

PRICING OF OPTIONS USING THE BLACK AND SCHOLES MODEL –  
THE CASE OF NAIROBI STOCK EXCHANGE STOCKS

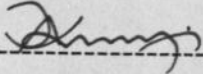
BY JULIE AKINYI NYANG'AYA

A RESEARCH PROJECT SUBMITTED TO THE FACULTY OF  
COMMERCE IN PARTIAL FULFILMENT OF THE REQUIREMENTS  
OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION,  
UNIVERSITY OF NAIROBI.

OCTOBER 2001

**DECLARATION**

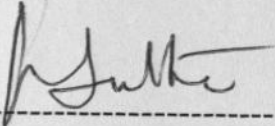
This research paper is my original work and has not been submitted for examination in any other university.

Signed:   
-----  
Julie Akinyi Nyang'aya

Date: 22/10/2009  
-----

---

This research paper has been submitted for examination with my approval as a university supervisor.

Signed:   
-----  
Otieno Odhiambo Lurther

Date: - -----

## DEDICATION

To my family, Bob, Hazel and George. The MBA was important but you are my life.

## ACKNOWLEDGEMENTS

My heartfelt appreciation goes to several groups of people without whom this research project would not have been possible:

To my parents, Job and Dolphine Okech, without whom I would not be in this world and who taught me that I can achieve anything I want in life and instilled in me the confidence and determination to do so.

To my supervisor, Otieno Odhiambo Luther for his unwavering belief and support, through thick and thin, to ensure this research project was completed. Thank you for your patient but firm encouragement.

To V O Kamasara, J Karanja and W Iraki for their critical but constructive input when I needed it most.

To my fellow students, Stephen Kamanda, Matu Mugo, Paul Nguru and Evelyn Agutu for their generosity with time and ideas.

Last but certainly not least, to my best friend Bob, for the encouragement, support and understanding throughout our life together and particularly during my life as an MBA student. Without your consistent support and understanding, I would not have reached this far.

## ABSTRACT

The objectives of this research were, first , to determine the level of stock volatility, for the period 1997 to 2000, on the Nairobi Stock Exchange and identify securities that warrant hedging through the use of options. Having assessed the volatilities, the second objective was to determine the range of exercise prices, for individual stocks, that would generate in-the-money European options. Thirdly, the research sought to determine whether the world re-known Black and Scholes option pricing model could be used to value options on stocks quoted on the Nairobi Stock Exchange.

The level of stock volatility on the Nairobi Stock Exchange was determined using the expected returns and monthly share price movements for each stock. Exercise price ranges were determined using a mathematical model described in detail in the research paper. Having collated all the data required to use the Black and Scholes model, option values were determined using a Black and Scholes computation software, *derivagem*.

The expected returns for stocks in the four years under review were markedly poor, which is perhaps expected, in view of the downturn in the Kenyan economy in the said period, mirrored in the performance of the Exchange. Stock volatilities were significant for all stocks on the Exchange with the exception of Kapchorua Tea Company, Limuru Tea Company and Regent Undervalued Assets Africa Fund. The latter did not trade while for Kapchorua Tea Company and Limuru Tea

Company, monthly share prices remained virtually the same during the period of study.

The mathematically determined exercise price ranges were fairly reasonable in view of the fact that they fell within actual share price movements in the periods under review and were in tandem with the individual volatilities of the stocks, that is the higher the volatility, the wider the range of mathematically derived exercise ranges and vice versa. The research indicates that the Black and Scholes option pricing model can be used to determine option values and ranges for in-the-money options for stocks quoted on the Nairobi Stock Exchange. All the data required to use the model was based on secondary market data, with stock volatility and exercise price ranges being determined mathematically using historical data.

The study gives useful insight into the performance of the Exchange (in specific, returns and volatilities of stocks quoted thereon) and offers to investors and fund managers an alternative means of managing the risks of their quoted investments, by hedging through the use of options. To the regulatory authority, the study gives the practicalities of pricing options in a Kenyan context, which will be crucial in order to effectively establish the options exchange (fourth segment) in Kenya. Being a pioneer study in option pricing, the study opens an avenue for further extensive research by Kenya's academia.

