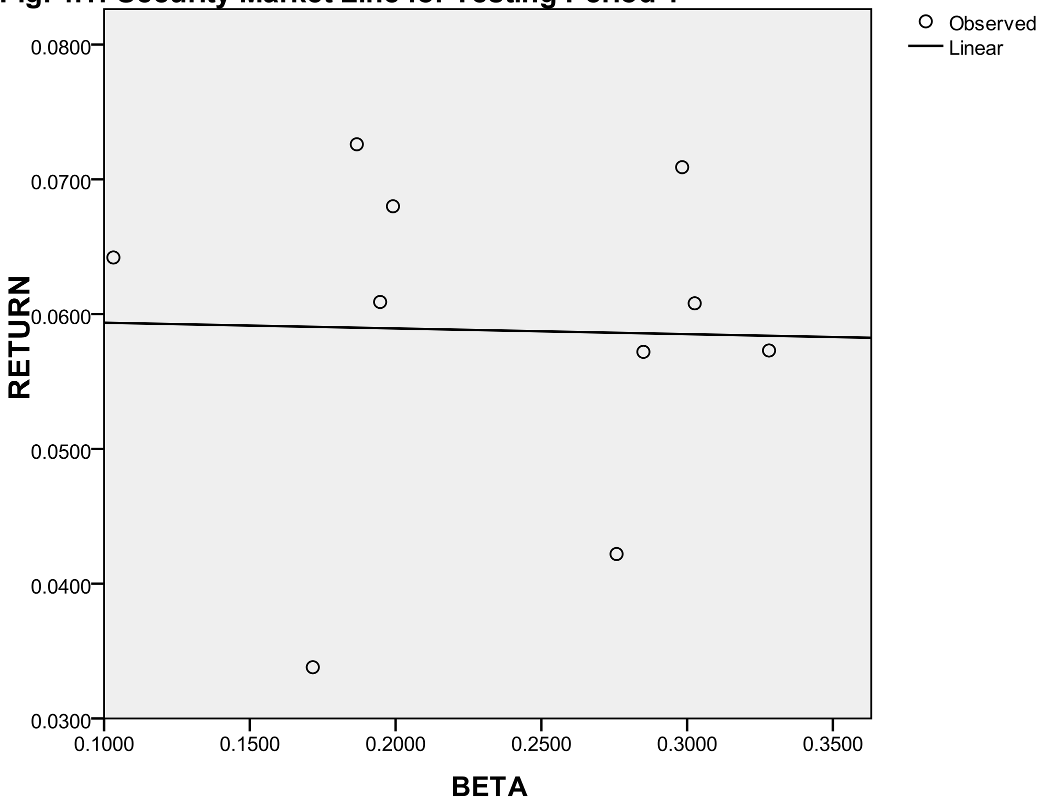

Table 4.2: Table of constants of the slope for testing period 1

Gradient of the SML(Rm-Rf)	-0.0042
Constant of the equation/y-intercept/Y1	0.0598

The graph presented above has the gradient of -0.0042. This implies that the excess market return over the risk free return was -0.0042 and the y-intercept which is the constant of the equation and represents Y_0 in the equation is 0.0598 implying that the alpha values of the portfolio is significantly above zero. In addition, the values of γ_2 which tests the linearity of CAPM as in table 4.1 above shows a significant variation from zero. It is therefore possible to conclude from this testing period that the excess there is evidence against CAPM because the alpha values are not zero while higher risk stocks do not give higher returns as predicted by CAPM. Also there is evidence against the linearity of the relationship between beta and returns as shown by the γ_2 values on table 4.1.

4.2 PERIOD 2

Table 4.3: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return, alpha values and test for linearity for period 2

	BETA	RETURNS	Excess Returns over risk free return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.521	0.093	-0.010	0.043	0.020	0.032	0.00
PORTFOLIO 2	0.209	0.053	-0.040	0.063	-0.030	-0.681	0.00
PORTFOLIO 3	0.324	0.090	-0.020	0.056	0.010	0.037	0.00
PORTFOLIO 4	0.190	0.113	0.000	0.065	0.010	0.625	0.00
PORTFOLIO 5	0.579	0.097	0.000	0.040	0.040	0.021	0.00
PORTFOLIO 6	0.173	0.110	-0.010	0.066	0.000	0.700	0.00
PORTFOLIO 7	0.243	0.064	-0.010	0.061	0.000	-0.402	0.00
PORTFOLIO 8	0.304	0.096	-0.020	0.057	0.000	0.101	0.00
PORTFOLIO 9	0.192	0.113	-0.010	0.065	0.010	0.611	0.00
PORTFOLIO 10	0.436	0.071	-0.030	0.049	0.000	-0.037	0.00

For period two, there is a slight difference from period 1. A number of portfolios show that the value of alpha is actually zero. Four out of ten portfolios show that alpha is zero while three show an insignificant 0.01. Only two of the values are large at 0.02, 0.04 and -0.03 for portfolios 1, 5 and 2 respectively. This goes to support CAPM. However, the values of γ_2 still show significant variance from zero and therefore are not supportive of the evidence in favour of CAPM. When portfolio betas are plotted against the returns, the graph in figure 4.2 below is obtained.

Fig. 4.2: Security Market Line For Testing period 2

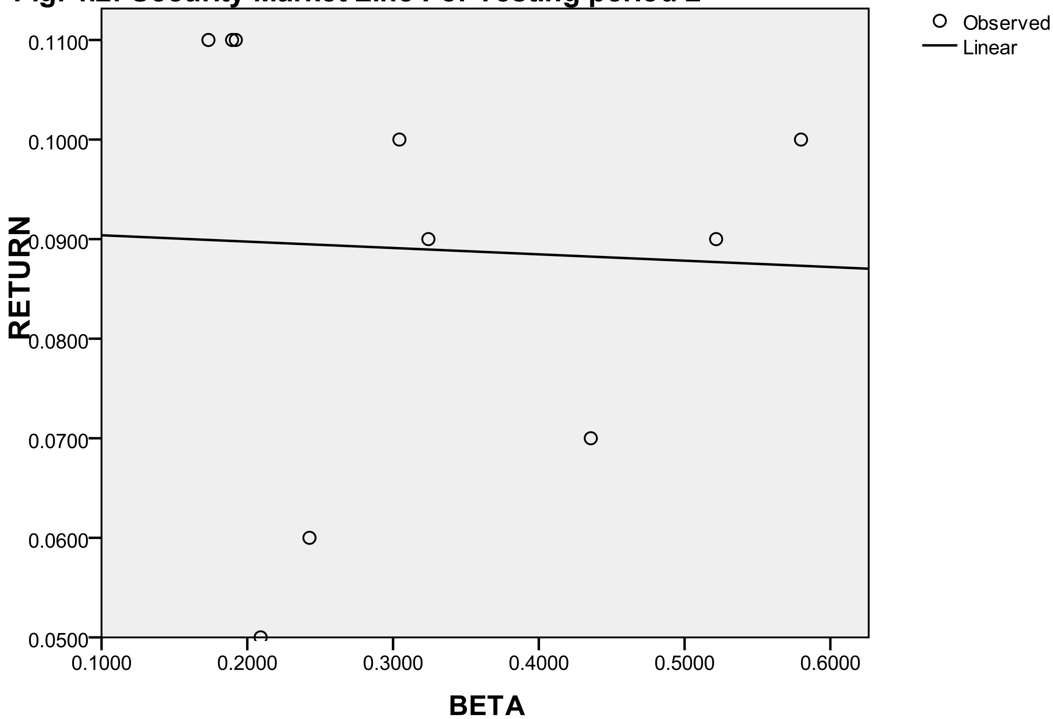

Table 4.4: Table of constants of the slope for testing period 2

Gradient of the SML(Rm-Rf)	-0.00638
Constant of the equation/y-intercept/Y0	0.091

The graph in figure 4.2 above has the gradient of -0.00638. This shows that higher risk stocks give lower returns and thus negates CAPM. The y- intercept is 0.091 and is not zero as purported by CAPM. In both the cases, there is evidence against CAPM albeit with portfolios 6, 7, 8 and 10 supporting it in terms of zero alpha values

4.3 PERIOD 3

Table 4.5: Summary of Portfolio beta, returns, excess portfolio returns over risk free return, CAPM estimated return alpha and test for linearity values for period 3

	BETA	RETURNS	Excess Returns Over Risk Free Return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.2616	0.0587	-0.0081	-0.0138	0.0058	0.3731	-7.96
PORTFOLIO 2	0.1422	0.0341	-0.0259	-0.0075	-0.0184	0.1255	-2.48
PORTFOLIO 3	0.6156	0.0625	-0.0008	-0.0326	0.0317	0.0732	-57.76
PORTFOLIO 4	0.2859	0.0582	-0.0080	-0.0151	0.0071	0.3084	-12.81
PORTFOLIO 5	0.2706	0.0606	-0.0109	-0.0143	0.0034	0.3857	-2.95
PORTFOLIO 6	0.1390	0.0468	-0.0112	-0.0074	-0.0038	0.6773	-2.29
PORTFOLIO 7	0.0211	0.0317	0.0161	-0.0011	0.0172	-8.8095	-0.42
PORTFOLIO 8	0.2407	0.0589	-0.0071	-0.0127	0.0056	0.4366	-5.51
PORTFOLIO 9	0.3246	0.0500	-0.0079	-0.0172	0.0092	0.1639	-7.43
PORTFOLIO10	0.2109	0.0306	-0.0290	-0.0112	-0.0178	0.0323	-12.70

Fig. 4.3 Security Market Line For Testing Period 3

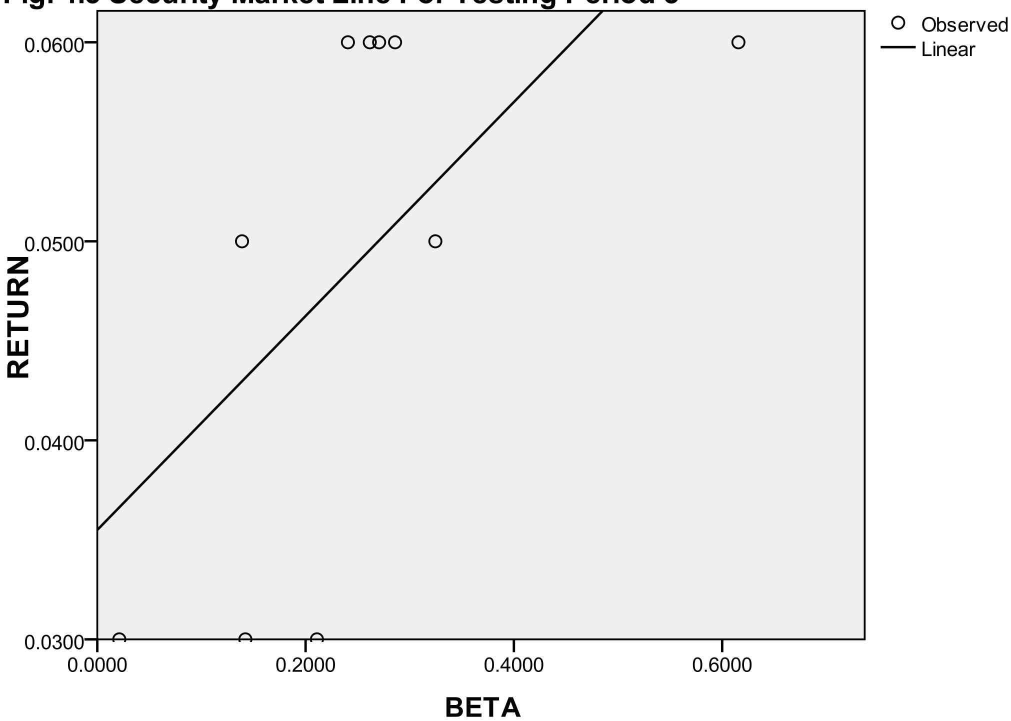

Table 4.6: Table of constants of the slope for testing period 3

Gradient of the SML(Rm-Rf)	0.05537
Constant of the equation/y-intercept/Y0	0.0353

Period 3 shows strong evidence in support of CAPM. The alpha values from table 4.3 above are largely insignificant, most falling below 0.01except portfolios 2, 3 and 6. This is also evident in the graph in figure 4.3 which has a gradient of 0.05537 showing a positive relationship between the beta values and returns i.e. the higher the beta values (Risk), the higher the returns. However, the constant which is the y-intercept is 0.0353 which does not support the argument in the CAPM. The γ_2 values on table 4.4 are also not in support of the evidence in favour of CAPM. Most of the values are significantly larger than zero and therefore negates the theory.

4.4 PERIOD 4

Table 4.7: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return, alpha values and test for linearity for period 4

PORTFOLIO	BETA	RETURNS	Excess Returns Over Risk Free Return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	-0.0268	0.0366	-0.0256	0.0024	-0.0280	-2.2450	-0.02
PORTFOLIO 2	0.0689	0.0187	-0.0435	-0.0061	-0.0374	-3.3161	-0.09
PORTFOLIO 3	-0.0303	0.0261	-0.0361	0.0027	-0.0388	-13.6366	-0.01
PORTFOLIO 4	0.0274	0.0554	-0.0068	-0.0024	-0.0044	24.0870	-0.02
PORTFOLIO 5	0.0225	0.0625	0.0003	-0.0020	0.0023	49.2820	0.00
PORTFOLIO 6	-0.0051	0.0419	-0.0203	0.0005	-0.0207	165.2179	0.00
PORTFOLIO 7	-0.0543	0.0319	-0.0304	0.0048	-0.0352	-2.4768	-0.03
PORTFOLIO 8	0.0747	0.0234	-0.0388	-0.0066	-0.0322	-2.0042	-0.06
PORTFOLIO 9	0.0141	0.0376	-0.0246	-0.0012	-0.0233	2.4816	0.00
PORTFOLIO10	0.0534	0.0355	-0.0267	-0.0047	-0.0219	-0.1888	-0.04

Fig. 4.4: Security Market Line For Testing Period 4

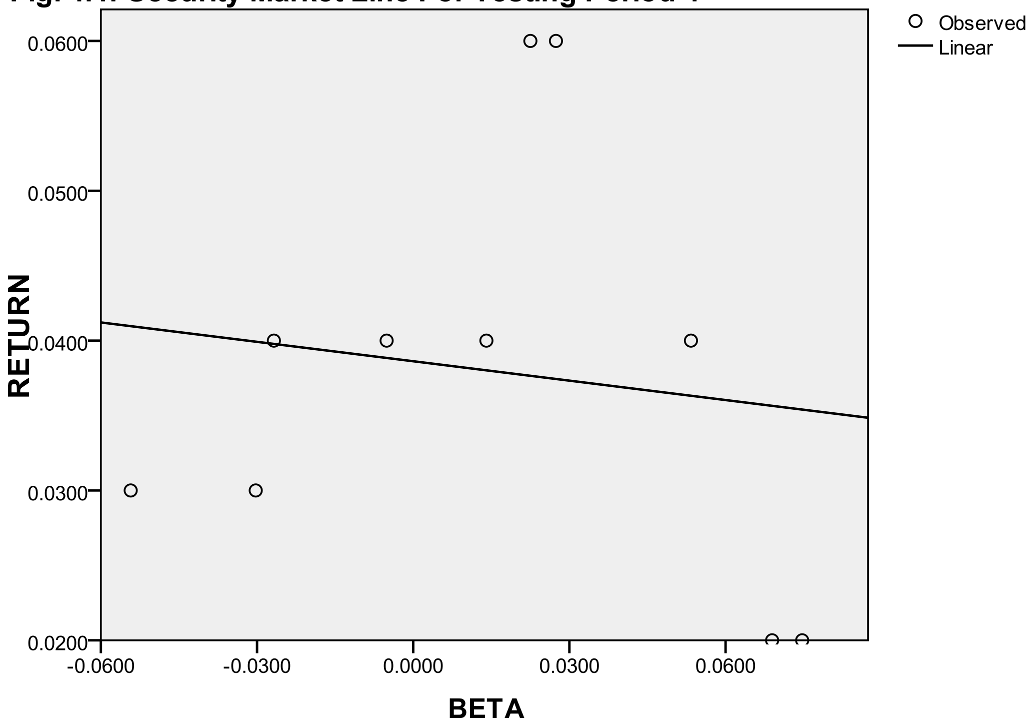

Table 4.8: Table of constants of the slope for testing period 4

Gradient of the SML(Rm-Rf)	-0.0392
Constant of the equation/y-intercept/Y0	0.0375

This period shows a more significant difference among the different portfolios except for portfolio 4 and 5. There is still evidence against CAPM from the above analysis. The alpha values are larger than or less than zero with none at zero. The gradient of the slope is -0.0392 which shows that the higher the beta (risk), the lower the returns which is the opposite of CAPM. The γ_2 values are also significantly different from zero and thus offer evidence against CAPM.

