APPLICATION OF THE ARBITRAGE PRICING MODEL IN PREDICTING STOCK RETURNS AT THE NAIROBI STOCK EXCHANGE

By

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DECLARATION

This Research Paper is my original work and has not been presented for a degree in any other University.

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Abstract

This study applies the multi-index (APT) to explore the relationship of NSE companies stock returns to selected market and industrial variables. In this study I have used a model i.e. the relative pricing (APT) model, to explain the expected returns at the NSE. Use of indices as well as unanticipated changes in economic variables as factors driving security returns are employed. Regression results on the variables are mixed; in particular, interest on loans and interest on savings are positively related to NSE stock returns, but the relationships are not significant.

The results of this paper suggest that a multi-index APT using selected economic and industrial variables provides additional power in explaining the variability of NSE stock returns over a single index model using the market index alone. It is therefore noted that the inclusion of economic variables to a large extent improves the explanation of the cross-section of expected returns.

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GLOSSARY

Word.	
APT	Arbitrage Pricing Theory
CAPM	Capital Asset Pricing Theory
N.S.E	Nairobi Stock Exchange
GNP	Gross National Product
IRR	Internal rate of return
NPV	Net present value
GDP	Gross Domestic Product
CBK	Central Bank of Kenya
CMA	Capital Market Authority
AAR	Accounting rate of return
NMG	Nation Media Group
BBK	Barclays Bank Of Kenya
ER	Exchange Rate
FER	Foreign exchange Reserves
SMB	The difference between the return of a portfolio of small capitalization and the return of a portfolio of large capitalization.

HML	The difference between the return for a portfolio of high book to market stocks and the return of a portfolio of low book to market stocks

Chapter 1

INTRODUCTION

1.1 Background

It is a well-known fact that people have many motives for investing. Some people invest in order to gain a sense of power or prestige. Often the control of corporate empires is a driving motive. For most investors however, their interest is largely pecuniary - to earn a return on their money. However selecting stocks exclusively on the basis of maximization of return is not enough. The risk element has to be taken into account. *(Markowitz Portfolio selection Theory [1952-1956])*

Return is a key variable in the investment decision. It allows us to compare actual or expected gains from various investments with the level of return we need. Return can be measured historically or it can be used to formulate future expectations. The level of return achieved or expected from an investment will depend on a variety of factors. The key factors are internal characteristics and external forces. The internal factors could include type of investment vehicle, quality of management, type of financing e.t.c, whereas those of external could include war, price controls, political events, inflation among others. These factors that determine stock return do contribute towards the level of risk. For this particular study the primary purpose is to focus upon the factors that influence stock return at the NSE, especially the external ones.

It is worth noting that investment decisions are dependent on two steps:

- Security analysis, which is built around the idea that investors are concerned with two principal properties inherent in securities: the return that can be expected from holding a security, and the risk that the return that is achieved will be less than the return that was expected.
- Portfolio analysis, selection and management, which is a comparison of return-risk estimates in order to decide how to allocate available funds among securities on a continuing basis.

1.1.1 *The importance of the concept of return in financial decision-making*

One of the most important developments in finance theory in the last decade is the ability to talk about return in a quantifiable fashion. Knowledge on measurement and determination of rate of return enables us to value risky assets. This in turn leads to a better allocation of resources in the economy. Investors can then do a better job of allocating their savings to various types of securities and managers can better allocate funds provided by shareholders and creditors among scarce capital resources.

Rate of return is a crucial element in the valuation models. Valuation is a process by which an investor determines the worth of a security using the risk return concepts *(J.B Williams; Valuation Theory [1938]).* Value of the firm depends not only on the security of the firm itself, but also on other securities available for investment. By analysing decisions in relation to their likely effect on expected return and systematic risk, we are able to judge their effect on valuation. To make itself as valuable as possible to shareholders, a firm must choose the best combination of decisions on investment, financing and dividends as these will have a hand in shaping the company's return-risk character and the firms value in the eyes of suppliers of capital. Whatever the valuation model for a given degree of risk, the financial markets expects a company to earn a minimum required return commensurate with the risk involved. The greater the systematic risk, the greater the return the financial markets expects of an investment opportunity.

The management's primary objective is to increase shareholder value over time. (*Source: Ameritech Annual Report [1992]).* Value is represented by market price of the company's common stock that is a function of the firm's investment, financing and dividend decisions. By investing monies in products and projects, a company creates value if the expected return exceeds the return required by the financial markets for the risk involved. Thus value is created through investments by exploiting opportunities for excess returns, thereby providing returns – excess of what the financial markets require for the risk involved. In investments the question of value therefore centres on return.

Investors want to maximize expected returns subject to their tolerance for risk. Return is the motivating force and the principle reward in the investment process and is the key method available to investors in company alternative investments. Measuring historical returns allows investors to assess how well they have done and it plays apart in the estimation of future, unknown returns.

Every financial decision contains an element of return. The expected rate of return is considered to be the minimum return of that stock which is equivalent to the cost of equity *(Joel Dean & Lutzes [1951]).* As an example, the cost of equity in an emerging market establishes the discount rate to be used in capital budgeting decisions for projects in that country. It equates the present market value of the stock with the present value of the stream of expected future earnings from it. Despite the fundamental importance of the cost of equity, much uncertainty remains in the public and private sector financial communities regarding the proper way to determine it when investing in emerging countries. This uncertainty has fundamental repercussions on the channelling of funds to these emerging countries. At stake is the fact that lack of clarity regarding how to value assets and projects in these countries keeps investors away. Knowledge of the factors affecting the ability of the pricing models to estimate the cost of equity more accurately and reliably in emerging markets would lower the level of uncertainty and spur investments in the long run.

The rate of stock return plays too an important role when it comes to investment appraisal. In evaluating risky investment opportunities, a market asset-pricing model (CAPM & APT), relates the acceptance of the project to its systematic or unavoidable risk to investors. The required rate of return is the risk free rate plus a premium for the systematic risk of the project. In addition various other techniques, utilizing rates of return are used to appraise investments. They do include such models as;

Net Present Value (NPV)

The Net Present value of a project is equal to the sum of the present value of all the cash flows associated with it.

$$NPV = \sum_{t=0}^{n} CF/(1+r)^t$$

where r = cost of capital/ rate of return
CF= Cash flow (both inflows and outflows) at end of year t.
n = Life of the project

Rationale for the NPV method;

- An NPV of zero signifies that the benefits of the project e.g. cash inflows overtime, are just enough the recoup the capital invested and earn the required return on capital invested.
- A positive NPV implies that the project earns excess returns augmenting shareholders wealth.
- A negative NPV implies that the project has made a loss

Internal rate of Return

The internal rate of return of a project is the discount rate, which makes its NPV equal to zero

$$0 = \sum_{t=0}^{n} CF_t \; / \; (1 + r)^t$$

where: CF_t = Cash flow at end of year t
r = discount rate
n = life of the project

Accounting Rate of Return

The accounting rate of return on an investment is a measure of profitability that relates income to investment both measured in accounting terms. The higher the ARR, the better the project. Several measures exist:

$$ARR = \frac{\text{Average income after tax}}{\text{Initial investment}}$$

$$ARR = \frac{\text{Average income after tax but before interest}}{\text{Average investment}}$$

$$ARR = \frac{\text{Average IBIT}}{\text{Average Investment}}$$

1.1.2 - Measures and determinants of stock return

Two terms often used in the language of investments need to be distinguished;

- Realized return – It is the return that was earned. It is thus historical.
- Expected return – It is the return from an asset that investors anticipate they will earn over some future period. It is a predicted return. It may or may not occur. It is a vital measure of performance.

But the crucial question now is what is the expected rate of return for an asset? Return on a typical investment consists of two components. The basic component is the periodic cash receipts (or income) on the investment, either in the form of interests or dividends. The second component is the change in the price of the asset, commonly called capital gain or loss. The income from an investment consists of one or more cash payments paid at specified intervals of time *(Van Horne C.J.;. Financial Management & Policy, 10th ed. [1992]).*

Total return = Income + Price change (-/+)

Returns across time or from different securities can be measured and compared using the total return concept i.e.

$$\text{Total return} = \frac{\text{Cash payments received + Price change over the period}}{\text{Purchase price of the asset}}$$

Note that price change over the period is the difference between the beginning or purchase price and the ending or sales price.

For a one year holding period, rate of return is the link between end of period wealth and an initial shilling investment. Benefits associated with ownership of common stock include cash dividends paid during the year together with an appreciation in market price or capital gain realized at the end of year.

$$R = \frac{\text{Dividends + (End price – Beginning price)}}{\text{Beginning price}} \qquad 1$$

where: R is the expected rate of return.

Arithmetic Return

It is the sum of each of the values being considered divided by the total number of values.

$$X = \sum \bar{X} / n \qquad 2$$

It is appropriate as a measure of the central tendencies of a number of returns calculated for a particular time. However when percentage changes over time are involved, the arithmetic mean of these changes can be misleading. E.g. suppose an investor purchases a stock in one year for ksh 50 and it rose to ksh 100 by year-end. This is 100% return [(100-50)/50]. Then the stock went from

ksh 100 at the start of the first year to ksh 50 at the end of the year. Return for year two is -50% [(50-100)/100]. The arithmetic average return is 25% (100-50)/2. But realistically, if an investor bought a stock of ksh 50 and held it for two years and it was still ksh 50, clearly there is no return at all.

The geometric average

It is defined as the nth root of the product resulting from multiplying a series of returns together, less one. It gives the true rate of return for multiple periods

$$G= [(1+R_1)(1+R_2)(1+R_3)....(1+R_n)]^{1/n} - 1 \qquad 3$$

where: R= total return
n = number of periods

- *General formula for return*

(J.B. Williams [1938], Myron & J. Gordon [1962])

$$P_o = \sum_{t=1}^{n} D_t/(1 + r)^t \quad + \quad P_n / (1 + r)^n \qquad 4$$

where .
P_0 = market price at time 0
D_t = the expected dividend at end of period t
P_n = the expected terminal value at end of period n
r = the expected rate of return
The expected rate of return would be determined by solving for r in the above two equations.

If the end period is known with certainty, then so is the rate of return. However, this is seldom the case in the real world. For risky assets, rate of return is found by assigning probabilities to various possible outcomes; (Utility theory given uncertainty)

$$E(R_i) = \sum_{i=1}^{n} R_i P_i \qquad 5$$

where
P_i = Probability of a random event R_i
n = Total number of possible events
$E(R_i)$ = Expected return

For a portfolio of investments, the expected rate of return is simply the weighted average of the expected rates of return for the individual investments in the portfolio;

$$E(R_P) = \sum_{i=1}^{n} w_i R_i \qquad 6$$

where;

w_i = the percentage of the portfolio in asset i.
R_i = the expected rate of return for asset i.
n = number of portfolios

Expected return for individual security

For the individual security, the relevant risk is not the standard deviation of the security itself (total) risk, but the marginal effect the security has on the standard deviation of an efficiently diversified portfolio (systematic risk). As a result, a security expected return should be related to its degree of systematic risk (not to its degree of total risk). Systematic risk is the thing that matters to an investor holding a well-diversified portfolio. If we assume the unsystematic risk is diversified away, the expected rate of return of stock j can be expressed in terms of a factor model using either single or multiple risk components to characterize unavoidable risk. In essence, the required return establishes a level of compensation compatible with the amount of risk involved *(R Hamada [1969] & Rubinstein[1973]).*

$$E(R_j) = R_f + (E(R_M) - R_f)\,\beta_j \qquad 7$$

where

R_f = the risk free rate
$E(R_m)$ = the expected overall return of the market portfolio
β_j = beta coefficient of security j

Since $\beta_j = \dfrac{r_{jm}\,\delta_j\delta_m}{\delta_m^2}$ 8

$$E(R_j) = R_f + \frac{[E(R_m) - R_f]\, r_{jm}\,\delta_i\,\delta_m}{\delta_m^2} \qquad 9$$

$$E(R_i) = R_f + \frac{[E(R_m) - R_f]\, r_{jm}\,\delta_i}{\delta_m} \qquad 10$$

This is the minimum rate of return an investor requires an investment to earn, given its risk characteristics, for investment to be considered worthwhile.

Stock valuation models

As mentioned earlier, rate of return is a critical component of the various valuation models that determine the worthness of assets. Because of the importance of the concept of valuation of assets in financial decision-making, knowledge of how the value of an asset is determined is very essential. Stock valuation models determine either an expected rate of return or the intrinsic worth of a share of stock, which in effect represent the stocks "justified price". In this way we obtain a standard of performance, based on future stock behaviour that can be used to judge the investment merits of a particular security. Some of the models being used for this purpose include;

The basic model

The value for an asset is the present value of the expected future cash flows discounted at the relevant required rate of return.

$$V_o = CF_1 / (1 + r)^1 + CF_2 / (1 + r)^2 + \ldots + CF_n / (1 + r)^n \qquad 11$$

$$V_o = \sum_{t=1}^{n} CF_t / (1 + r)^t$$

where

V_o = value of the asset at the present time 0
CF_t = cash flow expected at end of year t.
t = any year (t = 1,2, …, n)
r = required rate of return(appropriate discount rate)
n = assets expected life.

Dividends discount Models
(Gordon & Shapiro [1956])

They are designed to compute stock return under specific assumption as to the growth pattern of future dividends.

- *Perpetual Growth Model*

If dividends on a company are expected to grow at a constant rate, g, implied return becomes:

$$P_o = \frac{D_o (1+g)}{(1+r)} + \frac{D_o (1+g)^2}{(1+r)^2} + \ldots + \frac{D_o (1+g)^\infty}{(1+r)^\infty}$$

where

P_0 =value of the asset at the present time zero.

D_0 = the dividend per share.

Assuming r is greater than g,

$$P_0 = \frac{D_1}{r - g}$$

Rearranging $r = \frac{D_1}{P_0} + g$

The critical assumption in this valuation model is that dividends per share are expected to grow perpetually at a compound rate of g.

- *Growth Phases dividend valuation models*

Share price is the summation of the present values of expected future dividends on each of the growth phases.

P_0 = PV (Phase 1) + PV (Phase 2) + …. PV (phase n)

Example

In a three phase growth, suppose the present dividend is Kshs.2/= per share and the market price is Kshs.40

$$\text{Kshs. } 40 = \sum_{t=1}^{5} \frac{2(1.14)^t}{(1+r)^t} + \sum_{t=6}^{10} \frac{D_5(1.11)^{t-5}}{(1+r)^t} + \sum_{t=11}^{\infty} \frac{D_{10}(1.7)^{t-10}}{(1+r)^t}$$

Pricing of security portfolios

One of the dominant themes in the academic literature since the 1960s has been the concept of pricing of security portfolios. The investigations of the characteristics of the analyzed capital market segment, and the disclosure of curiosities affecting the pricing models (CAPM & APT) can give a relatively objective and indirect notion about the state of development, the regulation of the market and about the relationship to other ones. It can be stated that the results of return predictability tests can give the basis of advice and recommendations for further development and organizational decisions in the analyzed market.

The models on security or capital asset pricing (like the Capital Asset Pricing Model (CAPM) or the Arbitrage Pricing Theory (APT)) are searching the answers to what is the equilibrium price for a financial asset. They suppose that there exists an equilibrium price of the deviating future return

opportunities. Normal (fair) return is defined as the expected return which results from any pricing model like CAPM or APT. The return above the previously mentioned normal or "fair" return is defined as the excess (or abnormal) return. So normal and abnormal returns can only be mentioned in statistical means. The tests of predictability generally examine the possibility to gain excess profit by using the historical data of a given security, examining the historical data of other securities or capital markets, studying the time pattern in security returns, analyzing the information obtained about characteristics of a company or security market. Results from the tests of return predictability can then be used to evaluate the performance of portfolios of securities. Knowledge of the factors that captures important effects in emerging markets that affect stock return can be used to improve the predictability of the pricing models.

Measures of Risk

Forces that contribute to variation in return constitute elements of risk. They may be external to the firm hence can't be controlled and affect large number of securities. Other influences are internal to the firm and are controllable to a large degree. Risk can be thought as the possibility that the actual return from holding a security will deviate from the expected return. It is a critical element in the determination of return as the various factors that determine it contribute to the level of risk *(Markowitz Portfolio Selection Theory).*

As noted earlier, every financial decision contains an element of risk and return. The relationship between the two exists in the form of a risk-return trade off, by which we mean that it is only possible to earn higher returns by accepting higher risk. Risk and return are thus positively correlated. The implication for a financial manager in evaluating a prospective investment project is that an effective decision about the project's value to the firm cannot be made simply by focusing on its expected level of return; the projects level of risk must also be simultaneously considered. This risk-return trade off is central to investment decision making for the managers to achieve the objective of shareholder wealth maximization. i.e. maximizing the value of the share price. This is in turn principally determined by risk and return trade off. Risk can either be classified as systematic/ undiversifiable or unsystematic/diversifiable.

- *Systematic Risk*

It is measured by beta. It is the sensitivity of the security's excess return to that of the market portfolio. It arises from market factors such as general or macroeconomic conditions e.g. balance of payments, inflation, interest rate etc. It can't be diversified away.

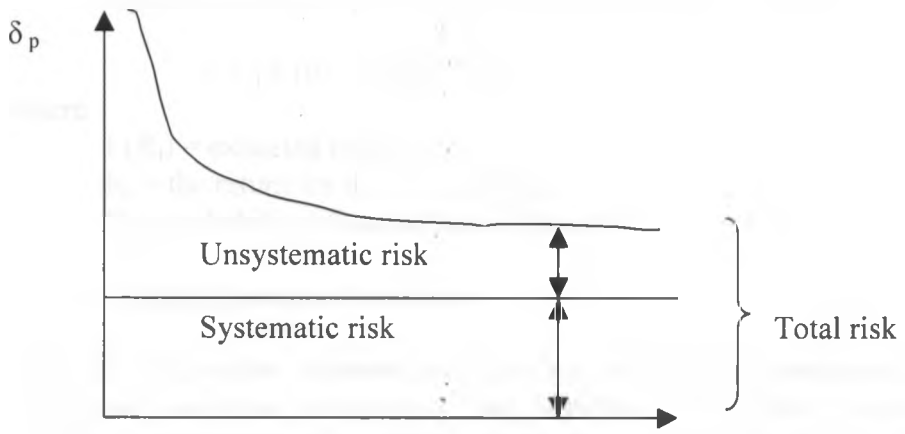
The two models i.e.CAPM/APT uses beta to look formally the notions of risk and return. They can be used to understand the risk-return trade offs involved in various types of investment decisions.

$$\beta_i = \frac{Cov_{im}}{\delta_m^2}$$

- *Unsystematic risk (Avoidable risk.)*

It is unique to a particular company, being independent of economic, political and other factors that affect securities in a systematic manner e.g. wildcat strike may affect only one company; a new competitor may begin to produce essentially the same product. By diversification this risk can be reduced and even eliminated.

Portfolio risk



Diag. Total unsystematic and systematic risk

Unsystematic risk is reduced at a decreasing rate toward zero as more randomly selected securities are added to the portfolio. Various studies suggest that 15-20 stocks selected randomly are sufficient to eliminate most of unsystematic risk of a portfolio.

Quantifying risk and its appraisal

Since investors and managers are risk averse, it behooves management to incorporate the risk of an investment proposal into its analysis of the proposal's worth. Otherwise, capital budgeting decisions are unlikely to be in accord with an objective of maximizing share price. Because investment proposals entail differing degrees of business risk one must analyze not only their expected return but also the possible deviations from the expectations. Risk shows how the price of a security responds to market forces and it has impact on the return expected from a share of stock.

- *Variance*

It is a measure of the dispersion of a distribution around its expected value. The larger the variance the greater the dispersion.

$$\delta^2 = \Sigma [R_i - E(R_i)]^2 P_i$$

- *Total risk for a single investment (Standard deviation (δ))*

$$\delta = \{\Sigma [R_i - E(R_i)]^2 P_i\}^{1/2}$$

where

$E(R_i)$ = expected return
R_i = the return for the ith possibility
P_i = probability of occurrence of that return

- *Portfolio standard deviation*

The risk of portfolio depends not only on the standard deviations of the individual securities comprising the portfolio of possible returns. By deciding securities that have little relationship in each other, an investor is able to reduce relative risk. Diversification is combining securities in such a way that will reduce relative risk *(Harry Markowitz Formula).*

$$\delta_p = \{\sum_{i=1}^{n} w_i^2 \delta_i^2 + \sum_{i=1}^{n} \sum_{j=1}^{n} w_i w_j Cov_{ij}\}^{1/2}$$

where

δ_p = the standard deviation of the portfolio

w_i = the weights of the individual assets in the portfolio, where weights are determined by the proportion of value in the portfolio.

δ_i^2 = the variance of rates of return for asset i.

cov_{ij} = the covariance between rates of return for assets i and j

It is the statistic most frequently used to measure dispersion of distribution, a measure of investment risk.

- *Covariance of returns*

It is a measure of the degree to which two variables "move together" relative to their individual mean values over time. Also defined as a measure of the extent in which two possible returns of two securities are expected to vary together rather than independently of each other. It is the appropriate measure of the contribution of a single asset to portfolio risk.

$$Cov_{ij} = E\{[R_i - E(R_i)][R_j - E(R_j)]\}$$

- *Correlation coefficient* (r_{ij})

The correlation coefficient between two random variables is defined as the covariance divided by the product of the standard deviations. It ranges from –1 to +1. The value +1 would indicate a positive linear relationship between R_i and R_j, meaning the returns for the two stocks move together in a completely linear manner. The value -1 would indicate a perfect negative relationship between the two return series such that when one stock's rate of return is above its mean, the other stock's rate of return will be below its mean by the comparable amount.

$$r_{ij} = \frac{Cov_{ij}}{\delta_i \delta_j}$$

where

r_{jk} = the expected correlation between possible returns for securities i and j.

δ_i = standard deviation for security i.

δ_j = standard deviation for security j.

Macroeconomic Forces Impacting Stock Returns

Extensive research work done in the developed world has established that a set of several macroeconomic factors can explain as much as possible the variation in stock returns. Among these factors include:

1. *$f_1(t)$: Confidence risk(Default risk).*

Confidence risk is the unanticipated changes in investors' willingness to undertake relatively risky investments. It is measured as the difference between the rate of return on relatively risky corporate bonds and the rate of return on government bonds, both with 20-year maturities, adjusted so that the mean of the difference is zero over a long historical sample period, In any month when the return on corporate bonds exceeds the return on government bonds by more than the long-nm average, this measure of confidence risk is positive ($f_1 > 0$). The intuition is that a positive return difference reflects increased investor confidence because the required yield on risky corporate bonds has fallen relative to safe government bonds. Stocks that are positively exposed to this risk ($\beta_{i1} > 0$) then will rise in price. Most equities *do* have a positive exposure to confidence risk, and small stocks generally have greater exposure than large stocks.

2. *$f_2(t)$ Time horizon risk(Term structure of interest).*

Time horizon risk is the unanticipated changes in investors' desired time to payouts. It is measured as the difference between the return on 20-year government bonds and 30-day Treasury bills, again adjusted to be mean-zero over a long historical sample period. A positive realization of time horizon risk ($f_2 > 0$) means that the price of long-term bonds has risen relative to the 30-day Treasury bill price. This is a signal that investors require less compensation for holding investments with relatively longer times to payouts. The price of stocks that are positively exposed to time horizon risk ($\beta_{i2} > 0$) will rise to appropriately decrease their yields. Growth stocks benefit more than income stocks when this occurs.

3. *$f_3(t)$: Inflation risk.*

Inflation risk is a combination of the unexpected components of short- and long-run inflation rates. Expected future inflation rates are computed at the beginning of each period from available information: historical inflation

rates, interest rates, and other economic variables that influence inflation. For any month, inflation risk is the unexpected surprise that is computed at the end of the month—the difference between the actual inflation for that month and what had been expected at the beginning of the month. Because most stocks have negative exposures to inflation risk ($\beta_{i3} < 0$), a positive inflation surprise ($f_3 > 0$) causes a negative contribution to return. whereas a negative inflation surprise ($f_3 < 0$), a deflation shock, contributes positively toward return. Luxury-product industries are most sensitive to inflation risk-Consumer demand for luxury goods plummets when real income is eroded through inflation, thus depressing profits for industries such as retailing, services, eating places, hotels and motels, and toys. In contrast, industries least sensitive to inflation risk tend to sell necessities, the demands for which are relatively insensitive to declines in real income. Examples include foods, cosmetics, tires and rubber goods, and shoes. Also, companies that have large asset holdings such as real estate or oil reserves may benefit from increased inflation.

4. *$f_4(t)$: Business cycle risk(Monthly changes in Industrial production)*

Business cycle risk represents unanticipated changes in the level of real business activity. The expected values of a business activity index are computed both at the beginning and end of the month, using only information available at those times. Then, business cycle risk is calculated as the difference between the end-of-month value and the beginning-of-month value. A positive realization of business cycle risk ($f_4 > 0$) indicates that the expected growth rate of the economy, measured in constant dollars, has increased. Under such circumstances, firms that are more positively exposed to business cycle risk—for example, firms such as retail stores, which do well when business activity increases as the economy recovers from a recession— will outperform those such as utility companies that respond only weakly to increased levels in business activity.