## LIST OF APPENDICES

1.0	Computation of monthly returns	1
2.0	Computation of estimated volatilities	2
3.0	Computation of expected returns	3
4.0	Estimation of exercise prices	4
5.0	Estimation of exercise price ranges	13
6.0	Simulation of option values using Bopscol	17
7.0	Summary of findings	18
2.0	CHAPTER TWO: LITERATURE REVIEW	20
2.1	Option pricing models	21
2.2	The Black and Scholes Option Pricing Model	24
2.3	Extensions of the model	25
2.4	Empirical tests of the Black and Scholes Option Pricing Model	29
2.5	Summary of the empirical work	41
3.0	CHAPTER THREE: RESEARCH METHODOLOGY	43
3.1	Research design	43
3.2	Population and sample design	44
3.3	Data collection	44
3.4	Data analysis	45

# TABLE OF CONTENTS

	Pages
<b>1.0 CHAPTER ONE: INTRODUCTION</b>	
1.1.1 Background	1
1.1.2 Factors affecting option pricing	5
1.2.1 The case for options in Kenya	9
1.2.2 Recent developments on the Nairobi Stock Exchange	13
1.3.1 Statement of the problem	17
1.3.2 Objectives of the study	18
1.3.3 Importance of the study	18
<b>2.0 CHAPTER TWO: LITERATURE REVIEW</b>	
2.1 Option pricing models	21
2.2 The Black and Scholes Option Pricing Model	24
2.3 Extensions of the model	26
2.4 Empirical tests of the Black and Scholes Option Pricing Model	29
2.5 Summary of the empirical work	41
<b>3.0 CHAPTER THREE: RESEARCH METHODOLOGY</b>	
3.1 Research design	44
3.2 Population and sample design	44
3.3 Data collection	44
3.4 Data analysis	51



## **4.0 CHAPTER FOUR: RESEARCH FINDINGS AND INTERPRETATION**

<b>4.1</b>	<b>Expected returns</b>	<b>56</b>
<b>4.2</b>	<b>Stock volatilities</b>	<b>58</b>
<b>4.3</b>	<b>Exercise price ranges</b>	<b>65</b>
<b>4.4</b>	<b>Summary of in-the-money options</b>	<b>75</b>
<b>4.5</b>	<b>Possible pay-offs using options</b>	<b>79</b>

## **5.0 CHAPTER FIVE: RESEARCH CONCLUSION**

<b>5.1</b>	<b>Conclusion</b>	<b>84</b>
<b>5.2</b>	<b>Limitations of study</b>	<b>85</b>
<b>5.3</b>	<b>Suggestions for further research</b>	<b>86</b>

## **REFERENCES**

## **APPENDICES**

## **1.0 CHAPTER ONE: INTRODUCTION**

### **1.1.1 Background**

Options fall under the class of investments known as derivatives. A derivative (or derivative security) is a financial instrument whose value depends on the values of other, more basic underlying variables. Derivatives are used by investors to reduce risk, change/manage the nature of one's financial exposure and reduce transaction costs. In recent years, derivatives have become increasingly important in the world of finance. Futures and options are now traded actively on many exchanges. Forward contracts, swaps, and many different types of options are regularly traded outside exchanges by financial institutions, fund managers and corporations in what is termed the over-the-counter market. Derivatives also often form part of a bond or stock issue.

An option is an investment vehicle that offers the option buyer the right, but not the obligation, to buy or sell a particular asset at a given price for a specific period of time for a market premium. The underlying asset, the option type, strike price and expiration date identifies options. The underlying asset is the specific stock or commodity that the option conveys to the purchaser when the option is exercised. The underlying asset may be available in stocks, stock indices, foreign currencies, debt instruments, commodities and futures contracts. In all, an option is a right but not an obligation to buy.