4.5 PERIOD 5

Table 4.9: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return alpha values and test for linearity for period 5

	BETA	RETURNS	Excess Returns Over Risk Free Return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.0897	0.0366	-0.0085	-0.0061	-0.0024	-0.6450	0.585
PORTFOLIO 2	0.1090	0.0187	-0.0331	-0.0074	-0.0256	-1.6985	12.206
PORTFOLIO 3	0.0981	0.0261	-0.0098	-0.0067	-0.0031	-1.6073	10.183
PORTFOLIO 4	0.0889	0.0554	0.0032	-0.0061	0.0093	1.5962	3.901
PORTFOLIO 5	0.1206	0.0625	-0.0008	-0.0082	0.0075	1.3775	10.905
PORTFOLIO 6	0.0562	0.0419	-0.0030	-0.0038	0.0009	-0.1419	0.941
PORTFOLIO 7	0.0467	0.0319	-0.0089	-0.0032	-0.0057	-4.7151	1.527
PORTFOLIO 8	0.1509	0.0234	-0.0114	-0.0103	-0.0011	-0.7641	10.622
PORTFOLIO 9	0.0928	0.0376	-0.0023	-0.0063	0.0040	-0.5425	6.626
PORTFOLIO 10	0.1251	0.0355	-0.0240	-0.0085	-0.0154	-0.2552	7.397

Fig. 4.5: Security Market Line For Testing Period 5

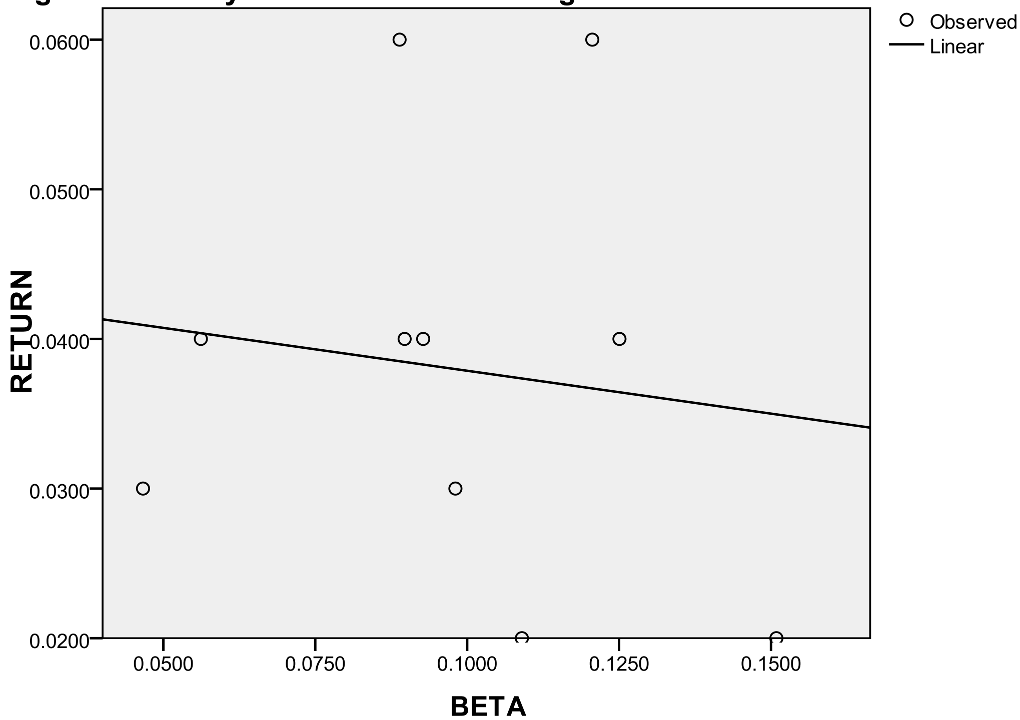

Table 4.10: Table of constants of the slope for testing period 5

Gradient of the SML(Rm-Rf)	-0.05695
Constant of the equation/y-intercept/Y0	0.04253

Testing period 5 is not too different from periods one to four. Although the alpha values across the portfolios show that there is small difference between the returns estimated by CAPM and the excess returns over risk free rate, the gradient of the slope is still negative i.e. -0.05695 which is an indication that higher portfolio risks give lower portfolio returns, an evidence against CAPM. Also, the values of γ_2 are significantly different from zero which gives further evidence against CAPM.

4.6 PERIOD 6

Table 4.11: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return alpha values and test for linearity for period 6

	BETA	RETURNS	Excess Returns Over Risk Free Return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.0897	0.0366	-0.0085	-0.0061	-0.0024	-0.6413	-0.08
PORTFOLIO 2	0.1090	0.0187	-0.0331	-0.0074	-0.0256	-1.6960	-0.12
PORTFOLIO 3	0.0981	0.0261	-0.0098	-0.0067	-0.0031	-1.6042	-0.08
PORTFOLIO 4	0.0889	0.0554	0.0032	-0.0061	0.0093	1.6000	-0.10
PORTFOLIO 5	0.1206	0.0625	-0.0008	-0.0082	0.0075	1.3796	-0.07
PORTFOLIO 6	0.0562	0.0419	-0.0030	-0.0038	0.0009	-0.1324	-0.02
PORTFOLIO 7	0.0467	0.0319	-0.0089	-0.0032	-0.0057	-4.7014	-0.01
PORTFOLIO 8	0.1509	0.0234	-0.0114	-0.0103	-0.0011	-0.7628	-0.19
PORTFOLIO 9	0.0928	0.0376	-0.0023	-0.0063	0.0040	-0.5390	-0.05
PORTFOLIO10	0.1251	0.0355	-0.0240	-0.0085	-0.0154	-0.2533	-0.17

Fig. 4.6: The Security market line for Testing Period 6

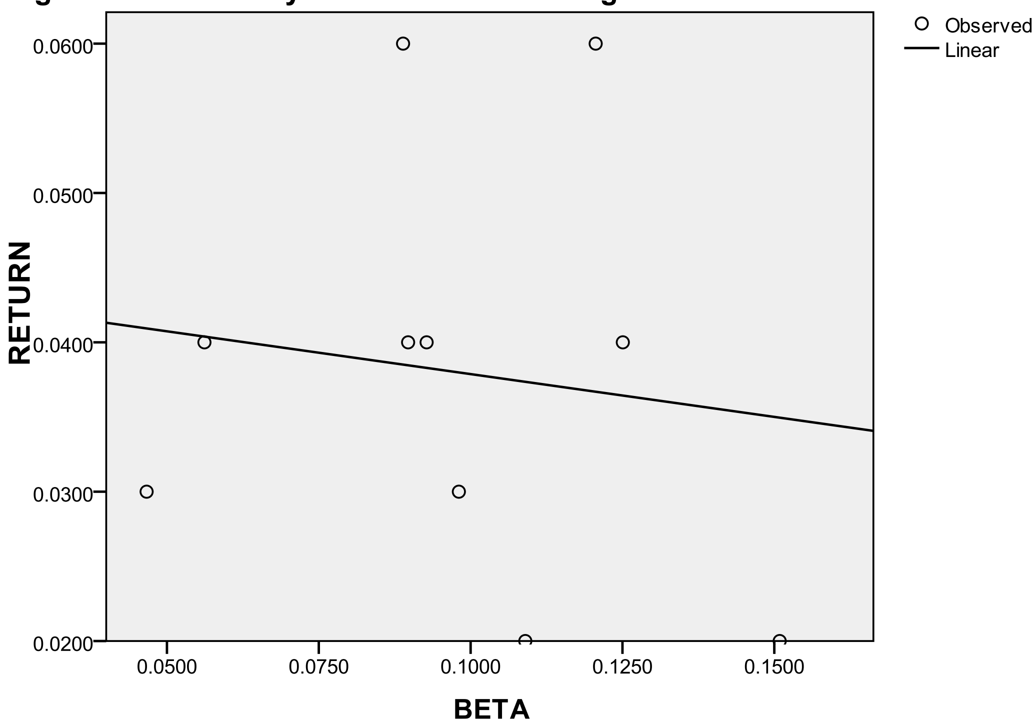

Table 4.12: Table of constants of the slope for testing period 6

Gradient of the SML(Rm-Rf)	-0.0569
Constant of the equation/y-intercept/Y0	0.0425

Period 6 offers more evidence against CAPM. The alpha values from table 4.6 above are significant values except for portfolio 6 which has a value close to zero. The gradient of the slope is -0.0569. This shows that the higher the risk, the lower the return and vice versa. This is the opposite of CAPM and thus the results here are not in support of CAPM. The values of γ_2 are also very highly varied from zero, a further indication that CAPM is not supported by the study.

4.7 PERIOD 7

Table 4.13: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return alpha values and test for linearity for period 7

	BETAS	RETURNS	Excess Returns Over Risk Free Return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.5216	0.0934	0.0081	-0.0358	0.0438	0.1714	-1.77
PORTFOLIO 2	0.2092	0.0530	-0.0323	-0.0143	-0.0179	0.3946	-0.76
PORTFOLIO 3	0.3242	0.0898	0.0045	-0.0222	0.0268	0.4360	-0.77
PORTFOLIO 4	0.1896	0.1134	0.0281	-0.0130	0.0411	1.8247	-0.59
PORTFOLIO 5	0.5799	0.0969	0.0116	-0.0397	0.0514	0.1417	-1.86
PORTFOLIO 6	0.1733	0.1105	0.0252	-0.0119	0.0371	2.1182	-0.25
PORTFOLIO 7	0.2427	0.0644	-0.0209	-0.0166	-0.0042	0.4582	-0.28
PORTFOLIO 8	0.3043	0.0956	0.0103	-0.0209	0.0312	0.5394	-0.89
PORTFOLIO 9	0.1921	0.1126	0.0273	-0.0132	0.0405	1.7566	-0.18
PORTFOLIO 10	0.4357	0.0707	-0.0146	-0.0299	0.0152	0.1819	-1.73

Fig. 4.7: The Security market line for Testing Period 7

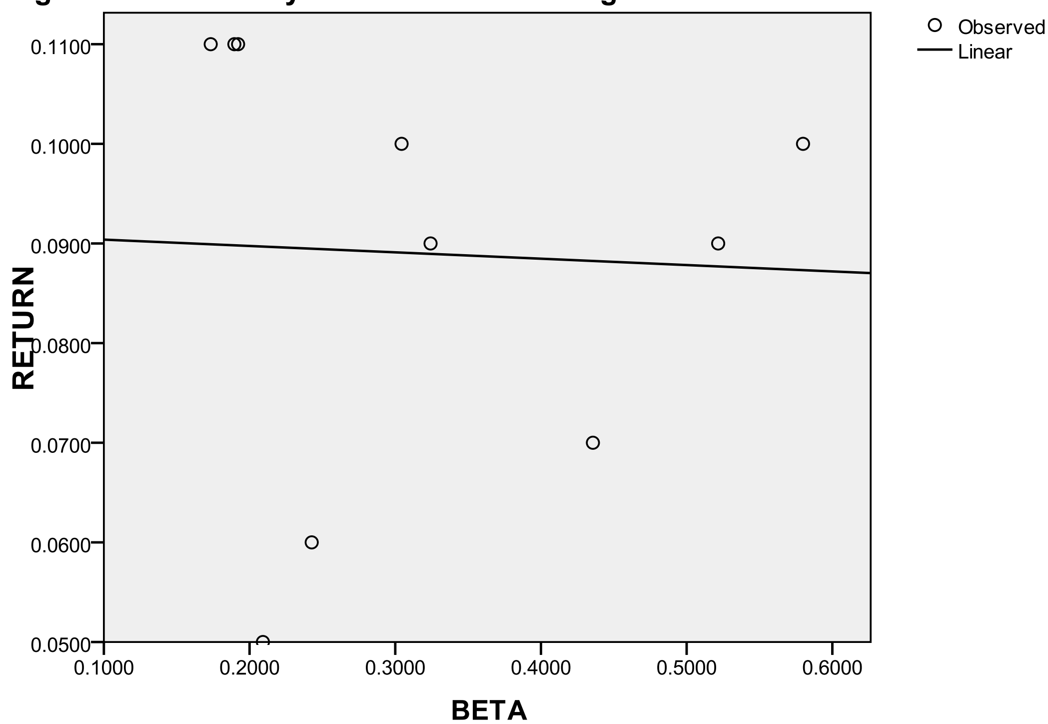

Table 4.14: Table of constants of the slope for testing period 7

Gradient of the SML(Rm-Rf)	-0.01392
Constant of the equation/y-intercept/Y0	0.09444

In period seven, just like in the other prior periods, show evidence that is not in support of the idea of CAPM. None of the alpha values is zero. The gradient of the slope is -0.01392 indicating that the excess market returns over the risk free rate is -0.01392 and this implies that high risk stocks give lower returns while low risk stocks give higher returns and thus negates the basic principle of CAPM. The γ_2 values are also not in support of CAPM as all the values are highly varied from zero

4.8 PERIOD 8

Table 4.15: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return, alpha values and test for linearity for period 8

	BETAS	RETURNS	Excess Returns over risk free return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.2616	0.0587	-0.0081	-0.0138	0.0058	0.3633	-0.53
PORTFOLIO 2	0.1422	0.0341	-0.0259	-0.0075	-0.0184	0.0924	-0.10
PORTFOLIO 3	0.6156	0.0625	-0.0008	-0.0326	0.0317	0.0714	-3.10
PORTFOLIO 4	0.2859	0.0582	-0.0080	-0.0151	0.0071	0.3003	-0.80
PORTFOLIO 5	0.2706	0.0606	-0.0109	-0.0143	0.0034	0.3766	-0.20
PORTFOLIO 6	0.1390	0.0468	-0.0112	-0.0074	-0.0038	0.6427	-0.18
PORTFOLIO 7	0.4403	0.0736	0.0161	-0.0233	0.0394	0.1575	-0.91
PORTFOLIO 8	0.2407	0.0589	-0.0071	-0.0127	0.0056	0.4251	-0.39
PORTFOLIO 9	0.3246	0.0500	-0.0079	-0.0172	0.0092	0.1576	-0.41
PORTFOLIO 10	0.2109	0.0306	-0.0290	-0.0112	-0.0178	0.0173	-0.53

Fig. 4.8: The Security market line for Testing Period 8

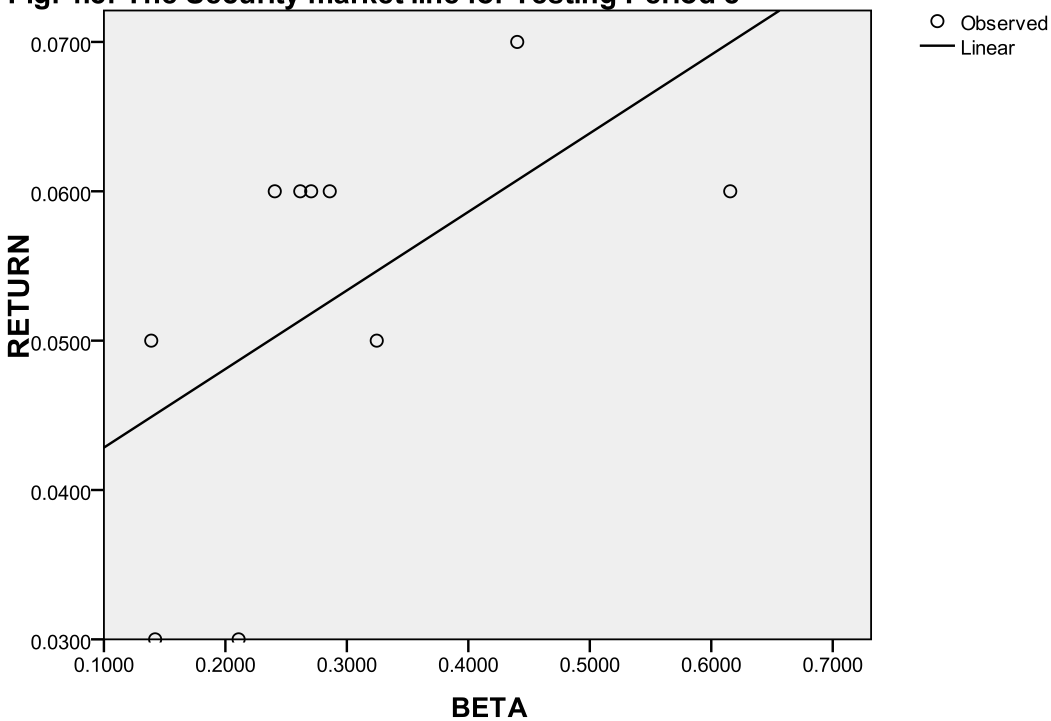

Table 4.16: Table of constants of the slope for testing period 8

Gradient of the SML(Rm-Rf)	0.05945
Constant of the equation/y-intercept/Y0	0.03597

The eighth testing period, just like in the third testing period offers some support to the model in the sense that the slope of the curve shows a positive gradient. This indicates that the higher the risk (beta), the higher the returns. However, the alpha values of the portfolios go in a different direction. Except for portfolios 1, 4, 8 and 9 whose alpha values are insignificant at approximately 0.01, all the others are significantly large and thus evidence against CAPM. The γ_2 values also show significant variation from zero, and therefore negate CAPM.

