PORTFOLIO RETURN CHARACTRESTICS OF DIFFERENT MARKET SECTORS AT THE NAIROBI STOCK EXCHANGE

BY

MURIUKI J. MUTURI

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DECLARATION

I, **Muriuki John Muturi**, hereby certify that...

1. Except where due acknowledgement has been made, this project work is mine alone.
2. The project has not been previously submitted in whole or in part, to qualify for any other academic award.

Signed ----------Date 7th November 2003

Muriuki John Muturi
(D61/P/7723/2001)

I, **Mr. Otieno Odhiambo Luther**, hereby certify that this project has been presented for examination with my approval as the University of Nairobi supervisor.

Signed ----------Date 7-11-2003

Mr. Luther
Lecturer, Faculty of Commerce,
University of Nairobi

DEDICATION

This project is dedicated to my family members- my loving wife Brenda, daughter Anita Wambui, brother, sisters and my mother. May God bless you all in abundantly.

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I am greatly indebted to a number of persons, without whom, this project work would not have been completed. I wish to convey my sincere gratitude to my family for the patience and understanding during this period. I also wish to thank the management and staff of the Faculty of Commerce, University of Nairobi, the management of the Housing Finance and my fellow students for the time, logistics and moral support they have accorded me all along.

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ASANTENI SANA

LIST OF ABBREVIATIONS

	FULL NAME	*SHORT NAME*
1.	Nairobi Stock Exchange	NSE
2.	Portfolio	Port.
3.	Brooke Bond Ltd.	BBOND
4.	George Williamson Kenya Ltd.	GWK
5.	Kakuzi	KAKUZI
6.	Kapchorua Tea Co. Ltd	KAPCHO
7.	Limuru Tea Co. Ltd	LIMTEA
8.	Rea Vipingo Plantations Ltd.	REAVIP
9.	Sasini Tea & Coffee Ltd	SASINI
10.	Eaagads Ltd.	EAGADS
11.	A.Baumann & Co.Ltd	ABOUM
12.	Uchumi Supermarket Ltd.	UCHUMI
13.	Car & General (K) Ltd	CGEN
14.	CMC Holdings Ltd	CMC
15.	Express Ltd	EXPRES
16.	Kenya Airways Ltd	KENAIR
17.	Marshalls (E.A.) Ltd	MARSH
18.	Nation Media Group	NMG
19.	Tourism Promotion Services Ltd (Serena)	SERENA
20.	Standard Newspaper Group	SMG
21.	Barclays Bank Ltd	BBK
22.	C.F.C Bank Ltd	CFC
23.	City Trust Ltd	CTRUST
24.	Diamond Trust Bank Kenya Ltd	DTK
25.	Housing Finance Co Ltd	HFCK
26.	I.C.D.C Investments Co Ltd	ICDC
27.	Jubilee Insurance Co. Ltd	JUB
28.	Kenya Commercial Bank Ltd	KCB
29.	National Bank of Kenya Ltd	NBK
30.	National Industrial Credit Ltd	NIC
31.	Barclays Bank Ltd	PANAFR
32.	Standard Chartered Bank Ltd	SCB
33.	NIC Bank Ltd.	NICB
34.	Athi River Mining	ARM
35.	Bamburi Cement Ltd	BAMB
36.	British American Tobacco Kenya Ltd	BAT
37.	B.O.C Kenya Ltd	BOC

38.	Carbacid Investments Ltd	CARB
39.	Crown Berger Ltd	CBERG
40.	Dunlop Kenya	DUN
41.	East African Breweries Ltd	EABL
42.	E.A.Cables Ltd	EACABL
43.	E.A.Packaging Ltd	EAPACK
44.	E.A.Portland Cement Ltd	EAPORT
45.	Firestone East Africa Ltd	FIRE
46.	Kenya Oil Co Ltd	KENOL
47.	Kenya National Mills Ltd	KNM
48.	Kenya Power & Lighting Ltd	KPLC
49.	Total Kenya Ltd	TOTAL
50.	Unga Group Ltd	UNGA
51.	Portfolio Return Characteristics	PRC

ABSTRACT

This study compares the portfolio stock return characteristics of different market sectors at the Nairobi Stock Exchange from January 1997 to December 2001. We begin by examining the average returns of each of the stocks in the Agricultural, Commercial, Financial and Industrial market sectors, without considering the risk level of each of the stocks included in the sample. We then factor in risk dimension into the analysis, both at the individual stock and portfolio levels.

The analysis of sectoral portfolio return characteristics does indicate that there are significant differences between sectors in terms of their risk-return relationships. The portfolio return characteristics do not only differ across sectors but also from one period to the other. These differences were intermittent. The existence of these risk-return differences is a manifestation of the inherent differences in market conditions and sector characteristics.

Empirical evidence suggests that stock returns across market sectors are not uniform. According to Fama and French (1992, 1996), much of the cross sectional variation in equity returns can be explained by firm characteristics such as market capitalization, price-to-earnings ratios, change in operating earnings and book-to-market ratios. They examine many of these factors simultaneously and conclude that size and book-to-market, explain the majority of the cross sectional variation in stock returns.

The differences observed in our study were significant enough to influence investor choice while determining which stocks to include in the investment basket and their respective proportions.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Investors are interested in earning good returns from the investments they make. This they can only achieve when they select their investments carefully. This is because investment is about sacrifice of current shillings for future shillings. It involves waiting (time) and risk. Whereas the sacrifice takes place now and is certain, the reward comes later or may not come at all. Furthermore investors have different preferences for different assets that show different risks. In simple words, risk and return dominate the investor's world; and the risk tolerance varies from one investor to another or over a period of time.

The primary objective of an investor is to invest in assets that will achieve the investment objective. The starting point for establishing an investment portfolio must be the investor. No two people have the same set of personal circumstances, and those circumstances change as you move through life. Different people also have different emotional responses to risk and varying expectations on return.

Modern finance theory allows us to consider the investor and his or her perception differently from the asset that is being considered for investment. This allows us to determine the return and risk characteristics of an asset or portfolio of assets and match it with the investor's requirements. The advantage of this approach is that we can design a series of efficient portfolios that appeal to different investors.

What emerges is that different assets or portfolios compete and the investor or investor's adviser has to choose and rank them. Investors have different preferences; some may prefer investing in specific sectors, others in specific

companies within sectors, and others may be indifferent to sector classification thus investing in any company regardless of the sector the firm falls.

However it does not make sense performing security analysis for each sector if the risk and return characteristics is not significantly different across sectors. There is no evidence that show that in the case of the Nairobi Stock Exchange (NSE), risk and return amongst different sectors is significantly different to warrant sector or sector analysis. This study sought to explore the risk/return characteristics of various sectors at the NSE.

The stock exchange is a market that facilitates trading in securities issued by public listed institutions and the Government. Stock Exchanges encourage investment in real assets by providing Secondary market where investors can sell or buy shares and other securities.

In Kenya, stock exchange practice can be traced back in the 1920's when the country was still a British colony. Nairobi Stock Exchange was initially setup as an overseas stock exchange in 1953. In the following year (1954), Nairobi Stock Exchange was constituted as a voluntary association of stockbrokers registered under the societies Act. Since then Nairobi Stock Exchange has deyeloped to be one of the admirable stock exchange in Africa.

The structure of the Nairobi Stock Exchange has witnessed tremendous transformation during the last 10 years that has seen its operating environment and trading systems improve as part of measures aimed at improving market transparency and efficiency. Fundamental reform of the market structure was undertaken in year 2000.

The Nairobi Stock Exchange offers a wide range of counters where investors can minimize their risk. The establishment of collective investment vehicles allows investors to access a full-diversified investment in a single unit, greatly enhancing

their ease of access to the market, diversifying their investment and minimizing risk.

Common stocks and other equity related securities are highly responsive to conditions in the economy. The business cycle reflects the current status of a variety of economic variables, including GDP (Gross Domestic Product), industrial production, personal disposable income, and the unemployment rates.

The environment in which firms operate is characterized by rapid technological change and dynamic intervention with the external environment. According to Pearce & Robinson (1997), factors that more directly influence a firm's prospects originate in the environment of its sector including entry barriers, competitor rivalry, the availability of substitutes and the bargaining power of buyers and suppliers. The operating environment comprises factors that influence a firm's immediate competitive situation-customer profiles, supplier's creditors and the labor market. These three sets of factors provide many of the challenges that a particular firm faces in its attempts to attract or acquire needed resources and to profitably market its goods and services and thus maximizing on the shareholder wealth.

A strong economy is reflected in an expanding business cycle. When business is good, firm make profits and therefore stock react by increasing in volume and return. Growth oriented speculative stocks tend to especially do well in strong markets. To a lesser extent, so do low risk and income oriented stocks. In a declining economy, the opposite has been observed.

Pouchkarev, Spronk and Vliett (2001) link the two-dimensional BCG matrix to the new and old economy stock. In their study, the new economy stocks represent 'stars' or 'question marks' while the old economy stocks represent 'dogs' or 'cash cows'. What these new stocks and new sectors characterize is their growth potential, which largely determines their value. They further state that, growth

potential depends on firm specific and sector specific factors e.g. management capability to identify and exploit valuable growth options on the number of strategic alliances and the rate of technological change within a sector.

The firm potential to generate positive cash flows is greatly influenced by the risk – return relationship characteristics of the investments engaged in. The objective of portfolio management is to attain risk and returns that satisfy shareholders wealth maximization – objectives. The assumption is that shareholders are risk averse. That suggests that investors expect to be adequately compensated for the risk they assume. At least they expect fair return from their investments.
That investors expect to be compensated for the risk they assume suggest that investments have uncertain outcomes and are thus risky. The problem facing any investor is to determine which particular risky asset to invest in. Furthermore modern investors do not own individual assets but a portfolio of assets. Portfolio is a collection of assets and the investor's problem becomes selecting an optimal portfolio from a set of possible portfolios.

Makowitz (1952) put forth a solution to this portfolio selection problem when he advanced the modern portfolio theory approach to investing. Makowitz (1952) begins by assuming that an investor has a sum of money to invest in the present time, for a known length of time referred to as holding period, then sold off. His approach to portfolio selection assumes that investors seek both maximum expected returns for a given level of risk and minimum risk for a given level of expected return. Expected return is the measure of potential reward associated with a portfolio and standard deviation is a measure of a portfolio risk.

The question that then arises is how Makowitz (1952) approach can be used once it is recognized that there is infinite number of portfolios available for investment? What emerges is that portfolios compete and it is investors wish to choose the best one.

In this study we investigated portfolio return characteristics of different market sectors and determined the sector that outperforms the other sectors. This involved designing efficient portfolios for each sector then evaluated the difference between the market sectors.

1. 2 STATEMENT OF THE PROBLEM

The study sought to examine and compare the Portfolio Return Characteristics (PRC) of Different Market Sectors at the Nairobi Stock Exchange. The relationship between risk and return is useful in evaluating and ranking portfolios.

In addition we set to determine whether there is a sector that dominates all other sectors in terms of share price performance. In an efficient market it is not possible earning excess return on the basis of observable market sector characteristics because arbitrageur will take advantage and push the prices to their equilibrium levels.

Different market sectors exhibit different characteristics. It is a reasonable assumption that the differential in market sector characteristics will have a significant bearing in their returns and risks. This then becomes an empirical issue. Furthermore, market conditions are difficult to predict and usually can be identified only after they exist.

This study sought to establish whether by comparing portfolios across sectors, we may conclude that discriminating conditions exist to warrant incurring search costs and additional security analysis required of investors when selecting assets (shares) from individual sectors to include in the portfolio.

If the sector classification picks up differences between sectors, then we expect an insignificant difference in risk and return within a sector and significant differences across sectors. The differences should be significant enough to influence shareholder choice. For example, firms in sectors with erratic demand

or large fixed costs are expected to have higher risk than the firms in sectors with more stable demand or greater variable costs. If for example the capital structure is sector specific then we should expect the financial risk and return characteristic to vary from sector to sector.

The asset allocation problem is an important one in investment finance. This is a problem faced by an investor who has to decide how to allocate his/her wealth across different assets or asset classes. The issue that arises is whether the investor should be indifferent to the sector classification at NSE when deciding on the assets to include in the portfolio.

The investor's dilemma in this case is at two levels. First is choosing assets to include in a portfolio. In choosing the assets to include in the portfolio, the risk - return trade off features prominently. Secondly is choosing the best portfolio. We want to address the two issues by examining whether differences in return exist across the market classifications. We achieved this by modeling the past performance of different combinations of stocks within market sectors and across the market sectors.

In doing this, we were able to quantify and understand better the risk and return potential of different portfolios across the market sectors.

The key question that we addressed in the study was to what extent do these different market sectors differ in terms of portfolio return characteristics. Specifically we determined whether the difference is empirically regular.

1.3 HYPOTHESIS

We set the following hypothesis, which our investigation either confirmed or rejected:

H_0 Portfolio Return Characteristics of the Different Market Sectors at the Nairobi Stock Exchange do not differ significantly.

1.4 OBJECTIVE OF THE STUDY

The objective of this study was to determine whether there exist Portfolio Return characteristics differentials across the different market sectors.

1.5 IMPORTANCE OF THE STUDY

The study will be important in the following ways:

i. **Academic:** The study will give a good insight to scholars who want to do further research on the theory of Portfolio Return and Risk Diversification.

ii. **Individual and Institutional Investors:** The study will provide guidance on how best to construct investment portfolio's across market sectors.

iii. **Capital Market Intermediaries:** The study will provide important market sector return characteristics that can be used in designing optimal investment selection for their clientele.

iv. **Asset Management/Fund Managers:** The study will provide guidance on how best to place investor funds in a combination of high yield returns across the different market sectors.

1.5 OVERVIEW OF THE STUDY

Chapter 1 gives a brief background of the study, the problem that the study will address, the objectives of the study and finally the value that is likely to accrue from this study.

Chapter 2 looks at what has been done by scholars both in Kenya and the rest of the world as pertains to this area of Portfolio Return Characteristics of different market sectors.

Chapter 3 outlines the research procedures that were adopted in resolving the research problem and specifically addresses the tools that were used in interpreting and understanding the data collected on the subject.

Chapter 4 gives a summary of the data analysis and the observations made from the research.

Chapter 5 outlines the key findings of this study, limitations and areas where this research can be modified or refined in future.

CHAPTER 2: LITERATURE REVIEW

2.1 CAPITAL MARKETS IN KENYA

2.1.1 History and Operation of Nairobi Stock Exchange (N.S.E)

The Nairobi Stock Exchange was established in 1954. It operated as an association of stockbrokers with no trading floor until October 1991. The introduction of the trading floor has led to a substantial increase in trading volumes and dramatic upward movement in the various indexes. The Nairobi Stock Exchange has been instrumental in enabling the public and private sectors in Kenya to raise large amounts of capital for expansion projects and for the financing of new businesses. It has also allowed for the participation of foreign investors in a bid to increase the investor base and bring into the country the much-needed foreign investment. This has in effect increased the number of participants in the bourse.

The NSE thus represents the financial market in Kenya. It has 51 registered brokers and has about 52 firms listed on the exchange. It deals in ordinary shares and fixed income securities such as Preference shares and most recently treasury bonds. The NSE also has some of its shares cross-listed with other stock exchanges in South Africa, Uganda and Tanzania. Both operational and informational efficiencies are key to ensuring that the NSE fulfils its mandate as the capital markets intermediary for Kenya and the world over.

2.1.2 Market Structure Reforms at Nairobi Stock Exchange (N.S.E.)

The structure of the Nairobi Stock Exchange has witnessed tremendous transformation during the last 10 years that has seen its operating environment and trading systems improve as part of measures aimed at improving market transparency and efficiency. Fundamental reform of the market structure was undertaken in year 2000. This saw the market recognized into four independent market classes namely: -

- **The Main Investments Market Segment (MIMS)**

This is the main quotation market, with more stringent listing requirements. The main investment market Segment is further divided into four markets namely:

i. Agricultural market Segment
ii. Commercial and services market Segment
iii. Finance and investment market Segment
iv. Industrial and allied market Segment

- **The Alternative Investments Market Segment (AIMS)**

AIMS is aimed at providing access to the capital markets for small and medium-sized companies with high growth potential. This provides an alternative method of raising capital to those companies that find it difficult to meet the more stringent listing requirements of the MIMS. This is particularly necessary in order to respond to changing needs of issuers and to provide access to the capital markets to younger innovative companies with high growth potential.

AIMS facilitates liquidity to companies with a large shareholder base through the process of "introduction". This is the process by which existing shares are listed for the purpose of marketability and not for the purpose of raising capital.

AIMS offers investment opportunities to institutional investors and high net worth individuals to diversify their portfolios and access high growth sectors of the economy.

This market segment has its own eligibility and listing requirements.

- **Fixed Income Securities Market Segment (FISMS)**

This is a special trading window for fixed income securities. It is aimed at providing a separate independent market for fixed income securities such as treasury bonds, corporate bonds, preference shares and debenture stocks.

The segment also lists other short-term financial instruments such as treasury bills and commercial papers.

The money market presents wide opportunities that are yet to be taken up by specialist money market players. Expertise in this area has grown rapidly over the years as proven in the launch of the EADB Bond, which pioneered the secondary trading in fixed income securities at the Exchange. Investment advisors have a real challenge to design solutions to the problems currently facing Kenya's financial markets regarding the need to structure and arrange securities customized to meet the specific needs of the Kenyan economy.

- **Futures and Options Market Segment (FOMS)**

FOMS will provide a mechanism to market participants to hedge against the risk associated with market volatility. The market segment is currently under development and will be implemented after further research on the necessary operational systems.

2.1.3 Role of Capital Markets Authority (C.M.A)

The Capital Markets Authority (CMA) under which the NSE operates enforces maximum disclosure by listed companies and all those seeking a listing on the exchange. CMA has also established a mechanism for monitoring the affairs of stock-broking houses and other players in the market, to ensure fair play.

2.2 THEORETICAL FOUNDATIONS OF PORTFOLIO THEORY

2.2.1 The Concept

The major aim of portfolio theory is to reduce risk without reducing returns. The Markowitz (1952) Model indicates that the proper goal of portfolio construction should be to generate a portfolio that provides the highest return at a given level of risk. A portfolio having this characteristic is known as an efficient portfolio. In the Markowitz's mean-variance framework the relevant information about securities can be summarized by 3 measures:

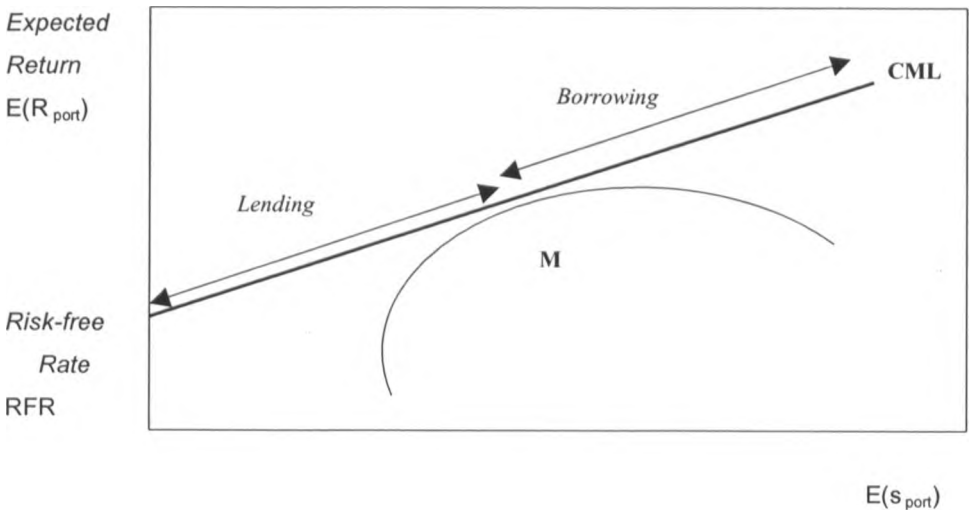
i. Mean return
ii. Standard Deviation of the returns
iii. Correlation with other assets' returns

2.2.2 Markowitz Portfolio Theory & Efficient Frontier

The fundamental assumption underlying the Markowitz approach to portfolio analysis is that investors are basically risk-averse and that the market gives prices. This means simply that investors must be compensated with higher return in order to accept higher risk. Consequently, given a choice, for example, between two securities with equal rates of return, an investor will select the security with the lower level of risk, thereby rejecting the higher-risk security. In more technical terms, this assumption means that investors maximize expected utility rather than merely trying to maximize expected return. Utility, a measure of satisfaction, considers both risk and return.

2.2.3 Capital Market Theory & Capital Market Line

The Markowitz's efficient frontier did not consider the existence of a risk-free asset. Adding the risk-free asset to the Markowitz's portfolio construction process allows portfolio theory to develop into capital market theory. The introduction of a risk-free asset changes the Markowitz efficient frontier into a straight line. This straight efficient frontier line is called the capital market line.



Source: P. Peterson, Risk Return and Diversification, FIN3403, Florida State University.

The Capital Market Line indicates that the *expected return on a portfolio* is equal to the risk free rate plus a risk premium, equal to the *price of risk* (as measured by the difference between the expected return on the market and the risk-free rate) times the quantity of market risk for the portfolio (as measured by the standard deviation of the portfolio). This can be represented as follows:

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

$E(R_p) = R_f$ + Market Price of Risk x Quantity of Market Risk

2.2.4 Capital Asset Pricing Model & Security Market Line

The Capital Asset Pricing Model (CAPM) allows us to find the returns required for a given level of risk. When return is plotted against systematic risk (beta) rather than total risk (σ), you get the security market line (SML). The equation of the SML is:

$$ER_{stock} = R_f + Beta_{stock} (ER_M - R_f)$$

The equation is called the capital asset pricing model (CAPM). The CAPM is a single risk factor (beta) model explaining security return.

The Security Market Line (SML) is the relationship between risk, as measured by the risky asst's covariance with the market, and its required return. The systematic risk for any asset is measured by its Beta which is calculated as the periodic covariance between the security's return and the market's return, expressed as a proportion of the variance of the market index.

$$\beta = \frac{Cov_{xm}}{\sigma_m^2}$$

Beta measures how volatile the asset has been, compared with the market average. The risk premium can be estimated from the Beta, in proportion to the market risk premium;

$$R_x = R_f + Beta\ (R_m - R_f)$$

Systematic Risk – refers to fluctuations in asset prices caused by macroeconomic factors that are common to all risky assets and cannot be diversified away; hence systematic risk is often referred to as market risk.
Examples of systematic risk factors include the business cycle, inflation, monetary policy and technological changes.

Firm-Specfic Risk – refers to fluctuations in asset prices caused by factors that are independent of the market such as sector characteristics or firm characteristics. *Examples* of firm-specific risk factors include litigation, patents, management, and financial leverage.

The systematic risk depends on the sensitivity of the individual assets to market movements as measured by beta. Assuming the portfolio is well diversified, the number of assets will not affect the systematic risk component of portfolio variance. The portfolio beta depends on the individual security betas and the portfolio weights of those securities.

On the other hand, the components of firm-specific risk are not perfectly positively correlated with each other and as more assets are added to the portfolio those additional assets tend to reduce portfolio risk. Hence, increasing the number of securities in a portfolio reduces firm-specific risk. For example, a patent expiration for one company would not affect the other securities in the portfolio. An increase in oil prices might hurt an airline stock but aid an energy stock. As the number of randomly selected securities increases, the total risk (variance) of the portfolio approaches its systematic variance.

The riskiness of a portfolio will depend on how a security blends with the existing securities and contributes to the overall risk of a portfolio. The covariance is a statistical that measures the riskiness of a security relative to others in a portfolio of securities. In essence, the way securities vary with each other affects the overall variance, hence the risk, of the portfolio.

2.3 EMPIRICAL EVIDENCE ON MARKET/SECTOR PORTFOLIO RETURN CHARACTERISTICS OUTSIDE KENYA

A number of studies have been done to determine whether there are market sectors that dominate other market sectors in terms of share price performance. In an efficient market it is not possible earning excess return on the basis of observable market segment characteristics because arbitrageur will take advantage and push the prices to their equilibrium levels.

The Efficient Market Hypothesis (EMH) explains how security prices should behave under the conditions of perfect market characterized by free availability of

information, homogenous investor expectations and zero transaction costs. These conditions sufficiently ensure that prices "fully reflect" what is knowable, obviously, when relevant information to the value of a security is reflected in its current price, the same is unbiased estimate of its intrinsic value. Every time new information is released, the price adjusts towards a new value.

As the fortunes of the issuing firms change with economic and industry conditions so do the prices of their stocks (Gitman and Joehnk (2001)). They further state that, not all stocks are affected in the same way or to the same extent. Some sectors of the economy may only be mildly affected by the economy. Others are usually hard hit when times are rough.

According to Lofthouse (2001), The original CAPM is a single index or single factor model. It states that return on assets is linked to a single factor, the market, by the asset's beta. The theory assumes that the only reason two stock prices would move together is because they are both moving with the market. That is not clearly the case. It is evident that there are sector or sector effects as well. This naturally leads to the notion of Multifactor Models, where returns depend on both market and sector factors.

Carow, Heron and Larsel (2002), "Portfolio optimization techniques applied to characteristic constituent portfolios result in enhanced returns in comparison to appropriate value weighted and equal-weighted custom benchmark portfolio's formed from the same population of stocks." They find that, enhanced portfolio returns with risk characteristics that do not depart materially from the benchmark and enhanced risk return performance can be consistently achieved relative to the custom benchmark portfolios.

Previous research provides evidence that much of the cross sectional variation in equity returns can be explained by firm characteristics such as market capitalization, price-to-earnings ratios, change in operating earnings and book-to-

market ratios. For example, the market capitalization anomaly is documented by Banz (1981). When Fama and French (1992, 1996) examine many of these variables simultaneously they conclude that two factors, specifically, size and book-to-market, explain the majority of the cross sectional variation in stock returns.

In a recent study, Daniel, Titman and Wei (2001) provide evidence that characteristics based return models tend to do better than the factor model of Fama and French (1993) in explaining the return in the U.S. and Japanese stock markets.

Dreman and Lufkin (1997) ranked stocks by price to earnings ratio etc. of the industry they are in. They found differences in the behaviour and performance of the market portfolios that they studied.

According to Pouchkarev, Spronk and Vliet (2003), the environment in which new economy firms operate is dynamic. The environment is characterized by rapid technological change and versatile interaction. In this environment, pro-active management style becomes a core competence. Growth potential depends on firm specific factors e.g. management's capability to identify and exploit valuable growth options, or the number of strategic alliances, and the rate of technological change within a sector.

Brealey and Myers (1991) note that, risk is best judged in portfolio context. Most investors do not put all their eggs in one basket; they diversify. Thus the effective risk of any security cannot be judged by an examination of that security alone. Part of the uncertainty about the security return is " diversified away" when the security is grouped with others in a portfolio. They further conclude that unique risk stems from the fact that many of the perils that surround an individual company are peculiar to the company and perhaps its immediate competitors.

The research done by Carow, Heron and Larsel (2002) was an extension of the work of Larsen and Resnick (2001) where they examined the use of portfolio optimisation techniques on firms stratified according to variety of characteristics that were shown to explain much of the cross-sectional variation in stock returns. The primary focus of their research was to determine if the characteristic portfolio approach provides consistent improvements in the risk return relationship relative to naïve investment strategies such as investing in cross-section of stocks, on either a value weighted or an equal weighted basis, from which the benchmark is constructed. They concluded that enhanced portfolio returns with risk characteristics could be achieved relative to the custom benchmark portfolios.

Gitman and Joehnk (2001) state that a wide variety of risk return behaviors are associated with each type of investment vehicle. Some common stocks offer low returns and low risk. Others offer high return and high risk. They conclude that a broad range of risk return behaviors exist for specific investments of each type.

Pouchkarev, Spronk and Vliet (2003) state that growth potential of firms influences the risk return profile of their cash flows. Projects or activities can be abandoned if conditions turn out unfavorable. This limits downside risk. On the other hand, successful projects can be expanded, thus leaving upside potential open. Because of this flexibility the distribution of the growth company's expected cash flows is characterized by asymmetry. The distribution characteristics of firm's cash flows are of course not automatically valid descriptions of the firms stock returns characteristics.

Three reasons are given for this phenomenon; Firstly, the market has its own perception of the firm's cash flows (e.g. due to information asymmetries), Secondly, after interest payments, only a residual of the cash flows goes to the stockowners. Therefore the degree of financial leverage affects the pay-off structure and could also introduce asymmetry in stock returns. Thirdly, the

market has the possibility of diversification, which means that, in general, not all cash flow risk is priced.

If cash flows distributions are not symmetrical, the stock return distributions may well be. However, empirical research shows that stock return distributions are not normally distributed (Fama 1965). The fat tail phenomenon is well documented. Not only individual stocks returns but also market indices are characterized by asymmetry. Several studies have demonstrated that systematic skewness is priced as market risk e.g. Kraus, Alan and Litzenberger (1973).

Boyle and Lin examine the portfolio selection problem in the presence of transaction costs. They use a discrete time approach by developing analytical expressions for the investor's indirect utility function and also for the boundaries of the no transactions region. The proof of their main theorem provides a constructive analytical procedure for determining the no transaction region. According to them, once this region is known the investor problem is solved.

Investor transaction costs can be summarized as follows:

i) Costs incurred before transacting e.g. search costs etc.
ii) Costs incurred during transacting e.g. commission etc.
iii) Costs incurred after transacting e.g. capital losses, opportunity costs etc.

2.4 EMPIRICAL EVIDENCE ON MARKET/SECTOR PORTFOLIO RETURN CHARACTERISTICS IN KENYA

A review of the empirical studies done in Kenya on portfolio return characteristics and portfolio theory indicate that very little work has been done in this area.

Risk is seen as a problem but investors still choose to invest in risky projects (Nyariji 2001)). The justification is that the most risky projects, if successful, offer the greatest reward. Investors therefore usually have to make a selection decision, as to which particular assets from the available alternatives to put their money in and how much to allocate to each of the selected securities.

Kamanda (2001) set out to determine and evaluate quoted equity portfolios of insurance companies. He did this by examining the risk return characteristics of the equity portfolio's held by the individual insurance companies. His major finding was that quoted equity portfolios held by Insurance companies were poorly diversified as they had performed worse than the market portfolio.

Kangethe (1999) set out to investigate the effect of Government ownership on share price volatility of companies quoted at Nairobi Stock Exchange for the period 1997 to 1998. The specific objective of the study was to establish whatever Government ownership influences the share price volatility of the companies quoted at the Nairobi Stock Exchange. He found that there was a significant difference in the share stock volatility between the companies in which the government had share holding and the market index.

The Efficient Market Hypothesis (EMH) explains how security prices should behave under the conditions of perfect market characterized by free availability of information, homogenous investor expectations and zero transaction costs. These conditions sufficiently ensure that prices "fully reflect" what is knowable. Obviously, when relevant information to the value of a security is reflected in its

current price, the same is unbiased estimate of its intrinsic value. Every time new information is released, the price adjusts towards a new value (Kiweu 1991).

Nyariji (2001) did a study to evaluate the risk reduction benefits of portfolio diversification at the Nairobi Stock Exchange. His analysis (using the mean-variance model) indicates that there is significant risk reduction at the Nairobi Stock Exchange as a portfolio grows in size. This continues until a portfolio size of 13 securities is held, beyond this size, the risk reduction becomes insignificant. At this optimal portfolio size the proportion of total risk eliminated is 34%. He concludes by saying that, the current size of the NSE does not fully diversify specific risk and therefore the need to widen the market to enhance further diversification.

CHAPTER 3: RESEARCH METHODOLOGY/DESIGN

3.1 POPULATION OF INTEREST

The population of interest consisted of all the companies quoted at the Nairobi Stock Exchange and classified under the various market sectors. **Appendix A** gives details of the companies quoted at Nairobi Stock Exchange as at 1st January 1997. The period of analysis entailed 5 years spanning from 1997 to 2001.

3.2 SAMPLING DESIGN

The sampling frame consisted of all the active trading companies quoted at the Nairobi Stock Exchange i.e. as at beginning of January 1997. We picked all the stocks for analysis using the traditional market classifications sectors as follows: -

(i) Agricultural market sector
(ii) Commercial market sector
(iii) Financial market sector
(iv) Industrial market sector

3.3 DATA COLLECTION METHOD

The research relied on secondary data obtained from Nairobi Stock Exchange or other financial intermediaries. Where data was not available from Nairobi Stock Exchange, we referred to financial statements published by companies studied. Such data included; movement in share prices, dividends paid, share price index etc.

3.4 DATA ANALYSIS METHOD

The main strategy in this study was to construct a set of portfolio formation opportunities in each individual market sector based on target returns. We used the mean- variance model to evaluate each of the portfolio formation (Nyariji 2001 and Nzioka 2002).

We then estimated the distribution of the performance values (e.g. average return, variance etc) of the entire portfolios that were constructed from stocks listed within a market sector.

Weekly return (R_j) of an individual stock was obtained as follows:

$$R_j = \frac{P_1 - P_0 + D_1}{P_0}$$

Where,

R_j= Return of Asset j
P_1= Price of share at period t
P_0= Price of share at period t-1
D_1=Dividend paid during the period

The behavior of average returns over a period of time was observed in each market sector to get a picture of the average development of the sampled market sector over a certain period of time.

Also, the behavior of the dispersions of these distributions provided a picture of the development of the market sector dynamics overtime.

We excluded short sales and companies whose share prices were flat while looking at portfolio opportunities in a market sector. The opportunity set consisted of all the constructed portfolios in each market sector with their respective weights equaling to 1.

The number of portfolio in the opportunity was infinite but distributions of portfolio performance value existed. We adopted the following procedure in determining the portfolio opportunity set and their respective values:

Step 1: We picked all shares in each of the market sector to constitute sector portfolios. We obtained return statistics of all the stocks at the Nairobi Stock Exchange. These statistics were calculated using observations i.e. by evaluating each market sector performance weekly from Jan 1997 to Dec 2001.

Step 2: We then used SAS optimizer (investment software) to set target return and determine the proportion of stock to be included in each of the market sector in order to achieve the expected return. Portfolio risk was then determined for each of the portfolio. This was done for each of the 5 years. By use of SAS statistical package, the weights associated to each of the security included in a given portfolio were determined. Then portfolio risk was computed (Nzioka 2002).

Step 3: We then plotted the results in a graph in order to determine the efficient frontier for each of the market sector.

Step 4: We then compared efficiency frontiers across the market sectors using descriptive statistics and ANOVA.

We incorporated the total return data of different market sectors at the Nairobi Stock Exchange over the sampled analysis period for:

- Agricultural Market Sector
- Commercial Market Sector
- Finance Market Sector
- Industrial Market Sector

The return of each of the stock was calculated as the weekly percentage increase of the stock price adjusted for dividends earned during the year.

One of the important aspects was how to handle changes in the respective market sectors. Such changes entailed new admissions, mergers, bankruptcies etc.

Incase of newly admitted companies we inserted a company stock into the market sector opportunity set as soon as the company shares started trading.

CHAPTER 4: DATA ANALYSIS & FINDINGS

4.1 Agricultural Sector Portfolio Return Characteristics

4.1.0 Background

There were 8 agricultural based companies trading at the Nairobi Stock Exchange during the period under review. The average estimated total assets held by these companies during the period amounted to Ksh.16 billion. This represented around 4% of the total assets held by companies quoted at Nairobi Stock Exchange then. The average profitability before taxation was around 855 million being 6% of the total average profitability recorded by quoted companies during the period under review.

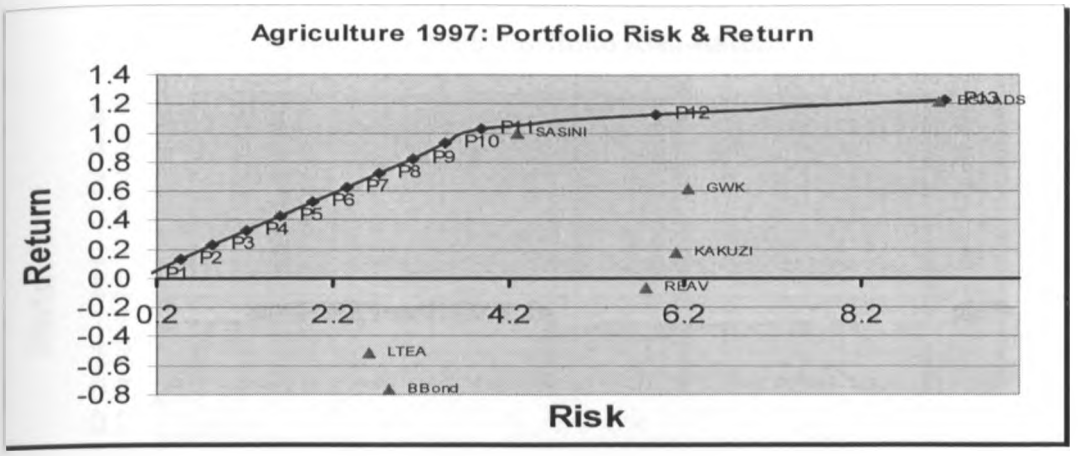
4.1.1 Risk-Return for the year 1997

Table1: Agricultural Risk-Return for 1997

Year 1997															
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13		
(In %)															
Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225		
Risk(Standard Deviation)	0.094	0.470	0.846	1.223	1.599	1.975	2.351	2.727	3.104	3.480	3.883	5.896	9.150		
Numbers of Stocks	4	4	4	4	4	4	4	4	4	4	3	2	1	Weekly	
				Portfolio Weights										Return	Risk
BBOND	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.766	2.827
SASIN	0.018	0.089	0.160	0.231	0.302	0.373	0.443	0.514	0.585	0.656	0.749	0.366	0.000	0.994	4.295
REAM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.057	5.772
UMTEA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.515	2.615
KAPCHO	0.975	0.874	0.774	0.673	0.572	0.472	0.371	0.271	0.170	0.069	0.000	0.000	0.000	0.000	0.000
KAKUZI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.171	6.108
GAK	0.008	0.013	0.023	0.033	0.043	0.053	0.064	0.074	0.084	0.094	0.034	0.000	0.000	0.607	6.253
EAGADS	0.005	0.024	0.044	0.063	0.083	0.102	0.122	0.141	0.160	0.180	0.217	0.634	1.000	1.209	9.089
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1		

Shows portfolio sets constructed in the Agricultural sector for the period 1 January to 31 December 1997. The table also shows the annual return and risk associated with each of the stock in the Agricultural sector during the period. The highest weekly return was recorded by EAGADS with a return of 1.209% but with a very high risk of 9.089%. The lowest weekly return was recorded by BBOND with a return of –0.766% and risk of 2.827%. It is noted from the table that most of feasible portfolio sets contain 4 stocks with the optimal being portfolio 9. This is line with the Makowitz mean-variance framework, which holds that risk is diversified by adding more assets in the portfolio. **Figure 1** plots the efficient frontier for the Agricultural sector in 1997.

Figure 1: Agricultural Portfolio Return for 1997



The graph shows the efficient frontier for the Agricultural sector based on the portfolios depicted in **Table 1**. Arguably, Portfolio number 10 was the most optimal as it lies just before the 'turning point' of the efficient frontier curve. At this point, an investor would have got the highest return relative to the level of risk. The graph also places individual company risk-return and it can be seen that all the stocks risk- return lie below the efficient frontier. This justifies why investors should invest in a group of assets in order to reduce risk as suggested by Makowitz mean-variance framework. In 1997, SASINI recorded highest risk-return compared to the other companies while Bbond was the lowest.

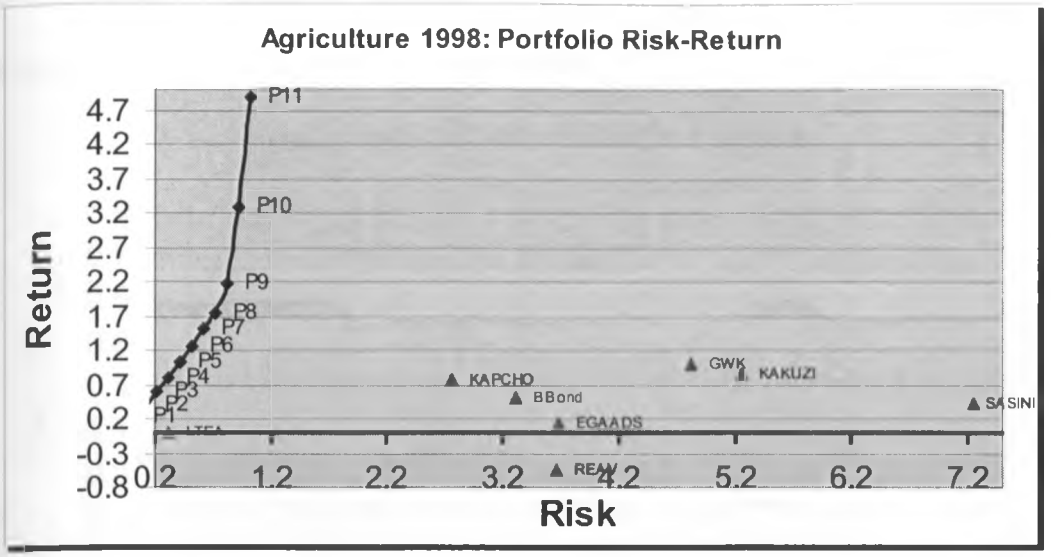
4.1.2 Risk-Return for the year 1998

Table 2: Agricultural Risk-Return for 1998

Year 1998													
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11		
(In %)													
Weekly Return(Estima	0.239	0.397	0.586	0.805	1.035	1.270	1.507	1.751	2.179	3.276	4.880		
Risk(Standard Deviati	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025		
Numbers of Stocks	8	7	7	7	7	6	6	5	4	3	1	Weekly	
Portfolio Weights												Return	Risk
BBOND	0.028	0.057	0.089	0.121	0.153	0.185	0.217	0.238	0.089	0.000	0.000	**0.508**	**3.317**
SASINI	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	**0.441**	**7.250**
REAVI	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-0.548**	**3.672**
LIMTEA	0.923	0.810	0.671	0.531	0.392	0.252	0.112	0.000	0.000	0.000	0.000	**0.000**	**0.324**
KAPCHO	0.016	0.068	0.123	0.178	0.233	0.288	0.343	0.402	0.471	0.206	0.000	**0.761**	**2.770**
KAKUZI	0.003	0.012	0.024	0.037	0.049	0.061	0.073	0.086	0.130	0.182	0.000	**0.859**	**5.251**
GWK	0.002	0.029	0.059	0.090	0.120	0.150	0.180	0.216	0.310	0.612	1.013	**0.999**	**4.820**
EAGADS	0.007	0.019	0.030	0.041	0.052	0.063	0.074	0.058	0.000	0.000	0.000	**0.137**	**3.682**
Total Weight	1	1	1	1	1	1	1	1	1	1	1		

The highest weekly return was recorded by GWK with a return of 0.999% but with a high risk of 4.82%. The lowest weekly return was recorded by REAVI, which had a return of −0.548% and with a risk of 3.672%. We constructed 11 portfolios sets with majority of them containing 7 stocks. Where the portfolio weight was more than 1, then it meant that an investor would have borrowed to invest in the best portfolio.

Figure 2: Agricultural Portfolio Return for 1998



The efficient frontier in 1998 was an improvement over the one in 1997. Portfolio 11 would have been the most efficient in 1998. The shape of the slope after the turning point meant that an investor could have earned higher returns at a proportionally lower risk. A stock like SASINI, which showed remarkable risk-return in 1997, was this time not doing well. The number of stocks, which yielded negative returns, reduced from 3 in 1997 to 1 in 1998.

4.1.3 **Risk-Return for the year 1999**

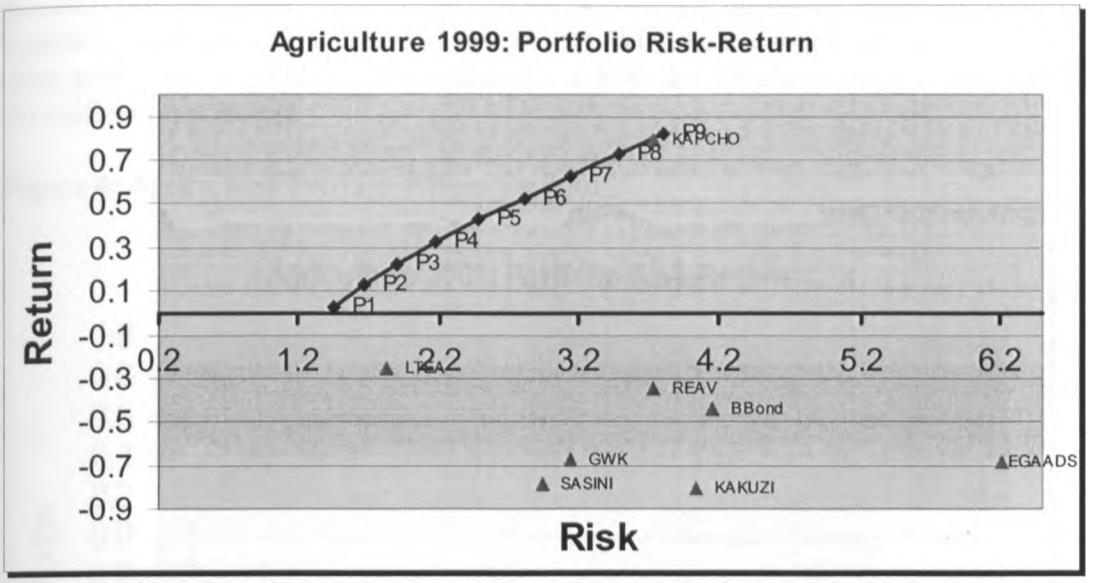
Table 3: Agricultural Risk-Return for the year 1999

Year 1999											
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9		
(In %)											
Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825		
Risk(Standard Deviation)	1.459	1.668	1.906	2.176	2.478	2.802	3.141	3.491	3.804		
Numbers of Stocks	6	6	3	3	3	3	3	2	1	Weekly Return	Risk
	Portfolio Weights										
BBOND	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.445	4.145
SASINI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.792	2.944
REAVI	0.146	0.144	0.142	0.127	0.112	0.098	0.083	0.057	0.000	-0.349	3.727
LIMTEA	0.403	0.397	0.388	0.308	0.228	0.148	0.068	0.000	0.000	-0.252	1.831
KAPCHO	0.333	0.401	0.470	0.565	0.660	0.755	0.849	0.943	1.020	0.791	3.731
KAKUZI	0.054	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.808	4.037
GWK	0.059	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.679	3.145
EAGADS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.687	6.208
Total Weight	1	1	1	1	1	1	1	1	1		

The weekly risk- return for the sector deteriorated during the period. A total of 7 stocks out of 8 recorded negative weekly returns. KAPCHO was the best with a return of

0.791% and risk of 3.731%. A stock like KAPCHO was represented in all the portfolios meaning that it was a superior stock. Most of the portfolios contained 3 stocks.

Figure 3: Agricultural Portfolio Return for 1999



The efficient frontier declined as from the 1998 level in line with the decline in NSE 20 share index. As indicated in **Table 1**, majority of the stocks performed poorly with the exception of KAPCHO. The worst stock was KAKUZI. Otherwise, diversification was unattainable in this year due to flat or negative returns dominating the stock performance.

4.1.4 **Risk-Return for the year 2000**

There were no portfolios constructed for the period because of negative returns in almost all the stocks in the sector. The target return that we set was all positive. In which case, if negative returns dominate the set then we will not expect any solution. It is unlikely that a rational investor will prefer negative returns. In this year, the sector was at its worst.

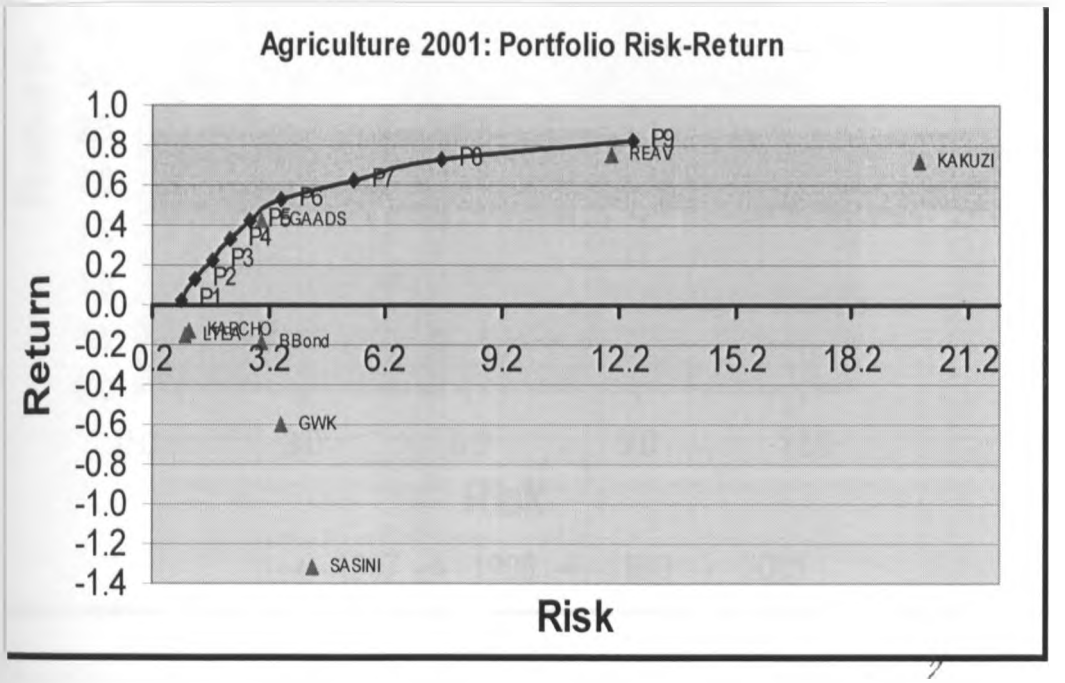
4.1.5 **Risk-Return for the year 2001**

Table 4: Agricultural Risk-Return for 2001

Year 2001											
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9		
(In %)											
Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825		
Risk(Standard Deviation)	0.938	1.315	1.752	2.221	2.713	3.498	5.367	7.643	12.536		
Numbers of Stocks	6	6	6	5	4	3	3	3	1	Weekly Return	Risk
				Portfolio Weights							
BBOND	0.107	0.120	0.133	0.114	0.077	0.000	0.000	0.000	0.000	-0.187	3.016
SASINI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.320	4.304
REAVI	0.045	0.063	0.081	0.095	0.106	0.218	0.432	0.646	1.043	0.749	12.021
LIMTEA	0.268	0.138	0.008	0.000	0.000	0.000	0.000	0.000	0.000	-0.149	1.061
KAPCHO	0.359	0.314	0.268	0.129	0.000	0.000	0.000	0.000	0.000	-0.128	1.165
KAKUZI	0.019	0.029	0.039	0.048	0.056	0.110	0.208	0.306	0.000	0.723	19.948
GWK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.599	3.528
EAGADS	0.202	0.336	0.470	0.614	0.761	0.672	0.360	0.048	0.000	0.418	2.988
Total Weight	1	1	1	1	1	1	1	1	1		

The table depicts a slight improvement of the agricultural sector stocks in 2001 as compared to 1999 and 2000. The highest weekly return was recorded by REAVI of 0.749% with a risk of 12.021%! Equally KAKUZI was not left behind with a weekly return of 0.723% and with a very high risk of 19.948%! A total of 5 out of 8 stocks recorded negative return. As indicated earlier, an investor interested in portfolio 9 had to borrow in order to attain that size of investment. With the exception of portfolio 9, the other portfolios i.e. portfolio 1-8 contained 3 to 6 stocks. This is in line with investment diversification principle.

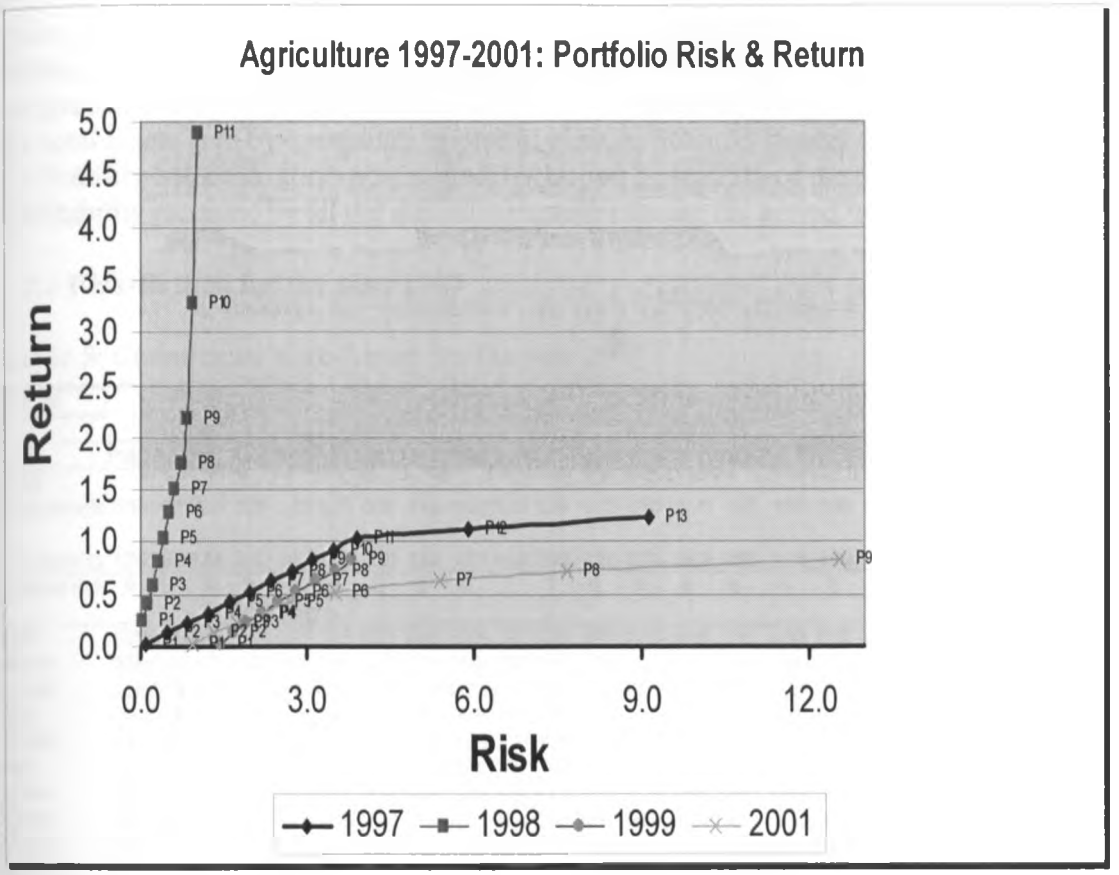
Figure 4: Agricultural Portfolio Return for 2001



We managed to construct 9 feasible portfolios with portfolio 6 recording the highest risk-return. EAGADS appeared to be close to portfolio 6 indicating that it was the best individual stock in relation to risk-return trade off. The efficient frontier curve resembled the one constructed in 1997. SASINI was way off the rest with a record of –0.132% weekly return and risk of 4.304%.