There are two distinct types of options: calls and puts. A call gives the holder the right to buy an asset at a fixed strike price. A put, on the other hand, gives the holder the right to sell an asset at a fixed strike price. Five items are needed to specify an option- the underlying asset, date of expiration, exercise price and whether the option is a call or a put.

The strike price or exercise price is the stated price at which the buyer of the call has the right to buy a specific contract, or the price at which the buyer of a put has the right to sell a specific contract. In accordance with the standardized terms of their contracts, all options expire on a certain date, called the "expiration date". For conventional listed options, this can be up to nine months from the date the options are first listed for trading. There are longer-term option contracts, called LEAPS, which can have expiration dates up to three years from the date of the listing. (*Chicago Board Options Exchange-CBOE-2000*)

An "American option" is an option contract that may be exercised at any time between the date of purchase and the expiration date. Conversely, a "European option" (used primarily for cash settled options) can only be exercised during a specific period of time just prior to expiration. The strike prices and expiration dates are established by the various exchanges on which options are traded. These are referred to as standard options.

Derivatives with more complicated payoffs than the standard European or American calls and puts are referred to as exotic options. Most exotic options trade in over the counter market and have been designed to meet the particular needs of corporations.

Options can be In The Money (ITM), At The Money (ATM), or Out of The Money (OTM). A call option is In The Money if its strike price is lower than the underlying market price, thus making it advantageous to exercise the option. A put option is In The Money if its strike price is higher than the underlying market price. An option is said to be At The Money if the option holder does not lose or gain whether he exercises his option or buys or sells the asset from the market. In this case the market price would be equal to the exercise price plus the premium paid to purchase the call option. An option is Out of the Money if it is not advantageous to exercise it (the exercise price is higher than the market price). Out of the Money (OTM) options cost less than In the Money (ITM) options.

The holder of an option has to pay a price for obtaining a call or put option. The price will have to be paid whether or not the holder exercises his option, and is called the option premium. The potential loss to the buyer of an option can be no greater than the initial premium paid for the contract, regardless of the performance of the underlying stock. This allows

an investor to control the amount of risk assumed. On the contrary, the seller of the option, in return for the premium received from the buyer, assumes the risk of being assigned if the contract is exercised. (CBOE-2000)

Until the establishment of the Chicago Board Option Exchange (CBOE) in 1973, there was no secondary market in options on common stock. Thus, an investor in a call option could either exercise it or permit it to lapse but could not sell the option to another party. The establishment of the CBOE allowed options to be traded. The primary advantage of an options exchange is that it permits the investor to get in and out of options at any time before the option expires. A second advantage of a traded options exchange is lower transactions costs. Before the CBOE was established, buying options involved high transaction costs for a variety of reasons, including the number of middlemen involved. The CBOE set up a computerized low-cost operation, administered by the Options Clearing House, that allows the purchase and sale of options with standardized periods of maturity and exercise prices. The result is that trading in options has increased enormously across the globe and particularly in the western world. (CBOE-2000)

### 1.1.2 Factors affecting option pricing

There are five major factors that determine the price of an option:

- The price of the underlying asset vis-à-vis the strike price of the option;
- The volatility of the underlying asset;
- The time remaining until the option expires
- The rate of interest
- Dividends

#### **The price of the underlying asset vis-a vis the strike price of the option**

The higher the stock price for a given exercise price, the greater the value of a call option. The option is worth at least the positive difference between the stock price and the present value of the exercise price.

#### **The volatility of the underling asset**

The more volatile the underlying common stock, the more valuable the option. Volatility is a measure of the amount by which an asset price fluctuates in a given time. Mathematically, volatility is the annualized standard deviation of the asset daily price changes.

There are two types of volatility: statistical volatility and implied volatility. Statistical volatility is a measure of actual asset price changes over specific period of time. Implied volatility is a measure of how much the “market

place" expects asset prices to move, for an option price. That is, the volatility that the market itself is implying. (Dr H S Sharaway-2000)

Options are valuable precisely because of the risk of the underlying common stock. An investor would not invest in an option to purchase a completely riskless common stock with an exercise price equal to the current market price.