4.9 PERIOD 9

Table 4.17: Summary of Portfolio beta and returns, excess portfolio returns over risk free return, CAPM estimated return, alpha values and test for linearity for period 9

	BETAS	RETURNS	Excess Returns over risk free return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	-0.0268	0.0366	-0.0256	0.0024	-0.0280	-2.2799	-0.02
PORTFOLIO 2	0.0689	0.0187	-0.0435	-0.0061	-0.0374	-3.3214	-0.09
PORTFOLIO 3	-0.0303	0.0261	-0.0361	0.0027	-0.0388	-13.6640	-0.01
PORTFOLIO 4	0.0274	0.0554	-0.0068	-0.0024	-0.0044	24.0537	-0.02
PORTFOLIO 5	0.0225	0.0625	0.0003	-0.0020	0.0023	49.2326	0.00
PORTFOLIO 6	-0.0051	0.0419	-0.0203	0.0005	-0.0207	164.2598	0.00
PORTFOLIO 7	-0.0543	0.0319	-0.0304	0.0048	-0.0352	-2.4853	-0.03
PORTFOLIO 8	0.0747	0.0234	-0.0388	-0.0066	-0.0322	-2.0087	-0.06
PORTFOLIO 9	0.0141	0.0376	-0.0246	-0.0012	-0.0233	2.3551	0.00
PORTFOLIO 10	0.0534	0.0355	-0.0267	-0.0047	-0.0219	-0.1976	-0.04

Fig. 4.9: The Security market line for Testing Period 9

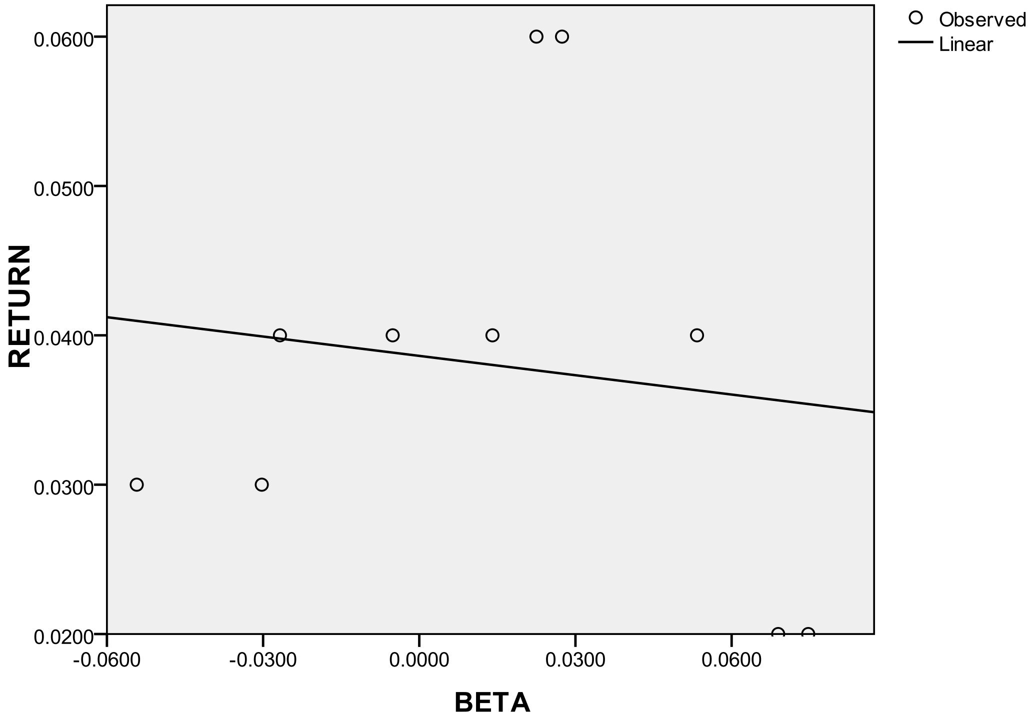

Table 4.18: Table of constants of the slope for testing period 9

Gradient of the SML(Rm-Rf)	-0.03956
Constant of the equation/y-intercept/Y0	0.037525

The period shows that the alpha values are significant except for period 4 and 5. The gradient of the slope is -0.03956 and this shows that the higher the risk, the lower the returns. Also, the value of $\gamma_{2,}$ which should be zero if CAPM is true, has significant values with an abnormally high value in period 6, 5 and 4.

4.10 PERIOD 10

Table 4.19: Summary of Portfolio beta, returns, and excess portfolio returns over risk free return, CAPM estimated return, alpha values and test for linearity for period 10

PORTFOLIO	BETAS	RETURNS	Excess Returns over Risk free return	CAPM Estimated Returns	Alpha	γ_2	γ_3
PORTFOLIO 1	0.0897	0.0366	-0.0085	-0.0061	-0.0024	-0.6449	-0.08
PORTFOLIO 2	0.1090	0.0187	-0.0331	-0.0074	-0.0256	-1.6984	-0.12
PORTFOLIO 3	0.0981	0.0261	-0.0098	-0.0067	-0.0031	-1.6072	-0.08
PORTFOLIO 4	0.0889	0.0554	0.0032	-0.0061	0.0093	1.5963	-0.10
PORTFOLIO 5	0.1206	0.0625	-0.0008	-0.0082	0.0075	1.3776	-0.07
PORTFOLIO 6	0.0562	0.0419	-0.0030	-0.0038	0.0009	-0.1416	-0.02
PORTFOLIO 7	0.0467	0.0319	-0.0089	-0.0032	-0.0057	-4.7147	-0.01
PORTFOLIO 8	0.1509	0.0234	-0.0114	-0.0103	-0.0011	-0.7641	-0.19
PORTFOLIO 9	0.0928	0.0376	-0.0023	-0.0063	0.0040	-0.5424	-0.05
PORTFOLIO 10	0.1251	0.0355	-0.0240	-0.0085	-0.0154	-0.2552	-0.17

Fig. 4.10: The Security market line for Testing Period 10

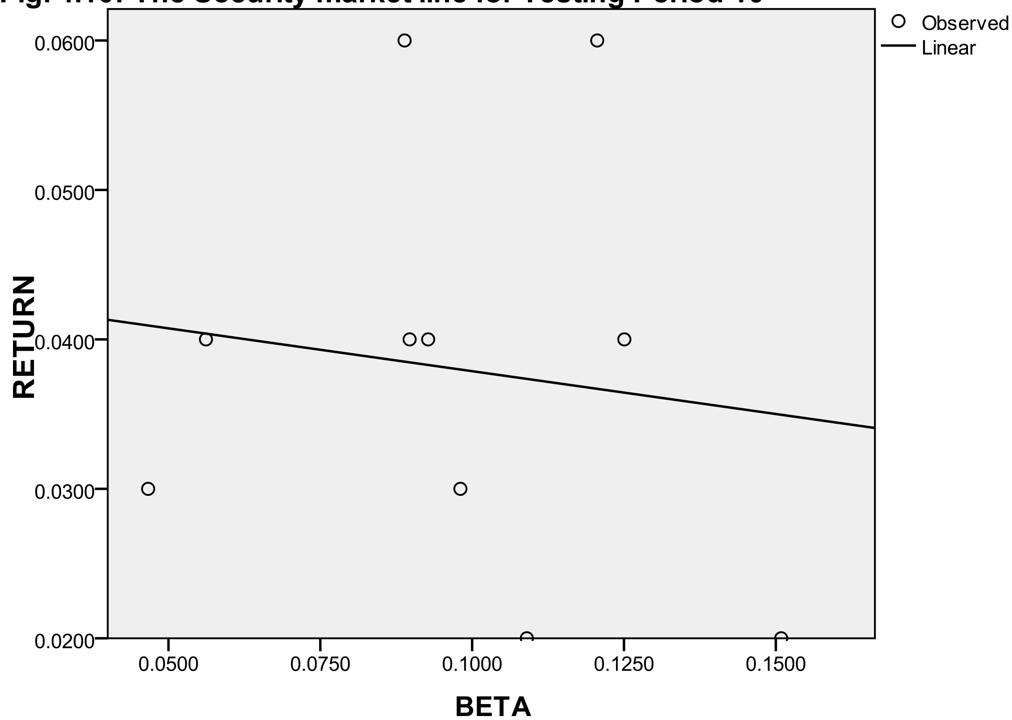

Table 4.20: Table of constants of the slope for testing period 10

Gradient of the SML(Rm-Rf)	- 0.05695
Constant of the equation/y-intercept/Y0	0.042529

Period 10 gives the same results as the periods 1, 2,4,5,6 and 9 above. The gradient of slope in figure 4.10 is -0.05695, implying that the higher the risk (Beta), the lower the returns. The alpha values are significantly different from zero except for 1, 6 and 7. The values of γ_2 for all the portfolios are significantly different from zero and this does not support CAPM.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study tested the validity of the CAPM for the stocks of the companies listed at the Nairobi Stock Exchange from January 1998 to December 2010. The results of the study do not support the theory's basic hypothesis that higher risk (Beta) is associated with a higher level of return. In order to diversify away most of the firm specific part of the returns thereby enhance the precision of the beta estimates, the securities were combined into portfolios with at least one stock from each of the four market sectors in the Main Investment Market Segment of the Nairobi stock Exchange. The results obtained approve of the linear structure of the CAPM equation being a good explanation of security returns. The CAPM's prediction of the intercept is that it should be equal to zero and the slope be equal to the excess return on the market portfolio. The finding of this study is in contradiction to the above hypothesis and show evidence against the CAPM. The inclusion of the squared of the beta coefficient to test for nonlinearity in the relationship between returns and betas indicates the findings are according to the hypothesis and the expected return beta relationship are linear. In addition, tests conducted to investigate whether the CAPM adequately captures all important aspects of reality by including the residual variance of stocks indicate that the residual has no effect on the expected returns on the portfolios. Although the results of the study on the data sampled for the period January 1998 to December 2010 do not appear to clearly reject CAPM, it can be concluded from the findings however, that beta is not sufficient to measure or determine the expected returns on securities or portfolios. These findings will be useful to financial analysts in the Kenyan Capital Markets

5.1 Recommendations

Although extensive research has been done in the area (CAPM), further research on the areas such as the combinations of market factors, macro economic factors and firms' specific factors and their influence on the CAPM puzzle. These will reveal more information as regards the subject.

5.2 Limitations of the study

Although most of the study was conducted smoothly, there were challenges that were met in the course of the study. Because the study covered a very long period of time (Ten years), it was not possible to use actual daily prices of the companies. It was therefore assumed that the monthly adjusted prices reflected either the gain or loss as far as the securities were concerned. This is however not true as there might have been increased volatility in a given period or month which might not be reflected in the monthly price changes

It is also worth noting that not all the companies that were picked for the analysis had been listed in the entire period of the study. Some were listed either too earlier in the study or much later in the study. In assessing whether to include a company for the analysis or not, only the companies that got listed in the last three years of the study were included. This was a challenge because the study could not give a very fine picture of the status at the NSE

It was noted that some stocks had been suspended from trading at the stock market for some periods of time for various reasons. These stocks were included in the study but an assumption was made that their returns for that period was zero e.g. Uchumi supermarkets. This might have affected the study in one way or the other

There was a limitation in getting the actual market return. It was therefore assumed that the NSE 20 share index was a good measure of the market index. This might not have been the case as the market index should be measured using all the stocks in the capital market

The risk free rate was taken as the 91 day treasury bill of the government of Kenya. This value had fluctuations through the days in the month but the values that were taken were the closing monthly prices. This assumption might have limited the accuracy of using this index thus affect the ultimate results

5.3 Suggestions for Further Research

The results obtained in the study conducted suggest that other factors other than risk affect the returns of a given security. There is need to conduct a study on this matter particularly the extent to which the other factors affect returns and how the invertors can be hedged off such risks

There is need for further study on how investors behaviors influence their investment decisions to invest in certain securities and not others and how this affects the market price of the security. This is important because by affecting the market price of the security, it also affects the returns of that security

There needs to be a study on the implication of taxation, transaction costs and regulations on Capital asset pricing model as used at the Nairobi Stock exchange. This is because the standard model assumes there are no transaction costs, taxes and regulations which is usually not the case.

REFERENCES

Alexander, Gordon J., and N.L. Chervany. (1980). "On the Estimation and Stability of Beta," *Journal of Financial and Quantitative Analysis.*

Arago, V., and Fernandez-Izquierdo, A. (2003). GARCH models with changes in variance: Un Approximation to Risk Measurements. *Journal of Asset Management*, 4(4), 277.

Basu S., (1977, June). Investment performance of common stocks in relation to their price earnings ratios: A test of the efficient market hypothesis. *The Journal of Finance. 3*, 663-682.

Beaver W., Kettler P., Scholes M. (1970). "The association between Market Determined & Accounting Determined Risks," *The Accounting Review*.

Bhalla, V.K. (2005*), Investment Management; Security Analysis and Portfolio Management;*, 12th ed.

Biglova, A., Ortobelli, S., Rachev, S., & Stoyanov, S. (2004, Fall). Different Approaches to Risk Estimation in Portfolio Theory. *Journal of Portfolio Management*, 3(1), 103-113.

Blume and Porters and Ezzel, (1975),'Betas and the Regression Tendencies,*' Journal of Finance.*

Bodie, Z., Kane, A., and Marcus, A. (2004). *Essentials of Investments*, (5th ed). New York, USA: McGraw-Hill/Irwin, McGraw-Hill Companies, Inc.

Brealey, R.A. (1969). *An Introduction to Risk and Return on Common Stocks*. Cambridge, Mass.: M.I.T. Press.

Brealeys, R.A, and Myers, S.C, (1991). *Principles of Corporate Finance*. McGraw-Hill.

Brown, R. (1991, Springs) ."*Risk and Return in the Emerging Markets," Investing.*

Byrne, P., and Lee. S. (2004, July). Different risk measures: different portfolio compositions? *Journal of Property Investment & Finance*, 22, 501-511.

Chan L., Hamao Y., and Lakonishok J. (1991, December). Fundamentals and stock returns in Japan. *Journal of Finance.,* 5, 1739-1764.

Chevalier, J. and Ellison, G. (1999, June). Are some mutual fund managers better than others? Cross sectional patterns in behavior and performance. *Journal of Finance,* 3(54), 875-900.

CMA (2008, November). *The Global Financial Crisis:* Its impact on Kenya and possible strategies to mitigate the effects.

CMA Statistical Bulletin: December 2009.

Damodaran, A. (2002). *Investment valuation tools and techniques for determining the value of any asset,* (2d ed.). New York, USA: John Wiley & Sons, Inc.

Damodaran, A. (2005, April/March). Value and Risk: Beyond Betas. *Financial Analysts Journal*, 61, 38-43.

Downe., E. (2000, January). Increasing returns: A theoretical explanation for the demise of beta. *American Business Review*.18, 86-89.

Elton, Edwin J., and Martin J. Gruber (1995). *Modern Portfolio Theory and Investment Analysis,* 5th ed. NewYork: John Wiley & Sons, Inc.

Eugene F. Fama and Kenneth R. French (January 1993). “Common Risk Factors in the Returns on Stocks and Bonds,” *Journal of Financial Economics* 33, no. 1.

Fabozzi, F., and Pollack, I.M. (1980) eds. *The Handbook of Fixed Income Securities,* 2d ed. Homewood 1II.: Dow Jones-Irwin.

Fama, E., and French K. (1992, June). The cross section of expected stock returns. *Journal of Finance*. 2, 427-465.

Fielding, J. (1989, November). *Is beta better? Management Accounting*, 67, 10-38.

Fischer D. E. and Jordan R. J. (2003). *Security Analysis and Portfolio Management*, 6th ed. New Delphi, Prentice Hall of India Private Limited.

Francis .J.C. (2006). *Investment Analysis and Management*, 4th Ed.

Frank K. Reilly and David J. Wright ((Spring 1988). "A Comparison of Published Betas," *Journal of Portfolio Management* 14, no. 3

Fuller, R., and Wong, W. (1988, Mar/Apr). Traditional versus Theoretical Risk Measures. *Financial Analysts Journal*, 44, 52-52.