4.1.6 **Agricultural Portfolio Risk-Return comparisons for the years 1997 to 2001**

Figure 6: Agriculture Portfolio Risk-Return for the years 1997 to 2001



Out of the 5 years i.e. 1997 to 2001 in the agricultural sector stocks, 1998 was the best for a wealth maximizing investor. The efficient frontier curve for 1998 was much superior compared to 1997, 1999, 2000 (not attainable) and 2001. The efficient frontiers for 1997, 1999 and 2001 were all inferior compared to 1998 with 1997 performing better than 1999 and 2001. The 1998 better performance could have been attributed to the after 1997 general elections investor sentiments. It is further observed that this trend of 1998 better performance is replicated in the commercial and industrial market sectors. The yearly differentials are a manifestation of the varying business conditions (both at micro and macro level) from one to the other. It is a reflection of the many business cycles that our economies face all over the world. In the circumstances, it means that investors have to continue reviewing and re-defining their investment portfolios to be in line with their investment objectives. This justifies an active approach strategy in the management of investments.

4.2 Commercial Sector Portfolio Return Characteristics

4.2.0 Background

There were 10 commercial based companies trading at the Nairobi Stock Exchange during the period under review. The average estimated total assets held by these companies during the period amounted to Ksh.30 billion. This represented around 8% of the total assets held by companies quoted at Nairobi Stock Exchange then. The average profitability before taxation was around 1.7 billion being 13% of the total average profitability recorded by all the quoted companies during the period under review.

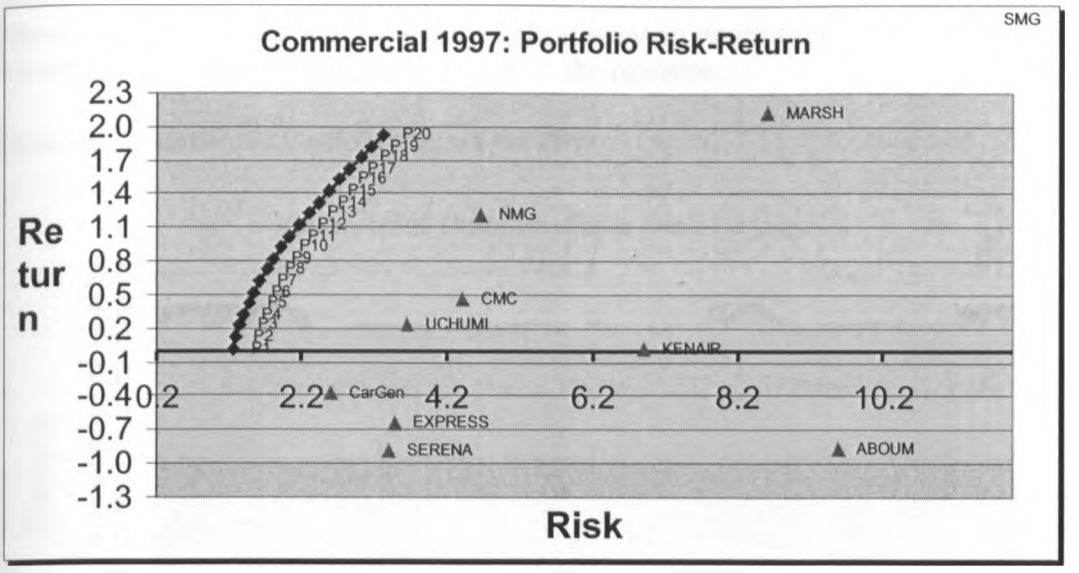
4.2.1 Risk-Return for the year 1997

Table 5: Commercial Risk-Return for the year 1997

Year 1997																							
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 15	Port 16	Port 17	Port 18	Port 19	Port 20		
(In %)																						
Weekly Return (E	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.425	1.525	1.625	1.725	1.825	1.925		
Risk (Standard De	1.238	1.300	1.351	1.410	1.478	1.552	1.632	1.721	1.820	1.926	2.041	2.164	2.294	2.429	2.569	2.713	2.860	3.010	3.162	3.317		
Numbers of Stock	9	10	10	9	9	9	8	8	8	7	7	6	6	6	6	6	6	6	6	6	Weekly Return	Risk
				Portfolio Weights																		
CGEN	0.230	0.265	0.283	0.294	0.305	0.315	0.321	0.313	0.305	0.287	0.265	0.240	0.215	0.191	0.166	0.141	0.117	0.092	0.067	0.042	-0.380	2.60
ABCLM	0.092	0.030	0.026	0.023	0.021	0.018	0.015	0.011	0.006	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.887	9.59
LOHUM	0.187	0.168	0.189	0.166	0.163	0.180	0.177	0.170	0.163	0.153	0.143	0.132	0.121	0.110	0.099	0.088	0.077	0.067	0.055	0.045	0.240	3.63
SMG	0.022	0.030	0.037	0.045	0.053	0.061	0.070	0.081	0.091	0.104	0.116	0.129	0.143	0.156	0.169	0.182	0.195	0.208	0.221	0.234	4.242	11.60
SERENA	0.151	0.125	0.095	0.070	0.044	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.887	3.38
NMG	0.118	0.137	0.155	0.172	0.188	0.205	0.221	0.233	0.245	0.258	0.272	0.287	0.302	0.318	0.334	0.349	0.365	0.380	0.396	0.411	1.220	4.65
MARSH	0.053	0.055	0.057	0.059	0.061	0.064	0.068	0.077	0.085	0.094	0.104	0.113	0.123	0.132	0.142	0.151	0.160	0.170	0.179	0.189	2.121	8.61
KENAIR	0.015	0.009	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	6.59
EXPRESS	0.171	0.152	0.129	0.109	0.088	0.057	0.047	0.027	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.635	3.47
CMC	0.000	0.010	0.028	0.042	0.056	0.070	0.092	0.093	0.097	0.100	0.100	0.098	0.095	0.093	0.091	0.088	0.085	0.084	0.081	0.079	0.466	4.40
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

Shows portfolio sets constructed in the Commercial sector for the period 1 January to 31 December 1997. The table also shows the weekly return and risk associated with each of the stock in the Commercial sector during the period. The highest weekly return was recorded by MARSH with a return of 2.121% but with a risk of 8.615%! The lowest weekly return was recorded by SERENA with a return of –0.887% and risk of 3.388%. The highest portfolio formation had 10 stocks while the lowest had 6 stocks and the efficient frontier is as depicted in **Figure 7**.

Figure 7: Commercial Portfolio Return for 1997



The graph shows the efficient frontier for the Commercial sector based on the portfolios depicted in **Table 5**. The graph also places individual company weekly risk-return. It can be seen from the graph that all the individual stock weekly risk- return lie below the efficient frontier. This means that diversification of investments reduces firm-specific risk. In 1997, NMG recorded highest weekly risk-return compared to the other companies while SERENA was the lowest. SMG stock was the riskiest.

4.2.2 **Risk-Return for the year 1998**

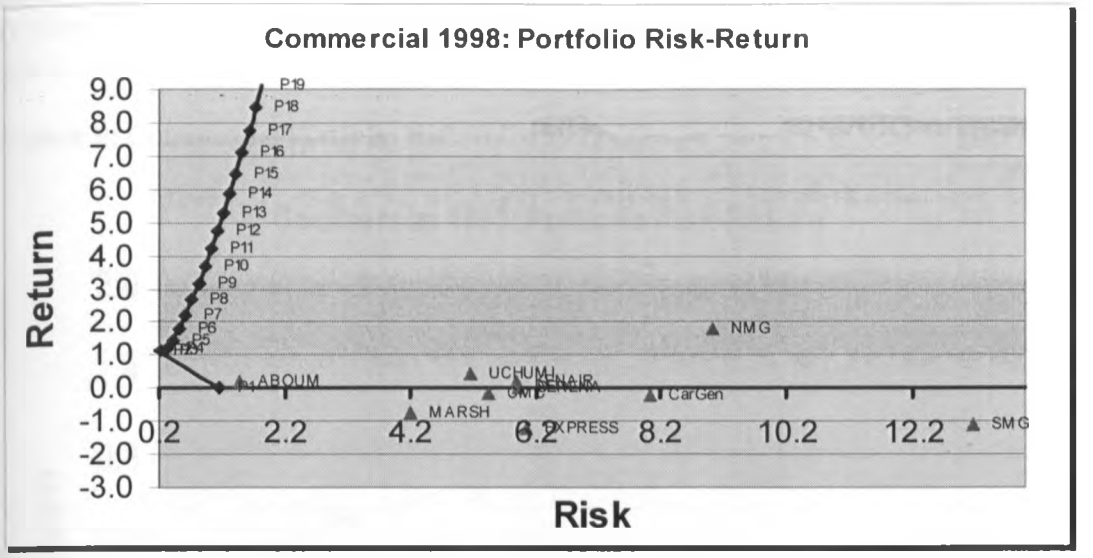
Table 6: Commercial Risk-Return for the year 1998

Year 1998																						
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 15	Port 16	Port 17	Port 18	Port 19		
(In %)																					
Weekly Return(Es	0.025	1.126	1.128	1.201	1.416	1.765	2.196	2.673	3.176	3.695	4.223	4.757	5.296	5.849	6.452	7.098	7.777	8.480	9.101		
Risk(Standard De	1.174	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.425	1.525	1.625	1.725	1.825		
Numbers of Stock	10	10	9	5	5	4	4	4	4	4	4	4	4	2	2	2	2	2	1	Weekly Return	Risk
	Portfolio Weights																				
CGEN	0.024	0.016	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.220	8.023
ABOUM	0.633	0.669	0.702	0.717	0.678	0.627	0.541	0.455	0.369	0.282	0.196	0.110	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.172	1.480
UCHUMI	0.056	0.060	0.067	0.087	0.108	0.132	0.167	0.201	0.236	0.270	0.305	0.339	0.374	0.352	0.278	0.204	0.130	0.056	0.000	0.448	5.140
SMG	0.018	0.013	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.137	13.176
SERENA	0.007	0.006	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.012	5.903
NMG	0.040	0.054	0.069	0.093	0.144	0.195	0.251	0.306	0.362	0.417	0.472	0.528	0.583	0.648	0.722	0.796	0.870	0.944	1.009	1.797	9.021
MARSH	0.109	0.079	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.760	4.198
KENAIR	0.034	0.037	0.040	0.045	0.045	0.045	0.042	0.038	0.034	0.031	0.027	0.023	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.165	5.871
EXPRESS	0.061	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.204	6.046
CMC	0.018	0.038	0.057	0.058	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.182	5.451
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The highest weekly return was recorded by NMG with a return of 1.797% but with a high risk of 9.021%! The lowest return was recorded by EXPRESS, which had a weekly return of –1.204% and a risk of 6.046%. We constructed 19 portfolios sets and the results are depicted in **Figure 8**. The number of stocks included in the 19 portfolios ranged from 1 to

10 stocks. Portfolios, which had 4 stocks, dominated the portfolio formations. NMG was present in all the portfolio formations meaning that it was much superior than all the others. An investor had the choice of including as many stocks as possible in the portfolio but obviously one has to bring search costs in the equation.

Figure 8: Commercial Portfolio Return for 1998



The efficient frontier in 1998 was an improvement over the one in 1997. This trend was replicated in the agricultural and industrial market sectors. This may have been contributed to investor sentiments immediately after the general elections. The 'twist' in the curve as you approach the weekly return of 1% is due to graph scaling problem. Out of 10 stocks in the commercial sector, 6 stocks had negative weekly returns. The worst was SMG and was closely followed by EXPRESS and CarGen. The investor could have effectively enhanced returns through diversification.

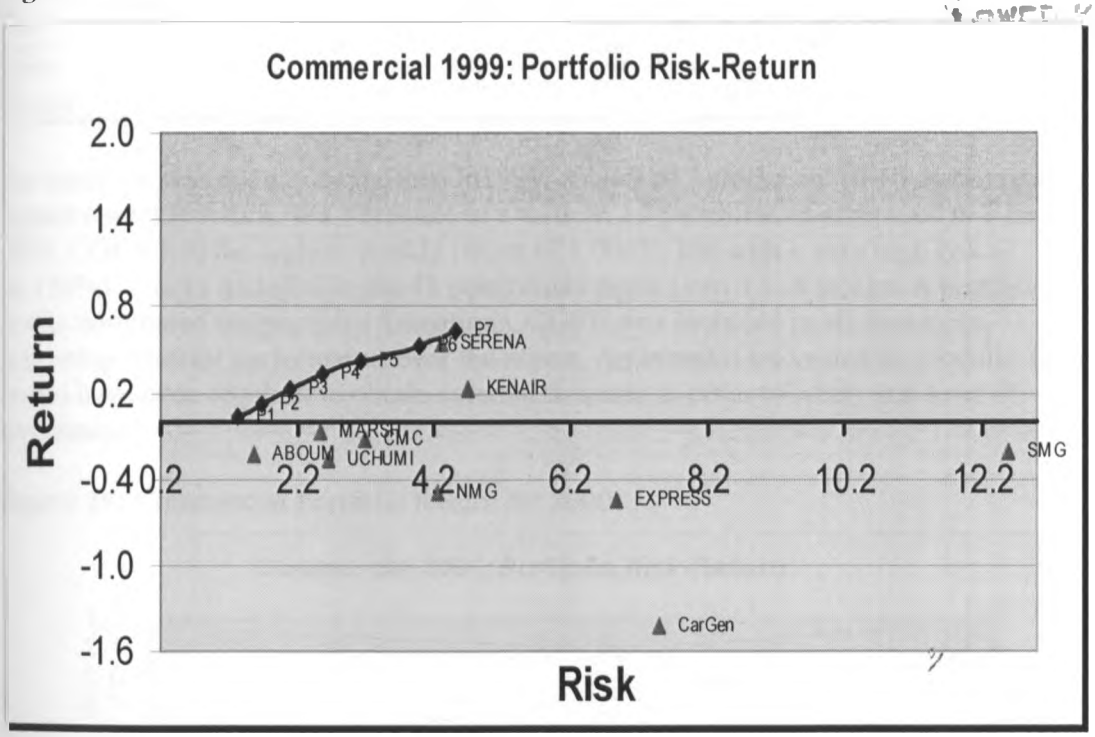
4.2.3 **Risk-Return for the year 1999**

Table 7: Commercial Risk-Return for the year 1999

Year 1999									
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7		
(In %)									
Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625		
Risk(Standard Deviation)	1.312	1.669	2.091	2.561	3.134	3.989	4.523		
Numbers of Stocks	6	5	5	3	3	2	1	Weekly Return	Risk
				Portfolio Weights					
CGEN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.427	7.506
ABOUM	0.270	0.159	0.035	0.000	0.000	0.000	0.000	-0.226	1.546
UCHUMI	0.133	0.101	0.061	0.000	0.000	0.000	0.000	-0.263	2.644
SMG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.213	12.576
SERENA	0.202	0.302	0.400	0.517	0.662	0.922	1.048	0.548	4.314
NMG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.498	4.252
MARSH	0.231	0.256	0.281	0.228	0.054	0.000	0.000	-0.075	2.525
KENAIR	0.139	0.183	0.224	0.255	0.284	0.078	0.000	0.231	4.693
EXPRESS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.546	6.878
CMC	0.025	0.000	0.000	0.000	0.000	0.000	0.000	-0.129	3.173
Total Weight	1	1	1	1	1	1	1		

The weekly risk- return for the sector deteriorated during the period. The number of portfolio formations reduced to 7 compared to 19 in 1998. This was mainly due to poor performance in the commercial sector during the period. The highest portfolio formation had 6 stocks while the least had only 1 stock. SERENA stock featured in all the portfolio formations indicating superior performance over the others. An investor would have been compelled to obtain external funds in order to invest in portfolio7. A total of 8 stocks out of 10 recorded negative weekly returns. SERENA was the best with a weekly return of 0.548% but with a high risk of 4.314%. CGEN was the worst with a return of –1.427% and a risk of 7.506%.

Figure 9: Commercial Portfolio Return for 1999



The efficient frontier deteriorated as compared to 1998. As indicated in **Table 1**, majority of the stocks performed poorly with the exception of SERENA and KENAIR. Majority of the stocks had negative returns. The worst stock was CarGen. An investor would have mitigated his/her loss by including more stocks in the investment basket, more so from the other sectors or other forms of investments.

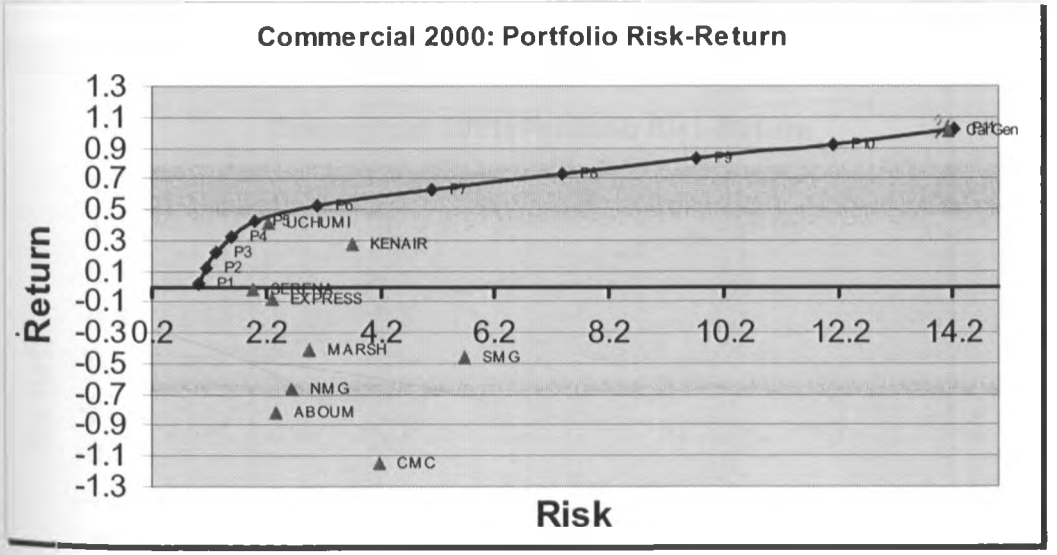
4.2.4 **Risk-Return for the year 2000**

Table 8: Commercial Risk-Return for the year 2000

Year 2000													
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11		
(In %) Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025		
Risk(Standard Deviation)	1.000	1.138	1.322	1.592	2.000	3.080	5.099	7.369	9.715	12.093	14.234		
Numbers of Stocks	8	8	7	5	4	2	2	2	2	2	1	Weekly Return	Risk
				Portfolio Weights									
CGEN	0.0095	0.0175	0.0317	0.0463	0.0634	0.1917	0.3583	0.5250	0.6917	0.8583	1.0075	1.006	14.128
ABOUM	0.0753	0.0116	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.823	2.361
UCHUM	0.3164	0.3693	0.4539	0.6013	0.7816	0.8083	0.6417	0.4750	0.3083	0.1417	0.0000	0.407	2.253
SMG	0.0281	0.0223	0.0064	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.462	5.671
SERENA	0.3014	0.3161	0.3039	0.2296	0.0100	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.014	1.956
NMG	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.663	2.656
MARSH	0.1065	0.0767	0.0084	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.409	2.952
KENAIR	0.0558	0.0698	0.0889	0.1216	0.1449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.279	3.716
EXPRESS	0.1071	0.1166	0.1069	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.080	2.313
CMC	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-1.142	4.192
Total Weight	1	1	1	1	1	1	1	1	1	1	1		

The situation was not any better than in1999. A total of 7 stocks out of 10 stocks recorded negative weekly return. We were able to construct 11 portfolios as compared to 7 in 1999. CGEN had the highest weekly return of 1.006%, but with a very high risk of 14.128%! Stocks included in the 11 portfolios ranged from 1 to 8 stocks. A portfolio of 2 stocks dominated the portfolio formations. CGEN was included in all the stocks indicating superior performance over the others. An investor interested in portfolio 11 would have been required to obtain external finances in order to attain that level of investment.

Figure 10: Commercial Portfolio Return for 2000



The efficient frontier improved slightly as compared to 1998. UCHUMI was the best in terms of risk-return relationship. That explains why UCHUMI was included in most of the portfolios depicted in **Table 8.** CMC was the worst stock. The CGEN stock clearly

demonstrated that the higher the return, the higher the risk. In this perspective, the investor risk profile determines what investments an investor engages in.

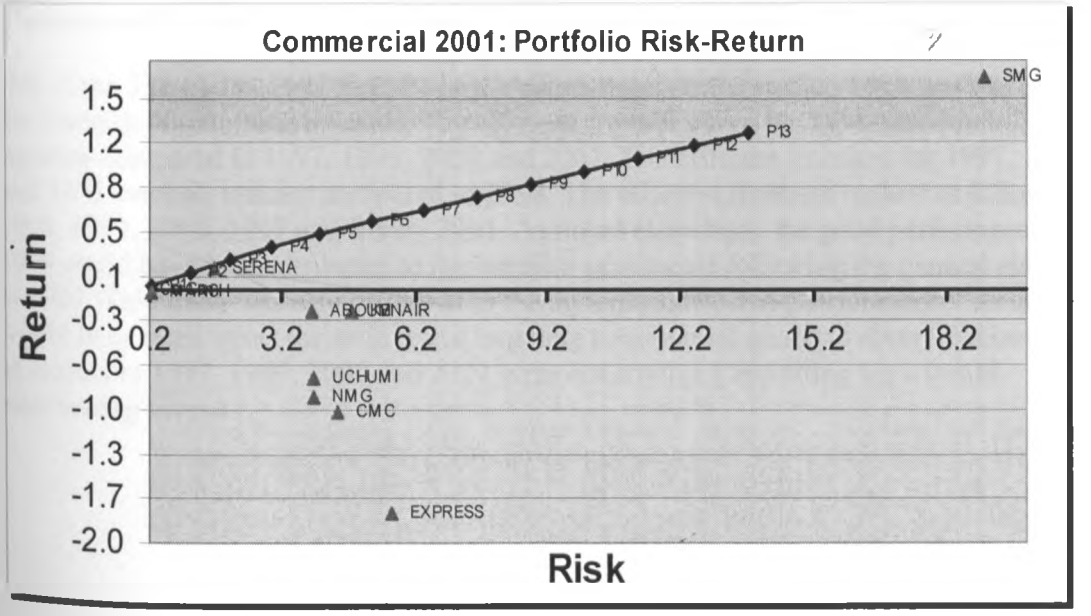
4.2.5 **Risk-Return for the year 2001**

Table 9: Commercial Risk-Return for the year 2001

Year 2001															
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13		
(In %)															
Weekly Return (Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.22		
Risk (Standard Deviation)	0.227	1.135	2.043	2.950	4.078	5.231	6.415	7.615	8.824	10.040	11.259	12.482	13.707		
Numbers of Stocks	3	3	3	2	2	2	2	2	2	2	2	2	2	Weekly Return	Risk
	Portfolio Weights														
OGEN	0.907	0.533	0.159	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ABCUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.180	3.901
UCHUM	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.692	3.927
SMG	0.007	0.036	0.065	0.116	0.182	0.248	0.315	0.381	0.447	0.513	0.579	0.646	0.712	1.657	19.049
SERENA	0.086	0.431	0.776	0.884	0.818	0.752	0.685	0.619	0.553	0.487	0.421	0.354	0.288	0.151	1.678
NMG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.858	3.942
MARSH	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.032	0.226
KENAIR	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.181	4.784
EXPRESS	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.771	5.695
CMC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.972	4.451
Total Weight	1	1	1.0000001	1	1	1	1	1	1	1	1	1	1		

The situation was not any better than what was experienced in year 2000. The highest weekly return of 1.657% was recorded by SMG but with the highest risk of 19.049%! We managed to construct 13 portfolios with the highest having a weekly return of 1.225% but with a risk of 13.707%. SMG and SERENA stocks were both included in the 13 portfolios being an indication of superior performance than the others. Out of the 13 portfolio formations, 10 had 2 stocks while 3 had 3 stocks. This is an indication that most of the stocks performed poorly during the period. **Figure 11** depicts this fact.

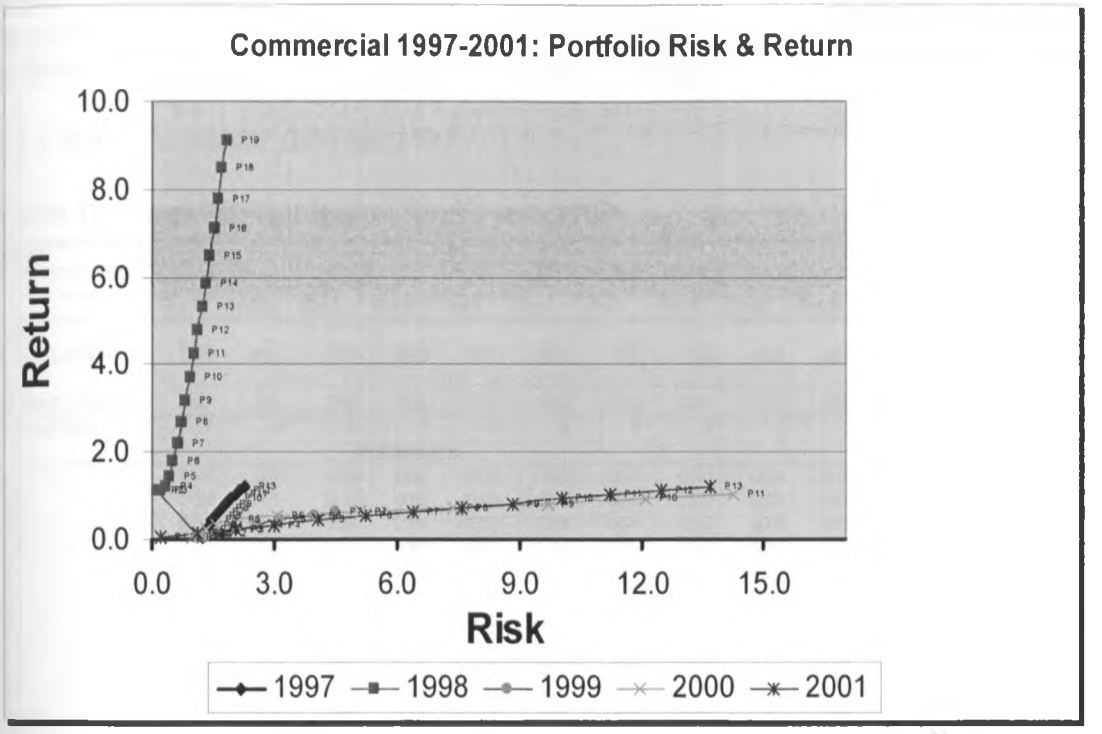
Figure 11: Commercial Portfolio Return for 2001



With the exception of SMG and SERENA all the other stocks had negative returns. CARGEN was flat during the period. The performance of the commercial sector in 2001 is well documented in **Table 9.**

4.2.6 **Commercial Portfolio Risk-Return comparisons for the years 1997 to 2001**

Figure 12: Commercial Portfolio Risk-Return for the years 1997 to 2001



Out of the 5 years i.e. 1997 to 2001 in the commercial sector stocks, 1998 was the best for a wealth maximizing investor. The efficient frontier curve for 1998 was much superior compared to 1997, 1999, 2000 and 2001. The efficient frontiers for 1997, 1999 and 2001 were all inferior compared to 1998. The efficient frontiers ranked as follows; 1998, 1997, 2000, 1999 and finally 2001. As noted elsewhere, the good performance in 1998 could have been attributed to the investor sentiments following the general elections in 1997. This trend was also observed in the agricultural and industrial market sectors. It would have been wiser for an investor targeting commercial sector to diversify elsewhere as returns in 1997, 1999, 2000 and 2001 were not anything appealing for a wealth maximizing investor.

4.3 Financial Sector Portfolio Return Characteristics

4.3.0 Background

There were 12 financial based companies trading at the Nairobi Stock Exchange during the period under review. The average estimated total assets held by these companies during the period amounted to Ksh.245 billion. This represented around 65% of the total assets held by companies quoted at Nairobi Stock Exchange then. The bulk of these assets were in form of loans advanced to corporate and individual customers. The average profitability before taxation was around 6 billion being 47% of the total average profitability recorded by all the quoted companies during the period under review.

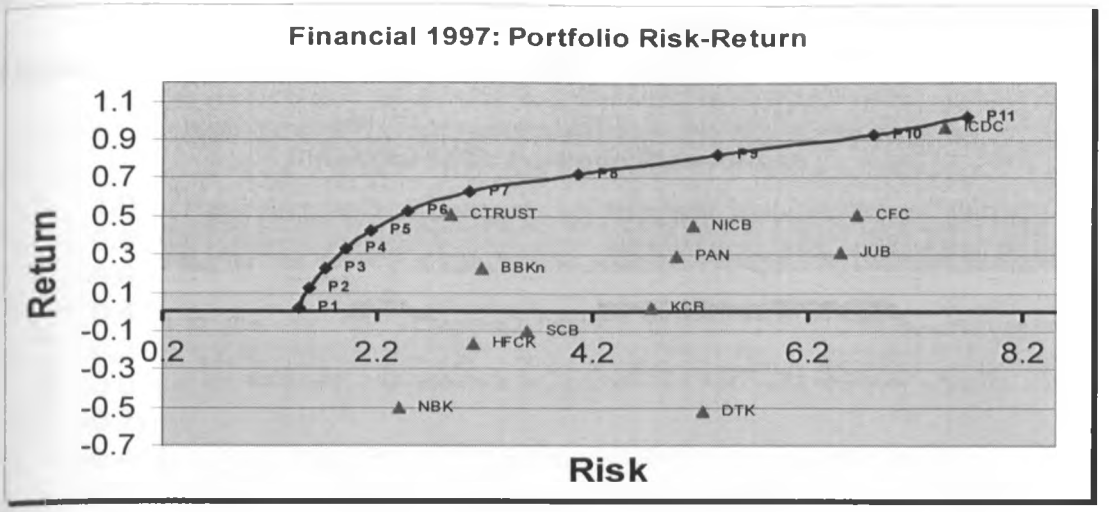
4.3.1 Risk-Return for the year 1997

Table 10: Financial Risk-Return for the year 1997

Year 1997													
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11		
(In %)													
Weekly Return (Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025		
Risk (Standard Deviation)	1.467	1.536	1.718	1.910	2.136	2.484	3.062	4.057	5.360	6.796	7.674		
Numbers of Stocks	7	8	8	7	6	5	4	3	3	3		Weekly Return	Risk
				Portfolio Weights									
BBK	0.178	0.210	0.219	0.225	0.218	0.053	0.000	0.000	0.000	0.000	0.000	0.22	3.175
SCB	0.079	0.047	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.102	3.55
PAN	0.036	0.112	0.124	0.138	0.152	0.111	0.008	0.000	0.000	0.000	0.000	0.28	4.97
NCB	0.064	0.057	0.071	0.078	0.087	0.103	0.100	0.089	0.087	0.006	0.000	0.463	5.127
NBK	0.329	0.247	0.172	0.087	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.50	2.40
KCB	0.046	0.039	0.033	0.026	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.02	4.74
JUB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.31	6.50
ICDC	0.000	0.010	0.029	0.046	0.064	0.151	0.278	0.466	0.695	0.905	1.000	0.97	7.46
HFCK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.17	3.09
DTK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.52	5.21
CTRUST	0.207	0.276	0.339	0.400	0.462	0.573	0.620	0.445	0.267	0.089	0.000	0.50	2.87
CFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.50	6.65
Total Weight	1	1	1	1	1	1	1	1	1	1	1		

Shows portfolio sets constructed in the financial sector for the period 1 January to 31 December 1997. The table also shows the weekly return and risk associated with each of the stock in the financial sector during the period. The highest return was recorded by ICDC with a weekly return of 0.97% but with a risk of 7.466%. The lowest weekly return was recorded by DTK with a weekly return of –0.524% and risk of 5.217%. The stocks included in the 11 portfolio formations ranged from 1 to 8 stocks. The optimal portfolio selection would have lied between portfolio 5 and portfolio 7. **Figure 13** plots the efficient frontier for the financial sector in 1997.

Figure 13: Financial Portfolio Return for 1997



The graph shows the efficient frontier for the financial sector based on the portfolios depicted in **Table 10**. The graph also places individual company risk-return and it can be seen that all the individual stock risk- return lie below the efficient frontier. This is a proof that risk-return relationship can be improved by investing in-group of assets whose return is negatively correlated.

4.3.2 **Risk-Return for the year 1998**

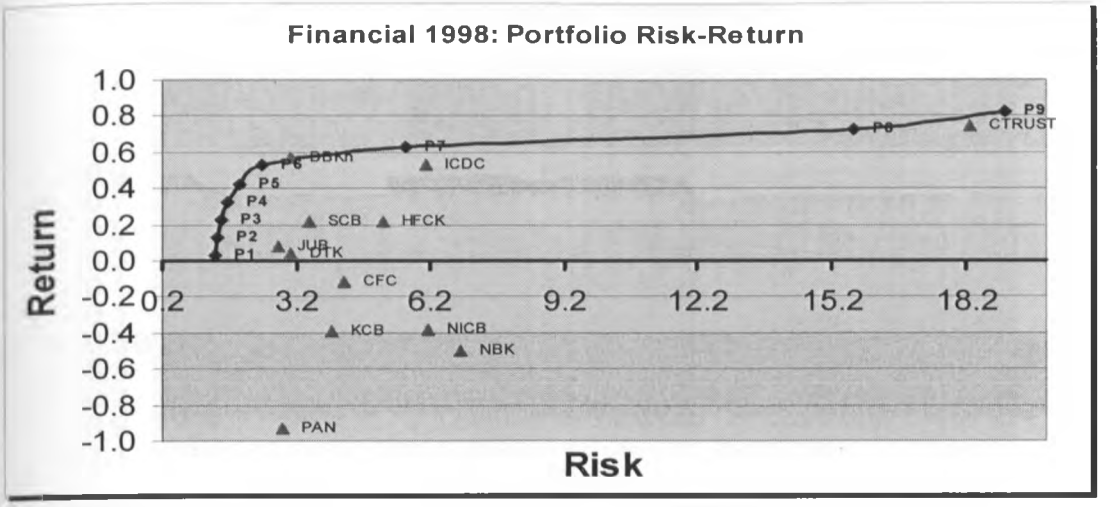
Table 11: Financial Risk-Return for the year 1998

Year 1998											
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9		
(In %)											
Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825		
Risk(Standard Deviation)	1.367	1.436	1.537	1.681	1.951	2.442	5.660	15.689	19.075		
Numbers of Stocks	8	7	8	8	5	4	2	2	1	Weekly Return	Risk
				Portfolio Weights							
BBK	0.208	0.259	0.312	0.424	0.588	0.736	0.694	0.139	0.000	0.567	3.080
SCB	0.061	0.076	0.085	0.057	0.000	0.000	0.000	0.000	0.000	0.215	3.505
PAN	0.152	0.089	0.027	0.000	0.000	0.000	0.000	0.000	0.000	-0.936	2.916
NICB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.382	6.147
NBK	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.497	6.877
KCB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.397	3.975
JUB	0.347	0.362	0.376	0.366	0.301	0.100	0.000	0.000	0.000	0.076	2.819
ICDC	0.000	0.000	0.007	0.033	0.074	0.116	0.000	0.000	0.000	0.528	6.076
HFCK	0.000	0.000	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.220	5.126
DTK	0.158	0.158	0.154	0.092	0.000	0.000	0.000	0.000	0.000	0.042	3.087
CTRUST	0.014	0.018	0.022	0.027	0.034	0.048	0.306	0.861	1.043	0.747	18.292
CFC	0.054	0.037	0.017	0.000	0.000	0.000	0.000	0.000	0.000	-0.118	4.291
Total Weight	1	1	1	1	1	1	1	1	1		

The highest return was recorded by CTRUST with a weekly return of 0.747% but with a risk of 18.292%! The lowest weekly return was recorded by PAN, which had a weekly return of –0.936% and a risk of 2.916%. We constructed 9 portfolios sets and each of the portfolios was composed of stocks ranging from 1 to 8 stocks. Portfolio 6 would have

been the optimal for a risk conscious investor. The results of the portfolios are as depicted in **Figure 14**.

Figure 14: Financial Portfolio Return for 1998



The efficient frontier in 1998 was an improvement over the one in 1997. Out of 12 stocks in the financial sector, 5 stocks had negative returns. The worst was PAN. CTRUST was the riskiest stock. Portfolio 6 would have been best in terms of risk-return relationship. BBK was the most promising stock as it nearly matched the best portfolio indicated above.

4.3.3 **Risk-Return for the year 1999**

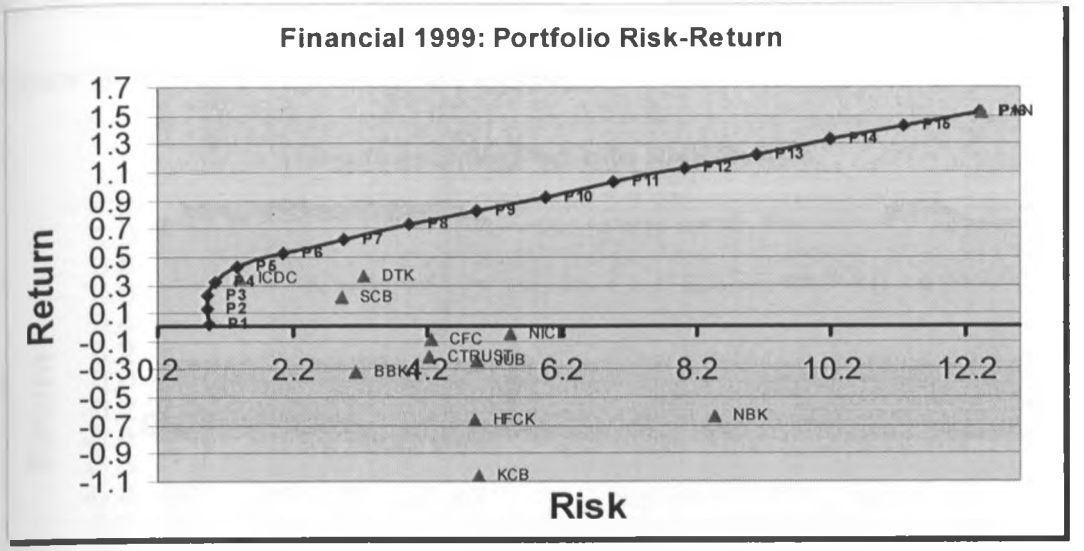
Table 12: Financial Risk-Return for the year 1999

Year 1999																		
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 15	Port 16		
(In %)																		
Weekly Return(Estima	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.425	1.525		
Risk(Standard Deviati	0.975	0.932	0.952	1.067	1.378	2.070	2.963	3.933	4.936	5.952	6.979	8.028	9.100	10.188	11.287	12.395		
Numbers of Stocks	10	11	10	8	4	3	3	3	3	3	2	2	2	2	1	2	Weekly Return	Risk
				Portfolio Weights														
BBK	0.090	0.053	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.317	3.129
SCB	0.073	0.089	0.110	0.116	0.096	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.211	2.924
PAN	0.000	0.002	0.012	0.027	0.071	0.144	0.228	0.312	0.396	0.480	0.565	0.651	0.737	0.823	0.909	0.996	1.528	12.450
NICB	0.090	0.083	0.089	0.045	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.048	5.421
NBK	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.630	8.484
KCB	0.048	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.064	4.955
JUB	0.035	0.036	0.038	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.242	4.930
ICDC	0.410	0.486	0.542	0.642	0.675	0.631	0.502	0.372	0.243	0.114	0.000	0.000	0.000	0.000	0.000	0.000	0.348	1.405
HFCK	0.033	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.658	4.915
DTK	0.039	0.063	0.091	0.121	0.168	0.225	0.270	0.315	0.361	0.406	0.435	0.349	0.263	0.177	0.091	0.004	0.366	3.243
CTRUST	0.135	0.102	0.074	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.219	4.214
CFC	0.046	0.048	0.045	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.085	4.258
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The weekly risk- return for the sector deteriorated during the period. A total of 8 stocks out of 12 recorded negative weekly returns. PAN had the highest weekly return of 1.528% but with a risk of 12.45%! KCB was the worst with a weekly return of –1.064% and a risk of 4.955%. We managed to construct 16 portfolios, which composed of 1 to 11

stocks. PAN and DTK featured in most of the portfolio formations indicating superior performance over the others.

Figure 15: Financial Portfolio Return for 1999



The efficient frontier deteriorated as compared to 1998. As indicated in **Table 12**, majority of the stocks performed poorly with the exception of ICDC, DTK, SCB and PAN. The worst stock was KCB. The best stock was ICDC. The most optimal region would have been between portfolio 4 and portfolio 5.

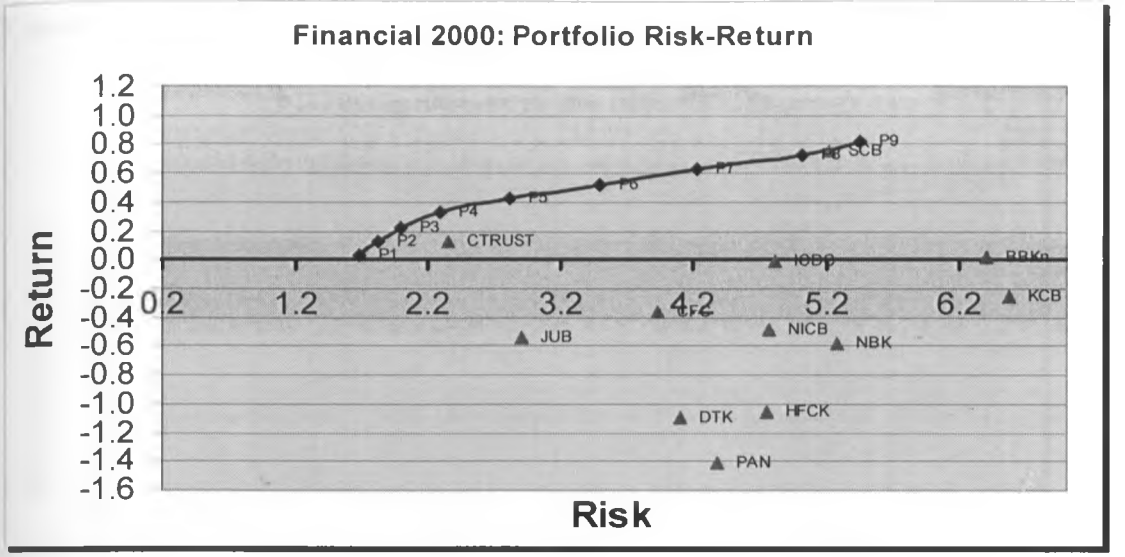
4.3.4 **Risk-Return for the year 2000**

Table 13: Financial Risk-Return for the year 2000

Year 2000											
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9		
(In %)											
Weekly Return(Estimat	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825		
Risk(Standard Deviati	1.685	1.826	1.993	2.289	2.823	3.492	4.232	5.021	5.448		
Numbers of Stocks	7	7	5	3	3	3	2	2	1	Weekly	
				Portfolio Weights						Return	Risk
BBK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.043	**0.019**	**6.395**
SCB	0.144	0.174	0.212	0.342	0.493	0.644	0.798	0.960	0.000	**0.751**	**5.224**
PAN	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-1.409**	**4.381**
NICB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-0.480**	**4.774**
NBK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-0.587**	**5.281**
KCB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-0.250**	**6.568**
JUB	0.047	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-0.543**	**2.914**
ICDC	0.124	0.136	0.153	0.121	0.077	0.032	0.000	0.000	0.000	**-0.012**	**4.819**
HFCK	0.063	0.047	0.006	0.000	0.000	0.000	0.000	0.000	0.000	**-1.057**	**4.759**
DTK	0.031	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	**-1.092**	**4.102**
CTRUST	0.526	0.576	0.614	0.537	0.430	0.324	0.202	0.040	0.000	**0.127**	**2.352**
CFC	0.066	0.048	0.015	0.000	0.000	0.000	0.000	0.000		**-0.369**	**3.928**
Total Weight	1	1	1	1	1	1	1	1	1		

The situation was much worse than in1999. A total of 10 stocks out of 12 stocks recorded a negative weekly return. We constructed 9 portfolio formations during the period. The small number of portfolio formation is explained by the poor performance of the sector and that most stocks were flat during the period. SCB had the highest weekly return of 0.751%, but with a very high risk of 5.224%!

Figure 16: Financial Portfolio Return for 2000



The efficient frontier deteriorated further in 2000. CTRUST was the best in terms of risk-return relationship. Only CTRUST, SCB and BBK stocks recorded positive weekly returns. All the other stocks recorded negative weekly returns with PAN, DTK and HFCK being the worst in this period. KCB had the highest risk that was not compensated for.

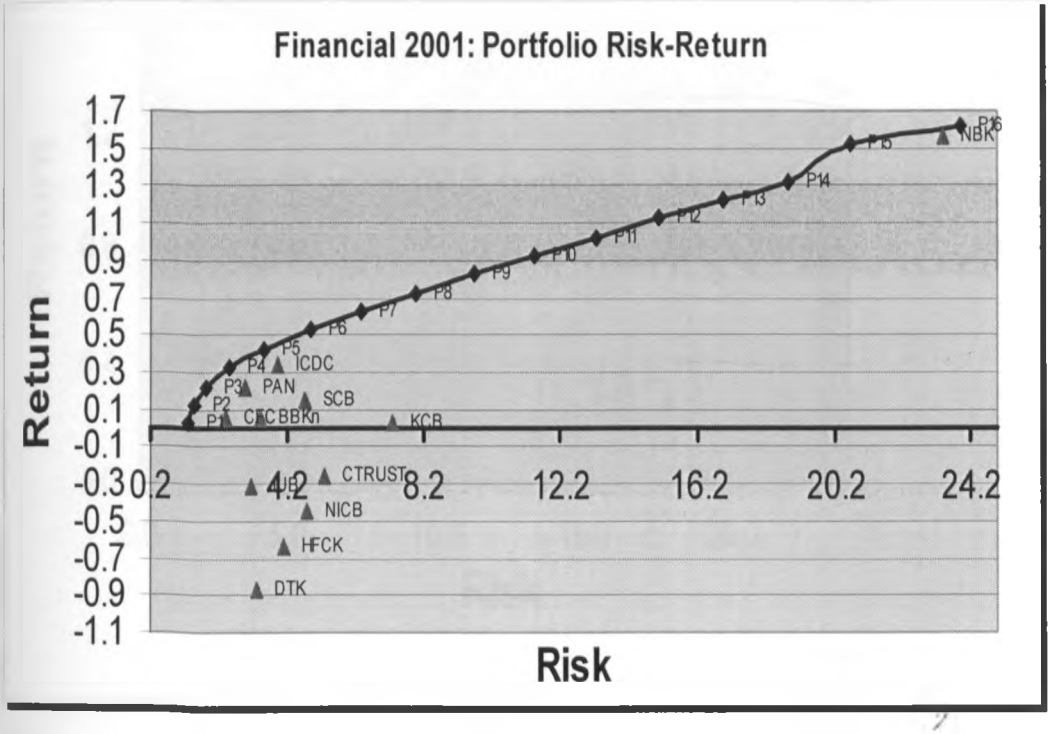
4.3.5 **Risk-Return for the year 2001**

Table 14: Financial Risk-Return for the year 2001

Year 2001																			
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 16	Port 17		
(In %)																		
Weekly Return(Estim	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.525	1.625		
Risk(Standard Devia	1.275	1.427	1.782	2.491	3.507	4.863	6.368	7.971	9.683	11.457	13.269	15.104	16.955	18.818	20.688	23.913		
Numbers of Stocks	11	9	6	6	3	3	3	3	2	2	2	2	2	2	2	1	Weekly Return	Risk
	Portfolio Weights																	
BBK	0.077	0.092	0.090	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.062	3.375
SCB	0.059	0.062	0.063	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.152	4.680
PAN	0.217	0.268	0.342	0.441	0.381	0.209	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.217	2.909
NICB	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.443	4.751
NBK	0.005	0.013	0.029	0.056	0.106	0.171	0.235	0.313	0.394	0.476	0.557	0.638	0.720	0.882	0.963	1.021	1.570	23.412
KCB	0.043	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	7.278
JUB	0.186	0.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.308	3.125
ICDC	0.093	0.137	0.228	0.374	0.513	0.620	0.728	0.687	0.606	0.524	0.443	0.362	0.280	0.118	0.037	0.000	0.338	3.893
HFCK	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.644	4.105
DTK	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.864	3.255
CTRUST	0.021	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.263	5.247
CFC	0.259	0.297	0.248	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.052	2.339
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The situation improved compared to 2000. The highest weekly return of 1.57% was recorded by NBK but with the highest risk of 23.412%! We managed to construct 17 portfolios with the highest having a weekly return of 1.625% but with a risk of 23.913%. The stocks included in the above portfolio formations ranged from 1 to 11 stocks. NBK featured in all the portfolio formations. This was an indication of superior performance as compared to the others. Equally ICDC was represented in most of the portfolio formations except in portfolio 17.

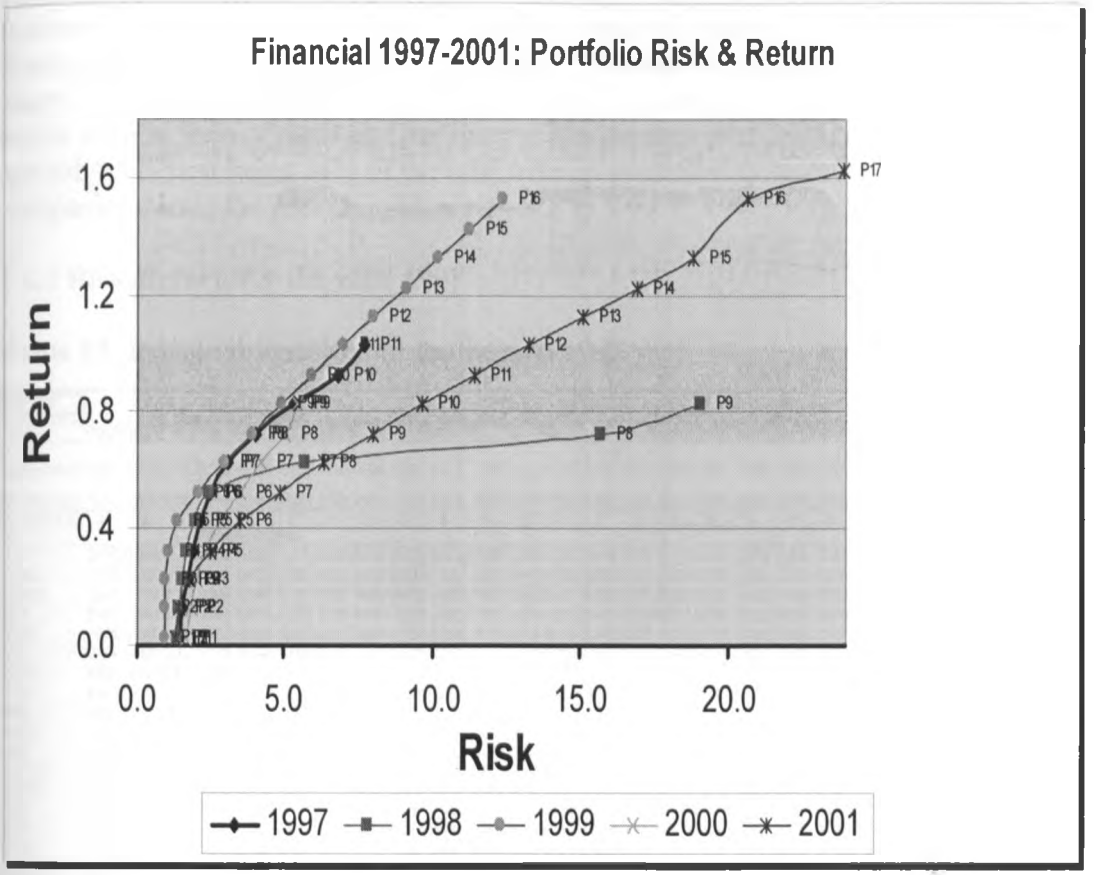
Figure 17: Financial Portfolio Return for 2001



The stocks that had negative weekly return reduced from 10 to 6. DTK was the worst stock. NBK had the highest return but was the riskiest. A risk taker would have invested in either portfolio 16 or 17, which mostly were made up of the NBK stock.

4.3.6 Financial Portfolio Risk-Return comparisons for the years 1997 to 2001

Figure 18: Financial Portfolio Risk-Return for the years 1997 to 2001



Out of the 5 years i.e. 1997 to 2001 in the financial sector stocks, 1999 was the best for a wealth maximizing investor. This was then followed by 1997, 1998, 2000 and finally 2001. Years 2001 and 1999 had the highest portfolio formation as compared to the other years. This is explained by the fact that the stocks in this sector for these two years performed relatively better compared to the other years. Also, most of the stocks in the 2 years experienced active trading as compared to the other years. The periodical differentials in stock performance imply that investors need to continuously review their investment portfolio with regard to the investment objective(s).

4.4 Industrial Sector Portfolio Return Characteristics

4.0 Background

There were 17 industrial based companies trading at the Nairobi Stock Exchange during the period under review. The average estimated total assets held by these companies during the period amounted to Ksh.85 billion. This represented around 23% of the total assets held by companies quoted at Nairobi Stock Exchange then. The bulk of these assets were in form of plant and machinery. The average profitability before taxation was around 4.5 billion being 34% of the total average profitability recorded by all the quoted companies during the period under review.