5. *$f_5(t)$ Market-timing risk(Market return)*

Market-timing risk is computed as that part of the market portfolio (NSE 20 share index) total return that is not explained by the first four macroeconomic risks and an intercept term. Many people find it useful to think of the APT as a generalization of the CAPM, and by including this market-timing factor, the CAPM becomes a special case. If the risk exposures to all of the first four macroeconomic factors were exactly zero (if $\beta_{i1} = ... = \beta_{i4} = 0$), then market-timing risk would be proportional to the NSE

20 share index total return. Under those extremely unlikely conditions, a stock's exposure to market-timing risk would be equal to its CAPM beta. Almost all stocks have a positive exposure to market timing risk ($\beta_{i5} > 0$), and hence positive market-timing surprises ($f_5 > 0$) increase returns, and vice versa.

6. f_6 *(t)Unemployment rate*

7. f_7 *(t)Tax rate*

8. f_8*(t)Interest rate*

A natural question, then, is whether confidence risk, time horizon risk, inflation risk, and business cycle risk among others help to explain stock returns better than the market portfolio (NSE 20 share index) alone. This question has been answered in the developed markets using rigorous statistical tests, and the answer is very clearly that they do. The fundamental question is to what extent do these factors do the same for the emerging markets like the NSE?

1.2 Statement of the problem

The NSE equity market has improved in value, though it remains low compared to the emerging markets. It has undergone growth since its inception in 1954, for example from a market capitalization of Ksh 4.3 billion in 1985 to Ksh 175.5 billion in 2003 *(NSE database)*.
Although evaluation of the common stock has been fairly simple i.e. either total risk (standard deviation (σ) of returns) or systematic risk (β), no such developments have been undertaken to critically identify and evaluate fundamental variables that determine stock return and hence the multi-index models in Kenya. One reason for this lack of critical analysis of the fundamental factors and hence development of stock portfolio performance measures was that prior to 1970s most stock portfolio managers followed buy & hold strategies, so their performance did not differ much. Interest rates too were relatively stable and the volume of activity at the market was low. One could therefore gain little from active management of stock portfolios.

The environment of the stock market changed considerably in the late 1970s and especially in the 1980s & 90s when the Kenyan Government realized and embraced the need to design and implement policy reforms to foster sustainable economic development with an efficient and stable financial system. This was to be attained both through political and economic liberalization. In particular, the government set out to enhance the role of the private sector in the economy, reduce the demands of public enterprises on the exchequer, rationalize the operations of the public enterprise sector to broaden the base of ownership and enhance capital market development through the formation of the CMA. This has spurred increased activity at the NSE leading to a dramatic increase towards more active stock portfolio management, which led to substantially more dispersed performance by stock portfolio managers. The dispersion in turn created a demand for techniques that would help investors evaluate the performance of stock portfolio managers. The question now is what models that will meet the tests of time are to be developed for the above purpose? What are the fundamental economic variables affecting these models hence the estimated accuracy of the expected return? How will these models be subsequently used to evaluate stock fund performance in Kenya in lieu of the effects of the fundamental economic variables? A solution to this will go in handy to help investors, managers, policy markers e.t.c arrive at sound decisions on matters affecting investment and portfolio management. As far as this topic is concerned, no such research has ever been undertaken in this particular area for the NSE.

1.3 Objectives of the study

- ✓ The research will identify factors which influence stock returns and hence security portfolio performance
- ✓ To examine the relative significance of each variable in explaining stock returns.
- ✓ To develop a multi-index model for Kenyan firms trading at the NSE that can be used to monitor performance of security returns of portfolios by investors and managers.

1.4 Importance of the study

To researchers

- ✓ Little attention has been paid to the fundamental economic variables affecting the relative stock pricing models despite their economic importance.
- ✓ Recent developments in the methodology of the testing of relative pricing methods (based on APT) have yet to be applied to the pricing of stocks in Kenya.
- ✓ The studies uses fundamental economic variables as well as return indexes to explain both returns and expected returns on stocks.
- ✓ The study will give a sort of international market outlook and a comparison of them.
- ✓ A detailed analysis of the Kenya's stock fund performance will supply interesting questions about the way market works in the emerging markets. The implications of the research will not only affect this sector of the study, but also the entire Capital market with indications on its efficiency.

To investors

- ✓ Knowledge of the factors affecting the ability of CAPM and APT to estimate the cost of equity more accurately in emerging markets would lower the level of uncertainty and spur investments in the long run.
- ✓ A general study of the factors influencing stock return will not only give an investor a grasp of the underlying nature of the economic environment but also enable him or her assess the current state of the economy and formulate expectations about its future course.

To Managers

- ✓ The study employs forecast prepared by economists and investment professionals to measure unexpected changes in the fundamental economic influences that affect returns.
- ✓ Stock fund performance analysis, which is affected by market and industrial factors, will help them arrive at sound decisions involving investment and portfolio management. It will also help them predict the future course of a firm in terms of its likely earnings, stock prices, growth, cash flows et.c.
- ✓ Knowledge of the factors affecting the ability of CAPM and APT to accurately estimate stock return will contribute to improved policy formulation and implementation.

1.5 Hypothesis

H_0: Expected return, a measure of stock fund performance is not influenced by Fundamental economic variables.

H_1: Expected return, a measure of stock fund performance is influenced by fundamental economic variables.

Chapter 2

LITERATURE REVIEW

2.1 *Stock returns*

Stock represents an ownership interest in a corporation, entitling its owners a right to vote in the board of directors, and grants the holder a residual claim in the firm's cash flow *(Frank K Reilly. & Keith C. Brown; Investment and Portfolio Management [1997]).*

Common stock is a popular form of investing used by millions of individual investors. They are popular, in part, because they offer investors the opportunity to tailor their investment programs to meet individual needs and preferences. For people living off their investment holdings, stocks provide a way of earning a steady stream of current income (from dividends they produce). For investors less concerned about current income, common stock can serve as the basis for long run accumulation of wealth. Indeed, it is this potential for capital gains that is the real draw for most investors. Whereas dividends can provide a steady stream of income, the big returns come from capital gains. Few securities can match common stocks when it comes to capital gains.

Stock returns are crucial to investors. They not only take into account price behaviour but also dividend income. They can be used to assess the performance of stocks. Various pricing models can be used to determine stock returns. The models too can be used to assess the impact of the different factors influencing stock returns. It is these factors that ultimately determine the level of risk on the investment.

2.2 The CAPM and APT basics

A fundamental principle of finance is the trade-off between risk and return. Unless a portfolio manager possesses special information, one portfolio can be expected to outperform another only if it is riskier in some appropriate sense. The crucial question is: "What is the appropriate relationship between risk and return?"

Currently, only two theories provide a rigorous foundation for computing the trade-off between risk and return: the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT).

The CAPM, for which William F. Sharpe shared the 1990 Nobel Memorial Prize in Economic Sciences, predicts that only one type of non-diversifiable risk influences expected security returns, and that single type of risk is "market risk." In 1976, a little more than a decade after the CAPM was proposed, Stephen A. Ross invented the APT. The APT is more general than the CAPM in accepting a variety of different risk sources. This accords with the intuition that, for example, interest rates, inflation, and business activity have important impacts on stock return volatility.

Like the Capital Asset Pricing Method (CAPM), the Arbitrage Pricing Technique (APT) is an equilibrium model as to how security prices are determined. The model offers a testable alternative to the Capital Asset Pricing model. It assumes that the rate of return on any security is a linear function of k factors as shown below:

$$R_i = E(R_i) + b_1F_i + \varepsilon_i \qquad \text{(CAPM)}$$

$$R_i = E(R_i) + b_{i1}F_1 + \ldots + b_{ik}F_k + \varepsilon_i \qquad \text{(APT)}$$

where

R_i = the random rate of return on the ith asset
$E(R_i)$ = the expected rate of return on the ith asset
b_{ik} = the sensitivity of the ith asset's returns to the kth factor
F_k = the mean zero kth factor common to the returns of all assets under consideration
ε_i = a random zero mean noise term for the ith asset

The model suggests that the market equilibrium process is driven by individuals eliminating arbitrage profits across multiple factors. However the model does not tell us what the factors are or why they are economically on behaviourally relevant, its major handicap. It merely states that there is a relationship between security returns and a limited number of factors, in contrast to CAPM where the only relevant risk variable is the covariance of the asset with the market portfolio. To date there is no agreement as to the risk factors of importance, nor has empirical testing produced parameter stability and consistence over time.

The APT is derived under the usual assumptions of perfectly competitive and frictionless capital markets. Furthermore, individuals are assumed to have homogeneous beliefs and that the random returns for the set of assets being considered are governed by the linear k-factor model in Eq. (1.1). The theory requires that the number of assets under consideration, n, be much larger than the number of factors, k, and that the noise term, ε_i be the unsystematic

risk component for the ith asset. It must be independent of all factors and all error terms for other assets.

2.3 Superiority of APT over CAPM

The arbitrage pricing theory is much more robust than the capital asset pricing model for several reasons:

- ✓ The APT makes no assumptions about the empirical distribution of asset returns.
- ✓ The APT makes no strong assumptions about individual's utility functions (at least nothing stronger than greed and risk aversion).
- ✓ The APT allows the equilibrium returns of assets to be dependent on many factors, not just one (e.g. beta).
- ✓ The APT yields a statement about the relative pricing of any subset of assets; hence one need not measure the entire universe of assets in order to test the theory.
- ✓ There is no special role for the market portfolio in the APT, whereas the CAPM requires that the market portfolio be efficient.
- ✓ The APT is easily extended to a multi period framework (see Ross [1976]).

2.4 APT, the Multi-Index Model

The APT is a multi-index model that attempts to capture some of the non-market influences that cause securities move together. Such include a set of economic factors on structural groups (industries) that account for common movement in stock prices beyond that accounted for by the market index. While it is easy to find a set of indices that is associated with non-market effects over any period of time, it is quite another matter to find a set that is successful in predicting covariances that are not market related.

The multi-index models introduce extra indices in the hope of capturing additional information, picking up random noise rather than real influences. The assumption underlying the single index model is that stock prices move together only because of common movement with the market. Researchers have found that there are influences beyond the market that cause stocks to move together, King (1996). *(Elton/Gruber – Modern Portfolio Theory & Investment Analysis, 5th Edition)*

The general multi-index model is given as:

$$R_i = a_i + b_1I_1 + b_2I_2 + \ldots b_nI_n + c_i$$

where I_j = actual level of index j

b_{ij} = a measure of the responsiveness of the return on stock I to changes in the index j .It is equivalent to beta (β)
a_i = expected value of return not related to indices (R_f)
c_i = random component of unique return

How well do multi-index models work?

Researchers have found that the models lie in an intermediate position between full historical correlation matrix itself and the single index model in ability to reproduce the historical correlation matrix. The more indices added, the more accurately the historical correlation matrix is reproduced. (Elton & Gouler). However this led to a poorer prediction of the future correlation matrix and to the selection of portfolios that, at each risk level, tended to have lower returns. Thus added indices introduced more random noise than real information into the forecasting process. In general Elton & Gruben found (that on both statistical grounds & Economic grounds) adding additional indices to the single index model led to a decrease in performance. Although adding more indices led to a better explanation of the historical correlation matrix, it led to a poor prediction of the future correlation matrix and to the selection of portfolios

Cohen & Pogue examined the use of a specialized multi-index model to select portfolios (a test of economic significance). Standard industrial classifications were used to divide the stocks in their sample industries i.e. by end products such as steel or chemical. Single index models and multi-index models, with a market and industry index were then run. The performance of the multi-index model was inferior to the single index model. This had more desirable properties and led to lower expected risks and was much simpler to use.

While the use of multi-index models as a way of forecasting the future correlation structure between security returns holds great promise for the future, the results to date have been mixed. A national question arises "if the addition of more indices to a single index model can at times, introduce more random noise than real information into the forecasting process, might not a technique that smoothes more of the historical data lead to better results?

More recent studies have been to see how many indices best explain the historical variance covariance or correlation matrix. Roll & Ross report that at least 3 indices are needed to explain the historical variance-covariance matrix, Dhrymes, Friend and Gultekin show that the number of indices that

are needed is very dependent on the number of firms that are being analyzed. Depending on the sample size they find that many more than three are needed. Gibbons, analyzing bond and stock data, finds that six or seven indices are needed.

Meyers (1973) and Livingston (1977) in similar studies confirmed King's findings. The Meyers study involved 60 of the same companies used by King and 60 additional companies, using data through December 1967. Meyers concluded that although there were strong industry effects, King may have overstated the percent of residual variance explained by industry association. *Livingston* used 50 companies in 10 industry groups and studied monthly returns from January 1966 through June 1970. He also found strong co-movement among stocks in the same industry, and concluded that 18% of residual variance was accounted for by industry effects. The recognition that factors other than movement in the market index affect security returns led to the development of multi-index models.

Some early studies of industry effects on stock returns show that up to 20% of a stock's residual variance, or 10% of total variance, is due to industry association. These early studies mainly documented that stocks in the same industry do tend to move together.

Beginning in the early 1980's, researchers began applying multi-index CAPMs to identify which factors influenced stock returns. These studies tend to cover stocks in various industries, mainly focusing on utility industry, and show that various factors have significant influence on stock returns. In particular, the CAPM approach has been widely used in the utility industry for determining its cost of capital and the utility's rate structure.

Chen, Roll & Ross, and Burmerister writing with others have recently produced a set of multi-index models based on a priori-hypothesized set of macroeconomic variables. They tested an APT model for significance of several factors in explaining security returns using monthly data for the period 1953-1983. Their conclusions provide valuable insight into what the underlying factors might be. Four macroeconomic variables were significant; an index of industrial production, changes in a default risk premium (measured by the differences in promised yields to maturity on AAA versus Baa corporate bonds), twists in the yield curve (measured by differences in promised yields to maturity on long-and short-term government bonds) and unanticipated inflation. These models have several potential applications in finance.

Several subsequent studies attempted to determine factors other than the market index that affect security prices. *Sharpe (1982)* studied monthly returns for stocks of 2,197 firms from 1931 through 1979. His findings showed that the R^2 for a regression model was significantly improved using dividend yield, company size, and bond beta in addition to a market index. *Pari and Chen (1984)* conducted a test of an Arbitrage Pricing Theory (APT) model for 2,090 firms for the period 1975 to 1980. Using this model, they found that factors such as the general market index, price volatility of energy, and interest rate risk, influence stock price.

Chen (1991) provides improved framework for analysing stock returns and macroeconomic factors. He shows that using the test period 1954-1986, state variables, such as the lagged production growth rate, the default risk premium, the term premium, the short-term interest rates, and the market dividend-price ratio, are important indicators of current economic growth, which is in turn negatively correlated with the market excess return.

Chan(1991) examines the cross-sectional differences in Japanese stock returns and finds a significant relationship between expected returns in the Japanese stock market and four variables including earnings yield, size, book to market ratio, and cash flow yield, of which the last two variables have the most significant positive effect on expected stock returns.

The Cross-Section of Expected Stock Returns: A Test of the Fama and French Three-Factor Model on the French Stock Market Recent works show that cross-sectional patterns of common stock returns are related to firm characteristics like size, book-to-market ratio, earnings-to-price ratio, and cash flow to price ratio. Fama and French (1993) propose a three-factor model (beta, HML, SMB) to explain these patterns. This survey on the French market shows that HML and SMB factors help CAPM's beta to describe the cross-sectional patterns of stock returns, for portfolios formed on size and book-to-market ratio. They show that the excess return of a portfolio to the risk free rate is mostly explained by three factors: the excess return on a market portfolio; the difference between the return of a portfolio of small capitalization and the return of a portfolio of large capitalization, called SMB; the difference between the return of a portfolio of high book-to-market stocks and the return of a portfolio of low book-to-market stocks, called HML On the other hand, in this sample, CAPM anomalies in returns are not well explained by this three-factor model. Their conclusion is that alone or in combination with other explanatory variables, market betas

explains little of the average return of studied stocks. On the contrary, the others variables have a better explanatory power.

One of the knocks against the APT has been the approximate nature of its pricing equation. *Chen and Ingersoll (1983)* provide some arguments for an exact pricing relationship. *Dybvig (1983) and Grinblatt and Titman (1983)* provide bounds on the approximation error, also known as the pricing error. *Robin and Shukla (1991)* provide a procedure for estimating the pricing errors of individual securities.

Shanken challenged whether the APT can be empirically verified. He contends that the nature of many of the tests are such that it is impossible to reject the theory. (*The Shanken challenge to testability of the APT*).

Unfortunately, none of these studies or other recent similar studies make an attempt to examine whether multi-index models are better as forecasters than single index models of the *future* variance covariance matrix. It would not be at all surprising if multi index models better explained the historical variance covariance matrix but led to poorer forecasting due to a change in the structure over time. Thus although recent research should encourage future work in this area, it does not provide evidence in favour of the use of multi-index models to forecast the correlation structure in portfolio analysis.

General disagreements/ contradictions

- ✓ Burmeister and McElroy estimated a linear factor model (LFM), the APT and a CAPM. They found a significant January effect that was not captured by any of the models. When they went beyond the January effect, however they rejected the CAPM in favour of the APT. In this anomaly, the returns in January are significantly larger than in any other month. Gultekin and Gultekin too tested the ability of the APT model to adjust to this anomaly and found similar result.
- ✓ Studies by Roll and Ross and by Chen among others have provided results that support the APT because the model was able to explain different rates of return, in some cases with results that were superior to that of CAPM. In contrast results by Reinganum's study do not support the APT model because it did not explain the small firm results. He addressed the APT's ability to account for the differences in average returns between small firms and large firms. His test results were clearly inconsistent with the model. The small firm portfolio experienced a positive and statistically

significant average excess return, whereas the large firm portfolio had a statistically significant negative average excess return.

✓ Dhrymes and Shanken both questioned the usefulness of the APT model because it was not able to identify the factors that determined the expected rates of return. They questioned whether the theory is testable under these conditions.

✓ Some tests of the APT model have generated mixed results. No matter how precise the model of expected return, surprises always occur, and expected returns differ from actual returns. This is because factors seldom do exactly what is forecast for them and because the idiosyncratic portion of return, $\varepsilon_i(t)$ is almost never zero.

Because of these and the importance of the topic, it is likely that testing of the model will continue.

Fundamental multi-index models

A number of multi index models have recently been developed relating security return to macro economic variables.

Chen, Roll and Ross (CRR) published the first multi index models of stock return. They hypothesized a broad set of influences that could affect security returns. Their work is based on two concepts. The first is that the value of a share of stock is equal to the present value of future cash flows to the equity holder. Thus an influence that affects either the size of future cash flows or the function (discount rates) used to value cash flow impacts price. Once a set of variables is identified the second concept comes into play. They argue that because current beliefs about these variables are incorporated in price, it is only innovations or unexpected changes in these variables that can affect return.

A series of articles, Burmeister, McElroy and others have continued the development of the multi index model building on the work of CRR. They find that five variables are sufficient to describe security returns i.e. default rate, term structure (note that it is the unexpected changes in these variables rather than their level that affect returns), unexpected inflation, unexpected changes in GNP – a proxy for the unexpected changes in long run profits for the economy, market or stock return

Chapter 3

RESEARCH METHODOLOGY

3.1 Research Design

The study surveys data on expectations to measure unanticipated changes in expectations. Information or data was collected using a representative sample of the companies trading at the NSE. Treating changes as unexpected is consistent with a rational expectation view of economic decision-making and is consistent with a large body of empirical evidence. The use of survey data has the advantage of focusing directly on expectations rather than depending on unspecified link between the measure used and expectations as justification for the measure.
Both the unexpected changes in hypothesized economic variables together with returns on portfolios represented the factors determining expected stock returns;

- ✓ Return series to measure aggregate default risk, term risk and stock market return. These served as proxies for unobservable variables, donated by R_{jt} in equation (5).
- ✓ Unexpected changes in the macroeconomic measures i.e. unanticipated changes inflation based on monthly data; the proxy for the unexpected change in the forecast of the real Gross National Product (GNP) (nominal GNP with inflation removed) or GDP i.e. FER. They were utilized as observable variables donated by g_{kt} in equation (5).

Basically the research was conducted as a survey of the returns of firms at the NSE. Procedures for the empirical tests of APT will used involved; Estimation of the expected returns and then factor coefficients from a time series data on individual asset returns; Used these estimates to test the basic cross-sectional pricing conclusion implied by the APT. Specifically, were the expected returns for these assets consistent with the common factors derived in the first step?

3.2 *Model specifications*

It is hypothesized, in the tradition of Chen, Roll, and Ross (1986), that returns are generated by a mixture of tradeable portfolios and fundamental economic factors. In general the return generating process can be written as:

$$r_{it} = E[r_i] + \sum_{j=1}^{J} \beta_{ij} (R_{jt} - E[R_j]) + \sum_{k=1}^{K} \gamma_{ik} g_{kt} + \eta_{it} \quad (1)$$

where

i. r_{it} is the return on asset i at time t (i = 1, …, N);
ii. R_{jt} is the return on tradeable portfolio j at time t;
iii. g_{kt} is the unexpected change in the k th fundamental variable at time t;
iv. β_{ij} is the sensitivity of asset i to the innovation of the j th tradeable portfolio;
v. γ_{ik} is the sensitivity of asset i to the innovation of the k th fundamental variable;
vi. η_{it} is the time-t return of asset i that is unrelated to either tradeable portfolios or fundamental variables;
vii. E [.] denotes expectation;
viii. $E[g_k] = E[\eta_i] = 0$

Note that g_k represents unexpected changes in a fundamental economic variable, and, since the expected value of an unexpected change is by definition zero, $E[g_k] = 0$.

From the Arbitrage Pricing Theory (APT) of Ross (1976), equation (1) leads to the following expression for the expected return of asset i:

$$E[r_i] = \lambda_0 + \sum_{j=1}^{J} \beta_{ij}\lambda_j + \sum_{k=1}^{K} \gamma_{ik}\lambda_k \quad (2)$$

where

1. λ_0 is the return on the riskless asset (R_F) if it exists. It is assumed it exists.
2. λ_j is the market price of sensitivity to the j th tradeable portfolio.
3. λ_k is the market price of sensitivity to the k th fundamental variable.

When variables in the return–generating process are tradeable portfolios, the APT market price of risk associated with such a portfolio is the portfolio's expected return minus λ_0. Thus $\lambda j = E[R_j] - \lambda_0$ for j=1,… J. Substituting this expression into equation (2) and recognizing that $\lambda_0 = R_f$ yields:

$$E[r_i] = R_f + \sum_{j}^{J} \beta_{ij} (R_j - R_f) + \sum_{k=1}^{K} \gamma_{ik} \lambda_k \quad (3)$$

Substituting equation (3) into Equation (1) and allowing R_f to vary over time yields:

$$r_{it} - R_{ft} = \sum_{j=1}^{J} \beta_{ij} (R_{jt} - R_{ft}) + \sum_{=1}^{K} \gamma_{ik} (\lambda_k + g_{kt}) + \eta_{it} \quad (4)$$

Rearranging equation (4) yields:

$$r_{it} - R_{ft} = \alpha_i + \sum_{j=1}^{J} \beta_{ij} (R_{jt} - R_{ft}) + \sum_{k=1}^{K} \gamma_{ik} g_{kt} + \eta_{it} \quad (5)$$

where:

$$\alpha_i = \sum_{k=1}^{k} \gamma_{ik} \lambda_k \quad (6)$$

3.3 Target population

The targeted population will consist of all quoted companies trading at the NSE.

3.4 Sampling

Sampling was done on 39 companies that actively traded at the NSE as of January 1995 to December 2002. Measures of activity included the daily stock prices quoted at the NSE and the listing of respective companies. The units of analysis were the security returns/portfolio indices and the economic indicators.

Companies were divided into subgroups /sampling units comprising various sectors of the economy. The sectors included Commercial and Services, Financial and Investment and Industrial and Allied sectors. Each sector was as homogeneous as possible in terms of the activities being carried out. Sampling from each exclusive strata was then done with an equal and known probability. The sampling frame is given as appendix A.

3.5 Data collection

The data utilized in this particular study consisted of secondary data composed of observable variables obtained both from the NSE and the CBK and the Central Bureau of Statistics databases. This covered the period January 1995 to December 2002, making a total of 96 monthly observations. They comprised stock prices and their dividends; Interest on Commercial Bank Loans & Advances; Interest on savings of Commercial banks; 91 Day Treasury bills; Inflation rate; Foreign Exchange reserves; and Exchange rate of the U.S dollar. Monthly data on the following factors that initially was to be collected was not available: government and corporate bonds, both of 20-year maturities; the 30-day treasury bills; unemployment rate; and GDP.

3.6 Data Analysis

Summary of the analysis procedure;

- ✓ Using a (maximum-likelihood) factor analysis procedure to identify the number of factors and their factor loadings, β_{ik} and γ_{ik}.
- ✓ Computing the empirical variance-covariance matrix from the returns data.
- ✓ Using the estimated factor loadings, β_{ik} and γ_{ik} to explain the cross-sectional variation of individual estimated expected returns and to measure the size and statistical significance of the estimated risk premia associated with each factor.
- ✓ After developing and parameterizing relative pricing models on stock indexes, I used the models with these parameters to analyze the performance of a sample of stocks sector funds with data over a certain time period.