Grinblatt, M., and Titman, S. (2001). *Financial markets and corporate strategy,* (2nd ed). New York, USA: McGraw-Hill/Irwin, McGraw-Hill Companies, Inc.

Grundy, K., and Malkiel, B. (1996, Spring). Reports of beta's death have been greatly exaggerated. *Journal of Portfolio Management*, 22(3), 36-44.

Gupta, L.C. (1981), *Rates of Return on Equities: The India Experience*, Delphi: Oxford.

Harrington, D.R. (1987). *Modern Portfolio Theory, The Capital Asset Pricing Model and Arbitrage Pricing Theory: A User Guide*. 2d ed. Englewood Cliffs, N.J.: Prentice Hall.

Howton, S., and Peterson, D. (1998, August). An Examination of Cross Sectional Realized Stock Returns using a Varying Risk Beta Model. *The Financial Review*, 33(3), 199-205.

Jay Shanken (December 1982). "The Arbitrage Pricing Theory ;Is It Testable?" *Journal of Finance* 37, no. 5.

Kritzman, M., and Rich, D. (2002 May/June). The measurement of risk, *Financial Analysts Journal*, 58(3), 91-96.

Lintner, J. (1965). "Security Prices, Risk and Maximal Gains from Diversification", *Journal of Finance,* 20, No. 4.

Lintner, J. (1965). "The valuation of risk Assets and the Selection of Risky Investments in Stock Portfolio and Capital Budgets," *Review of Economics & Statistics*, Vol. 47.

Markowitz, H.M. (1952). 'Portfolio Selection,' *Journal of Finance,* Vol. 7

Markowitz, H.M. (1959). *Portfolio Selection: Efficient Diversification of investments. C*owles Foundation Monograph No. 16. New York: John Wiley & Sons, Inc.

Miller, Merton, and Myron Scholes, (1972). "*Rate of Return in Relation to Risk: An examination of some recent findings,"* in Studies in the Theory of Capital Markets. Michael. C. Jensen, ed. New York: Praeger.

Mossin, J. (1966). "Equilibrium in a Capital Asset Market", *Ecometrics*, No.4.

Nai-fu Chen, Richard Roll, and Stephen A. Ross (April 1986). "Economic Forces and the Stock Market," *Journal of Business* 59, no. 3

Nyandemo S.M. (2007). *Research Methodology, Methods and Approaches,* Nairobi: Richmond Designers and Printers.

Pandey, I.M. (2006). *Financial Management,* 9th ed. Vikas Publishing House PVT ltd.

Philip H. Dybvig and Stephen A. Ross (September 1985). "Yes, The APT Is Testable," *Journal of Finance* 40, no. 4 Jay Shanken (September 1985). "Multi-Beta CAPM or Equilibrium APT? : A Reply," *Journal of Finance* 40, no. 4

Reilly K. Frank and Keith C. Brown (2002),*Investment Analysis; Portfolio Management,* 7th ed. South Western College.

Reilly, Frank K., and Rashid A. Akhtar (Fall 1995). "The Benchmark Error Problem with Global Capital Markets."

Ross, S. A. (1976). “The Arbitrage Theory of Capital Asset Pricing.” *Journal of Economic Theory.*

Ross, S.A and Roll, R. (1980). “An Empirical Investigation of the Arbitrage Pricing Theory,” *Journal of Finance.*

Ross, S.A. (1976). “The Current Status of the Capital Asset Pricing Model,” *Journal of Finance*.

Sharpe, W. F. (1970). *Portfolio Theory and Capital Markets.* New York: McGraw-Hill.

Sharpe, W., Alexander, G., Bailey, J. (1999). *Investments*. Prentice Hall, Inc. New Jersey.

Sharpe, W.F. (1963). “a Simple Model for portfolio Analysis” *Management Science.*

Sharpe, W.F. (1964). “Capital Asset Prices: A theory of Market Equilibrium under conditions of Risk”, *Journal of Finance.*

Shefrin, H., & Statman, M. (1994, September). Behavioral capital asset pricing theory. *Journal of Financial and Quantitative Analysis*, 29(3), 323-335.

Shukla, R., and Trzcinka, C. (1991). Research on risk and return: Can measures of risk explain anything? *Journal of Portfolio Management*, 17, 15-21.

The World Bank (2006). *“Capital Market Integration in the East African Community.”* (Washington, DC: World Bank).

Wikipedia (Aug, 2011) Retrieved from http://en.wikipedia.org/wiki/stock_market

APPENDIX I

Companies listed at the Main investment Market Segment of the Nairobi Stock Exchange as at 31 December 2010

	Company	**TOTAL NO OF SHARES ISSUED**
1	Unilever Tea Kenya Ltd Ord 10.00	48,875,000
2	Kakuzi Ord.5.00	19,599,999
3	Rea Vipingo Plantations Ltd Ord 5.00	60,000,000
4	Sasini Ltd Ord 5.00	228,055,500
	COMMERCIAL AND SERVICES	
5	Access kenya Ltd Ord. 1.00	199,885,578
6	Car & General (K) Ltd Ord 5.00	22,279,616
7	Centum Investment Co. Ltd Ord 5.00	549,951,880
8	CMC Holdings Ltd Ord 5.00	485,591,200
9	Hutchings Biemer Ltd Ord 5.00	360,000
10	Kenya Airways Ltd Ord 5.00	461,615,484
11	Marshalls (E.A.) Ltd Ord 5.00	14,393,106
12	Nation Media Group Ord. 5.00	71,305,260
13	Safaricom Ltd	
14	ScanGroup Ord. 1.00	159,000,000
15	Standard Group Ltd Ord 5.00	73,275,029
16	TPS Eastern Africa (Serena) Ltd Ord 1.00	107,838,705
17	Uchumi Supermarket Ltd Ord 5.00	180,000,000
	FINANCE AND INVESTMENT	
18	Barclays Bank Ltd Ord 10.00	1,357,884,000
19	C.F.C Bank Ltd ord.5.00	156,000,000
20	Diamond Trust Bank Kenya Ltd Ord 4.00	139,746,093
21	Equity Bank Ltd Ord 5.00	362,209,905
22	Housing Finance Co Ltd Ord 5.00	115,000,000
23	Jubilee Holdings Ltd Ord 5.00	56,250,000
24	Kenya Commercial Bank Ltd Ord 10.00	1,996,000,000
25	Kenya Re-Insurance Corporation Ltd Ord 2.50	600,000,000
26	National Bank of Kenya Ltd Ord 5.00	200,000,000
27	NIC Bank Ltd 0rd 5.00	98,897,463
28	Pan Africa Insurance Holdings Ltd 0rd 5.00	48,000,000

29	Standard Chartered Bank Ltd Ord 5.00	271,967,810
30	The Co-operative Bank of Kenya Ord. 1.00	3,492,369,900

	INDUSTRIAL AND ALLIED	
31	Athi River Mining Ord 5.00	94,000,000
32	B.O.C Kenya Ltd Ord 5.00	19,525,446
33	Bamburi Cement Ltd Ord 5.00	362,959,275
34	British American Tobacco Kenya Ltd Ord 10.00	100,000,000
35	Carbacid Investments Ltd Ord 5.00	11,326,755
36	Crown Berger Ltd 0rd 5.00	23,727,000
37	E.A.Cables Ltd Ord 5.00	202,500,000
38	E.A.Portland Cement Ltd Ord 5.00	90,000,000
39	East African Breweries Ltd Ord 2.00	790,774,356
40	Eveready East Africa Ltd Ord.1.00	210,000,000
41	Kenya Oil Co Ltd Ord 0.50	101,475,170
42	Kenya Power & Lighting Ltd Ord 20.00	79,128,000
43	KenGen Ltd. Ord. 2.50	2,198,361,456
44	Mumias Sugar Co. Ltd Ord 2.00	1,530,000,000
45	Olympia Capital Holdings ltd Ord 5.00	40,000,000
46	Sameer Africa Ltd Ord 5.00	278,342,393
47	Total Kenya Ltd Ord 5.00	175,064,706
48	Unga Group Ltd Ord 5.00	63,090,728
49	NSE 20share index(Market rate)	
50	91 day t-bill(Risk free)	

APENDIX II

Portfolios formed for the testing period

	PORTFOLIO 1
1	Unilever Tea Kenya Ltd Ord 10.00
2	Uchumi Supermarket Ltd Ord 5.00
3	Barclays Bank Ltd Ord 10.00
4	Athi River Mining Ord 5.00
5	Kenya Power & Lighting Ltd Ord 20.00
	PORTFOLIO 2
1	Kakuzi Ord.5.00
2	Car & General (K) Ltd Ord 5.00
3	C.F.C stanbic holdings Ltd ord.5.00
4	B.O.C Kenya Ltd Ord 5.00
5	Olympia Capital Holdings ltd Ord 5.00
	PORTFOLIO 3
1	Rea Vipingo Plantations Ltd Ord 5.00
2	Centum Investment Co. Ltd Ord 5.00
3	Diamond Trust Bank Kenya Ltd Ord 4.00
4	Bamburi Cement Ltd Ord 5.00
5	Sameer Africa Ltd Ord 5.00
	PORTFOLIO 4
1	Sasini Ltd Ord 5.00
2	CMC Holdings Ltd Ord 5.00
3	Standard Chartered Bank Ltd Ord 5.00
4	British American Tobacco Kenya Ltd Ord 10.00
5	Total Kenya Ltd Ord 5.00
	PORTFOLIO 5
1	Unilever Tea Kenya Ltd Ord 10.00
2	Hutchings Biemer Ltd Ord 5.00
3	Housing Finance Co Ltd Ord 5.00
4	Carbacid Investments Ltd Ord 5.00

5	Unga Group Ltd Ord 5.00
	PORTFOLIO 6
1	Kakuzi Ord.5.00
2	Kenya Airways Ltd Ord 5.00
3	Jubilee Holdings Ltd Ord 5.00
4	Crown Berger Ltd 0rd 5.00
	PORTFOLIO 7
1	Rea Vipingo Plantations Ltd Ord 5.00
2	CMC Holdings Ltd Ord 5.00
3	Kenya Commercial Bank Ltd Ord 10.00
4	E.A.Cables Ltd Ord 5.00
	PORTFOLIO 8
1	Sasini Ltd Ord 5.00
2	Nation Media Group Ord. 5.00
3	Jubilee Holdings Ltd Ord 5.00
4	E.A.Portland Cement Ltd Ord 5.00
	PORTFOLIO 9
1	Unilever Tea Kenya Ltd Ord 10.00
2	Standard Group Ltd Ord 5.00
3	National Bank of Kenya Ltd Ord 5.00
4	East African Breweries Ltd Ord 2.00
	PORTFOLIO 10
1	Kakuzi Ord.5.00
2	Uchumi Supermarket Ltd Ord 5.00
3	NIC Bank Ltd 0rd 5.00
4	Kenya Oil Co Ltd Ord 0.50

APENDIX III

Table of monthly returns (Numbers 1 to 50 represent companies as in appendix 1)

1998

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.000	0.029	0.000	0.016	-0.046	0.000	0.000	0.000	0.097	0.000	-0.012
2	0.162	0.008	-0.077	0.000	0.192	0.014	0.034	-0.067	-0.036	0.015	0.043
3	-0.006	-0.125	-0.043	0.045	0.000	-0.114	0.048	0.000	-0.077	0.000	0.000
4	0.262	0.113	-0.213	0.078	-0.006	0.000	0.000	0.078	0.002	-0.024	0.043
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	-0.017	-0.347	0.000	-0.077	-0.084	0.091	0.000	0.000	0.000	0.029	-0.028
7	-0.044	-0.094	0.082	0.074	0.165	0.053	0.033	0.039	0.045	0.087	0.350
8	-0.093	-0.103	-0.180	-0.053	0.035	0.000	0.020	0.000	-0.013	-0.007	0.020
9	0.000	0.029	0.000	0.016	-0.046	0.000	0.000	0.000	0.097	0.000	-0.012
10	0.096	0.049	0.102	0.143	0.149	0.272	0.007	0.161	0.146	0.151	0.239
11	-0.056	0.000	-0.018	0.000	0.000	-0.079	-0.276	-0.082	-0.010	0.000	0.000
12	0.023	0.081	0.408	-0.599	1.795	0.000	0.060	0.016	-0.024	0.025	0.096
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	-0.111	0.250	-0.200	-0.156	0.315	-0.408	-0.059	-0.392	0.304	0.150	0.194
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.04	-	0.00	0.169	-	-	0.018	0.000	0.006	-	0.173

	7	0.111	0		0.016	0.087				0.128	
18	0.115	-0.100	-0.055	0.145	-0.010	-0.048	0.029	-0.021	0.011	0.043	0.259
19	-0.012	-0.048	-0.213	0.167	-0.026	-0.061	0.000	-0.032	-0.032	0.000	0.007
20	0.046	0.000	-0.098	0.059	0.000	-0.091	0.000	0.013	-0.013	0.013	0.086
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	-0.045	0.071	-0.156	0.105	-0.042	0.059	-0.085	-0.103	0.004	0.014	0.126
23	0.075	0.046	0.173	-0.102	-0.228	0.049	-0.063	0.000	0.000	-0.067	0.071
24	-0.019	-0.160	0.029	0.000	0.000	0.006	-0.014	-0.107	-0.048	-0.043	0.088
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.012	-0.166	-0.044	0.021	0.121	-0.135	-0.099	-0.028	-0.086	-0.175	0.304
27	0.030	-0.087	-0.277	0.228	-0.018	0.024	-0.208	-0.008	-0.015	-0.100	0.282
28	-0.028	-0.028	-0.089	-0.032	0.000	0.000	-0.033	-0.051	-0.128	0.042	0.000
29	-0.055	0.154	-0.002	0.178	0.072	0.052	0.094	0.083	0.072	0.133	0.362
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.026	0.032	-0.294	0.209	0.266	-0.179	-0.046	0.047	0.032	0.010	0.100
32	0.045	0.000	-0.014	0.000	-0.007	-0.007	0.015	0.079	0.057	0.056	0.056
33	-0.138	0.159	-0.169	0.053	0.000	-0.171	0.017	-0.051	0.000	-0.071	0.385
34	-	-	-	0.023	0.000	0.000	0.067	0.062	0.078	0.000	0.391

	0.047	0.109	0.022								
35	-0.068	-0.101	-0.032	0.066	0.125	-0.097	0.030	-0.030	-0.031	-0.159	0.179
36	0.082	-0.223	-0.025	-0.050	0.000	0.000	-0.027	0.081	-0.230	0.104	-0.053
37	-0.033	-0.224	0.067	0.000	-0.073	-0.101	-0.025	0.026	-0.025	-0.026	0.053
38	-0.193	-0.050	-0.130	-0.200	0.175	-0.149	0.000	-0.050	-0.047	-0.019	-0.011
39	0.000	0.000	-0.044	-0.052	0.222	0.146	0.037	0.039	-0.041	0.191	0.362
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.133	-0.015	-0.179	-0.073	0.118	0.000	0.018	0.017	-0.034	-0.035	0.000
42	0.075	-0.100	-0.055	0.065	0.050	0.026	0.010	-0.066	0.049	-0.145	0.137
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	-0.020	-0.030	-0.021	-0.111	0.822	-0.773	-0.071	-0.221	-0.099	-0.014	0.111
46	0.199	-0.158	-0.113	-0.017	0.000	0.059	-0.056	-0.056	-0.050	-0.010	0.066
47	-0.070	-0.167	-0.130	-0.069	0.037	0.000	-0.024	-0.097	-0.020	-0.048	0.420
48	0.179	11.533	-0.030	-0.819	-0.026	0.062	-0.067	-0.018	-0.295	-0.058	0.288
49	-0.044	-0.062	-0.003	-0.033	-0.019	0.003	-0.018	-0.027	-0.055	0.146	0.007
50	0.263	0.267	0.270	0.264	0.255	0.247	0.237	0.225	0.206	0.177	0.126