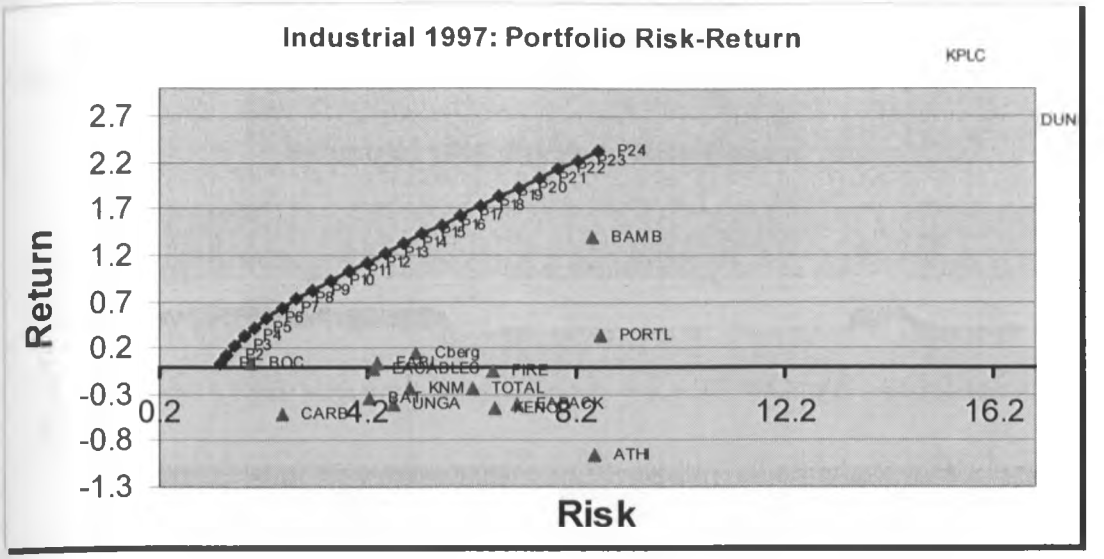
4.4.1 Risk-Return for the year 1997

Table 15: Industrial Risk-Return for the year 1997

Year 1997																												
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 15	Port 16	Port 17	Port 18	Port 19	Port 20	Port 21	Port 22	Port 23	Port 24				
In %																												
Weekly Return	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.425	1.525	1.625	1.725	1.825	1.925	2.025	2.125	2.225	2.325				
Risk(Standard	1.360	1.481	1.631	1.816	2.031	2.275	2.548	2.844	3.160	3.491	3.831	4.180	4.534	4.893	5.257	5.623	5.991	6.362	6.734	7.108	7.483	7.859	8.236	8.615				
Numbers of Stc	14	12	11	11	8	7	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5	6				
	Portfolio Weights																								Weekly Return	Risk		
BOC	0.468	0.505	0.557	0.608	0.663	0.665	0.661	0.630	0.599	0.568	0.537	0.506	0.475	0.444	0.413	0.382	0.351	0.319	0.288	0.257	0.226	0.190	0.151	0.226	0.034	1.962		
CARB	0.096	0.047	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.518	2.561		
CBERG	0.088	0.102	0.109	0.109	0.108	0.105	0.101	0.094	0.087	0.080	0.073	0.066	0.059	0.052	0.044	0.037	0.030	0.023	0.016	0.009	0.002	0.000	0.000	0.002	0.146	5.110		
ATHI	0.042	0.040	0.033	0.020	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.953	8.558		
BAMB	0.035	0.041	0.050	0.057	0.065	0.074	0.082	0.091	0.100	0.109	0.118	0.127	0.136	0.144	0.153	0.162	0.171	0.180	0.188	0.197	0.206	0.215	0.225	0.206	1.396	8.514		
BAT	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.350	4.251		
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.251	6.200		
PORT	0.017	0.015	0.009	0.005	0.000	0.000	0.000	0.001	0.001	0.002	0.002	0.003	0.004	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.008	0.329	8.673		
KNM	0.032	0.031	0.026	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.234	5.009		
KENOL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.459	6.625		
FIRE	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.046	6.594		
EAPACK	0.027	0.025	0.020	0.009	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.406	7.051		
EACABL	0.066	0.068	0.065	0.050	0.036	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.022	4.297		
EABL	0.100	0.090	0.076	0.055	0.032	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	4.378		
DUN	0.016	0.022	0.027	0.036	0.044	0.053	0.063	0.072	0.082	0.092	0.101	0.111	0.121	0.130	0.140	0.149	0.159	0.169	0.178	0.188	0.198	0.207	0.216	0.198	2.650	19.702		
UNGA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.415	4.697		
KPLC	0.004	0.016	0.027	0.041	0.056	0.073	0.092	0.111	0.131	0.150	0.169	0.188	0.207	0.226	0.245	0.265	0.284	0.303	0.322	0.341	0.360	0.322	0.398	0.360	3.339	14.950		
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				

Shows portfolio sets constructed in the Industrial sector for the period 1 January to 31 December 1997. The table also shows the weekly return and risk associated with each of the stock in the Industrial sector during the period. The highest return was recorded by KPLC with a weekly return of 3.339% but with a risk of 14.95%! The lowest weekly return was recorded by ATHI with a weekly return of –0.953% and a risk of 8.558%. We constructed 24 portfolios in sector based on the weekly return-return features of the stocks within the sector during 1997. The high number of portfolio formation as compared to the other sectors is to a larger extent explained by the high number of companies that traded at the NSE i.e. 17. (Agricultural-8, Commercial- 10& Financial-12). Stocks included in each of the portfolio construction ranged from 6 to 14. Portfolios with 6 stocks accounted for 18 sets out of the 24 formations. BOC, BAMB, DUN and KPLC appeared in all the 24 portfolio formations. This was indication of superior performance over the other stocks in the sector.

Figure 19: Industrial Portfolio Return for 1997



The graph shows the efficient frontier for the Industrial sector based on the portfolios depicted in **Table 15**. The graph also places individual company risk-return. It can be seen that all the individual stock risk- return lie below the efficient frontier. This implies that investors need to invest in a group of assets in order reduce risk and improve on the overall return of an investment.

4.4.2 **Risk-Return for the year 1998**

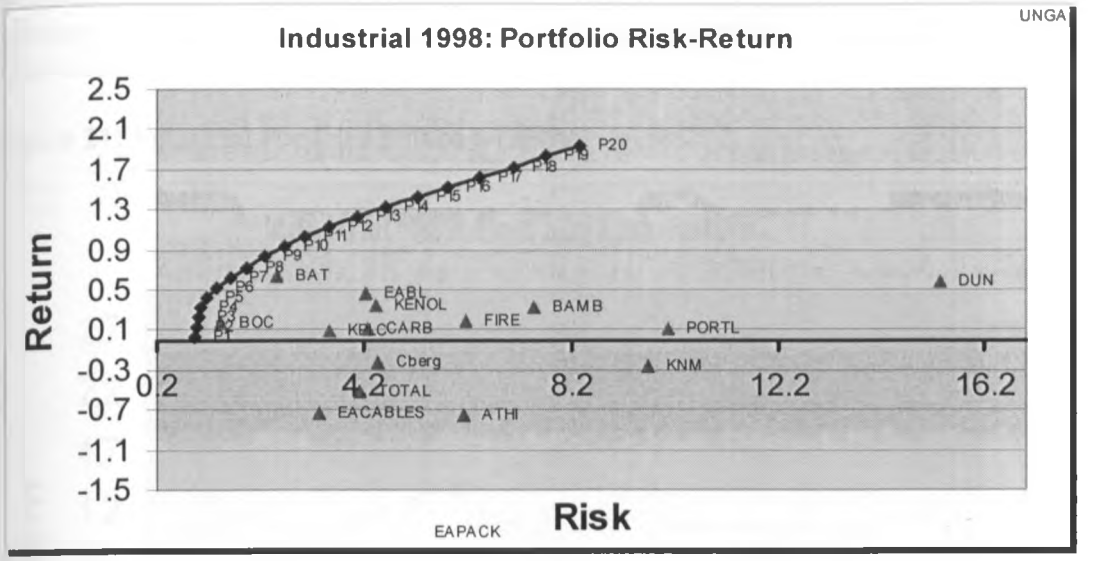
Table 16: Industrial Risk-Return for the year 1998

Year 1998																							
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 15	Port 16	Port 17	Port 18	Port 19	Port 20		
(In %)																						
Weekly Return	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.425	1.525	1.625	1.725	1.825	1.925		
Risk(Standard	0.940	0.966	1.008	1.068	1.164	1.363	1.637	1.956	2.302	2.668	3.081	3.548	4.069	4.630	5.218	5.826	6.448	7.080	7.720	8.366		
Numbers of Sto	11	11	11	9	7	8	7	7	7	6	5	3	3	2	2	2	2	2	2	2	Weekly	
Portfolio Weights																					Return	Risk
BOC	0.562	0.576	0.589	0.591	0.533	0.427	0.312	0.194	0.077	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.174	1.424
CARB	0.030	0.037	0.045	0.053	0.059	0.062	0.062	0.062	0.061	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.100	4.263
CBERG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.228	4.449
ATHI	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.761	6.120
BAMB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.333	7.462
BAT	0.134	0.181	0.228	0.272	0.346	0.438	0.529	0.621	0.712	0.799	0.868	0.888	0.871	0.854	0.832	0.811	0.790	0.768	0.747	0.725	0.636	2.541
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.513	4.101
PORT	0.003	0.008	0.013	0.018	0.020	0.019	0.019	0.018	0.018	0.015	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.106	10.052
KNM	0.019	0.015	0.011	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.264	9.675
KENOL	0.026	0.027	0.028	0.028	0.021	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.351	4.433
FIRE	0.033	0.024	0.016	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.193	6.165
EAPACK	0.069	0.051	0.032	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-2.032	5.198
EACABL	0.057	0.034	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.727	3.325
EABL	0.011	0.005	0.000	0.000	0.000	0.017	0.032	0.047	0.062	0.061	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.458	4.207
DUN	0.000	0.000	0.000	0.000	0.003	0.005	0.007	0.010	0.012	0.013	0.011	0.008	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.584	15.353
UNGA	0.000	0.003	0.007	0.010	0.018	0.029	0.039	0.049	0.059	0.070	0.084	0.104	0.125	0.146	0.168	0.189	0.210	0.232	0.253	0.275	5.317	31.116
KPLC	0.056	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096	3.524
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The highest weekly return was recorded by UNGA with a return of 5.317% but with a risk of 31.116%! The lowest weekly return was recorded by EAPACK, which had a return of –2.032% and a risk of 5.198%. We constructed 20 portfolios sets. This was a reduction as compared to 1997. Stocks included in each of the portfolio set ranged from 2

to 11 stocks. BAT and UNGA featured in most of the portfolio formations and that was an indication of superior performance over the other stocks.

Figure 20: Industrial Portfolio Return for 1998



The efficient frontier in 1998 was an improvement over the one in 1997. As indicated earlier, this could have been attributed to the investor sentiments immediately after the 1997 general elections. Out of 17 stocks in the industrial sector, 6 stocks had negative returns. The worst was EAPACK. UNGA and DUN were the riskiest stocks. BAT was the most promising stock.

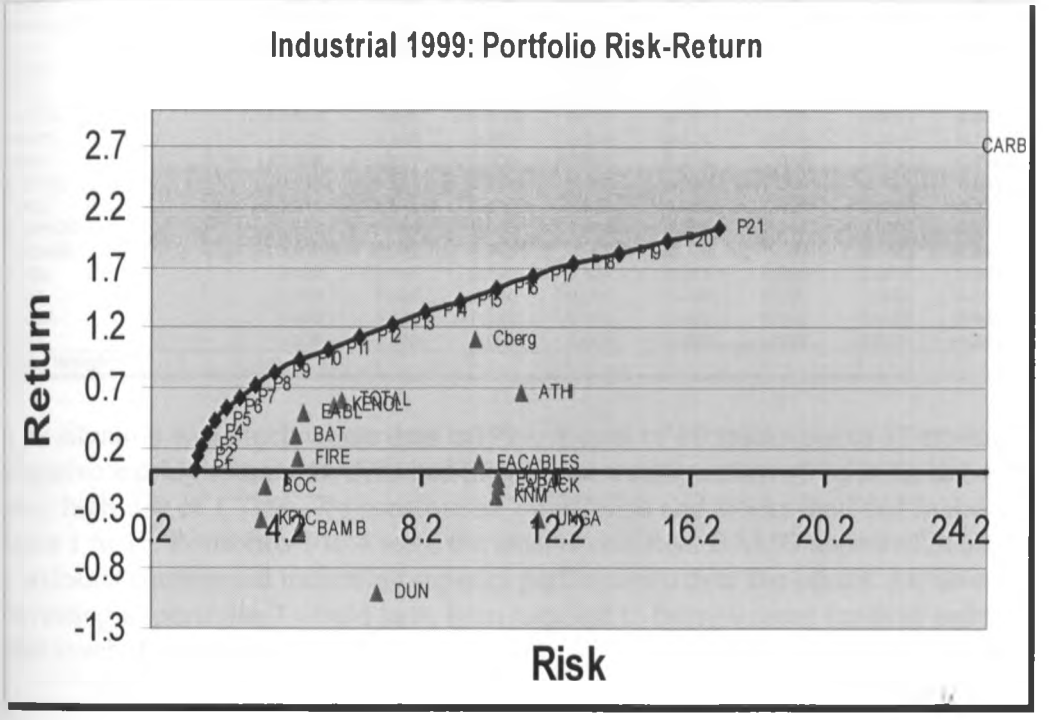
4.4.3 **Risk-Return for the year 1999**

Table 17: Industrial Risk-Return for the year 1999

Year 1999																								
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11	Port 12	Port 13	Port 14	Port 15	Port 16	Port 17	Port 18	Port 19	Port 20	Port 21		
In %)																							
Weekly Return	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.825	0.925	1.025	1.125	1.225	1.325	1.425	1.525	1.625	1.725	1.825	1.925	2.025		
Risk(Standard	1.541	1.581	1.684	1.860	2.110	2.424	2.812	3.296	3.867	4.595	5.446	6.370	7.340	8.339	9.361	10.415	11.508	12.713	14.066	15.530	17.076		
Numbers of Sic	13	13	12	12	11	9	8	6	6	6	6	5	6	4	4	3	2	2	2	2		Weekly Return	Risk
	Portfolio Weights																						
BOC	0.221	0.207	0.196	0.171	0.091	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.120	3.563
CARB	0.000	0.000	0.006	0.015	0.021	0.027	0.039	0.053	0.074	0.104	0.133	0.163	0.193	0.223	0.255	0.290	0.331	0.392	0.454	0.515	0.577	2.714	28.757
CBERG	0.041	0.053	0.065	0.081	0.099	0.117	0.144	0.169	0.209	0.271	0.333	0.395	0.456	0.518	0.579	0.632	0.664	0.608	0.546	0.485	0.423	1.093	9.823
ATHI	0.002	0.008	0.012	0.016	0.019	0.025	0.038	0.048	0.060	0.061	0.063	0.064	0.066	0.067	0.062	0.049	0.005	0.000	0.000	0.000	0.000	0.665	11.170
BAMB	0.114	0.095	0.057	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.471	4.599
BAT	0.157	0.168	0.174	0.173	0.167	0.158	0.121	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.298	4.504
TOTAL	0.000	0.000	0.000	0.007	0.046	0.085	0.118	0.154	0.175	0.166	0.158	0.149	0.140	0.132	0.104	0.029	0.000	0.000	0.000	0.000	0.000	0.597	5.851
PORT	0.044	0.047	0.050	0.051	0.046	0.041	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.062	10.499
KNM	0.012	0.013	0.013	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.195	10.428
KENOL	0.027	0.044	0.061	0.084	0.125	0.168	0.197	0.220	0.216	0.181	0.145	0.110	0.075	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.546	5.639
FIRE	0.000	0.043	0.076	0.085	0.068	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.107	4.568
EAPACK	0.076	0.082	0.085	0.087	0.082	0.078	0.058	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.129	10.482
EACABL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074	9.905
EABL	0.158	0.181	0.204	0.222	0.234	0.249	0.261	0.275	0.267	0.218	0.168	0.119	0.069	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.497	4.739
DUN	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.010	6.882
UNGA	0.010	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.403	11.682
KPLC	0.127	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.397	3.434
Total Weight	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The weekly risk- return for the sector deteriorated during the period. A total of 8 stocks out of 17 recorded negative weekly returns. CARB had the highest weekly return of 2.714% but with a risk of 28.757%! DUN was the worst with a weekly return of –1.01% and a risk of 6.882%. We constructed 21 portfolios during the period. The stocks included in each of the portfolio set ranged from 2 to 13 stocks. CARB and CBERG featured in most of the portfolio formations, indicating superior performance over the other stocks.

Figure 21: Industrial Portfolio Return for 1999



The efficient frontier deteriorated as compared to 1998. As indicated in **Table 17**, majority of the stocks had negative weekly return with the exception of CARB, Cberg, ATHI, TOTAL, KENOL, EABL, FIRE and EACABLES. As can be seen from the graph, CARB was the riskiest stock. A risk seeker would have preferred to invest in CARB and as well expect to be compensated for the high-risk undertaken.

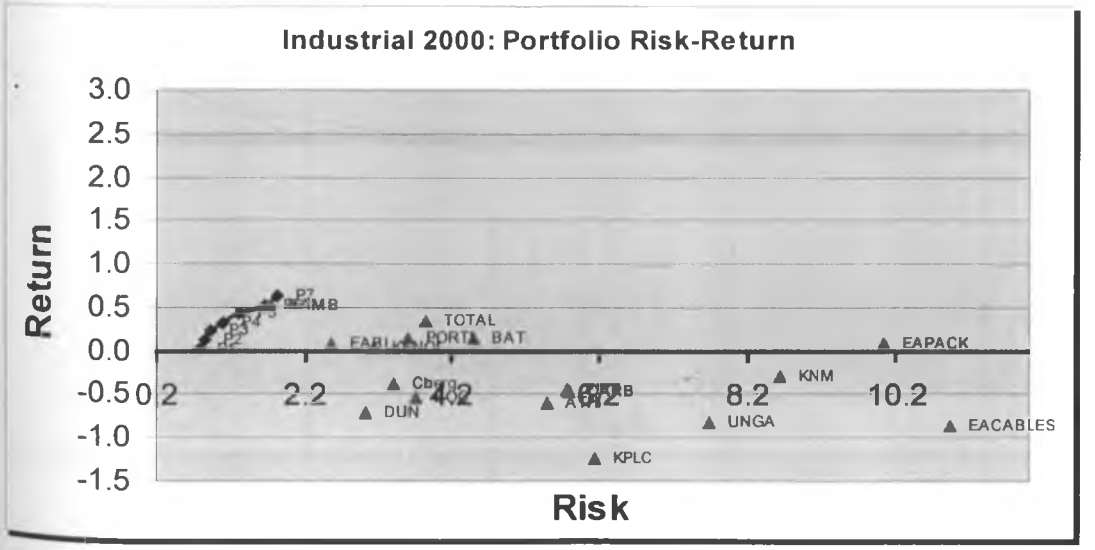
4.4.4 **Risk-Return for the year 2000**

Table 18: Industrial Risk-Return for the year 2000

Year 2000									
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7		
(In %)									
Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625		
Risk(Standard Deviation)	0.768	0.840	0.936	1.084	1.301	1.667	1.818		
Numbers of Stocks	15	14	12	10	7	2	1	Weekly Return	Risk
				Portfolio Weights					
BOC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.525	3.691
CARB	0.052	0.046	0.036	0.012	0.000	0.000	0.000	-0.466	5.786
CBERG	0.122	0.105	0.080	0.030	0.000	0.000	0.000	-0.378	3.393
ATHI	0.006	0.000	0.000	0.000	0.000	0.000	0.000	-0.602	5.496
BAMB	0.332	0.407	0.486	0.599	0.734	0.974	1.062	0.526	1.710
BAT	0.041	0.046	0.050	0.047	0.040	0.000	0.000	0.140	4.494
TOTAL	0.014	0.015	0.019	0.037	0.067	0.026	0.000	0.335	3.846
PORT	0.041	0.050	0.055	0.049	0.024	0.000	0.000	0.144	3.584
KNM	0.026	0.027	0.028	0.025	0.015	0.000	0.000	-0.290	8.645
KENOL	0.095	0.080	0.071	0.068	0.046	0.000	0.000	0.045	3.128
FIRE	0.016	0.015	0.012	0.000	0.000	0.000	0.000	-0.446	5.762
EAPACK	0.013	0.009	0.005	0.000	0.000	0.000	0.000	0.071	10.041
EACABL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.867	10.947
EABL	0.136	0.145	0.147	0.122	0.073	0.000	0.000	0.089	2.561
DUN	0.063	0.026	0.000	0.000	0.000	0.000	0.000	-0.705	3.020
UNGA	0.008	0.011	0.012	0.010	0.000	0.000	0.000	-0.830	7.687
KPLC	0.036	0.018	0.000	0.000	0.000	0.000	0.000	-1.245	6.135
Total Weight	1	1	1	1	1	1	1		

The situation was much worse than in1999. A total of 10 stocks out of 17 stocks recorded negative weekly returns. BAMB had the highest weekly return of 0.526%, but with a very high risk of 1.71%. We constructed 7 portfolios and stocks included in them ranged from 1 to 15. Portfolios 1 to 4 were the most diversified. BAMB appeared in all the portfolios constructed indicating superior performance over the others. An investor investing in portfolio 7 would have been required to borrow more funds in order to attain that level of investment.

Figure 22: Industrial Portfolio Return for 2000



The efficient frontier deteriorated further in 2000. BAMB was the best in terms of weekly risk-return relationship. KPLC was the worst stock. EACABLES was the riskiest stock.

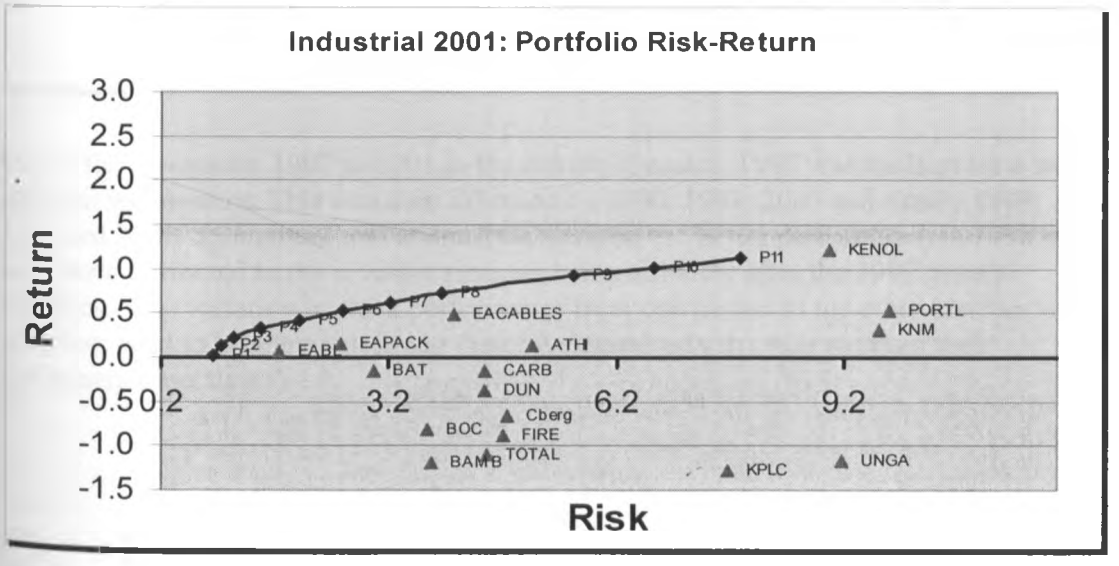
4.4.5 **Risk-Return for the year 2001**

Table 19: Industrial Risk-Return for the year 2001

Year 2001													
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Port 11		
(In %) Weekly Return(Estimated)	0.025	0.125	0.225	0.325	0.425	0.525	0.625	0.725	0.925	1.025	1.125		
Risk(Standard Deviation)	0.867	0.983	1.152	1.506	2.016	2.598	3.221	3.898	5.626	6.692	7.830		
Numbers of Stocks	11	12	8	7	7	7	6	5	3	3	3	Weekly Return	Risk
				Portfolio Weights									
BOC	0.041	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.813	3.720
CARB	0.032	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.154	4.469
CBERG	0.054	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.852	4.763
ATHI	0.025	0.040	0.056	0.070	0.076	0.081	0.065	0.025	0.000	0.000	0.000	0.123	5.093
BAMB	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.193	3.767
BAT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.152	2.989
TOTAL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.110	4.504
PORT	0.000	0.015	0.032	0.048	0.064	0.080	0.096	0.111	0.112	0.106	0.099	0.531	9.802
KNM	0.019	0.023	0.025	0.029	0.033	0.038	0.041	0.044	0.000	0.000	0.000	0.307	9.653
KENOL	0.059	0.067	0.082	0.121	0.173	0.225	0.282	0.346	0.594	0.729	0.865	1.224	9.005
FIRE	0.032	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.881	4.724
EAPACK	0.232	0.246	0.266	0.256	0.227	0.197	0.119	0.000	0.000	0.000	0.000	0.159	2.561
EACABL	0.033	0.044	0.075	0.146	0.231	0.315	0.397	0.475	0.294	0.165	0.036	0.478	4.069
EABL	0.384	0.418	0.425	0.329	0.197	0.065	0.000	0.000	0.000	0.000	0.000	0.065	1.757
DUN	0.089	0.077	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.383	4.465
UNGA	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.167	9.177
KPLC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.277	7.689
Total Weight	1	1	1	1	1	1	1	1	1	1	1		

The situation was not impressive in 2001. The highest return of 1.224% was recorded by KENOL but with the highest risk of 9.005%! We managed to construct 11 portfolios with the highest having a return of 1.125% but with a risk of 7.83%. Number of stocks included in each of the stock ranged from 3 to 11 stocks. EACABL and KENOL appeared in all the portfolio formation indicating superior performance over the other stocks in the sector during the period.

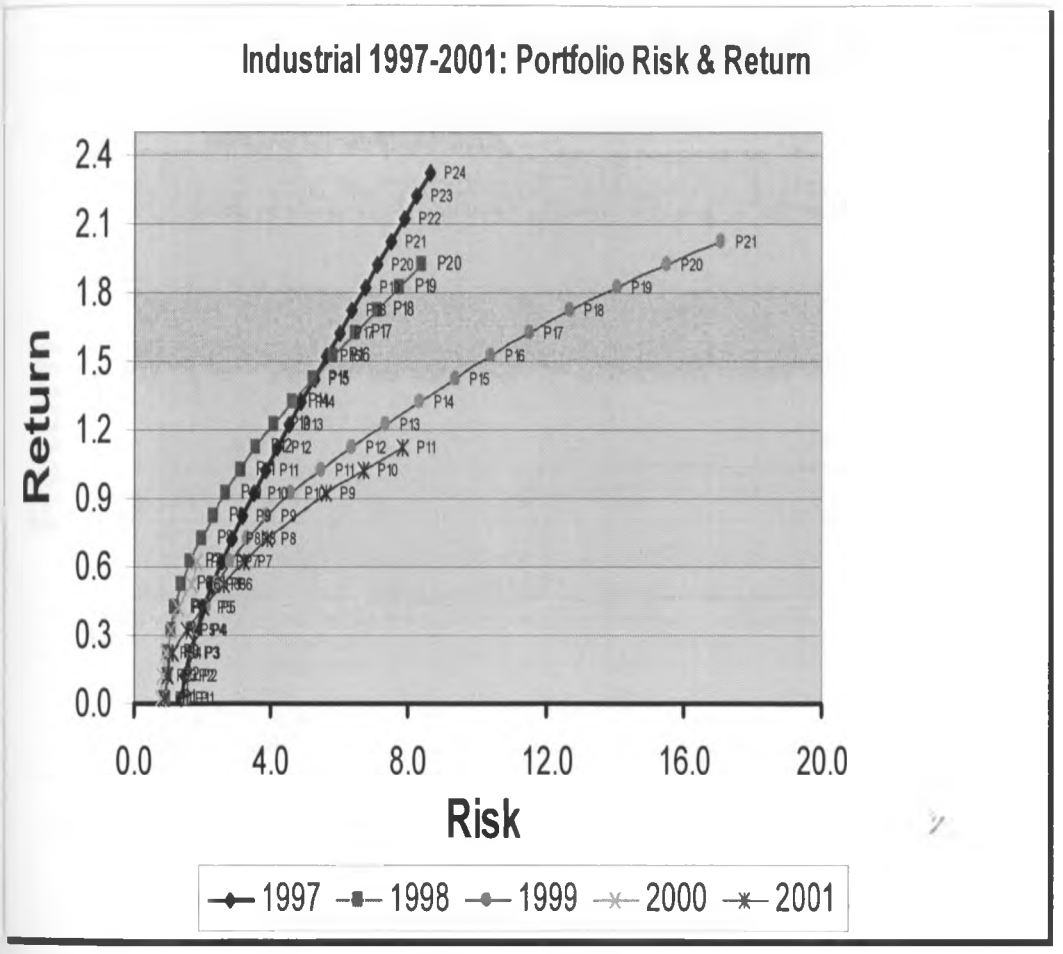
Figure 23: Industrial Portfolio Return for 2001



The number of stocks with negative weekly returns stood at 10. KPLC exhibited the worst performance. PORT was the riskiest stock.

4.4.6 **Industrial Portfolio Risk-Return comparisons for the years 1997 to 2001**

Figure 24: Industrial Portfolio Risk-Return for the years 1997 to 2001

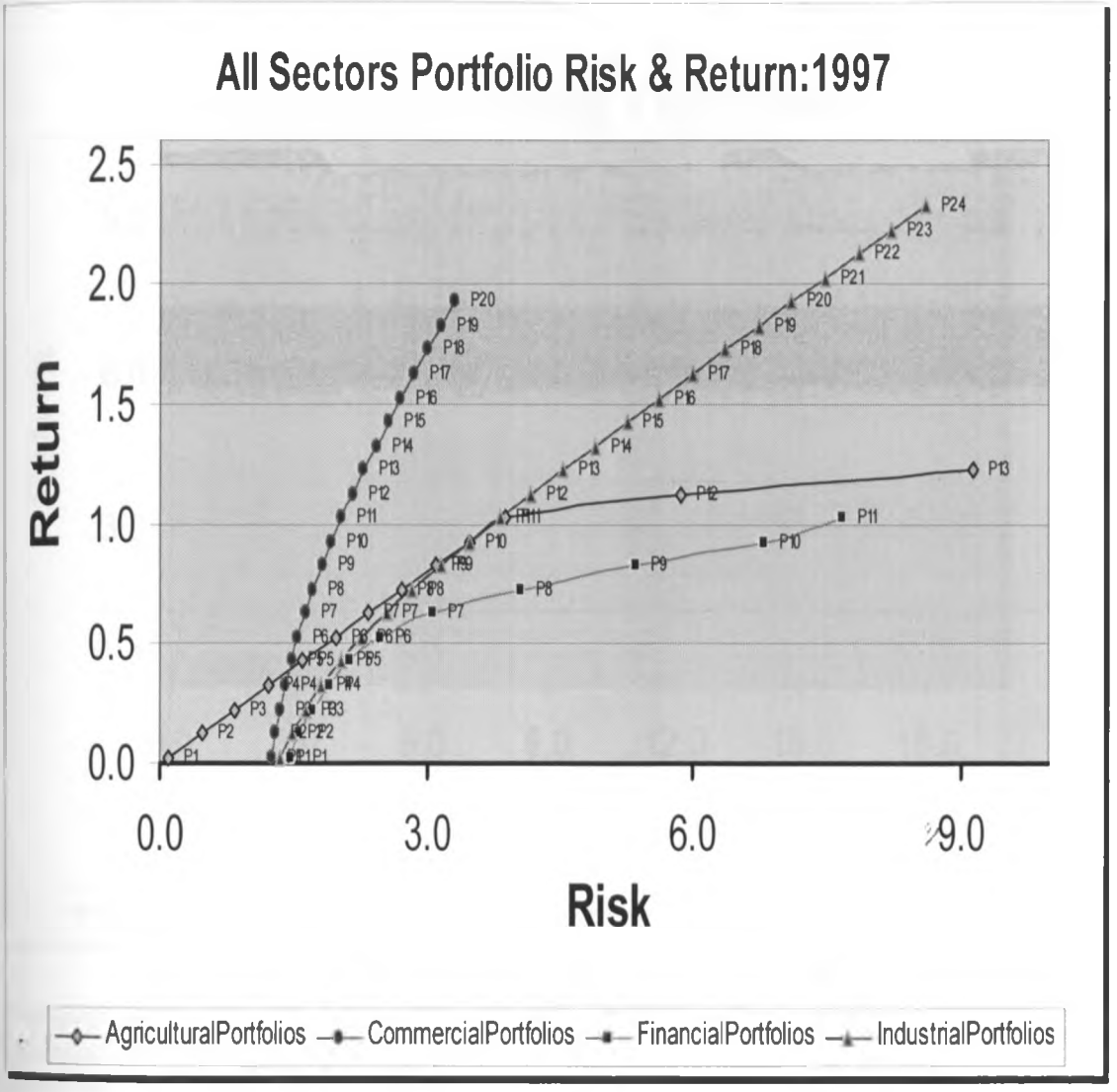


Out of the 5 years i.e. 1997 to 2001 in the industrial sector, 1998 was the best for a wealth maximizing investor. This was then followed by 2000, 1997, 2001 and finally 1999. As noted in the agricultural and commercial sectors, the better performance in 1998 may have been attributed to the investor sentiments immediately after the 1997 general elections. The variation in stock performance from one period to the other justifies why investors need to keep on redefining their investment mix in order to attain their investment objective(s).

4.5 Inter- Sectoral Portfolio Return Characteristics Comparisons-Graphs

4.5.1 Comparison for the year 1997

Figure 20: All sector comparison for 1997

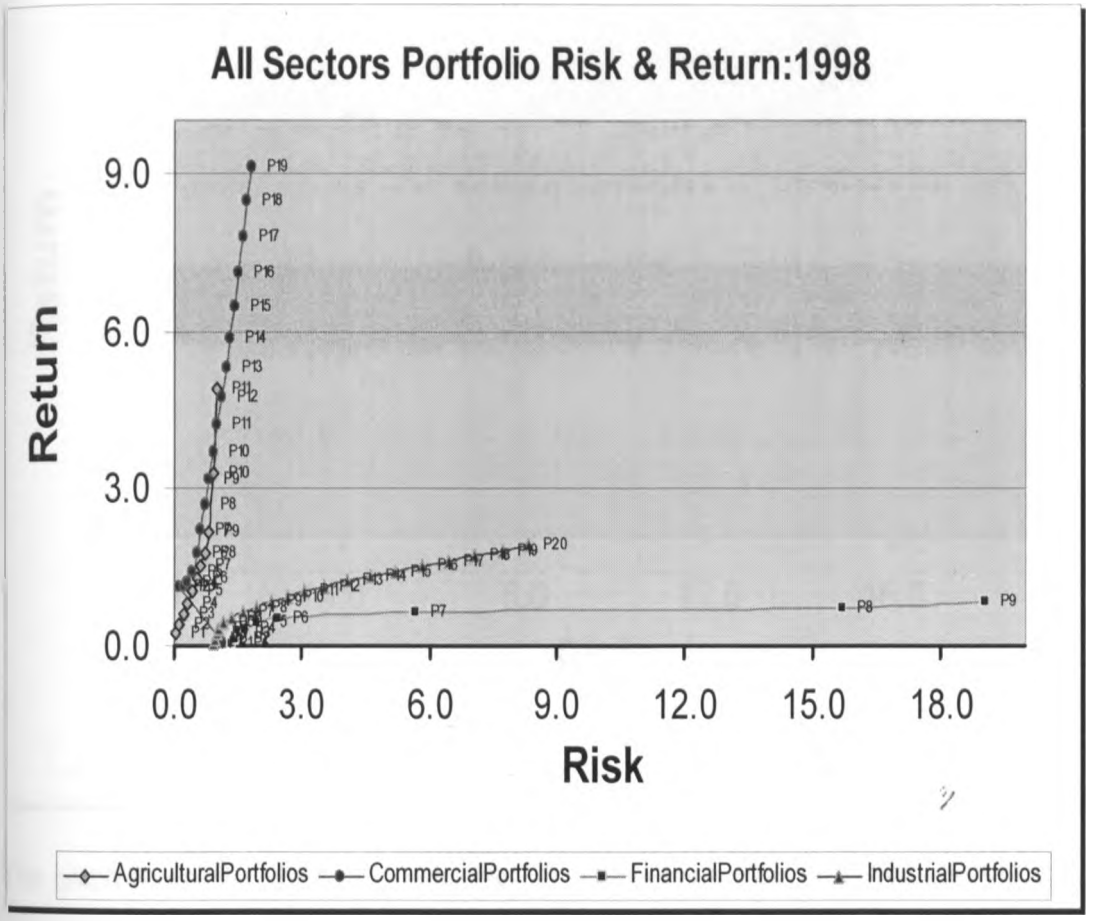


The graph shows the efficient frontier for all the market sectors at the Nairobi Stock Exchange for 1997. The efficient frontier for commercial sector was the best compared to the other 3 sectors. The commercial sector was then followed by the agricultural sector. In third place came the industrial sector and then finally the financial sector. The graph documents observable significant portfolio risk-return characteristics across the sectors. For instance, the commercial sector efficient portfolio is far much superior compared to the other 3 sectors. Another deduction from the above graph is where the efficient frontiers inter-cross each other. For instance, the agricultural sector efficient frontier intercrossed that one of commercial. What it means is that investors would have been

indifferent as to which sector to invest in. This is a common feature through out our analysis.

4.5.2 Comparison for the year 1998

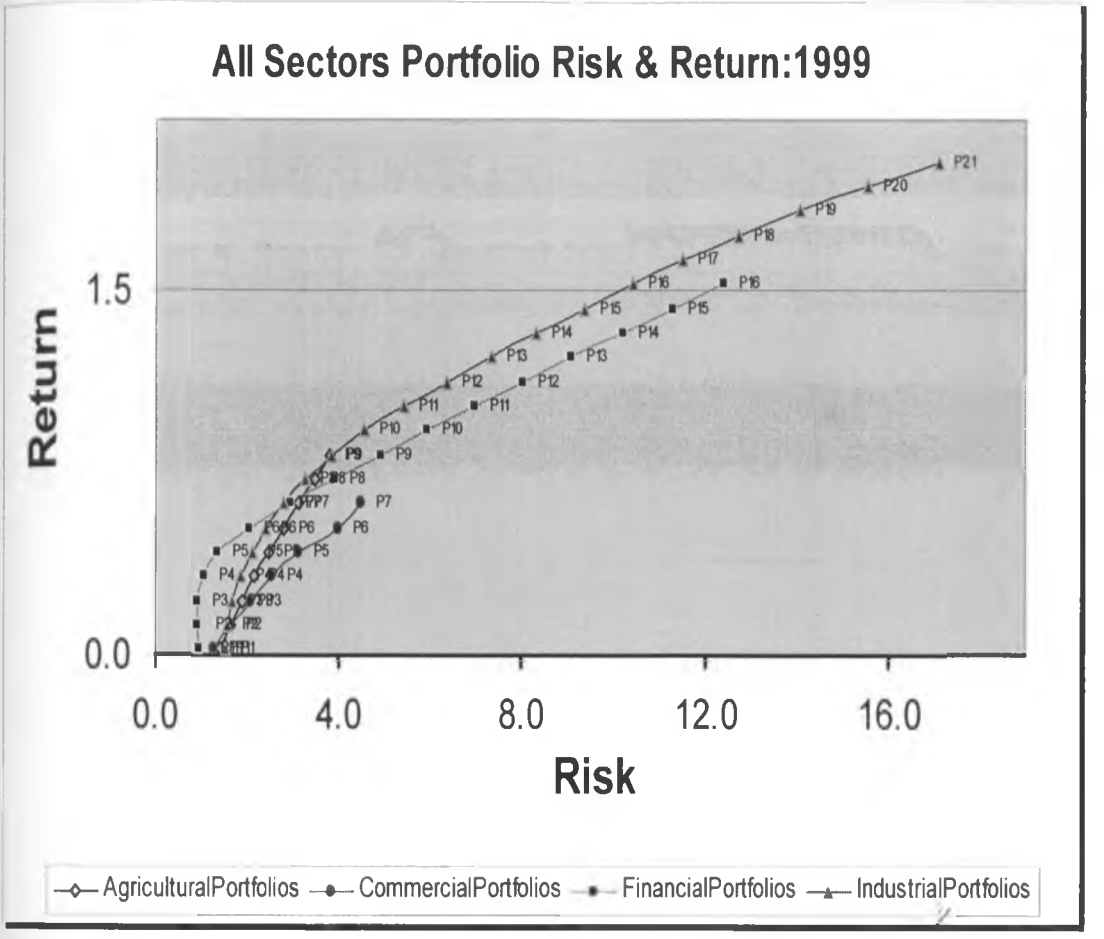
Figure 21: All sector comparison for 1998



The graph shows the efficient frontiers for all the market sectors at the Nairobi Stock Exchange for 1998. As in 1997, the efficient frontier for commercial sector was the best compared to the other 3 sectors. The commercial sector was then followed by the agricultural sector. The efficient frontier for commercial and agricultural sectors showed remarkable improvement as compared to 1997. As seen in our earlier analysis, this trend was consistent with the good return-risk recorded by individual company stocks in these 2 sectors. Ranked number 3 was the industrial sector while the financial sector was ranked 4th. Again, as noted earlier there were significant differences in portfolio risk-return characteristics across the sectors. The commercial and agricultural sectors portfolio risk-return characteristics departed significantly from the industrial and financial sectors. As noted earlier, where the efficient frontiers inter-crossed, it meant that investors would have been indifferent as to which sector to invest in.

4.5.3 Comparison for the year 1999

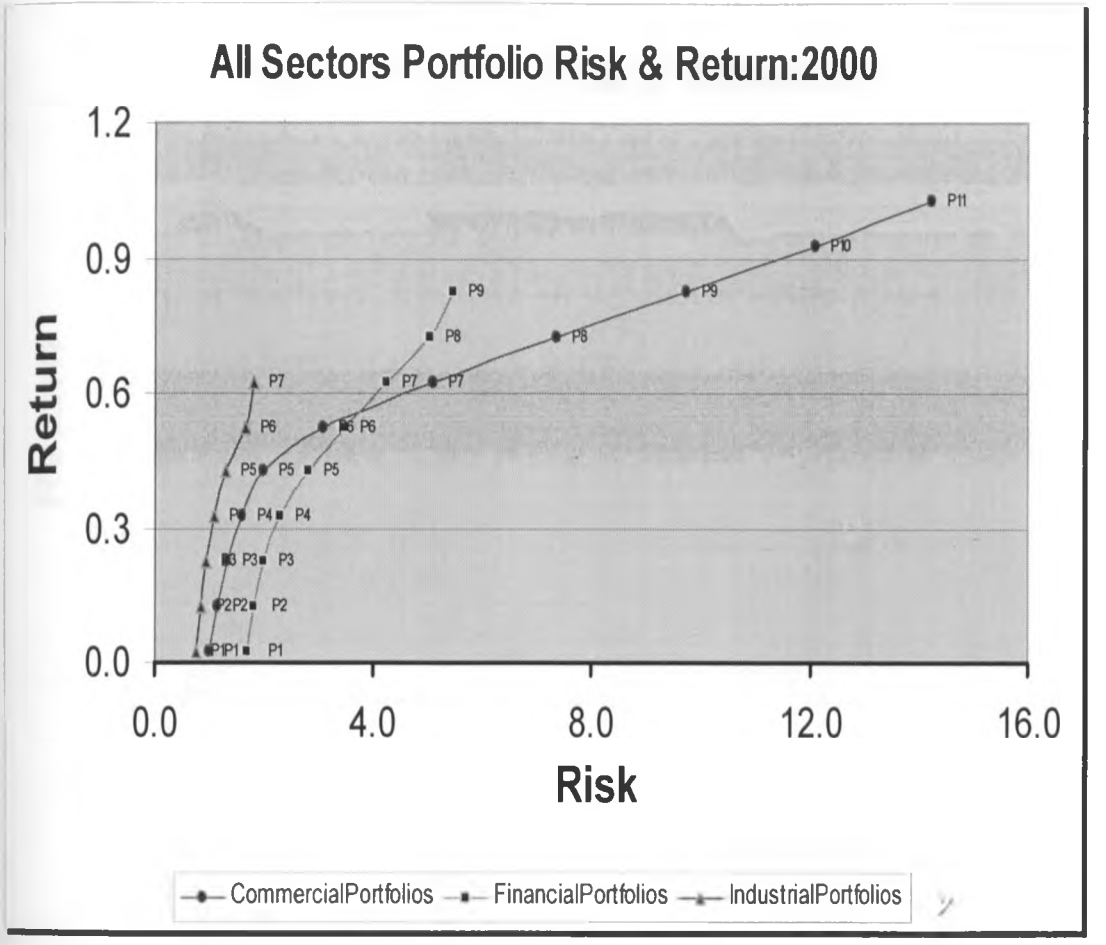
Figure 22: All sector comparison for 1999



The graph shows the efficient frontiers for all the market sectors at the Nairobi Stock Exchange for the period 1999. In 1999, the efficient frontier for financial sector emerged the best compared to the other 3 sectors. The financial sector was then followed by the industrial sector. Ranked number 3 was the agricultural while the commercial sector was ranked 4th. The efficient frontiers for all the market sectors at the Nairobi Stock exchange deteriorated during the period. This was a reflection of the poor performance and return volatility exhibited by individual stocks across all the market sectors. The differences between market sectors were not as significant as in 1997 and 1998. Industrial and financial sectors presented the widest portfolio formations. The inter crossing of efficient frontiers is documented elsewhere.

4.5.4 Comparison for the year 2000

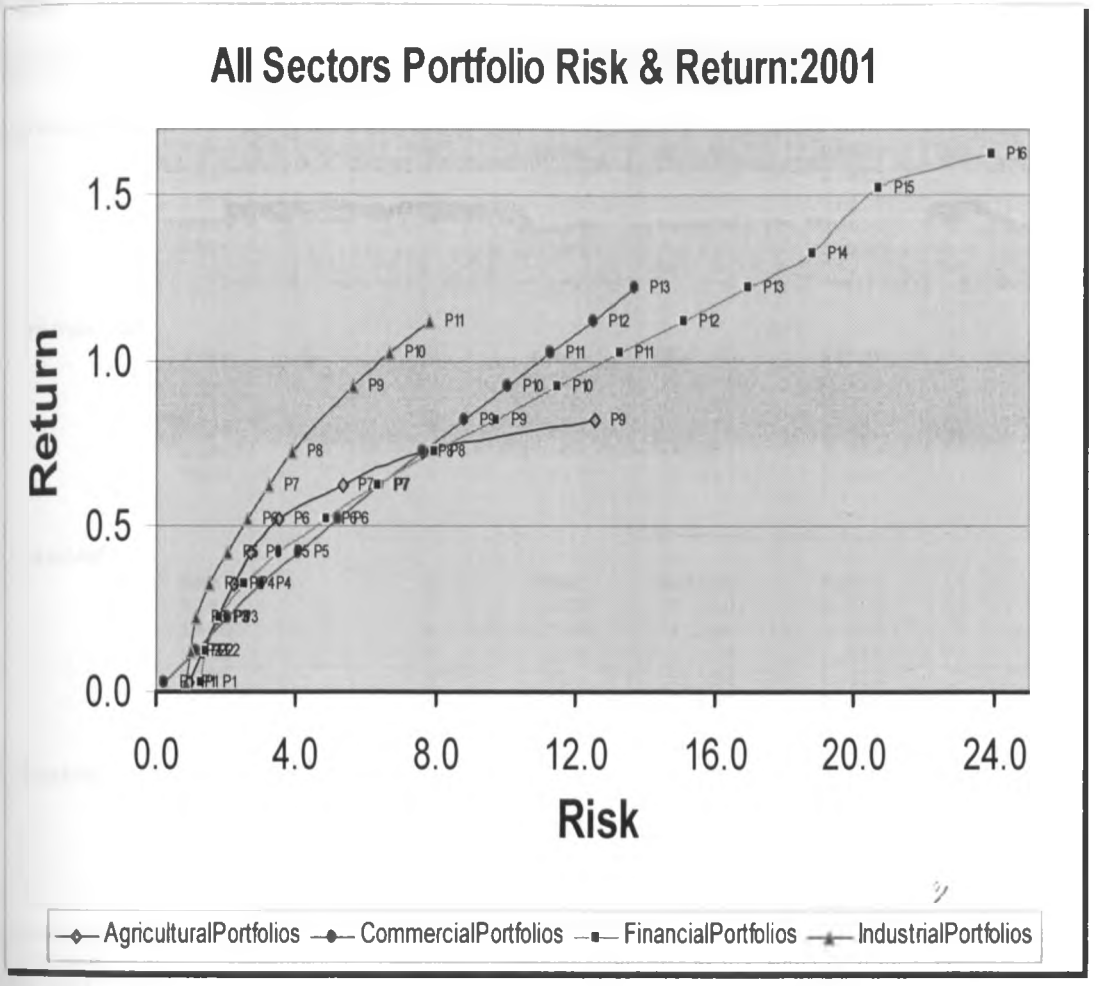
Figure 23: All sector comparison for 2000



The graph shows the efficient frontiers for all the market sectors (with the exception of agriculture) at the Nairobi Stock Exchange for the period 2000. In 2000, the efficient frontier for industrial sector emerged the best compared to the other 2 sectors. The industrial sector was then followed by the commercial sector. Ranked number 3 was the financial sector We were not able to generate portfolio formations for the agricultural sector in 2000 as almost all the stocks in the sector had negative returns. The target return that we set was all positive. No investor places his/her investment with the intention of making losses. In which case, if negative returns dominate the set then we will not expect any solution. The differences between market sectors were not as significant as in 1997 and 1998. The commercial sector had the largest portfolio formations than any other sector.

4.5.5 **Comparison for the year 2001**

Figure 24: All sector comparison for 2000



The graph shows the efficient frontiers for all the market sectors at the Nairobi Stock Exchange for the period 2001. In 2001, the efficient frontier for industrial sector emerged the best compared to the other 3 sectors. The industrial sector was then followed by the agricultural sector. Ranked number 3 was the financial sector while the commercial was the 4th Evidently the graph depicts significant differences in the formation of the efficient frontiers. For instance, there was significant difference between the industrial sector and the commercial sector. The financial sector had the largest portfolio formations. We also observed the inter-crossing of efficient frontiers. The implication of this is that investors would have been indifferent as to which sector to invest in.

4.6 Yearly Sectoral Portfolio Return Characteristics Comparisons-Statistics

4.6.1 Descriptive statistics

Table 20: Descriptive statistics: Risk

Descriptive Statistics (Weekly %): Risk

Agricultural

Year	N	Mean	Median	StDev
1997	7	1.223	1.223	0.813
1998	7	0.834	0.805	0.464
1999	7	2.233	2.176	0.611
2001	7	2.543	2.221	1.513

Commercial

Year	N	Mean	Median	StDev
1997	20	2.100	1.984	0.661
1998	13	2.602	2.196	1.491
1999	7	2.754	2.561	1.193
2000	6	1.689	1.457	0.769
2001	6	2.617	2.517	1.863

Financial

Year	N	Mean	Median	StDev
1997	7	2.049	1.910	0.566
1998	6	1.736	1.609	0.403
1999	9	2.134	1.378	1.486
2000	8	2.920	2.556	1.222
2001	6	2.557	2.137	1.396

Industrial

Year	N	Mean	Median	StDev
1997	18	3.517	3.325	1.639
1998	15	2.374	1.956	1.435
1999	12	3.132	2.618	1.619
2000	7	1.202	1.084	0.410
2001	8	2.030	1.761	1.116

The table gives a summary of the descriptive statistics (mean, median and standard deviation) of the weekly risk on the quoted stocks for the Agricultural, Commercial, Financial and Industrial sectors for the period from 1997 to 2001.

The Agricultural sector weekly risk standard deviation ranged between 0.813% and 1.513%. The average weekly risk for the sector ranged between 0.834% and 2.543%.

The Commercial sector weekly risk standard deviation ranged between 0.661% and 1.863%. The average weekly risk for the sector ranged between 1.689% and 2.754%.

The Financial sector weekly risk standard deviation ranged between 0.403% and 1.486%. The average weekly risk for the sector ranged between 1.736% and 2.920%.

The Industrial sector weekly risk standard deviation ranged between 0.410% and 1.639%. The average weekly risk for the sector ranged between 1.202% and 3,517%.

4.6.2 One-Way ANOVA

Table 21: One-way ANOVA Statistics (Weekly %): Risk

Agriculture

DF	SS	MS	F	P
3	13.810	4.603	5.21	0.007

Year	N	Mean	StDev
1997	7	1.2226	0.8127
1998	7	0.8340	0.4638
1999	7	2.2331	0.6107
2001	7	2.5433	1.5126

Pooled StDev = 0.9403

Individual 95% CIs For Mean Based on Pooled StDev

Commercial

DF	SS	MS	F	P
4	6.24	1.56	1.15	0.346

Year	N	Mean	StDev
1997	20	2.100	0.661
1998	13	2.602	1.491
1999	7	2.754	1.193
2000	6	1.689	0.769
2001	6	2.617	1.863

Pooled StDev = 1.165

Individual 95% CIs For Mean Based on Pooled StDev

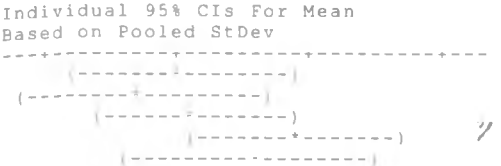
Financial

DF	SS	MS	F	P
4	6.08	1.52	1.16	0.347

Year	N	Mean	StDev
1997	7	2.049	0.566
1998	6	1.736	0.403
1999	9	2.134	1.486
2000	8	2.920	1.222
2001	6	2.557	1.396

Pooled StDev = 1.144

Individual 95% CIs For Mean Based on Pooled StDev



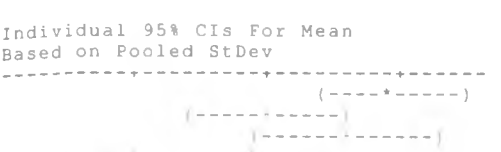
Industrial

DF	SS	MS	F	P
4	35.14	8.78	4.27	0.004

Year	N	Mean	StDev
1997	18	3.517	1.639
1998	15	2.374	1.435
1999	12	3.132	1.619
2000	7	1.202	0.410
2001	8	2.030	1.116

Pooled StDev = 1.434

Individual 95% CIs For Mean Based on Pooled StDev



The table gives a summary of the yearly analysis of the variance (ANOVA) at 95% confidence level of the weekly risk of the quoted stocks for the Agricultural, Commercial, Financial and Industrial sectors for the period from 1997 to 2001.

The results as denoted by the P-VALUE indicate that only Agriculture and Industrial sectors weekly risk characteristics for the period 1997 to 2001 were significantly different. As for the Commercial and Financial sectors, the weekly risk characteristics for the period were not significantly different.

4.7 Inter- Sectoral Portfolio Return Characteristics Comparisons-Analysis of Variance (ANOVA)

Table 22: One-way ANOVA Statistics (Weekly %): Risk

Year: 1997

	DF	SS	MS	F	P
	3	34.60	11.53	9.25	**0.000**

Individual 95% CIs For Mean Based on Pooled StDev

	N	Mean	StDev
Agriculture	7	1.223	0.813
Commercial	20	2.100	0.661
Financial	7	2.049	0.566
Industrial	18	3.517	1.639

Pooled StDev = 1.117

1.0 2.0 3.0

Year: 1998

	DF	SS	MS	F	P
	3	16.42	5.47	3.51	**0.024**

Individual 95% CIs For Mean Based on Pooled StDev

	N	Mean	StDev
Agriculture	7	0.834	0.464
Commercial	13	2.602	1.491
Financial	6	1.736	0.403
Industrial	15	2.374	1.435

Pooled StDev = 1.248

0.0 1.0 2.0 3.0

Year: 1999

	DF	SS	MS	F	P
	3	6.45	2.15	1.16	**0.339**

Individual 95% CIs For Mean Based on Pooled StDev

	N	Mean	StDev
Agriculture	7	2.233	0.611
Commercial	7	2.754	1.193
Financial	9	2.134	1.486
Industrial	12	3.132	1.619

Pooled StDev = 1.359

1.60 2.40 3.20 4.00

Year: 2000

	DF	SS	MS	F	P
	2	11.815	5.907	7.38	**0.005**

Individual 95% CIs For Mean Based on Pooled StDev

Level	N	Mean	StDev
Commercial	6	1.6888	0.7685
Financial	8	2.9203	1.2220
Industrial	7	1.2020	0.4102

Pooled StDev = 0.8949

1.0 2.0 3.0 4.0

Year: 2001

	DF	SS	MS	F	P
	3	1.67	0.56	0.26	**0.855**

Individual 95% CIs For Mean Based on Pooled StDev

	N	Mean	StDev
Agriculture	7	2.543	1.513
Commercial	6	2.617	1.863
Financial	6	2.557	1.396
Industrial	8	2.030	1.116

Pooled StDev = 1.468

1.60 2.40 3.20

The table gives a summary comparison of the yearly analysis of the variance (ANOVA) at 95% confidence level of the weekly risk of the quoted stocks across the Agricultural, Commercial, Financial and Industrial sectors for the period from 1997 to 2001.

The results as denoted by the P-VALUE indicate that for the years 1997, 1998 and 2000, there were significant differences between sectors in terms of the weekly risk characteristics. In 1999 and 2001, the weekly risk characteristics were not significantly different between sectors.

CHAPTER 5: SUMMARY FINDINGS &CONCLUSION

5.1 Findings

The analysis of sectoral portfolio return characteristics does indicate that there are significant differences between sectors in terms of return and risk. The portfolio return characteristics do not only differ across sectors but also from one period to the other. We were able to establish that these differences are intermittent i.e. not steady. The existence of these risk-return differences is a manifestation of the inherent differences in market conditions and sector characteristics.