The analysis involved performing tests of index and relative pricing models. To know how much of the movement in stock returns is picked up by the seven explanatory variables, I formed a stratified sample of sector funds. From the full sample of 39 stock funds I selected three stocks, one from each sector i.e. Bamburi Cement company from Industrial & Allied sector, BBK from the financial sector and NMG from the Commercial sector. The funds selected spaned the full spectrum of stocks contained in the sample.

Correlation of the matrix of excess returns on the sample with the set of explanatory variables was studied. Canonical (standard) correlation was used to examine the relationship between fund returns and the seven variables under study (i.e. an aggregate stock return index, indices representing interest on loans, interest on savings, change of Exchange rate of the U.S dollar, and the two observable expectational variables i.e. inflation, and Foreign exchange Reserves.)

The F-test was then be used to determine the number of correlations that are significantly different from zero. This procedure enabled me to select a set of variables of interest that were used to investigate the performance of a model containing the six variables and three others containing a logical subject of the six variables. By doing so I was able to judge the impact of including different types of variables on the ability of the models to explain returns and expected returns. The four models being investigated l included:

- ✓ A single index model based on an aggregate stock index *(index -I)*
- ✓ Four-index models employing not only an aggregate stock index but also three indices representing interest on both loans and Savings, and change in exchange rate of the U.S dollar. *(Index- 4)*.
- ✓ A four-index model that in addition to a change in exchange rate of the U.S dollar index and an aggregate index of stock returns, incorporates unexpected changes in macro-economic measures of inflation and Foreign exchange reserves. *(Fundamental- 4)*.
- ✓ A six-index model that incorporates all the influences contained in the second and third models *(Fundamental- 6)*.

Chapter 4

DATA ANALYSIS AND FINDINGS

4.1 EMPIRICAL RESULTS

4.1.1 Identification of the factors that influence stock returns and their relative significance in explaining returns

Test I: Likelihood Ratio Test statistics

The findings are that the APT restrictions cannot be rejected at 5% level for any of the four models under study. Because of this, it is appropriate to continue to study and to compare the APT restricted form of the four models by several pairing of the four models since some models are nested within others.

Table I Pairwise Test (Involves APT Restricted models only)

Models	$F_{0.05}$	P[b]	q[c]	$qF_{0.05}$	La	$L\text{-}qF_{0.05}$	Reject null?
Fundemental-4 vs. Fundamental-6	1.29	236	78	100.620	104.45	3.83	Yes
Index-4 vs. Fundamental-6	1.29	236	80	102.936	1433.46	1330.26	Yes
Index-1 vs. Fundamental-6	1.00	236	197	197.000	2027.47	1830.47	Yes
Index-1 vs. Fundamental-4	1.22	158	119	145.418	1923.01	1777.83	Yes
Index-1 vs. Index-4	1.23	156	117	143.325	594.00	450.09	Yes

The results of pairwise tests (Table I) show that adding return indices (i.e. interest on loans, interest on savings and change in exchange rate of the dollar) improve the ability to explain the time series pattern of returns and expected returns and that adding fundamental variables (Foreign exchange reserves, and inflation) also improves performance. It is clear that both the added return indexes and the fundamental variables are important influences in explaining the time series of returns and expected returns.

Table II : Market Price of risk associated with fundamental variables

Model	λ_{FER}	t_{FER}	λ_{INFL}	t_{INFL}	$\lambda_{ER\$}$	$t_{ER\$}$
Fundamental-4	-3.689	2.125***	-0.171	2.693*	-1.222	2.455**
Fundamental-6	-3.596	2.140***	-0.166	2.693*	-1.191	2.460**

Statistical significance at 5%***
Statistical significance at 2%**
Statistical significance at 1%*

Table II presents the λs (prices of risk) and statistical significance of the λs associated with the one return index and two fundamental variables.

In both the Fundamental-6 and Fundamental-4 models, the market price of risk (λ) associated with inflation and Foreign exchange reserves is significantly different from zero at the 1% and 5% levels respectively. The same findings were found for the Exchange rate of the dollar in both models except that the market price of risk associated with this factor was significant at 2%. This points to the importance of a model that includes these fundamental variables

Tables: III, IV, & V

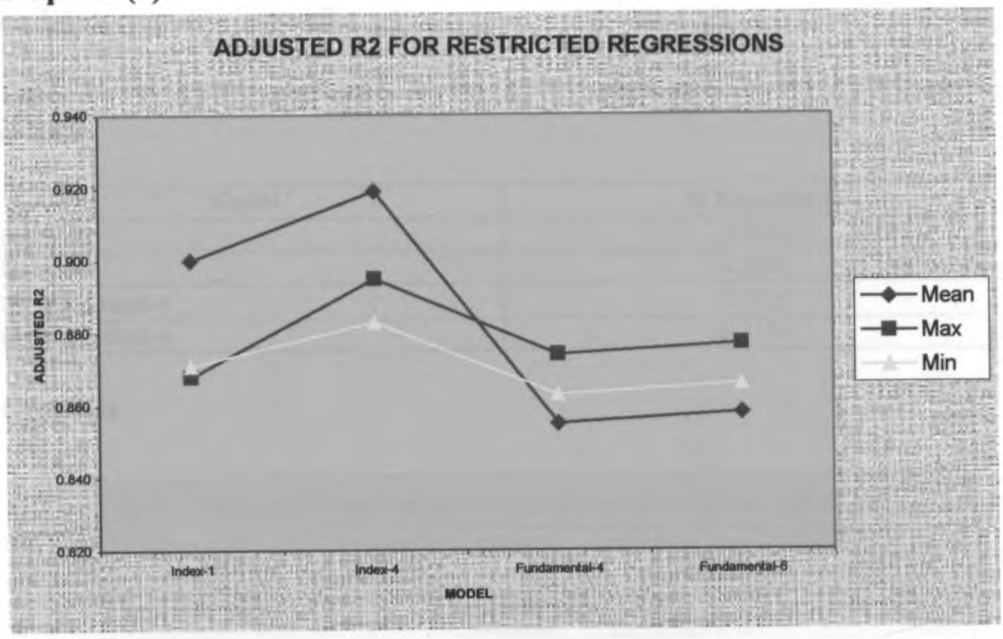
They provide additional evidence on the importance of the fundamental variables. Tables III & IV attempt to decompose into explanations of the time series and of the cross-sectional of returns.

R-squared ranges from 0 to 100 and reflects the percentage of a fund's movements that are explained by movements in its benchmark index. An R-squared of 100 means that all movements of a fund are completely explained by movements in the index. Conversely, a low R-squared indicates that very few of the fund's movements are explained by movements in its benchmark index. Thus, R-squared can be used to determine the significance of a particular beta or alpha (the higher the R-squared, the more significant alpha and beta).

Table III: Adjusted R^2 for restricted regressions (Equation-4)

Model	Mean	Max	Min
Index-1	0.900	0.868	0.871
Index-4	0.919	0.895	0.883
Fundamental-4	0.855	0.874	0.863
Fundamental-6	0.858	0.877	0.866

Graph iii (a)



Graph iii (b)

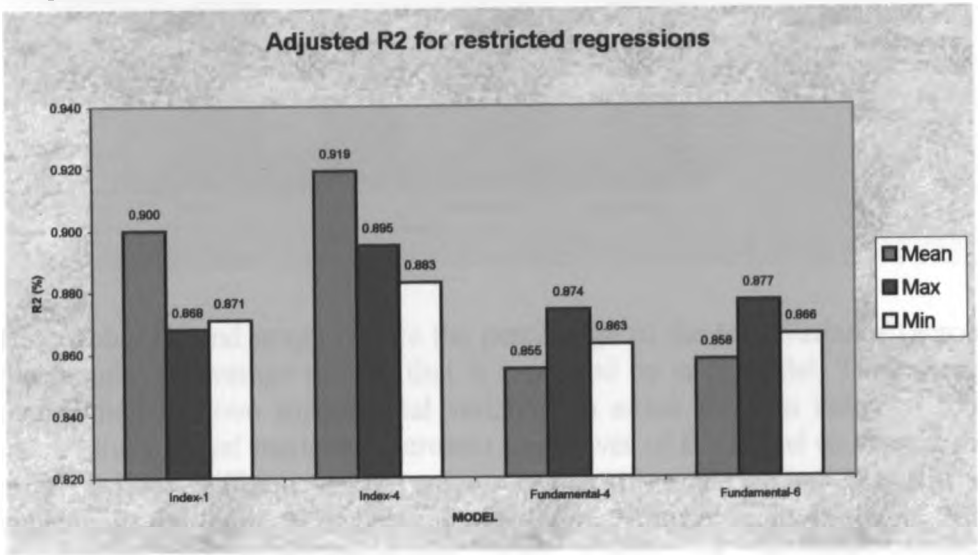


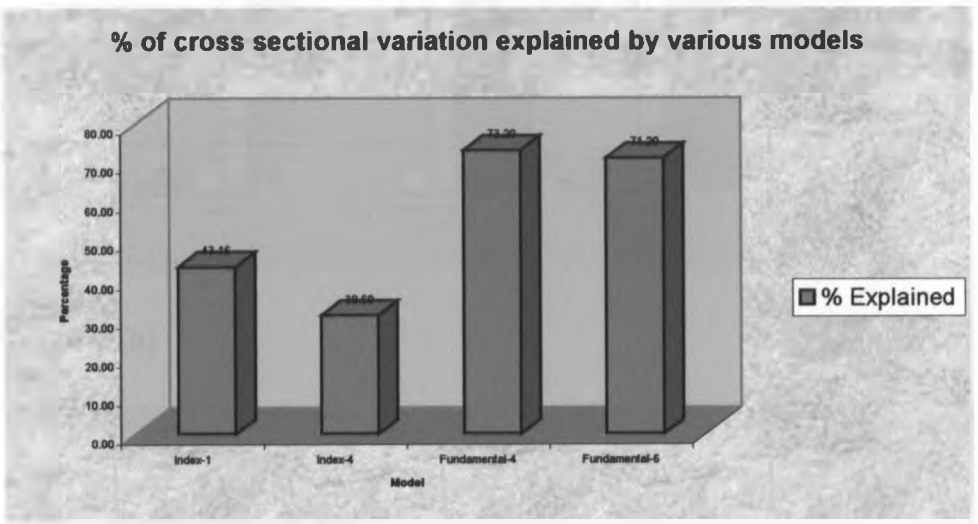
Table III and graphs iii (a & b) present the average of the time series explanatory power of each model (averaged across all portfolios). It is clear that most of the adjusted R^2 is associated with the aggregate index of stock

performance. While adding return indices for the securities on fundamental variables increases the ability of the model to explain the time series behavior of the average passive stock portfolio, the increase in rate explanatory power is small.

Table IV: Percentage of cross-sectional variation explained by various models

Model	% Explained
Index-1	0.4316
Index-4	0.3060
Fundamental-4	0.7320
Fundamental-6	0.7120

Graph iv

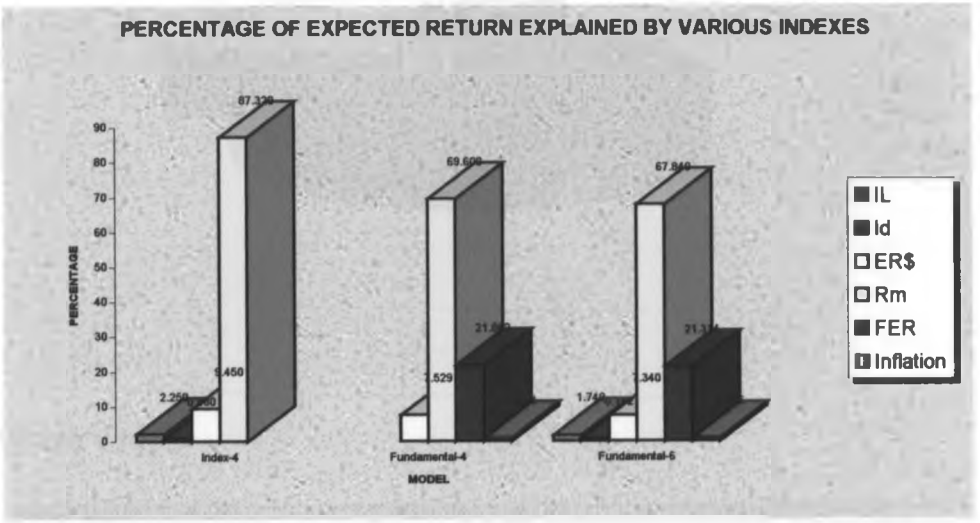


Both Table IV and graph iv give the percentage of the total variance (across the sample) of average returns that is explained by each model. They shows that adding the two fundamental variables to either the two index or four index return model markedly increases the power of the model to explain the cross sectional differences in average returns. This evidence indicates that in explaining the pattern of returns over time, return indices are of key importance, while in explaining cross section of expected returns, fundamental variables play a key role.

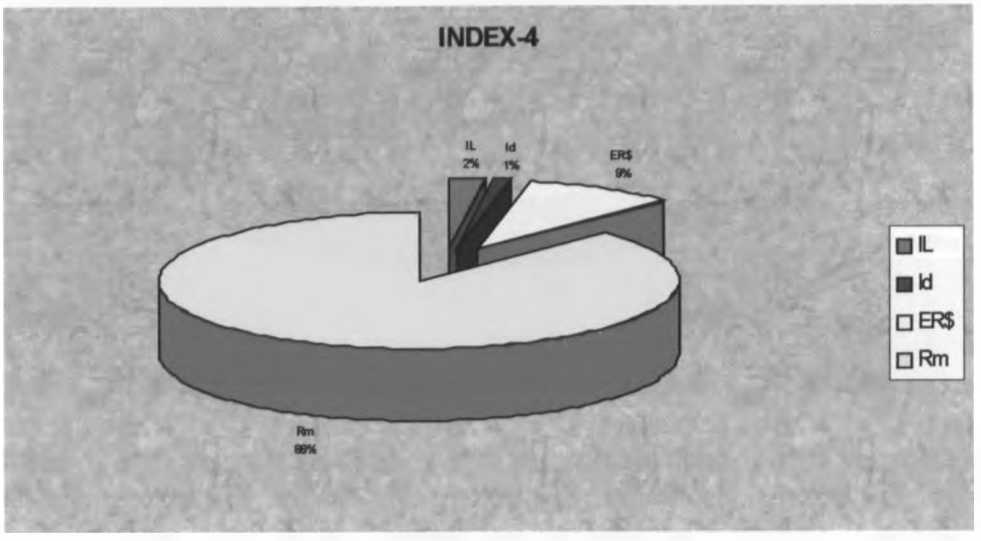
Table V: Percentage of expected return explained by various indices

Model	Interest on Loans	Interest on Deposits	Exchange rate of $	Aggregate Stock return	FER	Inflation
Index-4	2.250	0.980	9.450	87.322	N/A	N/A
Fundamental-4	N/A	N/A	7.529	69.600	21.862	1.012
Fundamental-6	1.749	0.762	7.340	67.849	21.314	0.986

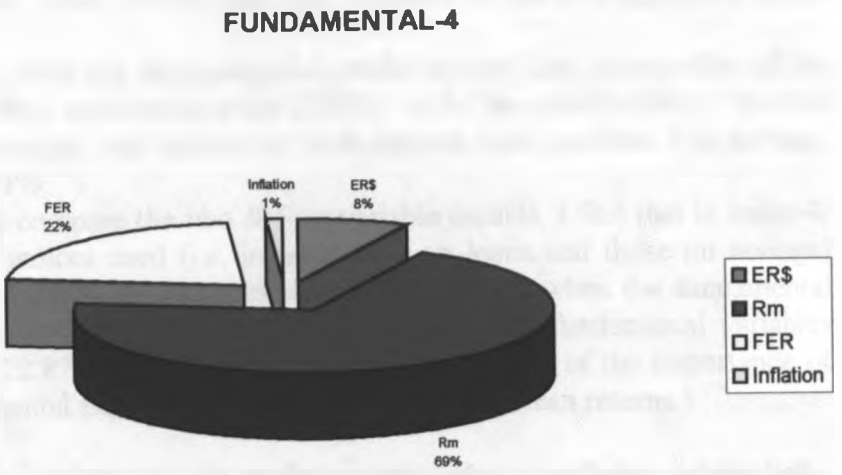
Graph v (a)



Graph v (b)



Graph v (c)



Graph v (d)

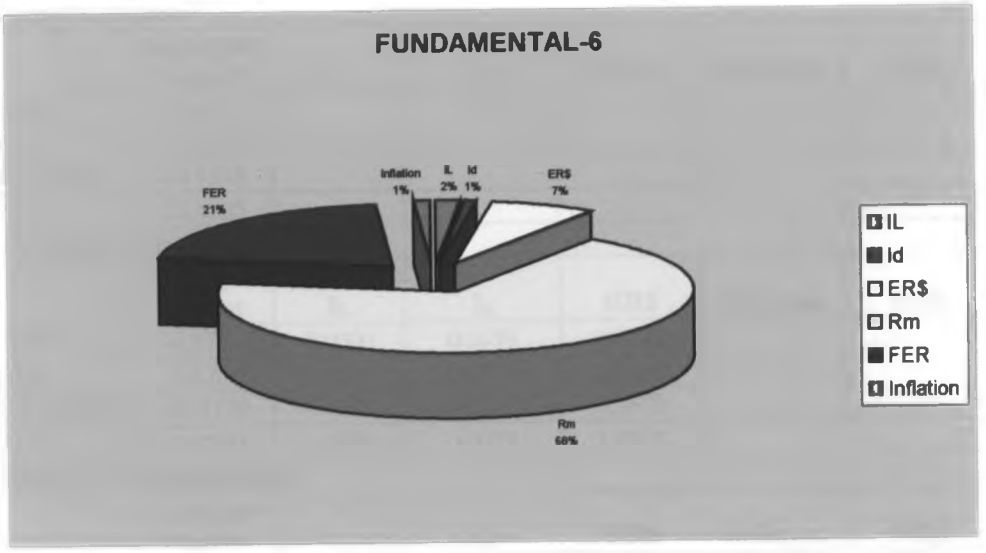


Table V and graphs v (a-d) show the influence of fundamental variables in explaining expected returns. When the aggregate stock index is employed with the three other security indices (no fundamental variables), it accounts

for 87.322% of the estimate of expected return. When fundamental variables are employed, the fraction of returns explained by fundamental variables is substantial and much greater than that explained by the non-aggregate return indices.

For example when the fundamental-6 model is used, the contribution of the two fundamental variables average 22.30% while the contribution of the two of the two security sub indices i.e. both interest rates on loans and savings, average 2.511%.

Similarly, if I compare the two & four variable models, I find that in index-4, the two sub indices used (i.e. interest rates on loans and those on savings) account for 3.23 % of return explained. In contrast when the fundamental variables are used in Fundamental-4 model, the two fundamental variables account for 22.874% of the expected return (evidence of the importance of using fundamental expectational variables to explain mean returns.)

The table also shows that the exchange rate index contributes substantially, in the index-4, Fundametal-4 and Fundamental-6 models, in explaining the mean returns. It accounts for 9.450%, 7.529% and 7.340% respectively in the three models.

Table VI: Average Sensitivities for company's funds sample

Panel A: Index-1

	Aggregate Market	I_L	I_d	ER$	Inflation	FER
NMG	-8.4365					
BBK	-14.4437					
BAMBURI	-24.9545					
ALL	-15.4895					

Panel B: Index-4

	Aggregate Market	I_L	I_d	ER$	Inflation	FER
NMG	-4.8763	0.0000	0.0659	1.8212		
BBK	-9.8705	-0.0229	0.0145	1.4018		
BAMBURI	-20.2770	-0.0176	0.0952	0.3572		
ALL	-11.4944	-0.0056	0.0078	1.0301		

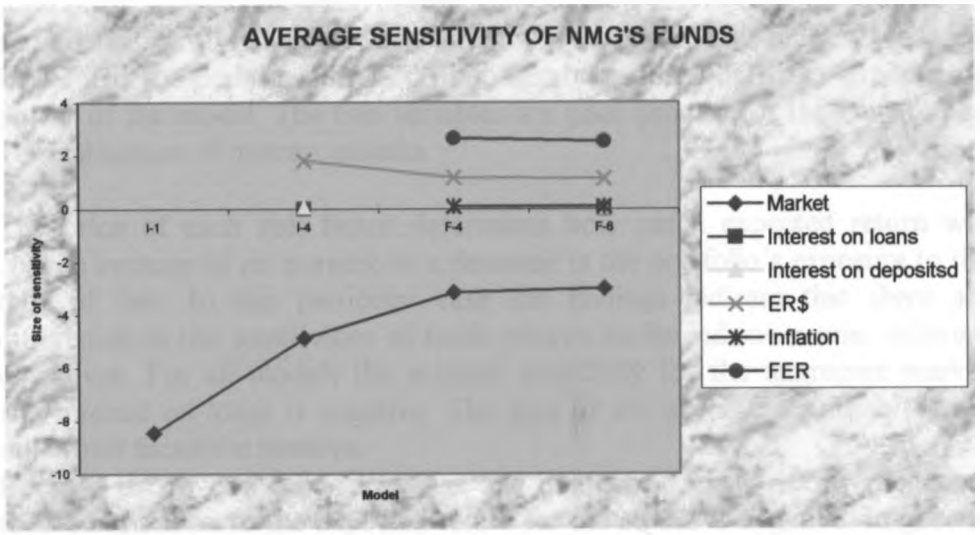
Panel C: Fundamental-4

	Aggregate Market	I_L	I_d	ER$	Inflation	FER
NMG	-3.1362			1.1725	0.0789	2.6561
BBK	-7.4495			1.0580	0.0023	2.2069
BAMBURI	-15.500			0.2729	0.3064	1.7568
ALL	-8.2667			0.7416	0.0976	2.0891

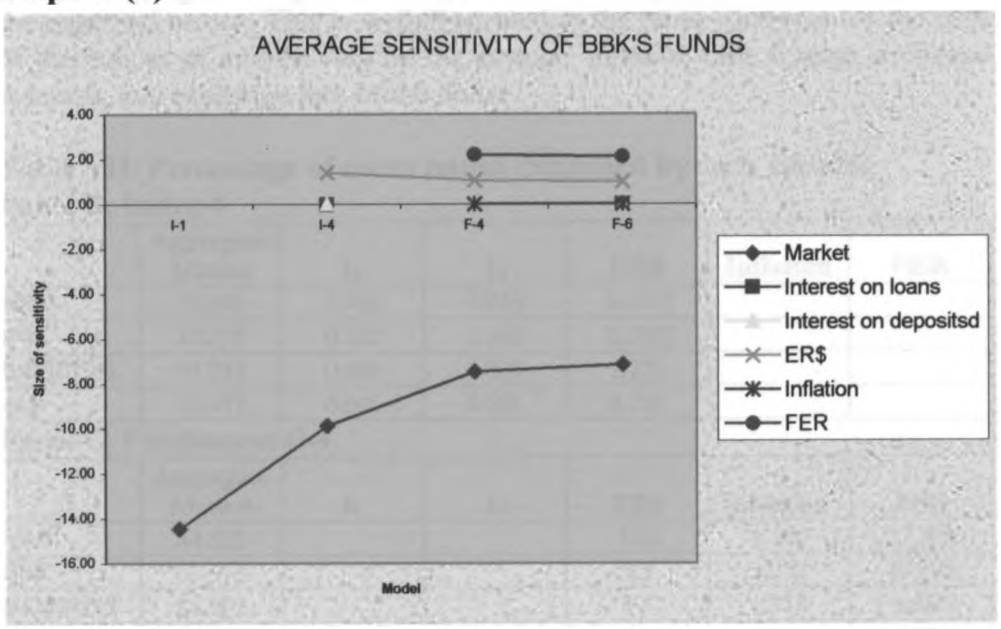
Panel D: Fundamental-6

	Aggregate Market	I_L	I_d	ER$	Inflation	FER
NMG	-3.0034	0.0000	0.0406	1.1217	0.0756	2.5436
BBK	-7.1315	-0.0165	0.0105	1.0128	0.0022	2.1127
BAMBURI	-14.6110	-0.0127	0.0685	0.2573	0.2888	1.6560
ALL	-8.0593	-0.0085	0.0232	0.5157	0.1980	2.0367

Graph vi (a)



Graph vi (b)



Panel A-D

When one examines the results across alternative models in table vi and graphs vi (a & b), it is seen that the sensitivities to the aggregate index and to the interest in both loans and deposits indexes remain reasonably constant and independent of the number of indices utilized in the regression.
The variations in the sensitivities to the fundamental variables are not substantial when comparing models that include the interest in both loans and deposits with models that exclude these variables. This indicates that the Loans and the deposit indexes do not improve substantially the explanatory power of the model. The two variables are poor proxies for the Default and Term structure of interest indexes.

The price of each risk factor determines how much expected return will change because of an increase or a decrease in the portfolio's exposure to the type of risk. In this particular case the findings indicate that there are differences in the sensitivities of funds returns to the indexes across different objectives. For all models the average sensitivity for the aggregate market and interest on loans is negative. The sign of the average sensitivity to the other four factors is positive.
Because the reward for market risk and interest on loans risk are negative, their contribution to the expected return for the stocks is negative. In general stocks with negative exposures to a risk factor have a positive contribution to the expected return. This is well illustrated in the table VI above for the case of the indices of interest rate on the savings, inflation rate, foreign exchange reserves, and exchange rate of the dollar.