1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	0.021	0.000	0.073	-0.042	0.068	0.038	0.155	0.023	0.125	0.114	0.083	0.065
3	0.014	0.042	-0.156	-0.008	0.009	0.060	0.017	0.017	-0.154	0.020	-0.073	-0.016
4	0.050	-0.048	-0.050	-0.105	0.118	0.053	-0.100	0.065	-0.200	0.011	0.032	0.000
5	0.043	-0.093	0.019	0.052	-0.046	0.094	0.056	0.117	-0.025	-0.053	-0.161	0.057
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	0.000	0.041	0.017	0.000	-0.017	-0.199	0.000	0.000	0.000	0.000	0.000	0.000
8	0.071	0.100	0.107	0.088	0.107	0.031	0.081	0.019	0.030	0.030	0.030	0.030
9	-0.153	-0.016	-0.064	0.000	0.000	0.000	0.068	0.008	0.017	0.025	0.025	0.025
10	0.021	0.000	0.000	-0.125	-0.017	-0.051	0.071	-0.067	0.039	0.031	0.000	-0.020
11	0.059	0.138	0.053	0.000	0.013	0.012	-0.177	-0.111	0.100	-0.053	0.248	0.006
12	0.040	0.000	0.000	-0.067	0.000	0.000	0.000	0.031	0.000	0.000	-0.060	0.000
13	-0.007	0.029	-0.036	0.000	-0.059	0.016	-0.070	-0.083	-0.018	-0.019	-0.028	-0.012
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.163	0.000	-0.364	0.274	-0.111	-0.256	-0.104	0.000	-0.075	-0.081	0.098	-0.120
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

18	0.023	0.083	0.026	-0.040	0.000	0.063	0.111	0.078	-0.033	-0.065	0.040	0.114
19	-0.054	-0.032	-0.074	-0.038	0.020	0.036	0.053	-0.152	0.000	0.021	0.010	0.000
20	0.324	-0.085	-0.180	-0.063	0.000	0.068	0.000	0.000	0.003	-0.003	-0.067	0.048
21	0.137	0.040	-0.029	-0.010	-0.040	-0.020	0.032	-0.176	0.151	0.022	0.032	0.062
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
23	-0.009	-0.119	0.007	-0.131	0.078	-0.053	0.040	-0.069	-0.174	0.000	-0.025	0.129
24	0.100	0.000	0.000	0.000	-0.068	-0.073	0.053	-0.091	-0.009	-0.065	0.030	0.058
25	0.016	-0.064	-0.163	-0.081	-0.022	0.045	-0.015	-0.138	-0.011	-0.092	0.028	-0.126
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
27	-0.064	-0.056	-0.099	-0.123	0.000	0.000	-0.077	-0.081	-0.019	-0.090	0.098	0.000
28	-0.047	-0.077	0.068	-0.064	0.098	0.034	-0.108	0.046	0.027	0.008	-0.085	0.085
29	-0.030	0.030	0.010	-0.010	0.400	0.266	0.000	0.111	-0.100	1.167	-0.481	0.000
30	0.024	0.122	0.088	0.099	0.120	0.187	0.173	0.109	0.099	0.139	0.031	0.159
31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
32	0.114	-0.184	-0.167	0.200	-0.083	0.000	0.100	-0.083	0.081	0.000	-0.075	0.036
33	0.109	-0.048	0.086	0.036	0.064	0.056	0.029	0.050	0.051	0.024	0.038	0.039
34	0.028	-0.162	-0.032	-0.192	0.031	0.050	0.114	0.026	-0.125	0.010	-0.019	0.048

35	-0.131	0.308	-0.040	0.132	0.016	-0.104	-0.116	0.053	0.069	-0.023	-0.102	0.169
36	0.104	0.014	0.029	-0.021	0.007	-0.028	0.043	-0.111	-0.062	0.084	0.000	0.030
37	0.180	-0.248	0.189	-0.030	0.055	-0.006	0.041	0.456	0.015	0.007	-0.254	0.000
38	0.475	-0.246	-0.140	-0.007	0.000	0.046	0.000	0.000	-0.057	0.000	-0.307	0.000
39	0.140	0.013	-0.012	-0.500	0.450	-0.034	0.000	0.004	-0.217	-0.223	0.287	0.023
40	-0.039	0.153	0.125	0.146	0.083	0.077	0.107	0.129	0.084	0.008	0.020	0.100
41	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
42	0.127	-0.097	0.071	-0.033	0.310	-0.197	0.148	-0.086	-0.094	0.000	0.207	-0.043
43	0.024	0.000	-0.093	0.017	-0.042	0.071	0.046	-0.011	0.053	-0.044	0.091	0.234
44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46	0.225	-0.041	-0.234	-0.036	-0.089	-0.051	0.000	-0.067	0.000	-0.079	-0.380	0.188
47	0.242	-0.103	-0.109	0.031	0.036	-0.035	0.000	-0.161	0.014	0.036	-0.017	0.188
48	0.020	0.110	-0.171	0.022	-0.021	0.033	0.052	0.040	-0.115	0.022	0.021	0.005
49	-0.043	-0.067	-0.185	-0.007	-0.176	-0.152	-0.279	-0.075	-0.116	-0.303	0.962	-0.038
50	0.002	-0.058	-0.017	-0.003	-0.001	-0.004	-0.091	-0.026	-0.044	-0.012	0.004	-0.001
	0.107	0.090	0.088	0.090	0.096	0.114	0.145	0.148	0.158	0.176	0.181	0.200

			2000									
1	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.085	0.085	0.043	0.050	0.071	0.058	0.036	-0.011	0.068	0.085	-0.090	0.105
2	0.141	-0.179	-0.068	-0.013	0.030	0.023	-0.021	0.032	-0.083	-0.025	0.094	0.036
3	-0.021	-0.106	-0.036	-0.012	0.013	-0.049	-0.065	0.028	-0.027	0.042	0.000	-0.200
4	0.011	-0.186	0.001	-0.091	0.163	-0.027	-0.013	0.015	0.036	0.038	0.085	0.031
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.024	-0.019	0.891	0.000	0.000	-0.458	0.000	0.000
7	0.030	-0.066	-0.063	0.176	0.048	0.113	-0.019	0.163	0.079	0.051	0.067	-0.045
8	0.025	0.025	-0.138	-0.173	-0.055	-0.009	0.045	0.017	0.032	0.047	0.018	0.048
9	0.000	0.000	-0.027	-0.021	0.000	-0.014	-0.040	-0.094	-0.017	0.000	-0.195	0.000
10	-0.045	-0.053	0.223	0.183	0.213	0.144	0.054	0.324	0.215	0.181	0.089	0.173
11	0.000	0.000	0.000	0.000	0.000	-0.179	0.000	0.000	0.000	-0.036	0.000	0.000
12	-0.051	-0.008	-0.013	-0.119	0.010	0.037	0.023	-0.055	0.011	0.062	0.004	0.019
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.091	-0.024	-0.043	-0.198	0.087	-0.303	0.033	-0.007	0.183	0.000	0.014	-0.046

16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.075	0.156	0.064	0.069	0.048	0.082	0.043	0.128	0.100	0.138	0.013	0.090
18	-0.020	0.366	-0.217	0.000	-0.033	-0.013	-0.044	0.046	0.048	0.055	-0.154	-0.106
19	0.051	0.044	0.127	0.098	-0.098	-0.214	0.135	0.100	-0.121	0.178	0.074	0.078
20	-0.029	0.120	-0.045	-0.075	-0.141	-0.059	-0.002	-0.098	-0.166	0.067	-0.095	-0.034
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	-0.020	-0.069	0.158	-0.115	0.095	-0.048	0.064	-0.027	0.289	0.047	-0.093	0.007
23	0.059	0.105	0.058	0.040	-0.084	0.115	0.080	-0.016	0.011	0.148	0.092	0.068
24	0.113	-0.102	-0.204	0.057	0.038	0.021	-0.152	0.054	0.040	0.038	0.037	-0.244
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.000	-0.199	-0.112	0.154	-0.038	-0.089	0.113	0.010	0.000	0.111	-0.121	-0.202
27	0.050	0.050	0.105	0.067	0.093	-0.157	0.262	0.109	-0.002	0.075	-0.076	-0.042
28	-0.056	-0.176	0.000	0.036	-0.035	-0.048	-0.027	-0.024	-0.065	0.000	-0.096	-0.315
29	0.138	0.423	0.137	0.013	0.089	0.124	0.159	0.150	0.091	0.108	0.000	0.032
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	-0.174	0.011	0.313	0.016	-0.063	-0.242	-0.011	0.022	-0.022	-0.011	0.011	-0.111
32	0.025	0.055	0.070	0.026	-0.128	-0.030	0.146	-0.064	0.131	0.083	0.115	0.137
33	0.038	0.029	0.094	0.001	0.111	0.061	0.125	0.024	0.039	0.039	0.061	0.045

34	0.086	0.400	0.031	0.096	0.113	0.073	0.184	0.197	0.198	0.113	0.075	0.001
35	0.000	0.045	0.000	-0.014	-0.181	-0.115	-0.020	-0.005	-0.077	0.000	0.067	-0.167
36	0.000	-0.035	0.078	0.140	0.081	-0.024	-0.115	0.031	-0.066	-0.155	-0.050	0.053
37	-0.019	-0.078	-0.191	0.000	0.000	-0.158	-0.250	0.146	0.418	-0.026	-0.158	0.063
38	0.009	0.013	-0.126	0.000	0.104	0.117	0.020	-0.012	0.000	-0.020	-0.041	-0.004
39	0.056	0.152	0.100	0.087	0.070	0.099	0.148	0.217	0.134	0.101	0.112	0.015
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.045	0.129	-0.038	0.105	-0.083	0.065	-0.024	-0.025	0.038	0.086	0.028	-0.040
42	0.065	0.066	0.053	-0.011	-0.198	0.068	0.019	-0.027	-0.023	-0.051	0.185	-0.088
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
45	0.026	-0.123	-0.064	-0.025	0.090	-0.118	0.000	0.000	0.000	0.000	0.000	-0.147
46	0.056	-0.116	0.056	0.072	0.007	0.203	0.010	0.011	0.169	0.095	0.071	0.045
47	0.016	0.326	-0.242	-0.005	0.000	0.041	0.079	0.027	0.000	0.000	0.018	-0.043
48	-0.256	0.000	0.331	0.222	-0.083	-0.445	-0.058	-0.069	0.107	-0.023	-0.007	-0.014
49	-0.003	-0.027	-0.032	-0.051	-0.024	-0.018	-0.004	0.022	0.021	-0.056	-0.008	-0.008
50	0.203	0.148	0.113	0.124	0.112	0.105	0.099	0.092	0.104	0.107	0.102	0.124

			2001									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.035	0.020	0.035	0.138	0.350	0.118	0.118	0.118	0.118	0.107	0.114	0.088
2	-0.047	-0.069	-0.054	-0.101	0.029	-0.008	-0.089	-0.044	0.012	0.099	0.011	-0.027
3	0.333	-0.313	0.200	0.000	-0.227	0.059	0.111	-0.050	0.018	0.052	0.016	-0.065
4	0.017	0.105	0.031	0.004	0.003	-0.002	0.075	0.015	-0.114	0.025	-0.016	-0.039
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.029	0.000
7	0.205	0.050	0.093	0.131	0.042	0.041	-0.068	0.015	0.056	0.044	0.001	0.065
8	-0.068	0.055	-0.076	-0.068	-0.034	0.085	0.134	0.151	-0.098	0.119	0.195	0.057
9	-0.079	-0.109	-0.109	-0.007	0.232	0.000	0.000	0.000	0.000	-0.012	-0.006	-0.036
10	0.144	0.143	-0.005	0.182	0.240	0.190	0.147	0.051	0.025	0.233	0.258	0.132
11	-0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	0.047	0.039	-0.126	-0.020	-0.171	0.093	0.077	0.016	-0.112	0.266	-0.126	0.084
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	-0.008	-0.014	0.000	0.000	0.643	-0.561	0.514	0.006	-0.285	0.327	-0.042	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.12	0.05	-	0.01	0.04	0.12	0.00	-	-	-	0.00	0.01

	7	0	0.015	4	7	4	3	0.051	0.038	0.021	5	3
18	0.139	0.225	0.133	0.034	0.159	0.255	0.109	0.070	0.075	0.177	0.152	0.154
19	-0.012	0.132	0.074	0.080	-0.044	0.073	0.085	0.079	0.030	0.135	0.105	0.103
20	-0.012	0.106	-0.028	0.046	-0.048	0.035	0.011	0.055	0.011	-0.076	0.067	0.044
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.091	0.041	0.010	0.097	-0.015	0.076	0.076	-0.105	0.095	0.129	-0.048	0.143
23	0.095	0.046	0.069	0.059	0.054	0.119	0.111	0.099	0.122	0.137	0.137	0.120
24	-0.020	0.205	0.017	0.022	-0.027	0.000	0.090	-0.196	-0.083	0.287	-0.223	0.070
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.191	-0.119	0.059	-0.144	-0.117	0.132	0.019	-0.083	-0.090	0.396	-0.098	-0.096
27	0.276	0.000	-0.039	0.099	0.057	0.206	0.162	-0.007	-0.025	0.502	0.097	0.088
28	0.091	0.000	-0.103	-0.024	0.124	0.059	0.077	0.003	0.015	-0.022	-0.022	0.000
29	0.278	0.398	0.035	0.319	0.231	0.289	0.165	0.079	0.255	0.270	0.254	0.088
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.000	0.000	0.125	0.000	-0.111	0.125	-0.111	0.000	-0.150	0.191	-0.025	0.013
32	0.070	0.056	-0.002	0.041	-0.121	0.131	0.086	0.133	0.102	0.060	0.190	0.118
33	0.058	-0.083	-0.077	0.027	0.027	0.062	-0.008	-0.086	-0.038	0.033	-0.188	0.008
34	0.242	0.075	0.079	0.107	0.126	0.136	0.153	0.030	0.162	0.198	0.196	0.122
35	0.13	-	0.01	-	0.02	0.24	0.06	-	0.07	0.07	0.15	-

	8	0.121	3	0.105	1	3	0	0.160	9	9	1	0.006
36	0.166	0.110	-0.011	0.083	0.159	-0.115	0.246	0.096	0.117	0.318	0.136	0.083
37	0.147	0.179	-0.141	0.038	-0.073	0.053	0.013	0.012	-0.049	0.000	-0.013	-0.039
38	0.000	-0.013	0.056	0.004	-0.061	-0.043	0.009	0.011	-0.052	0.221	0.774	0.013
39	0.132	0.127	0.118	0.070	0.061	0.140	0.136	0.088	0.147	0.104	0.055	0.083
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.279	0.164	0.098	-0.218	0.281	0.042	0.032	0.086	0.073	0.113	0.082	0.081
42	0.095	0.342	-0.169	-0.062	-0.155	0.112	-0.078	-0.184	0.103	-0.133	-0.075	-0.022
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.131
45	-0.102	-0.130	0.000	0.000	0.120	-0.107	0.060	-0.057	-0.050	0.105	-0.048	0.000
46	-0.030	-0.050	0.089	0.028	0.129	0.143	0.174	0.120	0.058	0.305	0.076	0.143
47	-0.109	-0.184	0.081	0.101	-0.118	-0.036	-0.093	-0.071	-0.240	0.185	-0.024	-0.050
48	-0.182	-0.269	0.140	-0.077	-0.111	-0.031	-0.097	-0.150	-0.261	0.955	-0.186	-0.029
49	0.019	-0.053	-0.034	-0.074	0.013	-0.022	-0.071	-0.069	0.051	-0.036	-0.046	-0.009
50	0.148	0.153	0.150	0.150	0.105	0.121	0.129	0.128	0.124	0.116	0.115	0.110
			2002									

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.130	0.222	0.111	0.106	0.112	0.077	0.091	-0.197	0.190	0.200	0.200	0.249
2	0.000	0.000	-0.167	0.000	-0.033	-0.034	-0.116	-0.352	-0.034	-0.013	-0.059	0.017
3	0.017	0.017	-0.033	0.000	-0.052	0.091	0.000	-0.133	0.079	0.045	0.161	0.116
4	0.052	0.014	0.075	0.067	-0.041	0.198	-0.026	0.091	-0.001	0.003	0.094	0.050
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.105	0.000	0.000
7	-0.046	-0.011	-0.239	0.048	0.088	0.057	0.105	0.083	0.378	0.144	0.189	0.086
8	0.082	0.010	0.038	0.347	0.550	-0.158	-0.012	0.195	0.470	0.150	0.271	-0.045
9	0.006	0.111	0.000	-0.006	0.000	-0.039	-0.029	-0.395	-0.010	0.000	0.000	0.060
10	0.235	0.106	0.164	0.076	0.108	0.056	0.102	-0.017	0.036	0.068	-0.003	0.380
11	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.727	0.020	0.000	0.000	0.000
12	0.071	0.108	0.381	0.015	0.023	0.039	0.015	0.114	0.106	0.186	0.189	0.418
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	-0.100	0.000	0.039	0.000	-0.419	0.053	0.261	0.742	0.069	-0.096	0.058	0.123
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.036	-0.04	-0.15	-0.07	0.031	0.084	-0.09	0.000	0.007	-0.03	0.072	0.663