Empirical evidence suggests that stock returns across market sectors are not uniform. According to Fama and French (1992, 1996), much of the cross sectional variation in equity returns can be explained by firm characteristics such as market capitalization, price-to-earnings ratios, change in operating earnings and book-to-market ratios. They examine many of these factors simultaneously and conclude that size and book-to-market, explain the majority of the cross sectional variation in stock returns.

According to Pouchkarev, Spronk and Vliet (2003), the environment in which new economy firms operate is dynamic. The environment is characterized by rapid technological change and versatile interaction. In this environment, pro-active management style becomes a core competence. Growth potential depends on firm specific factors e.g. management's capability to identify and exploit valuable growth options, or the number of strategic alliances, and the rate of technological change within a sector.

In this study we were able to pick up risk-return differences between sectors by modeling the past performance of different combinations of stocks within market

sectors. These differences were significant enough to influence investor choice while determining which stocks to include in the investment basket. The inter-sector and periodic stock performance differentials justify why investors need to regularly appraise and keep on redefining their investment choice in relation to their investment objective(s).

While the commercial sector risk-return dominated the other sectors in 1997 and 1998, the industrial sector dominated in 2000 and 2001. The financial sector dominated in 1999. This is an interesting observation for the investor. It means that market conditions are difficult to predict and usually can be identified only after they exist.

Another deduction from this study is that diversification of investments reduces risk and thus improving the risk-return relationship of investments held by an investor. In all the sectors analysed in **Chapter 4**, it clearly emerged that individual company stock risk-return were inferior to the risk- return recorded by investment portfolios constructed in this study.

5.2 Recommendations

The study sought to establish whether by comparing portfolios across sectors, we might conclude that discriminating conditions exist to warrant incurring search costs and additional security analysis required of investors when selecting assets (shares) from individual sectors to include in the portfolio.

The investor's dilemma is at two levels. First is choosing assets to include in a portfolio. In choosing the assets to include in the portfolio, the risk -return trade off features prominently. Secondly is choosing the best portfolio.

In this case it makes sense for an investor to perform security analysis for each sector, as the risk and return characteristics differ significantly across sectors.

Also a similar analysis should be carried from one period to the other. This way the investor's dilemma is resolved.

5.3 Problems and Limitations

The project was not without limitations.

A project of this magnitude requires ample time and financial resources to be able to achieve a wide coverage. In this project, our coverage was limited to a period of 5 years i.e. from 1997 to 2001. With abundant resources, a wide coverage of say 10 years would have been more ideal to give a better picture of the behaviour of the portfolio return characteristics of the different sectors over a long period of time.

5.4 Suggestions for future work

In this study, a new way of looking at the stock market performance of different market sectors and their differences has been introduced and illustrated. A number of refinements and extensions can be made though. It is recommended that the project be modified later to enable:

- Construction of portfolios that entail all the listed stock market sectors (market portfolios) and comparing the same with the individual market sectors.
- Establishing firm and sector characteristics at the Nairobi Stock Exchange (e.g. capital structure, asset base, management style etc.) and relate to the portfolio return characteristics.
- Study of the macro-economic variables over a period of time and how such variables have impacted on the portfolio return characteristics of the different market sectors at the Nairobi Stock Exchange.

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APPENDICES

Appendix A-List of companies quoted at N.S.E. as at 1st January 1997

	Company Name	Short Name
	Agricultural Sector	
1.	Brooke Bond Ltd.	BBOND
2.	George Williamson Kenya Ltd.	GWK
3.	Kakuzi	KAKUZI
4.	Kapchorua Tea Co. Ltd	KAPCHO
5.	Limuru Tea Co. Ltd	LIMTEA
6.	Rea Vipingo Plantations Ltd.	REAVIP
7.	Sasini Tea & Coffee Ltd	SASINI
8.	Eaagads Ltd.	EAGADS
	Commercial Sector	
1.	A.Baumann & Co.Ltd	ABOUM
2.	Uchumi Supermarket Ltd.	UCHUMI
3.	Car & General (K) Ltd	CGEN
4.	CMC Holdings Ltd	CMC
5.	Express Ltd	EXPRES
6.	Kenya Airways Ltd	KENAIR
7.	Marshalls (E.A.) Ltd	MARSH
8.	Nation Media Group	NMG
9.	Tourism Promotion Services Ltd (Serena)	SERENA
10.	Standard Newspaper Group	SMG
	Financial Sector	
1.	Barclays Bank Ltd	BBK
2.	C.F.C Bank Ltd	CFC
3.	City Trust Ltd	CTRUST
4.	Diamond Trust Bank Kenya Ltd	DTK
5.	Housing Finance Co Ltd	HFCK
6.	I.C.D.C Investments Co Ltd	ICDC
7.	Jubilee Insurance Co. Ltd	JUB
8.	Kenya Commercial Bank Ltd	KCB
9.	National Bank of Kenya Ltd	NBK
10:	National Industrial Credit Ltd	NIC
11.	Barclays Bank Ltd	PANAFR
12.	Standard Chartered Bank Ltd	SCB
13.	NIC Bank Ltd.	NICB
	Industrial Sector	
1.	Athi River Mining	ARM
2.	Bamburi Cement Ltd	BAMB
3.	British American Tobacco Kenya Ltd	BAT
4.	B.O.C Kenya Ltd	BOC
5.	Carbacid Investments Ltd	CARB
6.	Crown Berger Ltd	CBERG
7.	Dunlop Kenya	DUN

8.	East African Breweries Ltd	EABL
9.	E.A.Cables Ltd	EACABL
10.	E.A.Packaging Ltd	EAPACK
11.	E.A.Portland Cement Ltd	EAPORT
12.	Firestone East Africa Ltd	FIRE
13.	Kenya Oil Co Ltd	KENOL
14.	Kenya National Mills Ltd	KNM
15.	Kenya Power & Lighting Ltd	KPLC
16.	Total Kenya Ltd	TOTAL
17.	Unga Group Ltd	UNGA

Total count=48

Appendix B-Key Definitions

Expected Return is the return on a portfolio of assets that an investor anticipates receiving over a period of time.

Risk is defined as the uncertainty associated with the end of period value of an investment.

The **variance** (or standard deviation) measures the dispersion of returns around the expected return. It is our measure of risk in this study. The standard deviation is the square root of the variance. The idea is that the greater the dispersion of possible outcomes the greater the variance or standard deviation.

Variance-Covariance Matrix is a table that symmetrically arrays the covariance between a number of random variables. Variances of the random variables lie on a diagonal of matrix, whereas covariance's between the random variables lie above and below the diagonal.

Correlation Coefficient is a statistical measure similar to covariance. It measures the degree of mutual variation between two random variables. It re-scales covariance to facilitate comparisons across among pairs of random variables. The value +1 and -1 bound this coefficient.

Portfolio is a collection of investments. It can be a collection of securities (stocks and bonds) or assets such as buildings, inventories, trademarks, patents etc.

Diversification refers to the combination of assets whose returns do not vary with one another in the same direction and at the same time.

Appendix C-Sector Returns

Agriculture 1997

WeekEnd	Series	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
03-Jan-97	40	1.02	9.85	0.65	0.00	0.00	0.00	0.26	0.00
10-Jan-97	41	-7.75	-0.97	2.92	0.00	0.00	0.00	0.60	0.00
17-Jan-97	42	-4.73	10.54	10.66	0.00	0.00	0.51	4.10	0.00
24-Jan-97	43	-0.66	5.93	9.43	0.00	0.00	2.02	0.00	0.00
31-Jan-97	44	0.61	-12.75	-14.28	0.00	0.00	-0.49	-0.23	0.00
07-Feb-97	45	0.63	10.83	2.84	0.00	0.00	0.45	0.23	0.00
14-Feb-97	46	-0.02	0.51	11.74	0.00	0.00	0.06	0.85	0.00
21-Feb-97	47	-0.06	0.00	-2.42	0.00	0.00	0.97	0.12	0.00
28-Feb-97	48	0.57	2.12	-13.72	0.00	0.00	0.56	0.00	0.00
07-Mar-97	49	0.00	-0.05	-2.03	0.00	0.00	1.24	-0.52	0.00
14-Mar-97	50	-4.86	7.06	-1.60	0.00	0.00	-2.15	-0.46	0.97
21-Mar-97	51	-4.69	-5.09	-6.68	0.00	0.00	0.39	-0.29	0.00
28-Mar-97	52	-4.07	-0.23	-3.11	0.00	0.00	0.00	0.00	0.48
04-Apr-97	53	-6.96	2.28	-0.72	0.00	0.00	0.70	-2.96	-0.09
11-Apr-97	54	-1.40	-1.49	-1.09	0.00	0.00	-0.67	-1.21	0.01
18-Apr-97	55	2.50	3.94	5.35	0.00	0.00	0.00	-0.29	-0.39
25-Apr-97	56	-0.17	-3.05	-3.83	0.00	0.00	0.00	-0.05	0.00
02-May-97	57	1.62	-0.67	0.04	0.00	0.00	0.56	0.71	0.00
09-May-97	58	-0.68	4.85	-0.34	0.00	0.00	-0.34	-0.71	0.00
16-May-97	59	-0.99	-4.38	0.19	0.00	0.00	0.71	0.00	0.00
23-May-97	60	0.55	0.32	-1.19	0.00	0.00	0.32	-1.16	0.00
30-May-97	61	0.61	0.16	0.40	0.00	0.00	1.51	-0.27	0.00
06-Jun-97	62	-3.50	2.28	0.07	0.00	0.00	-8.49	1.45	0.00
13-Jun-97	63	4.09	0.69	1.33	0.00	0.00	12.05	0.00	0.00
20-Jun-97	64	-2.27	3.91	0.22	0.00	0.00	-1.13	0.11	0.00
27-Jun-97	65	-3.93	0.21	2.69	0.00	0.00	0.65	0.94	0.00
04-Jul-97	66	2.10	3.73	8.10	-14.94	0.00	-5.60	0.81	0.00
11-Jul-97	67	2.15	-6.15	1.39	0.00	0.00	5.00	-1.13	0.00
18-Jul-97	68	-2.33	2.39	-0.47	-0.66	0.00	1.32	1.39	0.00
25-Jul-97	69	-3.34	0.63	-23.25	0.00	0.00	-0.36	0.38	0.00
01-Aug-97	70	6.46	-0.54	9.78	0.00	0.00	0.00	0.61	0.00
08-Aug-97	71	-0.93	-1.76	0.43	0.59	0.00	2.60	-1.13	0.00
15-Aug-97	72	-1.23	1.19	3.36	0.00	0.00	5.75	2.99	0.00
22-Aug-97	73	4.84	6.60	0.05	0.00	0.00	7.44	4.08	0.00
29-Aug-97	74	-3.16	4.82	-2.97	0.00	0.00	3.33	0.00	0.00
05-Sep-97	75	-2.58	3.04	4.98	0.00	0.00	4.77	15.58	0.00
12-Sep-97	76	0.81	5.85	1.40	0.00	0.00	20.87	22.05	0.00
19-Sep-97	77	0.38	0.68	-0.40	0.00	0.00	1.79	8.92	0.00
26-Sep-97	78	-0.35	-1.93	1.05	0.00	0.00	-5.97	6.34	0.00
03-Oct-97	79	0.19	1.83	-1.69	-11.76	0.00	-3.88	1.00	65.38
10-Oct-97	80	0.76	-4.78	-2.64	0.00	0.00	0.00	0.46	-0.20
17-Oct-97	81	0.67	-0.09	0.00	0.00	0.00	-2.52	-5.40	0.00
24-Oct-97	82	-2.35	-1.88	-3.12	0.00	0.00	0.00	5.00	0.20
31-Oct-97	83	-0.83	0.07	-0.73	0.00	0.00	0.00	-6.67	0.00
07-Nov-97	84	1.48	-2.71	-0.07	0.00	0.00	-4.14	0.00	-3.49
14-Nov-97	85	0.00	3.53	-3.98	0.00	0.00	0.00	0.00	0.00
21-Nov-97	86	0.33	-1.80	1.05	0.00	0.00	-30.36	0.00	0.00
28-Nov-97	87	-1.04	-3.53	-1.51	0.00	0.00	-4.82	-31.37	0.00
05-Dec-97	88	-7.59	-1.10	3.38	0.00	0.00	2.02	1.75	0.00
12-Dec-97	89	0.82	6.88	-1.04	0.00	0.00	-1.82	0.00	0.00
19-Dec-97	90	-0.51	-0.04	4.63	0.00	0.00	0.00	1.67	0.00
26-Dec-97	91	0.00	0.00	1.25	0.00	0.00	4.02	2.99	
Avarage		-0.766	0.994	-0.067	-0.515	0.000	0.171	0.607	1.209
Variance		7.990	18.443	33.313	6.836	0.000	37.308	39.103	82.089
Standard D		2.827	4.295	5.772	2.615	0.000	6.108	6.253	9.060

27-Mar-98	104	0.08	37.17	-3.73	0.00	0.00	3.99	2.66	0.00
03-Apr-98	105	0.00	-1.52	0.97	-0.44	0.00	-2.71	1.85	0.00
10-Apr-98	106	-3.37	-10.99	-1.38	0.44	0.00	-0.17	13.85	0.00
17-Apr-98	107	1.76	-5.92	-0.22	0.00	0.00	0.00	0.76	0.00
24-Apr-98	108	-2.17	-2.42	0.41	0.00	0.00	0.00	0.51	0.00
01-May-98	109	2.15	-4.14	-1.14	0.00	0.00	-7.69	-3.17	0.00
08-May-98	110	-2.10	2.09	-2.82	0.00	0.00	0.00	-4.96	0.00
15-May-98	111	-0.38	-1.25	-6.70	0.00	0.00	0.00	6.31	0.00
22-May-98	112	2.61	0.42	1.89	0.00	0.00	1.67	0.26	0.00
29-May-98	113	1.91	5.19	2.00	0.00	0.00	-1.64	-0.53	0.00
05-Jun-98	114	0.53	1.69	6.63	0.00	0.00	0.00	1.34	0.00
12-Jun-98	115	4.57	3.91	-0.45	0.00	0.00	8.33	-2.16	0.00
19-Jun-98	116	1.03	-2.57	-0.94	0.00	0.00	5.02	7.58	0.00
26-Jun-98	117	2.55	-0.58	-2.12	0.00	0.00	-12.10	-4.98	0.00
03-Jul-98	118	1.72	-1.87	-4.83	0.00	0.00	18.20	-9.10	0.00
10-Jul-98	119	-0.27	-0.17	-0.97	0.00	0.00	1.27	-0.95	0.00
17-Jul-98	120	4.65	0.08	-5.05	-0.79	0.00	0.94	-3.98	0.00
24-Jul-98	121	1.38	0.38	-0.16	0.00	7.62	0.00	-15.71	0.00
31-Jul-98	122	0.73	-0.49	0.37	0.00	15.69	0.00	5.46	0.00
07-Aug-98	123	2.06	2.38	3.38	0.00	0.00	-3.55	9.17	0.00
14-Aug-98	124	2.06	0.00	-2.20	0.00	0.00	0.00	-0.07	0.00
21-Aug-98	125	-0.53	-2.21	-1.30	0.00	0.00	5.35	0.00	0.00
28-Aug-98	126	0.14	-2.53	7.12	0.00	0.00	0.45	0.40	0.00
04-Sep-98	127	3.31	2.58	-2.05	0.00	0.00	1.37	-0.26	0.00
11-Sep-98	128	-2.37	-1.29	-2.90	1.47	0.00	-1.13	-0.14	0.00
18-Sep-98	129	-0.15	2.42	1.81	0.00	0.00	1.07	0.38	0.00
25-Sep-98	130	-0.24	-0.80	2.88	0.00	0.00	1.38	-0.38	22.44
02-Oct-98	131	-1.12	3.58	-1.38	0.00	0.00	-7.89	1.54	5.40
09-Oct-98	132	0.94	-1.23	-1.36	0.00	0.00	0.00	0.23	-9.60
16-Oct-98	133	0.33	-2.63	1.20	0.00	0.00	0.00	0.28	0.00
23-Oct-98	134	-1.71	0.11	-2.92	0.00	0.00	-3.28	-0.51	0.00
30-Oct-98	135	-3.91	-0.59	-0.12	0.00	0.00	3.25	-0.01	0.00
06-Nov-98	136	-3.27	0.60	-2.25	0.00	0.00	0.00	0.10	0.00
13-Nov-98	137	-7.69	-3.95	2.12	0.00	0.00	-2.00	2.15	0.00
20-Nov-98	138	-3.29	-2.83	1.31	0.00	1.06	-0.71	0.13	0.00
27-Nov-98	139	-0.54	0.54	-1.30	-1.32	0.00	-2.33	0.63	0.00
04-Dec-98	140	6.12	-8.33	-1.65	0.00	0.00	2.55	0.00	0.00
11-Dec-98	141	1.03	8.37	0.60	0.00	0.00	0.36	3.23	0.00
18-Dec-98	142	1.10	0.11	-1.22	0.00	0.00	1.59	-3.13	0.00
25-Dec-98	143	7.17	0.00	-1.21	0.00	7.37	0.79	0.00	0.00
	Avarage	0.508	0.441	-0.548	0.001	0.761	0.859	0.999	0.137
	Variance	11.001	52.558	13.487	0.105	7.672	27.573	23.230	13.555
	Standard D	3.317	7.250	3.672	0.324	2.770	5.251	4.820	3.682

26-Mar-99	156	0.00	-1.15	-1.33	0.00	0.00	1.93	0.00	0.00
02-Apr-99	157	-1.78	-0.20	-4.24	0.00	0.00	0.00	0.00	0.00
09-Apr-99	158	2.53	-2.40	1.36	0.00	0.00	-15.84	0.00	0.00
16-Apr-99	159	0.44	-3.34	-3.81	0.00	0.00	9.68	0.12	0.00
23-Apr-99	160	-0.31	0.19	0.00	0.00	15.20	-5.26	1.19	0.00
30-Apr-99	161	1.19	4.03	0.06	0.00	0.00	-4.38	-0.59	0.00
07-May-99	162	0.72	-1.79	0.27	0.00	0.00	-1.57	0.00	0.00
14-May-99	163	-0.58	-1.50	-4.09	0.00	0.00	0.00	1.16	0.00
21-May-99	164	0.12	0.69	4.44	0.00	4.17	-2.22	-0.45	0.00
28-May-99	165	-0.31	-10.11	8.23	0.00	0.00	-2.63	0.00	0.00
04-Jun-99	166	0.98	0.00	-7.64	0.00	0.00	7.08	0.00	0.00
11-Jun-99	167	-0.16	2.39	4.54	0.00	0.00	-3.33	0.70	0.00
18-Jun-99	168	0.10	3.29	3.82	0.00	0.00	3.77	-0.70	0.00
25-Jun-99	169	-0.10	0.00	0.10	-13.33	0.00	0.00	1.05	0.00
02-Jul-99	170	-1.14	0.11	0.11	0.00	0.00	0.05	-0.34	0.00
09-Jul-99	171	1.14	0.00	0.05	0.00	0.00	0.00	-0.76	0.00
16-Jul-99	172	0.01	0.30	-0.22	0.00	0.00	0.47	-1.35	0.89
23-Jul-99	173	0.00	-0.30	0.00	0.00	0.00	0.00	0.00	0.00
30-Jul-99	174	0.00	1.18	-7.48	0.00	0.00	2.48	0.00	0.00
06-Aug-99	175	0.17	-1.17	0.92	0.00	0.00	-2.42	0.00	0.00
13-Aug-99	176	0.34	0.00	-1.91	0.00	0.00	0.00	0.00	0.00
20-Aug-99	177	-0.49	1.85	-2.77	0.00	0.00	0.00	0.00	-43.53
27-Aug-99	178	-24.54	0.00	-5.58	0.00	0.00	0.00	0.00	0.00
03-Sep-99	179	0.00	0.30	-0.85	0.00	0.00	0.00	0.00	0.00
10-Sep-99	180	-14.64	4.23	0.36	0.00	0.00	0.00	-17.86	7.50
17-Sep-99	181	6.53	0.25	-0.56	0.00	0.00	0.00	0.00	4.65
24-Sep-99	182	-1.81	-2.26	0.15	0.00	0.00	-17.36	0.00	0.00
01-Oct-99	183	1.29	-1.49	-0.58	0.00	0.00	0.00	0.00	2.91
08-Oct-99	184	1.67	0.00	-6.34	0.00	0.00	0.00	-1.86	0.00
15-Oct-99	185	0.00	2.14	3.09	0.00	0.00	-0.86	1.25	0.00
22-Oct-99	186	0.97	-2.97	-5.19	0.00	0.00	-0.08	0.00	0.00
29-Oct-99	187	-0.97	-2.02	0.55	0.00	0.00	0.00	-3.74	0.00
05-Nov-99	188	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00
12-Nov-99	189	2.65	0.00	9.79	0.00	0.00	0.00	2.42	0.00
19-Nov-99	190	-0.74	-8.32	-4.28	0.00	0.00	0.00	-2.94	0.00
26-Nov-99	191	-1.06	-3.52	-1.36	0.00	0.00	0.94	-3.98	0.00
03-Dec-99	192	0.37	-7.40	-0.60	0.00	0.00	-6.39	-8.32	0.00
10-Dec-99	193	0.71	-0.34	5.10	0.00	0.00	-3.32	-3.39	0.00
17-Dec-99	194	-1.65	-0.16	-5.57	0.00	0.00	0.00	0.00	0.00
24-Dec-99	195	1.47	2.15	5.99	0.00	0.00	-3.87	-0.92	0.00
31-Dec-99	196	0.94	0.00	-4.36	0.00	0.00	0.00	0.00	-6.43
	Avarage	-0.445	-0.792	-0.349	-0.252	0.791	-0.808	-0.679	-0.687
	Variance	17.182	8.668	13.890	3.354	13.917	16.299	9.894	38.540
	Standard D	4.145	2.944	3.727	1.831	3.731	4.037	3.145	6.208

Agriculture 2000

WeekEnd	Series	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
07-Jan-00	197	0.00	0.00	1.05	0.00	0.00	0.00	0.00	0.00
14-Jan-00	198	0.00	0.00	3.05	0.00	0.00	5.17	0.00	-3.85
21-Jan-00	199	-0.82	-8.62	-3.05	0.00	0.00	3.15	0.93	0.00
28-Jan-00	200	0.17	8.05	-0.94	0.00	0.00	0.00	1.08	0.00
04-Feb-00	201	0.00	0.00	1.76	0.00	0.00	3.46	-1.06	0.00
11-Feb-00	202	0.00	-11.92	-3.74	0.00	0.00	-0.15	0.00	0.00
18-Feb-00	203	0.00	-1.34	-16.44	0.00	0.00	0.00	0.00	0.00
25-Feb-00	204	-6.12	-6.49	2.76	0.00	0.00	0.00	-3.23	0.00
03-Mar-00	205	-17.55	0.00	12.64	0.00	0.00	-7.69	-1.62	0.00
10-Mar-00	206	0.00	-2.78	-11.04	0.00	0.00	-14.92	-1.74	0.00
17-Mar-00	207	22.29	0.02	-5.37	0.00	0.00	0.00	0.00	0.00
24-Mar-00	208	-4.51	2.83	-0.22	0.00	0.00	-8.58	-0.05	0.00
31-Mar-00	209	-4.28	-2.73	1.03	0.00	0.00	0.04	0.00	0.00
07-Apr-00	210	-7.80	0.15	4.66	0.00	0.00	0.08	0.05	0.00
14-Apr-00	211	-4.68	-2.17	0.58	0.00	0.00	2.01	0.04	0.00
21-Apr-00	212	-0.85	-14.69	0.65	0.00	0.00	-1.40	3.41	0.00
28-Apr-00	213	-0.52	7.14	-0.96	0.00	0.00	-3.34	0.00	0.00
05-May-00	214	0.00	0.00	-0.10	0.00	0.00	0.00	0.00	0.00
12-May-00	215	-0.10	5.23	-0.20	0.00	0.00	0.00	0.00	0.00
19-May-00	216	-0.40	5.41	0.62	0.00	0.00	-1.68	-9.71	0.00
26-May-00	217	0.50	3.54	-0.31	0.00	0.00	0.00	-5.24	0.00
02-Jun-00	218	-3.13	5.55	0.52	0.00	0.00	0.00	0.00	0.00
09-Jun-00	219	0.19	-3.81	-0.39	0.00	0.00	0.00	0.05	0.00
16-Jun-00	220	-0.41	0.00	-0.13	0.00	0.00	-0.75	0.00	0.00
23-Jun-00	221	-0.62	-4.20	-0.19	0.00	0.00	-3.76	-1.62	0.00
30-Jun-00	222	-1.36	0.21	-1.62	0.00	0.00	0.00	-0.60	0.00
07-Jul-00	223	1.01	0.00	1.64	0.00	0.00	0.00	0.00	0.00
14-Jul-00	224	-0.75	-0.31	-2.23	0.00	0.00	-0.78	-4.47	0.00
21-Jul-00	225	0.00	-1.80	2.26	0.00	0.00	-2.50	-0.65	0.00
28-Jul-00	226	-0.54	0.00	-9.85	0.00	0.00	1.76	0.00	0.00
04-Aug-00	227	0.42	-1.08	-0.13	0.00	0.00	0.00	0.00	-0.97
11-Aug-00	228	-0.24	0.77	-4.96	0.00	0.00	0.00	-4.90	0.00
18-Aug-00	229	-7.21	-0.63	-10.86	0.00	0.00	0.00	-5.88	0.00
25-Aug-00	230	5.84	-0.29	15.56	0.00	0.00	0.00	-7.50	0.00
01-Sep-00	231	4.92	0.00	2.44	0.00	0.00	0.00	0.00	0.00
08-Sep-00	232	-2.43	0.16	-3.06	0.00	0.00	0.00	0.00	0.00
15-Sep-00	233	7.79	2.91	6.52	0.00	0.00	-3.57	5.34	0.00
22-Sep-00	234	0.63	-7.82	-5.62	0.00	0.00	2.06	3.18	0.00
29-Sep-00	235	-0.15	-0.70	-0.15	0.00	0.00	-3.97	1.02	0.00
06-Oct-00	236	1.97	0.47	3.62	0.00	0.00	-7.27	7.75	0.00
13-Oct-00	237	1.02	5.66	3.00	0.00	0.00	0.00	0.00	0.00
20-Oct-00	238	6.88	0.00	-0.26	0.00	0.00	4.48	8.20	0.00
27-Oct-00	239	2.38	0.00	0.00	0.00	0.00	4.01	15.70	-18.31
03-Nov-00	240	-0.67	0.00	0.26	0.00	0.00	-12.47	3.75	0.00
10-Nov-00	241	3.06	0.00	1.37	0.00	0.00	-1.32	0.03	0.00
17-Nov-00	242	-1.53	0.74	3.68	0.00	0.00	4.21	0.00	1.36
24-Nov-00	243	6.05	1.40	-4.13	0.00	0.00	2.07	-1.10	0.00
01-Dec-00	244	-0.24	0.00	-0.75	0.00	0.00	1.18	0.00	0.00
08-Dec-00	245	0.38	0.83	-0.88	0.00	0.00	-1.38	0.29	0.00
15-Dec-00	246	0.00	-0.11	-8.36	0.00	0.00	0.00	0.82	0.00
22-Dec-00	247	-0.34	-0.05	-11.63	0.00	0.00	0.00	0.13	0.00
29-Dec-00	248	0.60	-2.76	-0.13	0.00	0.00	0.00	6.46	0.00
	Avarage	-0.022	-0.446	-0.732	0.000	0.000	-0.805	0.170	-0.419
	Variance	24.799	16.868	28.851	0.000	0.000	14.107	14.919	6.738
	Standard D	4.980	4.107	5.371	0.000	0.000	3.756	3.863	2.596

30-Mar-01	261	-2.31	9.69	11.93	0.00	0.00	-12.46	-0.03	0.00
06-Apr-01	262	3.19	-8.08	8.06	0.00	-6.67	0.00	-2.91	0.00
13-Apr-01	263	-5.76	-2.80	9.71	0.00	0.00	-12.38	0.00	0.00
20-Apr-01	264	-0.26	0.00	-6.21	0.00	0.00	-0.76	0.00	0.00
27-Apr-01	265	-0.40	-3.49	0.89	0.00	0.00	0.00	0.00	0.00
04-May-01	266	-1.49	-3.29	5.52	0.00	0.00	0.00	0.00	0.00
11-May-01	267	3.23	0.25	0.00	0.00	0.00	0.00	0.00	0.00
18-May-01	268	-1.01	-0.25	-22.46	0.00	0.00	-2.97	2.00	0.00
25-May-01	269	0.00	-1.61	0.00	0.00	0.00	3.06	-1.84	0.00
01-Jun-01	270	-1.53	-0.24	-1.55	0.00	0.00	2.22	0.00	0.00
08-Jun-01	271	2.45	0.76	1.23	0.00	0.00	0.00	5.87	0.00
15-Jun-01	272	1.15	-8.67	2.71	0.00	0.00	-4.33	-2.87	0.00
22-Jun-01	273	-0.69	3.34	1.82	0.00	0.00	2.26	1.01	0.00
29-Jun-01	274	1.23	-3.57	23.43	0.00	0.00	0.00	0.83	0.00
06-Jul-01	275	1.10	-0.85	-12.33	0.00	0.00	0.00	0.00	0.00
13-Jul-01	276	0.00	0.00	-4.30	0.00	0.00	0.00	0.48	0.00
20-Jul-01	277	1.40	0.94	-1.77	0.00	0.00	0.00	-0.35	0.00
27-Jul-01	278	-1.54	-1.23	10.17	0.00	0.00	-2.50	0.95	0.00
03-Aug-01	279	1.46	-0.71	-2.46	0.00	3.57	-6.41	-4.71	0.00
10-Aug-01	280	-2.87	0.00	2.73	0.00	0.00	-2.05	0.99	0.00
17-Aug-01	281	0.01	-6.26	-0.74	0.00	0.00	-2.10	-0.98	0.00
24-Aug-01	282	-0.23	0.64	-6.08	0.00	0.00	0.00	0.99	0.00
31-Aug-01	283	-1.98	0.00	9.25	0.00	0.00	0.00	-1.96	0.00
07-Sep-01	284	0.00	0.00	-6.94	0.00	-1.38	-2.72	-5.00	0.00
14-Sep-01	285	-3.88	0.00	5.67	0.00	-2.10	0.00	0.00	0.00
21-Sep-01	286	-2.65	-10.00	0.00	-7.58	0.00	0.00	0.00	0.00
28-Sep-01	287	0.53	-11.59	-4.98	0.00	0.00	0.00	0.00	0.00
05-Oct-01	288	-3.96	0.00	1.75	0.00	0.00	0.00	0.00	0.00
12-Oct-01	289	-0.97	0.00	-1.72	0.00	0.00	0.00	0.00	0.00
19-Oct-01	290	0.57	-3.27	-1.30	0.00	0.00	0.00	-3.16	0.00
26-Oct-01	291	0.57	-0.74	-4.50	0.00	0.00	6.47	0.00	0.00
02-Nov-01	292	1.87	-0.50	0.00	0.00	0.00	2.07	1.02	0.00
09-Nov-01	293	0.57	0.00	11.53	0.00	0.00	0.00	2.22	21.34
16-Nov-01	294	0.37	0.50	2.04	0.00	0.00	0.00	0.00	0.00
23-Nov-01	295	0.00	-10.41	4.66	0.00	0.00	0.00	0.00	0.00
30-Nov-01	296	-1.10	5.20	-0.28	0.00	-1.61	0.00	-18.16	0.00
07-Dec-01	297	0.00	-1.67	-2.85	0.00	1.63	0.00	-9.97	0.00
14-Dec-01	298	0.00	-6.74	0.13	0.00	0.00	0.00	-1.41	0.00
21-Dec-01	299	-3.97	-0.31	1.03	0.00	0.00	0.00	0.00	0.00
	Avarage	-0.187	-1.320	0.749	-0.149	-0.128	0.723	-0.599	0.418
	Variance	9.096	18.521	144.498	1.126	1.358	397.922	12.449	8.931
	Standard D	3.016	4.304	12.021	1.061	1.165	19.948	3.528	2.988

Commercial 1997

WeekEnd	Series	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
03-Jan-97	40	0.000	0.000	0.700	4.750		-0.477	0.000	0.574	0.483	0.479
10-Jan-97	41	0.000	0.000	1.758	-0.703		1.311	0.000	9.464	-0.369	-1.260
17-Jan-97	42	0.000	0.000	10.761	2.186		1.780	0.000	11.369	0.452	5.496
24-Jan-97	43	0.000	0.000	0.871	2.897		0.429	0.000	-4.040	0.305	3.778
31-Jan-97	44	0.000	27.452	-2.780	3.190		-0.953	2.139	-13.744	-11.360	-0.380
07-Feb-97	45	5.000	-0.141	-7.392	12.631		-3.927	0.000	-0.103	0.000	0.000
14-Feb-97	46	-3.095	-1.468	10.459	-1.396		0.002	0.000	2.664	-8.178	-3.740
21-Feb-97	47	-1.720	1.490	6.383	37.398		2.979	0.147	1.602	7.962	6.651
28-Feb-97	48	0.000	2.548	-1.580	5.605		-1.043	-1.715	-3.963	10.344	12.786
07-Mar-97	49	0.000	3.901	-1.985	-1.975		-0.371	2.128	2.748	-1.351	-0.819
14-Mar-97	50	0.000	-3.687	-8.859	-0.584		0.484	0.000	-2.897	3.645	-0.215
21-Mar-97	51	0.000	-2.947	-5.002	-1.206		0.913	0.000	1.878	-1.252	4.970
28-Mar-97	52	0.000	0.000	-0.373	-0.052		-0.666	0.000	-4.609	-2.306	-2.742
04-Apr-97	53	0.000	0.000	4.880	0.437		9.831	0.000	-2.522	-2.222	0.490
11-Apr-97	54	2.450	0.000	0.754	0.020		5.178	3.447	0.515	-0.221	-0.654
18-Apr-97	55	-2.391	-49.762	-0.134	-13.099		16.633	-3.332	-0.952	0.000	-14.182
25-Apr-97	56	0.000	0.000	-0.059	1.156		3.641	0.000	1.918	-3.499	-0.330
02-May-97	57	0.000	0.000	6.965	6.629		4.126	0.000	8.067	-3.738	-0.594
09-May-97	58	-15.000	0.000	2.774	6.300		3.093	0.000	-0.593	-5.175	2.468
16-May-97	59	0.000	28.190	-0.421	0.301	-4.184	0.312	0.000	-0.638	1.575	2.247
23-May-97	60	-5.294	0.000	0.478	2.644	-4.973	5.622	31.250	-5.344	3.828	0.402
30-May-97	61	0.000	0.000	-2.653	0.000	-5.118	-3.769	4.762	-2.932	0.917	-0.621
06-Jun-97	62	2.484	0.000	0.088	55.117	-2.261	-10.547	-15.909	2.019	-0.926	-0.068
13-Jun-97	63	0.000	0.000	0.000	5.632	-0.079	10.302	37.609	11.407	-4.698	9.668
20-Jun-97	64	2.242	0.000	0.000	6.996	3.983	4.234	4.392	-9.490	0.000	1.118
27-Jun-97	65	0.771	0.000	-3.620	7.331	2.453	-0.591	-3.421	12.799	0.308	3.603
04-Jul-97	66	-0.176	0.000	-2.600	-7.486	0.330	1.248	3.896	-6.614	0.048	12.315
11-Jul-97	67	-5.716	-7.169	-0.400	19.785	-1.153	3.186	-3.078	-7.487	-1.511	0.314
18-Jul-97	68	0.000	0.000	3.731	0.653	-0.261	-12.007	10.120	-4.227	-0.340	-2.012
25-Jul-97	69	1.563	0.000	-1.161	9.958	-0.068	11.606	3.807	14.070	-1.040	0.000
01-Aug-97	70	0.000	0.000	-1.805	-1.389	0.149	-5.902	4.361	-7.689	-0.215	-2.174
08-Aug-97	71	-1.538	0.000	0.942	2.209	-0.049	6.866	0.000	-2.887	-2.665	-1.623
15-Aug-97	72	0.000	0.000	-0.654	2.809	0.014	1.563	-8.108	3.041	-2.579	-4.000
22-Aug-97	73	0.000	0.000	2.628	16.999	-1.207	0.697	0.961	-2.163	0.000	-0.805
29-Aug-97	74	-0.562	-19.968	1.411	5.109	-9.412	0.253	0.269	18.261	-0.371	-3.554
05-Sep-97	75	0.000	-0.500	0.474	14.829	1.526	1.573	0.000	-18.745	1.952	-1.619
12-Sep-97	76	0.000	-3.116	0.229	17.259	9.478	2.585	0.000	0.902	-9.459	-2.893
19-Sep-97	77	0.566	-1.452	1.942	0.000	-1.544	0.133	0.000	10.451	-3.264	3.178
26-Sep-97	78	0.000	0.000	-1.743	-7.753	0.195	0.124	11.867	0.779	0.000	0.015
03-Oct-97	79	0.000	0.000	-2.851	-4.685	-1.010	4.894	0.000	2.435	1.651	-8.524
10-Oct-97	80	0.000	0.000	-0.391	3.082	-0.189	-3.113	0.000	-14.869	0.000	-1.443
17-Oct-97	81	0.313	0.000	-2.492	-4.122	-3.304	-1.146	15.625	-0.734	0.000	0.782
24-Oct-97	82	0.000	-3.158	1.821	-1.123	-8.184	1.113	21.356	-3.579	2.542	-4.743
31-Oct-97	83	-0.561	0.000	-0.280	-3.974	-5.222	-1.163	4.673	-1.036	-3.168	-3.737
07-Nov-97	84	0.251	0.000	-4.065	-5.911	-0.797	0.686	-1.596	0.030	-0.996	0.772
14-Nov-97	85	0.063	0.000	-2.993	-8.998	0.992	1.669	-0.627	-0.841	2.299	4.001
21-Nov-97	86	0.375	-2.174	4.945	-6.603	-1.269	1.121	-12.968	-0.825	0.000	0.000
28-Nov-97	87	0.498	0.000	-1.706	1.340	0.715	0.174	2.500	1.128	0.000	0.420
05-Dec-97	88	-0.929	0.000	0.847	-7.902	0.087	-1.404	0.000	0.547	0.000	3.849
12-Dec-97	89	0.625	0.000	-1.080	25.952	0.933	-0.028	0.000	1.705	-0.562	3.402
19-Dec-97	90	0.000	-13.611	3.792	17.479	0.744	0.049	-4.268	0.797	0.000	3.223
26-Dec-97	91	0.000	0.000	1.938	0.857	-0.576	0.138	0.000	3.000	0.000	0.000
	Avarage	-0.380	-0.876	0.240	4.242	-0.887	1.220	2.121	0.012	-0.638	0.456
	Variance	6.800	92.063	13.224	134.661	11.480	21.690	74.210	47.885	12.039	19.428
	Standard D	2.608	9.595	3.636	11.604	3.388	4.657	8.615	6.920	3.470	4.408

Commercial 1998

WeekEnd	Series	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
02-Jan-98	92	0.000	0.000	0.000	0.000	0.000	1.065	0.000	-1.328	0.000	0.000
09-Jan-98	93	0.000	0.000	4.001	-8.448	0.319	-0.873	0.000	-0.271	1.695	0.000
16-Jan-98	94	12.422	0.000	19.282	21.694	8.020	1.102	0.000	16.592	-5.633	0.547
23-Jan-98	95	11.878	0.000	5.119	-2.420	4.359	0.297	0.000	4.678	0.000	15.067
30-Jan-98	96	0.000	0.000	-14.701	-9.649	21.372	0.708	4.459	-1.841	28.046	26.600
06-Feb-98	97	0.000	0.000	-2.101	5.273	-18.331	0.161	5.951	-15.312	0.000	2.790
13-Feb-98	98	4.938	0.000	3.944	-1.192	2.058	1.131	0.965	2.224	-25.517	-3.686
20-Feb-98	99	-9.035	0.000	-0.639	-7.914	0.213	0.385	0.000	3.849	0.926	-0.398
27-Feb-98	100	-0.310	0.000	0.497	0.943	1.866	0.531	-3.084	-3.441	0.262	-10.231
06-Mar-98	101	3.788	0.836	1.404	-3.490	1.562	-0.419	-1.183	-0.925	0.654	-3.023
13-Mar-98	102	0.000	0.000	4.291	-3.398	-0.206	0.160	-0.009	-1.588	0.000	-6.549
20-Mar-98	103	0.000	2.041	-3.655	-1.452	-0.403	1.785	0.595	-1.270	-4.317	-0.843
27-Mar-98	104	-34.100	0.000	-5.248	1.355	-0.648	5.363	-0.592	-3.912	-4.633	-0.860
03-Apr-98	105	0.000	0.000	-5.554	27.305	-15.380	1.395	0.000	11.927	0.194	-1.000
10-Apr-98	106	0.000	0.000	-4.720	-15.416	0.183	34.048	0.000	-10.175	0.000	-0.786
17-Apr-98	107	0.000	0.000	2.929	-33.909	2.019	2.068	0.000	-0.265	0.000	0.000
24-Apr-98	108	-24.127	0.000	1.253	0.000	0.495	0.662	0.000	9.824	0.000	-14.016
01-May-98	109	30.000	0.000	0.670	0.000	-1.595	1.431	-1.786	-9.953	-9.019	-7.362
08-May-98	110	4.231	0.000	-0.375	-0.892	-0.259	1.337	0.000	-0.646	-4.918	-0.555
15-May-98	111	-0.369	0.000	0.831	0.000	-10.130	0.538	0.000	12.553	-7.949	-0.167
22-May-98	112	-2.148	0.000	2.040	-10.076	-3.452	-0.102	0.000	-11.503	-3.125	0.133
29-May-98	113	-9.160	1.563	9.647	0.000	7.228	0.420	0.000	-0.060	0.000	-0.362
05-Jun-98	114	-2.083	0.000	0.754	-14.123	6.757	-0.642	0.000	0.671	-7.097	-0.015
12-Jun-98	115	-1.021	-3.077	-5.906	10.649	-0.632	46.528	0.000	-2.981	-0.408	0.332
19-Jun-98	116	-3.267	0.000	-4.408	10.993	-4.843	-20.910	0.000	2.079	-3.216	-0.121
26-Jun-98	117	-1.778	-1.587	5.038	-3.484	5.937	-8.953	3.030	1.046	-5.663	0.168
03-Jul-98	118	0.724	0.000	5.847	0.000	-6.240	2.878	0.000	-0.106	-8.355	0.081
10-Jul-98	119	8.985	0.000	-7.116	0.000	1.515	-1.294	1.176	10.486	0.000	0.547
17-Jul-98	120	0.000	0.000	-1.717	0.000	1.187	3.961	0.000	3.160	0.000	0.023
24-Jul-98	121	-1.072	0.000	1.262	-19.853	-1.355	-3.215	-3.573	0.111	-1.448	0.294
31-Jul-98	122	0.000	0.000	-0.709	-14.583	-1.701	5.948	-4.998	5.327	1.469	-0.371
07-Aug-98	123	0.000	0.000	0.473	-2.312	0.175	-2.709	-3.532	-6.388	0.000	0.142
14-Aug-98	124	0.000	0.000	-1.926	-0.047	-0.061	5.788	-27.632	-0.622	0.124	-0.466
21-Aug-98	125	0.000	0.000	2.815	0.149	0.020	-1.462	0.000	1.457	0.709	0.463
28-Aug-98	126	0.000	0.000	-0.659	-1.112	0.461	2.469	1.634	2.279	0.661	1.259
04-Sep-98	127	0.000	0.000	1.018	0.217	-2.674	0.207	-1.576	-14.566	0.000	-0.791
11-Sep-98	128	0.000	0.000	0.548	0.756	-12.953	1.121	-1.617	-1.150	-2.963	1.667
18-Sep-98	129	0.000	0.000	0.075	-1.300	0.467	0.408	-0.077	1.131	0.000	0.000
25-Sep-98	130	0.000	0.000	2.510	1.064	-0.352	-0.672	-3.789	0.646	0.000	0.000
02-Oct-98	131	0.000	0.000	-2.904	-39.850	0.760	-0.189	-2.885	0.699	1.530	0.000
09-Oct-98	132	0.250	0.000	-1.125	-3.020	2.138	-9.955	-0.990	0.852	0.000	0.030
16-Oct-98	133	-0.249	9.677	0.658	-14.419	1.360	-6.048	0.000	-0.081	4.167	-0.973
23-Oct-98	134	0.000	0.000	2.917	1.386	0.269	4.962	0.000	0.456	0.000	-6.058
30-Oct-98	135	0.000	0.000	1.663	47.467	-0.917	8.404	0.000	0.902	0.000	4.666
06-Nov-98	136	0.000	0.000	-1.094	21.767	0.260	0.790	0.000	1.471	0.000	1.242
13-Nov-98	137	2.917	0.000	-2.750	13.130	-3.618	0.357	0.000	-0.923	2.000	0.038
20-Nov-98	138	0.000	0.000	-6.171	-12.249	8.183	-0.198	0.000	0.403	-1.836	1.212
27-Nov-98	139	-2.834	0.000	-7.728	0.000	-4.167	1.911	0.000	-0.408	-4.921	0.267
04-Dec-98	140	0.000	0.085	2.036	-0.072	-0.725	1.365	1.000	-0.104	1.681	-2.464
11-Dec-98	141	0.000	0.000	3.837	-0.830	4.833	1.907	0.000	2.104	-2.927	2.418
18-Dec-98	142	0.000	0.000	8.747	0.092	4.548	-0.515	0.000	0.167	0.000	0.000
25-Dec-98	143	0.000	-0.588	8.397	2.169	1.463	7.990	-0.990	1.297	-2.774	-8.333
	Avarage	-0.220	0.172	0.448	-1.137	-0.012	1.797	-0.760	0.165	-1.204	-0.182
	Variance	64.376	2.191	26.418	173.605	34.845	81.372	17.622	34.463	36.550	29.717
	Standard D	8.023	1.480	5.140	13.176	5.903	9.021	4.198	5.871	6.046	5.451

Commercial 1999

WeekEnd	Series	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
01-Jan-99	144	0.000	0.000	-2.981	16.500	6.833	-1.037	0.000	7.354	0.000	0.000
08-Jan-99	145	0.000	0.000	-1.444	0.000	6.857	1.457	0.000	0.644	0.000	0.000
15-Jan-99	146	0.000	0.000	2.395	13.398	11.270	3.473	2.000	6.097	4.950	10.606
22-Jan-99	147	0.000	0.000	0.393	3.322	7.386	0.246	0.000	-3.324	25.432	-4.040
29-Jan-99	148	0.000	0.000	-1.159	-0.780	-14.880	-0.881	0.000	4.215	3.769	-0.072
05-Feb-99	149	0.000	0.000	-1.533	3.204	-13.430	-4.524	0.801	-6.079	0.000	-5.263
12-Feb-99	150	0.000	0.000	2.263	-2.808	6.263	0.020	0.000	-10.495	0.000	-9.166
19-Feb-99	151	3.500	0.000	2.212	-1.340	2.386	0.791	0.000	6.102	0.000	-0.394
26-Feb-99	152	0.644	0.000	2.621	1.879	-7.664	0.726	0.000	-3.159	-0.589	0.017
05-Mar-99	153	0.000	0.000	2.706	-3.643	-2.518	0.999	0.000	-1.334	0.000	-3.161
12-Mar-99	154	0.000	0.000	2.588	0.239	6.932	0.568	0.000	0.112	-1.331	3.280
19-Mar-99	155	0.000	0.000	1.425	-0.758	1.168	-1.360	0.000	4.236	-8.225	-0.467
26-Mar-99	156	2.640	0.000	1.545	1.571	-6.944	-0.826	0.000	1.758	-1.392	-5.760
02-Apr-99	157	0.000	0.000	-0.521	-56.693	0.122	-0.397	1.618	-3.401	-16.230	-0.498
09-Apr-99	158	0.000	0.000	-2.484	50.901	3.266	-0.531	0.000	1.342	21.498	0.000
16-Apr-99	159	0.000	0.000	0.447	15.497	0.958	-0.293	0.000	3.242	-5.864	-7.143
23-Apr-99	160	0.000	0.000	-0.445	9.377	1.690	0.604	-7.159	-4.876	0.000	9.615
30-Apr-99	161	0.000	0.000	-3.169	-0.080	2.271	-0.351	0.000	2.331	2.508	-1.161
07-May-99	162	0.000	0.000	-0.135	-0.516	-1.195	1.356	0.000	3.672	0.000	-0.600
14-May-99	163	0.000	0.000	-1.066	4.087	0.357	-0.709	-9.278	-0.152	-14.706	0.000
21-May-99	164	0.000	0.000	0.712	-8.498	-0.187	-11.686	0.000	1.436	-0.396	0.000
28-May-99	165	-1.247	0.000	-0.185	0.000	0.521	11.344	0.000	-0.557	-7.381	-5.382
04-Jun-99	166	-1.342	0.000	0.690	0.000	-0.570	-1.187	0.000	0.771	-6.353	5.688
11-Jun-99	167	0.000	0.000	-0.204	-5.013	0.879	-14.394	0.000	0.481	3.778	0.000
18-Jun-99	168	-20.000	0.000	2.676	1.944	-3.139	14.019	0.000	2.583	0.136	1.338
25-Jun-99	169	0.000	0.000	-2.512	-2.034	-0.288	-0.541	0.000	-2.132	4.665	-1.321
02-Jul-99	170	0.000	0.000	0.270	-22.094	0.013	1.368	0.000	-1.622	-6.287	0.000
09-Jul-99	171	0.300	0.000	0.234	-5.595	1.627	-0.424	0.000	1.962	-2.102	0.893
16-Jul-99	172	-50.150	0.000	2.189	0.000	0.926	1.860	0.000	0.516	0.000	0.885
23-Jul-99	173	0.000	0.000	0.513	-21.415	3.351	-0.012	0.000	-15.073	0.000	1.754
30-Jul-99	174	0.000	0.000	0.627	5.911	-0.239	-1.486	0.000	0.021	4.000	3.134
06-Aug-99	175	0.000	0.000	1.027	9.050	0.726	0.023	0.000	-2.025	-1.767	0.043
13-Aug-99	176	0.000	0.000	0.069	0.833	0.087	-2.101	0.000	-1.215	0.000	0.294
20-Aug-99	177	0.000	0.000	-1.755	-0.735	0.004	-5.507	12.500	-4.021	-2.116	0.001
27-Aug-99	178	0.000	0.000	2.672	0.000	0.361	-6.812	1.010	-5.497	0.000	-0.014
03-Sep-99	179	0.000	0.000	0.287	-0.092	0.265	-6.165	0.000	0.618	-11.070	0.013
10-Sep-99	180	0.000	0.000	0.073	0.000	1.738	4.635	0.000	-1.945	3.452	0.102
17-Sep-99	181	0.000	0.000	-0.243	-7.500	3.976	-0.294	0.000	-0.770	0.000	-0.002
24-Sep-99	182	0.000	0.000	-2.581	0.000	4.802	-2.894	0.000	-1.029	-19.104	1.565
01-Oct-99	183	0.000	0.000	-1.156	0.000	2.595	1.205	0.000	-9.844	-1.645	-1.530
08-Oct-99	184	0.000	0.000	-4.807	0.000	-0.192	-0.128	0.000	12.326	1.113	-0.111
15-Oct-99	185	0.000	-11.243	0.028	-0.901	-0.033	-0.500	0.000	-0.420	-0.483	0.000
22-Oct-99	186	0.000	0.000	-1.080	2.273	0.013	-0.267	0.000	-0.005	0.000	0.000
29-Oct-99	187	0.000	0.000	2.022	-7.931	-0.091	-1.420	0.000	0.656	-0.078	-0.057
05-Nov-99	188	0.000	0.000	-11.793	-1.523	-0.040	3.204	0.000	-0.036	-0.598	0.057
12-Nov-99	189	0.000	0.000	-6.232	-0.224	-0.322	-5.639	0.000	5.446	0.000	0.000
19-Nov-99	190	0.000	0.000	0.150	-1.740	0.791	2.493	-5.480	5.138	0.000	0.000
26-Nov-99	191	-10.000	0.000	-0.131	0.000	-0.283	-4.655	0.000	5.783	0.000	0.000
03-Dec-99	192	0.000	0.000	-5.626	0.031	0.585	0.900	0.000	8.949	-1.586	0.000
10-Dec-99	193	0.000	0.000	2.458	11.965	0.213	1.061	0.000	3.342	0.000	0.000
17-Dec-99	194	0.000	-0.727	0.996	-9.821	0.117	-2.029	0.000	-1.780	5.556	0.000
24-Dec-99	195	0.000	0.000	0.058	-0.402	-0.872	0.935	0.000	2.031	-0.505	0.000
31-Dec-99	196	0.000	0.000	2.949	-1.153	0.579	-0.638	0.000	-0.122	0.000	0.000
	Avarage	-1.427	-0.226	-0.263	-0.213	0.548	-0.498	-0.075	0.231	-0.546	-0.129
	Variance	56.347	2.389	6.990	158.152	18.611	18.083	6.377	22.020	47.310	10.070
	Standard D	7.506	1.546	2.644	12.576	4.314	4.252	2.525	4.693	6.878	3.173