Table VII: Percentage of mean return explained by each variable
Panel B: Index-4

	Aggregate Market	I_L	I_d	ER$	Inflation	FER
NMG	72.098	0.001	0.975	26.927		
BBK	87.275	0.202	0.001	12.395		
BAMBURI	97.735	0.085	0.005	1.722		
ALL	91.677	0.045	0.001	8.216		
Panel C: Fundamental-4						
	Aggregate Market	**I_L**	**I_d**	**ER$**	**Inflation**	**FER**
NMG	44.525			16.6	1.120	37.708
BBK	69.513			9.9	0.022	20.593
BAMBURI	86.902			1.5	1.718	9.850
ALL	73.843			6.6	0.872	18.661

Panel D: Fundamental-6

	Aggregate Market	I_L	I_d	ER$	Inflation	FER
NMG	44.266	0.000	0.598	16.532	1.114	37.489
BBK	69.330	0.161	0.102	9.846	0.022	20.539
BAMBURI	86.485	0.075	0.406	1.523	1.710	9.802
ALL	74.339	0.078	0.214	4.757	1.826	18.786

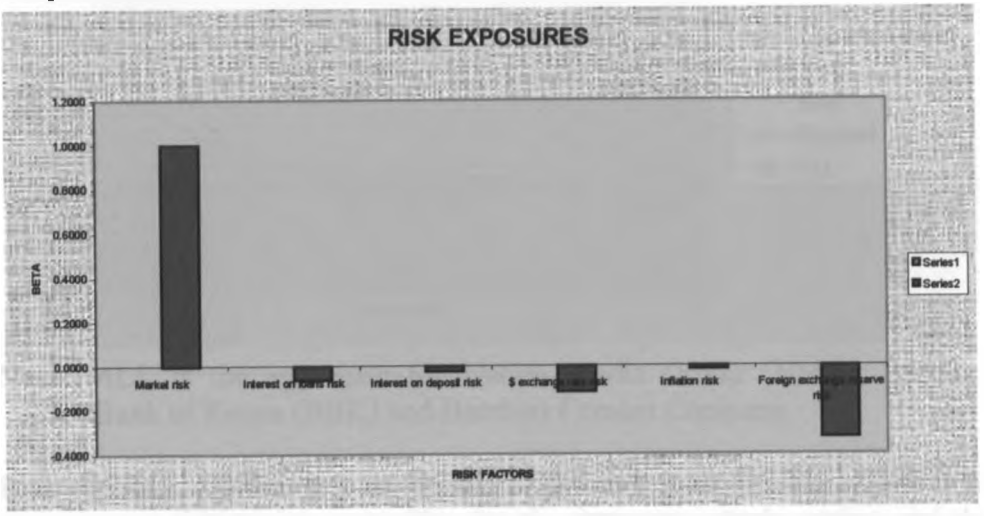
Table VII shows the average percentage of expected return explained by each factor. Consider NMG in the model Fundamental-6; about 44.27% of the return is explained by aggregate stock index. However a substantial proportion is explained by the two fundamental variables, 37.49% from FER variable and 1.114% from the inflation variable. The remaining 17.13% is explained by the other three indices with the larger portion being contributed by the exchange rate of the dollar variable. The findings indicate that the fundamental variables are important determinants of expected returns.

The results also indicate that the excess return of a portfolio to the risk free rate at the NSE is mostly explained by four factors: the excess return on a market portfolio, the unexpected change both in the Foreign exchange reserves and in inflation, and the change in the exchange rate of the U.S dollar.

4.1.2 Using the APT model to monitor performance of security returns of portfolios of some Kenyan firms trading at the NSE

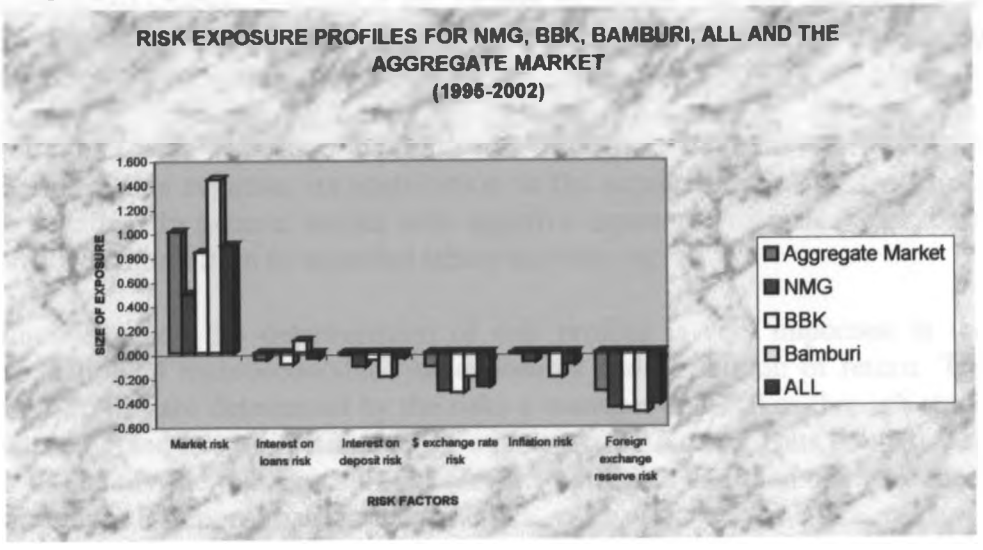
Test VIII: Evaluation of macroeconomic risk exposures and attribution of return

Graph viii (a)

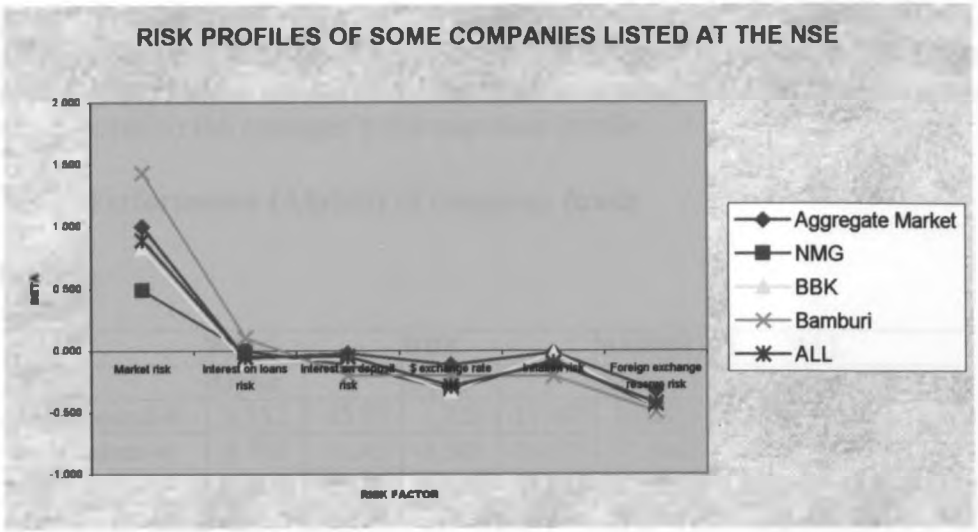


Graph viii (a) compares the risk profile of the aggregate market with those of the other risk factors. All the five risk factors have a negative size of risk exposure.

Graph viii (b)



Graph viii (c)



Note: ALL is the aggregate for Nation Media Group (NMG), Barclays Bank of Kenya (BBK) and Bamburi Cement Company.

Risk exposure profiles vary widely for stocks and portfolios. Graph viii (b & c) compares risk exposure profiles for the aggregate stock market and the three listed companies at the NSE. With the exception of the Market risk and interest on loans indexes, the three stocks i.e. NMG, BBK, Bamburi, have a negative risk exposure profile to the other risk factors. Their returns decrease with unanticipated increases in these factors i.e. interest on deposits, unexpected change in inflation and foreign exchange reserves, and change in the exchange rate of the dollar. The risk contribution of these factors to expected return is usually positive.

All stocks have a positive exposure to market risk. Because the reward for market risk is negative, its contribution to the expected return for the stocks is negative. In general stocks with negative exposures to market risk have positive contribution to expected return and vice versa.

Knowledge on the determination of risk profiles is very important in the evaluation of macroeconomic risk exposures and attribution of return. The risk profiles are determined by the risks a manager undertakes through stock selection, and in turn, determine the manager's APT style. Thus the first task is to identify the risk exposure profiles for portfolios and then compare them with those for appropriate benchmarks.

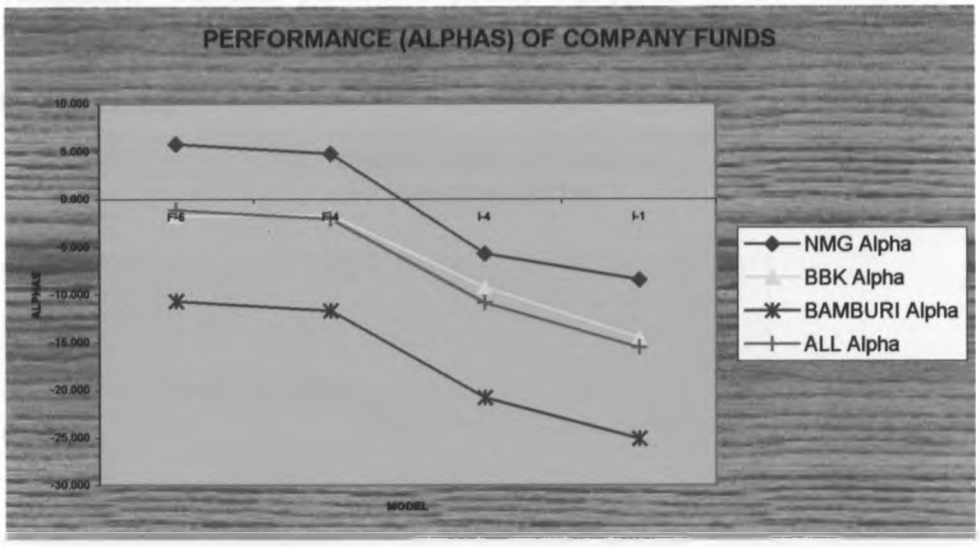
Whatever the manager's risk exposure profiles, the APT should be used to divide the mean *ex post* actual return into: (1) expected return, which is the reward for the risks taken, (2) unexpected macroeconomic factor return, which arises from factor bets and factor surprises, and (3) alpha, which arises from stock selection. More over, expected and unexpected factor return can be attributed to the manager's risk exposure profile.

IX Performance (Alphas) of company funds

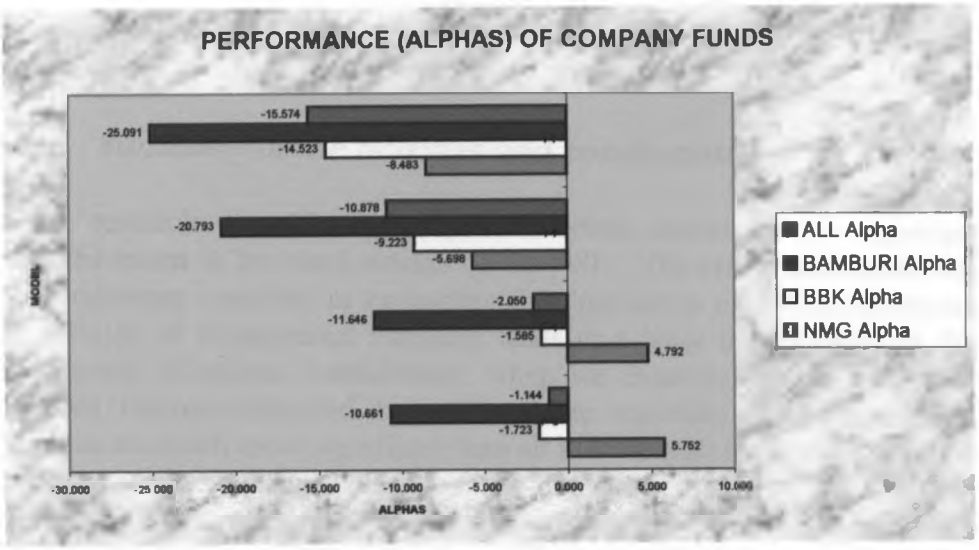
Table ix

	NMG		BBK		BAMBURI		ALL	
	Alpha	**t**	**Alpha**	**t**	**Alpha**	**t**	**Alpha**	**t**
Fundamental-6	5.752	-15.95	-1.723	-17.497	-10.661	-16.612	-1.144	-16.904
Fundamenta-4	4.792	-16.43	-1.585	-18.070	-11.646	-17.057	-2.050	-17.970
Index-4	-5.698	-33.87	-9.223	-29.113	-20.793	-22.358	-10.878	-30.748
Index-1	-8.483	-42.07	-14.523	-38.691	-25.091	-21.154	-15.574	-36.641

Graph ix (a)

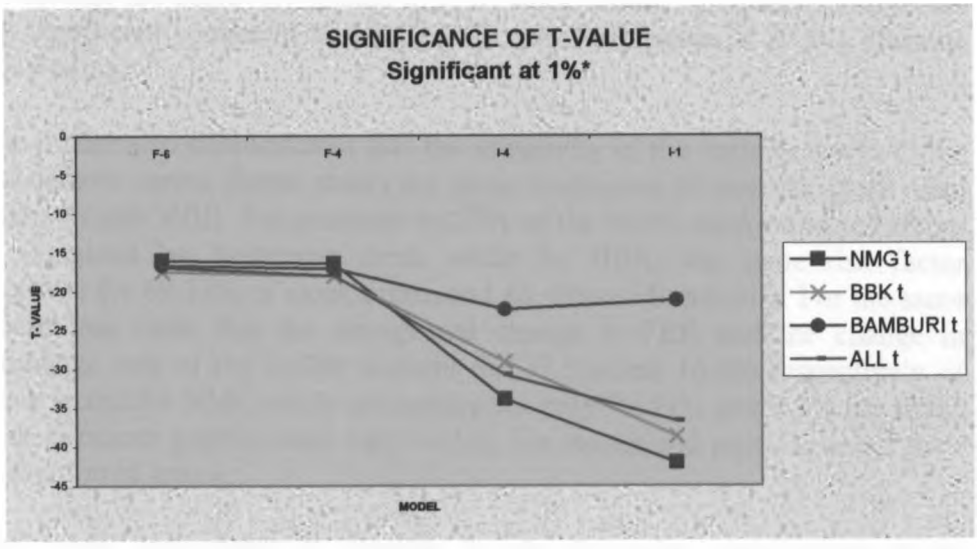


Graph ix (b)



The above graphs i.e. ix (a &b) indicate that NMG alpha is well above the ALL-alpha, the benchmark .It was the best performing company among the three followed by BBK whose performance was just slightly above the benchmark. Bamburi performed poorly compared to the benchmark as indicated by the graph.

Graph ix (c)



The results show that the t-statistic for the three companies all lie between –15 to –43 at the 1% statistical level.

Chapter 5

CONCLUSION

5.1 Summary of the findings and conclusions

In the research, the APT developed has been successful in explaining expected return in the stock market of the NSE. The return indices are the most important variables in explaining the time series of returns. However the addition of fundamental variables leads to a large improvement in the explanation of returns. Furthermore, when we examine the percentage of expected returns explained by each of the variables, the fundamental variables are much more significant than all indices with the exception of the aggregate stock index and exchange rate of the dollar index.

The research findings indicate that the APT model still holds in the emerging market of NSE. The model demonstrates that the multifactor APT approach has far greater explanatory power than the CAPM in explaining expected stock returns. In particular it shows that five factors are critical in explaining stock return at the NSE, with the Aggregate stock market return being the most important. The other four are the unexpected change in both the foreign exchange reserves and inflation rate; the change in exchange rate of the Dollar and the change in interest rate of loans. Although interest on loans and interest on savings are positively related to NSE stock returns, their relationships are not significant compared to the other factors. Both tables V & VII illustrate this finding.

The model also demonstrates that the sensitivity of the various stocks to the risk factors varies. Some stocks are more responsive to one risk factor than others (Table VIII). For example 44.27% of the NMG stock expected return is explained by Aggregate stock while for BBK, the same risk factor accounts for 69.33% of stock return and 86.49% of Bamburi's. For the same stocks one finds that the unexpected change in FER and the change in Exchange rate of the Dollar account for 37.5% and 16.5% respectively of stock return for NMG while accounting for only 20.54% and 9.8% for BBK. Risk exposure profiles thus vary widely for stocks and portfolios and their attribution of return.

The model also makes it possible for the following observations to be deduced from the research: (Tables I-IX)

- The price of each risk factor determines how much expected return will change because of an increase or decrease in the portfolios' exposure to that type of risk.
- The APT price risks can be negative. In the research findings, all are negative with the exception of that of the Aggregate stock market. Incase of inflation for example, all stocks have negative exposures to it because their returns decrease with unanticipated increases in inflation. The same applies to unexpected changes to FER, ER$, and change in interest rate of both loans and savings. In each of these cases, the risk contribution to expected return is usually positive (the negative risk exposure times the negative price for the risk factor equals a positive contribution to expected return.)
- All the stocks used in the research have a positive exposure to the Aggregate market risk ($\beta m > 0$) and thus when the aggregate market price rises relative to the price of 90 day Treasury bills, their return increases. Because the reward for the Aggregate Market risk is negative, (Table IV), Aggregate Market's contribution to the expected return for such stocks is negative.
- The market price of risk (Table II) for both the models F-4 and F-6, associated with the fundamental variables FER, Inflation and ER$ are all significantly different from zero at the 1-5% levels. Their t-values range from 2.125-2.693.This points to the importance of these factors to the APT model in explaining expected stock return at the NSE. This research finding leads to the rejection of the null hypothesis both at the 95-99% confidence level. This means that expected return, a measure of stock fund performance, is influenced by fundamental economic variables.
- The value of the excess returns (the Alphas) of the three companies trading at the NSE, i.e. NMG, BBK, and Bamburi, lie between 5.752 and -25.091 with their t-values of between –15.95 and –42.07. All are thus significantly different from zero at 1% statistical level. The null hypothesis is thus once again rejected at the 99% confidence level implying that the expected return, a measure of stock fund performance is influenced by fundamental economic variables.
- The APT could be used to form portfolios designed to track particular well diversified benchmarks; ALL in graphs ix (a-c). The tracking portfolio is constructed by forming a portfolio with a matching risk exposure profile. The ex post APT alpha can be made small by making the tracking portfolio well diversified so that the portfolio-specific return call it ε_p is near zero. Using ALL as the tracking benchmark, the model demonstrates that NMG was the best

performing stock among the three followed by BBK and lastly Bamburi.

5.2 *Limitations of the study*

- Reliability of the data
  - ✓ There is survivor bias in the database used to test the model. Database, used in studies was more likely to include distressed firms that survived and to missed distressed firms that failed. This would be the reason why the average returns on distressed stocks are overstated.
  - ✓ Data snooping could be a second argument in favor of the lack of reliability of the data. An extrapolation of data can lead to false conclusions. The systematic use of the same data when studying CAPM/APT and its anomalies may explain why asset-pricing researchers find similar patterns in average returns that are specific to the sample and inconsistent with CAPM/APT.
  - ✓ The tests used poor proxies for the GDP, Default risk and term structure of interest. The argument for poor proxies exposes the shortcomings of empirical proxies for the three factors. Choice of these proxies was necessitated by lack of data on the above explanatory factors.
- Time frame determined the number of time series observations affecting the number of factors discovered.
- It was difficult to identify the actual number of factors that characterize the return generating process. When the model is applied to portfolios of different sizes, the number of factors changed.

5.3 *Suggestions for future research*

Although the model has determined empirically that it captures some important effects at the NSE, an emerging market, the model described here can in future be enhanced in several ways. This may involve:

- Allowing the risk exposures, the β_{ij}'s, to vary over time.
- Use of data of certain economic indicators which was originally not available. This will be made possible with the further development of the Bond market that has started trading on long term Corporate and government bonds. This will enable one to obtain monthly data on the above long term Bonds. It is also hoped that other data will be made available by such organizations as the Central Bureau of

Statistics, the Central Bank of Kenya etc. Such data may include monthly returns of GDP, unemployment rate, etc.

- Introducing additional factors with zero risk prices, which are typically used to capture industry and sector effects. Although such non-priced factors do not contribute to expected return, they help to explain volatility, and they provide managers with a tool to evaluate the diversification of their portfolios. This may entail going beyond the traditional multi-factor approach of including macroeconomic factors. This will involve using such factors as:
    i. Market-based financial measures such as PE and Price to Book Value ratios.
    ii. Measures of the legal environment. Any one of three measures of the legal environment should be included. These are measures of enforceability of contracts, rule of law, and corruption.
    iii. Measures of corporate governance. To be included is a compound measure of shareholders' rights. Although largely ignored until the recent Asian financial crisis, issues of corporate governance and investor protection matter. Recent research as well as statistical analysis strongly suggest that investors require a return on this variable and that it should be accounted for in a multi-factor asset-pricing model

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APPENDIXES

A. Sample Frame

Commercial and services

1. A. Baumman
2. Car & General (K) Ltd
3. CMC Holdings Ltd
4. Express Ltd.
5. Kenya Airways
6. Marshals (EA) Ltd.
7. National Media group
8. Pearl Dry Cleaners
9. Tourism promotion services
10. Uchumi supermarkets
11. Standard Newspaper

The Finance & Investment sector

1. Barclays Bank Ltd
2. C.F.C Bank Ltd
3. City Trust
4. Diamond Trust Bank Ltd
5. Housing Finance Co. Ltd
6. I.C.D.C Investment Co. Ltd.
7. Jubilee Insurance Co. Ltd.
8. Kenya Commercial Bank Ltd
9. National Bank of Kenya Ltd
10. NIC Bank Ltd
11. Pan African Insurance Ltd
12. Standard BankLtd.