		0	8	6			3			0		
18	0.363	0.141	0.058	0.202	0.268	0.197	0.202	0.111	0.129	0.215	0.238	0.229
19	0.090	0.058	0.074	0.054	0.081	0.092	0.074	0.074	0.106	0.042	0.080	0.090
20	0.044	-0.029	-0.020	0.027	0.194	0.090	0.044	0.044	0.259	0.036	-0.008	0.014
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.000	-0.125	-0.114	-0.016	0.066	0.138	-0.081	0.088	-0.189	0.167	0.000	0.486
23	0.170	0.052	0.098	0.106	0.140	0.124	0.100	0.139	0.084	0.087	0.173	0.082
24	0.072	-0.030	-0.113	-0.071	-0.252	-0.031	0.011	-0.021	-0.085	0.326	-0.018	0.563
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.053	0.032	-0.018	-0.032	-0.164	0.039	-0.038	0.039	-0.118	0.134	0.285	0.092
27	0.150	0.134	0.030	-0.057	0.165	0.154	0.228	0.099	0.045	0.132	0.284	0.322
28	0.000	0.000	-0.313	-0.189	0.000	0.000	0.000	0.027	0.000	-0.067	0.000	0.000
29	0.339	0.058	0.103	0.192	0.220	0.209	0.191	0.114	0.218	0.205	0.119	0.221
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.000	-0.150	0.044	0.014	0.028	0.000	0.216	0.111	-0.060	-0.128	0.159	0.075
32	0.118	0.118	0.075	0.109	0.127	0.096	0.084	0.106	0.232	0.356	0.214	0.101
33	0.031	0.070	0.070	0.015	0.195	0.080	0.438	-0.052	0.074	0.225	0.350	0.357
34	0.178	0.175	0.078	0.175	0.165	0.193	0.274	0.093	0.158	0.226	0.202	0.106
35	0.106	0.091	0.089	0.062	0.089	0.062	0.639	0.648	0.632	1.055	0.270	0.757
36	0.167	0.133	0.209	0.028	0.211	0.200	0.200	0.541	0.048	0.133	0.370	0.159

37	0.081	-0.100	-0.222	0.000	0.018	0.000	0.193	0.103	-0.093	0.000	0.029	0.057
38	0.090	0.081	-0.056	0.042	0.282	0.080	0.198	0.110	0.091	0.119	0.086	0.115
39	0.146	0.141	0.121	0.098	0.158	0.134	0.113	0.208	0.201	0.196	0.133	0.345
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.207	0.048	0.037	-0.064	0.084	0.082	0.120	0.101	0.130	0.161	0.186	0.252
42	-0.106	-0.062	-0.372	-0.104	-0.049	0.010	-0.131	-0.140	0.041	0.364	-0.019	0.932
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	-0.027	0.000	0.092	0.012	0.040	0.285	0.098	-0.017	-0.029	0.118	0.320	0.268
45	0.040	0.010	0.000	-0.105	0.064	0.000	0.000	0.000	0.000	0.000	0.000	0.000
46	0.186	0.201	0.040	0.075	0.278	0.209	0.161	0.041	0.057	0.190	0.251	0.138
47	-0.113	0.009	-0.147	-0.059	-0.348	0.163	0.469	-0.013	0.067	-0.063	0.233	0.304
48	0.000	-0.059	-0.391	-0.231	0.333	0.025	0.061	0.172	0.118	-0.035	0.009	-0.099
49	-0.022	-0.099	-0.045	-0.052	0.015	0.010	-0.050	0.000	0.042	0.068	0.174	0.108
50	0.109	0.106	0.101	0.100	0.090	0.073	0.086	0.083	0.076	0.081	0.083	0.084
			2003									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.220	0.182	0.182	0.182	0.182	0.182	0.182	0.182	0.227	0.216	0.326	0.228
2	0.065	0.045	-0.07	0.341	0.173	-0.16	0.008	0.450	-0.37	0.547	-0.14	0.000

			4			4			6		3	
3	1.161	-0.202	-0.064	0.045	0.592	-0.061	0.023	0.098	0.144	0.076	0.201	-0.037
4	0.315	0.009	0.019	0.029	0.361	-0.096	0.025	-0.022	-0.063	0.410	-0.142	0.025
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	-0.028	0.000	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.095	0.000	0.042
7	0.313	0.092	0.065	0.091	0.134	0.213	0.073	0.106	0.194	0.048	0.033	0.181
8	0.178	0.042	0.080	0.198	0.486	0.073	-0.046	0.342	0.251	0.102	-0.012	0.152
9	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.052	0.189	0.103
10	-0.024	0.100	0.045	0.087	0.207	0.077	0.105	0.047	0.485	-0.127	0.192	0.075
11	0.000	0.000	0.186	0.000	-0.008	0.075	0.132	0.205	0.000	0.000	0.000	0.000
12	0.030	0.076	-0.060	0.232	0.056	0.030	0.044	0.458	0.144	0.074	0.093	0.058
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.282	-0.308	-0.146	1.196	0.340	-0.136	0.025	0.228	0.174	0.209	0.302	-0.122
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.167	-0.032	-0.015	0.054	0.077	-0.014	-0.053	-0.165	0.012	0.111	-0.034	0.039
18	0.191	0.199	0.191	0.214	0.142	-0.014	0.083	0.147	0.428	0.048	0.389	0.144
19	0.210	0.239	-0.003	-0.003	0.807	0.009	-0.043	-0.036	0.534	0.068	0.152	0.178
20	0.31	0.18	0.18	0.37	0.31	-	-	0.39	0.29	-	0.20	-

	6	3	4	8	0	0.087	0.225	8	1	0.087	7	0.034
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.163	0.083	0.069	0.236	0.133	0.117	-0.078	-0.040	0.253	0.000	0.070	-0.073
23	0.438	0.095	0.269	0.170	0.255	-0.060	0.058	0.122	0.981	-0.096	-0.021	0.016
24	0.326	-0.073	0.274	0.693	0.110	-0.140	-0.090	0.022	0.216	-0.084	0.255	-0.122
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.724	0.009	-0.143	0.064	1.164	0.188	-0.087	-0.003	0.066	-0.100	0.091	-0.059
27	0.302	0.083	0.054	0.398	-0.003	-0.019	0.275	0.019	0.481	-0.058	0.271	0.017
28	0.429	0.326	0.023	0.032	0.143	0.000	0.000	0.150	0.036	0.102	0.179	-0.051
29	0.240	0.144	0.153	0.312	0.136	0.063	0.084	0.184	0.460	0.111	0.251	0.093
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.164	0.439	0.597	0.315	0.032	0.214	-0.031	0.001	0.624	-0.102	-0.004	0.007
32	0.274	0.169	0.102	0.339	0.210	0.084	0.050	0.145	0.236	0.218	0.222	0.034
33	0.106	0.109	0.226	0.293	0.038	0.256	0.092	0.225	0.054	0.063	0.033	0.228
34	0.277	0.218	0.256	0.239	0.250	0.087	0.261	0.444	0.204	0.074	0.375	0.111
35	0.741	0.502	0.508	0.552	0.517	0.411	0.013	0.061	0.504	-0.002	0.047	0.163
36	0.428	0.052	0.366	0.261	0.883	0.106	-0.039	0.622	0.336	-0.012	0.248	0.015
37	0.176	-0.172	0.000	0.125	0.407	-0.158	0.021	-0.102	0.091	0.042	0.100	0.064
38	0.25	0.17	0.89	0.14	0.20	0.23	0.13	0.38	0.02	-	-	-

	4	6	6	5	6	4	2	4	9	0.034	0.007	0.068
39	0.140	0.222	0.237	0.261	0.009	0.142	0.221	0.187	0.175	0.170	0.237	-0.005
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.288	0.073	0.045	0.105	0.593	0.043	0.000	0.055	0.459	0.149	0.111	0.180
42	0.784	-0.208	0.100	0.139	0.131	-0.078	0.068	-0.051	0.355	-0.183	0.544	0.008
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.040	0.184	-0.134	-0.173	0.143	-0.005	0.090	0.231	0.009	0.023	0.126	-0.028
45	0.000	0.000	0.000	0.000	0.100	0.073	0.136	0.000	0.239	0.090	0.492	0.285
46	0.276	0.076	0.100	0.011	0.601	0.019	0.156	-0.188	0.255	0.031	0.174	0.076
47	0.167	0.190	0.085	0.132	0.222	0.020	0.034	0.048	0.150	0.013	0.039	0.103
48	0.600	-0.125	0.029	0.688	-0.095	0.095	0.037	0.000	0.420	-0.017	0.066	-0.062
49	0.031	0.032	0.148	0.123	-0.067	0.025	0.063	0.129	0.032	0.114	0.000	0.154
50	0.084	0.078	0.062	0.063	0.058	0.030	0.015	0.012	0.008	0.010	0.014	0.015
			2004									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.136	0.123	0.140	0.095	0.130	0.119	0.125	0.152	0.159	0.065	0.102	0.138
2	0.000	0.042	-0.040	-0.042	-0.022	0.289	0.009	-0.009	-0.026	0.177	-0.015	0.246
3	0.447	-0.041	0.244	0.028	-0.010	0.068	0.028	0.223	-0.036	0.133	0.071	0.090
4	-0.07	0.012	0.018	-0.00	0.493	-0.19	-0.05	0.136	0.058	0.167	-0.04	0.212

	1			1		5	5				1	
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.060	0.000	0.127	0.046	0.099	0.000	0.008	0.079	0.000	0.000	0.000	0.000
7	0.055	0.178	-0.197	-0.002	0.047	0.031	-0.221	0.100	0.078	0.210	0.066	0.050
8	0.712	0.043	-0.259	0.036	-0.045	0.000	0.108	0.043	-0.043	-0.026	0.113	0.033
9	0.013	0.000	0.019	-0.030	0.006	-0.006	0.000	0.031	0.042	-0.058	-0.025	0.013
10	0.184	0.056	0.053	0.293	0.163	0.054	0.040	0.152	0.054	0.320	0.021	0.010
11	0.023	0.100	0.768	-0.029	0.003	-0.021	0.000	-0.012	-0.073	0.000	-0.020	0.000
12	0.107	0.158	-0.111	0.094	-0.021	0.081	0.049	0.008	0.051	0.057	0.138	-0.076
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.698	-0.089	-0.138	0.010	-0.056	-0.010	-0.195	0.000	0.081	0.029	0.028	-0.022
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.029	-0.146	-0.018	-0.112	-0.113	-0.066	-0.304	0.334	-0.090	-0.024	0.197	0.082
18	0.108	0.060	-0.181	0.115	0.034	-0.079	0.117	0.039	0.069	0.137	0.043	0.004
19	0.784	0.121	-0.081	-0.039	-0.076	-0.088	-0.023	-0.030	0.092	0.102	0.129	0.066
20	0.746	-0.107	-0.168	-0.051	-0.039	0.023	0.031	0.015	-0.115	0.122	-0.053	0.102
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
22	0.568	-0.04	-0.32	-0.00	-0.16	-0.01	0.066	0.043	-0.16	-0.00	0.016	-0.08

		8	8	8	7	0			4	5		6
23	0.432	0.005	-0.080	-0.035	0.015	0.024	0.024	0.154	-0.011	0.024	0.095	0.056
24	0.545	0.049	-0.257	-0.069	-0.018	-0.108	0.243	-0.091	-0.009	0.009	0.084	0.016
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	1.078	0.289	-0.445	0.008	-0.028	-0.036	-0.080	0.018	-0.134	0.184	-0.005	0.056
27	0.496	-0.146	-0.116	0.156	0.102	-0.025	0.109	-0.084	0.044	0.066	0.132	0.048
28	0.075	0.128	0.175	0.000	-0.134	-0.034	-0.036	-0.315	0.065	-0.007	-0.024	0.099
29	0.093	0.253	-0.208	0.037	0.022	-0.135	0.145	0.026	0.020	0.099	0.020	-0.036
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.146	-0.055	-0.083	0.020	0.023	-0.031	-0.067	-0.019	-0.094	0.135	-0.005	-0.012
32	0.020	0.082	-0.001	-0.008	-0.008	0.042	0.020	0.020	-0.051	0.007	0.023	-0.009
33	0.028	-0.088	-0.068	-0.057	-0.067	0.038	0.050	0.056	0.096	0.182	0.016	0.054
34	0.128	0.052	-0.222	0.002	-0.046	0.093	-0.003	-0.045	0.145	0.050	0.064	0.063
35	0.209	0.097	-0.056	-0.021	-0.038	0.046	0.011	0.139	-0.059	0.027	0.060	-0.100
36	0.308	0.006	-0.081	-0.048	0.063	0.042	-0.089	0.065	-0.076	0.111	0.078	0.028
37	0.272	0.423	-0.071	0.791	-0.034	0.001	0.138	-0.115	0.033	0.178	0.113	0.420
38	0.220	-0.042	-0.186	0.106	0.010	-0.089	0.001	0.033	0.022	0.022	0.055	0.033

39	0.159	0.022	-0.036	0.077	-0.103	0.078	0.055	0.097	0.040	0.120	0.185	-0.134
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.025	-0.013	-0.014	-0.034	0.106	0.209	0.221	-0.140	0.213	-0.010	0.271	0.039
42	0.877	0.133	-0.180	0.010	-0.041	-0.031	-0.006	0.034	-0.058	-0.142	0.120	0.111
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.436	1.064	-0.322	-0.063	0.269	-0.101	0.257	0.038	-0.063	0.023	-0.004	0.009
45	1.277	-0.171	-0.397	-0.127	0.029	-0.042	0.000	-0.012	-0.089	0.111	-0.009	-0.059
46	0.260	-0.069	0.008	0.050	0.104	0.048	0.319	-0.036	0.109	0.173	0.144	0.053
47	0.451	0.056	-0.190	-0.021	0.075	-0.054	0.147	-0.038	0.019	0.013	0.051	0.032
48	0.676	-0.369	-0.133	0.125	-0.172	-0.027	-0.152	0.061	-0.100	-0.021	-0.043	-0.036
49	0.005	-0.127	-0.023	-0.007	-0.018	0.026	0.000	-0.014	0.061	0.030	0.003	0.057
50	0.016	0.016	0.016	0.021	0.029	0.020	0.017	0.023	0.027	0.040	0.051	0.080
			2005									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.125	0.125	0.180	0.144	0.217	0.191	0.336	0.071	0.067	0.085	0.071	0.054
2	0.104	0.153	-0.149	0.151	0.043	0.237	-0.026	0.027	-0.142	0.091	-0.005	0.026
3	0.553	-0.139	0.079	-0.022	0.289	0.511	-0.001	0.152	0.015	0.110	-0.007	0.027

4	0.158	-0.040	0.078	0.099	0.044	0.038	0.122	-0.096	-0.037	-0.017	0.009	-0.171
5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.013	-0.079	0.101	0.039	0.202	0.559	-0.100	0.167	-0.080	-0.008	-0.052	-0.156
7	0.065	0.074	0.009	0.081	0.080	0.085	0.073	0.073	0.036	0.063	0.042	0.055
8	-0.156	0.001	-0.002	-0.009	0.010	0.072	-0.013	0.015	-0.023	0.083	0.035	0.107
9	0.000	0.000	0.063	0.029	0.114	0.097	0.262	-0.004	-0.007	0.011	-0.004	-0.022
10	0.192	0.100	0.188	0.143	0.505	0.485	0.140	0.079	0.207	0.003	-0.026	0.021
11	0.000	0.000	0.000	0.000	0.000	0.733	0.115	0.034	-0.183	0.000	0.000	0.000
12	0.115	0.101	0.178	0.077	0.132	-0.001	0.009	-0.065	0.026	0.048	0.036	0.025
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	-0.067	-0.077	-0.032	-0.060	0.050	0.061	0.121	0.000	-0.085	0.037	-0.042	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	-0.065	-0.006	-0.224	0.107	0.010	0.382	-0.204	-0.019	-0.222	0.054	0.166	-0.024
18	0.140	0.087	0.017	0.098	0.165	0.110	0.049	0.018	0.067	0.089	0.041	0.122
19	-0.074	0.050	0.012	0.039	0.047	0.155	-0.130	0.227	0.010	0.102	0.001	0.009
20	0.060	0.133	0.075	0.049	-0.015	0.093	0.011	-0.006	-0.015	0.057	0.046	0.139
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