Commercial 2000

WeekEnd	Series	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
07-Jan-00	197	0.000	0.000	0.233	0.000	-0.566	0.021	0.000	-1.947	0.000	0.000
14-Jan-00	198	0.000	0.000	2.376	10.526	0.828	0.658	0.000	0.282	0.000	-0.537
21-Jan-00	199	0.000	0.000	-1.773	0.091	0.038	-1.475	0.000	-0.314	8.241	0.000
28-Jan-00	200	0.000	0.000	0.231	-1.818	-0.093	-2.723	0.000	-1.753	-2.258	0.000
04-Feb-00	201	0.000	0.161	2.706	0.347	-0.246	-3.049	0.000	-1.609	-3.214	-6.163
11-Feb-00	202	0.000	0.000	4.229	-3.114	-0.042	-1.196	0.000	-1.248	-1.845	7.143
18-Feb-00	203	0.000	0.000	-1.247	0.000	0.155	-1.251	0.000	-0.742	1.316	0.000
25-Feb-00	204	0.000	0.000	-2.172	-2.678	0.278	-0.068	0.000	-16.011	-0.762	0.000
03-Mar-00	205	0.000	0.000	2.255	0.000	-0.300	-1.268	0.000	11.690	1.292	0.000
10-Mar-00	206	0.000	0.000	2.379	2.534	0.210	0.561	0.000	1.405	0.000	0.000
17-Mar-00	207	0.000	-3.297	3.167	-4.560	0.494	-0.705	0.000	-0.619	-0.074	0.013
24-Mar-00	208	0.000	-0.694	1.528	0.000	1.001	-0.124	0.000	0.621	0.000	0.000
31-Mar-00	209	0.000	0.000	-6.708	0.056	0.128	-0.851	0.000	3.617	0.000	0.000
07-Apr-00	210	0.000	0.000	3.534	0.440	0.922	-1.077	0.000	2.557	1.625	-16.667
14-Apr-00	211	0.000	-1.958	-0.912	0.003	-0.814	-6.405	0.000	0.649	0.000	0.000
21-Apr-00	212	0.000	-0.143	0.050	0.000	-6.313	-13.299	0.000	0.262	0.000	-20.211
28-Apr-00	213	0.000	0.000	2.742	0.000	-2.672	1.758	0.000	0.161	0.000	0.405
05-May-00	214	0.000	0.000	-2.655	-23.919	4.962	1.484	0.000	3.067	0.000	-1.291
12-May-00	215	0.000	0.000	0.006	5.936	4.575	2.407	0.000	-1.555	0.000	1.166
19-May-00	216	13.889	0.000	0.207	4.938	-0.089	0.121	0.000	1.770	0.000	1.646
26-May-00	217	0.000	0.000	-0.686	6.423	-3.028	-1.101	0.000	-0.169	0.000	0.250
02-Jun-00	218	0.000	0.000	0.083	0.000	0.401	-0.304	0.000	1.679	0.000	-11.201
09-Jun-00	219	0.000	0.000	-1.492	-3.272	0.805	-0.919	0.000	3.800	-3.159	-1.643
16-Jun-00	220	0.000	-1.429	-1.407	6.286	-0.275	-0.270	0.000	0.462	0.000	0.000
23-Jun-00	221	0.000	0.000	1.021	-14.516	-0.278	0.127	0.000	-2.045	0.000	0.000
30-Jun-00	222	0.000	0.000	1.101	-14.430	0.563	0.109	0.000	-1.155	0.000	-5.258
07-Jul-00	223	-1.951	0.000	1.181	-11.122	-0.561	0.154	0.000	-0.144	0.000	0.000
14-Jul-00	224	89.055	0.000	-0.442	0.164	-0.312	0.364	0.000	-0.126	0.000	-2.580
21-Jul-00	225	0.000	-1.637	-0.107	0.000	-0.009	0.843	0.000	-2.423	-5.409	2.805
28-Jul-00	226	0.000	-2.388	0.295	0.000	0.009	0.264	0.000	0.347	0.000	-0.328
04-Aug-00	227	0.000	-1.887	0.245	2.000	0.020	-0.494	0.000	-10.391	-2.778	-0.500
11-Aug-00	228	0.000	0.000	-2.806	13.319	-0.029	0.006	0.000	-0.082	-2.857	0.000
18-Aug-00	229	0.000	0.000	1.441	0.000	1.494	-0.188	0.000	3.509	0.000	-1.791
25-Aug-00	230	0.000	-3.675	1.211	0.000	4.675	0.081	0.000	3.884	0.000	0.000
01-Sep-00	231	0.000	-4.170	2.587	0.000	0.619	-4.246	0.000	5.966	0.000	0.000
08-Sep-00	232	0.000	0.000	0.041	0.000	-0.291	4.217	0.000	2.603	0.000	-0.304
15-Sep-00	233	0.000	-1.667	0.435	0.000	-0.471	-0.412	0.000	5.041	0.000	-0.219
22-Sep-00	234	0.000	0.000	1.284	0.000	0.184	-1.434	0.000	1.201	0.000	0.000
29-Sep-00	235	0.000	0.000	0.600	0.000	-2.134	-6.924	0.000	-0.887	-0.735	0.000
06-Oct-00	236	0.000	0.000	-0.124	0.000	-4.292	-0.264	0.000	1.127	0.000	-2.225
13-Oct-00	237	-45.789	0.000	2.790	0.000	2.830	-1.181	-21.287	1.479	-2.519	0.000
20-Oct-00	238	0.000	0.000	2.692	0.000	-0.429	4.187	0.000	1.913	-1.216	0.000
27-Oct-00	239	-2.913	0.000	0.936	0.000	1.351	-0.571	0.000	0.087	0.000	0.000
03-Nov-00	240	0.000	0.163	2.699	3.315	0.337	2.660	0.000	-0.133	10.769	0.000
10-Nov-00	241	0.000	-15.613	3.905	-0.704	-0.481	-1.162	0.000	0.132	0.000	0.000
17-Nov-00	242	0.000	-3.403	-1.359	0.263	0.096	0.532	0.000	-4.037	0.000	0.041
24-Nov-00	243	0.000	0.000	0.001	0.722	0.120	-1.854	0.000	-1.126	0.000	0.000
01-Dec-00	244	0.000	0.000	-0.591	3.420	1.065	0.426	0.000	0.598	0.000	0.000
08-Dec-00	245	0.000	-1.175	-7.614	0.000	-0.447	0.789	0.000	1.699	-0.556	-1.915
15-Dec-00	246	0.000	0.000	0.928	0.000	0.483	1.141	0.000	1.731	0.000	0.000
22-Dec-00	247	0.000	0.000	0.708	0.000	0.089	-0.725	0.000	-0.586	0.000	0.000
29-Dec-00	248	0.000	0.000	1.422	-4.667	-5.278	-1.870	0.000	0.260	0.000	0.000
	Avarage	1.006	-0.823	0.407	-0.462	-0.014	-0.663	-0.409	0.279	-0.080	-1.142
	Variance	199.608	5.577	5.075	32.161	3.825	7.054	8.714	13.811	5.349	17.577
	Standard D	14.128	2.361	2.253	5.671	1.956	2.656	2.952	3.716	2.313	4.192

Commercial 2001

WeekEnd	Series	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
05-Jan-01	249	0.000	0.000	2.636	0.000	-0.371	-1.040	0.000	1.371	0.000	-2.201
12-Jan-01	250	0.000	0.000	-2.302	0.000	0.748	-0.475	0.000	-1.308	-19.329	-7.653
19-Jan-01	251	0.000	-10.580	0.689	0.000	0.716	-1.720	0.000	0.156	-3.048	-4.791
26-Jan-01	252	0.000	0.000	2.282	0.000	1.226	1.299	0.000	1.861	-0.089	-3.715
02-Feb-01	253	0.000	0.000	5.253	0.297	0.504	2.560	0.000	2.742	0.000	4.362
09-Feb-01	254	0.000	1.480	0.021	-49.490	-1.288	-0.014	-1.613	-2.054	0.000	0.992
16-Feb-01	255	0.000	0.000	-0.200	93.251	1.596	1.313	0.000	-0.016	-7.061	1.003
23-Feb-01	256	0.000	0.000	-3.224	0.000	0.994	0.099	0.000	0.694	0.000	0.000
02-Mar-01	257	0.000	-9.574	0.440	0.000	0.374	0.557	0.000	-0.357	0.000	-0.710
09-Mar-01	258	0.000	-10.256	0.101	0.000	0.067	-0.378	0.000	-0.282	0.000	-0.387
16-Mar-01	259	0.000	-7.096	-0.755	0.000	2.414	-0.546	0.000	-12.524	0.000	0.105
23-Mar-01	260	0.000	6.870	-5.015	0.000	0.118	-1.018	0.000	-2.532	0.000	-13.062
30-Mar-01	261	0.000	0.000	-2.022	0.000	-0.033	-2.497	0.000	0.725	0.000	0.000
06-Apr-01	262	0.000	0.000	0.939	0.000	0.067	-7.314	0.000	-1.813	0.000	0.000
13-Apr-01	263	0.000	0.000	-2.070	0.000	-0.096	-5.582	0.000	-0.045	0.000	-3.655
20-Apr-01	264	0.000	-0.719	0.013	0.000	0.019	0.122	0.000	2.675	0.000	0.000
27-Apr-01	265	0.000	0.000	-0.097	0.000	0.048	-5.802	0.000	1.541	0.000	-12.766
04-May-01	266	0.000	0.000	-2.207	0.000	0.076	2.088	0.000	-3.122	0.000	0.000
11-May-01	267	0.000	0.000	-2.051	0.000	-0.103	-2.372	0.000	-0.381	0.000	0.000
18-May-01	268	0.000	0.000	-0.173	-4.286	0.286	-2.061	0.000	1.656	-2.885	-9.915
25-May-01	269	0.000	-2.899	-6.927	0.000	-0.426	-6.321	0.000	1.529	0.000	-2.314
01-Jun-01	270	0.000	13.267	5.852	32.233	0.121	-4.537	0.000	0.870	0.000	0.000
08-Jun-01	271	0.000	12.006	-0.378	29.803	0.212	-8.293	0.000	1.899	0.000	-0.039
15-Jun-01	272	0.000	0.000	-0.221	-9.565	0.360	-5.358	0.000	8.430	0.000	2.313
22-Jun-01	273	0.000	0.000	1.239	0.000	-0.208	-3.322	0.000	-0.723	0.000	-2.222
29-Jun-01	274	0.000	0.000	-0.513	0.000	-0.703	2.526	0.000	-0.983	0.000	-1.136
06-Jul-01	275	0.000	0.000	3.845	-51.442	-3.198	8.855	0.000	-2.451	0.000	1.149
13-Jul-01	276	0.000	0.000	0.046	0.000	1.380	8.028	0.000	0.180	0.000	3.977
20-Jul-01	277	0.000	-2.353	0.093	0.000	2.318	0.572	0.000	1.825	0.000	0.000
27-Jul-01	278	0.000	0.000	-0.095	0.000	-1.070	-0.191	0.000	-0.867	-10.891	0.000
03-Aug-01	279	0.000	4.011	-0.039	34.053	-1.832	-2.505	0.000	1.085	0.000	0.401
10-Aug-01	280	0.000	0.000	-1.348	0.000	0.134	0.798	0.000	-8.011	0.000	8.853
17-Aug-01	281	0.000	-1.540	-0.875	13.854	-0.033	0.300	0.000	-1.542	0.000	0.000
24-Aug-01	282	0.000	0.000	-0.070	0.000	-0.684	-2.310	0.000	1.046	0.000	1.061
31-Aug-01	283	0.000	0.000	-7.168	-0.098	-2.300	-0.143	0.000	0.268	-33.676	-0.197
07-Sep-01	284	0.000	0.000	-1.111	0.000	-0.164	0.602	0.000	-0.196	-6.993	-0.855
14-Sep-01	285	0.000	0.000	-0.992	-3.896	-1.883	-0.444	0.000	-0.555	-4.606	0.000
21-Sep-01	286	0.000	0.000	-3.152	0.000	-4.547	-0.172	0.000	-0.698	0.000	0.000
28-Sep-01	287	0.000	0.000	-4.327	-10.135	-2.215	-9.517	0.000	-0.018	0.000	-6.285
05-Oct-01	288	0.000	0.000	-1.253	-17.331	-0.418	-3.160	0.000	-4.112	0.000	-10.072
12-Oct-01	289	0.000	0.000	-1.645	0.000	-2.937	-4.733	0.000	-16.741	1.964	-5.132

WeekEnd	Series	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
03-Jan-97	42	13.428	13.636	0.000	8.998	-2.508	2.069	18.923	19.269	13.256	17.355	8.501	37.931
10-Jan-97	43	-4.449	-5.786	1.026	7.492	-1.519	4.733	14.658	2.813	0.683	12.303	13.562	1.891
17-Jan-97	44	-1.226	-2.823	-1.016	1.533	-0.398	-0.447	-18.264	-11.850	-1.696	-11.360	0.204	-15.820
24-Jan-97	45	0.515	3.932	0.000	0.378	-3.059	1.266	-7.840	-4.406	-0.342	0.149	2.241	1.969
31-Jan-97	46	3.074	-0.694	0.000	-0.216	2.533	1.565	12.783	-2.755	0.076	-6.064	2.515	0.267
07-Feb-97	47	1.109	2.100	0.983	-6.429	0.327	3.386	8.945	16.197	-0.087	-1.146	4.082	1.472
14-Feb-97	48	-5.029	-4.207	3.422	-1.319	-0.136	4.206	5.458	5.335	0.021	9.036	0.000	-1.244
21-Feb-97	49	-2.190	-12.913	0.000	2.179	0.207	5.203	-8.865	0.152	0.091	-18.360	-2.778	-0.971
28-Feb-97	50	0.434	-1.514	1.495	2.637	-0.113	-7.630	-0.204	3.863	-0.109	1.896	0.000	1.123
07-Mar-97	51	-0.743	0.259	0.000	-0.383	0.217	0.053	-2.214	5.345	-1.949	-0.538	-4.859	-0.518
14-Mar-97	52	-8.697	-0.335	0.000	-1.485	-0.222	-0.746	20.351	-6.529	-0.821	-10.513	-0.148	-5.724
21-Mar-97	53	-0.745	-2.801	0.000	3.978	0.078	1.460	-11.468	6.544	1.685	6.717	0.752	-10.408
28-Mar-97	54	-0.631	-2.184	-5.660	0.975	-0.059	0.138	-2.004	-10.216	1.137	2.858	0.666	-8.016
04-Apr-97	55	0.974	-2.396	0.000	-1.550	-0.246	-1.997	-7.179	-1.757	-0.096	-0.248	1.516	4.167
11-Apr-97	56	2.970	0.561	0.000	-0.118	0.037	-7.421	-1.451	-2.993	0.124	3.265	-0.684	2.044
18-Apr-97	57	6.118	3.003	0.000	0.109	-0.165	2.400	-3.290	-2.431	-9.269	-2.816	0.000	2.516
25-Apr-97	58	5.120	1.263	0.000	4.826	0.093	4.565	4.203	4.938	2.410	1.326	0.000	-2.321
02-May-97	59	-0.039	1.711	0.261	1.368	-0.403	1.007	0.203	1.268	3.592	-0.373	3.416	1.786
09-May-97	60	-2.560	-0.302	0.000	0.719	0.828	0.714	-3.243	4.461	-0.226	1.644	-0.459	8.796
16-May-97	61	0.885	0.186	9.713	3.659	-3.503	0.994	-7.220	2.349	2.232	2.509	0.000	-5.078
23-May-97	62	-0.797	0.987	12.958	0.215	1.735	3.016	7.158	1.415	0.377	-1.295	1.429	0.047
30-May-97	63	0.134	-0.160	0.000	0.983	0.788	4.176	1.774	7.609	-0.102	-2.023	-0.704	3.549
06-Jun-97	64	0.000	1.244	-10.667	1.434	-1.907	12.303	1.964	-1.837	1.116	-1.699	0.065	1.571
13-Jun-97	65	-0.589	-0.425	6.176	4.372	2.513	5.878	1.734	1.156	0.146	0.582	4.187	4.092
20-Jun-97	66	-0.606	1.326	-1.999	13.137	-0.077	-0.390	-2.256	11.311	-1.458	-0.472	0.000	6.434
27-Jun-97	67	-0.230	5.107	0.000	-13.762	0.328	-14.053	-0.515	17.900	0.330	0.022	-1.206	-1.571
04-Jul-97	68	-0.421	0.062	0.114	1.012	0.506	-2.455	-0.299	-1.302	0.275	-0.143	-1.112	-3.014
11-Jul-97	69	-3.421	-3.988	0.000	2.274	0.196	2.050	-3.556	-10.404	0.800	-0.082	-2.090	2.363
18-Jul-97	70	-0.945	-2.229	0.000	0.373	-0.009	-4.773	0.261	4.831	-3.568	-0.009	0.000	-1.755
25-Jul-97	71	0.769	-3.781	12.554	-16.462	-1.044	-4.201	2.852	12.379	2.681	-0.637	-3.280	-0.692
01-Aug-97	72	2.587	1.122	0.000	2.936	-14.521	1.076	-2.382	1.001	-5.616	-2.485	0.000	-2.105
08-Aug-97	73	-2.136	5.057	0.000	-1.846	1.332	1.905	-0.629	0.325	-8.334	-3.275	0.000	-8.050
15-Aug-97	74	-0.127	-2.501	0.000	6.486	0.123	0.035	-0.127	-4.227	0.729	-1.374	2.941	1.025
22-Aug-97	75	-2.129	1.108	0.000	-3.901	-0.610	1.181	-0.744	-0.408	1.071	-6.166	-5.714	-0.042
29-Aug-97	76	0.980	-1.835	0.000	4.499	-0.463	-0.245	0.534	-2.306	1.520	0.321	4.055	-0.927
05-Sep-97	77	0.599	-4.419	10.000	3.610	-0.654	-0.250	0.510	-4.820	-0.177	-1.940	-0.985	0.238
12-Sep-97	78	0.422	-0.051	-22.592	-1.865	-2.416	-0.114	-2.906	-5.309	-3.533	-2.621	0.000	-0.284
19-Sep-97	79	0.085	0.918	0.000	-11.420	-0.903	-7.086	-0.142	-12.652	-1.201	-0.474	0.000	0.000
26-Sep-97	80	0.833	0.124	-0.762	0.035	-0.232	-1.828	-4.255	22.937	-0.187	-3.095	0.224	-0.950
03-Oct-97	81	1.862	-1.846	0.000	2.204	-2.542	-11.322	-0.765	-6.814	-0.138	0.251	-0.223	0.959
10-Oct-97	82	-0.206	-1.030	-0.592	3.519	-4.450	4.193	-0.456	-7.875	-3.692	-1.953	0.000	0.000
17-Oct-97	83	-0.882	0.419	0.000	-2.873	0.014	4.979	-0.795	-5.036	-2.086	-3.810	1.471	-4.650
24-Oct-97	84	-0.542	0.316	-2.381	0.494	-0.026	3.016	-1.453	0.425	0.463	1.267	0.000	-2.817
31-Oct-97	85	-1.369	-2.406	0.000	-1.106	0.227	-11.349	0.790	-5.976	0.393	0.366	-2.174	-0.084
07-Nov-97	86	-4.095	-1.882	0.000	5.259	-0.891	-7.318	0.593	-1.081	-2.239	-0.193	0.000	-0.093
14-Nov-97	87	5.067	5.969	0.000	-10.424	0.197	0.966	1.453	0.651	-0.165	-3.907	0.000	0.000
21-Nov-97	88	4.513	1.177	0.000	0.233	0.893	-1.452	-0.415	2.381	-0.429	-0.932	0.000	-3.605
28-Nov-97	89	2.529	-1.078	-2.439	5.098	0.551	2.551	2.133	0.635	-1.693	0.299	0.741	-1.126
05-Dec-97	90	-0.853	1.265	4.375	1.958	2.318	2.741	2.174	2.565	4.755	-4.287	0.000	-0.008
12-Dec-97	91	1.284	0.435	0.000	0.747	-0.361	1.638	0.000	1.398	-0.366	0.000	0.000	-0.174
19-Dec-97	92	-1.202	3.288	0.000	-1.961	0.565	-2.025	0.000	0.000	0.631	4.961	0.085	0.000
26-Dec-97	93	2.262	1.711	0.000	0.967	0.512	2.754	1.809	1.983	0.132	-0.089	0.000	-1.126
Avarage		0.225	-0.102	0.288	0.453	-0.506	0.021	0.314	0.970	-0.170	-0.524	0.505	0.021
Variance		10.107	12.903	24.759	26.290	5.774	22.554	42.249	55.736	9.586	27.212	8.278	44.310
Standard D		3.179	3.592	4.976	5.127	2.403	4.749	6.500	7.466	3.096	5.217	2.877	6.657

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WeekEnd	Series	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
02-Jan-98	94	3.337	4.727	0.000	1.892	2.941	13.457	7.798	13.883	11.276	4.199	0.000	4.419
09-Jan-98	95	0.726	0.176	-9.810	0.599	12.386	-1.033	1.049	13.041	7.681	0.942	0.735	11.112
16-Jan-98	96	-3.082	-1.451	-4.393	-0.818	-4.967	-4.255	-0.812	6.489	-9.956	-1.170	0.000	-1.539
23-Jan-98	97	-1.551	-3.630	1.471	-0.055	-10.116	-3.213	1.336	1.236	0.568	-3.374	117.518	0.000
30-Jan-98	98	4.454	-0.716	-0.487	-0.287	2.623	-0.785	2.593	2.133	-0.343	-0.620	-54.027	0.607
06-Feb-98	99	2.132	-2.755	1.508	0.918	-1.064	-0.429	-1.008	-0.817	-0.401	0.475	3.769	-0.583
13-Feb-98	100	5.298	-1.956	-1.762	2.261	-0.598	-0.884	1.400	-8.978	-1.175	3.318	-1.404	1.966
20-Feb-98	101	-1.611	-8.221	-3.448	0.213	1.457	0.626	3.665	-7.523	2.387	-1.652	-0.845	-1.221
27-Feb-98	102	0.801	2.437	0.171	-5.363	0.898	-4.550	1.094	-3.397	5.198	-0.565	-2.147	0.416
06-Mar-98	103	-7.551	-0.348	0.685	3.074	-1.073	-4.399	2.390	0.559	2.951	-0.266	0.735	-0.092
13-Mar-98	104	-1.328	0.417	-3.447	-3.732	-13.652	-6.987	0.124	-2.685	1.308	-1.401	-7.243	-5.162
20-Mar-98	105	-1.675	2.486	0.000	-4.219	-5.617	-0.050	-0.377	-9.088	-1.540	0.385	10.169	10.209
27-Mar-98	106	-0.222	0.616	-1.394	-2.853	-1.574	2.043	0.412	-1.590	-9.326	-9.451	0.000	0.000
03-Apr-98	107	-2.239	-2.865	-10.677	-0.934	0.850	3.659	1.394	-0.280	-2.204	0.863	0.000	-3.232
10-Apr-98	108	-2.343	-5.282	-0.067	-4.034	0.654	-3.428	-1.353	0.854	-2.198	0.805	0.000	-13.622
17-Apr-98	109	0.288	-1.688	0.000	-18.732	-1.930	-0.311	-0.266	-0.491	-1.776	0.580	0.000	-3.963
24-Apr-98	110	-1.272	-0.557	3.333	-2.105	-1.239	-0.017	-2.780	2.222	-0.834	6.089	0.000	-11.210
01-May-98	111	0.083	-0.348	-0.194	0.528	4.468	-0.320	2.921	0.695	-0.127	0.666	0.000	0.232
08-May-98	112	2.435	7.329	-3.480	5.198	3.813	-8.299	-5.242	2.077	2.803	1.227	-2.857	9.511
15-May-98	113	5.890	-1.807	0.000	19.598	-7.315	5.812	-2.471	18.335	5.051	0.732	-3.676	9.306
22-May-98	114	6.417	3.548	0.000	-3.770	0.206	4.728	-4.143	-12.620	5.473	-0.297	0.000	-3.858
29-May-98	115	2.014	4.683	0.000	-1.230	0.761	1.268	0.365	5.003	-15.139	3.387	0.000	-1.397
05-Jun-98	116	-2.244	-1.988	0.000	-4.149	-0.817	-4.583	0.102	-3.533	12.205	-0.198	0.000	-0.601
12-Jun-98	117	-3.726	0.077	0.458	0.437	9.958	0.866	-5.170	2.663	-2.613	-2.878	-3.562	0.599
19-Jun-98	118	1.336	-3.620	0.000	2.296	15.562	1.470	-0.519	-1.359	-0.188	-0.900	0.000	-0.931
26-Jun-98	119	-0.123	-0.854	0.168	-0.520	-21.394	-0.172	1.033	0.838	2.361	-0.190	-8.179	0.890
03-Jul-98	120	-2.628	1.216	0.000	6.120	-0.351	-0.608	0.971	-2.533	1.766	-9.091	-5.724	1.015
10-Jul-98	121	-3.015	-4.364	0.000	-4.956	-0.516	-0.145	-2.560	0.288	1.762	0.000	0.000	0.000
17-Jul-98	122	-0.065	0.924	0.000	-0.260	-0.049	1.015	2.169	-1.166	0.106	-0.056	-6.730	1.699
24-Jul-98	123	2.340	-1.906	0.058	6.703	-2.258	0.700	1.012	-0.886	-0.590	-0.112	0.000	-8.362
31-Jul-98	124	1.213	1.667	-0.058	-5.576	-8.987	1.138	-0.072	0.477	-6.241	0.065	0.000	0.000
07-Aug-98	125	-0.303	-1.707	-0.064	-6.086	0.749	-1.095	1.129	1.077	-0.648	0.091	0.000	-0.024
14-Aug-98	126	0.633	0.879	0.000	-0.397	0.540	-1.112	-4.940	3.693	-1.396	-0.005	0.000	0.000
21-Aug-98	127	0.465	-1.527	-3.271	-15.990	0.047	-0.327	0.904	-10.352	0.125	-6.872	0.000	0.000
28-Aug-98	128	-2.917	5.370	-0.578	12.792	-0.162	0.061	1.374	9.924	-1.062	1.061	0.000	-0.104
04-Sep-98	129	0.181	0.464	-4.622	-5.427	-0.021	-5.234	-0.497	1.634	-7.414	2.005	0.000	0.104
11-Sep-98	130	0.396	-5.760	1.818	-5.074	0.782	-2.771	-0.448	-6.665	-3.362	2.358	0.000	-1.563
18-Sep-98	131	0.603	-1.649	-1.786	-0.079	-2.359	-2.384	-0.389	-5.840	1.211	1.611	0.000	-1.497
25-Sep-98	132	0.561	0.610	-7.455	-0.353	-10.421	-5.834	0.106	-5.698	1.828	-2.472	0.000	-3.401
02-Oct-98	133	0.228	-1.863	-4.715	0.626	-5.883	-0.912	0.462	2.750	3.444	-2.134	0.000	-3.136
09-Oct-98	134	-0.671	-0.274	-0.736	-0.675	4.313	0.966	0.013	-1.897	0.901	3.841	0.000	0.000
16-Oct-98	135	0.331	0.178	-0.297	-1.795	3.257	-1.549	-0.582	-1.985	-2.707	1.151	0.000	3.266
23-Oct-98	136	0.610	1.077	0.000	2.562	-0.500	0.703	-0.122	1.195	-1.312	2.075	2.330	0.061
30-Oct-98	137	0.303	0.347	0.000	-11.714	-5.210	1.402	-2.660	-2.876	-0.464	2.137	-0.145	0.133
06-Nov-98	138	-0.013	0.779	-4.167	-1.193	-8.140	0.668	3.769	-2.686	12.149	-0.079	0.000	0.000
13-Nov-98	139	0.503	1.279	7.510	-3.338	-10.466	-0.517	-2.551	2.953	-2.805	-1.563	0.000	-0.133
20-Nov-98	140	2.730	0.916	0.000	3.679	1.485	-6.610	-2.690	1.438	-8.195	-2.244	0.000	0.000
27-Nov-98	141	5.473	2.301	0.000	-0.715	-5.016	-5.035	2.761	0.742	1.089	3.211	0.000	0.393
04-Dec-98	142	9.095	4.874	1.103	6.393	12.034	-0.161	-5.282	2.038	-0.121	6.832	0.148	0.000
11-Dec-98	143	7.754	13.478	0.000	8.848	9.772	12.672	-1.297	15.021	6.996	0.000	0.000	3.577
18-Dec-98	144	-3.883	5.695	-0.064	8.146	16.485	3.872	9.838	8.638	6.239	-4.817	0.000	0.000
25-Dec-98	145	3.324	-0.215	0.000	3.698	-0.175	0.237	0.000	0.482	-1.285	4.506	0.000	0.000
Avarage		0.567	0.215	-0.936	-0.382	-0.497	-0.397	0.076	0.528	0.220	0.042	0.747	-0.118
Variance		9.484	12.284	8.505	37.790	47.298	15.802	7.946	36.920	26.276	9.532	334.581	18.413
Standard D		3.080	3.505	2.916	6.147	6.877	3.975	2.819	6.076	5.126	3.087	18.292	4.291

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WeekEnd	Series	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
01-Jan-99	146	2.168	0.568	0.000	15.631	39.627	0.216	2.310	0.495	7.350	1.461	-11.730	3.435
08-Jan-99	147	0.785	-3.533	0.064	-10.607	-2.607	9.855	25.971	0.671	13.368	1.965	0.000	12.523
15-Jan-99	148	-6.604	1.440	-3.000	-5.749	-34.310	-6.424	-2.959	-1.675	-7.332	8.145	0.000	9.809
22-Jan-99	149	-1.019	-10.992	0.000	-9.393	11.147	-0.103	-10.677	0.443	-19.371	1.620	16.304	0.792
29-Jan-99	150	6.489	0.586	0.000	7.655	-1.220	-0.050	-4.874	0.237	7.109	0.305	0.000	-0.454
05-Feb-99	151	0.029	1.838	4.101	0.910	2.263	2.740	1.578	0.881	1.514	2.163	0.000	0.291
12-Feb-99	152	-1.640	3.392	-0.814	-1.935	-10.978	-0.095	-0.768	-0.394	-3.507	1.200	0.000	0.000
19-Feb-99	153	-2.868	-1.483	-0.156	0.744	-3.662	-6.177	-0.206	2.533	-4.987	0.236	0.000	-8.775
26-Feb-99	154	-2.289	0.897	0.000	2.299	-3.927	-6.928	0.339	2.704	-5.295	0.000	0.000	-1.088
05-Mar-99	155	-2.018	0.910	0.000	-3.279	-1.403	0.720	0.743	0.713	-1.303	0.125	0.000	0.000
12-Mar-99	156	-12.189	-3.234	0.000	5.122	-1.188	-6.512	0.816	1.729	3.145	-3.692	8.411	-11.867
19-Mar-99	157	5.803	2.664	0.000	-2.716	-7.245	-7.230	0.075	-0.575	1.008	-0.285	-9.863	-11.569
26-Mar-99	158	2.152	-2.762	0.289	-2.237	1.403	-1.728	1.098	-0.519	-0.669	1.099	-2.448	6.334
02-Apr-99	159	-0.856	-0.581	0.000	4.898	1.756	-5.963	-1.186	0.170	-0.295	-1.066	0.000	4.000
09-Apr-99	160	0.216	1.034	0.000	1.024	-0.544	6.462	0.196	1.964	0.114	-0.016	0.000	-0.421
16-Apr-99	161	-0.658	-0.329	-0.288	11.938	-4.410	-8.113	-0.144	1.469	-2.191	1.571	-3.922	-2.758
23-Apr-99	162	-3.105	-1.231	0.153	-17.150	-5.107	-0.866	-0.088	2.594	-2.213	-1.552	0.000	-5.650
30-Apr-99	163	0.660	0.729	0.000	-2.541	-0.983	-0.443	0.037	0.093	-9.842	0.000	3.313	-1.420
07-May-99	164	2.095	-6.447	23.565	5.908	-0.543	-0.424	-0.008	-0.256	0.223	-3.924	-14.916	-0.242
14-May-99	165	0.252	2.201	51.798	3.485	-1.091	2.843	0.008	0.287	1.354	-0.109	4.475	-0.114
21-May-99	166	-0.011	8.472	-27.604	0.167	0.959	-2.822	0.000	-0.062	4.851	-3.249	0.000	0.000
28-May-99	167	-1.304	-2.354	6.086	-0.181	2.104	1.771	-6.608	0.090	3.520	2.210	0.000	0.000
04-Jun-99	168	1.101	2.553	24.768	-1.627	0.377	-1.715	-5.815	0.031	1.379	1.211	1.428	6.972
11-Jun-99	169	-0.252	0.719	-18.295	-0.236	11.743	-0.154	-2.836	0.572	-0.803	3.196	-1.408	-3.179
18-Jun-99	170	0.758	1.485	-2.093	-0.690	-6.405	-0.173	0.748	0.069	-2.471	-3.631	0.000	4.035
25-Jun-99	171	1.847	1.604	0.000	5.320	-0.521	0.588	2.515	0.182	-2.201	-1.574	0.000	-0.568
02-Jul-99	172	2.228	2.522	0.000	1.643	-2.329	5.802	3.036	1.138	-1.453	-0.601	0.000	1.586
09-Jul-99	173	3.724	5.861	0.000	-0.830	-2.066	6.633	-0.010	1.724	-0.499	1.331	4.444	2.848
16-Jul-99	174	-0.813	0.868	0.626	-4.198	-8.151	-7.028	0.412	0.321	-0.139	1.373	0.000	0.335
23-Jul-99	175	0.777	-1.304	-0.622	-3.087	1.351	-4.747	-0.158	0.645	0.689	-0.596	0.000	-3.787
30-Jul-99	176	1.426	0.990	0.000	-4.692	0.118	1.039	-0.289	0.656	0.632	0.432	0.000	-0.858
06-Aug-99	177	-3.312	3.662	0.000	0.403	-6.002	0.926	0.000	0.616	-1.595	1.910	-2.128	0.021
13-Aug-99	178	-5.913	0.423	1.268	3.055	-0.825	-13.013	0.499	-0.752	-0.680	-5.779	0.000	0.274
20-Aug-99	179	-0.641	-2.253	0.000	3.066	-1.632	0.779	-1.621	1.416	-4.087	-8.656	0.000	-2.816
27-Aug-99	180	-8.123	-1.185	9.634	-2.555	2.262	3.259	-5.172	-1.359	-2.266	-3.823	-2.174	-4.245
03-Sep-99	181	3.449	0.882	-4.855	7.072	0.840	-6.288	2.458	0.709	-8.999	-1.042	-5.556	0.000
10-Sep-99	182	-0.390	-0.381	-5.334	-9.920	-4.153	-3.502	-4.682	1.793	-5.539	0.724	0.000	0.000
17-Sep-99	183	-3.970	-0.282	0.209	4.591	-0.058	-4.594	4.507	-2.805	-7.192	3.369	0.000	7.143
24-Sep-99	184	0.710	0.611	0.231	0.374	0.155	2.190	-4.892	-0.175	2.811	10.931	0.000	0.333
01-Oct-99	185	2.178	1.475	0.000	3.354	-0.446	2.992	-5.271	-0.597	4.610	4.077	0.000	-3.090
08-Oct-99	186	2.132	0.625	52.107	1.531	-3.754	-0.890	-0.850	1.076	0.284	-4.302	0.000	2.884
15-Oct-99	187	-0.012	1.745	-3.636	-2.533	-7.072	-0.275	1.446	1.522	-0.405	4.348	0.000	1.629
22-Oct-99	188	-0.531	2.057	-1.887	-0.515	0.478	-4.124	-3.535	-2.330	0.451	-2.083	0.000	-1.795
29-Oct-99	189	-2.463	0.965	-6.465	0.959	9.634	-3.113	0.035	-0.111	-0.169	-2.744	3.965	-3.180
05-Nov-99	190	0.174	2.237	-9.594	1.330	-8.791	-11.098	-0.357	0.045	-0.533	-1.404	0.000	-0.455
12-Nov-99	191	0.459	-0.285	-5.982	-2.935	7.079	-0.486	0.167	0.464	-0.404	2.066	0.000	0.000
19-Nov-99	192	2.039	-0.470	-1.991	-6.398	2.953	11.385	3.334	-0.551	-2.778	0.306	0.000	-2.913
26-Nov-99	193	0.048	-6.657	-1.333	-0.937	0.237	-1.103	1.076	0.194	3.629	2.098	0.174	0.000
03-Dec-99	194	-2.022	-0.947	1.351	-0.224	0.170	5.721	-0.060	-0.097	-0.957	2.841	0.000	-0.097
10-Dec-99	195	2.101	0.467	0.000	-5.378	0.302	-8.008	-3.336	5.678	1.299	5.973	0.000	0.000
17-Dec-99	196	-0.702	0.110	-7.407	5.701	-0.451	-4.494	-0.069	-2.252	7.315	-1.439	0.000	0.000
24-Dec-99	197	0.488	0.630	7.412	1.587	0.462	2.241	-8.911	-1.394	-4.491	2.763	0.000	2.321
31-Dec-99	198	0.606	0.675	-1.311	0.247	1.083	4.142	9.143	-1.573	3.126	-0.080	0.000	-0.729
	Avarage	-0.317	0.211	1.528	-0.048	-0.630	-1.064	-0.242	0.348	-0.658	0.366	-0.219	-0.085
	Variance	9.788	8.551	155.015	29.387	71.981	24.556	24.304	1.973	24.160	10.518	17.758	18.132
	Standard D	3.129	2.924	12.450	5.421	8.484	4.955	4.930	1.405	4.915	3.243	4.214	4.258

31-Mar-00	211	0.033	1.195	0.000	0.490	-0.340	4.358	0.198	1.049	-0.622	-1.846	0.000	0.615
07-Apr-00	212	0.500	0.880	0.000	-1.374	0.455	6.854	-1.632	1.032	-0.670	1.887	0.000	4.838
14-Apr-00	213	-0.541	-0.432	0.000	0.418	2.405	1.235	-1.846	6.069	-8.567	-0.231	0.000	0.077
21-Apr-00	214	-1.155	-7.700	3.571	-0.324	-0.242	-6.796	0.000	5.346	-3.900	-6.757	0.000	0.000
28-Apr-00	215	0.392	-2.024	0.000	0.743	0.194	-12.852	0.000	-0.271	0.762	0.000	-3.986	0.000
05-May-00	216	-0.716	-1.555	0.000	-0.335	-0.078	16.941	-0.094	2.062	0.671	-18.694	0.000	9.436
12-May-00	217	0.282	2.263	0.000	0.630	0.000	-0.357	-12.265	-0.621	1.414	2.756	0.000	0.036
19-May-00	218	-0.562	-0.129	-3.448	1.332	0.000	2.917	-6.040	-0.132	-1.673	1.144	-5.317	-1.841
26-May-00	219	-2.793	-1.712	-4.905	-1.257	-0.632	-3.250	0.726	0.993	-0.030	-0.465	0.000	0.000
02-Jun-00	220	-1.210	-4.755	0.000	-0.825	-10.290	-3.179	0.461	0.038	-4.884	0.755	0.000	1.695
09-Jun-00	221	-0.153	3.427	0.000	-0.793	-1.329	-2.437	2.353	3.169	-1.330	1.137	0.000	-1.898
16-Jun-00	222	1.203	0.179	0.000	-0.918	-4.730	6.034	0.000	1.495	1.617	-4.898	0.000	-5.325
23-Jun-00	223	0.245	0.773	0.000	-15.884	2.413	1.020	0.534	-1.577	-5.870	-0.506	0.000	-8.545
30-Jun-00	224	0.697	0.997	-1.452	-8.683	2.456	-6.379	2.756	-3.660	-0.609	-1.315	0.000	-14.696
07-Jul-00	225	-0.554	5.291	1.626	14.378	1.216	1.663	2.364	-1.680	-1.491	0.000	0.000	2.209
14-Jul-00	226	0.221	0.480	0.000	9.826	7.171	-6.758	-4.348	0.958	1.129	-0.022	0.000	0.000
21-Jul-00	227	-1.992	0.397	-2.550	-0.684	3.578	-4.127	0.000	-1.284	-0.636	-0.925	0.000	1.449
28-Jul-00	228	-3.746	1.231	-0.176	3.576	0.531	-0.969	0.000	-1.767	-4.579	0.452	0.000	0.000
04-Aug-00	229	3.928	2.099	0.000	-2.127	0.171	0.400	0.000	1.388	0.720	0.000	0.000	0.000
11-Aug-00	230	0.862	0.602	0.000	-0.094	0.120	-2.064	-9.091	-0.675	-11.969	-2.964	0.000	0.000
18-Aug-00	231	0.902	0.536	0.000	-0.111	1.703	-5.418	-1.000	3.491	-6.112	-7.205	0.000	2.190
25-Aug-00	232	0.464	1.293	0.000	0.121	-1.373	9.191	-0.453	5.808	12.096	0.000	0.000	-2.036
01-Sep-00	233	-0.300	1.487	0.000	0.372	0.203	3.027	0.000	1.460	8.044	-0.768	0.000	-0.517
08-Sep-00	234	1.052	1.065	0.000	2.968	1.104	0.163	-0.813	4.252	5.526	-15.758	0.000	-0.686
15-Sep-00	235	0.539	-0.096	-6.907	-3.344	1.109	0.104	-6.342	-2.335	6.442	-0.312	0.000	0.000
22-Sep-00	236	1.130	0.012	-1.998	-7.756	-1.281	5.602	-1.342	1.843	0.347	0.000	0.000	-7.607
29-Sep-00	237	1.433	-0.595	0.000	0.211	-0.449	2.060	-0.281	-4.112	-0.368	6.667	0.000	1.196
06-Oct-00	238	1.824	0.233	0.000	-0.182	4.642	0.931	-0.077	-0.603	1.286	-0.014	0.000	-1.045
13-Oct-00	239	3.059	-0.228	-4.225	0.008	5.372	3.931	0.801	2.583	-8.396	-0.105	15.000	1.991
20-Oct-00	240	1.717	0.528	0.000	-3.110	5.351	-4.316	4.772	-0.497	-0.900	0.119	1.087	0.000
27-Oct-00	241	0.990	0.062	0.000	-0.085	7.079	4.843	-0.120	0.334	-1.926	-1.174	0.000	-1.531
03-Nov-00	242	-10.144	-4.571	-1.412	-5.017	-0.562	-0.328	0.120	2.978	-12.029	-4.909	0.000	2.073
10-Nov-00	243	-2.665	-5.593	-4.236	-4.135	-3.264	-0.111	1.388	-1.007	1.876	-2.730	0.000	-3.249
17-Nov-00	244	-3.587	-0.624	-1.558	0.391	-16.371	0.159	-0.099	-0.001	1.569	-0.858	0.000	-0.314
24-Nov-00	245	-1.297	0.539	0.617	-3.811	-2.612	-0.587	-1.271	-2.777	-0.623	0.997	0.165	0.332
01-Dec-00	246	-4.389	-0.386	-14.221	-2.692	-1.604	-2.327	1.317	0.557	-0.617	-2.822	0.000	-0.499
08-Dec-00	247	-9.117	-9.838	-11.536	-10.111	-20.018	-17.356	-1.164	-11.190	0.185	-1.626	0.000	-6.052
15-Dec-00	248	-11.787	-8.802	-8.816	-4.218	-1.655	-11.929	-2.765	0.104	-4.125	0.000	0.000	4.996
22-Dec-00	249	21.854	19.373	0.000	3.873	3.270	23.319	0.000	3.189	-6.114	0.000	0.000	7.428
29-Dec-00	250	0.358	6.733	9.210	11.546	10.020	4.243	-0.194	0.990	2.647	0.000	0.000	-10.448
	Average	0.019	0.751	-1.409	-0.480	-0.587	-0.250	-0.543	-0.012	-1.057	-1.092	0.127	-0.369
	Variance	40.890	27.291	19.193	22.789	27.892	43.134	8.493	23.225	22.650	16.823	5.532	15.432
	Standard D	6.395	5.224	4.381	4.774	5.281	6.568	2.914	4.819	4.759	4.102	2.352	3.928

Financial 2001

WeekEnd	Series	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
05-Jan-01	251	5.899	-2.560	-0.051	3.742	-51.494	-21.610	2.503	5.491	-2.937	2.922	0.000	0.000
12-Jan-01	252	-4.397	-3.626	0.000	-2.032	146.521	-0.751	0.389	3.908	2.372	-0.757	0.000	0.000
19-Jan-01	253	-5.866	-5.750	0.359	-0.599	-6.525	1.203	-2.536	1.001	-1.028	-2.256	0.000	-0.352
26-Jan-01	254	1.513	6.806	-2.104	1.481	0.981	1.650	0.000	5.026	4.915	-6.025	0.000	0.354
02-Feb-01	255	1.736	3.089	1.725	-11.104	-9.961	-0.977	1.522	-0.831	0.460	-1.029	0.000	3.333
09-Feb-01	256	2.298	-1.233	-1.250	7.482	0.162	1.317	-2.437	-5.582	0.168	0.024	0.000	-3.908
16-Feb-01	257	-0.105	4.005	-0.844	-4.226	4.048	-2.088	-4.610	-0.396	0.384	1.816	0.000	6.361
23-Feb-01	258	3.722	12.027	2.128	-0.208	-2.656	19.233	-0.088	6.438	-4.764	2.127	0.000	1.000
02-Mar-01	259	3.588	-3.300	-0.189	3.130	-1.920	11.532	-2.752	-4.055	-1.489	-3.852	0.000	-0.521
09-Mar-01	260	-4.835	1.653	-5.655	-8.817	0.015	-1.172	0.000	0.654	0.614	0.009	-19.570	1.875
16-Mar-01	261	-1.363	0.840	0.000	-3.892	-1.722	-9.840	-1.471	0.472	0.257	0.376	0.000	-0.299
23-Mar-01	262	2.751	-19.049	-2.677	-5.206	3.381	3.864	1.309	0.974	-1.673	-0.383	0.000	-0.628
30-Mar-01	263	-0.295	7.929	0.000	0.662	0.201	0.250	0.182	5.161	-1.967	2.084	-8.200	-0.292
06-Apr-01	264	0.424	0.852	0.000	-2.702	-1.185	0.093	-1.082	7.184	3.655	-2.042	0.000	0.000
13-Apr-01	265	-0.425	0.088	-6.268	-0.384	-11.453	6.076	-2.502	-4.315	-1.321	0.000	0.000	0.000
20-Apr-01	266	0.825	-0.036	2.936	-2.886	-1.040	-1.040	-1.652	16.371	-0.799	0.000	0.000	0.105
27-Apr-01	267	-9.295	2.064	-5.715	-0.183	-3.107	-0.397	-0.772	0.825	-0.843	0.000	0.000	-4.250
04-May-01	268	-2.232	1.484	-0.044	0.010	0.211	4.455	0.000	0.876	-8.580	-0.399	-6.796	-2.303
11-May-01	269	0.711	-0.279	4.939	-0.234	-8.572	11.039	-6.246	-0.785	0.138	-7.323	0.000	-2.938
18-May-01	270	-0.146	0.133	12.441	-5.519	-5.684	-2.794	0.174	-1.205	1.129	-2.500	0.000	-1.407
25-May-01	271	1.961	-3.009	0.000	-1.010	2.761	-4.933	0.552	-0.206	-0.396	0.000	0.000	-0.873
01-Jun-01	272	7.965	1.753	0.000	0.581	24.178	1.812	-0.421	-0.056	-2.262	-5.804	0.000	-0.292
08-Jun-01	273	-1.370	2.651	4.961	3.871	14.219	-5.811	0.659	-0.167	0.942	-0.190	0.000	1.246
15-Jun-01	274	2.957	4.099	0.523	2.946	-10.111	2.832	3.615	-0.496	1.518	1.818	0.000	-1.231
22-Jun-01	275	7.371	2.697	-1.851	-0.087	-7.966	3.103	-0.089	-0.042	-0.957	0.504	0.000	-0.145
29-Jun-01	276	-1.077	-2.460	2.298	0.256	-4.722	-2.178	-1.302	-1.816	2.655	-2.369	0.000	-0.811
06-Jul-01	277	-4.893	-1.772	4.000	1.167	-3.525	-4.251	0.324	-1.812	-2.972	0.198	1.250	-0.177
13-Jul-01	278	0.571	0.158	0.151	0.297	2.854	1.246	-1.187	-4.922	0.089	0.000	0.000	-0.605
20-Jul-01	279	0.731	1.930	3.306	3.611	5.803	-4.119	-1.116	-5.087	-1.328	0.218	0.000	-1.145
27-Jul-01	280	0.697	-0.304	0.000	0.029	-0.919	18.031	-3.929	0.109	1.969	1.329	0.000	-1.659
03-Aug-01	281	1.301	1.542	0.411	-2.117	5.167	-4.307	-9.536	-2.281	-1.732	-1.482	0.000	0.979
10-Aug-01	282	-2.595	-1.645	-0.040	0.307	0.364	-7.449	0.000	2.168	-3.283	-0.045	0.000	3.382
17-Aug-01	283	-0.953	-8.714	0.000	-3.302	-2.681	-5.489	13.383	-1.993	-9.135	2.273	0.000	0.268
24-Aug-01	284	-2.964	-5.676	0.000	-7.471	-9.294	-0.422	-1.010	0.292	-6.916	-2.222	0.000	0.000
31-Aug-01	285	-4.748	-0.752	0.000	0.556	3.895	-0.079	-1.812	-0.550	-1.042	0.000	0.000	0.000
07-Sep-01	286	-2.296	-4.064	3.457	-0.077	0.377	-2.964	-2.108	0.119	-4.571	0.000	1.852	0.000
14-Sep-01	287	-1.652	1.639	-1.909	-12.686	-0.052	-6.431	3.285	-0.061	0.380	-3.564	-3.489	-4.609
21-Sep-01	288	0.044	10.349	0.000	-0.948	-2.754	-0.449	2.071	0.235	2.832	0.000	-5.804	-1.285
28-Sep-01	289	0.232	0.056	-1.460	-7.764	-12.893	0.576	-3.043	-0.335	1.693	-10.941	0.000	-0.051
05-Oct-01	290	4.758	0.643	0.000	4.237	15.454	1.005	1.622	0.670	0.759	-12.638	0.000	-2.500
12-Oct-01	291	4.326	-0.046	-0.741	11.408	10.637	8.500	0.404	0.862	-1.212	2.480	0.000	6.410
19-Oct-01	292	1.199	0.668	0.000	3.613	7.470	19.530	-2.027	6.538	0.472	6.416	0.000	0.185
26-Oct-01	293	-4.199	-3.461	0.000	13.129	1.228	-2.922	4.132	-8.039	0.308	0.060	27.882	4.995
02-Nov-01	294	-2.064	-1.873	-3.731	2.653	0.861	-7.643	2.653	-1.448	11.263	-0.009	0.000	-0.352
09-Nov-01	295	2.610	3.268	1.550	-4.819	-5.052	-10.881	-0.172	0.387	-8.666	0.000	0.000	-0.575
16-Nov-01	296	0.671	-0.796	0.000	1.151	-8.742	-2.395	0.627	0.776	-2.280	1.174	0.000	3.468
23-Nov-01	297	-0.769	2.064	0.000	0.055	2.316	-3.551	-1.092	-4.271	-11.400	-1.101	0.000	-2.235
30-Nov-01	298	3.105	1.929	0.000	0.134	1.156	0.369	0.000	0.280	10.565	0.450	0.000	4.659
07-Dec-01	299	-2.365	1.446	0.000	0.072	-3.296	0.880	0.494	0.506	2.436	-1.673	0.000	-0.629
Avarage		0.062	0.152	0.217	-0.443	1.570	0.034	-0.308	0.338	-0.644	-0.864	-0.263	0.052
Variance		11.389	21.898	8.463	22.568	548.110	52.964	9.768	15.154	16.852	10.596	27.527	5.471
Standard D		3.375	4.680	2.909	4.751	23.412	7.278	3.125	3.893	4.105	3.255	5.247	2.339

WeekEnd	Series	BOC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENDL	PIPE	EAPACKAGEABLES	EAPEL	CLNLUNGA	KR
03-Jan-97	40	0.123	0.000	0.000		3.333	0.021	2.114	3.518	-1.111	-24.466	8.129	-2.899	0.000	1.850	1.951	0.000
10-Jan-97	41	1.414	3.630	2.000		8.834	3.965	2.115	0.097	-2.028	7.948	-3.970	0.000	0.000	-1.244	0.000	0.000
17-Jan-97	42	0.000	1.824	4.128		35.157	20.236	35.000	8.247	-1.370	21.732	4.603	4.612	8.455	4.487	3.654	0.000
24-Jan-97	43	3.636	-4.179	3.271		-2.665	5.537	7.050	4.795	-15.433	7.297	0.851	-0.124	9.880	-0.341	0.000	0.000
31-Jan-97	44	2.339	0.905	18.810		-7.105	-0.128	-5.469	1.815	-2.255	-2.225	9.208	-0.005	-0.516	5.668	2.041	0.000
07-Feb-97	45	1.814	3.278	-2.908		-0.037	-3.614	-9.767	1.426	0.581	0.398	-0.285	0.000	2.549	-4.317	8.913	0.000
14-Feb-97	46	0.772	0.826	-1.498		6.420	-5.450	-4.994	4.866	-4.999	-2.778	0.057	0.000	-2.632	-0.090	0.000	0.000
21-Feb-97	47	3.286	-0.381	-7.770		30.736	-17.874	-1.942	6.801	-3.794	-0.228	0.004	-1.429	0.129	8.545	0.000	0.000
28-Feb-97	48	-0.179	0.709	-9.880		-5.953	-1.460	-1.944	8.253	6.951	0.000	-1.219	-0.252	-0.021	10.916	0.000	0.000
07-Mar-97	49	1.351	0.000	-4.167		7.528	3.267	-2.866	19.923	-1.531	-1.653	2.091	0.253	-3.829	-6.522	-3.175	0.000
14-Mar-97	50	-4.000	2.026	3.606		-1.352	-0.255	-17.556	-0.319	0.094	0.000	-0.176	-2.174	0.000	-3.411	1.724	0.000
21-Mar-97	51	0.000	-1.724	5.997		9.435	0.163	0.272	-0.196	8.646	-0.959	-3.880	0.000	-18.559	0.461	0.000	0.000
28-Mar-97	52	-0.736	-2.919	0.560		1.425	-1.386	3.528	0.001	-2.413	0.388	-16.767	0.000	1.276	5.530	0.000	0.000
04-Apr-97	53	0.742	3.542	-3.468		-5.546	-0.429	1.947	0.495	0.437	-2.495	-2.172	0.000	2.359	-4.008	0.000	0.000
11-Apr-97	54	0.000	-1.410	-1.398		1.974	-0.431	-1.271	3.270	1.072	0.000	-3.063	0.000	2.301	1.784	-0.565	0.000
18-Apr-97	55	-2.778	0.736	4.339		0.564	-0.476	-0.650	1.650	-4.219	0.000	5.692	0.000	-1.512	-2.599	0.000	0.000
25-Apr-97	56	-1.200	0.351	10.155		0.475	-0.022	0.470	2.561	-1.557	0.000	3.527	0.000	0.000	-0.098	-5.682	0.000
02-May-97	57	-0.347	1.591	-1.229		1.957	-0.739	1.234	-1.337	-2.671	0.000	0.208	-23.422	1.045	2.790	0.000	0.000
09-May-97	58	1.108	-0.660	-11.378		1.660	0.920	1.020	9.161	2.655	10.598	9.584	3.824	1.289	-0.016	0.000	0.000
16-May-97	59	0.469	-1.236	0.702		-3.698	-0.868	1.189	12.835	-2.240	-7.209	8.908	-1.242	13.857	-2.098	0.000	0.000
23-May-97	60	-0.314	-0.197	0.299		-0.524	2.365	6.097	-1.284	2.253	-2.076	-15.366	36.879	-5.488	-0.373	-0.602	0.088
30-May-97	61	0.258	-1.733	3.078		-0.978	1.091	0.580	-2.281	-0.360	-5.717	8.266	-8.180	-3.202	3.113	-1.164	0.000
06-Jun-97	62	1.401	2.409	5.780		0.152	0.169	-0.339	-17.442	5.055	7.579	-0.290	1.194	2.330	-2.815	0.000	0.000
13-Jun-97	63	0.451	0.000	-5.464		-0.177	-3.148	-6.188	-5.366	1.753	1.722	-1.206	0.000	0.008	1.175	0.000	0.000
20-Jun-97	64	6.578	2.548	5.491		1.089	2.138	-3.429	10.859	15.786	-12.887	11.402	-2.671	-0.008	-1.989	0.000	0.000
27-Jun-97	65	0.000	-4.902	-1.553		0.025	-1.465	1.064	6.243	10.543	14.165	-11.066	0.000	0.000	2.806	0.000	0.000
04-Jul-97	66	0.000	-1.019	2.226		-0.225	0.000	-0.320	-0.517	-4.465	-7.419	-1.165	0.000	-2.276	-3.880	0.000	-4.505
11-Jul-97	67	-2.542	2.742	-3.539		3.640	-0.564	0.462	-3.999	-12.026	-1.167	17.366	2.123	-0.772	0.095	-0.662	-2.099
18-Jul-97	68	-1.351	-2.640	3.662		-2.979	0.283	0.911	1.610	2.760	0.000	-7.317	0.000	-0.719	0.207	0.000	1.100
25-Jul-97	69	2.740	-5.307	-2.091		0.424	-1.913	-1.098	7.611	-7.212	0.000	2.165	0.000	0.724	-0.211	0.000	0.406
01-Aug-97	70	-2.333	1.914	2.136		1.665	0.953	-0.972	0.115	8.014	6.175	-4.474	0.000	-0.139	-1.161	107.407	5.081
08-Aug-97	71	0.341	0.165	0.091		-3.007	-1.868	-5.210	-8.866	0.170	-7.765	-5.319	1.066	0.139	-2.865	-2.275	-4.802
15-Aug-97	72	1.361	-4.200	0.636		6.050	-1.365	1.429	0.998	-0.494	5.998	-3.535	0.000	0.000	1.029	0.000	-0.118
22-Aug-97	73	-2.665	-0.016	5.235	-15.172	1.711	-2.473	-1.361	9.451	3.868	0.000	-0.349	-10.679	0.160	-1.018	0.000	0.716
29-Aug-97	74	-3.448	-2.709	0.868	4.991	5.422	-2.308	-2.094	0.000	-5.684	-3.168	-6.078	-0.799	-0.160	-6.676	0.000	-0.594
05-Sep-97	75	1.157	1.722	0.765	9.732	-0.057	-1.572	-1.072	-3.907	-0.554	0.000	8.258	0.000	0.848	6.598	1.232	1.333
12-Sep-97	76	0.000	0.601	-2.278	-2.990	-0.044	-2.057	2.628	-13.343	-2.124	-3.998	-10.528	-4.167	0.000	-0.575	0.000	2.801
19-Sep-97	77	-1.144	-2.999	-1.235	-4.783	-6.480	-1.665	-2.461	0.000	-0.128	0.000	1.694	0.000	-0.841	-1.953	-17.870	-0.954
26-Sep-97	78	1.429	1.346	0.525	7.042	-2.682	-1.306	-1.459	0.000	4.577	-2.314	-2.431	0.000	-0.048	-10.170	0.000	2.406
03-Oct-97	79	0.000	0.000	-4.352	-3.819	-0.853	-4.378	-0.788	-4.957	4.065	1.523	-1.945	9.565	0.048	-0.788	0.000	3.468
10-Oct-97	80	-0.563	-2.672	0.000	-6.069	-12.544	-0.160	-3.195	-8.274	-3.983	-7.500	0.004	0.000	-1.224	0.674	0.000	-0.233
17-Oct-97	81	-0.860	-1.003	0.000	-5.010	-12.124	1.559	-0.854	-15.407	-1.786	-2.649	-3.088	0.000	0.448	9.842	0.000	-1.600
24-Oct-97	82	0.000	-3.836	-12.102	16.347	-1.184	1.366	-2.178	-0.258	-0.384	-6.036	-4.595	0.000	-0.787	-13.815	-40.669	0.631
31-Oct-97	83	0.000	-3.713	-6.729	-18.794	19.145	-0.026	-4.109	28.748	0.157	1.127	-4.781	0.000	1.557	2.580	0.000	-1.242
07-Nov-97	84	-1.757	-4.788	1.776	2.061	-1.631	0.544	0.151	-15.921	-1.154	0.000	8.272	-7.880	-3.125	3.734	79.259	0.000
14-Nov-97	85	0.000	-5.293	0.872	-6.434	-9.701	0.877	0.369	-9.353	-4.115	-6.897	4.111	0.000	-9.003	0.274	0.000	-18.239
21-Nov-97	86	0.000	-1.372	0.541	7.966	-4.714	-0.920	-1.199	0.000	-0.268	0.670	-10.746	0.000	-0.992	3.736	13.443	-6.154
28-Nov-97	87	1.789	2.863	-0.323	-9.214	-2.634	-3.225	-0.503	-3.649	-2.815	0.811	2.109	0.000	-2.491	-0.051	-5.294	-2.538
05-Dec-97	88	-2.100	1.294	-2.697	3.177	14.946	-0.080	1.467	-21.906	0.402	2.052	3.028	0.000	0.000	-2.715	-1.712	0.922
12-Dec-97	89	-5.151	2.754	6.430	1.803	0.459	0.107	0.951	0.000	0.116	-5.051	0.118	0.000	2.752	0.899	-2.172	-16.667
19-Dec-97	90	0.692	-5.785	-0.208	1.014	-2.800	-0.080	0.251	0.000	1.033	2.638	3.666	-14.708	4.959	-0.004	0.000	19.222
26-Dec-97	91	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.064	0.000	0.000	0.000	0.000	0.000	-1.022	0.000	0.000
	Avera	0.034	-0.518	0.146	-0.953	1.396	-0.350	-0.251	0.323	-0.234	-0.469	-0.046	-0.406	-0.022	0.041	2.650	-0.415
	Varia	3.850	6.558	26.112	73.245	72.484	18.089	38.441	75.218	25.080	43.892	43.345	49.723	18.464	19.165	388.185	22.059
	Stand	1.962	2.561	5.110	8.558	8.514	4.251	6.200	8.673	5.008	6.625	6.584	7.051	4.297	4.378	19.702	4.697