### **The time remaining until the option expires**

The longer the maturity of the option, the more valuable it is. The reason is that the holder of the call option benefits when the stock price rises, and a longer maturity of the option provides more opportunities for the stock price to rise.

A longer maturity essentially provides more time for the stock price to drift to a level where it would be profitable to exercise the option.

### **The rate of interest**

The higher the risk free interest rate, the higher the value of the option. A higher interest rate increases the value of an option because it reduces the present value of the exercise price (and the present value of the dividends on the underlying stock).

Price of

Call option > Price of stock- Present value of dividend- Present value of Exercise price

The exercise price can be viewed as the face value of a loan to the purchaser of the call option. The "loan" is repaid when the option is exercised. The present value of a loan decreases as the interest rate increases. Thus an increase in the interest rate reduces the present value of the effective liability and therefore increases the present value of the option.

### **Dividends**

Payment of dividends reduces the asset's market value, converting the investor's return from capital appreciation to cash flow. Thus, other than the tax implication of this conversion, the underlying asset's owner should not lose any overall net worth over the payment of the dividend. On the other hand, the problem for the prospective call option owner is that he will not receive the dividend. Therefore the reduction in the present value of the stock will reduce the value of the derivative contract. Being rational, he will reduce the price he is willing to pay for the call option on the dividend bearing securities. Consequently, dividends become a fifth factor in the option valuation process.



Various scholars have over the past century, come up with models for pricing options. The one that has however gained worldwide acceptance both in the academic and professional world is that which was developed by Fischer Black and Myron Scholes and is popularly referred to as the Black and Scholes model, or simply, the B-S model. Fischer Black was then a Partner at Goldman Sachs and Company, New York, while Myron Scholes was the Frank E Buck Professor of Finance at Stanford University. The model has been pivotal to the growth and success of financial engineering in the 1980s and 1990s. In 1997, the importance of the model was recognized when Myron Scholes and Robert Merton (who did various extensions of the model as indicated in the literature review of this research paper, pages 25 to 28) were awarded the Nobel prize of economics. Sadly, Fischer Black died in 1995, otherwise he also would undoubtedly have been one of the recipients of this prize.

The Black-Scholes valuation model holds that the value of a call option is a function of the price of the underlying security, the exercise price, the time to maturity, the risk free rate and the stock volatility (factors earlier identified as determining the pricing of an option) i.e.  $C = f(S, X, T, RFR, v)$  where  $C$  is the value of the option,  $S$  is the share price,  $X$  is the exercise price,  $T$  is time to maturity/expiration of the option,  $RFR$  is the risk free rate and  $v$  is the stock volatility. The share price and the risk free rate are observable market factors, while the exercise price and the time to

expiration are normally defined by the option contract. The only variable that an investor must provide is  $\nu$ , the stock volatility.

Many academic papers have proposed more complicated models only to conclude that the simple Black and Scholes model can be modified to give almost equally good results. (See empirical studies on the model as indicated under the literature review section of this research paper, pages 28 to 40).

### **1.2.1 The case for options in Kenya**

The 1999 Economic Survey cited a number of factors contributing to the slow down of the economic growth of Kenya, in particular the poor state of infrastructure, inadequate power supply, telecommunication services, depressed investments, declined level of tourism, depressed manufacturing production, rising costs of inputs and poor world commodity prices in addition to continued high level of interest rates.

The situation did not improve in the year 2000 when, in addition to the above problems which did not improve at all, the country was faced with acute power rationing which seriously dented the performance of the majority, if not all sectors of the economy. In addition, threats from globalization and the never-ending circus of political intrigues continues to compound the problem in the year 2001.

All the above translate into high risk, that is, making investing in Kenya a relatively risky business. The need to manage risk is therefore real.