The Industrial & Allied Sector

1. Athi River mining Co.
2. BOC Kenya Ltd
3. Bamburi Cement Ltd
4. BAT Kenya Ltd
5. Carbacid Investment Ltd
6. Crown Berger Ltd
7. Dunlop Kenya Ltd
8. E.A Cables Ltd
9. E.A Packaging
10. E.A Portland cement Ltd.
11. E.A Brewery Ltd
12. Firestone E.A Ltd
13. Kenya Oil Co. Ltd
14. Kenya National Mills
15. KPL Ltd
16. Total Kenya Ltd
17. Unga Group Ltd

B. ECONOMIC INDICATORS

1995	Month	91 Day T. Bill	Interest on Commercial Bank loans & Advances	Interest on Savings of Commercial Banks	Inflation Rate	Foreign exchange Reserves (U.S $ 000)	R_{fer}	Exchange Rate of U.S $	$R_{\$}$
	Jan	17.93	25.32	15.68	3.6	44740	-	44.47	-
	Feb	17.63	24.34	15.51	1.4	45251	1.14	44.14	-0.74
	March	16.84	23.61	14.9	-0.7	46554	2.88	43.55	-1.34
	April	15.16	23.32	12.15	-3.7	44912	-3.53	45.89	5.37
	May	15.85	23.1	11.81	-1.9	51007	13.57	54.04	17.76
	Jun	16.77	22.74	11.62	0.2	51832	1.62	54.63	1.09
	July	18.46	22.36	11.51	-0.5	49705	-4.1	55.83	2.2
	Aug.	19.64	24.18	11.6	1.3	51890	4.4	55.32	-0.91
	Sept.	21.16	25.6	12.04	4	50347	-2.97	55.47	0.27
	Oct.	24.07	27.34	11.93	3.3	50040	-0.61	55.5	0.05
	Nov.	24.87	28.38	11.85	5.6	46340	-7.39	55.78	0.5
	Dec.	21.67	28.99	12.09	6.9	49263	6.31	55.94	0.29
1996	Jan	21.3	27.81	12.35	6.4	52415	6.4	59.53	6.42
	Feb	25.96	27.79	12.3	5.7	53845	2.73	58.39	-1.92
	March	26.68	28.06	13.02	6.5	57619	7.01	58.39	0
	April	24.2	27.99	12.63	7.3	60006	4.14	58.33	-0.1
	May	22	28.06	13.6	7.1	63025	5.03	58.2	-0.22
	Jun	21.9	28.32	13.74	9.8	70504	11.87	57.42	-1.34
	July	21.75	28.15	13.72	11.2	69200	-1.85	57.24	-0.31
	Aug.	21.6	28.18	13.56	11	68761	-0.63	56.92	-0.56
	Sept.	23.15	28.44	13.93	10.4	65139	-5.27	56.11	-1.42
	Oct.	24.08	28.54	14.12	10.8	67076	2.97	55.69	-0.75
	Nov.	22.09	28.7	14.21	11.4	66793	-0.42	55.4	-0.52
	Dec.	21.51	28.58	14.49	10.8	70709	5.86	55.02	-0.69
1997	Jan	21.61	28.81	14.09	10.8	68142	-3.63	54.71	-0.56
	Feb	21.47	28.6	14.05	11.9	74291	9.02	54.99	0.51
	March	21.42	28.57	14.05	15.7	81988	10.36	54.71	-0.51
	April	21.02	28.57	13.99	16.1	86062	4.97	55.49	1.43
	May	20.35	27.26	12.43	17.2	81985	-4.74	53.45	-3.68
	Jun	19.56	27.49	10.59	12.8	83530	1.88	54.46	1.89
	July	18.45	26.86	10.79	8.9	84722	1.43	58.91	8.17
	Aug.	19.7	26.48	10.82	7.7	83248	-1.74	65.92	11.9
	Sept.	26.19	28.21	10.71	8.8	79072	-5.02	62.28	-5.52
	Oct.	27.14	29.07	10.92	8.7	76837	-2.83	63.99	2.75
	Nov.	26.78	29.8	10.19	8.2	80302	4.51	63.54	-0.7
	Dec.	26.37	29.85	9.73	8.3	85457	6.42	62.68	-1.35
1998	Jan	26.28	29.81	9.77	11.3	82918	-2.97	60.04	-4.21
	Feb	26.33	29.9	9.77	12.3	83214	0.36	59.99	-0.08
	March	26.74	30.2	9.8	8.1	86467	3.91	59.89	-0.17
	April	26.98	30.41	10.81	7	83182	-3.8	59.71	-0.3
	May	26.38	30.54	11.23	4.6	81087	-2.52	63.06	5.61
	Jun	25.48	30.46	12.27	7.4	76559	-5.58	59.48	-5.68
	July	24.67	30.67	11.56	11.7	76387	-0.22	59.05	-0.72

	Aug.	23.74	29.77	10.81	5.2	80160	4.94	59.54	0.83
	Sept.	22.48	29.08	10.46	4	79002	-1.44	60.04	0.84
	Oct.	20.59	29.09	9.77	3.3	76451	-3.23	59.73	-0.52
	Nov.	17.66	28.12	9.46	3	77291	1.1	60.05	0.54
	Dec.	12.56	26.13	7.89	2.5	65598	-15.13	61.91	3.1
1999	**Jan**	10.7	23.67	6.54	-1.1	64913	-1.04	61.75	-0.26
	Feb	8.95	22.84	5.93	-0.5	64613	-0.46	63.74	3.22
	March	8.85	21.36	5.49	1.3	67480	4.44	64.91	1.84
	April	9.03	20.9	4.14	1.4	69528	3.03	67.72	4.33
	May	9.63	20.86	4.52	2.1	66404	-4.49	70.5	4.11
	Jun	11.44	20.7	4.57	1.8	70590	6.3	72.91	3.42
	July	14.47	21.12	5.15	-0.6	74289	5.24	74.23	1.81
	Aug.	14.84	21.93	4.81	6.9	74705	0.56	75.17	1.27
	Sept.	15.78	22.44	5.35	7.2	78760	5.43	77.07	2.53
	Oct.	17.63	23.12	5.72	8.2	79301	0.69	75.19	-2.44
	Nov.	18.14	24.43	6.04	8.3	79796	0.62	74.66	-0.7
	Dec.	19.97	25.19	6.15	8	80419	0.78	72.93	-2.32
2000	**Jan**	20.3	25.14	6.42	8.7	84578	5.17	72.81	-0.16
	Feb	14.84	25.39	6.04	5.7	87765	3.77	73.4	0.81
	March	11.28	23.79	5.14	3.4	86911	-0.97	74.87	2
	April	12.44	23.44	5.3	4.1	89415	2.88	74.86	-0.01
	May	11.22	23.4	4.77	5.2	93105	4.13	76.7	2.46
	Jun	10.47	23.11	4.89	6	94806	1.83	77.95	1.63
	July	9.9	22.39	4.71	6.7	93165	-1.73	74.56	-4.35
	Aug.	9.25	21.23	4.53	5.9	98702	5.94	77.62	4.1
	Sept.	10.36	20.57	4.36	7.1	102080	3.42	78.99	1.77
	Oct.	10.65	20.22	4.31	6.6	102443	0.36	79.36	0.47
	Nov.	11.17	19.79	4.36	7.7	107730	5.16	79.3	-0.08
	Dec.	12.9	19.6	4.51	7.5	109037	1.21	78.04	-1.59
2001	**Jan**	14.76	20.27	4.67	12	115340	5.78	78.06	0.03
	Feb	15.3	20.3	4.63	10.2	112748	-2.25	78.01	-0.06
	March	14.97	20.19	4.66	9.5	112774	0.02	77.99	-0.03
	April	12.9	19.56	4.64	9	116855	3.62	77.55	-0.56
	May	10.52	19.2	4.42	6.9	117098	0.21	78.52	1.25
	Jun	12.07	19.26	4.39	4.6	115777	-1.13	78.99	0.6
	July	12.87	19.71	4.34	4.2	115334	-0.38	78.88	-0.14
	Aug.	12.84	19.54	4.43	4	115919	0.51	78.98	0.13
	Sept.	12.39	19.44	4.89	3.1	117393	1.27	79.02	0.05
	Oct.	11.63	19.77	4.37	3.2	113125	-3.64	79.08	0.08
	Nov.	11.5	19.44	4.35	2.1	111512	-1.43	78.97	-0.14
	Dec.	11.01	19.49	4.4	1.8	114563	2.74	78.6	-0.47
2002	**Jan**	10.85	19.3	4.42	0.4	113267	-1.13	78.6	0
	Feb	10.61	19.18	3.54	1.1	113195	-0.06	78.11	-0.62
	March	10.14	18.86	3.71	1.9	115383	1.93	78.06	-0.06
	April	10.01	18.69	4.12	0.9	118145	2.39	78.33	0.35
	May	9.04	18.54	4.02	1.7	117067	-0.91	78.32	-0.01
	Jun	7.34	18.38	4.8	2.8	123042	5.1	78.78	0.59
	July	8.63	18.12	3.89	2.1	124872	1.49	78.7	-0.1

Aug.	8.34	18.11	3.74	1.8	123432	-1.15	78.6	-0.13
Sept.	7.6	18.14	3.53	1.8	122230	-0.97	78.8	0.25
Oct.	8.07	18.34	3.79	1.9	121646	-0.48	79.3	0.63
Nov.	8.3	18.05	3.81	2.7	120594	-0.86	79.6	0.38
Dec.	8.38	18.34	3.47	4.1	120250	-0.29	79.5	-0.13

C. STOCK RETURNS
1995-2002
(Dividends & come dividends inclusive)

Year 1995		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
Commercial and services	1	A. Baumman	41.00	42.50	43.50	45.00	45.13	43.13	45.75	48.50	44.63	47.50	47.88	46.88
	2	Car & General (K) Ltd	18.73	17.85	17.88	18.13	18.23	20.28	21.63	22.00	19.70	20.25	20.13	20.38
	3	CMC Holdings Ltd	70.00	60.00	54.50	56.50	48.88	47.50	44.00	39.13	37.50	49.25	60.00	54.00
	4	Express Ltd.	95.00	79.50	71.75	71.00	71.75	74.75	80.50	80.25	72.00	75.75	98.75	82.50
	5	Kenya Airways	-	-	-	-	-	-	-	-	-	-	-	-
	6	Marshals (EA) Ltd.	41.00	41.25	41.75	42.13	41.00	40.38	38.75	37.00	37.50	37.88	39.00	38.00
	7	National Media group	79.25	76.35	84.00	84.50	79.25	82.00	82.50	73.75	67.50	77.50	92.00	93.75
	8	Pearl Dry cleaners	12.25	9.78	5.00	-	-	-	11.15	11.53	11.00	11.33	5.00	-
	9	Standard Newspaper	15.98	13.70	14.15	12.48	11.30	13.00	14.48	11.60	12.68	10.95	12.05	12.95
	10	Tourism promotion services (Serena)	-	-	-	-	-	-	-	-	-	-	-	-
	11	Uchumi supermarkets	60.00	57.00	56.50	55.00	49.13	47.00	45.13	44.38	44.13	45.25	44.75	41.63
The Finance & Investment	1	Barclays Bank Ltd	147.00	185.50	178.50	140.00	139.00	137.50	137.50	134.50	128.00	139.00	159.00	149.00
	2	C.F.C Bank Ltd	136.00	367.50	135.00	35.88	36.50	32.75	30.00	28.88	27.38	25.75	28.50	28.75
	3	City Trust	26.00	26.38	25.78	27.50	27.88	28.00	28.13	28.25	27.63	26.75	27.25	-
	4	Diamond Trust Bank Ltd	71.00	59.50	58.34	61.25	63.50	61.50	63.25	55.38	49.38	53.75	55.50	51.50
	5	Housing Finance Co. Ltd	24.25	27.63	24.60	21.25	22.50	24.50	24.88	24.25	24.38	27.25	27.50	25.50
	6	I.C.D.C Investment Co. Ltd.	44.88	42.75	36.11	32.00	30.38	28.88	31.88	31.88	29.90	33.63	34.88	31.50
	7	Jubilee Insurance Co. Ltd.	58.00	58.75	58.52	49.25	49.25	45.63	43.75	45.00	41.38	44.25	52.13	49.50
	8	Kenya Commercial Bank Ltd	75.00	72.50	64.78	63.25	67.50	67.00	67.75	69.75	69.50	79.50	84.50	83.00
	9	National Bank of Kenya Ltd	22.13	22.75	21.67	20.60	20.88	21.50	21.88	22.25	21.75	23.50	23.00	23.25
	10	NIC Bank Ltd	52.25	50.38	48.54	39.75	40.13	41.50	42.75	44.25	41.88	45.75	49.13	47.63
	11	Pan African Insurance Ltd	59.50	59.75	59.18	55.50	66.25	65.50	51.25	49.50	47.88	50.50	54.00	59.75
	12	Standard Bank Ltd	67.50	65.75	64.85	52.00	51.00	36.98	52.75	51.75	47.25	50.13	55.75	51.50
The Industrial & Allied	1	Athi River mining Co.	-	-	-	-	-	-	-	-	-	-	-	-
	2	BOC Kenya Ltd	99.00	96.00	62.00	78.00	66.25	62.00	63.00	68.75	69.25	68.50	80.50	88.50
	3	Bamburi Cement Ltd	62.50	58.00	35.25	63.75	50.50	35.25	31.63	34.50	31.00	29.38	34.13	35.75
	4	BAT Kenya Ltd	190.00	147.50	109.50	129.00	120.50	109.50	108.00	95.25	96.50	94.25	103.50	93.50
	5	Carbacid Investment Ltd	98.75	96.50	77.75	77.50	74.00	77.75	84.75	86.50	82.00	84.00	96.50	92.50
	6	Crown Berger Ltd	23.75	21.63	18.55	19.63	18.85	18.55	19.75	20.50	21.50	23.50	24.75	22.13
	7	Dunlop Kenya Ltd	-	251.00	250.00	249.50	252.50	250.00	237.50	252.50	253.00	254.00	-	-
	8	E.A Cables Ltd	45.38	44.25	31.13	41.13	-	31.13	29.75	31.75	34.38	38.00	40.88	38.88
	9	E.A Packaging	-	-	97.50	109.50	103.00	97.50	91.75	82.50	75.75	72.25	76.00	75.50
	10	E.A Portland cement Ltd.	-	47.13	55.50	50.75	51.75	55.50	51.75	50.50	51.13	54.50	53.75	52.50
	11	E.A Brewery Ltd	92.50	72.50	67.50	60.00	88.00	67.50	67.00	59.75	63.00	68.25	65.25	59.50
	12	Firestone E.A Ltd	36.00	29.38	25.50	26.50	25.13	25.50	24.63	24.50	24.38	23.63	25.88	24.75
	13	Kenya Oil Co. Ltd	59.25	58.00	62.00	59.25	64.75	62.00	59.50	59.00	58.00	61.25	60.50	60.75

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	14	Kenya National Mills	42.38	39.75	46.63	46.13	48.75	46.63	51.75	55.00	47.25	49.75	54.25	51.00
	15	KPL Ltd	81.00	79.75	117.00	101.00	110.50	117.00	118.00	115.00	105.50	110.00	133.00	155.50
	16	Total Kenya Ltd	222.50	202.50	141.00	134.00	136.50	141.00	142.50	127.00	113.50	136.00	168.00	171.50
	17	Unga Group Ltd	86.00	75.50	110.00	93.50	99.75	110.00	123.00	115.00	100.25	114.00	134.00	141.00
Year 1996	1	A. Baumman	47.00	45.38	37.00	35.25	34.88	34.38	34.63	34.00	35.00	35.00	33.00	33.00
Commercial and services	2	Car & General (K) Ltd	21.00	20.63	20.50	20.38	20.50	20.63	21.75	22.38	20.75	20.13	20.00	20.00
	3	CMC Holdings Ltd	54.50	59.25	62.00	64.00	59.75	59.75	61.25	61.50	61.00	64.00	61.75	65.00
	4	Express Ltd.	84.75	74.75	69.50	70.00	72.25	76.25	83.75	81.50	81.00	81.25	93.00	88.00
	5	Kenya Airways	-	-	-	-	-	6.03	11.55	10.88	10.35	9.73	9.13	8.73
	6	Marshals (EA) Ltd.	36.63	38.13	38.50	38.75	38.25	37.88	38.50	45.50	46.50	47.25	47.00	47.75
	7	National Media group	100.75	99.25	89.00	77.75	82.75	89.50	97.50	99.25	104.00	106.50	105.50	106.00
	8	Pearl Dry cleaners	12.25	12.35	12.00	11.88	10.63	9.48	-	10.63	9.48	9.93	9.95	9.85
	9	StandardNewspaper	11.03	13.15	12.50	12.15	10.33	10.00	10.53	9.55	8.48	7.78	8.73	8.33
	10	Tourism promotion services	-	-	-	-	-	-	-	-	-	-	-	-
	11	Uchumi supermarkets	40.25	40.38	38.00	35.63	35.25	37.00	21.00	38.75	40.13	45.00	47.63	48.38
The Finance & Investment	1	Barclays Bank Ltd	148.50	146.15	127.00	118.00	118.00	114.50	113.00	103.50	110.50	100.50	94.00	97.25
	2	C.F.C Bank Ltd	19.25	26.13	26.00	23.25	23.50	22.00	22.25	19.03	20.60	18.65	18.75	18.78
	3	City Trust	25.50	26.88	27.00	26.63	-	28.25	30.38	30.00	32.00	31.00	27.63	26.75
	4	Diamond Trust Bank Ltd	-	50.50	50.00	45.00	42.25	41.50	43.75	44.25	36.63	40.00	33.50	33.25
	5	Housing Finance Co. Ltd	26.00	25.88	23.00	22.08	23.25	24.00	24.88	24.63	26.50	22.38	20.13	18.88
	6	I.C.D.C Investment Co. Ltd.	32.50	33.63	32.00	30.75	33.13	32.75	32.25	29.88	31.75	33.50	33.15	32.38
	7	Jubilee Insurance Co. Ltd.	47.00	45.00	52.00	55.00	46.75	42.88	42.75	39.63	39.50	38.25	35.88	33.50
	8	Kenya Commercial Bank Ltd	81.75	84.50	85.50	66.50	58.00	53.50	53.75	55.50	55.00	53.75	56.25	71.00
	9	National Bank of Kenya Ltd	23.88	20.63	20.50	17.48	17.30	17.38	16.30	17.38	17.00	15.13	14.00	13.50
	10	NIC Bank Ltd	49.50	53.00	51.50	49.00	45.75	42.75	41.50	39.63	41.75	40.25	39.50	39.50
	11	Pan African Insurance Ltd	62.75	63.50	65.00	64.50	66.75	64.50	64.75	61.25	59.50	57.00	-	50.00
	12	Standard Bank Ltd	51.63	50.75	47.50	44.38	47.25	49.63	47.25	46.50	45.00	45.63	46.50	47.25
The Industrial & Allied	1	Athi River mining Co.	-	-	-	-	-	-	-	-	-	-	-	-
	2	BOC Kenya Ltd	86.75	79.50	79.00	-	71.75	68.50	64.25	62.50	61.00	-	66.25	65.25
	3	Bamburi Cement Ltd	33.25	36.13	32.00	28.50	29.13	30.88	30.50	29.00	29.38	28.50	28.50	29.13
	4	BAT Kenya Ltd	89.50	80.25	67.00	67.50	68.25	72.25	69.75	69.25	67.50	64.75	61.75	62.00
	5	Carbacid Investment Ltd	95.25	101.00	98.50	70.00	78.50	83.50	82.50	86.50	87.50	96.50	81.00	81.25
	6	Crown Berger Ltd	21.50	21.25	21.00	19.23	16.48	15.98	16.58	12.75	10.15	10.25	10.20	9.60
	7	Dunlop Kenya Ltd	253.50	252.00	270.50	250.00	250.00	250.00	253.00	251.00	259.50	260.00	257.50	257.50
	8	E.A Cables Ltd	36.88	36.75	36.50	35.00	30.00	32.63	35.88	34.00	34.25	32.75	31.75	30.75
	9	E.A Packaging	72.00	75.00	74.00	70.50	69.50	69.50	68.50	70.00	70.50	70.50	69.00	-

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	10	E.A Portland cement Ltd.	56.00	130.00	126.00	18.03	20.65	25.50	26.50	24.63	23.00	21.88	23.50	22.00
	11	E.A Brewery Ltd	53.00	49.00	45.00	41.25	42.88	45.25	46.50	46.50	46.50	48.00	47.75	51.75
	12	Firestone E.A Ltd	24.13	24.38	22.50	21.50	22.88	24.75	26.75	25.75	26.88	26.50	26.63	28.25
	13	Kenya Oil Co. Ltd	65.00	66.50	68.50	72.00	69.00	-	-	-	-	69.00	-	50.00
	14	Kenya National Mills	51.00	46.38	48.50	43.38	48.50	46.50	49.00	48.50	48.00	50.00	47.00	44.13
	15	KPL Ltd	172.00	127.75	84.50	81.50	81.25	90.50	100.25	98.00	107.50	121.00	127.00	137.00
	16	Total Kenya Ltd	170.50	170.00	171.50	169.00	127.50	89.00	84.00	78.25	73.00	70.50	65.50	64.00
	17	Unga Group Ltd	144.00	144.00	151.00	151.00	152.50	154.00	148.00	153.50	156.50	162.50	158.50	159.00
Year 1997	1	A. Baumman	-	42.00	42.63	21.00	26.88	-	24.00	20.00	19.45	18.70	18.00	15.55
Commercial and services	2	Car & General (K) Ltd	20.00	20.50	20.00	17.88	16.55	16.75	16.50	15.88	15.93	15.65	16.15	16.08
	3	CMC Holdings Ltd	66.75	71.25	78.00	74.75	70.78	77.50	90.50	85.00	80.25	72.50	69.50	75.85
	4	Express Ltd.	81.25	76.50	83.50	77.75	72.50	72.50	70.00	67.00	74.25	-	59.00	59.00
	5	Kenya Airways	9.48	8.53	9.03	8.45	8.50	8.05	8.38	8.40	8.50	8.00	6.73	7.38
	6	Marshals (EA) Ltd.	47.00	47.50	48.00	49.00	58.00	68.00	80.00	88.75	32.00	42.13	43.50	39.25
	7	National Media group	108.50	106.50	106.00	135.50	162.50	109.25	109.50	111.00	113.50	140.00	125.80	123.50
	8	Pearl Dry cleaners	10.00	10.00	10.00	10.25	-	-	9.00	9.35	10.03	10.00	9.15	10.50
	9	Standard Newspaper	8.63	11.90	14.28	13.15	14.03	22.25	29.00	37.88	51.38	50.00	41.50	45.13
	10	Tourism promotion services	-	-	-	-	16.50	16.78	17.75	17.83	16.10	16.18	13.95	13.98
	11	Uchumi supermarkets	52.00	39.88	39.00	36.13	39.88	39.00	37.50	38.13	39.25	37.75	35.50	37.63
The Finance & Investment	1	Barclays Bank Ltd	113.50	111.50	105.00	99.00	111.00	107.00	104.53	100.50	103.00	105.50	109.00	109.00
	2	C.F.C Bank Ltd	22.88	23.50	22.38	19.28	21.00	22.75	22.13	21.50	20.50	19.90	19.20	34.00
	3	City Trust	29.88	34.50	34.00	33.75	35.13	35.50	35.88	34.50	33.38	34.13	34.13	21.25
	4	Diamond Trust Bank Ltd	36.63	34.38	33.88	26.75	30.50	30.75	29.63	28.13	25.00	23.63	23.13	21.13
	5	Housing Finance Co. Ltd	21.53	22.25	22.63	22.00	21.95	23.38	22.50	21.85	21.00	17.50	18.93	18.68
	6	I.C.D.C Investment Co. Ltd.	38.25	32.50	44.50	41.25	41.38	47.50	57.00	60.50	60.25	36.00	27.25	30.75
	7	Jubilee Insurance Co. Ltd.	40.88	41.50	39.63	43.00	35.13	39.75	39.38	38.38	40.38	36.00	34.13	35.13
	8	Kenya Commercial Bank Ltd	80.25	90.50	93.00	78.50	88.50	107.50	108.50	95.00	94.50	79.00	80.50	74.50
	9	National Bank of Kenya Ltd	15.28	16.73	16.08	15.50	16.85	15.50	16.00	14.53	13.50	12.63	12.25	12.33
	10	NIC Bank Ltd	45.50	44.25	48.50	46.50	52.25	55.13	55.00	53.00	41.50	47.50	47.50	47.38
	11	Pan African Insurance Ltd	51.00	52.50	53.00	50.00	52.50	59.25	58.50	50.00	47.50	42.13	41.00	40.88
	12	Standard Bank Ltd	54.50	53.50	48.75	44.63	45.00	46.88	48.75	47.75	48.75	44.25	42.75	42.63
The Industrial & Allied	1	Athi River mining Co.	-	-	-	-	-	-	-	10.58	11.63	10.53	9.80	9.40
	2	BOC Kenya Ltd	65.00	72.50	73.25	70.25	70.25	63.53	74.00	72.25	70.50	71.00	68.75	67.50
	3	Bamburi Cement Ltd	38.00	49.88	50.00	38.75	39.50	38.13	40.00	40.13	42.75	35.63	33.50	33.75
	4	BAT Kenya Ltd	74.00	71.50	61.25	60.00	59.00	62.25	57.50	58.00	53.25	50.75	52.00	50.00

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	5	Carbacid Investment Ltd	82.50	73.00	82.25	85.25	84.00	84.25	81.00	77.50	74.00	72.00	63.25	63.00
	6	Crown Berger Ltd	11.05	11.13	9.88	11.00	10.53	10.50	10.68	11.40	11.65	10.15	9.33	9.53
	7	Dunlop Kenya Ltd	267.50	290.50	287.50	277.50	275.00	272.00	270.00	530.00	504.50	270.00	294.00	102.00
	8	E.A Packaging	69.75	69.50	68.25	50.50	67.25	66.25	67.00	64.00	57.50	63.00	59.00	49.50
	9	E.A Cables Ltd	34.88	37.00	32.50	30.50	32.88	33.00	32.00	31.88	32.13	31.50	29.50	28.88
	10	E.A Portland cement Ltd.	22.88	27.00	34.75	37.63	46.50	38.63	42.13	42.50	38.75	31.00	30.50	20.00
	11	E.A Brewery Ltd	47.75	52.50	59.50	55.00	56.00	51.00	54.75	51.50	50.00	30.00	36.25	44.00
	12	Firestone Ltd	30.13	33.00	29.63	25.63	29.25	30.00	31.00	27.50	26.75	23.25	23.00	23.25
	13	Kenya Oil Co. Ltd	64.00	70.50	68.50	66.00	67.00	65.00	64.50	63.00	59.50	55.25	48.13	49.00
	14	Kenya National Mills	39.63	33.75	34.13	35.50	34.63	41.50	41.00	41.38	38.25	46.13	38.50	35.38
	15	KPL Ltd	215.00	112.50	111.50	119.00	144.00	164.50	165.50	167.00	167.50	190.50	156.50	157.50
	16	Total Kenya Ltd	82.50	82.50	68.00	63.50	68.25	66.25	63.75	61.00	58.50	54.50	51.25	52.00
	17	Unga Group Ltd	118.50	115.00	104.00	110.50	116.00	127.50	149.50	138.00	156.00	161.50	125.00	110.00
Year 1998	1	A. Bauman	15.55	15.55	15.80	16.00	16.13	15.63	15.50	-	-	17.00	17.00	16.90
Commercial and services	2	Car & General (K) Ltd	19.18	20.20	16.50	11.50	12.88	11.40	12.08	12.00	12.00	12.03	12.18	12.00
	3	CMCHoldings Ltd	107.50	84.50	46.50	39.25	32.63	34.75	35.75	35.50	33.13	33.50	35.75	34.50
	4	Express Ltd.	63.25	54.50	51.50	46.75	38.00	33.00	29.75	30.25	29.50	31.25	30.88	29.38
	5	Kenya Airways	8.23	7.90	7.50	7.53	7.00	6.93	7.75	7.25	6.88	7.48	7.53	7.60
	6	Marshals (EA) Ltd.	42.75	40.88	39.63	41.63	-	42.50	40.50	27.75	26.75	25.00	25.00	25.13
	7	National Media group	127.00	113.00	113.00	173.50	142.50	119.50	109.25	121.50	117.50	111.00	121.75	131.50
	8	Pearl Dry cleaners	10.00	10.00	10.00	-	10.00	10.25	10.00	-	-	10.00	-	-
	9	Standard Newspaper	53.50	50.13	50.13	45.50	29.00	28.50	22.00	20.50	16.00	12.58	19.43	19.25
	10	Tourism promotion services	16.85	15.85	15.85	14.00	12.85	13.63	13.20	13.00	12.05	10.88	11.65	12.93
	11	Uchumi supermarkets	45.25	42.63	42.63	39.13	43.25	43.50	41.75	41.63	42.75	43.38	40.00	42.25
The Finance & Investment	1	Barclays Bank Ltd	114.50	125.00	113.00	92.00	96.00	94.00	97.00	96.00	96.00	96.00	97.00	110.00
	2	C.F.C Bank Ltd	19.53	19.98	19.75	18.00	16.35	16.88	17.03	16.00	15.75	14.73	15.05	15.30
	3	City Trust	34.13	54.13	33.00	35.00	33.38	31.38	27.25	-	-	-	26.13	-
	4	Diamond Trust Bank Ltd	23.00	22.38	19.00	20.75	21.50	22.50	20.88	19.63	19.13	20.00	19.63	21.13
	5	Housing Finance Co. Ltd	21.13	20.63	23.28	18.75	18.25	19.63	16.75	15.80	13.90	13.53	15.30	15.28
	6	I.C.D.C Investment Co. Ltd.	41.38	45.75	38.75	33.00	37.50	37.63	35.00	36.00	35.38	31.50	26.75	37.13
	7	Jubilee Insurance Co. Ltd.	39.13	40.00	44.25	43.00	42.25	35.00	31.00	31.00	30.53	27.75	28.75	27.75
	8	Kenya Commercial Bank Ltd	85.00	76.00	69.00	66.75	65.50	62.00	66.00	69.78	65.25	56.50	57.53	53.75
	9	National Bank of Kenya Ltd	13.93	12.55	11.58	10.28	10.90	12.00	11.58	9.38	8.85	7.85	7.00	7.50
	10	NIC Bank Ltd	47.50	47.50	46.50	40.00	38.25	39.00	39.25	36.00	31.00	31.63	28.75	29.13
	11	Pan African Insurance Ltd	37.38	36.00	34.75	32.00	30.00	30.00	30.00	30.13	28.25	25.13	24.13	24.50
	12	Standard Bank Ltd	49.13	44.75	41.75	41.13	40.50	40.00	39.00	39.38	40.25	39.00	39.28	46.00