Industrial 1998

WeekEnd	Series	BCC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	GACABLES	EABL	DUN	UNGA	KPLC
02-Jan-98	92	0.000	0.000	3.340	-5.343	4.468	-1.857	0.709	0.000	0.000	2.612	0.000	-1.010	0.000	0.000	0.000	0.652	0.000
09-Jan-98	93	0.000	11.660	0.909	1.441	4.080	1.902	0.000	0.000	-0.012	0.000	0.193	0.000	-1.220	-1.140	0.000	0.000	4.315
16-Jan-98	94	-0.698	0.000	4.304	3.650	19.194	0.000	3.882	55.938	8.941	0.000	2.358	0.510	3.007	2.718	0.000	0.000	7.360
23-Jan-98	95	0.000	2.991	5.854	0.252	-0.839	0.027	16.671	22.091	0.565	0.000	7.959	-3.959	0.240	5.131	2.531	0.783	0.869
30-Jan-98	96	0.000	4.417	8.341	2.196	-4.758	0.027	9.444	0.000	10.204	21.212	9.497	0.000	-0.217	-2.713	0.211	10.799	-2.045
06-Feb-98	97	0.000	2.715	0.837	-2.478	-3.999	1.333	-8.864	-21.213	10.052	6.781	2.408	0.000	0.054	1.317	0.557	0.000	-3.347
13-Feb-98	98	4.519	2.222	3.734	0.852	0.000	-1.131	-5.733	0.000	-6.980	1.454	-12.866	0.000	-2.812	-1.557	-0.319	3.343	4.085
20-Feb-98	99	-1.311	-2.427	1.520	-0.797	-0.100	0.505	-1.484	0.000	0.532	3.047	-2.238	0.000	-0.239	-0.553	-2.911	5.750	2.045
27-Feb-98	100	3.358	-4.487	1.812	4.919	-19.820	-0.371	1.798	0.000	-0.190	0.169	25.757	-24.112	0.000	1.030	-0.002	3.110	0.095
06-Mar-98	101	0.000	-1.719	1.084	-4.457	12.297	0.133	-0.268	-0.357	-4.417	0.274	8.497	0.089	0.000	0.169	0.000	4.111	0.475
13-Mar-98	102	-0.361	1.022	-16.233	-0.355	7.393	-0.504	-4.441	0.368	-0.768	-1.155	-3.999	0.703	-5.172	0.946	0.000	-0.625	-0.568
20-Mar-98	103	1.304	-0.343	-7.441	0.180	3.494	-9.235	-5.565	-4.167	33.747	0.789	-19.836	-0.357	-6.074	-0.059	-0.857	126.062	-0.094
27-Mar-98	104	-1.845	-9.427	-1.465	0.074	0.025	-0.854	-3.366	0.000	6.547	-0.901	11.724	-8.790	-13.027	0.115	-2.161	-1.946	-4.912
03-Apr-98	105	0.568	-1.861	0.603	-0.512	-0.150	0.059	-3.349	-13.043	0.751	0.000	-0.441	0.000	0.329	-0.175	0.000	-1.465	-3.118
10-Apr-98	106	0.000	1.606	0.000	-3.765	-13.020	-0.712	-5.831	0.000	0.137	-17.015	-1.254	1.141	3.179	-8.702	0.000	-3.190	-4.598
17-Apr-98	107	0.000	-1.619	-0.100	-1.314	-7.857	0.030	-3.635	0.000	0.244	0.870	-5.005	-13.534	7.698	5.355	0.000	-1.424	-2.934
24-Apr-98	108	-0.725	-2.614	-2.600	-2.427	-0.406	-1.046	0.611	-12.000	-0.235	-1.076	-2.330	0.000	0.000	-0.014	-1.959	-1.155	-1.250
01-May-98	109	-0.730	-0.556	1.951	-21.026	4.466	0.302	-3.335	0.000	-0.764	0.000	-4.566	0.000	-4.000	-1.445	0.946	0.848	0.461
08-May-98	110	0.000	0.035	0.705	-9.738	-7.504	-0.572	-2.614	13.636	0.470	0.000	7.066	0.000	0.000	-1.556	-3.172	-1.668	-0.274
15-May-98	111	-3.765	4.220	-2.100	0.204	1.917	0.000	-1.729	-8.000	-1.244	-3.636	-4.195	0.000	4.036	-14.201	0.000	-0.774	3.201
22-May-98	112	-2.017	0.307	-1.941	5.440	4.909	2.059	-4.296	-13.043	1.524	0.000	-0.732	-2.609	-2.862	2.103	-7.426	-0.150	2.183
29-May-98	113	2.823	2.028	-0.937	9.505	0.425	0.030	0.465	0.059	0.000	-1.224	-1.342	0.000	-0.099	11.535	-1.344	5.146	0.742
05-Jun-98	114	0.410	0.000	0.210	4.726	5.991	-0.059	-1.818	-0.039	-25.208	0.000	1.246	0.000	0.000	9.076	0.000	21.935	2.155
12-Jun-98	115	0.000	9.019	-0.105	13.496	-0.057	0.000	1.995	0.998	6.257	4.274	0.047	-11.822	-5.076	1.000	3.353	2.196	4.413
19-Jun-98	116	1.289	-1.686	1.891	8.451	0.486	0.030	0.029	0.000	0.182	0.952	3.188	-0.583	1.679	0.774	106.060	0.951	1.625
26-Jun-98	117	-1.551	4.531	-2.052	-3.048	-0.426	-0.445	0.378	9.072	-0.655	0.000	-0.520	0.000	-5.927	1.637	-11.518	-6.115	-0.372
03-Jul-98	118	2.273	0.418	-0.737	-0.500	0.265	0.477	0.592	0.413	-18.648	2.020	-4.483	-18.520	1.136	4.607	-3.660	-10.133	1.517
10-Jul-98	119	0.000	-1.417	0.848	-7.398	-0.057	0.059	-1.223	4.750	-6.257	0.000	-0.347	0.000	4.494	-0.411	-1.205	1.413	-2.622
17-Jul-98	120	2.993	-2.282	-0.105	-10.184	-2.193	-2.550	0.814	1.632	-11.336	1.594	1.331	0.000	-3.618	0.666	-7.974	-19.839	-9.239
24-Jul-98	121	0.718	-2.682	0.000	-13.012	-0.990	2.190	-0.509	-12.951	-0.395	0.000	-0.359	-0.527	-10.402	1.783	3.738	22.759	11.906
31-Jul-98	122	-0.086	-3.698	-1.053	-4.911	-9.794	0.357	0.907	-2.439	-0.413	1.759	4.547	-0.919	-0.398	-0.102	-1.245	1.412	1.511
07-Aug-98	123	0.086	-2.658	0.638	9.668	-3.750	0.030	-2.082	0.250	0.944	0.000	0.500	0.000	0.000	1.719	-2.581	0.612	2.017
14-Aug-98	124	0.000	0.360	0.000	7.181	-1.762	2.313	-0.107	-0.249	0.720	0.000	-0.531	1.572	0.000	0.081	-0.312	-1.525	0.107
21-Aug-98	125	0.000	0.000	-1.268	4.108	-2.310	2.841	0.192	-0.054	-2.462	-1.596	-0.549	-2.606	0.000	-2.314	-1.445	-2.144	-0.429
28-Aug-98	126	-2.857	2.929	-3.640	-6.984	5.507	1.635	2.904	0.000	-0.013	0.216	0.550	0.000	-2.500	0.728	-2.122	-0.966	-1.306
04-Sep-98	127	0.000	2.497	-0.111	-8.446	-6.557	-0.693	-1.863	0.000	1.189	1.399	-5.876	0.000	0.000	-0.011	-2.502	-3.217	-0.006
11-Sep-98	128	0.000	0.000	8.231	2.024	3.580	0.335	1.141	0.857	-0.722	0.977	-5.056	1.282	2.564	-0.039	-0.756	-0.382	-0.763
18-Sep-98	129	0.000	-2.973	2.775	-6.584	3.699	1.475	-4.213	-1.769	-0.116	2.448	-0.034	0.000	0.000	-0.759	-0.095	-6.797	-1.215
25-Sep-98	130	0.676	3.064	0.000	0.527	-6.057	2.962	-1.268	-2.630	0.238	-0.501	-0.218	0.000	0.000	-7.117	-17.202	1.865	-0.879
02-Oct-98	131	2.220	-2.973	0.000	1.294	-0.639	1.172	-3.341	0.000	-1.710	-2.009	0.661	0.000	0.000	1.763	-6.841	-0.194	-4.725
09-Oct-98	132	0.029	0.000	-14.800	2.469	-0.893	3.423	-2.377	0.000	-3.347	0.000	2.765	0.000	0.000	-0.075	-0.143	0.669	0.722
16-Oct-98	133	0.714	-2.665	-6.103	2.242	4.108	0.229	1.436	0.000	-0.463	-5.983	-3.473	0.000	-1.250	-4.283	-0.829	3.466	6.246
23-Oct-98	134	0.000	-1.973	-4.875	-5.731	-3.081	2.205	-0.422	-3.047	0.661	0.000	-0.127	0.000	-1.122	-1.370	0.712	-1.131	-1.168
30-Oct-98	135	0.000	1.606	-1.445	-0.681	0.000	1.916	-4.357	-1.077	-4.464	3.636	-0.368	-14.147	0.000	-1.273	-6.082	-0.792	-0.227
06-Nov-98	136	0.681	0.000	0.000	4.039	-1.250	0.903	1.895	-1.868	-6.138	-1.230	-3.857	-4.212	-1.682	-5.171	-6.055	-29.247	-0.413
13-Nov-98	137	0.000	0.438	-3.857	1.852	-8.101	-1.234	-4.886	1.893	-38.527	-7.635	-1.610	0.000	-1.042	8.947	-2.284	-73.483	-8.462
20-Nov-98	138	0.000	-16.234	8.599	-5.798	-1.614	1.249	0.485	0.000	-0.237	5.485	1.666	0.000	1.053	1.283	1.878	159.553	-0.312
27-Nov-98	139	-1.381	-4.675	2.171	3.140	5.240	0.411	0.636	-0.270	16.461	0.270	-1.828	0.000	0.000	0.966	2.003	26.548	-0.557
04-Dec-98	140	1.514	6.773	4.750	-5.269	-0.760	-0.337	-2.754	-2.873	11.792	0.000	0.038	-2.720	0.055	-0.886	1.686	10.737	-3.969
11-Dec-98	141	0.675	6.655	-3.938	4.308	-0.383	6.721	0.579	0.000	4.406	-0.909	-0.324	0.000	0.000	0.318	1.494	4.515	1.181
18-Dec-98	142	-0.461	0.000	0.000	-5.257	2.884	4.554	9.171	-3.657	-1.540	0.917	0.179	1.266	-0.055	4.506	-1.408	23.111	2.904
25-Dec-98	143	0.000	4.716	0.000	-2.118	31.988	10.769	2.328	-1.668	6.857	0.000	6.232	-1.782	1.498	9.462	1.593	2.497	2.698
	Average	0.174	0.100	-0.228	-0.761	0.333	0.636	-0.513	0.106	-0.264	0.351	0.193	-2.032	-0.727	0.468	0.584	5.317	0.096
	Variance	2.027	18.174	19.793	37.465	55.674	6.468	16.821	101.051	93.610	19.648	38.003	27.019	11.055	17.702	235.715	968.217	12.420
	Standard	1.424	4.263	4.449	6.120	7.462	2.541	4.101	10.052	9.675	4.433	6.165	5.198	3.325	4.207	15.353	31.116	3.524

30-Apr-99	161	-1.014	0.103	0.849	10.034	-1.467	10.453	0.805	-55.000	-4.039	0.000	-0.077	0.000	-11.366	5.673	-0.170	0.000	-0.531
07-May-99	162	1.977	0.033	-14.105	12.913	-12.570	0.616	0.536	0.000	-0.025	0.000	0.012	-2.703	0.000	0.808	0.000	-0.778	0.348
14-May-99	163	0.747	-0.103	4.412	0.783	-6.775	-0.807	2.357	11.111	0.827	26.037	-0.865	0.000	-2.561	0.031	1.910	1.657	-1.346
21-May-99	164	0.727	0.549	3.052	7.438	3.281	2.230	-0.106	0.000	2.846	0.500	0.332	-7.813	-0.489	0.852	-8.728	-0.985	-0.240
28-May-99	165	-0.127	0.887	-2.733	-7.892	-2.734	1.441	-3.929	26.000	0.253	0.000	0.538	-3.741	0.000	-1.657	5.113	-12.099	-4.163
04-Jun-99	166	0.581	-65.605	1.288	-7.483	2.563	-2.976	4.065	14.237	2.921	0.000	0.016	-12.352	0.491	2.687	-5.330	-8.317	1.916
11-Jun-99	167	1.155	0.000	4.624	-0.919	0.857	-0.502	-1.984	0.000	0.646	0.000	-0.013	0.000	0.000	-1.583	-1.052	-6.272	-0.028
18-Jun-99	168	-1.086	196.255	0.000	9.430	14.942	0.518	2.608	3.030	0.045	0.000	0.151	0.000	0.320	-0.269	0.228	23.244	-0.015
25-Jun-99	169	0.648	0.000	44.309	-0.661	-8.655	0.307	-0.442	-1.477	-0.045	0.000	-1.624	0.000	3.037	-0.238	-3.994	-1.152	-0.072
02-Jul-99	170	0.000	0.000	5.666	-4.219	-0.989	-0.361	0.089	-0.759	0.022	0.000	-1.654	-1.071	0.000	0.534	0.057	0.197	-1.441
09-Jul-99	171	0.000	-1.777	-2.856	-1.339	1.768	-4.128	0.631	-3.448	-0.022	-20.865	-1.252	0.000	0.000	1.557	0.000	1.071	-1.023
16-Jul-99	172	-4.865	2.904	-2.013	0.857	12.613	-6.634	3.143	3.571	0.000	2.020	4.517	0.000	0.000	0.482	-0.262	-0.966	0.218
23-Jul-99	173	0.000	0.000	-8.676	2.871	-3.555	-2.400	1.033	0.000	-0.182	2.677	0.057	0.000	0.000	0.951	0.262	-0.298	2.313
30-Jul-99	174	4.412	-0.017	9.833	2.326	0.661	-2.746	1.937	-0.368	0.000	4.552	-0.073	-1.083	0.000	0.330	0.667	-3.798	-2.190
06-Aug-99	175	0.000	0.761	6.222	0.833	4.594	-1.888	-0.469	0.000	-1.249	6.916	-0.072	0.000	0.000	0.157	-0.662	-16.004	0.435
13-Aug-99	176	-0.085	-0.738	-3.000	-29.752	-1.288	-4.082	0.543	-3.092	1.449	-2.383	0.024	0.000	0.000	1.842	0.051	-8.506	-0.636
20-Aug-99	177	-1.325	0.000	-11.561	-2.370	0.368	2.686	1.278	0.357	0.000	-5.457	0.061	6.569	0.000	1.710	0.000	0.075	0.654
27-Aug-99	178	0.000	0.000	-16.486	41.378	-0.400	-0.612	-0.077	0.000	-44.328	-1.538	-2.952	-1.712	0.000	3.024	-7.964	-10.621	-1.319
03-Sep-99	179	0.171	-13.030	-0.399	-6.342	-2.544	1.914	2.126	0.000	-3.723	0.000	-5.875	-2.629	0.000	-0.219	1.410	7.549	-3.004
10-Sep-99	180	0.000	2.993	0.000	0.000	3.022	0.470	-0.011	0.000	3.547	0.000	-10.064	0.000	-3.003	-1.261	-1.701	-9.287	-4.726
17-Sep-99	181	-0.171	-0.943	-1.301	-1.283	-0.100	3.288	-0.427	0.000	15.830	0.000	-1.439	-28.432	0.000	-1.596	1.730	0.008	-1.225
24-Sep-99	182	-0.114	0.000	-2.865	-11.768	-6.306	1.713	-3.398	-0.427	10.698	0.000	1.701	0.000	0.000	-2.836	-1.813	-3.798	-0.519
01-Oct-99	183	0.057	0.000	0.314	16.129	-5.413	0.731	-3.441	-17.709	0.373	0.000	-1.105	0.000	-2.047	4.430	0.000	-1.257	-2.173
08-Oct-99	184	0.000	-4.762	5.329	7.323	0.753	0.142	-3.434	-3.179	0.000	0.000	1.450	0.000	0.000	0.922	1.847	0.000	-0.599
15-Oct-99	185	0.057	1.440	3.472	0.496	0.299	-0.551	-1.570	0.000	-32.176	0.000	0.178	0.500	0.000	-4.774	-1.786	1.535	1.349
22-Oct-99	186	0.000	-1.420	0.575	-0.004	-2.833	-0.272	1.710	0.000	0.260	0.000	0.227	0.000	0.000	-1.548	0.000	-50.756	-1.951
29-Oct-99	187	-2.857	4.940	25.739	0.000	-0.269	-0.429	2.914	-23.294	15.203	0.000	0.277	0.000	0.000	-1.241	-3.245	0.000	-3.170
05-Nov-99	188	0.000	3.240	0.607	0.000	1.038	0.415	-0.075	0.000	4.005	0.000	1.305	-0.498	0.000	-0.455	-3.035	25.968	-11.399
12-Nov-99	189	0.000	0.000	-2.411	-8.484	-0.914	-8.584	0.286	0.000	3.257	0.000	-2.064	0.000	-14.523	-10.042	1.757	16.506	-3.927
19-Nov-99	190	-3.676	0.000	-3.861	7.542	-3.304	-1.165	0.003	-0.595	-0.196	-5.469	-0.027	3.000	0.000	0.351	-14.460	15.420	1.109
26-Nov-99	191	0.000	0.000	0.884	-3.821	6.357	1.601	0.397	17.725	4.541	0.000	0.113	0.000	0.000	-7.483	-25.618	23.248	0.016
03-Dec-99	192	3.817	0.000	1.354	-11.963	-2.727	3.619	0.120	16.529	7.091	15.665	0.701	-32.039	0.000	13.463	-4.216	31.135	1.674
10-Dec-99	193	-1.471	0.142	-12.333	11.000	-0.154	-5.916	0.497	-5.665	8.083	0.662	0.196	57.143	0.000	-4.800	0.012	-0.370	1.892
17-Dec-99	194	0.746	3.462	1.254	7.164	0.000	0.053	1.371	1.666	-0.029	-0.625	12.861	0.465	0.000	-0.440	9.674	0.681	7.517
24-Dec-99	195	-2.222	-3.337	0.973	0.881	0.000	1.118	-1.952	0.180	-1.545	0.000	0.097	0.000	0.000	-0.051	8.069	0.000	3.726
31-Dec-99	196	-2.273	3.064	-0.876	-1.102	0.000	-0.421	0.102	0.000	-3.104	-3.214	0.162	1.786	0.000	2.999	0.073	-1.480	0.326
Averag		-0.120	2.714	1.093	0.665	-0.471	0.298	0.597	-0.052	-0.195	0.546	0.107	-0.129	0.074	0.487	-1.010	-0.403	-0.337
Variance		12.693	836.954	95.501	124.779	21.150	20.287	34.235	110.234	108.751	31.795	20.865	109.880	98.110	22.454	47.362	136.473	11.792
Standa		3.563	28.757	9.823	11.170	4.599	4.504	5.851	10.499	10.428	5.639	4.568	10.482	9.905	4.739	6.882	11.682	3.434

Industrial 2000

WeekEnd	Series	BOC	CARB	Oberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	CABLES	EABL	DUNLOP	UNGA	KPLC
07-Jan-00	197	0.000	0.000	-2.239	0.000	0.952	0.476	0.480	0.166	-1.957	0.000	-0.143	9.803	0.000	-2.817	3.593	1.157	-0.242
14-Jan-00	198	-0.775	0.000	0.000	-5.286	-0.952	0.070	-0.078	-0.118	0.000	0.000	3.478	1.215	-18.809	0.080	0.000	-12.118	-0.363
21-Jan-00	199	0.000	-1.497	0.000	-10.305	1.308	-3.016	-0.445	0.000	0.577	-0.369	-1.192	0.000	-1.158	-0.834	2.238	-18.140	-0.118
28-Jan-00	200	0.000	6.000	0.000	-3.193	-0.873	-1.085	1.885	2.430	-4.530	1.069	-0.679	0.000	-0.238	0.889	-0.878	-1.094	1.013
04-Feb-00	201	0.000	-1.424	0.000	2.053	0.651	0.073	0.111	0.174	-0.026	2.702	-0.545	0.000	0.080	-3.007	0.384	0.185	0.072
11-Feb-00	202	0.000	-2.854	0.000	0.374	-0.875	0.000	-0.031	-0.301	4.111	-0.112	-0.998	0.000	-0.457	2.017	-0.500	-2.859	-0.720
18-Feb-00	203	0.000	0.000	0.000	0.000	0.729	0.073	-2.381	0.000	-0.055	6.313	0.000	0.000	-0.031	0.443	0.503	3.308	0.801
25-Feb-00	204	0.000	4.424	0.000	0.000	-0.953	1.186	1.565	-0.309	-2.842	12.343	-0.201	0.000	20.375	1.290	-15.000	-1.074	-2.254
03-Mar-00	205	0.000	-0.738	0.000	0.000	0.038	16.595	7.059	0.000	-1.576	-5.238	-14.927	0.000	2.810	-0.624	0.000	1.630	2.729
10-Mar-00	206	0.000	0.795	0.000	-0.317	0.289	12.624	18.322	0.000	-0.378	-0.285	-8.657	0.000	-25.551	4.188	0.294	1.192	-3.605
17-Mar-00	207	1.047	0.000	0.000	-3.550	-0.230	1.145	-14.507	-12.073	0.111	-1.013	-1.654	2.371	-6.599	0.593	-0.293	0.029	0.500
24-Mar-00	208	0.076	0.000	0.000	4.011	3.576	-14.552	-8.055	0.000	0.552	2.302	2.876	0.000	-1.325	1.666	0.000	-0.942	-2.602
31-Mar-00	209	0.000	0.000	0.000	10.082	3.898	1.529	1.202	0.000	35.410	-2.833	3.583	0.000	-6.992	-5.647	-3.529	0.000	1.190
07-Apr-00	210	0.000	0.000	0.000	13.705	-4.895	-1.130	-1.478	0.000	34.464	0.000	-2.912	0.000	-4.596	-2.498	-2.435	28.016	-1.022
14-Apr-00	211	-0.387	0.000	0.000	2.647	1.315	0.841	2.371	0.000	-0.851	0.315	-0.868	0.000	0.000	1.930	-0.970	8.957	-4.211
21-Apr-00	212	0.900	-1.423	0.000	1.198	-1.520	0.519	0.271	0.000	5.303	4.202	3.444	1.982	0.068	2.665	0.000	21.339	-8.025
28-Apr-00	213	0.000	0.000	0.000	0.738	-2.108	0.376	-0.882	14.925	2.895	0.000	-3.033	0.000	3.088	-3.678	0.000	-0.053	-1.904
05-May-00	214	-3.000	0.037	0.000	-0.730	1.980	-6.223	0.082	0.000	0.723	3.636	-0.302	0.000	-2.713	-0.248	0.000	-1.618	0.929
12-May-00	215	-4.837	-12.062	0.000	-7.208	5.547	0.283	0.109	-3.896	-1.108	1.107	-4.083	-0.383	-0.358	1.468	0.737	-3.705	0.257
19-May-00	216	5.000	15.345	0.000	0.802	0.322	-0.498	0.012	0.000	-4.301	-4.627	2.020	0.000	0.000	-0.153	0.236	0.093	-15.239
26-May-00	217	-10.746	0.000	0.000	-1.106	0.000	1.200	0.565	0.000	-6.519	-6.580	-0.901	0.000	0.000	-0.383	0.000	-1.842	0.443
02-Jun-00	218	-10.190	-6.515	0.000	1.136	1.390	-0.478	-0.483	0.000	-6.566	0.436	-1.017	0.000	0.000	-1.299	2.316	-15.323	-8.796
09-Jun-00	219	0.000	1.119	0.000	-1.350	0.281	-1.142	0.785	0.000	0.000	0.668	-14.916	0.000	-1.053	-3.987	1.025	0.000	-15.660
16-Jun-00	220	0.000	1.342	0.000	0.000	1.227	-1.188	-0.951	-0.360	1.215	0.784	25.257	0.000	-2.616	-3.441	0.000	-1.889	-0.762
23-Jun-00	221	-14.396	0.215	0.000	0.000	-0.519	-1.863	0.997	0.000	-23.735	0.000	-10.772	0.000	-1.683	4.282	-3.256	0.000	-0.101
30-Jun-00	222	0.000	-4.161	0.000	-15.014	0.661	-3.660	1.433	0.000	-8.673	5.058	13.095	2.308	-1.960	-3.652	-6.125	-20.295	0.608
07-Jul-00	223	0.000	-6.838	0.000	-11.419	0.415	1.702	2.258	4.294	-5.757	1.027	-1.074	-0.752	-7.708	1.508	1.008	-18.539	0.102
14-Jul-00	224	0.000	-1.020	0.000	-9.017	0.826	5.338	3.322	0.000	0.200	0.205	-0.256	0.000	-1.761	2.340	0.000	-2.676	1.875
21-Jul-00	225	9.089	-0.546	0.000	9.615	4.542	-0.318	3.039	14.695	-8.793	0.610	-2.624	-1.515	-0.397	1.158	-0.706	-4.141	-2.300
28-Jul-00	226	0.000	-1.341	0.000	-9.812	4.443	1.174	-0.812	0.000	-0.871	-0.606	-0.309	7.691	-8.740	0.418	0.000	-1.898	2.500
04-Aug-00	227	0.000	0.000	0.000	11.050	0.063	-0.498	-1.448	-4.384	-4.207	-2.439	0.000	0.715	-10.116	0.636	0.000	-0.528	-3.312
11-Aug-00	228	-6.491	0.515	0.000	-0.058	0.031	0.050	2.404	-1.186	0.000	0.000	-3.707	-2.128	5.565	-0.953	-0.427	0.000	0.424
18-Aug-00	229	-2.450	0.000	0.174	3.127	-0.750	5.164	3.787	0.000	-0.522	0.000	0.000	0.000	0.000	0.085	0.000	-6.414	0.844
25-Aug-00	230	0.000	-1.669	0.000	-1.782	0.787	-0.158	-0.171	0.000	-1.176	0.000	-5.682	5.072	0.000	6.363	0.000	1.695	-3.260
01-Sep-00	231	-4.651	0.000	0.000	2.818	0.155	0.333	1.338	0.000	0.000	-3.566	-2.528	0.000	0.000	7.235	0.000	-2.752	-3.303
08-Sep-00	232	0.000	0.000	0.000	-2.025	-0.998	1.553	-1.656	0.000	-6.679	0.000	0.250	0.000	0.000	-0.987	0.000	0.222	-0.257
15-Sep-00	233	0.000	0.000	0.000	0.579	1.008	2.479	-2.713	0.000	-4.324	1.095	5.005	0.000	0.000	2.257	4.000	2.940	-2.387
22-Sep-00	234	2.439	-6.146	0.000	3.513	0.561	9.020	0.281	0.000	0.861	6.049	4.470	0.000	61.884	0.259	-3.846	9.707	-1.986
29-Sep-00	235	-1.762	0.000	0.000	-3.826	-0.599	-0.098	1.594	0.000	4.499	0.000	-0.983	0.000	-13.160	0.526	0.000	3.112	-0.538
06-Oct-00	236	4.023	10.966	0.000	-1.120	0.624	-2.179	0.846	0.000	9.826	-2.077	0.304	0.000	0.000	-0.050	0.000	-2.516	-1.844
13-Oct-00	237	0.186	0.000	-17.104	-0.740	1.519	0.228	-1.785	-2.000	5.626	0.617	0.767	-1.379	-2.062	1.698	0.000	-2.422	-1.992
20-Oct-00	238	0.000	0.000	-0.218	-5.340	1.817	1.068	1.083	0.000	-4.301	0.000	0.083	0.000	2.105	-0.385	0.000	1.018	-4.881
27-Oct-00	239	0.000	0.000	8.862	-5.127	-0.270	0.409	-0.118	0.000	-4.850	0.613	-0.685	0.000	0.000	0.091	0.103	-1.470	-24.646
03-Nov-00	240	0.000	22.004	-13.869	10.822	1.394	-1.039	0.893	0.000	-8.557	-1.865	0.058	0.000	-3.505	0.979	-4.000	-0.476	20.927
10-Nov-00	241	2.326	-4.411	0.117	0.300	-1.306	-0.340	0.301	-1.275	-3.729	0.000	0.775	-65.035	-5.983	3.024	0.000	-0.326	12.412
17-Nov-00	242	0.000	1.757	-2.214	-0.523	-0.301	1.181	0.582	-2.214	-4.944	0.000	-0.253	0.000	-4.308	-0.636	-11.111	-1.485	2.350
24-Nov-00	243	1.136	0.000	-1.669	0.534	-0.452	-1.407	-0.763	0.000	-4.818	-3.050	-0.900	0.000	0.000	-0.015	0.000	0.059	2.705
01-Dec-00	244	0.000	-18.740	2.303	-1.365	-0.061	1.042	-0.241	0.000	0.000	0.000	-0.119	20.105	-4.998	-1.263	0.000	0.000	2.839
08-Dec-00	245	0.000	-3.125	1.303	-1.058	0.485	-0.254	-1.109	-0.643	4.077	-3.359	-0.046	0.000	0.000	-0.007	0.000	0.000	-2.258
15-Dec-00	246	6.180	0.237	2.924	0.000	1.055	-5.099	-0.707	0.000	1.273	-1.831	-1.772	0.000	-6.125	-4.682	0.000	-0.276	0.587
22-Dec-00	247	0.000	-4.055	1.477	-2.749	0.746	-4.225	-0.136	-0.496	0.041	-5.405	-0.741	15.189	-6.658	-4.081	0.000	-0.998	-0.114
29-Dec-00	248	0.000	-10.443	0.560	-6.400	0.415	-10.022	-0.602	0.000	-0.172	-3.571	-0.171	8.408	10.678	-0.104	0.000	0.000	-2.144
	Average	-0.525	-0.466	-0.378	-0.602	0.526	0.140	0.335	0.144	-0.230	0.045	-0.446	0.071	-0.857	0.089	-0.705	-0.830	-1.245
	Variance	13.625	33.483	11.512	30.206	2.926	20.196	14.790	12.844	74.733	9.786	33.198	100.827	119.827	6.558	9.118	59.087	37.632
	Standard	3.691	5.786	3.393	5.496	1.710	4.494	3.846	3.584	8.645	3.128	5.762	10.041	10.947	2.561	3.020	7.687	6.135

Industrial 2001

WeekEnd	Series	BOC	CARB	Cberg	ATH	BIMB	BAT	Total	PCRTL	KNM	KENCL	FIRE	EAPCKGA	CABLE	EAEL	DLNUNGA	
05-Jan-01	249	0.000	-0.125	0.223	0.000	-0.413	4.738	0.000	0.000	0.000	7.865	0.000	0.000	19.223	0.740	0.000	-2.704
12-Jan-01	250	0.000	4.475	0.000	13.440	1.007	6.612	-5.537	-2.137	-0.816	0.000	-0.016	0.000	0.000	1.476	0.000	-4.844
19-Jan-01	251	0.000	0.000	0.000	-7.668	-0.616	1.504	-3.928	0.000	0.823	0.370	-0.448	0.000	0.488	1.998	-7.813	-3.256
26-Jan-01	252	0.529	0.000	0.000	-4.748	1.063	-0.733	-1.201	2.183	0.000	0.000	-1.034	10.015	0.000	-3.433	0.000	-4.787
02-Feb-01	253	-1.053	0.000	3.333	0.468	0.486	-0.508	-0.570	0.000	-0.093	8.662	-8.626	0.000	0.000	1.169	-2.542	-1.676
09-Feb-01	254	-1.054	8.016	2.688	-0.369	0.291	0.433	-0.045	0.000	0.093	-1.394	-4.818	6.670	5.154	1.545	0.000	-1.105
16-Feb-01	255	-0.344	-10.611	1.047	-0.075	0.753	0.092	-10.038	0.000	-2.641	8.488	-3.807	0.000	12.875	0.944	-4.318	-8.887
23-Feb-01	256	0.000	-0.857	-1.036	0.451	-1.553	-4.308	0.205	0.000	-0.977	1.176	-1.305	0.000	4.649	0.183	-7.429	-14.000
02-Mar-01	257	0.000	0.000	0.638	14.342	-12.212	1.312	0.000	-1.282	-4.252	-0.581	-0.166	0.000	0.000	0.712	0.000	-3.080
09-Mar-01	258	-9.301	0.000	0.000	-12.282	3.195	-0.111	-10.218	1.299	-2.508	2.924	-14.286	0.000	-0.399	1.809	0.000	-1.446
16-Mar-01	259	0.045	0.000	-1.145	7.976	-4.708	-2.984	-4.310	1.425	-0.329	2.520	-1.361	0.000	-5.674	0.027	3.389	1.590
23-Mar-01	260	0.000	0.000	-4.737	3.548	-5.212	-1.835	8.246	0.000	2.346	-0.292	0.132	0.000	0.195	0.442	1.359	0.487
30-Mar-01	261	-0.952	1.250	-7.624	-0.137	-0.016	-2.187	2.515	3.020	7.759	-1.212	0.492	0.000	-1.359	-0.857	4.333	6.514
06-Apr-01	262	0.000	0.000	0.000	0.000	0.000	-0.959	0.666	0.000	1.051	3.344	-0.762	0.000	-8.087	1.362	-10.180	1.195
13-Apr-01	263	0.952	-4.289	-4.147	-0.381	0.000	4.747	2.608	-3.476	0.000	-3.973	-6.335	2.270	-1.068	0.623	10.971	-7.581
20-Apr-01	264	-4.762	0.000	-0.166	0.221	0.000	-1.325	2.150	0.000	0.000	3.380	0.227	0.000	2.265	-0.721	0.000	-0.409
27-Apr-01	265	0.000	0.000	0.000	0.161	-3.571	-5.888	-2.611	0.000	-2.089	0.000	0.068	0.000	5.528	0.552	-9.706	-0.005
04-May-01	266	0.000	-3.986	0.000	0.020	-3.348	2.830	1.423	3.080	-12.512	-3.432	-0.616	-0.556	-0.535	-0.038	0.000	-0.473
11-May-01	267	0.000	0.000	0.000	-0.020	7.333	-3.378	5.011	-1.207	0.000	1.961	-6.145	0.000	0.000	-1.802	0.000	0.475
18-May-01	268	0.000	0.000	4.018	-0.546	0.002	-1.994	-2.465	-3.940	-9.378	4.327	-0.105	-6.670	-7.548	1.030	0.000	-10.394
25-May-01	269	-12.881	-5.977	2.146	0.549	0.000	-0.033	-2.023	0.000	-5.860	-0.403	1.339	-1.892	-0.230	0.265	9.780	-0.775
01-Jun-01	270	0.000	0.000	0.000	-11.111	0.000	-0.558	-2.861	0.000	-2.318	4.253	-1.322	0.000	-0.926	-2.213	1.818	0.095
08-Jun-01	271	-11.061	5.756	-2.353	0.550	0.000	-1.077	-3.899	0.000	0.000	9.410	0.648	0.000	0.000	-3.986	0.000	0.000
15-Jun-01	272	-8.997	2.700	-3.614	7.336	0.000	3.357	-2.095	-4.671	0.000	-0.694	-0.644	0.000	2.199	2.524	0.000	-1.400
22-Jun-01	273	-2.508	20.976	0.000	0.611	-0.638	-2.677	-6.179	0.000	-9.918	-1.086	-2.802	0.000	2.523	1.462	-1.339	0.000
29-Jun-01	274	1.898	0.000	-8.889	-0.064	2.918	-1.979	0.691	-0.016	0.082	-0.513	0.073	0.000	0.000	-0.592	-1.328	2.504
06-Jul-01	275	10.714	0.000	-16.907	3.564	-9.998	1.242	5.289	0.000	-0.183	-1.320	2.809	0.000	0.130	2.841	0.000	0.649
13-Jul-01	276	0.000	0.000	-0.513	-6.147	8.609	1.841	-0.068	0.000	0.000	-0.838	0.004	0.000	-0.129	0.089	-2.640	0.000
20-Jul-01	277	0.000	0.000	-0.422	2.500	-2.411	-1.831	1.703	-9.091	-3.473	-0.047	-0.015	1.220	0.000	0.355	0.000	1.304
27-Jul-01	278	0.000	0.000	1.049	-3.683	-1.183	3.665	1.769	0.000	-7.913	-0.909	0.023	0.000	2.464	0.145	0.000	1.897
03-Aug-01	279	-2.238	0.000	3.199	-3.057	3.704	0.482	-4.528	0.000	0.000	-2.999	0.550	0.000	-1.429	1.038	0.000	-10.795
10-Aug-01	280	0.000	0.000	4.520	-4.769	-2.433	-10.911	-5.235	0.000	0.000	-0.921	-0.105	0.000	-0.952	-0.021	-9.434	-1.914
17-Aug-01	281	0.680	0.000	0.147	4.126	-0.247	-0.197	0.236	2.500	-6.250	0.000	-0.413	0.000	0.000	1.654	0.000	0.000
24-Aug-01	282	-1.639	-9.759	0.000	1.130	-6.509	-0.152	1.128	0.000	-1.333	-34.837	-5.731	2.410	0.000	-0.830	13.352	0.000
31-Aug-01	283	0.000	-10.241	-0.607	-1.117	-1.999	-5.446	-5.513	-2.439	0.000	40.000	6.940	0.000	-0.013	-1.664	-4.795	-7.090
07-Sep-01	284	1.667	-4.603	-5.758	0.000	0.000	1.034	-4.765	-10.000	0.000	10.215	1.418	0.000	2.484	-1.365	-3.475	-4.057
14-Sep-01	285	-1.639	-1.455	-0.654	-6.798	-5.297	-0.698	0.000	0.000	0.000	0.813	6.088	-5.882	-2.979	2.651	0.000	0.000
21-Sep-01	286	0.000	0.000	-5.468	0.000	-0.677	-1.317	-11.357	-15.926	0.000	0.000	-3.608	0.000	0.000	1.028	0.000	0.000
28-Sep-01	287	-2.174	-0.063	2.599	-7.469	0.000	-3.322	-4.721	0.000	0.000	-1.282	-11.832	6.250	0.000	-0.152	-5.000	-11.550
05-Oct-01	288	2.222	0.000	-3.441	0.000	-1.340	3.146	-9.490	0.000	-13.209	-0.872	-3.372	1.176	0.000	0.129	0.000	-13.914
12-Oct-01	289	0.000	0.000	-10.010	7.884	-5.112	2.240	-0.651	5.719	-6.579	2.190	5.868	0.000	0.000	-0.204	5.263	-15.657
19-Oct-01	290	0.000	0.000	9.174	7.757	0.000	2.461	-1.547	0.000	0.000	1.054	0.758	-6.977	0.000	0.183	0.000	0.355
26-Oct-01	291	-5.312	0.000	0.000	-0.267	-3.435	4.313	-0.025	0.000	51.746	0.371	3.843	0.000	0.000	0.415	0.000	18.109
02-Nov-01	292	-1.192	1.429	1.675	1.103	3.428	-1.176	9.972	0.007	4.352	1.408	-7.186	0.000	0.000	2.688	5.000	27.609
09-Nov-01	293	-0.242	-1.408	16.542	-4.134	0.264	-0.384	10.366	64.975	9.980	0.000	17.295	0.000	0.000	-0.947	0.000	41.033
16-Nov-01	294	0.000	1.429	-0.474	0.000	-4.523	-1.103	1.052	0.000	31.949	-0.078	0.084	0.000	-3.466	-3.157	-4.762	-6.231
23-Nov-01	295	3.571	0.000	0.000	3.175	-4.916	0.998	-4.102	2.209	3.365	0.628	-6.849	0.000	2.083	0.596	0.000	-8.280
30-Nov-01	296	1.504	1.394	-0.237	0.000	-0.111	0.757	0.313	0.000	-1.434	1.525	1.291	0.000	0.000	-6.718	0.000	-4.839
07-Dec-01	297	0.000	2.366	-0.596	-5.112	-10.414	1.624	-0.312	0.078	-0.311	-0.596	-0.822	0.000	-0.340	-0.394	0.000	0.000
14-Dec-01	298	5.952	-3.646	0.000	4.729	-1.103	0.369	-0.995	-5.185	0.000	-17.741	-0.468	0.000	0.341	0.085	0.000	-5.685
21-Dec-01	299	-3.810	-0.703	-7.481	0.629	0.000	1.346	-0.544	0.000	-3.571	21.464	0.145	0.000	-3.061	-0.404	0.000	-1.552
	Average	-0.813	-0.154	-0.652	0.123	-1.198	-0.152	-1.110	0.531	0.307	1.224	-0.881	0.159	0.478	0.065	-0.383	-1.167
	Variance	13.837	19.972	22.691	25.986	14.191	8.936	20.284	96.087	98.171	81.094	22.316	6.585	16.559	3.097	19.983	84.212
	Standar	3.720	4.469	4.763	5.098	3.767	2.989	4.504	9.802	9.663	9.005	4.724	2.561	4.069	1.757	4.465	9.177

Appendix D-Correlation Coefficient

Correlation Agricultural 1998

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	1							
SASINI	-0.05722	1						
REAV	-0.02525	-0.011	1					
LTEA	-0.1548	-0.07068	-0.16765	1				
KAPCHO	0.019924	0.15244	0.033378	-0.00044	1			
KAKUZI	0.05763	0.262357	-0.15156	0.02709	0.090304	1		
GWK	-0.21256	0.045894	-0.08273	0.161357	-1.9E-05	0.12472	1	
EGAADS	-0.03283	-0.04288	0.111543	-6E-05	-0.01042	-0.09571	-0.06932	1

Correlation Coefficient Agricultural 1999

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	1							
SASINI	-0.10588	1						
REAV	0.191184	0.000216	1					
LTEA	-0.0116	-0.03766	-0.01701	1				
KAPCHO	0.01338	0.067222	-0.15637	0.029679	1			
KAKUZI	-0.03964	0.072985	-0.28225	-0.02802	-0.08231	1		
GWK	0.37656	-0.05802	0.066138	-0.07677	-0.10676	0.058422	1	
EGAADS	-0.05678	-0.08361	0.11145	-0.0155	0.023915	-0.02226	-0.1686	1

Correlation Coefficient Agricultural 2000

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	1							
SASINI	0.077442	1						
REAV	-0.12299	0.125363	1					
LTEA	#DIV/0!	#DIV/0!	#DIV/0!	1				
KAPCHO	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1			
KAKUZI	0.184153	-0.05779	-0.02478	#DIV/0!	#DIV/0!	1		
GWK	0.202046	-0.13043	0.008308	#DIV/0!	#DIV/0!	0.061375	1	
EGAADS	-0.07071	-0.0141	-0.03165	#DIV/0!	#DIV/0!	-0.21141	-0.55501	1

Correlation Coefficient - Agricultural 2001

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	1							
SASINI	-0.19819	1						
REAV	-0.50488	0.132894	1					
LTEA	0.116507	0.288075	0.008904	1				
KAPCHO	-0.0418	0.126003	-0.09159	-0.01573	1			
KAKUZI	-0.02552	0.101199	-0.41613	0.005174	-0.01239	1		
GWK	0.111087	0.006603	-0.03465	-0.02427	0.089798	0.012685	1	
EGAADS	0.035758	0.043775	0.12814	0.02	0.01573	-0.00517	0.114164	1

Correlation Commercial 1997

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	1									
ABOUM	0.120303	1								
UCHUMI	-0.25351	-0.07693	1							
SMG	0.055975	0.085308	0.140583	1						
SERENA	0.235124	0.066435	-0.11949	0.162398	1					
NMG	-0.20927	-0.3671	0.112743	-0.2287	0.126468	1				
MARSH	-0.10363	0.085609	-0.05644	-0.24098	-0.2392	0.208395	1			
KENAIR	0.098012	-0.19503	0.202158	0.02585	-0.16186	0.199464	-0.00088	1		
EXPRESS	0.139846	-0.12831	-0.14356	0.065175	-0.47253	-0.07073	0.028697	-0.07692	1	
CMC	0.01928	0.396582	-0.01543	0.173066	0.218195	-0.13414	0.135907	0.077203	0.273297	1

Correlation Commercial 1998

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	1									
ABOUM	-0.00929	1								
UCHUMI	0.177046	0.042668	1							
SMG	0.056154	-0.16464	0.111048	1						
SERENA	0.030996	0.037334	0.076193	-0.24833	1					
NMG	-0.02422	-0.29984	-0.15352	0.071185	-0.01614	1				
MARSH	-0.01867	0.00909	-0.0113	0.068435	0.030086	-0.06143	1			
KENAIR	-0.02551	0.002303	0.215526	0.205457	0.132335	-0.17991	-0.00766	1		
EXPRESS	-0.11699	0.120178	-0.39294	-0.10028	0.341829	0.025835	0.039161	-0.08087	1	
CMC	0.139989	-0.02235	-0.31817	-0.01144	0.343053	-0.02336	0.165814	-0.01561	0.533308	1

Correlation Commercial 1999

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	1									
ABOUM	-0.02832	1								
UCHUMI	-0.16377	-0.01969	1							
SMG	-0.01142	0.014557	-0.06565	1						
SERENA	0.027514	0.019728	0.023639	0.108224	1					
NMG	-0.22677	0.003313	0.064942	0.0738	0.084327	1				
MARSH	-0.00578	-0.00444	-0.0153	-0.10167	-0.00912	-0.15478	1			
KENAIR	-0.05113	0.023291	-0.224	0.270012	-0.01186	0.05154	-0.07287	1		
EXPRESS	-0.01155	-0.00931	0.002308	0.464914	0.106615	0.011322	0.10126	0.015474	1	
CMC	-0.07925	-0.00607	0.022546	0.062958	0.260798	0.013729	-0.12759	0.161818	-0.01664	1

Correlation Commercial 2000

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	1									
ABOUM	0.0253	1								
UCHUMI	-0.1174	-0.19825	1							
SMG	0.031584	-0.00995	-0.01056	1						
SERENA	-0.11405	-0.04807	-0.00793	-0.13724	1					
NMG	0.064896	0.066244	-0.01143	-0.01429	0.463763	1				
MARSH	0.468319	-0.04929	-0.14956	-0.01151	-0.20561	0.027529	1			
KENAIR	-0.02573	-0.00858	0.108255	0.00629	0.081444	-0.01422	-0.04565	1		
EXPRESS	0.071698	0.046025	0.051473	0.019575	-0.00532	0.093227	0.149105	0.143619	1	
CMC	-0.04874	-0.09391	-0.02135	0.051572	0.260721	0.46299	-0.0385	-0.08537	-0.06615	1

Correlation Coefficient Commercial 2001

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	1									
ABOUM	#DIV/0!	1								
UCHUMI	#DIV/0!	0.070918	1							
SMG	#DIV/0!	0.224911	0.021483	1						
SERENA	#DIV/0!	-0.11614	0.324252	0.284392	1					
NMG	#DIV/0!	-0.19281	0.194727	-0.06476	0.288059	1				
MARSH	#DIV/0!	-0.06076	-0.02592	0.3835	0.122781	-0.03062	1			
KENAIR	#DIV/0!	0.105963	0.380744	0.036514	0.34655	-0.02218	0.055932	1		
EXPRESS	#DIV/0!	0.016035	0.266849	-0.0938	0.159928	-0.08381	-0.04442	0.004462	1	
CMC	#DIV/0!	-0.04548	-0.03527	0.114667	0.094797	0.35233	-0.06303	-0.01161	0.053181	1

Correlation Financials 1997

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	1											
SCB	0.569	1.000										
PAN	-0.032	-0.099	1.000									
NICB	0.067	-0.115	-0.096	1.000								
NBK	-0.153	-0.069	0.127	-0.109	1.000							
KCB	0.022	-0.019	-0.075	0.324	0.002	1.000						
JUB	0.079	0.289	0.123	0.015	0.107	0.120	1.000					
ICDC	0.285	0.329	0.194	-0.060	0.068	-0.005	0.237	1.000				
HFCK	0.290	0.197	0.198	0.126	0.158	0.043	0.331	0.325	1.000			
DTK	0.289	0.352	0.069	0.230	-0.081	-0.059	0.315	0.317	0.425	1.000		
CTRUST	0.196	0.174	-0.003	0.375	-0.040	0.255	0.453	0.144	0.299	0.517	1.000	
CFC	0.525	0.463	0.011	0.240	-0.060	0.056	0.465	0.392	0.535	0.493	0.373	1.000

Correlation Financial 1998

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	1											
SCB	0.368153	1										
PAN	0.102126	0.090322	1									
NICB	0.217971	0.314224	0.03084	1								
NBK	0.117744	0.234935	-0.04745	0.217459	1							
KCB	0.307087	0.323724	0.129705	0.243786	0.271924	1						
JUB	-0.233	-0.02224	-0.17267	0.068262	0.042671	0.243782	1					
ICDC	0.119458	0.402636	0.012676	0.556657	0.224903	0.398108	0.105144	1				
HFCK	0.074703	0.13397	-0.10528	0.191266	0.085679	0.269642	0.307993	0.112935	1			
DTK	0.372209	0.09136	0.114588	0.07556	0.088269	0.075145	-0.16598	0.154571	0.02642	1		
CTRUST	-0.15778	-0.12162	0.099852	-0.01509	-0.17274	-0.07176	0.005216	-0.01661	-0.00084	-0.09957	1	
CFC	0.209081	0.354275	-0.13815	0.278776	0.157605	0.161481	0.035127	0.297358	0.228295	-0.02062	0.007076	1

Correlation Financials 1999

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	1											
SCB	0.179	1.000										
PAN	0.077	-0.138	1.000									
NICB	0.099	0.154	0.105	1.000								
NBK	0.206	-0.195	-0.047	0.341	1.000							
KCB	0.262	-0.022	0.153	-0.197	0.208	1.000						
JUB	0.058	0.023	-0.081	-0.058	-0.013	0.247	1.000					
ICDC	0.087	-0.035	0.017	-0.175	0.042	-0.071	0.008	1.000				
HFCK	0.197	0.222	0.026	0.212	0.187	0.193	0.414	-0.032	1.000			
DTK	0.122	0.043	-0.136	-0.177	-0.113	0.144	-0.095	0.030	0.011	1.000		
CTRUST	-0.324	-0.155	-0.022	-0.359	-0.107	0.087	-0.191	0.100	-0.328	0.052	1.000	
CFC	0.159	0.034	0.128	-0.059	-0.092	0.207	0.284	-0.226	0.069	0.311	0.004	1.000