The performance of the stock market is a mirror of the performance of the economy and the level of performance in the Nairobi Stock Exchange was and continues to be attributed to the economic downturn that has continued to significantly affect corporate earnings, dividend payout and turnover.

The fluctuations in the market share prices and therefore the stock market index is directly related to stock volatility which is defined as the measure of the amount by which an asset price fluctuates in a given time. Mathematically, volatility is the annualized standard deviation of the asset daily price changes. As a result of the volatility on the NSE, investment firms such as ICDC Investment Company and pension funds have and continue to recognize significant losses on revaluation of their quoted investment portfolio and on the sale of majority of securities listed on the Exchange. Investors are particular about lopsided risk and would like to eliminate it. Vehicles for eliminating risk, options being one of them, are invaluable to developing economies.

In evaluating a form of investment, such as in stocks, an investor is concerned with the expected return (which may be in the form of capital appreciation or cash flow in the form of dividends) and the risk of the investment. If there existed certainty, the return would be expected and

there would be no risk. Risk in an investment implies variability of returns. This variability in returns hampers the ability to better plan ahead by projecting the future cash flows. Hedging would assist one to better plan ahead by, projecting cash flows that would not be affected by the whims of the financial markets.( *Jorion and Cheery* (1991). Increasing volatility in the financial markets has led to rise in the importance of risk management techniques using derivative securities such as options, which allows parties to hedge against stock volatility.(*Walmsley* 1988)

Recall that options give the holder the right but not obligation to buy (in the case of a call option) or sell (in the case of a put option) an asset at a certain specified time and a specific price.

If an investor anticipates a certain directional movement in the price of a stock, the right to buy or sell that stock at a predetermined price, for a specific duration of time can offer an attractive investment opportunity. The decision as to what type of option to buy is dependent on whether the investor's outlook for the respective security is positive (bullish) or negative (bearish). If the outlook is positive, buying a call option creates the opportunity to share in the upside potential of a stock without having to risk more than a fraction of its market value. Conversely, if a downward movement is anticipated, buying a put option will enable one to protect against the downside risk without limiting profit potential. Purchasing options offers one the ability to position oneself according to

your market expectations in a manner such that you can both profit and protect with limited risk. (CBOE-2000)

In the Kenyan context where traded options are yet to be introduced, a limitation of a study on option pricing would be the fact that there would be no actual market prices to be compared with the theoretical/model prices that would be generated using the Black and Scholes option pricing model. However, as indicated in the literature review of this research paper, even the pioneer study by Black and Scholes in 1973 was undertaken under similar circumstances and over 25 years later and following several subsequent empirical studies, the results of their findings have been found to be fairly accurate and no superior model is yet to be identified. The comparison of the theoretical values determined by this study to the actual prices when the fourth segment of the Nairobi Stock Exchange (the Options Exchange) is operationalized, would be just one of the many opportunities for further research in option pricing in Kenya. The challenge in the Kenyan context is to identify the stocks whose volatility is significant enough to justify investors/portfolio managers investing in options to hedge against bullish and/or bearish movements in the market and the range of exercise prices that give options on such securities positive values (thus making it worthwhile to invest in the option contract and pay upfront the required premium/option value). Having identified stock

volatility and exercise prices, the option values are easily derived using the world-reknown Black and Scholes model.

### 1.2.2 Recent developments on the Nairobi Stock Exchange

In its paper "*A reform strategy on proposed fundamental reorganization of Kenya's capital market*" (Revised 29 March 2000), the Capital Markets Authority (CMA) indicated its proposal to reorganize the Nairobi Stock Exchange market operations into four independent segments which would have specific defined eligibility and disclosure requirements for the purpose of listing in each of the market segments. Each market, depending on the degree of the underlying risks pertaining to the nature of securities listed therein, would have its own defined categories of investors such that some segments may be restricted to specific institutional investors and high net worth individuals only. The 4 segments are namely:

- Main Investments Market Segment (MIMS)

This represents the main quotation market for the NSE and has stringent eligibility and disclosure requirements. It essentially adapted the previous listing of the NSE but has been further subdivided into agricultural, commercial and services, finance and investment and allied segments.