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
The Industrial & Allied		Athi River mining Co.												
	1		9.45	9.75	9.65	7.88	6.75	8.73	7.58	7.05	6.45	6.48	6.48	6.23
	2	BOC Kenya Ltd	65.00	66.75	69.00	68.50	66.00	66.75	64.00	68.00	69.00	70.25	70.50	71.50
	3	Bamburi Cement Ltd	40.63	30.25	38.63	33.75	33.38	35.38	32.50	27.50	28.50	28.63	26.63	31.63
	4	BAT Kenya Ltd	51.38	51.00	46.63	44.50	44.50	44.50	44.00	49.75	48.50	50.50	55.50	65.75
	5	Carbacid Investment Ltd	70.50	73.25	65.00	61.50	62.00	70.00	68.25	64.25	66.00	64.50	57.25	59.75
	6	Crown Berger Ltd	11.00	12.60	11.08	9.90	34.75	9.65	9.53	9.38	9.50	8.68	7.85	8.18
	7	Dunlop Kenya Ltd	103.00	102.50	98.50	95.50	47.00	175.00	90.25	27.50	22.98	19.25	17.50	19.03
	8	E.A Cables Ltd	29.50	29.50	25.00	23.88	23.75	17.50	21.38	19.75	20.00	19.75	19.05	19.50
	9	E.A Portland cement Ltd.	34.00	29.63	29.38	23.50	21.50	21.75	22.13	20.10	19.63	18.43	18.13	17.03
	10	E.A Brewery Ltd	48.00	41.00	48.50	45.75	42.00	52.50	49.00	52.00	43.50	48.25	48.50	54.75
	11	Firestone E.A Ltd	26.13	30.00	27.25	18.25	17.78	17.63	17.63	17.30	16.50	16.05	15.55	15.55
	12	E.A Packaging	47.75	35.75	33.25	33.25	28.38	20.75	19.85	19.88	19.75	16.75	11.13	15.75
	13	Kenya National Mills	41.63	47.25	51.50	60.50	61.00	26.75	22.48	20.63	18.65	18.73	13.48	15.03
	14	Kenya Oil Co. Ltd	54.75	65.00	66.50	55.50	52.50	55.50	58.50	57.50	58.25	56.00	53.50	54.00
	15	KPL Ltd	187.50	190.50	190.00	161.00	149.00	172.50	182.00	195.00	183.00	202.50	151.00	117.50
	16	Total Kenya Ltd	63.75	61.25	55.00	45.75	42.13	41.13	41.13	41.13	39.50	36.00	35.50	41.13
	17	Unga Group Ltd	127.00	132.00	258.50	328.50	321.00	63.25	55.00	55.00	53.00	47.13	23.63	42.38
Year 1999	1	A. Bauman	17.15	-	-	15.00	14.88	14.35	15.00	14.40	14.28	14.88	15.00	14.85
Commercial and services	2	Car & General (K) Ltd	12.00	12.45	12.80	-	11.35	10.00	7.63	-	-	10.00	9.50	-
	3	CMCHoldings Ltd	33.38	29.75	28.88	27.25	26.38	28.25	29.00	29.25	30.25	29.50	-	30.00
	4	Express Ltd.	34.00	38.50	33.50	34.00	24.75	26.13	25.63	23.50	18.93	18.35	18.00	18.88
	5	Kenya Airways	8.45	7.60	7.75	7.75	8.00	8.50	7.68	6.40	6.15	6.35	6.38	7.88
	6	Marshals (EA) Ltd.	25.50	-	26.63	24.25	22.00	-	-	24.88	-	-	23.63	-
	7	National Media group	141.50	133.00	132.50	132.50	118.00	116.00	125.50	105.50	105.00	107.00	103.00	101.00
	8	Pearl Dry cleaners	-	-	-	-	9.88	-	-	3.00	-	-	-	-
	9	Standard Newspaper	23.25	24.63	17.38	18.75	18.48	15.95	11.70	12.05	11.55	10.68	10.60	10.00
	10	Tourism promotion services	15.23	13.18	12.98	13.48	13.50	13.45	13.80	14.25	15.28	16.05	15.95	16.25
	11	Uchumi supermarkets	44.00	46.63	48.25	48.75	48.13	47.00	49.50	50.75	48.63	43.25	38.50	38.75
The Finance & Investment	1	Barclays Bank Ltd	115.50	120.50	108.00	101.50	105.00	107.00	113.00	106.00	88.00	97.50	99.50	95.50
	2	C.F.C Bank Ltd	17.78	18.98	15.80	14.90	14.10	14.73	15.53	14.55	15.03	14.75	14.25	14.25
	3	City Trust	24.88	26.75	27.50	25.00	23.88	23.00	23.50	23.00	21.88	-	22.25	-
	4	Diamond Trust Bank Ltd	23.75	25.63	25.63	25.25	21.50	21.28	24.00	22.50	21.63	23.63	23.00	24.50
	5	Housing Finance Co. Ltd	17.03	14.85	14.13	13.25	12.65	13.13	11.55	11.78	10.40	8.65	9.70	10.00
	6	I.C.D.C Investment Co. Ltd.	37.00	40.63	45.00	44.13	44.13	45.25	48.25	46.25	46.00	49.00	48.00	50.75

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	7	Jubilee Insurance Co. Ltd.	35.25	31.50	29.75	31.25	31.88	29.00	29.38	28.88	28.50	25.75	25.63	24.75
	8	Kenya Commercial Bank Ltd	39.50	58.25	53.00	44.63	44.00	40.88	45.50	38.38	37.00	34.25	31.75	33.13
	9	National Bank of Kenya Ltd	12.85	7.90	5.68	6.23	5.75	6.38	5.70	5.30	5.20	4.80	5.00	5.08
	10	NIC Bank Ltd	37.75	33.13	34.13	35.00	33.63	32.13	28.25	27.13	27.25	28.38	27.00	23.50
	11	Pan African Insurance Ltd	24.63	25.00	25.13	25.38	38.00	37.75	36.13	38.00	37.25	52.50	37.00	26.00
	12	Standard Bank Ltd	40.00	46.25	46.75	44.50	45.50	48.00	52.38	54.00	55.00	57.00	43.75	55.25
The Industrial & Allied		Athi River mining Co.												
	1		7.53	6.23	5.63	5.15	6.00	5.83	5.80	5.00	5.30	5.58	5.50	5.88
	2	BOC Kenya Ltd	73.50	68.50	70.50	69.00	70.50	71.50	69.50	70.50	69.25	69.00	66.75	66.00
	3	Bamburi Cement Ltd	38.00	33.50	30.50	26.75	23.00	27.00	28.38	30.00	27.50	26.63	25.50	26.13
	4	BAT Kenya Ltd	98.25	74.50	81.50	92.50	96.25	91.75	81.25	77.50	83.25	78.00	77.75	76.25
	5	Carbacid Investment Ltd	68.00	70.00	72.50	69.75	39.00	70.25	68.50	65.50	61.50	62.00	65.00	66.50
	6	Crown Berger Ltd	9.75	8.25	7.75	8.78	8.50	8.78	8.88	11.35	12.73	13.73	11.58	9.95
	7	Dunlop Kenya Ltd	26.25	24.75	19.00	17.50	16.15	15.48	14.88	14.35	13.78	13.55	10.75	9.00
	8	E.A Cables Ltd	25.50	21.00	20.63	20.50	18.85	19.48	-	-	18.85	-	14.53	12.98
	9	E.A Portland cement Ltd.	19.38	19.23	20.25	9.50	13.55	14.25	14.05	12.50	8.55	10.25	15.10	11.13
	10	E.A Brewery Ltd	60.00	58.00	63.50	69.00	72.25	74.25	72.75	80.25	78.50	76.75	67.50	68.50
	11	E.A Packaging	18.28	18.98	18.50	18.00	-	15.43	13.70	14.23	10.00	10.03	8.65	-
	12	Firestone E:A Ltd	20.08	18.90	16.75	16.30	16.50	16.60	16.80	15.20	13.83	14.30	13.28	15.10
	13	Kenya Oil Co. Ltd	59.00	58.50	58.25	59.00	75.75	60.25	65.50	66.50	57.75	-	65.25	68.50
	14	Kenya National Mills	21.90	18.88	13.90	13.50	13.50	13.80	13.85	10.63	8.65	8.00	9.28	10.00
	15	KPL Ltd	137.00	115.50	120.00	116.00	112.00	110.00	109.00	106.50	97.50	87.00	79.25	89.75
	16	Total Kenya Ltd	50.25	48.25	45.50	46.00	46.50	46.75	49.00	51.75	49.00	46.50	48.63	48.50
	17	Unga Group Ltd	47.50	44.50	35.00	33.75	29.63	29.13	27.38	21.50	19.63	14.38	20.13	24.75
Year 2000	1	A. Baumman	-	4.00	14.00	14.03	14.00	13.65	-	12.35	11.80	-	9.65	-
Commercial and services	2	Car & General (K) Ltd	-	-	-	-	10.25	10.05	19.00	-	-	10.15	-	-
	3	CMC Holdings Ltd	29.00	30.00	25.00	20.00	19.38	16.90	16.58	16.58	16.23	16.00	15.98	15.48
	4	Express Ltd.	19.93	19.20	19.50	-	19.03	-	17.75	17.00	16.88	17.13	17.90	-
	5	Kenya Airways	7.68	6.85	7.50	7.75	8.08	8.23	7.58	7.73	8.45	8.95	8.53	8.83
	6	Marshals (EA) Ltd.	-	-	-	7.50	-	19.30	-	-	-	18.60	-	-
	7	National Media group	96.25	86.75	89.00	79.00	73.00	73.50	74.50	71.50	69.00	69.25	67.25	65.75
	8	Pearl Dry cleaners	-	-	-	-	5.50	2.70	-	-	2.05	-	-	-
	9	Standard Newspaper	10.88	10.43	10.00	8.55	8.70	7.65	6.13	6.63	7.20	7.18	7.30	7.33
	10	Tourism promotion services	16.18	16.13	17.00	15.73	16.18	16.13	16.05	16.63	16.48	16.35	16.55	16.25
	11	Uchumi supermarkets	40.50	41.75	43.00	-	42.63	42.50	42.25	42.25	44.88	48.00	48.25	46.50
The Finance & Investment		Barclays Bank Ltd												
	1		92.50	100.50	98.00	88.25	88.25	84.00	84.25	81.25	85.00	76.25	86.25	65.75

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	2	C.F.C Bank Ltd	14.13	13.88	14.50	15.63	13.95	11.90	10.20	10.73	9.60	9.00	9.53	9.40
	3	City Trust Ltd	21.50	22.00	22.00	-	20.75	20.00	20.00	-	-	23.13	-	-
	4	Diamond Trust Bank Ltd	25.50	26.50	27.50	25.88	19.63	20.88	20.63	19.00	16.50	15.60	15.25	14.15
	5	Housing Finance Co. Ltd	9.90	8.00	8.50	8.50	7.95	7.50	7.13	6.33	7.25	6.65	6.50	5.93
	6	I.C.D.C Investment Co. Ltd.	48.50	45.00	44.00	43.38	43.75	35.00	44.25	46.00	48.75	50.50	50.75	46.75
	7	Jubilee Insurance Co. Ltd.	25.00	25.88	26.50	26.00	23.50	21.63	22.50	20.75	18.78	18.05	18.98	18.83
	8	Kenya Commercial Bank Ltd	32.00	32.13	27.00	29.63	26.25	27.00	24.25	24.00	25.25	25.63	27.00	23.78
	9	National Bank of Kenya Ltd	5.13	4.65	4.00	3.98	4.03	3.60	3.75	4.00	4.20	4.50	4.55	3.40
	10	NIC Bank Ltd	23.63	25.50	27.00	26.00	25.00	23.75	23.00	21.00	23.50	23.25	21.00	17.25
	11	Pan African Insurance Ltd	25.50	1.03	21.00	21.38	21.00	19.98	19.73	19.35	18.25	17.00	16.40	13.00
	12	Standard Bank Ltd	57.50	65.00	63.00	50.50	48.13	45.50	48.00	52.50	53.25	53.75	51.38	44.00
The Industrial & Allied	1	Athi River mining Co.	5.23	4.78	5.50	6.50	6.28	5.25	4.33	4.65	4.68	4.35	4.58	4.38
	2	BOC Kenya Ltd	64.00	64.00	65.00	64.00	56.75	46.00	47.63	43.75	43.50	43.50	44.25	47.25
	3	Bamburi Cement Ltd	26.75	26.13	27.00	26.63	33.25	29.63	28.50	31.25	32.00	33.13	32.00	33.50
	4	BAT Kenya Ltd	73.50	82.50	80.00	62.50	57.00	56.78	58.50	63.50	67.50	70.00	68.75	62.00
	5	Carbacid Investment Ltd	68.00	68.50	70.00	69.00	62.25	53.00	49.50	48.50	47.50	62.00	53.25	44.00
	6	Crown Berger Ltd	9.70	9.75	10.00	11.13	12.95	12.48	12.00	11.28	11.08	9.60	8.43	8.93
	7	Dunlop Kenya Ltd	10.10	9.25	8.50	7.90	8.20	7.75	7.73	7.50	7.65	7.35	6.40	6.40
	8	E.A Cables Ltd	12.83	14.18	11.00	9.65	9.50	8.70	7.00	6.90	10.55	8.85	8.40	8.13
	9	E.A Portland cement Ltd.	11.35	11.43	10.00	11.55	11.10	11.70	13.05	12.50	12.50	12.13	11.93	11.70
	10	E.A Brewery Ltd	66.75	60.25	67.50	67.25	65.00	58.50	59.25	64.00	74.50	74.50	57.25	73.00
	11	East African Packaging Ltd.	11.00	11.70	12.50	13.05	13.00	13.25	13.55	14.15	14.50	14.30	5.70	7.10
	12	Firestone E.A Ltd	16.25	14.55	12.50	12.78	11.25	12.35	12.50	11.50	11.83	12.25	12.30	11.75
	13	Kenya Oil Co. Ltd	69.75	83.50	78.00	79.50	80.00	79.25	81.25	77.50	81.00	80.50	78.00	72.25
	14	Kenya National Mills Ltd.	8.48	9.25	13.00	17.05	16.20	12.35	9.25	8.25	8.43	8.28	6.65	7.03
	15	KPL Ltd	93.25	88.25	90.00	-	64.25	50.75	51.50	49.25	43.50	37.25	43.88	41.75
	16	Total Kenya Ltd	48.50	56.25	52.00	50.50	49.38	50.50	54.75	56.50	55.25	56.00	56.25	55.75
	17	Unga Group Ltd	22.13	18.20	21.50	28.88	27.75	22.58	15.20	13.53	15.15	14.83	14.70	14.20
Year 2001	1	A. Bauman	8.63	8.23	6.65	6.90	7.60	-	8.50	8.50	8.50	8.48	8.43	8.25
	2	Car & General (K) Ltd	10.00	-	-	-	-	-	-	-	-	-	10.00	-
	3	CMCHoldings Ltd	13.60	13.80	12.63	10.78	9.00	8.85	9.23	10.15	9.05	8.15	-	8.93
	4	Express Ltd.	14.45	13.00	-	-	12.63	-	11.25	8.75	6.35	6.63	6.50	7.00
	5	Kenya Airways	9.18	9.25	8.30	7.80	8.00	8.58	18.30	7.98	7.33	7.08	7.50	7.50

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	6	Marshals (EA) Ltd.	18.30	-	-	-	-	-	-	-	-	-	18.30	-
	7	National Media group	67.75	66.00	66.00	57.00	51.00	43.50	48.50	47.50	44.75	44.75	35.00	43.75
	8	Pearl Dry cleaners	-	-	-	-	-	-	-	-	-	-	-	-
	9	Standard Newspaper	7.13	7.00	-	-	9.10	7.73	6.60	7.73	6.40	6.40	7.40	7.05
	10	Tourism promotion services	16.15	16.38	16.83	16.98	16.98	16.80	16.70	16.38	15.23	15.00	16.30	17.03
	11	Uchumi supermarkets	49.63	50.88	48.25	45.00	42.50	44.40	44.75	42.50	38.00	40.13	31.38	31.88
The Finance & Investment	1	Barclays Bank Ltd	75.50	72.75	66.00	72.00	61.50	71.50	80.00	77.00	71.00	74.25	74.00	74.00
	2	City Trust	19.00	-	18.70	17.68	16.00	-	16.20	-	15.75	17.00	19.20	-
	3	C.F.C Bank Ltd	8.90	9.28	9.73	9.63	9.10	8.60	8.30	8.25	8.25	8.15	8.73	9.08
	4	Diamond Trust Bank Ltd	13.75	13.53	13.35	13.15	12.35	11.30	11.00	11.13	10.75	8.73	9.25	8.90
	5	Housing Finance Co. Ltd	5.75	5.85	5.65	5.53	4.75	4.95	4.65	4.33	3.78	4.15	4.08	3.75
	6	I.C.D.C Investment Co. Ltd.	50.00	50.00	51.50	53.00	48.25	45.00	41.50	39.75	30.13	40.25	33.00	37.00
	7	Jubilee Insurance Co. Ltd.	18.63	17.90	16.98	16.50	15.50	15.40	15.13	14.03	14.60	14.78	14.30	15.53
	8	Kenya Commercial Bank Ltd	22.00	22.53	24.38	25.55	23.13	18.10	16.50	15.38	13.50	15.50	17.50	15.43
	9	National Bank of Kenya Ltd	3.80	3.55	3.48	3.28	2.75	3.33	2.93	3.13	2.80	3.13	3.30	3.15
	10	NIC Bank Ltd	19.63	19.50	17.30	15.00	14.38	14.25	15.00	14.53	12.70	13.23	13.93	14.85
	11	Pan African Insurance Ltd	11.70	11.88	11.38	10.45	10.90	12.35	12.98	13.63	13.85	13.45	13.00	-
	12	Standard Bank Ltd	49.00	54.00	51.75	46.50	49.00	53.50	54.50	51.00	46.50	50.13	48.75	55.00
The Industrial & Allied	1	Athi River mining Co.	4.43	4.48	4.30	4.40	4.25	4.25	4.20	4.03	3.68	3.88	3.80	3.90
	2	BOC Kenya Ltd	47.25	46.25	42.50	41.00	35.25	28.75	30.50	30.25	29.50	29.00	29.00	30.63
	3	Bamburi Cement Ltd	34.38	32.50	29.13	27.00	28.00	26.50	25.25	26.38	23.88	22.00	17.50	17.15
	4	BAT Kenya Ltd	63.75	59.75	59.75	57.50	54.00	54.50	55.25	48.88	44.88	50.00	49.88	51.00
	5	Carbacid Investment Ltd	43.25	41.13	40.50	37.50	36.50	41.50	-	38.25	35.13	35.25	33.50	35.00
	6	Crown Berger Ltd	9.28	9.60	8.90	8.30	8.38	6.93	6.25	6.28	5.90	5.83	6.60	6.15
	7	Dunlop Kenya Ltd	5.83	5.25	5.30	5.23	5.55	5.30	5.30	5.18	4.88	5.13	5.00	-
	8	E.A Cables Ltd	9.53	11.28	10.65	10.15	9.78	10.28	10.13	10.13	9.88	-	9.73	9.50
	9	E.A Portland cement Ltd.	11.58	11.63	11.98	12.03	11.78	11.10	10.00	9.63	8.15	7.88	13.33	12.75
	10	E.A Packaging	8.63	-	-	8.90	8.35	8.20	8.30	8.50	8.30	8.00	8.00	8.00
	11	E.A Brewery Ltd	75.00	75.00	76.50	75.50	75.50	75.00	75.75	57.25	77.75	81.50	78.00	73.50
	12	Firestone E.A Ltd	10.88	9.15	8.15	7.38	7.15	6.88	7.00	6.95	6.90	7.18	7.35	7.08
	13	KNM	7.00	6.60	6.60	6.50	5.40	4.75	4.25	3.85	3.25	4.28	6.60	6.50
	14	Kenya Oil Co. Ltd	77.25	86.50	90.00	62.50	70.50	75.00	69.75	57.50	68.75	71.00	72.00	67.05
	15	KPL Ltd	40.50	49.75	46.00	38.75	31.88	29.15	27.00	25.00	20.63	23.88	17.50	19.50
	16	Total Kenya Ltd	51.50	44.13	40.63	39.00	29.00	26.15	26.25	24.13	18.38	18.75	21.00	19.50

		Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
	17	Unga Group Ltd	12.75	10.28	9.15	9.30	8.50	7.88	7.50	6.48	5.20	6.40	7.90	6.65
Year 2002	1	A. Bauman	8.08	8.98	8.98	8.95	9.03	8.68	8.50	6.75	5.00	4.63	-	5.30
Commercial & Services	2	Car & General (K) Ltd	-	-	-	-	-	-	-	-	-	-	-	-
	3	CMC Holdings Ltd	9.28	8.70	7.85	9.58	12.60	12.68	10.33	11.60	14.83	17.50	23.35	21.75
	4	Express Ltd.	-	7.00	-	7.00	7.00	7.00	7.00	7.00	-	-	-	6.90
	5	Kenya Airways	7.43	7.63	7.25	7.18	7.25	7.50	7.25	6.73	6.35	6.05	5.75	5.93
	6	Marshals (EA) Ltd.	-	-	-	-	-	-	-	-	-	-	-	-
	7	National Media group	42.88	44.75	56.38	61.75	50.00	39.50	39.25	21.78	43.75	47.25	52.75	72.00
	8	TSC Serena	17.50	17.63	17.18	17.13	16.90	16.53	15.95	16.43	15.98	16.53	18.00	19.10
	9	Pearl Dry cleaners	-	-	-	-	-	-	-	-	-	-	-	-
	10	Standard Newspaper	6.63	6.30	6.55	-	4.40	3.75	4.53	7.05	9.58	8.75	8.28	9.85
	11	Uchumi supermarkets	32.38	29.38	23.53	19.73	16.58	16.73	15.80	15.00	13.53	14.78	18.48	20.98
The Finance & Investment	1	Barclays Bank Ltd	78.50	81.50	83.00	72.83	78.25	83.25	85.78	84.75	77.25	80.50	89.00	95.50
	2	C.F.C Bank Ltd	9.00	7.55	8.88	9.03	8.78	8.75	8.88	9.00	9.23	9.20	9.05	9.10
	3	City Trust	19.00	-	19.30	19.20	-	18.25	17.60	17.50	-	-	17.75	-
	4	Diamond Trust Bank Ltd	9.03	8.70	7.98	7.60	8.18	8.95	8.90	9.00	10.03	10.90	10.90	10.30
	5	Housing Finance Co. Ltd	3.75	4.35	4.23	3.13	3.45	3.75	3.28	3.73	3.45	3.13	4.23	4.35
	6	I.C.D.C Investment Co. Ltd.	34.38	28.25	26.38	24.50	21.20	19.20	18.10	19.20	21.20	24.50	26.38	28.25
	7	Jubilee Insurance Co. Ltd.	15.90	15.10	15.83	15.05	15.60	15.68	14.85	15.68	15.60	15.05	15.83	15.10
	8	Kenya Commercial Bank Ltd	16.75	16.00	14.95	15.00	11.73	10.13	10.00	10.38	8.75	10.65	12.65	14.35
	9	National Bank of Kenya Ltd	2.80	3.13	3.05	2.98	2.78	2.50	2.65	2.48	2.45	2.48	4.85	3.35
	10	NIC Bank Ltd	14.93	15.15	15.50	13.63	12.15	13.30	13.88	14.35	13.70	13.30	16.20	17.55
	11	Pan African Insurance Ltd	13.00	-	11.05	8.15	-	-	7.30	7.40	-	7.25	6.85	7.03
	12	Standard Bank Ltd	51.61	54.88	49.00	45.38	48.25	51.00	53.75	53.00	52.00	55.50	59.50	58.50
The Industrial & Allied	1	Athi River mining Co.	3.50	3.70	3.43	3.83	3.45	3.75	3.80	5.00	4.80	4.13	4.50	4.63
	2	BOC Kenya Ltd	30.50	30.13	29.25	28.25	27.50	27.25	25.75	25.13	25.38	29.88	37.38	37.00
	3	Bamburi Cement Ltd	16.50	15.75	16.03	15.50	16.15	16.98	20.53	22.38	22.00	23.50	30.00	37.88
	4	BAT Kenya Ltd	50.00	50.80	48.25	45.88	45.90	46.78	51.13	45.53	48.75	51.00	57.75	54.25
	5	Carbacid Investment Ltd	35.25	35.75	36.00	35.63	36.25	36.50	35.75	35.75	35.50	47.50	33.50	35.25
	6	Crown Berger Ltd	6.00	5.85	6.00	5.63	5.05	5.00	5.18	6.00	6.63	6.00	7.20	7.13
	7	Dunlop Kenya Ltd	5.10	5.13	5.25	4.70	4.85	5.00	5.00	5.15	6.63	-	5.00	7.13
	8	E.A Packaging	7.75	7.70	8.00	-	-	-	8.00	8.00	7.95	8.00	-	8.00
	9	E.A Cables Ltd	10.00	9.03	8.00	7.18	7.08	7.15	7.88	8.95	8.75	8.50	8.55	9.18

	Company	Jan.	Feb.	March	April	May	June	July	Aug	Sep	Oct	Nov.	Dec.
10	E.A Portland cement Ltd.	12.88	12.83	11.45	10.70	12.50	11.25	13.60	13.60	13.40	13.50	13.10	13.00
11	E.A Brewery Ltd	74.00	74.50	78.00	77.00	77.50	82.50	79.05	82.00	87.50	91.00	99.38	114.00
12	Firestone E.A Ltd	7.03	7.50	7.43	7.08	7.33	8.10	8.13	8.00	7.05	7.28	10.90	8.65
13	Kenya Oil Co. Ltd	83.50	84.00	82.75	76.00	71.00	73.00	75.00	77.75	79.75	83.00	91.25	103.25
14	KPL Ltd	18.15	16.15	12.28	9.50	9.25	8.83	5.70	6.88	6.45	7.75	13.00	13.13
15	Total Kenya Ltd	17.83	16.88	15.75	14.08	11.48	9.53	16.20	15.15	16.40	15.28	20.50	20.63
16	Unga Group Ltd	6.68	6.40	4.93	3.18	3.50	4.23	4.60	5.15	5.55	5.58	5.73	4.95

C. Statistical descriptions

	Market	Loans	Deposit	ER$	Infl.	C-infl	Fer	C-Fer
Mean	-0.528	24.234	8.386	0.657	5.779	0.0053	1.135	-0.003
Variance	21.763	16.843	15.549	9.147	17.712	3.83	17.852	34.47
Std Deviation	4.665	4.104	3.943	3.024	4.209	1.957	4.225	5.871
Covariance	21.763	-1.021	-0.363	-1.058	-0.258	0.205	-5.789	-3.066
Correlation	1.000	-0.053	-0.020	-0.075	-0.013	-0.294	-0.294	-0.112

Beta of the models

Risk factor		β	I-4	β	F-4	β	F-6
Market risk	b_m	1.000	0.873	1.000	0.6960	1.000	0.6785
Interest on loans risk	b_l	-0.061	-0.001			-0.061	-0.0011
Interest on deposit risk	b_d	-0.023	0.000			-0.023	-0.0002
$ Exchange rate risk	$b_{er\$}$	-0.116	-0.011	-0.116	-0.0087	-0.116	-0.0085
Inflation risk	b_{infl}			-0.015	-0.0002	-0.015	-0.0001
Foreign exchange reserve risk	b_{fer}			-0.324	-0.0708	-0.324	-0.0691
Beta-p			0.861		0.616		0.600

Contributions

	I-4	B*P	%	F-4	B*P	%	F-6	B*P	%
Pm	-17.402	17.402	87.32	-17.402	17.402	69.60	-17.402	17.402	67.849
Pl	7.354	0.449	2.25				7.354	0.449	1.749
Pd	-8.494	0.195	0.98				-8.494	0.195	0.762
Per$	-16.230	1.883	9.45	-16.230	1.883	7.529	-16.230	1.883	7.340
Pinfl.				-16.864	0.253	1.012	-16.864	0.253	0.986
Pfer				-16.872	5.467	21.862	-16.872	5.467	21.314
		19.929	100		25.004	100		25.648	100

Table I

Pairwise Test (Involves APT- restricted models only)

Models	L_a	p^b	q^c	$F_{0.05}$	$qF_{0.05}$	$L-qF_{0.05}$	Reject null?
Fundamental-4 Vs Fundamental-6	104.45	236.00	78.00	1.29	100.62	3.83	Yes
Index-4 Vs Fundamental-6	1433.46	236.00	80.00	1.29	103.20	1330.26	Yes
Index-1 Vs Fundamental-6	2027.47	236.00	197.00	1.000	197.00	1830.47	Yes
Index-1 Vs Fundamental-4	1923.01	158.00	119.00	1.220	145.18	1777.83	Yes
Index-1 Vs Index-4	594.00	156.00	117.00	1.230	143.91	450.09	Yes

Table II

Market Price of risk associated with fundamental variables

Model	λ_{fer}	t_{fer}	λ_{infl}	t_{infl}	$\lambda_{ER\$}$
Fundamental-4	-3.689	2.125***	-0.171	2.693*	-1.222
Fundamental-6	-3.596	2.140***	-0.166	2.693*	-1.191

Statistical Significance at 5% ***

Statistical Significance 2% **

Statistical Significance 1% *

Adjusted R2 for the restricted regression

Table III

Model	Mean	Max	Min
Index-1	0.900	0.868	0.871
Index-4	0.919	0.895	0.883
Fundamental-4	0.855	0.874	0.863
Fundamental-6	0.858	0.877	0.866

Table IV

Percentage of cross sectional variation explained by various models

Model	% Explained
Index-1	43.16
Index-4	30.60
Fundamental-4	73.20
Fundamental-6	71.20

t_{ERs}
.2.455**
2.460**

Table V

Model	I_L	I_d	$ER_\$$	R_m	FER	Inflation
Index-4	2.250	0.980	9.450	87.320	-	-
Fundamental-4	-	-	7.529	69.600	21.862	1.012
Fundamental-6	1.749	0.762	7.340	67.849	21.314	0.986

D. DATA ANALYSIS

Year	Month	NMG	Risk premium	BBK	Risk premium	Bamburi	Risk premium	ALL	R_m	Risk Premium	T.bill	β_L	R_L	$(R_{jt}-R_{ft})$	β_d	R_d	$(R_{jt}-R_{ft})$	γ_{infl}	infl	g_{infl}	$(R_{jt}-R_{ft})$	λ_{infl}	γ_{fer}	fer	g_{fer}	$(R_{jt}-R_{ft})$	λ_{fer}	$\beta_{er\$}$	R_{ers}	$(R_{jt}-R_{ft})$
1995	Jan.	-	-	-	-	-	-	-	-	17.930	17.93	-	25.32	7.39	-	15.68	-2.25	-	3.60	-	-	-14.33	-	-	-	-	-17.93	-	-	-17.93
	Feb	-3.66	-21.590	26.19	8.260	-7.2	-25.130	5.110	-0.170	-18.100	17.63	-0.061	24.34	6.71	-0.023	15.51	-2.12	-0.015	1.40	-2.20	-19.83	-16.23	-0.324	1.14	1.14	-16.49	-16.49	-0.116	-0.74	-18.37
	March	10.02	-7.610	-3.77	-21.400	-39.22	-56.850	10.990	-6.980	-24.610	16.84	-0.061	23.61	6.77	-0.023	14.90	-1.94	-0.015	-0.70	-2.10	-18.94	-17.54	-0.324	2.88	1.74	-15.10	-13.96	-0.116	-1.34	-18.18
	April	0.6	-16.240	-21.57	-38.410	-80.85	-64.010	19.960	-1.720	-18.560	15.16	-0.061	23.32	8.16	-0.023	12.15	-3.01	-0.015	-3.70	-3.00	-18.16	-18.86	-0.324	-3.53	-6.41	-21.57	-18.69	-0.116	5.37	-9.79
	May	-6.21	-21.370	-0.71	-15.870	-20.78	-35.940	-9.233	0.400	-14.760	15.85	-0.061	23.10	7.25	-0.023	11.81	-4.04	-0.015	-1.90	1.80	-14.05	-17.75	-0.324	13.57	17.10	1.25	-2.28	-0.116	17.76	1.91
	Jun	3.47	-12.380	-1.08	-16.930	-30.2	-46.050	-9.270	-2.060	-17.910	16.77	-0.061	22.74	5.97	-0.023	11.62	-5.15	-0.015	0.20	2.10	-14.67	-16.57	-0.324	1.62	-11.95	-28.72	-15.15	-0.116	1.09	-15.68
	July	0.61	-16.160	-	-	-10.27	-27.040	-4.830	1.330	-15.440	18.46	-0.061	22.36	3.90	-0.023	11.51	-6.95	-0.015	-0.50	-0.70	-19.16	-18.96	-0.324	-4.10	-5.72	-24.18	-22.56	-0.116	2.20	-16.26
	Aug.	-10.61	-29.070	-2.18	-20.640	9.07	-9.390	-1.240	-1.800	-20.260	19.64	-0.061	24.18	4.54	-0.023	11.60	-8.04	-0.015	1.30	1.80	-17.84	-18.34	-0.324	4.40	8.50	-11.14	-15.24	-0.116	-0.91	-20.55
	Sept.	-8.47	-28.110	-4.83	-24.470	-10.14	-29.780	-7.813	-3.840	-23.480	21.16	-0.061	25.60	4.44	-0.023	12.04	-9.12	-0.015	4.00	2.70	-18.46	-17.16	-0.324	-2.97	-7.37	-28.53	-24.13	-0.116	0.27	-20.89
	Oct.	14.81	-6.350	8.59	-12.570	-5.23	-26.390	6.057	5.570	-15.590	24.07	-0.061	27.34	3.27	-0.023	11.93	-12.14	-0.015	3.30	-0.70	-24.77	-20.77	-0.324	-0.61	2.36	-21.71	-24.68	-0.116	0.05	-24.02
	Nov.	18.71	-5.360	14.39	-9.680	16.17	-7.900	16.423	7.210	-16.860	24.87	-0.061	28.38	3.51	-0.023	11.85	-13.02	-0.015	5.60	2.30	-22.57	-19.27	-0.324	-7.39	-6.78	-31.65	-32.26	-0.116	0.50	-24.37
	Dec.	1.9	-22.970	-6.29	-31.160	4.75	-20.120	0.120	-2.210	-27.080	21.67	-0.061	28.99	7.32	-0.023	12.09	-9.58	-0.015	6.90	1.30	-20.37	-14.77	-0.324	6.31	13.70	-7.97	-15.36	-0.116	0.29	-21.38

1996	Jan	7.47	14.200	-0.34	22.010	-6.99	28.660	0.047	-1.270	22.940	21.30	-0.061	27.81	6.51	-0.023	12.35	-8.95	-0.015	6.40	-0.50	-21.80	-14.90	-0.324	6.40	0.09	-21.21	-14.90	-0.116	6.42	-14.88
	Feb	-1.49	22.790	-1.58	22.880	8.66	12.640	1.863	4.010	17.290	25.96	-0.061	27.79	1.83	-0.023	12.30	-13.66	-0.015	5.70	-0.70	-26.66	-20.26	-0.324	2.73	-3.67	-29.63	-23.23	-0.116	-1.92	-27.88
	March	-10.33	36.290	-13.1	39.060	-11.43	37.390	11.620	-3.560	29.520	26.68	-0.061	28.06	1.38	-0.023	13.02	-13.66	-0.015	6.50	0.80	-25.88	-20.18	-0.324	7.01	4.28	-22.40	-19.67	-0.116	0.00	-26.68
	April	-12.64	39.320	-7.09	33.770	-10.94	37.620	10.223	-7.900	34.580	24.20	-0.061	27.99	3.79	-0.023	12.63	-11.57	-0.015	7.30	0.80	-23.40	-16.90	-0.324	4.14	-2.87	-27.07	-20.06	-0.116	-0.10	-24.30
	May	6.43	17.770	-	-	2.21	21.990	4.320	-1.480	25.680	22.00	-0.061	28.06	6.06	-0.023	13.60	-8.40	-0.015	7.10	-0.20	-22.20	-14.90	-0.324	5.03	0.89	-21.11	-16.97	-0.116	-0.22	-22.22
	Jun	8.16	13.840	-2.97	24.970	6.01	15.990	3.733	-2.790	24.790	21.90	-0.061	28.32	6.42	-0.023	13.74	-8.16	-0.015	9.80	2.70	-19.20	-12.10	-0.324	11.87	6.84	-15.06	-10.03	-0.116	-1.34	-23.24
	July	8.94	12.960	-1.31	23.210	-1.23	23.130	2.133	0.440	21.460	21.75	-0.061	28.15	6.40	-0.023	13.72	-8.03	-0.015	11.20	1.40	-20.35	-10.55	-0.324	-1.85	-13.72	-35.47	-23.60	-0.116	-0.31	-22.06
	Aug.	1.79	19.960	-8.41	30.160	-4.92	26.670	-3.847	0.180	21.570	21.60	-0.061	28.18	6.58	-0.023	13.56	-8.04	-0.015	11.00	-0.20	-21.80	-10.60	-0.324	-0.63	1.22	-20.38	-22.23	-0.116	-0.56	-22.16
	Sept.	4.79	16.810	6.76	14.840	1.31	20.290	4.287	-0.550	22.150	23.15	-0.061	28.44	5.29	-0.023	13.93	-9.22	-0.015	10.40	-0.60	-23.75	-12.75	-0.324	-5.27	-4.64	-27.79	-28.42	-0.116	-1.42	-24.57
	Oct.	2.4	20.750	-9.05	32.200	-3	26.150	-3.217	-0.490	23.640	24.08	-0.061	28.54	4.46	-0.023	14.12	-9.96	-0.015	10.80	0.40	-23.68	-13.28		2.97	8.24	-15.84	-21.11	-0.116	-0.75	-24.83
	Nov.	-0.94	25.020	-6.47	30.550	-	-	-3.705	-1.890	25.970	22.09	-0.061	28.70	6.61	-0.023	14.21	-7.88	-0.015	11.40	0.60	-21.49	-10.69		-0.42	-3.39	-25.48	-22.51	-0.116	-0.52	-22.61
	Dec.	0.47	21.620	3.46	18.630	2.21	19.880	2.047	0.230	21.860	21.51	-0.061	28.58	7.07	-0.023	14.49	-7.02	-0.015	10.80	-0.60	-22.11	-10.71		5.86	6.28	-15.23	-15.65	-0.116	-0.69	-22.20
1997	Jan	2.36	19.150	16.71	-4.800	30.45	8.940	16.507	10.180	11.330	21.61	-0.061	28.81	7.20	-0.023	14.09	-7.52	-0.015	10.80	0.00	-21.61	-10.81		-3.63	-9.49	-31.10	-25.24	-0.116	-0.56	-22.17
	Feb	-1.84	23.450	-1.76	23.370	31.26	9.650	9.220	1.800	19.810	21.47	-0.061	28.60	7.13	-0.023	14.05	-7.42	-0.015	11.90	1.10	-20.37	-9.57		9.02	12.65	-8.82	-12.45	-0.116	0.51	-20.96
	March	-0.47	21.940	-5.83	27.300	0.24	21.230	-2.020	1.410	20.060	21.42	-0.061	28.57	7.15	-0.023	14.05	-7.37	-0.015	15.70	3.80	-17.62	-5.72	-0.324	10.36	1.34	-20.08	-11.06	-0.116	-0.51	-21.93
	April	27.83	6.410	-5.71	27.130	-22.5	43.920	-0.127	-5.570	26.990	21.02	-0.061	28.57	7.55	-0.023	13.99	-7.03	-0.015	16.10	0.40	-20.62	-4.92	-0.324	4.97	-5.39	-26.41	-16.05	-0.116	1.43	-19.59
	May	19.93	-1.090	12.12	-8.900	1.94	19.080	11.330	6.600	14.420	20.35	-0.061	27.26	6.91	-0.023	12.43	-7.92	-0.015	17.20	1.10	-19.25	-3.15	-0.324	-4.74	-9.71	-30.06	-25.09	-0.116	-3.68	-24.03
	Jun	-32.77	53.120	-3.6	23.950	-3.47	23.820	13.280	3.950	16.400	19.56	-0.061	27.49	7.93	-0.023	10.59	-8.97	-0.015	12.80	-4.40	-23.96	-6.76	-0.324	1.88	6.62	-12.94	-17.68	-0.116	1.89	-17.67
	July	0.23	19.330	-2.31	21.870	4.9	14.660	0.940	3.250	16.310	18.45	-0.061	26.86	8.41	-0.023	10.79	-7.66	-0.015	8.90	-3.90	-22.35	-9.55	-0.324	1.43	-0.45	-18.90	-17.02	-0.116	8.17	-10.28
	Aug.	1.37	-	-3.86	-	0.33	-	-0.720	0.660	-	19.70	-0.061	26.48	6.78	-0.023	10.82	-8.88	-0.015	7.70	-1.20	-20.90	-12.00	-0.324	-1.74	-3.17	-22.87	-21.44	-0.116	11.90	-7.80

			17.080		22.310		18.120			17.790																				
	Sept.	2.25	- 17.450	2.49	- 17.210	6.53	- 13.170	3.757	-2.550	- 22.250	26.19	-0.061	28.21	2.02	-0.023	10.71	-15.48	-0.015	8.80	1.10	-25.09	-17.39	-0.324	-5.02	-3.28	-29.47	-31.21	-0.116	-5.52	-31.71
	Oct.	23.35	-2.840	2.43	- 23.760	-16.65	- 42.840	3.043	-5.280	- 31.470	27.14	-0.061	29.07	1.93	-0.023	10.92	-16.22	-0.015	8.70	-0.10	-27.24	-18.44	-0.324	-2.83	2.19	-24.95	-29.97	-0.116	2.75	-24.39
	Nov.	-10.14	- 37.280	3.32	- 23.820	-5.98	- 33.120	-4.267	-5.080	- 32.220	26.78	-0.061	29.80	3.02	-0.023	10.19	-16.59	-0.015	8.20	-0.50	-27.28	-18.58	-0.324	4.51	7.34	-19.44	-22.27	-0.116	-0.70	-27.48
	Dec.	-1.83	- 28.610	-	-	0.75	- 26.030	-0.540	-1.840	- 28.620	26.37	-0.061	29.85	3.48	-0.023	9.73	-16.64	-0.015	8.30	0.10	-26.27	-18.07	-0.324	6.42	1.91	-24.46	-19.95	-0.116	-1.35	-27.72
1998	Jan	2.83	- 23.540	5.05	- 21.320	20.39	-5.980	9.423	12.710	- 13.660	26.28	-0.061	29.81	3.53	-0.023	9.77	-16.51	-0.015	11.30	3.00	-23.28	-14.98	-0.324	-2.97	-9.39	-35.67	-29.25	-0.116	-4.21	-30.49
	Feb	-11.02	- 37.300	9.17	- 17.110	-25.55	- 51.830	-9.133	-1.250	- 27.530	26.33	-0.061	29.90	3.57	-0.023	9.77	-16.56	-0.015	12.30	1.00	-25.33	-14.03	-0.324	0.36	3.33	-23.00	-25.97	-0.116	-0.08	-26.41
	March	-	-	-9.6	- 35.930	27.7	1.370	9.050	-2.370	- 28.700	26.74	-0.061	30.20	3.46	-0.023	9.80	-16.94	-0.015	8.10	-4.20	-30.94	-18.64	-0.324	3.91	3.55	-23.19	-22.83	-0.116	-0.17	-26.91
	April	53.54	26.800	-18.58	- 45.320	-12.63	- 39.370	7.443	-6.160	- 32.900	26.98	-0.061	30.41	3.43	-0.023	10.81	-16.17	-0.015	7.00	-1.10	-28.08	-19.98	-0.324	-3.80	-7.71	-34.69	-30.78	-0.116	-0.30	-27.28
	May	-17.87	- 44.850	4.35	- 22.630	-1.1	- 28.080	-4.873	-5.790	- 32.770	26.38	-0.061	30.54	4.16	-0.023	11.23	-15.15	-0.015	4.60	-2.40	-28.78	-21.78	-0.324	-2.52	1.28	-25.10	-28.90	-0.116	5.61	-20.77
	Jun	-16.14	- 42.520	-2.08	- 28.460	5.99	- 20.390	-4.077	3.990	- 22.390	25.48	-0.061	30.46	4.98	-0.023	12.27	-13.21	-0.015	7.40	2.80	-22.68	-18.08	-0.324	-5.58	-3.06	-28.54	-31.06	-0.116	-5.68	-31.16
	July	-8.58	- 34.060	3.19	- 22.290	-8.14	- 33.620	-4.510	-5.160	- 30.640	24.67	-0.061	30.67	6.00	-0.023	11.56	-13.11	-0.015	11.70	4.30	-20.37	-12.97	-0.324	-0.22	5.36	-19.31	-24.89	-0.116	-0.72	-25.39
	Aug.	11.21	- 13.460	-1.03	- 25.700	-15.38	- 40.050	-1.733	-4.580	- 29.250	23.74	-0.061	29.77	6.03	-0.023	10.81	-12.93	-0.015	5.20	-6.50	-30.24	-18.54	-0.324	4.94	5.16	-18.58	-18.80	-0.116	0.83	-22.91
	Sept.	-3.29	- 27.030	-	-	3.64	- 20.100	0.175	-4.340	- 28.080	22.48	-0.061	29.08	6.60	-0.023	10.46	-12.02	-0.015	4.00	-1.20	-23.68	-18.48	-0.324	-1.44	-6.38	-28.86	-23.92	-0.116	0.84	-21.64
	Oct.	-5.53	- 28.010	-	–	0.46	- 22.020	-2.535	-4.470	- 26.950	20.59	-0.061	29.09	8.50	-0.023	9.77	-10.82	-0.015	3.30	-0.70	-21.29	-17.29	-0.324	-3.23	-1.79	-22.38	-23.82	-0.116	-0.52	-21.11
	Nov.	9.68	- 10.910	1.04	- 19.550	-6.99	- 27.580	1.243	-3.520	- 24.110	17.66	-0.061	28.12	10.46	-0.023	9.46	-8.20	-0.015	3.00	-0.30	-17.96	-14.66	-0.324	1.10	4.33	-13.33	-16.56	-0.116	0.54	-17.12
	Dec.	8.01	-9.650	13.4	-4.260	18.78	1.120	13.397	7.780	-9.880	12.56	-0.061	26.13	13.57	-0.023	7.89	-4.67	-0.015	2.50	-0.50	-13.06	-10.06	-0.324	-15.13	-16.23	-28.79	-27.69	-0.116	3.10	-9.46
1999	Jan	7.6	-4.960	5	-7.560	20.14	7.580	10.913	16.480	3.920	10.70	-0.061	23.67	12.97	-0.023	6.54	-4.16	-0.015	-1.10	-3.60	-14.30	-11.80	-0.324	-1.04	14.09	3.39	-11.74	-0.116	-0.26	-10.96
	Feb	-6.01	- 16.710	4.33	-6.370	-11.84	- 22.540	-4.507	-3.260	- 13.960	8.95	-0.061	22.84	13.89	-0.023	5.93	-3.02	-0.015	-0.50	0.60	-8.35	-9.45	-0.324	-0.46	0.58	-8.37	-9.41	-0.116	3.22	-5.73
	March	-0.38	-9.330	-10.37	- 19.320	-8.96	- 17.910	-6.570	-5.150	- 14.100	8.85	-0.061	21.36	12.51	-0.023	5.49	-3.36	-0.015	1.30	1.80	-7.05	-7.55	-0.324	4.44	4.90	-3.95	-4.41	-0.116	1.84	-7.01