Correlation Coefficients - Financials 2000

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	1											
SCB	0.564	1.000										
PAN	0.037	-0.020	1.000									
NICB	0.198	0.292	0.354	1.000								
NBK	0.216	0.181	0.280	0.339	1.000							
KCB	0.361	0.493	0.231	0.206	0.283	1.000						
JUB	0.169	0.167	-0.042	-0.012	0.008	0.011	1.000					
ICDC	0.021	-0.118	0.237	0.335	0.358	0.269	0.080	1.000				
HFCK	0.044	0.050	-0.116	0.126	0.089	0.100	0.066	0.007	1.000			
DTK	0.086	0.137	-0.018	0.045	-0.020	-0.171	-0.027	-0.168	-0.030	1.000		
CTRUST	0.117	0.074	-0.098	-0.018	0.135	0.116	0.190	0.018	-0.174	0.010	1.000	
CFC	0.160	0.083	-0.066	0.333	0.026	0.233	-0.055	0.204	-0.140	-0.156	0.104	1.000

Correlations Financial 2001

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	1											
SCB	0.152	1.000										
PAN	0.099	0.062	1.000									
NICB	0.158	0.028	0.016	1.000								
NBK	-0.176	-0.074	-0.001	0.027	1.000							
KCB	0.165	0.145	-0.051	0.161	0.120	1.000						
JUB	-0.009	-0.164	-0.065	0.035	-0.012	-0.297	1.000					
ICDC	0.110	0.180	0.049	-0.193	0.069	0.093	-0.020	1.000				
HFCK	0.020	0.132	-0.111	0.091	0.131	0.070	-0.093	0.066	1.000			
DTK	-0.096	0.025	-0.061	0.195	-0.061	0.008	0.186	0.120	-0.142	1.000		
CTRUST	-0.011	-0.235	0.180	0.484	0.011	-0.042	0.105	-0.290	0.032	-0.014	1.000	

Correlation Industrial 1997

	BCC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KRLC
BCC	1																
CARB	-0.02369	1															
Cberg	-0.07689	0.148845	1														
ATH	0.03986	0.051319	-0.17789	1													
BAMB	0.076821	0.145782	-0.14112	-0.12462	1												
BAT	-0.05308	0.035519	0.268197	0.207908	0.103499	1											
Total	0.048658	-0.0259	0.087152	0.186085	0.457442	0.651968	1										
PORTL	0.246225	-0.09257	-0.13727	-0.35436	0.333468	0.038901	0.039805	1									
KNM	0.03869	0.159362	0.018066	-0.00775	-0.0243	0.00011	-0.11603	0.033611	1								
KENCL	-0.01355	-0.01353	-0.04193	-0.15098	0.375485	0.328441	0.429726	0.065991	0.050252	1							
FIRE	0.149732	0.19301	0.142717	-0.01842	0.025784	0.103978	0.004328	0.053772	-0.18729	-0.16809	1						
EAPACK	0.023408	0.094703	-0.06434	0.088692	0.040033	0.128151	0.170708	0.004665	0.056665	0.087202	-0.29668	1					
EACABLE	0.103607	0.081014	-0.05779	0.088604	0.07881	0.192479	0.259846	0.21038	-0.23396	0.229892	0.148526	-0.1466	1				
EABL	0.057641	-0.06932	0.09139	-0.3954	0.102539	-0.08151	0.197041	-0.00875	-0.00878	0.156802	0.04572	-0.07316	0.024509	1			
DUN	-0.1774	0.041633	0.166361	-0.06979	0.004803	0.047642	0.01174	-0.14138	0.16744	0.157261	0.031946	-0.08165	-0.03386	0.189673	1		
UNGA	0.199655	-0.08155	-0.1078	0.094405	0.037984	-0.02424	0.011089	0.078367	0.175866	0.216098	-0.00134	-0.16784	0.227414	-0.05876	0.121554	1	
KRLC	0.010979	0.266709	0.051812	-0.3085	0.498548	0.550763	0.666524	0.133866	0.024415	0.306361	0.152463	0.168482	0.230889	0.080791	-0.0149	0.158093	1

Correlation Industrial 1998

	BCC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KRLC
BCC	1																
CARB	-0.01997	1															
Cberg	0.123629	-0.10043	1														
ATH	0.128616	0.187657	-0.07857	1													
BAMB	-0.24237	0.151054	-0.03314	-0.00896	1												
BAT	-0.15546	0.18898	-0.00292	0.041688	0.336346	1											
Total	-0.05777	0.109463	0.328267	0.102277	0.142045	0.214764	1										
PORTL	-0.01347	0.040155	0.192125	0.057923	0.240489	-0.0346	0.403739	1									
KNM	-0.13738	0.057838	0.060566	0.03102	0.167597	-0.11865	0.050242	-0.00032	1								
KENCL	0.089862	0.020143	0.365703	0.00736	0.063152	0.020459	0.294888	-0.05538	0.259838	1							
FIRE	-0.00363	-0.16395	0.226388	0.089113	-0.16075	0.304657	0.363108	0.15348	-0.08478	0.17688	1						
EAPACK	-0.24605	0.049429	-0.0983	-0.20423	0.289077	0.03662	-0.04191	0.002959	0.086811	-0.1053	-0.35473	1					
EACABLE	0.018439	0.080578	0.272466	0.130985	-0.03483	0.200164	0.086394	0.174537	-0.13973	-0.05845	0.038124	-0.00554	1				
EABL	0.246199	-0.06255	0.020212	0.151917	0.269057	0.145538	0.167074	0.148191	-0.24368	0.121578	0.127649	-0.12987	-0.0412	1			
DUN	0.099275	-0.06378	0.092373	0.200866	0.043111	-0.0214	0.051495	0.000906	0.053661	0.035192	0.083942	0.039421	0.117636	0.050534	1		
UNGA	0.023668	-0.39882	0.14165	-0.08365	0.036452	-0.20325	0.019719	-0.08911	0.507005	0.245263	-0.19226	0.091109	-0.08082	-0.01085	0.035162	1	
KRLC	-0.05744	0.152217	0.010259	0.139805	0.351402	0.242873	0.249252	0.168469	0.174679	0.073698	-0.08634	0.006305	-0.11376	-0.00619	0.126546	0.204333	1

Correlation Industrial 1999

	BCC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KRLC
BCC	1																
CARB	-0.04831	1															
Cberg	0.023254	-0.00832	1														
ATH	-0.03934	0.14345	-0.09483	1													
BAMB	0.082635	0.425266	-0.01553	0.026108	1												
BAT	-0.08842	0.031844	-0.03059	0.17353	-0.15725	1											
Total	0.278455	0.011013	0.091609	0.137409	0.198259	0.239151	1										
PORTL	0.053289	-0.02468	-0.10092	-0.202	0.06875	-0.16288	0.013794	1									
KNM	0.091466	-0.00196	0.175975	-0.28117	0.088066	0.036154	0.143137	-0.00328	1								
KENCL	0.3203	-0.00869	0.120548	-0.11503	-0.05737	-0.00775	0.044008	0.195163	0.087488	1							
FIRE	-0.08626	0.016393	0.120829	0.182943	0.228934	0.090801	0.102017	0.019272	0.146846	0.053698	1						
EAPACK	-0.1	0.058835	-0.12365	0.135789	0.053101	-0.2599	0.012201	-0.18785	-0.05771	-0.12992	0.120745	1					
EACABLE	0.609379	0.002819	0.208932	0.171645	0.270897	-0.05912	0.546694	0.111814	0.086024	0.099027	0.353643	0.087482	1				
EABL	-0.10473	-0.04277	-0.01765	0.171536	-0.17172	0.309821	0.175248	-0.05584	-0.17368	0.016475	-0.12313	-0.30159	-0.09089	1			
DUN	-0.02215	0.080852	0.076007	0.135306	0.018512	0.029889	0.132392	-0.08053	0.151638	0.045666	0.49157	0.12304	0.276756	-0.04339	1		
UNGA	0.032483	0.24996	-0.00079	-0.03665	0.182377	0.012276	0.091863	0.057256	0.196896	0.103059	0.041197	-0.13537	-0.00498	0.002675	-0.20053	1	
KRLC	-0.09487	-0.01224	0.049237	0.189001	0.125407	0.123579	0.274365	0.016217	0.045891	-0.01451	0.645116	0.098734	0.320745	0.02636	0.382912	-0.00759	1

Correlation Coefficient Industrial 2000

	BOC	CARB	Cbeg	ATH	BAMB	BAT	Total	PORTL	KNM	KENOL	RAFE	EAPACK	EACABLE	EABL	DUN	UNGA
BOC	1															
CARB	0.180165	1														
Cbeg	0.003943	-0.37663	1													
ATH	0.101152	0.330175	-0.2154	1												
BAMB	0.080205	-0.0358	-0.11416	-0.12383	1											
BAT	-0.00181	-0.01573	-0.01102	0.038454	-0.15611	1										
Total	-0.0422	0.046917	0.027633	-0.01471	-0.02916	0.556154	1									
PORTL	0.2196	0.029866	0.068416	0.128915	0.035218	-0.01068	0.316882	1								
KNM	0.230415	-0.03342	0.004652	0.34943	-0.1052	0.002482	-0.06229	-0.05168	1							
KENOL	0.075867	-0.03568	0.01345	-0.03577	-0.023	-0.02955	-0.04826	0.035834	-0.06922	1						
RAFE	0.19245	0.021341	-0.03323	-0.00749	0.110376	-0.2755	-0.27558	-0.0548	0.108066	0.224574	1					
EAPACK	-0.07637	-0.0375	0.038819	-0.03452	0.147903	-0.04313	-0.03847	0.014666	0.047195	-0.06486	-0.01556	1				
EACABLE	0.046865	-0.03468	0.022148	0.03682	-0.01697	0.111052	-0.13758	0.076418	-0.05763	0.376319	0.095764	0.028668	1			
EABL	-0.17805	0.037663	-0.12278	-0.02434	-0.01016	0.156865	0.146812	-0.10538	-0.33876	0.038683	-0.23106	-0.21532	-0.01238	1		
DUN	-0.01989	-0.19746	0.11273	-0.10833	0.155105	-0.03221	-0.07035	0.051238	0.001372	-0.04874	-0.09124	0.015402	-0.28416	0.023154	1	
UNGA	0.136635	0.104622	0.011684	0.547733	-0.31544	0.123666	-0.04464	-0.07744	0.436132	0.040453	-0.1273	0.0051	0.199089	0.071867	-0.05085	1
KPLC	-0.01673	0.038529	-0.04754	0.116219	0.048526	0.028664	0.002791	-0.05114	-0.01792	-0.061	0.095551	-0.24701	-0.08735	0.036	-0.17763	-0.06522

Correlation Coefficient Industrial 2001

	BOC	CARB	Cbeg	ATH	BAMB	BAT	Total	PORTL	KNM	KENOL	RAFE	EAPACK	EACABLE	EABL	DUN	UNGA	KPLC
BOC	1																
CARB	-0.1054	1															
Cbeg	-0.22991	-0.00591	1														
ATH	0.154753	0.070687	-0.1827	1													
BAMB	-0.23563	0.07018	0.239238	-0.32947	1												
BAT	0.003232	0.001576	-0.12383	0.249465	-0.02338	1											
Total	0.192281	-0.01374	0.048652	0.116094	-0.07991	0.052176	1										
PORTL	-0.0037	-0.00166	0.038522	-0.13927	0.024446	-0.00531	0.420283	1									
KNM	-0.09029	-0.01623	0.076031	-0.05122	-0.07222	0.008	0.216398	0.137055	1								
KENOL	-0.12947	-0.04873	-0.0681	-0.0768	0.1594	-0.14643	-0.19042	-0.03058	-0.00121	1							
RAFE	0.112391	-0.00656	0.039139	0.147508	-0.02146	0.038479	0.321333	0.519857	0.166238	0.210484	1						
EAPACK	0.053103	0.074881	-0.10726	-0.16016	0.072661	-0.03603	-0.00524	0.01846	0.044815	-0.13609	-0.03423	1					
EACABLE	0.019148	-0.04903	0.028756	0.075515	0.035855	0.173869	-0.1092	-0.0131	-0.06538	0.063708	-0.07116	0.166553	1				
EABL	0.035725	0.038389	-0.0512	0.133252	-0.08432	0.154727	-0.04547	-0.10349	-0.13304	-0.12264	-0.16396	-0.22119	0.083122	1			
DUN	-0.19431	-0.14333	-0.13875	0.225848	-0.08163	0.398746	0.261764	0.036105	-0.07781	-0.33687	-0.07159	0.019253	-0.09126	-0.02824	1		
UNGA	-0.12305	0.092307	0.370905	-0.09207	0.031019	-0.00136	0.561559	0.613894	0.3953	-0.06425	0.350746	-0.00899	-0.07236	0.080183	0.143326	1	
KPLC	0.059352	0.125223	-0.20112	0.072652	-0.06499	0.048884	-0.21036	-0.23119	-0.2101	0.041741	-0.16612	0.03605	0.110833	0.009599	-0.23963	-0.39899	1

Appendix E-Covariance

Covariance Matrix Agriculture 1997

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	7.989958	-0.22981	2.025298	-1.04099	0	1.542859	0.414142	0.938134
SASINI	-0.22981	18.44311	8.348656	-1.04453	0	4.228361	6.400325	1.410249
REAV	2.025298	8.348656	33.31305	-2.00789	0	1.219269	4.804652	-2.18336
LTEA	-1.04099	-1.04453	-2.00789	6.836401	0	2.639093	-0.18154	-14.4483
KAPCHO	0	0	0	0	0	0	0	0
KAKUZI	1.542859	4.228361	1.219269	2.639093	0	37.30835	13.909	-4.94479
GWK	0.414142	6.400325	4.804652	-0.18154	0	13.909	39.10286	0.55657
EGAADS	0.938134	1.410249	-2.18336	-14.4483	0	-4.94479	0.55657	82.60242

Covariance Matrix 1998

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	11.00057	-1.37592	-0.30751	-0.16628	0.183033	1.00369	-3.39791	-0.40084
SASINI	-1.37592	52.55775	-0.2929	-0.16595	3.060997	9.987449	1.60363	-1.14441
REAV	-0.30751	-0.2929	13.48715	-0.1994	0.339523	-2.92278	-1.46437	1.50819
LTEA	-0.16628	-0.16595	-0.1994	0.104884	-0.0004	0.04607	0.251865	-7.2E-05
KAPCHO	0.183033	3.060997	0.339523	-0.0004	7.671709	1.313404	-0.00025	-0.10628
KAKUZI	1.00369	9.987449	-2.92278	0.04607	1.313404	27.57321	3.156496	-1.85036
GWK	-3.39791	1.60363	-1.46437	0.251865	-0.00025	3.156496	23.23019	-1.23015
EGAADS	-0.40084	-1.14441	1.50819	-7.2E-05	-0.10628	-1.85036	-1.23015	13.55517

Covariance Matrix Agricultural 1999

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	17.18217	-1.29218	2.953482	-0.08809	0.206908	-0.66332	4.9097	-1.46101
SASINI	-1.29218	8.668376	0.002373	-0.20307	0.738353	0.867518	-0.53731	-1.52826
REAV	2.953482	0.002373	13.88954	-0.1161	-2.17408	-4.24665	0.775315	2.57855
LTEA	-0.08809	-0.20307	-0.1161	3.354298	0.202785	-0.20721	-0.44225	-0.17619
KAPCHO	0.206908	0.738353	-2.17408	0.202785	13.9175	-1.23965	-1.25281	0.553875
KAKUZI	-0.66332	0.867518	-4.24665	-0.20721	-1.23965	16.29857	0.741881	-0.5579
GWK	4.9097	-0.53731	0.775315	-0.44225	-1.25281	0.741881	9.893807	-3.29228
EGAADS	-1.46101	-1.52826	2.57855	-0.17619	0.553875	-0.5579	-3.29228	38.53954

Covariance Matrix - Agricultural 2000

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	24.80	1.58	-3.29	0.00	0.00	3.44	3.89	-0.91
SASINI	1.58	16.87	2.77	0.00	0.00	-0.89	-2.07	-0.15
REAV	-3.29	2.77	28.85	0.00	0.00	-0.50	0.17	-0.44
LTEA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KAPCHO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KAKUZI	3.44	-0.89	-0.50	0.00	0.00	14.11	0.89	-2.06
GWK	3.89	-2.07	0.17	0.00	0.00	0.89	14.92	-5.56
EGAADS	-0.91	-0.15	-0.44	0.00	0.00	-2.06	-5.56	6.74

Covariance Matrix Agriculture - 2001

	BBond	SASINI	REAV	LTEA	KAPCHO	KAKUZI	GWK	EGAADS
BBond	9.095998	-2.57232	-18.304	0.372807	-0.14693	-1.53555	1.182084	0.322282
SASINI	-2.57232	18.5206	6.87487	1.31535	0.631981	8.68762	0.100254	0.562984
REAV	-18.304	6.87487	144.4977	0.113559	-1.28313	-99.7832	-1.46956	4.603148
LTEA	0.372807	1.31535	0.113559	1.125682	-0.01945	0.109505	-0.09084	0.063413
KAPCHO	-0.14693	0.631981	-1.28313	-0.01945	1.358277	-0.28816	0.36925	0.054786
KAKUZI	-1.53555	8.68762	-99.7832	0.109505	-0.28816	397.9224	0.892788	-0.30844
GWK	1.182084	0.100254	-1.46956	-0.09084	0.36925	0.892788	12.44859	1.203728
EGAADS	0.322282	0.562984	4.603148	0.063413	0.054786	-0.30844	1.203728	8.93055

Covariance Matrix Commercial 1997

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	6.800458	3.010145	-2.40409	1.693885	1.254298	-2.54152	-2.32792	1.768676	1.265366	0.221606
ABOUM	3.010145	92.0625	-2.68435	9.498463	1.51047	-16.4039	7.076075	-12.949	-4.27177	16.77202
UCHUMI	-2.40409	-2.68435	13.22392	5.932445	-0.88552	1.909388	-1.76803	5.087107	-1.81141	-0.24738
SMG	1.693885	9.498463	5.932445	134.6614	6.98851	-12.3597	-24.0894	2.075815	2.624224	8.852086
SERENA	1.254298	1.51047	-0.88552	6.98851	11.48019	1.978215	-8.53882	-4.14911	-3.75168	2.855047
NMG	-2.54152	-16.4039	1.909388	-12.3597	1.978215	21.68964	8.360745	6.428221	-1.143	-2.75366
MARSH	-2.32792	7.076075	-1.76803	-24.0894	-8.53882	8.360745	74.20977	-0.05254	0.857753	5.160415
KENAIR	1.768676	-12.949	5.087107	2.075815	-4.14911	6.428221	-0.05254	47.88508	-1.84694	2.354761
EXPRESS	1.265366	-4.27177	-1.81141	2.624224	-3.75168	-1.143	0.857753	-1.84694	12.03903	4.179661
CMC	0.221606	16.77202	-0.24738	8.852086	2.855047	-2.75366	5.160415	2.354761	4.179661	19.42774

Covariance Matrix Commercial 1998

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	64.37551	-0.11036	7.30122	5.936377	1.468031	-1.75271	-0.62869	-1.20155	-5.67492	6.12287
ABOUM	-0.11036	2.191329	0.324642	-3.21117	0.326233	-4.00391	0.056484	0.020017	1.075529	-0.18038
UCHUMI	7.30122	0.324642	26.41799	7.520446	2.311721	-7.11788	-0.24384	6.503177	-12.2102	-8.91479
SMG	5.936377	-3.21117	7.520446	173.6054	-19.3142	8.460699	3.785182	15.89204	-7.98841	-0.82141
SERENA	1.468031	0.326233	2.311721	-19.3142	34.84496	-0.85925	0.745527	4.585874	12.19894	11.03902
NMG	-1.75271	-4.00391	-7.11788	8.460699	-0.85925	81.37238	-2.32612	-9.52725	1.408953	-1.14876
MARSH	-0.62869	0.056484	-0.24384	3.785182	0.745527	-2.32612	17.62209	-0.18872	0.993866	3.794453
KENAIR	-1.20155	0.020017	6.503177	15.89204	4.585874	-9.52725	-0.18872	34.46299	-2.87027	-0.49963
EXPRESS	-5.67492	1.075529	-12.2102	-7.98841	12.19894	1.408953	0.993866	-2.87027	36.55002	17.57605
CMC	6.12287	-0.18038	-8.91479	-0.82141	11.03902	-1.14876	3.794453	-0.49963	17.57605	29.71658

Covariance Matrix Commercial 1999

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	56.34742	-0.32857	-3.25019	-1.0778	0.891007	-7.23856	-0.1095	-1.80107	-0.59632	-1.88766
ABOUM	-0.32857	2.388871	-0.08045	0.28294	0.131543	0.021777	-0.01732	0.168926	-0.09893	-0.02978
UCHUMI	-3.25019	-0.08045	6.989945	-2.18276	0.269615	0.730131	-0.10213	-2.77899	0.041979	0.189154
SMG	-1.0778	0.28294	-2.18276	158.1522	5.871409	3.946662	-3.22876	15.93409	40.21479	2.512458
SERENA	0.891007	0.131543	0.269615	5.871409	18.61084	1.54698	-0.09931	-0.24003	3.163571	3.570268
NMG	-7.23856	0.021777	0.730131	3.946662	1.54698	18.08318	-1.6621	1.028466	0.331166	0.185261
MARSH	-0.1095	-0.01732	-0.10213	-3.22876	-0.09931	-1.6621	6.376945	-0.86352	1.758817	-1.02246
KENAIR	-1.80107	0.168926	-2.77899	15.93409	-0.24003	1.028466	-0.86352	22.01976	0.499446	2.409614
EXPRESS	-0.59632	-0.09893	0.041979	40.21479	3.163571	0.331166	1.758817	0.499446	47.30989	-0.36315
CMC	-1.88766	-0.02978	0.189154	2.512458	3.570268	0.185261	-1.02246	2.409614	-0.36315	10.06993

Covariance Matrix Commercial 2000

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	199.6084	0.844124	-3.73649	2.530592	-3.15144	2.43524	19.53143	-1.35117	2.342804	-2.88709
ABOUM	0.844124	5.576679	-1.05462	-0.13329	-0.22202	0.415492	-0.34363	-0.07529	0.251372	-0.92974
UCHUMI	-3.73649	-1.05462	5.074709	-0.13489	-0.03494	-0.06838	-0.99458	0.906299	0.268178	-0.20166
SMG	2.530592	-0.13329	-0.13489	32.16142	-1.52221	-0.21532	-0.19276	0.132573	0.256745	1.226157
SERENA	-3.15144	-0.22202	-0.03494	-1.52221	3.825248	2.409115	-1.18705	0.591983	-0.02408	2.137827
NMG	2.43524	0.415492	-0.06838	-0.21532	2.409115	7.054465	0.215836	-0.14039	0.572682	5.155498
MARSH	19.53143	-0.34363	-0.99458	-0.19276	-1.18705	0.215836	8.713752	-0.5008	1.017969	-0.4765
KENAIR	-1.35117	-0.07529	0.906299	0.132573	0.591983	-0.14039	-0.5008	13.81132	1.23444	-1.33015
EXPRESS	2.342804	0.251372	0.268178	0.256745	-0.02408	0.572682	1.017969	1.23444	5.349097	-0.64143
CMC	-2.88709	-0.92974	-0.20166	1.226157	2.137827	5.155498	-0.4765	-1.33015	-0.64143	17.57654

Covariance Matrix Commercial 2001

	CarGen	ABOUM	UCHUMI	SMG	SERENA	NMG	MARSH	KENAIR	EXPRESS	CMC
CarGen	0	0	0	0	0	0	0	0	0	0
ABOUM	0	15.22054	1.086426	16.71456	-0.76025	-2.96517	-0.05354	1.977716	0.356258	-0.78972
UCHUMI	0	1.086426	15.41922	1.606927	2.136418	3.014063	-0.02299	7.152485	5.967208	-0.61653
SMG	0	16.71456	1.606927	362.8601	9.089905	-4.86276	1.649904	3.327567	-10.1757	9.722805
SERENA	0	-0.76025	2.136418	9.089905	2.815432	1.905233	0.046529	2.78184	1.528167	0.70803
NMG	0	-2.96517	3.014063	-4.86276	1.905233	15.53779	-0.02726	-0.41821	-1.88144	6.181994
MARSH	0	-0.05354	-0.02299	1.649904	0.046529	-0.02726	0.051009	0.060433	-0.05713	-0.06337
KENAIR	0	1.977716	7.152485	3.327567	2.78184	-0.41821	0.060433	22.88687	0.121553	-0.24726
EXPRESS	0	0.356258	5.967208	-10.1757	1.528167	-1.88144	-0.05713	0.121553	32.43021	1.348071
CMC	0	-0.78972	-0.61653	9.722805	0.70803	6.181994	-0.06337	-0.24726	1.348071	19.81386

Covariance Matrix 1997

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	10.1073	6.49462	-0.5063	1.098679	-1.16894	0.324807	1.62602	6.758859	2.858387	4.78637	1.796804	11.11384
SCB	6.49462	12.90272	-1.76214	-2.11932	-0.59545	-0.32933	6.737783	8.816407	2.193768	6.587248	1.795655	11.06228
PAN	-0.5063	-1.76214	24.75865	-2.4393	1.518867	-1.76604	3.963914	7.188938	3.052165	1.793024	-0.04221	0.377641
NICB	1.098679	-2.11932	-2.4393	26.28961	-1.34765	7.899586	0.50231	-2.29653	2.005481	6.157212	5.537207	8.19373
NBK	-1.16894	-0.59545	1.518867	-1.34765	5.774406	0.018315	1.666662	1.217766	1.174109	-1.01702	-0.27672	-0.96701
KCB	0.324807	-0.32933	-1.76604	7.899586	0.018315	22.55402	3.708963	-0.18547	0.630631	-1.46345	3.486886	1.770458
JUB	1.62602	6.737783	3.963914	0.50231	1.666662	3.708963	42.24942	11.48267	6.657305	10.695	8.477171	20.11938
ICDC	6.758859	8.816407	7.188938	-2.29653	1.217766	-0.18547	11.48267	55.73614	7.514986	12.35988	3.101408	19.48199
HFCK	2.858387	2.193768	3.052165	2.005481	1.174109	0.630631	6.657305	7.514986	9.586137	6.865081	2.666981	11.01745
DTK	4.78637	6.587248	1.793024	6.157212	-1.01702	-1.46345	10.695	12.35988	6.865081	27.21197	7.763107	17.11161
CTRUST	1.796804	1.795655	-0.04221	5.537207	-0.27672	3.486886	8.477171	3.101408	2.666981	7.763107	8.277615	7.138129
CFC	11.11384	11.06228	0.377641	8.19373	-0.96701	1.770458	20.11938	19.48199	11.01745	17.11161	7.138129	44.31014

Covariance Matrix Financial 1998

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	9.310641	3.973765	0.917215	4.126547	2.493764	3.759318	-2.02269	2.235322	1.179269	3.539049	-8.88796	2.762942
SCB	3.973765	12.1588	0.923227	6.770282	5.662973	4.510277	-0.21975	8.574698	2.406941	0.988635	-7.79692	5.328177
PAN	0.917215	0.923227	8.817386	0.552901	-0.95168	1.50364	-1.41944	0.224615	-1.57383	1.031761	5.326552	-1.72878
NICB	4.126547	6.770282	0.552901	37.44412	9.193664	5.957323	1.182888	20.79257	6.027107	1.43413	-1.69659	7.35373
NBK	2.493764	5.662973	-0.95168	9.193664	43.21857	7.433954	0.827239	9.398188	3.020459	1.874271	-21.7308	4.651048
KCB	3.759318	4.510277	1.50364	5.957323	7.433954	16.05665	2.731663	9.615722	5.494381	0.922261	-5.21783	2.75444
JUB	-2.02269	-0.21975	-1.41944	1.182888	0.827239	2.731663	6.287112	1.800904	4.450362	-1.44453	0.268934	0.424893
ICDC	2.235322	8.574698	0.224615	20.79257	9.398188	9.615722	1.800904	37.0575	3.517545	2.899743	-1.84576	7.753019
HFCK	1.179269	2.406941	-1.57383	6.027107	3.020459	5.494381	4.450362	3.517545	26.55467	0.418134	-0.07908	5.021554
DTK	3.539049	0.988635	1.031761	1.43413	1.874271	0.922261	-1.44453	2.899743	0.418134	9.032896	-5.62328	-0.27321
CTRUST	-8.88796	-7.79692	5.326552	-1.69659	-21.7308	-5.21783	0.268934	-1.84576	-0.07908	-5.62328	348.2138	0.555375
CFC	2.762942	5.328177	-1.72878	7.35373	4.651048	2.75444	0.424893	7.753019	5.021554	-0.27321	0.555375	19.16388

Covariance Matrix Financial 1999

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	10.148	1.638	2.993	1.676	5.462	4.055	0.899	0.384	3.026	1.239	-4.266	2.120
SCB	1.638	8.885	-5.009	2.437	-4.832	-0.314	0.338	-0.142	3.185	0.408	-1.908	0.423
PAN	2.993	-5.009	160.358	7.078	-5.009	9.459	-4.969	0.291	1.616	-5.506	-1.158	6.796
NICB	1.676	2.437	7.078	30.506	15.677	-5.290	-1.537	-1.335	5.661	-3.107	-8.194	-1.356
NBK	5.462	-4.832	-5.009	15.677	74.774	8.732	-0.548	0.497	7.816	-3.103	-3.825	-3.328
KCB	4.055	-0.314	9.459	-5.290	8.732	24.749	6.023	-0.494	4.705	2.318	1.811	4.369
JUB	0.899	0.338	-4.969	-1.537	-0.548	6.023	22.011	0.057	10.033	-1.526	-3.965	5.957
ICDC	0.384	-0.142	0.291	-1.335	0.497	-0.494	0.057	1.912	-0.219	0.137	0.592	-1.350
HFCK	3.026	3.185	1.616	5.661	7.816	4.705	10.033	-0.219	24.546	0.179	-6.801	1.449
DTK	1.239	0.408	-5.506	-3.107	-3.103	2.318	-1.526	0.137	0.179	10.818	0.714	4.289
CTRUST	-4.266	-1.908	-1.158	-8.194	-3.825	1.811	-3.965	0.592	-6.801	0.714	18.466	0.063
CFC	2.120	0.423	6.796	-1.356	-3.328	4.369	5.957	-1.350	1.449	4.289	0.063	18.732

Covariance Matrix Financials 2000

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	32.62638	18.83989	1.035985	6.051253	7.301909	15.16135	3.141734	0.656116	1.349968	2.258439	1.761888	4.023296
SCB	18.83989	20.34987	-0.4528	7.289341	4.995069	16.91728	2.540802	-2.96251	1.250682	2.934343	0.909949	1.702165
PAN	1.035985	-0.4528	17.57562	7.393187	6.47237	6.636573	-0.54202	5.005251	-2.42046	-0.32301	-1.00757	-1.13522
NICB	6.051253	7.289341	7.393187	20.27105	8.538545	6.449396	-0.1691	7.717613	2.860248	0.880635	-0.20283	6.248487
NBK	7.301909	4.995069	6.47237	8.538545	26.34601	9.814006	0.130625	9.12166	2.23447	-0.43064	1.675233	0.536858
KCB	15.16135	16.91728	6.636573	6.449396	9.814006	32.8239	0.213314	8.50662	3.112778	-4.61611	1.799094	6.015044
JUB	3.141734	2.540802	-0.54202	-0.1691	0.130625	0.213314	8.831249	1.121318	0.910098	-0.32263	1.301216	-0.63339
ICDC	0.656116	-2.96251	5.005251	7.717613	9.12166	8.50662	1.121318	23.93645	0.164458	-3.32335	0.204536	3.867985
HFCK	1.349968	1.250682	-2.42046	2.860248	2.23447	3.112778	0.910098	0.164458	22.77143	-0.57955	-1.94934	-2.62425
DTK	2.258439	2.934343	-0.32301	0.880635	-0.43064	-4.61611	-0.32263	-3.32335	-0.57955	17.45939	0.09596	-2.51567
CTRUST	1.761888	0.909949	-1.00757	-0.20283	1.675233	1.799094	1.301216	0.204536	-1.94934	0.09596	5.757156	0.960037
CFC	4.023296	1.702165	-1.13522	6.248487	0.536858	6.015044	-0.63339	3.867985	-2.62425	-2.51567	0.960037	12.74564

Covariance Matrix Financial 2001

	BBK	SCB	PAN	NICB	NBK	KCB	JUB	ICDC	HFCK	DTK	CTRUST	CFC
BBK	11.555	2.403	0.975	2.533	-13.873	4.046	-0.099	1.450	0.274	-1.057	-0.186	0.750
SCB	2.403	22.741	0.849	0.613	-8.103	4.939	-2.398	3.283	2.544	0.385	-5.782	0.270
PAN	0.975	0.849	8.829	0.227	-0.047	-1.075	-0.595	0.558	-1.323	-0.582	2.746	-0.125
NICB	2.533	0.613	0.227	23.536	3.022	5.573	0.523	-3.573	1.775	3.009	12.052	1.956
NBK	-13.873	-8.103	-0.047	3.022	571.409	20.475	-0.845	6.253	12.635	-4.657	1.324	1.544
KCB	4.046	4.939	-1.075	5.573	20.475	55.248	-6.745	2.646	2.077	0.193	-1.588	-0.586
JUB	-0.099	-2.398	-0.595	0.523	-0.845	-6.745	10.176	-0.244	-1.193	1.890	1.725	0.281
ICDC	1.450	3.283	0.558	-3.573	6.253	2.646	-0.244	15.813	1.050	1.519	-5.918	0.392
HFCK	0.274	2.544	-1.323	1.775	12.635	2.077	-1.193	1.050	14.553	-1.902	0.683	1.283
DTK	-1.057	0.385	-0.582	3.009	-4.657	0.193	1.890	1.519	-1.902	11.004	-0.236	2.328
CTRUST	-0.186	-5.782	2.746	12.052	1.324	-1.588	1.725	-5.918	0.683	-0.236	28.721	3.013
CFC	0.750	0.270	-0.125	1.956	1.544	-0.586	0.281	0.392	1.283	2.328	3.013	5.231

Covariance Matrix Industrial 1997

	BOC	CARB	Oberg	ATHI	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KPLC
BOC	3.850	-0.120	-0.771	0.587	1.285	-0.526	0.591	4.173	0.970	-0.176	1.934	0.324	0.923	0.495	-6.858	1.812	0.322
CARB	-0.120	6.558	1.948	1.192	3.178	0.387	-0.411	-2.056	2.044	-0.229	3.254	1.710	0.891	-0.777	2.101	-0.981	10.211
Oberg	-0.771	1.948	26.112	-6.118	-6.139	5.826	2.761	-6.084	0.462	-1.420	4.801	-2.318	-1.289	2.044	16.749	-2.587	3.958
ATHI	0.587	1.192	-6.118	73.245	-8.049	2.729	2.514	-32.475	-0.174	-3.908	-0.803	4.035	2.179	-17.185	-12.490	5.944	-15.983
BAMB	1.285	3.178	-6.139	-8.049	72.484	3.746	24.147	24.623	-1.036	21.180	1.445	2.421	2.883	3.822	0.806	3.918	63.456
BAT	-0.526	0.387	5.826	2.729	3.746	18.069	17.446	2.466	0.002	9.249	3.078	3.841	3.516	-1.517	3.990	-0.484	35.000
Total	0.591	-0.411	2.761	2.514	24.147	17.446	38.441	2.146	-3.603	17.652	0.177	7.463	6.923	5.348	1.434	0.323	61.698
PORTL	4.173	-2.056	-6.084	-32.475	24.623	2.466	2.146	75.218	3.632	3.792	3.070	0.285	7.863	-0.332	-24.159	3.192	17.356
KNM	0.970	2.044	0.462	-0.174	-1.036	0.002	-3.603	3.632	25.080	1.657	-6.175	1.997	-5.035	-0.193	16.521	4.137	1.828
KENCL	-0.176	-0.229	-1.420	-3.908	21.180	9.249	17.652	3.792	1.657	43.892	-7.375	4.074	6.546	4.542	20.527	6.693	30.344
FIRE	1.934	3.254	4.801	-0.803	1.445	3.078	0.177	3.070	-6.175	-7.375	43.345	-13.727	4.202	1.318	4.141	-0.041	15.006
EAPACK	0.324	1.710	-2.318	4.035	2.421	3.841	7.463	0.285	1.997	4.074	-13.727	49.723	-4.412	-2.258	-11.344	-5.569	17.761
EACABLE	0.923	0.891	-1.289	2.179	2.883	3.516	6.923	7.863	-5.035	6.546	4.202	-4.412	18.464	0.461	-2.857	4.590	14.832
EABL	0.495	-0.777	2.044	-17.185	3.822	-1.517	5.348	-0.332	-0.193	4.542	1.318	-2.258	0.461	19.165	16.360	-1.208	5.288
DUN	-6.858	2.101	16.749	-12.490	0.806	3.990	1.434	-24.159	16.521	20.527	4.141	-11.344	-2.857	16.360	388.185	11.249	-4.399
UNGA	1.812	-0.981	-2.587	5.944	3.918	-0.484	0.323	3.192	4.137	6.693	-0.041	-5.569	4.590	-1.208	11.249	22.069	11.101
KPLC	0.322	10.211	3.958	-15.983	63.456	35.000	61.698	17.356	1.828	30.344	15.006	17.761	14.832	5.288	-4.399	11.101	223.502

Covariance Matrix Industrial 1998

	BOC	CARB	Oberg	ATHI	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KPLC
BOC	2.100	-0.121	0.783	1.103	-2.575	-0.562	-0.396	-0.193	-1.892	0.246	-0.085	-1.821	0.087	1.475	2.170	1.311	-0.338
CARB	-0.121	18.472	-1.905	4.896	4.805	2.026	1.896	1.721	2.386	0.381	-4.306	1.095	1.144	-1.122	-4.175	-52.639	2.287
Oberg	0.783	-1.905	20.599	-2.139	-1.100	-0.033	5.990	8.592	2.608	7.015	6.209	-0.866	4.031	0.378	6.310	19.637	0.161
ATHI	1.103	4.896	-2.139	38.519	-0.318	0.648	2.557	5.409	1.837	0.200	2.607	-6.497	2.665	3.912	18.875	-15.930	2.996
BAMB	-2.575	4.805	-1.100	-0.318	36.887	6.415	4.347	18.038	12.099	2.089	-7.394	11.212	-0.864	8.447	4.939	22.394	9.241
BAT	-0.562	2.026	-0.033	0.648	6.415	4.232	2.238	-2.161	-2.915	0.230	4.773	0.484	1.692	1.556	-0.835	-16.071	2.175
Total	-0.396	1.896	5.990	2.557	4.347	2.238	15.364	16.645	1.994	5.361	9.180	-0.893	1.301	2.883	3.243	2.516	3.603
PORTL	-0.193	1.721	8.592	5.409	18.038	-2.161	16.645	104.808	-0.031	-2.468	9.511	0.155	5.834	6.268	0.140	-21.616	5.968
KNM	-1.892	2.386	2.608	1.837	12.099	-2.915	1.994	-0.031	96.340	11.144	-5.057	4.366	-4.463	-9.920	7.956	152.637	5.956
KENCL	0.246	0.381	7.015	0.200	2.089	0.230	5.361	-2.468	11.144	20.441	4.835	-2.426	-0.862	2.267	2.396	33.828	1.151
FIRE	-0.085	-4.306	6.209	2.607	-7.394	4.773	9.180	9.511	-5.057	4.835	38.795	-11.367	0.167	3.311	7.945	-36.878	-1.876
EAPACK	-1.821	1.095	-0.866	-6.497	11.212	0.484	-0.893	0.155	4.366	-2.426	-11.367	27.893	-0.096	-2.840	3.146	14.736	0.116
EACABLE	0.087	1.144	4.031	2.665	-0.864	1.692	1.301	5.834	-4.463	-0.862	0.167	-0.096	11.393	-0.576	6.005	-8.362	-1.333
EABL	1.475	-1.122	0.378	3.912	8.447	1.556	2.883	6.268	-9.920	2.267	3.311	-2.840	-0.576	16.366	3.264	-1.420	-0.092
DUN	2.170	-4.175	6.310	18.875	4.939	-0.835	3.243	0.140	7.956	2.396	7.945	3.146	6.005	3.264	245.234	16.798	6.847
UNGA	1.311	-52.639	19.637	-15.930	22.394	-16.071	2.516	-21.616	152.637	33.828	-36.878	14.736	-8.362	-1.420	16.798	1001.020	22.407
KPLC	-0.338	2.287	0.161	2.996	9.241	2.175	3.603	5.968	5.956	1.151	-1.876	0.116	-1.333	-0.092	6.847	22.407	12.616

Covariance Matrix Industrial 1999

	BOC	CARB	Oberg	ATHI	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KPLC
BOC	13.013	-4.949	0.814	-3.953	1.354	-1.419	5.805	1.993	3.398	6.435	-1.404	-3.735	21.504	-1.768	-0.543	1.352	-1.161
CARB	-4.949	869.285	-2.350	46.080	56.241	4.125	1.853	-7.420	-0.589	-1.068	2.153	17.735	0.803	-5.828	12.003	97.205	-1.209
Oberg	0.814	-2.350	100.281	-10.406	-0.706	-4.008	5.265	-10.409	18.027	6.677	5.422	-12.723	20.330	-0.831	5.138	-0.091	1.661
ATHI	-3.953	46.080	-10.406	129.706	1.341	8.736	8.981	-23.691	-32.753	-7.245	9.335	16.017	18.991	9.089	10.402	-4.662	7.250
BAMB	1.354	56.241	-0.706	1.341	21.987	-3.257	5.335	3.320	4.224	-1.488	4.809	3.042	12.331	-3.742	0.586	9.798	1.980
BAT	-1.419	4.125	-4.008	8.736	-3.257	21.075	6.303	-7.703	1.698	-0.197	1.868	-12.129	-2.638	6.613	0.927	0.646	1.913
Total	5.805	1.853	5.265	8.981	5.335	6.303	35.466	0.847	8.734	1.452	2.727	0.748	31.799	4.869	5.331	6.279	5.513
PORTL	1.993	-7.420	-10.409	-23.691	3.320	-7.703	0.847	114.642	-0.360	11.554	0.924	-20.674	11.628	-2.778	-5.826	10.702	0.585
KNM	3.398	-0.589	18.027	-32.753	4.224	1.698	8.734	-0.360	112.888	5.144	6.947	-6.308	6.820	-8.577	10.883	23.950	1.643
KENCL	6.435	-1.068	6.677	-7.245	-1.488	-0.197	1.452	11.554	5.144	32.771	1.383	-7.679	5.531	0.440	1.768	6.789	-0.281
FIRE	-1.404	2.153	5.422	9.335	4.809	1.868	2.727	0.924	6.947	1.383	21.699	5.781	16.000	-2.665	15.453	2.198	10.119
EAPACK	-3.735	17.735	-12.723	16.017	3.042	-12.129	0.748	-20.674	-6.308	-7.679	5.781	114.200	9.083	-14.980	8.876	-16.577	3.554
EACABLE	21.504	0.803	20.330	18.991	12.331	-2.638	31.799	11.628	6.820	5.531	16.000	9.083	102.034	-0.981	18.866	-0.577	10.909
EABL	-1.768	-5.828	-0.831	9.089	-3.742	6.613	4.869	-2.778	-8.577	0.440	-2.665	-14.980	-0.981	23.221	-1.415	0.148	0.429
DUN	-0.543	12.003	5.138	10.402	0.586	0.927	5.331	-5.826	10.883	1.768	15.453	8.876	18.866	-1.415	47.544	-16.122	9.049
UNGA	1.352	97.205	-0.091	-4.662	9.798	0.646	6.279	10.702	23.950	6.789	2.198	-16.577	-0.577	0.148	-16.122	141.905	-0.304
KPLC	-1.161	-1.209	1.661	7.250	1.980	1.913	5.513	0.585	1.643	-0.281	10.119	3.554	10.909	0.429	9.049	-0.304	11.904

Covariance Matrix Industrial 2000

	BOC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KPLC
BOC	14.169	3.848	0.049	2.052	0.506	-0.005	-0.599	2.905	7.991	0.876	4.093	-2.831	1.957	-1.683	-0.222	3.877	-0.379
CARB	3.848	32.480	-7.395	10.497	-0.948	-0.149	1.089	0.613	-1.672	-1.732	0.678	-5.084	-6.010	0.561	-3.450	4.649	3.011
Cberg	0.049	-7.395	11.891	-4.017	-0.663	-0.168	0.361	0.783	0.134	0.143	-0.650	1.339	0.823	-1.057	1.155	0.305	-9.836
ATH	2.052	10.497	-4.017	30.633	-1.164	0.950	-0.311	2.501	16.602	-1.664	-2.454	-5.216	5.223	-0.343	-1.798	23.140	3.986
BAMB	0.506	-0.948	-0.663	-1.164	3.044	-1.200	-0.191	0.216	-1.570	-0.123	0.989	2.540	-0.318	-0.044	0.803	-4.542	0.510
BAT	-0.005	-0.149	-0.168	0.950	-1.200	18.439	9.612	-0.172	0.096	-0.417	-7.134	-1.946	5.439	1.825	-0.437	4.272	0.796
Total	-0.599	1.089	0.361	-0.311	-0.191	9.612	15.370	4.395	-2.071	-0.581	-6.109	-1.486	-5.792	1.446	-0.817	-1.379	0.066
PORTL	2.905	0.613	0.783	2.501	0.216	-0.172	4.395	13.361	-1.911	0.665	-1.132	0.528	2.998	-0.957	0.565	-2.133	-1.124
KNM	7.991	-1.672	0.134	16.602	-1.570	0.096	-2.071	-1.911	77.780	-1.872	5.134	4.097	-5.453	-7.499	0.036	28.616	-0.950
KENCL	0.876	-1.732	0.143	-1.664	-0.123	-0.417	-0.581	0.665	-1.872	9.279	4.048	-2.041	12.887	0.662	-4.144	0.973	-1.171
FIRE	4.093	0.678	-0.650	-2.454	0.989	-7.134	-6.109	-1.132	5.134	4.048	34.550	-0.900	6.103	-3.409	-1.570	-5.638	3.370
EAPACK	-2.831	-5.084	1.339	-5.216	2.540	-1.946	-1.486	0.528	4.097	-2.041	-0.900	98.635	3.150	-5.537	0.467	0.394	-15.216
EACABLE	1.957	-6.010	0.823	5.223	-0.318	5.439	-5.792	2.998	-5.453	12.887	6.103	3.150	121.299	-0.347	-9.393	16.580	-5.865
EABL	-1.683	0.561	-1.057	-0.343	-0.044	1.825	1.446	-0.957	-7.499	0.662	-3.409	-5.537	-0.347	6.462	0.178	1.415	0.566
DUN	-0.222	-3.450	1.155	-1.798	0.803	-0.437	-0.817	0.565	0.036	-4.144	-1.570	0.467	-9.393	0.178	9.469	-1.180	-3.290
UNGA	3.877	4.649	0.305	23.140	-4.542	4.272	-1.379	-2.133	28.616	0.973	-5.638	0.394	16.580	1.415	-1.180	61.484	-3.217
KPLC	-0.379	3.011	-9.836	3.986	0.510	0.796	0.066	-1.124	-0.950	-1.171	3.370	-15.216	-5.865	0.566	-3.290	-3.217	39.126

Covariance Matrix Industrial 2001

	BOC	CARB	Cberg	ATH	BAMB	BAT	Total	PORTL	KNM	KENCL	FIRE	EAPACK	EACABLE	EABL	DUN	UNGA	KPLC
BOC	13.267	-1.752	-4.074	2.932	-3.638	0.036	3.226	-0.135	-3.242	-4.337	1.975	0.506	0.290	0.240	-3.061	-4.200	1.703
CARB	-1.752	20.537	-0.126	1.613	1.182	0.008	-0.277	-0.257	-0.700	-1.961	-2.034	0.857	-0.892	0.733	-2.860	3.786	4.303
Cberg	-4.074	-0.126	22.640	-4.432	4.180	-1.763	1.063	23.511	3.496	-2.921	2.231	-1.308	0.557	-0.420	-2.951	16.213	-7.366
ATH	2.932	1.613	-4.432	26.559	-6.321	3.798	2.663	-6.953	-2.469	-3.614	3.549	-2.057	0.321	1.192	4.680	-4.303	0.495
BAMB	-3.638	1.182	4.180	-6.321	14.752	-0.270	-1.366	0.903	-2.626	5.407	-3.763	0.701	0.918	-0.558	-1.373	2.800	-1.882
BAT	0.036	0.008	-1.763	3.798	-0.270	9.255	0.702	-0.155	1.962	-3.942	0.487	-0.276	2.115	0.827	5.322	-0.037	1.147
Total	3.226	-0.277	1.063	2.663	-1.366	0.702	21.122	18.583	9.494	-7.723	6.837	-0.060	-2.001	-0.360	5.264	23.209	-7.409
PORTL	-0.135	-0.257	23.511	-6.953	0.903	-0.155	18.583	99.367	12.968	-2.699	24.078	0.463	-0.523	-1.782	1.335	55.222	-17.425
KNM	-3.242	-0.700	3.496	-2.469	-2.626	1.962	9.494	12.968	96.730	-1.052	8.583	1.108	-2.568	-2.256	-3.353	35.015	-15.593
KENCL	-4.337	-1.961	-2.921	-3.614	5.407	-3.942	-7.723	-2.699	-1.052	68.444	8.954	-3.184	2.335	-1.940	-15.433	-5.309	2.890
FIRE	1.975	-2.034	2.231	3.549	-3.763	0.487	6.837	24.078	8.583	8.954	23.219	-3.680	-1.368	-1.527	-1.516	15.205	-6.034
EAPACK	0.506	0.857	-1.308	-2.057	0.701	-0.276	-0.060	0.463	1.108	-3.184	-3.680	6.828	1.933	-0.995	0.220	-1.630	1.694
EACABLE	0.290	-0.892	0.557	0.321	0.918	2.115	-2.001	-0.523	-2.568	2.335	-1.368	1.933	16.982	0.594	-1.658	-2.702	3.468
EABL	0.240	0.733	-0.420	1.192	-0.558	0.827	-0.360	-1.782	-2.256	-1.940	-1.527	-0.995	0.594	3.211	-0.222	1.291	1.318
DUN	-3.061	-2.860	-2.951	4.680	-1.373	5.322	5.264	1.335	-3.353	-15.433	-1.516	0.220	-1.658	-0.222	20.757	5.872	-7.986
UNGA	-4.200	3.786	16.213	-4.303	2.800	-0.037	23.209	55.222	35.015	-5.309	15.205	-1.630	-2.702	1.291	5.872	87.285	-27.708
KPLC	1.703	4.303	-7.366	0.495	-1.882	1.147	-7.409	-17.425	-15.593	2.890	-6.034	1.694	3.468	1.318	-7.986	-27.708	61.580

TITLE:HOUSEHOLD GENDER ROLES AND T ADOPTION OF AGROFORESTRY AMONG SM SCALE FARMERS IN KWANZA DIVISION, TR NZOIA DISTRICT, KENYA.

BY: MUSA KIMOMO OKANGO

REGISTRATION NUMBER: C/50/P/8245/200

A RESEARCH POJECT SUBMITTED TO TH DEPARTMENT OF SOCIOLOGY, UNIVERSITY NAIROBI IN PARTIAL FULFILLMENT FOR T CONFERMENT OF THE DEGREE OF MASTER ARTS IN SOCIOLOGY (RURAL SOCIOLOGY A COMMUNITY DEVELOPMENT).

MARCH 2005

DECLARATION.

This project is my original work and has not been presented to any other University for the conferment of a degree.

MUSA KIMOMO GICHUKI MAF

This project has been submitted with our approval as university supervisors.

PROFESSOR P.O CHITERE 18/02/05
DEPARTMENT OF SOCIOLOGY
UNIVERSITY OF NAIROBI

PROFESSOR E.N H NJERU 22/02/05
DEPARTMENT OF SOCIOLOGY
UNIVERSITY OF NAIROBI

DEDICATION.

TO.

L.A.O

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MUSA KIMOMO OKANGO.

ABSTRACT.

Kenya is faced by the problem of degradation of forests, which in turn negatively affects agricultural productivity. Agroforestry is one of the strategies that the government and other stakeholders have used to try and curb forest destruction in the country. Agroforestry is encouraged especially among small-scale farmers because they make the greater percentage of farmers and also because they play a leading role in agricultural production in the country. However in small-scale households, roles are organized according to sex, which tends to impede the practice of agroforestry. This study critically analyzes in what ways the organization of roles in the household according to sex affect the practice of agroforestry by focusing on the small scale households of Kwanza Division in Trans-Nzoia District this study also gives some recommendations on how farmers can be motivated to adopt the practice of agroforestry.

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CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

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1. INTRODUCTION.

1.1 BACKGROUND.

The agricultural sector plays an important role in Kenya's socio-economic development. Despite its important role the contribution of the agricultural sector to the gross domestic product (GDP) has progressively declined from 37% of the GDP in the early 1970's to about 25% at the end of the year 2000. (Republic of Kenya, 2002).

Kenya has been facing major challenges in sustaining high agricultural productivity as a result of wanton destruction of forests; currently forest cover is less than 2% of the Kenya's total land surface, which is against the recommended 10% of the forest covering the total land mass. (East African Standard, 2002). Deforestation has contributed to the problem of degradation of watersheds, unreliable rainfall, landslides, soil erosion, floods etc, all of which tend to undermine agricultural productivity. For instance soil degradation through deforestation has resulted in declining soil fertility and although soil can be improved through mineral fertilizers most small-scale farmers cannot afford sufficient quantities of fertilizers to replenish soil nutrients. This has negatively affected agricultural productivity in the country. In Kenya there is a high demand of woodfuel, according to the Ministry of Energy approximately 80% of Kenya's population is dependent on woodfuel for its domestic energy needs, it provides for 93% of rural household energy requirements and 80% of the household energy needs in the urban areas mainly in the form of charcoal. (Republic of Kenya, 2002). This high demand for woodfuel threatens the government's efforts in forest conservation.

The government and other stakeholders have responded to these challenges by encouraging agroforestry, agroforestry is the practice of growing trees on the same land

that one grows food and or cash crops. Agroforestry offers a wide range of benefits to farmers. According to Beets (1989) agroforestry helps maintain or improve soil fertility, trees recommended for agroforestry are able to add nutrients to the soil and hold the soil together thus preventing soil erosion. By improving soil fertility agroforestry helps in increasing substantially crop yields thereby helping in solving the problem of food insecurity, also by improving the productivity of land that has already been cleared agroforestry reduces the need to convert additional forestland into farmland thus helping to conserve forests, agroforestry trees produce several valuable commodities e.g green manure, firewood, timber, mulch, fruits, fodder etc. Through the production and the sale of these products, low-income households can meet their subsistence needs. Some of these trees are of medicinal value and some can be used as high quality substitute for commercial livestock feeds, using these feeds according to East African Standard (May, 2002) saves the Kenyan smallholder dairy farmer about 6240 to 9360 shillings per year, in addition these fodder trees have an added benefit because they are able to increase butterfat content of milk thereby increasing its marketability and nutritive value. Agroforestry therefore improves social and economic development, sustains agriculture, improves bio-diversity on farms and enhances the environment.

On the other hand some cultural and social norms exist in many communities in Kenya that have created division of labour along gender lines so that planned objectives to be achieved through agroforestry systems are likely to be thrown into jeopardy if gender issues and concerns are not addressed (Nwonwu, 1996).