- Alternative Investment Market Segment (AIMS)

This segment is aimed at providing access to the capital markets to small and medium sized companies with high growth potential and

currently includes such firms as Kapchorua Tea Company, George Williamson Kenya, Eaagads and A Baumann & Company.

- Fixed Income Securities Market Segment (FISMS)

This segment is aimed at providing a separate market for fixed income securities such as treasury bills, corporate bonds, preference shares and debenture stocks. It could also list other forms of short-term financial instruments such as treasury bills and commercial papers. It currently lists Kenya Power and Lighting Company/Marshalls/Lonhro/Kenya Orchards preference shares.

- Futures and Options Market Segment (FOMS)

The fourth segment of the Exchange which should be established in the short term (2 to 5 years) and is the area of interest for this research project, "is aimed at providing a mechanism to market participants to hedge/offset their risks against adverse movements of variables over which they have no control. It will also help promote market efficiency. FOMS will offer additional investment opportunity to institutional investors and high net worth individuals and will have its own eligibility and listing requirements".

The paper goes further to state that the market segment is to be implemented after further development of necessary operational and institutional support. The preliminary work and study was to be completed by June 2001 and an implementation timetable announced.

A discussion with the Head of Research at the Capital Markets Authority indicated that while the above deadline has been pushed by about a year, there is a firm commitment to set up an options and futures segment of the Exchange in the next 2 to 5 years.

Based on the above, the actual trading in futures and options is soon to become a reality in Kenya. Prior to the establishment of the fourth segment of the Exchange, the Capital Markets Authority would however have to consider among other factors, the following:

- Enhancing confidence and knowledge among all market participants to guarantee the stability of the fourth segment

In light of the complexity of some option contract payoff specifications (for exotic options), and the mathematical concepts underlying the market and credit risk pricing and management models, it is necessary that the target and actual risk levels be supervised by managers who possess a sufficient educational training in finance and in quantitative methods applied in asset modeling. To minimize educational risk, one could for instance, condition the hiring process upon the obtaining of a university degree, or a professional degree, and on the attendance of a specialized course on derivatives. Eventually the financial community could introduce examinations that test the future candidate's minimum body of



knowledge required to perform a specific task or be responsible for a specific risk exposure. Such an examination policy is already compulsory for traders on most regulated exchanges across the globe.

- Enhancing information standardization and disclosures at all levels of the fourth segment.

The Authority would have to enforce the publication of complete information on the options' products specifications, on trading activity and harmonization of accounting standards. It would also be necessary to institute the legal framework within which the derivatives market would operate. The adoption of International Accounting Standards(IAS) by Kenya will greatly facilitate the harmonization of accounting standards and IAS 39 gives the minimum disclosure requirements that an organization dealing in derivatives needs to disclose in its financial statements.

- Identification of the securities that should have options traded on the fourth segment and the exercise prices for such options.

An Exchange must specify the terms of the option contracts it trades. In particular, it must specify the size of the contract, the precise expiration date and the strike/exercise price.

The above forms the heart of this research project.

### 1.3.1 Statement of the problem

Investors and managers of equity portfolios have a choice between two styles of management: passive versus active management of their portfolios. Three generic themes are available to active portfolio managers to time the market and add value to their portfolios in comparison to the market benchmark. Firstly, they can try to time the equity market by shifting funds in and out of stocks, bonds and treasury-bills depending on broad market forecasts and estimated risk premiums. Secondly, they can shift funds among different equity sectors and industries or among investment styles to catch the next "hot" concept before the rest of the market does. Thirdly, equity managers can do stock-picking, looking at individual issues in an attempt to find undervalued stocks-ie buy low and sell high.

Trading in options would enable investment managers to proactively manage their portfolios by enabling them to position themselves according to their market expectations in a manner such that they can both profit and protect their investments with limited risk.