22	0.218	0.024	-0.108	0.011	-0.047	0.396	0.098	-0.068	-0.062	-0.008	0.074	0.073
23	0.080	0.109	-0.003	0.044	0.090	0.092	-0.043	0.109	0.046	0.059	0.184	0.009
24	0.122	-0.034	-0.029	0.073	0.091	0.051	0.128	0.070	0.075	0.181	0.137	0.055
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.098	-0.084	-0.042	-0.085	0.160	0.062	0.208	-0.020	0.237	-0.025	-0.034	0.018
27	0.058	0.085	0.000	-0.004	0.046	0.152	0.064	0.027	-0.013	0.093	0.028	0.067
28	0.095	0.087	0.020	0.059	0.056	0.105	0.206	0.079	-0.030	0.006	0.025	-0.024
29	0.061	0.061	0.007	0.111	0.082	0.058	0.116	0.047	0.026	0.062	0.054	0.047
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.154	0.113	-0.081	0.015	0.120	0.350	0.181	0.085	0.071	0.176	0.078	0.010
32	0.033	0.159	0.081	0.027	0.049	0.041	0.047	0.039	0.016	0.029	0.130	0.027
33	0.089	0.096	0.023	0.058	0.146	0.194	0.154	0.068	0.045	0.045	0.045	0.073
34	0.194	0.128	-0.035	0.057	0.144	0.084	0.066	0.029	0.088	0.087	0.069	0.052
35	-0.006	0.003	0.255	-0.020	0.049	-0.013	0.026	0.047	0.077	0.082	0.029	0.036
36	0.107	-0.040	-0.059	-0.009	0.009	0.036	-0.078	0.121	0.075	0.155	-0.081	0.022
37	0.170	0.112	-0.004	0.433	0.158	0.710	-0.103	0.105	0.040	0.103	0.004	-0.036
38	0.170	0.056	0.046	0.027	0.063	0.728	0.041	0.080	0.033	0.070	0.023	0.023
39	0.084	-0.04	0.072	0.040	0.179	0.115	0.030	-0.01	-0.02	-0.04	-0.00	-0.01

		2						7	4	5	4	9
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	-0.008	0.023	0.055	0.068	0.334	0.231	-0.018	0.074	0.113	-0.040	0.024	0.114
42	-0.095	0.023	-0.006	-0.045	0.078	0.254	0.031	0.215	0.033	0.054	0.003	-0.030
43	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
44	0.125	0.003	-0.009	0.072	0.434	0.358	0.189	0.039	0.120	-0.027	0.003	0.088
45	-0.019	0.000	-0.003	0.077	-0.099	0.528	0.087	0.000	0.000	-0.280	-0.181	0.085
46	0.135	0.125	-0.098	0.181	0.430	0.105	0.214	0.082	-0.030	0.003	0.068	0.161
47	0.109	0.043	0.043	-0.017	0.128	0.136	-0.106	0.070	0.080	0.095	0.006	0.035
48	0.052	0.336	-0.228	0.083	0.048	0.487	-0.175	0.063	0.056	-0.045	0.131	-0.021
49	0.038	-0.027	0.032	0.086	0.133	0.002	-0.011	-0.027	0.028	0.009	0.000	0.050
50	0.083	0.086	0.086	0.087	0.087	0.085	0.086	0.087	0.086	0.082	0.078	0.081
			2006									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.073	0.073	0.073	0.077	0.052	0.057	0.092	0.080	0.043	-0.030	0.139	2.030
2	-0.016	-0.153	-0.031	-0.103	0.143	-0.075	-0.054	0.000	0.200	-0.012	-0.036	0.056
3	0.027	-0.008	0.039	0.012	0.030	0.128	0.023	0.178	0.152	-0.063	0.151	0.031
4	0.083	-0.041	-0.065	-0.028	0.119	-0.036	0.064	0.062	0.706	0.820	0.324	0.135

5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	0.109	0.186	-0.008	-0.041	0.209	-0.137	0.234	-0.061	0.302	0.228	0.003	-0.069
7	0.069	0.053	0.046	0.033	0.097	0.284	0.605	0.087	0.780	0.383	-0.100	-0.085
8	0.002	-0.018	0.058	0.086	0.047	0.281	0.114	0.174	0.357	0.159	0.206	0.100
9	-0.004	-0.004	-0.004	0.000	-0.027	-0.024	0.012	0.000	-0.040	-0.125	0.048	2.000
10	0.124	0.030	0.140	0.054	0.152	-0.049	-0.019	0.024	0.173	-0.047	-0.026	0.023
11	0.061	0.010	0.029	0.002	0.233	0.074	-0.007	0.074	0.399	-0.090	0.078	-0.024
12	0.067	0.035	0.020	0.015	0.040	0.040	0.020	0.034	0.173	0.151	0.271	-0.047
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.755	-0.230	-0.134	0.179
15	0.012	0.012	-0.152	0.007	0.086	-0.053	-0.028	0.207	0.254	0.264	-0.194	0.231
16	0.000	0.000	0.000	0.000	0.188	-0.025	-0.060	-0.091	-0.150	-0.012	0.006	0.024
17	0.459	-0.123	-0.118	-0.006	-0.079	0.003	0.003	0.003	0.003	0.003	0.003	0.003
18	0.046	-0.083	-0.007	0.000	0.035	0.043	0.015	0.113	0.108	0.357	0.336	-0.163
19	0.011	-0.081	-0.002	-0.032	0.291	-0.164	0.042	0.162	0.116	0.026	-0.051	0.063
20	0.242	0.180	-0.049	0.056	0.054	0.132	0.061	0.222	0.206	-0.066	0.034	0.016
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.07	-	0.04

	0	0	0	0	0	0	0	0	8	4	0.013	3
22	0.215	0.050	-0.140	0.520	0.280	-0.067	0.081	0.317	0.405	-0.207	-0.080	0.185
23	0.168	0.029	0.024	0.054	0.167	0.124	0.183	0.090	0.159	0.122	0.781	-0.083
24	0.052	0.052	0.042	0.026	0.393	0.056	0.048	0.070	0.111	0.107	0.042	0.138
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
26	0.165	-0.015	-0.015	-0.007	0.310	0.118	-0.106	0.154	0.385	-0.089	-0.049	-0.009
27	0.086	0.029	0.012	0.050	0.436	0.049	0.090	0.189	0.163	0.035	0.015	0.055
28	0.000	-0.094	0.103	0.000	0.063	0.012	0.047	0.667	0.220	-0.158	0.039	0.144
29	0.081	0.026	0.061	0.047	0.074	0.106	0.075	0.061	0.115	0.264	0.055	0.017
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	0.162	0.027	0.000	0.088	0.318	0.075	0.055	0.237	0.078	-0.046	-0.037	0.009
32	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027
33	0.000	0.000	0.000	0.000	0.064	-0.020	0.027	0.160	0.057	0.087	0.040	0.034
34	0.061	0.043	0.072	0.062	0.039	0.030	0.081	0.070	0.089	0.035	0.074	0.074
35	0.036	0.036	0.036	0.036	0.036	0.036	0.055	0.055	0.055	0.055	0.055	0.055
36	0.112	-0.044	0.104	0.026	-0.018	0.021	-0.026	0.051	0.092	0.020	0.074	0.159
37	0.149	0.016	0.116	0.149	0.214	0.099	0.231	0.793	0.278	-0.262	-0.218	0.098
38	0.112	0.021	0.021	0.021	0.029	0.101	0.010	-0.005	0.010	0.025	-0.005	-0.005
39	0.003	-0.03	0.026	-0.01	0.072	-0.00	-0.03	0.077	0.024	-0.04	0.003	-0.00

		4		2		4	3			5		4
40	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
41	0.014	-0.044	0.046	-0.030	0.023	-0.031	-0.040	0.000	-0.125	0.067	-0.009	0.018
42	-0.004	-0.062	0.098	-0.033	0.216	0.078	-0.097	0.352	0.101	0.230	-0.016	0.020
43	0.000	0.000	0.000	0.000	0.000	0.104	-0.068	-0.033	0.038	0.009	-0.062	-0.067
44	0.181	-0.016	0.064	0.153	0.203	0.044	-0.007	-0.047	-0.058	-0.025	0.011	0.002
45	0.000	-0.019	0.003	0.016	0.063	-0.059	0.063	-0.118	-0.023	1.423	-0.310	0.265
46	0.069	-0.041	0.026	-0.031	0.166	-0.061	-0.047	0.031	0.252	0.325	0.221	-0.069
47	0.098	0.061	0.022	0.023	0.107	-0.038	0.051	0.076	0.044	0.014	0.015	0.121
48	0.158	-0.093	-0.048	-0.039	0.260	-0.220	-0.109	0.131	-0.058	0.044	0.042	-0.030
49	-0.026	0.010	-0.019	0.081	-0.021	0.000	0.053	0.088	0.089	0.057	0.005	0.023
50	0.082	0.080	0.076	0.070	0.070	0.066	0.059	0.060	0.065	0.068	0.064	0.057
			2007									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-0.145	0.109	0.034	0.034	-0.032	0.037	0.019	0.020	0.038	0.038	-0.054	-0.103
2	0.012	-0.082	-0.057	0.081	-0.206	0.331	-0.160	-0.014	0.000	-0.157	0.085	0.133
3	-	0.03	0.06	-	0.00	0.07	0.18	-	-	0.04	0.08	0.12

	0.128	7	0	0.062	7	7	7	0.049	0.017	3	5	1
4	0.000	-0.039	-0.168	0.052	-0.051	0.051	0.004	-0.002	-0.039	-0.066	0.064	0.006
5	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.266	-0.026	0.012	0.105	0.243
6	0.191	-0.210	-0.152	-0.060	0.357	0.077	0.211	0.011	-0.071	-0.078	0.132	0.030
7	-0.064	-0.159	-0.023	0.048	0.016	0.107	0.081	0.120	-0.134	-0.029	0.056	0.138
8	0.041	-0.098	-0.050	-0.070	0.031	0.024	0.114	0.012	0.015	0.023	0.064	0.169
9	-0.182	0.074	0.000	0.000	-0.069	0.000	-0.019	-0.019	0.000	0.000	-0.096	-0.153
10	-0.076	-0.038	-0.050	-0.095	-0.043	0.004	-0.003	-0.035	0.025	-0.113	0.125	-0.018
11	0.001	-0.182	-0.131	0.042	0.283	0.293	-0.050	0.029	0.029	0.070	0.174	-0.046
12	0.003	-0.082	-0.102	0.008	0.049	0.020	0.068	0.015	0.110	0.028	0.086	0.088
13	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.052	-0.035	0.086	-0.017	0.096	0.061	0.069	0.003	0.040	0.003	0.146	0.074
15	0.023	0.015	0.174	-0.181	-0.085	0.046	-0.035	0.009	0.000	-0.091	0.060	0.075
16	0.043	-0.086	0.083	0.032	-0.014	0.079	0.165	-0.034	-0.023	-0.024	0.001	0.056
17	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
18	0.047	-0.145	0.062	0.032	0.002	0.105	0.104	0.015	0.009	-0.055	0.099	0.032
19	0.496	-0.12	0.007	0.068	-0.01	0.024	0.221	-0.03	0.050	-0.04	-0.06	0.091

		8			9			0		5	2	
20	0.068	-0.077	0.071	0.014	0.020	0.100	0.166	0.069	0.015	-0.130	0.111	0.025
21	0.543	-0.005	0.255	0.055	0.252	0.277	-0.105	0.005	-0.087	-0.020	0.145	0.167
22	-0.203	-0.222	-0.193	0.156	-0.054	0.467	-0.097	-0.050	-0.129	0.017	0.214	0.294
23	-0.091	-0.057	-0.195	0.277	-0.082	0.063	0.117	0.055	-0.119	-0.057	-0.026	0.125
24	-0.012	-0.079	0.104	0.145	-0.044	0.036	0.223	-0.022	-0.032	0.024	0.091	0.070
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.080	0.000	0.154
26	-0.035	-0.161	-0.043	-0.089	0.183	-0.020	0.005	-0.031	-0.157	-0.006	0.058	0.140
27	0.151	-0.133	-0.017	0.024	0.066	0.121	0.460	0.083	0.177	-0.091	0.123	0.032
28	0.291	-0.148	-0.156	0.115	0.027	0.059	0.078	0.014	-0.015	-0.016	-0.022	0.116
29	0.098	-0.123	0.127	-0.030	0.042	0.112	0.025	0.066	0.035	0.020	0.171	0.039
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	-0.030	-0.043	-0.020	-0.020	0.021	0.063	0.301	-0.010	-0.010	0.006	0.011	0.035
32	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027
33	-0.002	0.054	-0.042	0.023	-0.016	0.029	0.024	0.086	0.023	-0.016	0.039	0.023
34	0.175	-0.074	0.033	-0.006	-0.011	0.063	-0.011	-0.034	-0.048	0.013	0.041	0.098
35	0.055	0.055	0.055	0.055	0.055	0.055	0.073	0.073	0.073	0.073	-0.454	0.234

36	0.273	-0.053	-0.201	0.077	0.111	0.047	0.125	0.047	-0.024	-0.010	0.097	0.124
37	0.009	-0.150	0.036	0.035	0.083	0.094	-0.006	0.057	-0.072	-0.079	0.116	-0.024
38	0.103	-0.026	-0.137	0.054	-0.072	0.012	0.075	0.121	0.010	0.010	0.048	0.046
39	0.068	-0.017	-0.031	0.039	-0.004	0.072	0.029	0.118	0.062	0.036	0.168	0.058
40	0.000	0.000	-0.167	0.072	-0.041	0.063	0.088	0.081	0.034	-0.104	0.065	0.082
41	-0.083	0.030	0.010	0.000	0.015	0.005	0.020	0.049	-0.053	0.116	0.082	0.000
42	0.028	-0.096	-0.202	0.084	0.002	0.003	0.099	0.070	-0.066	-0.031	0.028	0.028
43	-0.231	0.171	-0.225	0.495	0.011	-0.025	0.152	0.094	-0.068	-0.023	0.066	0.029
44	-0.215	-0.263	-0.004	-0.118	-0.015	0.099	0.150	0.272	-0.023	0.204	0.050	0.044
45	-0.129	-0.139	-0.355	0.267	-0.147	0.139	0.084	-0.005	-0.206	-0.111	0.028	0.007
46	-0.082	-0.270	-0.111	-0.066	-0.030	-0.008	0.069	-0.047	-0.151	-0.013	-0.041	0.136
47	0.022	-0.039	0.178	0.125	-0.039	0.064	0.144	0.039	0.056	0.042	0.142	0.205
48	0.008	-0.080	-0.042	-0.034	-0.071	0.021	0.027	-0.090	-0.015	-0.081	0.032	0.207
49	-0.067	-0.047	0.013	-0.038	0.029	0.038	0.006	-0.042	-0.034	0.053	0.040	-0.134
50	0.060	0.062	0.063	0.066	0.068	0.065	0.065	0.073	0.073	0.076	0.075	0.069

			2008									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	-0.180	-0.087	0.080	0.080	-0.022	0.090	0.090	0.090	0.090	0.090	0.090	0.090
2	-0.228	0.143	-0.078	0.288	-0.099	0.168	-0.063	-0.220	0.009	-0.288	0.095	0.000
3	-0.100	0.112	-0.040	0.142	-0.070	0.075	0.027	-0.006	-0.030	-0.104	-0.085	0.048
4	-0.237	0.116	-0.070	0.184	-0.146	0.014	-0.088	-0.097	-0.338	-0.013	-0.203	0.148
5	-0.008	0.111	0.052	0.297	0.002	0.061	-0.069	-0.006	-0.123	-0.304	0.056	0.086
6	-0.109	0.142	-0.102	0.013	-0.011	0.039	0.013	0.013	-0.085	-0.018	-0.064	0.115
7	-0.150	0.118	-0.065	0.176	-0.053	-0.011	-0.058	-0.032	-0.136	-0.254	0.037	0.378
8	-0.042	0.073	-0.049	0.237	0.123	0.077	-0.007	0.022	-0.031	-0.187	0.080	0.060
9	-0.246	-0.167	0.000	0.000	-0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	-0.241	0.096	0.106	0.043	-0.003	0.020	-0.042	0.065	-0.039	-0.316	0.074	0.117
11	0.026	0.026	0.026	0.151	-0.071	-0.067	-0.133	0.049	0.017	0.033	-0.063	0.037
12	-0.079	0.116	0.036	0.081	-0.001	0.069	0.240	-0.229	-0.104	-0.161	0.259	0.082
13	0.000	0.000	0.000	0.000	0.000	0.000	-0.208	-0.043	-0.099	-0.291	0.087	0.000
14	-0.051	0.140	-0.058	0.245	-0.031	0.067	-0.076	0.130	-0.077	-0.078	0.054	0.039
15	-	0.11	-	0.09	0.05	0.02	-	-	-	0.02	0.00	0.03