1.2 PROBLEM STATEMENT.

The benefits of agroforestry are well documented and if widely adopted agroforesty promises a bright future for Kenyan farmers. In order to realize these benefits research in agroforestry should not only focus on the bio-physical aspects of agroforestry but also on the socio-cultural and economic conditions of farmers, because it is the farmers who understand better their situation, priorities and needs who based on their priorities, situation and needs will make a choice of whether to adopt or reject the practice of agroforestry. To realize the benefits of agroforestry there is need to encourage farmers to move away from planting a few trees on the household compound to planting trees on farms alongside crops and livestock, and this cannot be done effectively when agroforestry promoters do not know or understand the farmers' socio-economic conditions. This calls for an examination and deeper understanding of the farmers' social conditions so that obstacles to adoption of agroforestry emanating from the farmers socio-economic conditions can be unearthed and addressed by agroforestry promoters. This study seeks to contribute to deeper understanding of farmers' socio-economic conditions. Specifically this study seeks to understand the social organization of labour in the household in terms of household gender roles and its implication for agroforestry adoption among small-scale farmers in Kwanza Division of Trans-Nzoia District.

This study will attempt to establish:

i. How does the number of roles performed by each sex affect the household's adoption of agroforestry?

ii. How does the management of time by sex in the performance of household roles affect the adoption of agroforestry?

(iii) How does the degree of differentiation of roles between men and women in the household affect the adoption of agroforestry?

1.3 OBJECTIVES.

The broad objective of the study is to investigate the social organization of labour in the household in terms of household gender roles and its implication for agroforestry adoption among small-scale farmers.

The specific aims of the study are.

i. To investigate how the number of roles performed in the household by sex affect the adoption of agroforestry.

ii. To examine how the management of time by sex in the performance of household roles affect the adoption of agroforestry.

iii. To find out how the degree of differentiation of roles between men and women in the household affect the adoption of agroforestry.

1.4 JUSTIFICATION

Among the data to be generated from this study will be the percentage of households studied that have adopted the practice of agroforestry in Kwanza Division. The government or organizations that promote this practice in this region can use this information to evaluate the extent to which they have been successful or not in promoting agroforestry activities in Kwanza Division of Trans-Nzoia District.

Secondly this study will reveal how the organization of roles at the household level affects the adoption of agroforestry. This information will help those involved in agroforestry promotion to design measures to counter the negative influences of the organization of household roles on agroforestry activities and or to promote the positive

influence on agroforestry activities emanating from the organization of roles at the household level, by helping organizations design and take measures to enhance agroforestry adoption. This study will have contributed to the realization of the benefits of agroforestry to farmer's i.e.higher agricultural productivity, food security, and higher incomes to farmers, forest conservation and sustainable development. Findings from this study will help in reducing poverty levels in Trans-Nzoia District and Kenya at large.

Thirdly there are about three million smallholders farmers in Kenya of whom 80% have less than two hectares of land. Despite their small farm size smallholders account for over 75% of the total production and over 50% of the market production (Chemengich, 1996). In order to improve and sustain the smallholders' vital contribution to agricultural production. There is need to focus on the constraints smallholders face in agricultural production, so that the government and other stakeholders can formulate appropriate and informed policies aimed at improving the smallholder agricultural production, by focusing on the smallholder this study will contribute to a deeper understanding of the challenges faced by small holder farmers' in agricultural production, that emanate from his\her social conditions.

Fourthly, although this study will focus on agroforestry adoption it will also give an insight into the adoption of other farming technologies e.g new varieties of maize, beans, bananas or new types of farm machinery. This will help change agents to anticipate the challenges they might face in introducing new technologies to farmers and prepare themselves appropriately for these challenges.

Finally this study is topical, the issues that this study seeks to address, gender issues and agroforestry are very critical for the success of many development projects and ensuring

sustainable development in Kenya and most developing countries. According to Emerton (1996) many development projects are bound to fail if they fail to recognize and address gender issues and implications. As for agroforestry it is according to Harrison (1988) "arguably the single most important discipline for the future of sustainable development in Africa. It should be given priority and resources that it deserves both nationally and internationally." Agroforestry can convert all of the Africa's smallholders into potential foresters and it is by far the speediest way to reforesting Kenya and Africa at large.

CHAPTER TWO

2. LITERATURE REVIEW.

This section will focus in detail on the adoption process of farm practices before focusing on gender roles, household work burden, gender role differentiation and time management.

2.1 ADOPTION PROCESS OF FARM PRACTICES

Adoption is the process through which individuals arrive at the decision to accept an innovation from the time he or she first became aware of it. For many practices people appear to go through a series of distinguishable stages. Lionberger (1960) and Rogers and Shoemaker (1971) identified five stages, which people follow in the adoption process.

Awareness: At this stage a person first learns about a new idea, product or practice, he or she has general information about it. He or she knows little or nothing about its qualities its potential usefulness or how it would likely work.

Interest: At this stage the individual develops an interest in the new idea or farm practice that he or she has learned about, he\she wants more detailed information about it and actively seeks the information desired.

Evaluation: At the stage of evaluation, a person weighs the information and the evidence accumulated in the previous stages in order to decide if the new practice is basically good. However evaluation is involved at all stages of the adoption process but it is at this stage that it is most evident.

Trial stage: At this stage the individual is confronted with the problem of putting the innovation into practice. It is the tentative trying out of the farm practice and acquisition of information of how to do it.

Adoption stage: At this stage the person decides that the farm practice is good for full-scale and continued use.

However Lionberger (1960) points out that these do not necessarily represent distinctly separate stages in the individual adoption process nor is it implied that they are universally followed by all people in all decisions they make or that these are the most useful and appropriate stages. These stages do represent a useful way of describing a relatively continuous sequence of actions, events and influences that intervene between knowledge about a farm practice and the actual adoption of it. Furthermore not all decisions involve a clear cut five stage sequences many are simply made on the basis of habit or traditions and even after the final adoption any issue may be re-opened for consideration and not all practices will result into adoption, farmers can reject a farm practice innovation.

Many factors influence the rate of adoption and diffusion of a farm practice including agroforestry. Most of these factors are non-technical and revolve around socio-cultural, economic and personal factors. (Noordin, 1996).

(i) Social Factors

People do not live apart from others and independent of their influence and we are all members of many social groups or systems. By belonging to various social groups we most of the time strive to conform to the expectations of the group. These social groups tend to establish norms that govern the group. Group pressure or social influence keep people in line with local expectations regarding many aspects of life including the adoption of farm practices. Conformity to the group may hinder initiation of new ideas and farm practices because individuals wait to see whether anybody else in the

community supports the new farm practice, conformity to the group could also facilitate the adoption of a new farm practice in an area where the farm practice is already popular.

(ii) Cultural Factors

Culture is the accumulated experience of generations, expanded, adjusted and transmitted from one generation to the next. (Van Doorne, 2000). Culture is a way of life and people who share culture together form a society. The ideas and beliefs of human beings (non-material culture) and the things that he/she has to work with (material culture) set limits to what he/she can do at a given time and place and very often on how it may be done. (Lionberger, 1960). Culture provides ready-made answers to many agricultural problems facing farmers. Culture determines which tools to use or what to grow in what season and which technology to be used.

(iii) Economic Factors

Availability of resources is an important factor in the adoption of farm practices. These resources include among others income, the size of the farm and tenure status.

a) Income

High farm income is nearly always associated with high farm practice adoption levels higher income means that capital is available for the adoption of new farm practices.

b) Size of the farm

Size of the farm is nearly always positively related to the adoption of new farm practices. Many technological advances require large-scale operations and substantial economic investment for their use. Also the use of improved farm practices produces economic benefits that permit expansion of farming operations that in turn makes it economically possible to use more and advanced improved farm practices.

c) Tenure Status

Farm owners have a complete control over farming operations than tenants, owners can make decisions to adopt new farm practices but tenants must obtain permission from landowners before trial or use of a farm practice. Consequently adoption rates are usually higher for owners than for those who rent land. (Lionberger, 1960).

(iv) Personal factors

The fact that some people adopt new ideas and practices more quickly than others relates in part to the individual. Individual and personal factors include; age, level of education, psychological characteristics such as attitude, rationality, mental flexibility, e.t.c. All these will determine the rate of adoption of farm practices or whether adoption will occur or not.

Finally, some unpredictable\sudden happenings do occur that can enhance or retard the adoption of farm practices, for instance environmental phenomena such as earthquake floods or drought may provoke out-migration of individuals and thus retard the adoption of a farm practice. Similarly an outbreak of pests may force farmers to adopt measures that will ensure and enhance the control of pests.

Another important ingredient in the adoption process is the nature of the farm practice itself. The characteristics of a farm practice as perceived by individuals in the society affected its rate of adoption. Rogers and Shoemaker (1971) enumerated five attributes of a farm practice that could affect the rate and scale of its adoption.

Relative advantage: This is the degree to which a new farm practice is perceived to be better or superior than the old practice it seeks to replace in terms of economic profitability, low initial cost, lower perceived risk, decreasing discomfort or saving time

and effort and immediacy of the reward Farm practices that are more advantageous than the previous ones will be adopted faster.

Compatibility: Compatibility is the degree to which a farm practice is perceived consistent with the existing values, past experiences and needs of the community. A farm practice may be compatible with the socio-cultural values and beliefs, the previously introduced ideas and the clients' needs.

Complexity: This is the degree to which a farm practice is perceived to be difficult to understand and use, some farm practices are clear in their meaning and use to potential adopters than others. Complexibility of a farm innovation is more highly related in a negative direction to the rate of adoption.

Triability: This is the degree to which a farm innovation may be experimented on a limited scale to determine its efficacy before adopting it on a large scale. Innovation that can be tried on a limited scale are more likely to be adopted faster due to their lower risks to adopter.

Observability: This is the degree to which the results of a farm innovation is visible to others, for example the killing power of new pesticide can be easily, understandably and convincingly demonstrated and therefore one can easily convince people to adopt it.

Apart from the nature of the farm practice, **the communication process** plays an important role in the diffusion process of farm practices. Communication is the process through which ideas, innovations or messages are transmitted from the source to the ultimate users in order to modify the behaviour of the receivers in a desired direction .The process is continuous and has distinct elements such as communicator (researcher, scientist, extension worker, key communicator e.t.c) message (new discoveries,

innovation, new ideas etc) channel (media, interpersonal) and recipient (farmers, students, members of society) directed towards eliciting a specific intended response from the recipient.(Singh,1981). Thus any element in the line of communication or diffusion of the farm innovation from the source of origin to the final destination of the message is in a position to exercise some control over what is transmitted how and in what form.

Effective communication is instrumental in determining farmers' needs, constraints and priorities, educating them on the values of agroforestry, recommending suitable trees for different agro-ecological zones, encouraging adoption of appropriate technical packages and evaluating farmers' reaction and attitudes towards the practice and the agroforestry promoter (Roling 1996).

In conclusion many of the factors considered are not independently related to the adoption of farm practices. One factor is interrelated with many others to determine whether an individual will adopt a farm practice or not.

2.2 GENDER

Gender is a socio-cultural construct that refers to roles, responsibility, attitudes and beliefs about and towards men and women. These roles, responsibilities, attitudes and beliefs are defined, supported and reinforced by societal structures and institutions they are learned and change overtime and vary within and between cultures (Joldersma, 1996). Gender focuses on women, men, girls and the elderly men and women. Gender roles are patterns of attitude and behaviour that a society expects of its members because of their sex. Tasks and roles assigned to men and women in most cultures are assumed to be highly correlated with anatomy and people have long viewed gender roles as natural,

innate, God-given and universal. However, Margaret Mead's (1935) research on gender roles in three societies of New Guinea in comparison with gender roles in USA has disproved this. In the USA she found that males were aggressive and independent, whereas females were gentle and passive. But among the Tchambuli people in New Guinea the females were dominant and aggressive and the girls were encouraged to take interest in economic activities whereas boys were not, males were sentimental, emotional, passive, took care of children, and did housework. Among the Arapesh both men and women behaved in similar ways, both displayed similar attitudes and behaviour, they were found to be cooperative, unaggressive, sensitive to each others' needs, they were gentle and males were as enthusiastic as the females in taking care of the family and bringing up children. Among the Mundugumor male and female alike were selfish, aggressive, insensitive and violent. They continually quarrel and Mundugumor mothers have little to do with their children. Mead's research indicates that gender roles vary from society to society and that culture and socialization are the major influences on gender roles.

2.2.1 THE DIVISION OF HOUSEHOLD GENDER ROLES

Roles and responsibilities are designated according to gender in most of the cultures (Kabutha and Hambly, 1996). Each gender role has its own associated behaviour, expectations and status.

Moser (1993) divides gender roles into three categories. Reproductive roles, productive roles and community managing /community politics roles.

According to Moser (1993), "Reproductive roles comprise the child bearing /rearing responsibilities and domestic tasks undertaken by women required to guarantee the

maintenance and reproduction of labour force. They include not only biological reproduction but also the care and maintenance of the work force (husband and working children and future work force (infants and school going children)." The second category of gender roles is the productive role. " Productive roles comprise work done by both women and men for payment in cash or in kind." The third category of the gender roles is the community managing and community politics role. Community managing role comprise of "activities undertaken primarily by women at the community level as an extension of their reproductive role. This will ensure the provision and maintenance of scarce community resources such as water, health care, and education. It is voluntary unpaid work undertaken in free time." The community politics role comprises "activities undertaken by men at the community level organizing at the formal political level. It is usually paid work, either directly or indirectly through wages or increases in status and power." For Moser (1993) women have a triple role of productive, reproductive and community-managing role while men are only involved in the productive and community politics roles. And when women's reproductive roles are many their productive roles are jeopardized.

Although patterns of division of labour run through all societies there is a wide variability in gender roles a cross cultures. The roles associated with being female or male are by no means universal. However a general pattern of gender roles can be observed a cross human cultures.

Generally men undertake work that require a lot of physical energy such land preparation and jobs which are specific to distant locations such as livestock herding and generally jobs that are perceived to be prestigious by members of the society. Women generally

carry out repetitious extremely boring, time consuming tasks like weeding and fetching water and firewood and those tasks that are located close to the home such as care of the kitchen garden, milking, nurturing of children e.t.c, women's work is generally perceived to be less prestigious than men's work. Some activities in the household are shared, for example looking after livestock, men can look after large animals and women look after smaller ones. Children may assist in these activities but in many circumstances male children would assist in tasks that are associated with males while females would assist in tasks that are associated with females, some tasks or roles are gender neutral and some roles may shift to the opposite sex, for example the introduction of new technology may cause a particular job to be reassigned to the opposite sex and men most often tend to assume tasks that become mechanized (Oppong, 1997).

2.3 HOUSEHOLD WORK BURDEN

Women especially in rural areas in Kenya have a long and arduous working day. For instance the source of most of the domestic energy used in Kenya is wood fuel and it is the women who use woodfuel most of the time at home, e.g in cooking the responsibility of collecting or gathering fuelwood is placed on women .To collect fuelwood, women usually walk long distances looking for fire wood and carry heavy loads of it to home, where there is scarcity of woodfuel every dawn brings with it a long march in search of fuelwood. In addition women are involved in the cutting and drying of fuelwood sometimes illegally from protected forests. Men can assist in the cutting of fire wood and carrying of it using carts or bicycles. But most often men are involved in charcoal making which is in most for commercial purposes rather than for home use. Men also assist in the

collection of firewood in situations where there is extreme shortage of firewood that could threaten the survival of the family. Women are also involved in the collection of animal fodder especially among the sedentary communities in Kenya, in nomadic communities it is usually men who move out with animals to look for greener pastures and water. Women also assist to gather grass, branches, leaves and fruit to feed small domestic animals such as goats, rabbits, pigs and poultry.

The task of supplying and managing water falls squarely on women. It is the women who in most instances have the knowledge of the location reliability and the quality of the local water sources.

Collecting water is usually a tiring and arduous task that usually needs to be undertaken several times each day the nearest source of water may entail walking several kilometers and this walk usually become longer in the dry season (Rodda 1993). In addition to walking long distances the women have to carry this water to their homes and sometimes the paths to and or from the water sources may be steep thus increasing the burden of carrying the water. Men assist in ferrying water but usually men use bicycles, carts or donkeys to carry the water thus lessening the burden of carrying water for men. (Ibid)

In the agricultural sector women have made and continue to make a considerable contribution to agricultural production. In Africa rural women account for 60% of the agricultural labour force and up to 80% of the total food production (Jazairy et.al).

Men are increasingly relinquishing their managerial roles in farms to women either inadvertently through death or deliberately due to rural to urban migration in search of non-farm jobs or through nomadic livestock herding that calls for the occasional moving of bigger livestock away from homesteads in search of greener pastures in distant

locations, (Nwonwu, 1996).Women are increasingly assuming leadership roles and decision making status in the management of agricultural production.(Fortmann and Rocheleau,1985). One study revealed that 27% of smallholdings are solely headed by women who are also the legal heads of the households and another 47%of the smallholdings are managed by women whose husbands are away from home (Thomas et.al, 1995). Housekeeping is essentially a woman's role. Women are responsible for the domestic chores, childcare, providing homecare for the sick and the elderly. Women in rural areas in Africa do up to 95% of housework (Rodda, 1993). The house is viewed as a woman's place even when women have a waged job outside the home, the women's allocation of domestic work particularly childcare remains extraordinarily rigid and persistent and at the global level (Moser, 1993). Men do not have clearly defined housekeeping roles but this does not mean that they cannot or do not assist in housekeeping. Men can be widowed or can be separated from their lives and thus assume the females roles and responsibilities in the house. Women have a heavier work and physical burden in the households than men, while men in most instances use bicycles, carts, donkeys, oxen or camels or other machines to make their work easier. Women generally use their heads, backs to carry fuel wood forage water or children. This has serious health implications on the women as frequent carrying of heavy loads on their heads and backs produces frequent headaches, fractures, bruises, chest pains, backaches or miscarriages in cases where the woman is pregnant. Poor health in turn affects the energy available for agricultural activities (Rodda, 1993).

Agroforestry is a labour intensive technology, which requires a lot of attention and management for it to yield the intended benefits (Nwonwu, 1996). As a labour intensive

technology, with its adoption agroforestry brings with it a heavier workload to farmers especially women farmers.

2.4 HOUSEHOLD GENDER ROLE DIFFERENTIATION

The extent of gender division of work in the household can vary from almost nil to very strictly defined separation of men and women's domains. The degree type and terms of division vary substantially between regions, ethnic groups, religions and classes. People hold different attitudes; negative or positive, strong or weak towards what society expects them to be or to do as a result of their anatomy. Male members of the family are generally less devoted to household chores than the female members of the family. The men and male children perceive certain farm and household chores such as firewood collection, planting vegetables, cooking, childcare as degrading and should be left to the females. Some men are afraid of ridicule from other men if they were seen assisting or doing what is perceived to be feminine. Men who assist with housekeeping duties are perceived to be dominated by the wife and many men are afraid to be labeled as such. Women may also perceive house chores to be the domain for women and may resist letting men perform these chores.

Men would rather cut and saw timber, burn charcoal, fetch poles or tend livestock. Most men do favour or involve themselves in activities or tasks that involve capital expenditure and in tasks that will bring to them high monetary gains or where they are able to control important resources.

Beliefs and social taboos exist in some communities that tend to enhance peoples perceptions and attitudes (positively and negatively) towards certain roles and activities.

Chavangi, Engelhard and Jones (1988) noted that several taboos and beliefs exist among the Maragoli of Western Kenya that restrains women's active participation in tree planting activities.

. If a woman plants a tree she will become barren.

. If a woman plants a tree her husband will die.

. If a woman plants a tree it is viewed as a direct challenge to her husband and hence viewed as grounds for divorce.

. Certain tree species are believed to be sensitive to women and if women were to carry the seedlings from the nursery to the planting site it is said that the seedlings will wither and die.

These strongly held beliefs affect people's effective participation in agroforestry activities. In situations where there is male out-migration agro forestry activities are bound to suffer.

Negative attitudes towards performance of household chores by men held by both men and women means that women cannot be assisted in the housework unless they hire somebody to assist them where they cannot or are unable to hire labor this leaves many women with a lot of time and physical burden and this effectively limits women participation in agroforestry projects. Generally farming activities especially agro forestry practices will suffer if gender related inhibiting rules and regulations are strictly observed and adhered to.

2.5 HOUSEHOLD TIME MANAGEMENT

Among the key issues that need to be considered in any assessment of women's and men's access to resources is that of time (Greco, 1996). Time budget studies show that

women have a far longer hours of labor and therefore less leisure than men do in their households (Oppong, 1996).

According to rural labour survey in Kenya (1995) girls and women aged 8-85 perform economic activities to an average level of 26.5 hours a week compared to 24.5 hours for men per week. In addition women spend 6-7 hours daily on housework (Kabutha and Hambly 1996).

This pattern is not unique to Kenya as shown in Table1 below.

Table1: Average Daily Working Hours in Economic Activities by Sex.

		Agricultural	Non-Agricultural	Total
Burkina Faso	Men	7.0	1.7	8.7
	Women	8.3	6.0	14.3
Kenya	Men	4.3	3.8	8.1
	Women	6.2	6.1	12.3
Nigeria	Men	7.0	1.5	8.5
	Women	9.0	5.0	14.0
Zambia	Men	6.4	0.8	7.2
	Women	7.6	4.6	12.2

Source: Saito et al:In Kabutha and Hambly: 1996.

On average in African societies women put in 70% of all the time expended on food production, 100% of the time spent on food processing, 50% of that spend on food storage and animal husbandry, 60% of all marketing, 90% of time spent obtaining water and 80% of the time spent to obtain the fuel supply. (Sunday Nation, April 13, 2003).

It can be concluded that despite women's longer hours of work they receive much smaller incomes than do their husbands.

Women also use their time working on the men's fields without appropriate remuneration and this restricts the availability of women's labour on their own fields (Ardayfio-Schardorf 1996). Such time burdens reduce both the time availability to women in their own fields on agroforestry activities as well as their ability to search for information necessary to improve agroforestry activities or to look for better markets for their produce.

2.6 THEORETICAL FRAME WORK:

A theory is an explanation of the relationship between two or more facts.

In this study the following theories will be applied.

Social Behavioral Theory, Marxian Feminism and Adoption and Diffusion Theory.

2.6.1 Social Behavioral Theory.

According to the social behaviour theory, people learn gender role behaviour, just as they learn other forms of behaviour. This theory suggests that observation learning and reinforcement histories are sufficient to explain the acquisition of gender roles. (Baron and Graziano 1991).

(a) Reinforcement

According Baron and Graziano1991, reinforcement is the pattern of rewards and punishments one has encountered in the past in response to ones behaviour. Children are rewarded more by their parents and society for exhibiting behaviours appropriate to their

sex than exhibiting behaviours appropriate to the opposite sex. Children are also punished for engaging in behaviours stereotyped as more appropriate for members of the opposite sex, conformity to same sex roles is more insisted for male children than for female. Reinforcement provides children with information about which gender role behaviours will yield rewards and which will yield disapproval and rejection in the future, anticipated rewards and punishments in turn influences whether or not people engage in particular behaviours people are drawn towards behaviours and activities that will elicit positive consequences and are reluctant to engage in behaviours and activities that they believe will yield negative consequences.

(b) Observational Learning

Observational learning refers to the process of acquiring new patterns of behaviour by watching others perform them (also referred to as **modeling**). Observational learning occurs when children model the behaviours they observe. Children pay attention to the same-sex models and imitate the behaviours of same sex models especially if the child thinks that imitating this behaviour will have positive consequences (ibid).

Social behaviour theory views gender role acquisition as a social process. The process of socialization of individuals by significant institutions encountered in daily life. The most important of these institutions being the family, peer groups, schools, religion or mass media. Social behaviour theory also explains why gender roles differ from one society to another, because societies differ in the way they socialize its members this difference in the socialization process between societies also tend to produce differing gender roles

One criticism against behaviour theory is that it doesn't explain the origin of gender roles.

2.6.2 Marxian Feminism

This theory was propounded by Friedrich Engels in 1884; Marxian Feminism laid the basis of a materialist analysis of gender inequality by locating it in the family and within the economic structure of society. According to this theory, the changes in the mode of production, i.e the way society organizes to produce the things needed for life affected the whole mode of human existence including the relationship between men and women. Engels (1884) wrote: "The determining factor in history is in the last resort, the production and reproduction of immediate life. But this itself is of a two-fold character. On the one hand, the production of means of subsistence of food clothing and shelter and tools requisite thereof, on the other the propagation of species."

Production and reproduction are therefore not independent of one another, the first, production, is decisive in shaping the second, reproduction, and the more society develops the more is this the case. According to Marxian Feminism women enjoyed a status equal to that of men in the primitive communist societies which preceded the emergency of classes. Under the mother right descent was traced through the mother and not the father. This was because in the group marriage that existed then ones link to the mother was far more easily demonstrated than ones ties to the father. Primitive communist societies were also matriarchal, with significant power resting in the hands of women who had great decision-making power and access to resources. As society advanced the primitive communism was replaced by slave-owning, feudal and capitalistic societies, with these changes there was an increase in productivity and accumulation of

private property, with these changes the social relations between men and women also changed. Gradually women who had been previously supreme within the home found their position eroded. As property accumulation increased men wanted to be able to pass it on to their own male children, children whom they had undisputed paternity and also to have a compliant labor force slaves captives women or children. Mother right stood on their way and so it was overthrown in its place was set the monogamous family which became the first form of family not founded on the natural but on the economic condition of society that is the victory of private property over primitive and natural collectivism, with monogamy one woman is bound to one man for life and subject to his will. The "overthrow of the mother right was the world historic defeat of the female sex." Since then there has been the exploitation of labour of women as housewives or mothers they are exploited through domestic labour to support the men. Domestic labour is unpaid for and its real cost cannot be quantified. There is need to destroy the class structure, property rights and exploitation of labour in order for women to attain social political economic and personal freedom to choose which roles to play or not to play.

In conclusion, although this theory has been challenged on the question of lack of evidence,

it, however, provides a very important analysis of gender roles and inequalities. The theory traces the origin of gender roles and inequalities to the changes that occur as societies advance from a primitive communist society to a capitalistic society, from a simple to a complex society; particularly the emergence of the monogamous marriage and the accumulation of private property.

2.6.3 Adoption and Diffusion Theory.

Diffusion is the process by which innovations spread to members of a social system (Rogers 1971). According to this theory ideas or technology is spread from the source of origin to the receiver via a medium. Diffusion of innovations has stimulated the growth of human culture as a whole and also has enriched the content of individual cultures (both material and non material culture) by allowing members of one society to come into contact and borrow or adopt ideas and technologies that are superior than the ones that already exist in the society. Rogers (1971) points out some principles of diffusion of innovations these include: An innovation will be taken up first by those societies that are closer to the point of origin than those at far of places. Secondly, an innovation may be diffused alone or with other elements that are functionally related. Thirdly, the presentation of a new innovation to the people does not necessarily mean acceptance of those innovations. Fourthly, material culture elements (artifacts, tools, technologies e.t.c) are more easily accepted than non-material culture elements (language, beliefs e.t.c). Finally, innovations are accepted on the basis of perceived utility and compatibility to the existing culture.

Adoption is the decision to make full use of a new idea as the best course of action available. Adoption of an innovation by farmers is a process rather than a single unit. According to Rogers (1971), farmers can be categorized according to the period they had taken to adopt a given farm practice these categories include: Innovators; these are the first people to adopt a new farm practice. They constitute 3% of all the potential adopters; Early adopters, are the second group to adopt a farm practice and constitute 13% of all the potential adopters; Early majority, follow the early adopters in the adoption of a farm

practice and they constitute 34%of all the potential adopters; Late majority, adopt a new farm practice after the early majority and constitute34%of all the potential adopters, Laggards are the last group to adopt a farm practice they constitute 16% of all the potential adopters. The difference in the period of adoption can be attributed to the difference in the personal characteristics of the adopters. Many factors affect the rate of adoption of a farm practice after it has been introduced to the farmers. These factors include the nature of the farm practice the type of the innovation decision, the communication process, the nature of the social system, the extent of change agents promotion efforts; and the personal characteristics of the farmers (Rogers, 1971). The adoption and diffusion theory in this study will help to explain the diffusion or the spread and adoption of agroforestry technology by farmers.

In summary in this study the Marxian Feminism theory will help to explain the origin of gender roles, social behaviour theory explains how these roles are sustained from one generation to the next while the adoption and diffusion theory will help to explain both the adoption of agroforestry and new gender roles.

2.7 RESEARCH HYPOTHESES

A hypothesis is a tentative answer to a research problem expressed in the form of a clearly stated relation between the independent and the dependent variable. (Singleton et.al1988). In this study the following hypotheses will be put to test:

1. Ha, -- The more the household roles performed by women when compared to those performed by men in the household the less is the adoption of agroforestry.

2. Ha, -- The more the time utilized by women performing household roles when compared to that utilized by men the less is the adoption of agroforestry.

3. Ha, -- Rigid differentiation of household roles between men and women negatively affects agroforestry adoption.

2.8 OPERATIONALIZATION OF VARIABLES.

The aim of operationalizing variables in the hypothesis is to transform the variables from what cannot be observed and measured into what can be observed and measured. The researcher comes up with an observable and measurable concept that represents a basically unobservable phenomenon.

For the purpose of this study:

Household. This refers to a person or a group of people who are related in some way through blood marriage or adoption and who stay in the same homestead under one or several roofs in the compound and share food and other resources.

In the first hypothesis the independent variable is the **number of household roles.**

In this study it is defined as the number of roles performed by women when compared to the number performed by men in the household.

This will be indicated by:

The number of tasks allocated and performed by each sex in the household. :

Categories to respond to include.

More household roles, about the same number of household roles ,and less number of household roles

In the second hypothesis the independent variable is **time utilized performing household roles:** It is defined as the number of hours spent by women performing household roles when compared to that spent by men. .

This will be indicated by the number of hours spent on each activity performed by each sex each day.

Categories to respond to are:

More time, about the same amount of time, and less amount of time

In the third hypothesis the independent variable is, **rigid differentiation of household roles** it is defined as the degree to which the household members are resistant towards change of traditional household sex roles.

The variable will be indicated by.

Resistance towards change of traditional household sex roles.

Categories to respond to include.

Rigid, somewhat rigid and not rigid.

In all these three hypotheses the dependent variable will be; **adoption of agroforestry:**

Is defined the number of trees on the land that one grows food and or cash crops or rear livestock as a percentage of the recommended tree carrying capacity of that land.

Tree carrying of land is given by dividing the recommended spacing area of a tree over the total area of land.

Indicated by.

(a) The number of trees in rows or column planted on the land that one grows food, cash crops and or rear

livestock. Categories to respond to are:

(i) High adoption (where the farmer has planted above 60% of the recommended number of trees on a specified acreage of land)

(ii) Average adoption (where the farmer has planted between 31% to 59 % of the recommended number of trees on a specified acreage of land).

(iii) Low adoption (where the farmer has planted between 5% to 30% of the recommended number of trees on a specified acreage of land).

(iv) None adoption (where the farmer has planted below 5% of the recommended number of trees on a specified acreage of land).

CHAPTER THREE

3. METHODOLOGY

This study took place between 12th July 2004 and 27th August 2004 in Kwanza Division of Trans-Nzoia District. The main objective of the study was to find out how the social organization of work in the household in terms of gender roles affects the adoption of agroforestry. A total of one hundred (100) small-scale farm households were surveyed.

3.1 STUDY SITE.

Kwanza Division in Trans-Nzoia District shares borders with West Pokot District to the North, Cherangani Division to the North East, Saboti Division to the East and to the West it borders the Republic of Uganda. Inhabitants of Kwanza Division engage in agriculture as the main economic activity.

3.2 UNITS OF ANALYSIS

In this study the units of analysis were:

- Households Roles.
- Adoption of Agroforestry

3.3 UNITS OF OBSERVATION

The units of observation were:

1. Household Heads 2. Agroforestry Extension Staff 3.Household Farms

3.4 SAMPLING

3.4.1 Area Sampling

The sub-location in Kwanza Division where the study was conducted was selected using purposive sampling.

The reasons for using purposive sampling to select the sub-location were:

Frequent cattle rustling and general insecurity in some parts of the division especially those parts that share border with the neighboring West Pokot District. People who live in this area have refused to initiate meaningful development projects on their land for fear of frequent attacks by cattle rustlers from the neighbouring district. If the researcher was to use random selection chances are that these uninhabited areas would be selected as the area where the study will be conducted. Data relating to this study cannot be easily obtained because farmers have abandoned agricultural activities in this area.

Secondly there was need to select areas where the idea and practice of agroforestry has already been introduced and people are aware of the practice of agroforestry the researcher can easily obtain data and rate the peoples' response towards agroforestry i.e. whether farmers have rejected or adopted the practice of agroforestry.

Finally due to lack of access to necessary records, information and an effective sampling list which necessitated the need to develop a sampling frame and due to limited availability of resources in terms of time, money and manpower. The researcher will select the sub-location in the Division for study where he can easily access and where the available resources can easily cater for.

The researcher with the help of key informants from VI Agroforestry Project, a local NGO that promotes the practice of agroforestry identified one sub-location, Bidii, which meets the above-mentioned criteria. Within Bidii sub-location five villages; Bidii Juu, Bidii Chini, Misemwa, Kewaa and N'gambo were identified as appropriate for the study. One village, Misemwa, within Bidii sub-location was selected using simple random sampling technique.

3.4.2 Sampling of Respondent Households.

A list of households in the village was provided by the village head and from the assistant chief's office. The village had about three hundred and twenty households. In order to identify those households that were eligible for the study and to develop an effective sampling list, with the aid of the village head and a few knowledgeable people a sketch map of the village was drawn with approximate positions of some key features like main road, village paths, streams, shops and the village boundary that would be used as a guide around the village. With this sketch map together with the list of households residing in Misemwa village. Nearly every household in the village was visited in order to identify those households that were eligible for the study. In this preliminary study all those households with less than 5 acres of land, those whose main economic activity is subsistence agriculture, and those households who were familiar with the practice of agroforestry were identified and listed down on the sampling list. Households were also asked whether they were male or female headed. In total two hundred and ten (210) households were found to be eligible for the study. One hundred and seventy eight (178) households were found to be male headed while thirty two (32) were female headed. From the list of male-headed households 68 households were selected using simple random sampling technique. While all the 32 female headed households were all included for the study. A total of 100 households were sampled for the study.

3.5 METHODS OF DATA COLLECTION

The researcher using scheduled questionnaires that contained both open and closed ended questions personally interviewed a total of one hundred (100) households. The farms of those households interviewed were also observed and with the permission of the

household head, trees on the farms were physically counted and recorded. Records and documents from a local NGO and from the village head and assistant chief office provided information that enabled the preliminary study to identify eligible households for the study possible.

CHAPTER FOUR

4. DATA ANALYSIS AND INTERPRETATION

4.1 RESPONDENTS BACKGROUND

A total of one hundred (100) households were surveyed, 68% of those interviewed were men, while 32% of those interviewed were women, those who were interviewed were also the household heads. Of those interviewed 5% were between the ages of 18 to 30 years and the rest 95% were over the age of 30 years. In the survey 41% of those interviewed had primary level education 52% had secondary level education while 7% of those interviewed had attained middle level college education. Among the households studied the average number of household members is seven (7). In all households family members assist in the performance of household duties although in 12% of the households they sometimes hire labour to assist with household duties. All the households studied engage in agriculture as the main economic activity, although they also engage in other income generating activities and own less than five acres of land,

4.2 ROLE ALLOCATION

Households were also asked to list roles performed by men and women in the household. Household roles were divided into three main sectors; farm sector, livestock sector and housework. Since the number and type of work varies from household to household a fourth section named 'other'was provided to cater for those household roles that had not been mentioned under the three main sectors. Households then listed roles according to who performed them i.e. whether the roles were performed by men, women or by both men and women. Household roles listed under the farm sector were listed as equally

shared between men and women except ploughing using oxen, which was consistently listed on the side of men. Cultivation of trees was listed as both men and women affair. In the Livestock sector most tasks like herding, dipping, milking and selling of milk were listed on the side of men. While poultry keeping was listed on the side of women. In the house all work was listed on the side of women except house repair and gardening, which was consistently listed on the side of men. Most of the 'other' activities were listed as equally shared between men and women of the household. Based on the list of roles performed by men and women provided by the respondents 58% of the respondents confirmed that women perform more roles than men in their household, 27% of those interviewed indicated that the number of roles allocated and performed by men and women are about the same while 15% indicated that men performed more roles than women in their household. Table 2 below summarizes these responses.

TABLE 2.
DISTRIBUTION OF THE NUMBER OF HOUSEHOLD ROLES PERFORMED BY WOMEN WHEN COMPARED TO THE NUMBER OF ROLES PERFORMED BY MEN.

COMPARISON OF THE NUMBER OF ROLES	NUMBER OF HOUSEHOLDS	PERCENT
MORE ROLES	58	58
SAME AMOUNT OF ROLES	27	27
LESS NUMBER OF ROLES	15	15
TOTAL	100	100

The households studied were 68% male-headed and 32% female-headed.

In male headed households, in 44% of the households it was found that women perform more tasks than men, in 37% the number of roles performed by men and women were

about the same while in 19% of male-headed households, women were found to perform less number of household roles than men.

In female-headed households that were studied, in 88% of the households women perform more tasks than men, in 6% of the households the number of roles performed by men and women were about the same, while in the remaining 6% respondents indicated that women perform less number of roles than men in their households.

Table 3 below summarizes the above information.

TABLE 3
THE DISTRIBUTION OF THE NUMBER OF ROLES PERFORMED BY WOMEN WHEN COMPARED TO THE NUMBER OF ROLES PERFORMED BY MEN IN THE HOUSEHOLD.(according to the type of household)

COMPARISON OF THE NUMBER OF ROLES	TYPE OF HOUSEHOLD			
	MALE HEADED		FEMALE HOUSEHOLD	
	NUMBER OF MALE HEADED HOUSEHOLD	PERCENT	NUMBER OF FEMALE HEADED HOUSEHOLD	PERCENT
MORE	30	44.1	28	87.4
SAME	25	36.8	2	6.3
LESS	13	19.1	2	6.3
	68	100	32	100

4.3 TIME:
The respondent households were asked to develop a schedule of how men and women spent their time on a typical day and based on what they had developed, the time spent by men performing household duties was compared to the time spent by women performing household duties in each household. 55% of the household studied indicated that women spent more time than men in performing household duties, 28% indicated that the amount of time spent by men and women performing household duties were basically the same

while 15% indicated that men spent more time than women performing household duties. Table 4 below summarizes this information.

TABLE 4:
THE DISTRIBUTION OF THE AMOUNT OF TIME WOMEN SPENT PERFORMING HOUSEHOLD DUTIES WHEN COMPARED TO THE AMOUNT OF TIME MEN SPENT ON HOUSEHOLD DUTIES

AMOUNT OF TIME	NUMBER OF HOUSEHOLDS	PERCENT
MORE TIME	55	55
SAME AMOUNT OF TIME	28	28
LESS AMOUNT OF TIME	17	17
TOTAL	100	100

It was found that in male-headed households 41% of the women in those households spent more time than men performing household duties, 37% of the male-headed households studied indicated that women spent about the same amount of time as men performing household duties, while in 22% of the male-headed households women spent less amount of time than men performing household duties.

Among the female-headed households studied, women spent more time than men performing household duties in 84% of the households, in 10% of the households the amount of time spent by men and women are about the same, while in 6% of the female headed households men spend more time than women performing household duties. Table 5 below summarizes the above information.

TABLE 5

THE DISTRIBUTION OF THE AMOUNT OF TIME SPENT PERFORMING HOUSEHOLD ROLES BY WOMEN WHEN COMPARED TO THE AMOUNT OF TIME SPENT PERFORMING HOUSEHOLD ROLES BY MEN IN THE HOUSEHOLD (according to the type of household)

COMPARISON OF THE AMOUNT OF TIME	TYPE OF HOUSEHOLD			
	MALE HEADED		FEMALE HOUSEHOLD	
	NUMBER OF MALE HEADED HOUSEHOLD	PERCENT	NUMBER OF FEMALE HEADED HOUSEHOLD	PERCENT
MORE TIME	28	41.2	28	84.4
SAME	25	36.8	2	9.4
LESS TIME	15	22	2	6.2
	68	100	32	100

4.4 DEGREE OF ROLE DIFFERENTIATION

On the issue of the degree of role differentiation, households were asked whether there were certain roles in the household that members cannot perform because of their sex. All 100% confirmed that indeed there were roles that one cannot perform because of their sex. The respondents also provided a list of what roles men and women cannot perform because of their sex. Some of the roles that cannot be performed by men include babysitting, cooking, collecting firewood, and milling. Some of the roles that are not performed by women include herding, milking, house construction etc. Based on this differentiation of roles in the household, respondents were asked to rate the degree or extent to which the distinction of roles between men and women is adhered to in the process of performing household roles. 29% of those interviewed indicated that the distinction of roles between men and women in their households were rigidly adhered to i.e. there was strict separation of men's and women's, roles, 40% confirmed that the degree of differentiation of roles was somewhat rigidly adhered to in the process of

performing household duties, while 31% indicated that the separation of roles between men and women in the household was not rigidly adhered to in the process of performing household duties. Table 6 below summarizes the above information.

TABLE 6
THE DISTRIBUTION OF THE DEGREE OF DIFFERENTIATION BETWEEN ROLES PERFOMED BY MEN AND THOSE PERFOMED BY WOMEN IN THE HOUSEHOLD.

DEGREE OF ROLE DIFFERENTIATION	NUMBER OF HOUSEHOLDS	PERCENT
RIGIDLY ADHERED TO	29	29
SOMEWHAT RIGIDLY ADHERED TO	40	40
NOT RIGIDLY ADHERED TO	31	31
TOTAL	100	100

Rigid adherence to role differentiation between men and women is found in 37% and 13% of the male headed and female headed households respectively, in 44% of the male-headed and 31% of the female headed households the differentiation of roles between men and women is somewhat rigidly adhered to in the performance of household duties, while in19% of male headed and 56%of female headed households when members perform household duties they do not rigidly adhere to the differentiation of roles between men and women.

Table 7 below summarizes the above information.

Table 7
THE DISTRIBUTION OF THE DEGREE OF DIFFERENTIATION BETWEEN ROLES PERFOMED BY MEN AND THOSE PERFOMED BY WOMEN IN THE HOUSEHOLD (according to the type of household.)

DEGREE OF ROLE DIFFERENTIATION	TYPE OF HOUSEHOLD			
	MALE HEADED		FEMALE HOUSEHOLD	
	NUMBER OF MALE HEADED HOUSEHOLD	PERCENT	NUMBER OF FEMALE HEADED HOUSEHOLD	PERCENT
RIGIDLY ADHERED TO	25	36.8	4	12.5
SOMEWHAT RIGIDLY ADHERED TO	30	44.1	10	31.3
NOT RIGIDLY ADHERED TO	13	19.1	18	56.2
	68	100	32	100

4.5 ADOPTION OF AGROFORESTRY.

In all the households studied no household had planted trees that one could characterize as high adoption i.e. no household had planted more than 60% of the recommended number of trees on its land. Only 14% had planted trees one could categorize as average adoption (they have planted between 31% to 59% of the recommended number of trees on its land). 26% of the households could be categorized as low level adopters of agroforestry (i.e. they have planted between 5% to 30%of the recommended number of trees on its land). The majority of households studied (60%) were categorized as having not adopted the practice of agroforestry i.e. they have planted less than 5% of the trees recommended number of trees on their land. Most households had just a few stems of trees on their farms.

In all households studied, duties and tasks relating to trees were performed by both men and women and that there were no restrictions. Table 8 below summarizes the above information.

TABLE 8
THE DISTRIBUTION OF THE LEVEL OF AGROFORESTRY ADOPTED BY THE HOUSEHOLDS.

LEVEL OF AGROFORESTRY ADOPTION	NUMBER OF HOUSEHOLDS	PERCENT
HIGH	0	0
AVERAGE	14	14
LOW	26	26
NONE	60	60
	100	100

No male headed household had adopted the practice of agroforestry that one can characterize as high, 30% of male-headed households had adopted agroforestry at an average level, their was low level of adoption of agroforestry in 29%of male headed households while 55 % of male-headed households had not adopted the practice of agroforestry.

Among the female headed households studied their was no high level of adoption of agroforestry, 9% can be characterized as average adopters of agroforestry, 19% are characterized as low adopters and the majority 72 % had not incorporated agroforestry in their farming system.

Table 9 below summarizes the above information.

TABLE 9
THE DISTRIBUTION OF THE LEVEL OF AGROFORESTRY ADOPTED BY THE HOUSEHOLDS (according to the type of household).

LEVEL OF AGROFORESTRY ADOPTION	TYPE OF HOUSEHOLD HEAD			
	MALE HEADED		FEMALE HEADED	
	NUMBER OF HOUSEHOLDS	PERCENT	NUMBER OF HOUSEHOLDS	PERCENT
HIGH	0	0	0	0
AVERAGE	11	16.2	3	9.4
LOW	20	29.4	6	18.7
NONE	37	54.4	23	71.9
	68	100	32	100

4.6 HYPOTHESIS TESTING.

In determining whether the relationships between the variables under the study are significant or not chi-square test was performed. The coefficient of correlation was calculated using the gamma method in order to determine the strength and direction of the association.

4.6.1 THE RELATIONSHIP BETWEEN THE NUMBER OF HOUSEHOLD ROLES PERFORMED BY WOMEN WHEN COMPARED TO THOSE PERFORMED BY MEN AND THE ADOPTION OF AGROFORESTRY.

TABLE:10

THE DISTRIBUTION OF THE RELATIONSHIP BETWEEN THE NUMBER OF HOUSEHOLD ROLES PERFORMED BY WOMEN WHEN COMPARED TO THOSE PERFORMED BY MEN AND THE ADOPTION OF AGROFORESTRY.

DEGREE OF AGROFORESTRY ADOPTION	MORE	SAME	LESS	TOTAL
HIGH	0	0	0	0
AVERRAGE	4	7	3	14
LOW	11	8	7	26
NONE	43	12	5	60
TOTAL	58	27	15	100

degrees of freedom = 6, level of confidence = 95%, chi-square = 13.11

From Table 10, the calculated chi-square is 13.11 and the tabulated chi-square at 6 degrees of freedom and 95% level of confidence is12.59. Since the calculated chi-square is greater than the tabulated chi-square. The null hypothesis is rejected and the alternative hypothesis is accepted therefore it's concluded that there is a significant relationship between the number of roles performed by women when compared to those performed by men and the adoption of agroforestry.

The strength and direction of the correlation was calculated using gamma because the variables are measured at the ordinal level the coefficient of correlation was found to be 0.503 this means that there is a strong positive association between the amount of time

spent by women performing household duties when compared to that spent by men and the adoption of agroforestry.

4.6.2 THE RELATIONSHIP BETWEEN THE AMOUNT OF TIME SPENT BY WOMEN PERFORMING HOUSEHOLD ROLES WHEN COMPARED TO THAT SPENT BY MEN AND THE ADOPTION OF AGROFORESTRY.

TABLE:11
THE DISTRIBUTION OF THE RELATIONSHIP BETWEEN THE AMOUNT OF TIME SPENT BY WOMEN PERFORMING HOUSEHOLD ROLES WHEN COMPARED TO THAT SPENT BY MEN AND THE ADOPTION OF AGROFORESTRY

DEGREE OF AGROFORESTRY ADOPTION	MORE TIME	SAME TIME	LESS TIME	TOTAL
HIGH	0	0	0	0
AVERRAGE	4	6	4	14
LOW	17	10	9	26
NONE	44	12	4	60
TOTAL	55	28	17	100

level of confidence= 95%, degrees of freedom= 6, chi-square=22.22

From Table11 above, the calculated chi-square is 22.22 while the tabulated chi-square at 6 degrees of freedom and 95% level of confidence is12.92. Since the calculated chi-square is greater than the tabulated chi-square, the null hypothesis rejected and alternative hypothesis is accepted. This means that there is a significant relationship between the amount of time women spent performing household duties when compared to the amount of time men spent performing household duties and the adoption of agroforestry.

The strength and direction of the correlation was calculated using gamma because the variables are measured at the ordinal level the coefficient of correlation was found to be 0.6 this means that there is a strong positive association between the amount of time spent by women performing household duties when compared to that spent by men and the adoption of agroforestry.

4.6.3. THE RELATIONSHIP BETWEEN THE DEGREE OF DIFFERENTIATION OF ROLES BETWEEN MEN AND WOMEN IN THE HOUSEHOLD AND THE ADOPTION OF AGROFORESTRY.

TABLE:12

THE DISTRIBUTION OF THE RELATIONSHIP BETWEEN THE DEGREE OF DIFFERENTIATION OF ROLES BETWEEN MEN AND WOMEN IN THE HOUSEHOLD AND THE ADOPTION OF AGROFORESTRY.

DEGREE OF AGROFORESTRY ADOPTION	RIGID	SOMEWHAT RIGID	NOT RIGID	TOTAL
HIGH	0	0	0	0
AVERRAGE	2	7	5	14
LOW	8	12	6	26
NONE	19	21	20	60
TOTAL	29	40	31	100

degrees of freedom = 6, level of confidence = 95%, chi-square=2.93

From Table 12 above, the calculated chi-square is 2.93 while the tabulated chi-square at 6 degrees of freedom and 95% level of confidence is12.59 the null hypothesis is accepted and the alternative hypothesis is rejected. It's therefore concluded that there is no significant relationship between the degree of differentiation of household gender roles and the adoption of agroforestry.

The strength and direction of the correlation was calculated using gamma because the variables are measured at the ordinal level the coefficient of correlation was found to be 0.05 this means that there is a very weak positive association between the degree of differentiation of household roles between men and women and the adoption of agroforestry.

CHAPTER FIVE

5. SUMMARY AND CONCLUSION.

The number of roles performed by women and the amount time they spent performing these roles in the household when compared to the number of roles and the amount of time men use to perform these household roles affects the level and extent of agroforestry adoption. The more the number of roles and the amount of time women use to perform household duties the less is the time and energy devoted to agroforestry activities or tree planting activities. This kind of scenario has a negative implication for the environment as this means less and less number of trees will be planted to cater for household fuelwood and other needs. It also means continued degradation of forests because as farmers do not plant more trees they will continue to deplete the already existing trees. Therefore farmers will continue experiencing the negative effects associated with destruction of forests or lack of tree planting.e.g low agricultural productivity.

Although it has been also shown that the degree of role differentiation has no effect on the level of agroforestry adoption. Strictly separating roles between men and women in the households means that members of the household cannot easily and willingly perform roles associated with the other sex these restrictive and rigid attitudes increases time and physical burden of household roles on one or both sexes as members of the opposite sex cannot assist each other in performing household duties less time and energy will therefore be available for agroforestry activities.

From the findings it can be concluded that the relationship between men and women affect agroforestry activities. Where the relationship between men and women is negative i.e. where one sex is overburdened with household duties, less time and energy will be

available to be spent on other vital productive and reproductive activities that will make the household adapt better to the environment and produce goods and provide services necessary for survival. Generally negative relationships between men and women negatively affect the capacity of households to engage in productive and reproductive activities.

5.1 RECOMMENDATIONS

From the findings it is recommended that:

There is a need to encourage members of a household to negotiate for a more equitable sharing of workload at home so as to enable all the productive and reproductive activities to be performed and also lessen the burden of household duties on women and also relaxing the rules on strict differentiation of roles between men and women in the household this can be encouraged through the media both print and electronic. Agroforestry programs, if they are to be successful and sustainable should incorporate into them gender issues and concerns and take into gender issues facilitate or impede agroforestry activities and therefore devise measures like agroforestry systems and technologies that are not only less time consuming but also those technologies that would not add extra burden to farmers, especially women farmers there is need for provision of effective advisory services and good agroforestry extension education to farmers that will focus on the importance and short term and long term benefits of agroforestry to farmers and the how to plant and take care of trees and also the types of trees to be planted in which season. Agroforestry promoters should aim at motivating farmers to plant trees and to create a tree planting culture among the small-scale farmers.

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QUESTIONNAIRE

1.Name: _____
2.Sex: Man [i] Woman [ii]
3.Age: Under 18yrs [i] 18-30yrs[ii] Over 30yrs [iii]
4.Level of Education. None [i] Primary [ii] Secondary[iii] College [iv] Other Specify_____
5.Marital Status: Single[i] Married [ii] Divorced [iii] Widowed [iv]
6.Occupation_____
7.What is your relationship to the household head.
Head[i] Spouse[ii] Child[iii] Relative[iv] Other(specify)_____
8.How many members are there in this household; by sex.
Males [i]____ Females[ii]_____
9.How many acres of land does this household own?
[i] 0.1-2 [ii] 2.1-4 [iii] 4.1-5
10.What kind of economic activity or activities does this household derive there livelihood?_____
_____

11.Do the members of this household assist in performing various activities in this household.
Yes [i] No [ii]
12.Are there other sources of labour apart from the family members?
Yes [i] No [ii]

13.Could you please indicate whether males, females or both male and female perform the following roles in this household?
Put a tick where appropriate.

SECTOR	ACTIVITY	MALES	FEMALES	BOTH MEN&WOMEN
FARM	Ploughing Oxen Ploughing Hoe			
	Planting			
	Weeding			
	Chemical application			
	Harvesting			
	Processing/Winnowing			
	Storing			
	Selling Produce			
	Planting Trees			
LIVESTOCK	Herding			
	Fetching fodder			
	Dipping			
	Milking			
	Giving animals water			
	Selling Milk			
	Poultry Keeping			

HOUSEWORK	Cooking			
	Washing Cloths			
	Washing Utensils			
	Washing Children			
	House Cleaning			
	House Repair			
	Caring For the sick			
	Collecting Firewood			
	Splitting Firewood			
	Collecting Water			
	Milling			
	Gardening			
OTHERS				

14.Basing your answer on Question 13 above. Which of the following statements would you agree with?

Women perform more household roles than men in this household.

☐The amount of household roles performed by women is the same as those performed by men in this household.

☐The amount of household roles performed by women is less than that on men in this household.

15. Can you please indicate the kind of activity men and women in this household engage in at different times of a typical day starting from the time they wake up to the time they go to bed.

TIME OF THE DAY (IN HOURS)	MALES ACTIVITY	FEMALES ACTIVITY

16.Basing your answer on Question 15. Which of the following statement about this household would you agree with.

[ ] The amount of time women utilize performing household roles than that utilized by men performing household roles in this household.

[ ] The amount of time women utilize performing household roles is about the same amount of time men utilize performing household roles in this household.

[ ] The amount of time women utilize performing household roles is less than the amount of time men utilize performing household roles in this household.

17. Are there roles in the household that one cannot perform because of their sex?

Yes [i] No [ii]

18. If Yes in Question 17 above please can you list the roles that men and women cannot perform because of their sex.

MEN	WOMEN

19. In most households you will find that roles are divided between men and women. For instance in some communities women fetch water while men look for pasture for the cattle. When it comes to the performance of these roles in this household to what extent would you say that household members adhere to the differentiation of sex roles.
[i] Rigidly [ii] Somewhat Rigidly [iii] Not Rigidly

20.Would you say that trees are planted on the same land that crops are planted and or livestock reared in this household?
Yes[i] No[ii]
21. If YES above how would you rate the extent of to which this household plants trees on the land that you also grow and or rear of required livestock?
[i] High(Where over 60% of the recommended number of trees are planted on specified acreage of land)
[ii] Average (Where between 31% to 59% of the recommended number of trees are planted on specified acreage of land)
[ii] Low (Where below 30% of the recommended number of trees are planted on specified acreage of land)

22.In your own opinion what do you think should be done in order to increase or sustain the practice of growing trees on the same land that one grows crops and or rear livestock?

DIRECT OBSERVATION.

What to observe:

1. Count the number of trees on the farm.

2. Calculate the adoption level