	April	-	-	-6.02	14.870	-12.3	21.150	-9.160	-2.820	11.670	9.03	-0.061	20.90	11.87	-0.023	4.14	-4.89	-0.015	1.40	0.10	-8.93	-7.63	-0.324	3.03	-1.41	-10.44	-6.00	-0.116	4.33	-4.70
	May	-10.94	19.970	3.45	-5.580	-14.02	23.050	-7.170	-0.880	-9.910	9.63	-0.061	20.86	11.23	-0.023	4.52	-5.11	-0.015	2.10	0.70	-8.93	-7.53	-0.324	-4.49	-7.52	-17.15	-14.12	-0.116	4.11	-5.52
	Jun	-1.69	11.320	1.9	-7.730	17.39	7.760	5.867	1.740	-7.890	11.44	-0.061	20.70	9.26	-0,023	4.57	-6.87	-0.015	1.80	-0.30	-11.74	-9.64	-0.324	6.30	10.79	-0.65	-5.14	-0.116	3.42	-8.02
	July	8.19	-3.250	5.61	-5.830	5.11	-6.330	6.303	-0.970	12.410	14.47	-0.061	21.12	6.65	-0.023	5.15	-9.32	-0.015	-0.60	-2.40	-16.87	-15.07	-0.324	5.24	-1.06	-15.53	-9.23	-0.116	1.81	-12.66
	Aug.	-15.94	30.410	-6.19	20.660	5.71	-8.760	-5.473	-2.830	17.300	14.84	-0.061	21.93	7.09	-0.023	4.81	-10.03	-0.015	6.90	7.50	-7.34	-7.94	-0.324	0.56	-4.68	-19.52	-14.28	-0.116	1.27	-13.57
	Sept.	-0.47	15.310	-16.98	31.820	-8.33	23.170	-8.593	-5.290	20.130	15.78	-0.061	22.44	6.66	-0.023	5.35	-10.43	-0.015	7.20	0.30	-15.48	-8.58	-0.324	5.43	4.87	-10.91	-10.35	-0.116	2.53	-13.25
	Oct.	1.9	13.880	10.8	-4.980	-3.16	18.940	3.180	-0.230	16.010	17.63	-0.061	23.12	5.49	-0.023	5.72	-11.91	-0.015	8.20	1.00	-16.63	-9.43	-0.324	0.69	-4.74	-22.37	-16.94	-0.116	-2.44	-20.07
	Nov.	-3.74	21.370	2.05	15.580	-4.24	21.870	-1.977	-4.470	22.100	18.14	-0.061	24.43	6.29	-0.023	6.04	-12.10	-0.015	8.30	0.10	-18.04	-9.84	-0.324	0.62	-0.07	-18.21	-17.52	-0.116	-0.70	-18.84
	Dec.	-1.94	20.080	-4.02	22.160	2.47	15.670	-1.163	0.040	18.100	19.97	-0.061	25.19	5.22	-0.023	6.15	-13.82	-0.015	8.00	-0.30	-20.27	-11.97	-0.324	0.78	0.16	-19.81	-19.19	-0.116	-2.32	-22.29
2000	Jan	-4.7	24.670	-3.14	23.110	2.37	17.600	-1.823	-0.340	20.310	20.30	-0.061	25.14	4.84	-0.023	6.42	-13.88	-0.015	8.70	0.70	-19.60	-11.60	-0.324	5.17	4.39	-15.91	-15.13	-0.116	-0.16	-20.46
	Feb	-9.87	30.170	8.65	11.650	-2.32	22.620	-1.180	-0.400	20.700	14.84	-0.061	25.39	10.55	-0.023	6.04	-8.80	-0.015	5.70	-3.00	-17.84	-9.14	-0.324	3.77	-1.40	-16.24	-11.07	-0.116	0.81	-14.03
	March	2.59	12.250	-2.49	17.330	3.33	11.510	1.143	0.100	14.740	11.28	-0.061	23.79	12.51	-0.023	5.14	-6.14	-0.015	3.40	-2.30	-13.58	-7.88	-0.324	-0.97	-4.74	-16.02	-12.25	-0.116	2.00	-9.28
	April	-11.24	22.520	-9.95	21.230	-1.37	12.650	-7.520	-3.330	14.610	12.44	-0.061	23.44	11.00	-0.023	5.30	-7.14	-0.015	4.10	0.70	-11.74	-8.34	-0.324	2.88	3.85	-8.59	-9.56	-0.116	-0.01	-12.45
	May	-7.59	20.030	-	-	24.86	12.420	8.635	-3.310	15.750	11.22	-0.061	23.40	12.18	-0.023	4.77	-6.45	-0.015	5.20	1.10	-10.12	-6.02	-0.324	4.13	1.25	-9.97	-7.09	-0.116	2.46	-8.76
	Jun	0.68	10.540	-4.82	16.040	-10.89	22.110	-5.010	-6.520	17.740	10.47	-0.061	23.11	12.64	-0.023	4.89	-5.58	-0.015	6.00	0.80	-9.67	-4.47	-0.324	1.83	-2.30	-12.77	-8.64	-0.116	1.63	-8.84
	July	1.36	-9.110	0.3	10.170	-3.81	14.280	-0.717	-0.140	10.610	9.90	-0.061	22.39	12.49	-0.023	4.71	-5.19	-0.015	6.70	0.70	-9.20	-3.20	-0.324	-1.73	-3.56	-13.46	-11.63	-0.116	-4.35	-14.25
	Aug.	-4.03	13.930	-3.56	13.460	9.65	-0.250	0.687	-1.120	11.020	9.25	-0.061	21.23	11.98	-0.023	4.53	-4.72	-0.015	5.90	-0.80	-10.05	-3.35	-0.324	5.94	7.67	-1.58	-3.31	-0.116	4.10	-5.15
	Sept.	-3.5	12.750	4.62	-4.630	2.4	-6.850	1.173	2.920	-6.330	10.36	-0.061	20.57	10.21	-0.023	4.36	-6.00	-0.015	7.10	1.20	-9.16	-3.26	-0.324	3.42	-2.52	-12.88	-6.94	-0.116	1.77	-8.59
	Oct.	0.36	10.000	-10.29	20.650	3.53	-6.830	-2.133	-1.360	11.720	10.65	-0.061	20.22	9.57	-0.023	4.31	-6.34	-0.015	6.60	-0.50	-11.15	-4.05	-0.324	0.36	-3.06	-13.71	-10.29	-0.116	0.47	-10.18
	Nov.	-2.89	-	13.11	2.460	-3.41	-	2.270	-3.490	-	11.17	-0.061	19.79	8.62	-0.023	4.36	-6.81	-0.015	7.70	1.10	-10.07	-3.47	-0.324	5.16	4.80	-6.37	-6.01	-0.116	-0.08	-11.25

		13.540				14.060			14.140						
	Dec.	-2.23	13.400	-23.77	34.940	4.69	-6.480	-7.103	-4.150	15.320	12.90	-0.061	19.60	6.70	-0.023	4.51
2001	Jan	3.04	-9.860	14.83	1.930	2.63	10.270	6.833	1.310	11.590	14.76	-0.061	20.27	5.51	-0.023	4.67
	Feb	-2.58	17.340	-3.64	18.400	-5.47	20.230	-3.897	0.490	14.270	15.30	-0.061	20.30	5.00	-0.023	4.63
	March	-	-	-9.28	24.580	-10.37	25.670	-9.825	-5.370	20.670	14.97	-0.061	20.19	5.22	-0.023	4.66
	April	-13.64	28.610	9.09	-5.880	-7.31	22.280	-3.953	-4.750	19.720	12.90	-0.061	19.56	6.66	-0.023	4.64
	May	-10.53	23.430	-14.58	27.480	3.7	-9.200	-7.137	-6.060	18.960	10.52	-0.061	19.20	8.68	-0.023	4.42
	Jun	-14.71	25.230	16.26	5.740	-5.36	15.880	-1.270	-2.410	12.930	12.07	-0.061	19.26	7.19	-0.023	4.39
	July	11.49	-0.580	11.89	-0.180	-4.72	16.790	6.220	-2.000	14.070	12.87	-0.061	19.71	6.84	-0.023	4.34
	Aug.	-2.06	14.930	-3.75	16.620	4.48	-8.390	-0.443	-3.950	16.820	12.84	-0.061	19.54	6.70	-0.023	4.43
	Sept.	-5.79	18.630	-7.79	20.630	-9.48	22.320	-7.687	-7.770	20.610	12.39	-0.061	19.44	7.05	-0.023	4.89
	Oct.	-	-	4.58	-7.810	-7.87	20.260	-1.645	4.860	-7.530	11.63	-0.061	19.77	8.14	-0.023	4.37
	Nov.	-21.79	33.420	-0.34	11.970	-20.45	32.080	14.193	3.530	-8.100	11.50	-0.061	19.44	7.94	-0.023	4.35
	Dec.	25	13.500	-	-	-2	13.500	11.500	0.600	10.900	11.01	-0.061	19.49	8.48	-0.023	4.40
2002	Jan	-1.99	13.000	6.08	-4.930	-3.79	14.800	0.100	-0.450	11.460	10.85	-0.061	19.30	8.45	-0.023	4.42
	Feb	4.36	-6.490	3.82	-7.030	-4.55	15.400	1.210	-1.070	11.920	10.61	-0.061	19.18	8.57	-0.023	3.54
	March	25.99	15.380	1.84	-8.770	1.78	-8.830	9.870	-2.920	13.530	10.14	-0.061	18.86	8.72	-0.023	3.71
	April	9.52	-0.620	-12.25	22.390	-3.31	13.450	-2.013	-6.380	16.520	10.01	-0.061	18.69	8.68	-0.023	4.12
	May	-19.03	29.040	7.44	-2.570	4.19	-5.820	-2.467	-1.200	11.210	9.04	-0.061	18.54	9.50	-0.023	4.02
	Jun	-21	30.040	6.39	-2.650	5.14	-3.900	-3.157	-0.190	-9.230	7.34	-0.061	18.38	11.04	-0.023	4.80

			-0.20	-13.10		-0.324							-1.59		
-8.39	-0.015	7.50			-5.40		1.21	-3.95	-16.85	-11.69	-0.116			-14.49	
			4.50	-10.26		-0.324							0.03		
-10.09	-0.015	12.00			-2.76		5.78	4.57	-10.19	-8.98	-0.116			-14.73	
			-1.80	-17.10		-0.324							-0.06		
-10.67	-0.015	10.20			-5.10		-2.25	-8.03	-23.33	-17.55	-0.116			-15.36	
			-0.70	-15.67		-0.324							-0.03		
-10.31	-0.015	9.50			-5.47		0.02	2.27	-12.70	-14.95	-0.116			-15.00	
			-0.50	-13.40		-0.324							-0.56		
-8.26	-0.015	9.00			-3.90		3.62	3.60	-9.30	-9.28	-0.116			-13.46	
			-2.10	-12.62		-0.324							1.25		
-6.10	-0.015	6.90			-3.62		0.21	-3.41	-13.93	-10.31	-0.116			-9.27	
			-2.30	-14.37		-0.324							0.60		
-7.68	-0.015	4.60			-7.47		-1.13	-1.34	-13.41	-13.20	-0.116			-11.47	
			-0.40	-13.27		-0.324							-0.14		
-8.53	-0.015	4.20			-8.67		-0.38	0.75	-12.12	-13.25	-0.116			-13.01	
			-0.20	-13.04		-0.324							0.13		
-8.41	-0.015	4.00			-8.84		0.51	0.89	-11.95	-12.33	-0.116			-12.71	
			-0.90	-13.29		-0.324							0.05		
-7.50	-0.015	3.10			-9.29		1.27	0.76	-11.63	-11.12	-0.116			-12.34	
			0.10	-11.53		-0.324							0.08		
-7.26	-0.015	3.20			-8.43		-3.64	-4.91	-16.54	-15.27	-0.116			-11.55	
			-1.10	-12.60		-0.324							-0.14		
-7.15	-0.015	2.10			-9.40		-1.43	2.21	-9.29	-12.93	-0.116			-11.64	
			-0.30	-11.31		-0.324							-0.47		
-6.61	-0.015	1.80			-9.21		2.74	4.17	-6.84	-8.27	-0.116			-11.48	
			-1.40	-12.25		-0.324							0.00		
-6.43	-0.015	0.40			-10.45		-1.13	-3.87	-14.72	-11.98	-0.116			-10.85	
			0.70	-9.91		-0.324							-0.62		
-7.07	-0.015	1.10			-9.51		-0.06	1.07	-9.54	-10.67	-0.116			-11.23	
			0.80	-9.34		-0.324							-0.06		
-6.43	-0.015	1.90			-8.24		1.93	1.99	-8.15	-8.21	-0.116			-10.20	
			-1.00	-11.01		-0.324							0.35		
-5.89	-0.015	0.90			-9.11		2.39	0.46	-9.55	-7.62	-0.116			-9.66	
			0.80	-8.24		-0.324							-0.01		
-5.02	-0.015	1.70			-7.34		-0.91	-3.30	-12.34	-9.95	-0.116			-9.05	
			1.10	-6.24		-0.324							0.59		
-2.54	-0.015	2.80			-4.54		5.10	6.01	-1.33	-2.24	-0.116			-6.75	

July	-0.63	-7.970	3.04	-4.300	20.91	13.570	7.773	2.670	-4.670	8.63	-0.061	18.12	9.49	-0.023	3.89
Aug.	-44.51	53.140	-1.2	-9.830	9.01	0.380	12.233	3.850	-4.780	8.34	-0.061	18.11	9.77	-0.023	3.74
Sept.	100.87	92.530	-8.85	17.190	-1.7	10.040	30.107	4.820	-3.520	7.60	-0.061	18.14	10.54	-0.023	3.53
Oct.	8	0.400	4.21	-3.390	6.82	-0.780	6.343	4.130	-3.470	8.07	-0.061	18.34	10.27	-0.023	3.79
Nov.	11.64	3.570	10.56	2.490	27.66	19.590	16.620	17.440	9.370	8.30	-0.061	18.05	9.75	-0.023	3.81
Dec.	36.49	28.190	7.3	-1.000	26.27	17.970	23.353	4.450	-3.850	8.38	-0.061	18.34	9.96	-0.023	3.47

-4.74	-0.015	2.10	-0.70	-9.33	-6.53	-0.324	1.49	-3.61	-12.24	-7.14	-0.116	-0.10	-8.73
			-0.30	-8.64		-0.324						-0.13	
-4.60	-0.015	1.80			-6.54		-1.15	-2.64	-10.98	-9.49	-0.116		-8.47
			0.00	-7.60		-0.324						0.25	
-4.07	-0.015	1.80			-5.80		-0.97	0.18	-7.42	-8.57	-0.116		-7.35
			0.10	-7.97		-0.324						0.63	
-4.28	-0.015	1.90			-6.17		-0.48	0.49	-7.58	-8.55	-0.116		-7.44
			0.80	-7.50		-0.324						0.38	
-4.49	-0.015	2.70			-5.60		-0.86	-0.38	-8.68	-9.16	-0.116		-7.92
			1.40	-6.98		-0.324						-0.13	
-4.91	-0.015	4.10			-4.28		-0.29	0.57	-7.81	-8.67	-0.116		-8.51

E. STATISTICAL DISCRIPTIONS

R_m	β_L	R_L	$(R_{jf}-R_{ft})$	β_d	R_d	$(R_{jf}-R_{ft})$	γ_{infl}	infl	g_{infl}	$(R_{jf}-R_{ft})$	λ_{infl}	γ_{fer}	fer	g_{fer}	$(R_{jf}-R_{ft})$	λ_{fer}	$\beta_{er\$}$	$R_{er\$}$	$(R_{jf}-R_{ft})$
-0.528	-0.061	24.234	7.354	-0.023	8.386	-8.494	-0.015	5.779	0.005	16.864	11.101	-0.324	1.135	-0.003	-16.87	-15.73	-0.116	0.657	-16.23

	NMG	BBK	Bamburi	ALL
Mean	1.1318	-0.098	0.509	0.504
Variance	288.25	77.195	227.59	65.166
Covariance	10.551	18.063	31.208	19.372
Beta	0.4848	0.8300	1.4340	0.8901

		R_L	R_d	inflation	fer	$R_{er\$}$
NMG	COV	0.05145	1.79567	-1.4056	-8.215	-2.90578
	VAR	16.8429	15.5488	17.712	17.8524	9.14725
	BETA	0.00305	0.11549	-0.0794	-0.4602	-0.31767
BBK	COV	-1.5927	-1.0128	-0.269	-8.2032	-3.06781
	BETA	-0.0946	-0.0651	-0.0152	-0.4595	-0.33538
BAMBURI	COV	-1.6815	-3.1307	-3.6857	-8.8882	-1.86667
	BETA	-0.0998	-0.2013	-0.2081	-0.4979	-0.20407
ALL	COV	-0.7848	-0.7399	-1.765	-7.6354	-2.61338
	BETA	-0.0466	-0.0476	-0.0997	-0.4277	-0.2857

NMG

Risk factor	I-1	Beta of the models	I-4		F-4		F-6
Market risk	0.4848	b_m	0.485	0.280	0.485	0.1802	0.485	0.1726
Interest on loans risk		b_l	-0.003	0.000			-0.003	0.0000
Interest on deposit risk		b_d	-0.115	-0.008			-0.115	-0.0048
$ exchange rate risk		$b_{er\$}$	-0.318	-0.112	-0.318	-0.0722	-0.318	-0.0691
Inflation risk		b_{mfl}	-0.079		-0.079	-0.0047	-0.079	-0.0045
Foreign exchange reserve risk		b_{fer}	-0.460		-0.460	-0.1574	-0.460	-0.1508
Beta-p	0.485			0.160		-0.054		-0.057

BBK

Risk factor	I-1	Beta of the models	I-4		F-4		F-6
Market risk	0.8300	b_m	0.830	0.567	0.830	0.4281	0.830	0.4098
Interest on loans risk		b_l	-0.095	-0.003			-0.095	-0.0022
Interest on deposit risk		b_d	-0.065	-0.002			-0.065	-0.0012
$ exchange rate risk		$b_{er\$}$	-0.335	-0.086	-0.335	-0.0652	-0.335	-0.0624
Inflation risk		b_{mfl}	-0.015		-0.015	-0.0001	-0.015	-0.0001
Foreign exchange reserve risk		b_{fer}	-0.466		-0.466	-0.1308	-0.466	-0.1252
Beta-p	0.830			0.476		0.232		0.219

		BETA		-0.0466			-0.0476			-0.0997		
			Contribu tions									
I-1		I-4	B*P	%		F-4		%		F-6		%
-8.436	Pm	-17.402	8.436	57.80	Pm	17.402	8.436	37.174	Pm	-17.402	8.436	35.600
	Pl	7.354	0.023	0.16					Pi	7.354	0.023	0.096
	Pd	-8.494	0.981	6.72					Pd	-8.494	0.981	4.139
	Per$	-16.230	5.156	35.32	Per$	16.230	5.156	22.718	Per$	-16.230	5.156	21.756
					Pinfl.	16.864	1.338	5.897	Pinfl.	-16.864	1.338	5.647
					Pfer	16.872	7.764	34.211	Pfer	-16.872	7.764	32.762
			14.596	100.00			22.694	100.000			23.698	100.000

			Contribu tions					0.00				
I-1 .		I-4	B*P	%		F-4		%		F-6		%
-14.44	Pm	-17.402	14.444	68.34	Pm	17.402	14.444	51.576	Pm	-17.402	14.444	49.375
	Pl	7.354	0.695	3.29					Pi	7.354	0.695	2.377
	Pd	-8.494	0.553	2.62					Pd	-8.494	0.553	1.891
	Per$	-16.230	5.443	25.75	Per$	16.230	5.443	19.437	Per$	-16.230	5.443	18.607
					Pinfl.	16.864	0.256	0.915	Pinfl.	-16.864	0.256	0.875
					Pfer	16.872	7.862	28.072	Pfer	-16.872	7.862	26.874
			21.136	100.00			28.004	100.000			29.253	100.000

BAMBUR
I

Beta of the models

Risk factor	I-1		I-4		F-4		F-6	I-1	
Market risk	1.4340	b_m	1.4340	1.165	1.4340	0.8907	1.4340	0.8396	-24.95	Pm
Interest on loans risk		b_l	-0.100	-0.002			-0.100	-0.0017		Pl
Interest on deposit risk		b_d	-0.201	-0.011	-0.201	0.0000	-0.201	-0.0081		Pd
$ exchange rate risk		$b_{er\$}$	-0.204	-0.022	-0.204	-0.0168	-0.204	-0.0159		Per$
Inflation risk		b_{infl}	-0.208		-0.208	-0.0182	-0.208	-0.0171		
Foreign exchange reserve risk		b_{fer}	-0.498		-0.498	-0.1041	-0.498	-0.0982		
Beta-p	1.434			1.130		0.752		0.699		

ALL

Beta of the models

Risk factor	I-1		I-4		F-4		F-6	I-1	
Market risk	0.8901	b_m	0.8901	0.661	0.8901	0.4750	0.8901	0.4631	-15.49	Pm
Interest on loans risk		b_l	-0.047	-0.001			-0.100	-0.0012		Pl
Interest on deposit risk		b_d	-0.048	-0.001			-0.201	-0.0027		Pd
$ exchange rate risk		$b_{er\$}$	-0.286	-0.063	-0.286	-0.0457	-0.204	-0.0318		Per$
Inflation risk		b_{infl}	-0.100		-0.100	-0.0058	-0.208	-0.0117		
Foreign exchange reserve risk		b_{fer}	-0.428		-0.498	-0.1238	-0.498	-0.1207		
Beta-p	0.8901			0.595		0.300		0.295		

I-4	Contributions B*P	%		F-4		%		F-6		%
-17.402	24.954	81.26	Pm	17.402	24.954	62.113	Pm	-17.402	24.954	58.551
7.354	0.734	2.39					Pi	7.354	0.734	1.723
-8.494	1.710	5.57					Pd	-8.494	1.710	4.013
-16.230	3.312	10.78	Per$	16.230	3.312	8.244	Per$	-16.230	3.312	7.771
			Pinfl.	16.864	3.509	8.735	Pinfl.	-16.864	3.509	8.234
			Pfer	16.872	8.400	20.908	Pfer	-16.872	8.400	19.709
	30.711	100.00			40.176	100.000			42.620	100.000

I-4	Contributions B*P	%		F-4		%		F-6		%
-17.402	15.490	74.21	Pm	17.402	15.490	53.370	Pm	-17.402	15.490	52.031
7.354	0.343	1.64					Pi	7.354	0.343	1.151
-8.494	0.404	1.94					Pd	-8.494	0.404	1.358
-16.230	4.637	22.21	Per$	16.230	4.637	15.977	Per$	-16.230	4.637	15.576
			Pinfl.	16.864	1.681	5.790	Pinfl.	-16.864	1.681	5.645
			Pfer	16.872	7.216	24.863	Pfer	-16.872	7.216	24.240
	20.873	100.00			29.023	100.000			29.770	100.000

Average Sensitivities for company's funds sample

Panel A: Index-1

	Market
NMG	-8.4365
BBK	-14.4437
BAMBURI	-24.9545
ALL	-15.4895

Panel B: Index-4

	Market
NMG	-4.8763
BBK	-9.8705
BAMBURI	-20.2770
ALL	-11.4944

Panel C: Fundamental-4

	Market
NMG	-3.1362
BBK	-7.4495
BAMBURI	-15.500
ALL	-8.2667

Panel D: Fundamental-6

	Market
NMG	-3.0034
BBK	-7.1315
BAMBURI	-14.6110
ALL	-8.0593

IL	Id	ER$	Infl	FER

IL	Id	ER$	Infl	FER
0.0000	0.0659	1.8212		
-0.0229	0.0145	1.4018		
-0.0176	0.0952	0.3572		
-0.0056	0.0078	1.0301		

IL	Id	ER$	Infl	FER
		1.1725	0.0789	2.6561
		1.0580	0.0023	2.2069
		0.2729	0.3064	1.7568
		0.7416	0.0976	2.0891

IL	Id	ER$	Infl	FER
0.0000	0.0406	1.1217	0.0756	2.5436
-0.0165	0.0105	1.0128	0.0022	2.1127
-0.0127	0.0685	0.2573	0.2888	1.6560
-0.0085	0.0232	0.5157	0.1980	2.0367

Table V

Percentage of mean return explained by each variable

Panel A: Index-4

	Market
NMG	72.098
BBK	87.275
BAMBURI	97.735
ALL	91.677

Panel B: Fundamental-4

	Market
NMG	44.525
BBK	69.513
BAMBURI	86.902
ALL	73.843

Panel C: Fundamental-6

	Market
NMG	44.266
BBK	69.330
BAMBURI	86.485
ALL	74.339

IL	Id	ER$	Infl	FER
0.001	0.975	26.927		
0.202	0.001	12.395		
0.085	0.005	1.722		
0.045	0.001	8.216		

IL	Id	ER$	Infl	FER
		16.6	1.120	37.708
		9.9	0.022	20.593
		1.5	1.718	9.850
		6.6	0.872	18.661

IL	Id	ER$	Infl	FER
0.000	0.598	16.532	1.114	37.489
0.161	0.102	9.846	0.022	20.539
0.075	0.406	1.523	1.710	9.802
0.078	0.214	4.757	1.826	18.786