	0.127	6	0.099	0	5	6	0.093	0.028	0.077	6	5	2
16	-0.264	0.197	0.064	0.075	0.044	-0.016	-0.057	0.026	-0.126	-0.105	0.103	-0.004
17	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
18	-0.114	0.029	-0.062	0.081	-0.027	-0.007	-0.064	-0.045	-0.071	-0.227	0.061	0.092
19	-0.060	0.025	-0.065	0.072	0.009	0.035	-0.075	-0.018	-0.114	-0.333	0.220	-0.083
20	-0.141	0.104	-0.029	0.178	-0.001	0.025	-0.011	-0.011	-0.066	-0.248	0.145	0.028
21	-0.124	0.230	0.006	0.655	0.116	0.084	-0.120	0.022	-0.244	-0.141	-0.120	0.198
22	-0.125	0.125	-0.151	0.146	-0.290	0.083	-0.146	-0.073	-0.138	-0.208	-0.036	0.255
23	-0.123	0.109	-0.028	0.053	-0.023	-0.019	-0.025	0.030	-0.054	-0.335	0.219	0.018
24	-0.087	0.134	-0.044	0.300	-0.008	0.005	0.014	-0.097	-0.038	-0.181	0.093	0.162
25	-0.095	0.082	-0.092	0.214	-0.008	0.064	-0.095	0.076	-0.071	-0.122	0.013	0.115
26	-0.128	0.166	-0.116	0.262	0.113	0.034	0.025	-0.064	-0.158	-0.244	0.080	0.068
27	-0.188	0.140	-0.056	0.243	-0.003	-0.042	-0.053	0.014	-0.096	-0.118	0.013	0.035
28	-0.171	0.014	0.008	0.033	-0.078	0.036	-0.018	0.093	0.028	-0.050	0.009	-0.101
29	0.030	0.106	-0.020	0.093	0.080	0.024	-0.002	0.003	0.018	-0.033	0.032	0.062
30	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
31	-0.01	0.063	-0.03	0.090	0.038	0.042	0.079	0.047	-0.05	-0.10	-0.02	0.019

	3		4						0	8	9	
32	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.043
33	-0.028	-0.013	-0.003	0.024	0.003	0.029	-0.023	0.013	-0.034	0.003	-0.013	-0.057
34	0.049	0.195	0.094	0.091	0.066	0.107	0.024	0.048	0.067	0.031	0.014	0.052
35	0.234	0.234	0.234	0.234	0.234	0.234	0.234	0.234	0.234	0.234	0.234	0.234
36	-0.154	0.166	-0.163	0.166	0.001	-0.011	-0.070	-0.423	0.577	-0.078	-0.034	0.030
37	-0.013	0.028	-0.056	0.187	-0.046	0.016	-0.074	0.025	-0.049	-0.244	0.067	0.088
38	-0.061	-0.066	0.052	-0.061	-0.040	0.045	-0.026	-0.018	-0.382	0.324	-0.111	-0.006
39	-0.094	0.084	0.023	0.137	0.107	0.104	-0.015	-0.016	-0.044	-0.223	0.148	0.106
40	-0.050	0.053	-0.176	-0.023	-0.219	0.150	-0.078	-0.028	-0.097	-0.161	0.013	-0.114
41	-0.181	-0.064	0.074	0.016	-0.022	0.011	0.005	0.022	0.000	-0.312	0.257	0.022
42	-0.050	0.054	-0.037	0.064	0.005	0.043	-0.110	0.000	-0.032	-0.153	-0.020	0.052
43	-0.093	0.103	-0.053	0.126	0.021	-0.012	-0.012	-0.023	-0.025	-0.240	0.141	0.096
44	-0.093	0.065	-0.093	0.192	-0.028	0.068	-0.131	-0.012	-0.117	-0.077	-0.099	0.175
45	-0.065	0.026	-0.054	0.083	-0.035	0.120	-0.071	-0.024	-0.039	-0.186	-0.105	0.020
46	-0.178	0.131	-0.058	0.104	-0.128	-0.039	-0.087	-0.106	-0.119	-0.277	0.157	0.017
47	-0.052	0.152	0.053	0.176	-0.038	0.071	0.088	0.064	0.088	0.003	0.266	0.063
48	-	0.03	-	0.09	-	0.00	-	-	0.28	-	0.07	0.04

	0.159	8	0.037	2	0.039	7	0.127	0.092	4	0.132	0	6
49	0.076	-0.045	0.102	-0.030	-0.003	-0.056	-0.045	-0.101	-0.190	0.000	0.040	-0.092
50	0.068	0.073	0.069	0.073	0.078	0.077	0.080	0.080	0.077	0.078	0.084	0.086
			2009									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
2	-0.043	-0.136	0.158	0.023	0.078	0.237	0.167	-0.100	0.048	0.015	-0.060	0.087
3	-0.053	-0.207	0.309	0.053	0.048	-0.053	-0.090	0.051	-0.034	0.128	-0.018	0.066
4	-0.171	-0.241	0.227	0.046	0.071	0.008	0.049	-0.039	0.050	0.214	0.166	-0.021
5	0.031	-0.227	0.156	0.105	0.184	0.138	-0.043	-0.107	-0.004	0.008	0.020	0.027
6	-0.074	0.017	-0.173	-0.032	0.102	0.289	0.051	0.004	-0.007	0.016	-0.083	-0.054
7	-0.190	-0.286	0.051	-0.025	0.306	0.229	0.013	-0.209	-0.105	-0.078	0.104	-0.038
8	-0.078	-0.220	0.277	-0.043	0.001	0.152	-0.040	-0.039	-0.042	0.055	0.173	0.031
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.029	-0.200	0.061	0.172	0.024	0.145	0.082	-0.056	-0.061	0.254	0.381	0.120
11	0.037	-0.052	-0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.094	0.000
12	0.018	-0.137	0.156	0.080	-0.002	0.172	-0.055	0.006	-0.009	0.071	0.069	0.006

13	-0.095	-0.184	0.210	-0.015	0.001	0.213	0.181	0.001	0.041	0.106	0.233	-0.040
14	-0.016	-0.208	0.151	0.166	0.078	0.169	0.030	0.189	-0.103	0.002	0.060	0.040
15	-0.076	0.024	0.024	-0.051	0.109	0.024	0.019	-0.111	0.016	-0.048	0.115	0.013
16	-0.041	-0.426	0.188	0.247	0.116	0.189	-0.042	0.024	0.083	-0.016	-0.011	0.153
17	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
18	-0.008	-0.194	0.167	0.127	0.084	0.263	-0.016	-0.081	0.007	0.040	0.084	0.039
19	-0.058	-0.062	-0.081	0.026	0.155	0.217	-0.030	-0.085	-0.034	-0.089	-0.069	-0.022
20	0.049	-0.263	0.155	0.111	0.118	0.115	-0.001	-0.015	0.041	-0.022	-0.001	0.067
21	-0.117	-0.230	0.557	-0.199	0.047	0.184	0.064	-0.132	-0.006	0.060	-0.050	0.095
22	-0.146	-0.162	0.141	0.004	0.071	0.122	-0.005	-0.017	-0.018	-0.038	0.103	0.182
23	0.082	-0.242	-0.006	0.154	0.148	0.175	-0.050	-0.062	0.066	-0.083	0.159	0.048
24	-0.089	-0.170	0.325	0.063	0.009	0.219	0.013	-0.009	0.049	0.019	0.069	0.061
25	-0.051	-0.221	0.476	0.123	0.046	0.038	-0.024	-0.088	0.007	0.059	0.129	0.106
26	-0.087	-0.287	0.009	0.186	-0.008	0.195	-0.006	-0.114	0.000	-0.064	0.107	0.076
27	-0.068	-0.154	-0.015	0.041	0.136	0.134	-0.063	-0.122	0.007	-0.086	0.025	0.067
28	-0.145	-0.075	-0.102	0.023	0.000	0.078	0.031	0.000	-0.020	-0.082	0.133	-0.080

29	0.068	-0.059	0.065	0.052	0.080	0.121	0.024	0.080	0.086	0.085	0.103	0.170
30	-0.193	-0.135	-0.142	-0.039	0.164	0.472	-0.120	-0.027	-0.034	-0.017	0.059	-0.006
31	-0.046	-0.153	-0.059	0.246	0.016	0.213	-0.043	0.019	0.068	0.039	0.003	0.152
32	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.013	0.013
33	-0.051	-0.150	0.042	0.027	0.084	0.250	0.074	0.040	0.104	0.050	0.025	0.010
34	0.163	0.151	0.115	0.135	0.209	0.209	0.130	0.090	0.086	0.097	0.097	0.075
35	0.234	0.234	0.234	2.278	0.073	0.073	0.109	0.109	0.109	0.109	1.605	-0.071
36	-0.046	-0.226	-0.113	0.294	0.425	0.176	0.069	0.151	-0.049	-0.026	0.051	0.022
37	-0.017	-0.293	0.259	0.163	0.024	0.196	0.041	-0.047	-0.009	-0.011	0.076	0.064
38	0.069	0.000	-0.118	0.000	0.000	-0.048	0.019	0.019	0.131	0.042	0.016	0.016
39	-0.014	-0.208	0.199	0.082	0.047	0.322	0.041	0.054	-0.003	0.071	0.037	0.099
40	-0.086	-0.109	0.088	-0.081	-0.105	0.020	0.019	0.057	-0.071	-0.019	0.176	-0.033
41	-0.011	0.002	0.202	0.437	0.133	0.196	0.073	0.118	0.108	0.163	0.173	0.107
42	-0.063	-0.147	0.166	0.053	0.044	0.313	0.029	-0.088	0.091	0.226	0.076	0.009
43	-0.050	-0.176	0.293	0.020	0.060	0.273	0.005	-0.073	-0.037	-0.035	0.138	0.156
44	-0.179	-0.177	0.383	-0.001	0.096	0.512	0.043	0.254	0.037	0.072	-0.023	0.137
45	-	-	0.17	-	0.17	-	-	0.03	-	0.10	-	0.04

	0.095	0.116	9	0.127	8	0.105	0.142	5	0.144	7	0.022	7
46	-0.017	-0.203	0.032	0.144	-0.027	-0.037	-0.019	-0.039	0.031	-0.050	0.031	0.110
47	0.021	0.023	0.254	0.104	-0.061	0.150	0.058	0.030	0.104	0.102	0.077	0.051
48	-0.338	-0.211	0.042	0.081	0.025	0.220	0.095	-0.068	-0.265	0.053	0.063	0.179
49	-0.226	0.133	0.003	0.014	0.155	-0.007	-0.052	-0.031	0.026	0.034	0.018	0.100
50	0.085	0.075	0.073	0.073	0.074	0.073	0.072	0.072	0.073	0.073	0.072	0.068
			2010									
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
2	0.086	0.529	0.704	-0.017	0.020	0.086	0.082	0.042	0.042	0.070	-0.032	0.025
3	0.123	0.254	0.438	-0.070	-0.106	0.157	-0.063	0.071	0.039	-0.001	0.022	0.097
4	0.174	0.126	0.673	0.031	-0.039	0.073	0.039	-0.037	0.034	0.125	-0.095	0.054
5	0.100	-0.042	-0.009	-0.012	-0.100	0.179	-0.002	-0.111	0.091	-0.055	-0.056	-0.156
6	-0.009	0.020	0.048	0.082	0.316	0.014	0.014	0.116	-0.107	0.077	-0.026	-0.007
7	0.196	-0.071	0.248	0.144	0.047	0.190	0.088	0.046	0.098	-0.049	0.011	-0.052
8	0.061	-0.060	0.191	0.158	0.001	0.009	0.013	0.083	0.031	0.046	-0.050	0.062
9	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

10	0.432	0.000	0.229	-0.041	0.000	-0.136	0.021	0.027	-0.005	0.000	0.050	0.022
11	-0.034	-0.095	0.000	0.000	-0.132	-0.006	-0.024	0.000	-0.013	-0.114	0.007	0.000
12	0.054	0.078	0.153	0.082	0.113	0.029	0.049	0.144	0.087	0.018	0.001	0.068
13	0.216	0.009	0.064	0.080	-0.007	0.080	0.043	-0.130	-0.038	0.131	-0.028	0.087
14	0.029	0.057	0.037	0.018	0.226	0.217	-0.074	0.499	0.156	0.104	-0.160	0.100
15	0.013	0.007	0.026	0.097	-0.012	-0.122	0.092	0.138	0.070	0.088	-0.056	0.017
16	0.087	0.011	0.371	0.027	-0.042	-0.036	0.254	0.001	0.087	0.154	-0.006	0.026
17	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
18	0.156	0.065	0.059	0.171	0.068	0.083	0.111	0.031	0.068	0.030	-0.041	0.103
19	0.000	-0.017	-0.096	0.250	0.370	0.080	0.142	0.030	0.017	0.000	-0.090	-0.052
20	0.043	0.022	0.125	0.100	0.007	0.076	0.089	0.139	0.023	0.241	-0.011	0.042
21	0.137	0.004	0.038	0.196	0.231	0.083	0.006	0.069	0.085	-0.003	-0.013	0.079
22	0.028	0.003	-0.002	0.404	-0.103	0.048	0.152	0.042	0.122	0.092	-0.102	0.076
23	0.242	-0.010	0.287	0.072	-0.019	0.100	0.042	0.148	-0.024	0.048	-0.014	-0.002
24	0.119	-0.020	0.119	0.089	-0.070	0.011	0.072	0.050	0.138	0.127	-0.010	0.081
25	0.199	-0.020	0.092	0.019	-0.060	0.058	0.065	0.025	0.021	0.046	0.026	-0.018
26	0.00	0.01	0.44	0.06	-	-	-	-	0.01	0.01	-	0.00

	6	2	7	5	0.080	0.019	0.013	0.013	3	9	0.031	6
27	0.127	0.035	0.000	0.198	-0.045	0.081	0.006	0.176	-0.011	0.087	-0.016	-0.036
28	0.102	-0.025	0.167	0.128	0.100	0.077	0.104	0.162	0.009	0.029	-0.054	-0.032
29	0.109	0.133	0.125	0.113	0.141	0.082	0.191	0.055	0.138	-0.013	0.086	0.008
30	0.078	0.010	0.026	0.185	0.068	0.186	0.000	0.100	0.109	0.087	-0.045	0.000
31	0.031	-0.065	0.109	0.022	0.125	0.104	0.117	0.054	0.138	-0.030	-0.025	0.086
32	0.039	0.058	-0.087	0.103	0.036	0.050	0.071	0.063	0.083	0.034	0.034	-0.012
33	0.060	0.095	0.129	0.040	0.086	0.028	0.028	0.032	0.081	-0.002	-0.020	0.000
34	0.052	0.133	0.113	0.018	0.106	0.086	0.199	0.087	0.076	0.059	0.044	0.021
35	0.021	0.050	0.290	0.194	0.101	-0.030	0.108	0.051	0.129	-0.115	0.014	-0.005
36	0.131	0.085	0.082	0.390	-0.087	-0.006	0.161	0.069	0.060	0.007	-0.096	0.160
37	0.191	0.012	0.023	0.056	-0.079	0.096	0.003	0.032	0.051	0.018	-0.084	0.117
38	0.016	0.078	0.120	0.287	-0.030	0.000	0.070	-0.024	0.033	-0.073	-0.130	-0.200
39	0.095	0.060	0.115	0.097	0.087	0.071	0.054	0.032	0.097	0.169	0.059	-0.026
40	0.293	-0.053	0.324	0.032	-0.103	-0.080	-0.038	0.039	-0.050	-0.053	-0.306	0.200
41	0.264	0.101	0.255	0.130	0.223	-0.049	0.136	-0.016	0.069	0.111	-0.037	0.052
42	0.11	0.13	0.16	0.03	0.15	0.04	0.02	0.09	0.18	-	-	0.10

	9	0	8	9	1	0	1	0	0	0.011	0.086	5
43	0.162	-0.045	0.157	0.085	0.102	0.038	0.049	0.029	0.040	0.045	-0.053	0.063
44	0.344	0.158	0.093	0.274	0.012	0.035	0.092	-0.105	0.071	-0.078	-0.074	0.057
45	0.190	-0.032	0.169	0.135	-0.114	-0.024	-0.092	0.131	-0.166	0.053	0.015	-0.108
46	0.218	0.236	0.503	0.068	-0.089	0.136	0.035	0.091	0.030	-0.018	-0.172	0.359
47	0.034	0.074	0.009	0.025	0.025	-0.007	0.103	0.001	0.108	-0.014	-0.007	0.034
48	-0.091	0.078	0.082	0.048	0.077	0.034	0.016	0.020	0.000	-0.055	-0.088	0.005
49	0.016	0.122	0.039	0.002	0.023	0.023	0.004	0.039	0.006	-0.057	0.009	-1.000
50	0.066	0.062	0.060	0.052	0.042	0.030	0.016	0.018	0.020	0.021	0.022	0.023