Risk management is the heart of good corporate governance and in view of the continued instability and erratic price movements of stock prices at the Nairobi Stock Exchange, it is imperative that investors/fund managers

identify and properly hedge against share price movements through use of options.

### 1.3.2 Objectives of the study

- To assess the level of stock volatility on the Nairobi Stock Exchange and identify which securities warrant hedging through options;
- To determine the range of exercise prices, for individual stocks, that would generate in the money European options
- To determine option values using the Black and Scholes Option pricing Model

### 1.3.3 Importance of the study

#### **Academic community**

To the academic community, this study will provide a body of knowledge regarding options and their pricing and hedging strategies. The research is also expected to provide a basis for further research in a related field.

#### **Regulatory authorities**

The study will provide insight to the regulatory authorities, namely the Capital Markets Authority and the Nairobi Stock Exchange, on checks and balances that have to be put in place before the full introduction of option trading in Kenya.

### **Investment advisors/stock brokers**

In order to guarantee regulation in the derivatives market, the managers, traders and other derivative dealers must receive the proper incentives when hedging, trading or speculating with those instruments. They can only do this if they fully understand how the instruments work. This study aims to show how option pricing and trading strategies can be determined.

### **Investors**

Confidence is only available to those market participants who have access to all the relevant information. By educating investors what options are and how they can be used in a Kenyan context, the study will boost confidence in option trading in Kenya.

Having given the background information on options and factors affecting their value and the need for research in this area in Kenya, it is important to look at what research work and studies have been done on the subject of options pricing. Chapter two covers the literature review on option

pricing with particular emphasis to research work using the Black and Scholes option pricing model.

The chapter is divided into 5 sections. The first section provides an overview of option pricing models developed to date. The second section reviews the original Black and Scholes option pricing model. The third section looks at the various extensions of the Black and Scholes model. The fourth section reviews research work in an empirical test of the Black and Scholes model. And finally, the fifth section provides a summary of the conclusions from the various research work.

## 2.1 Option pricing models

The valuation of options has been the subject of research over a long period of time. Early work started with *Blackett* (1940) who recognized that the option value depended (or was contingent) on the value of the underlying share and attempted a valuation by modeling the behaviour of the price of the share over time. This approach culminated in the work of *Black* (1964) who assumed that share prices were log normally distributed and derived a valuation by estimating the expected value of the call option at its expiration and discounting the value back to the date of valuation. (*Black* (1964))

Other work done on option valuation included *Sprengle* (1961), *Stoll* (1976), *Rozeff* (1978), *Samuelson* (1965), *Johnson, Statka and Gaudin* (1956) and *Chew* (1970). They all produced valuation formulas of the same

## 2.0 CHAPTER TWO: LITERATURE REVIEW

This chapter is divided into 5 sections. The first section provides an overview of option pricing models developed to date. The second section reviews the original Black and Scholes option pricing model. The third section looks at the various extensions of the Black and Scholes model. The fourth section reviews research work on empirical tests of the Black and Scholes model. And finally, the fifth section provides a summary of the conclusions from the various research work.

### 2.1 Option pricing models

The valuation of options has been the subject of research over a long period of time. Early work started with *Bachelier* (1900) who recognized that the option value depended (or was contingent) on the value of the underlying share and attempted a valuation by modeling the behavior of the price of the share over time. This approach culminated in the work of *Boness* (1964) who assumed that share prices were log-normally distributed and derived a valuation by estimating the expected value of the call option at its expiration and discounting the value back to the date of valuation.

(*C Ward-1985*)

Other work done on option valuation included *Sprenkle* (1961), *Ayres* (1963), *Boness* (1964), *Samuelson* (1965), *Baumol, Malkiel and Quandt* (1966) and *Chen* (1970). They all produced valuation formulas of the same

general form (with options expressed in the form of warrants) which were however incomplete as they all involved one or more arbitrary parameters.

Sprenkle's formula for the valuation of an option is written as follows:

$$kxN(b_1) - k^*cN(b_2)$$

Where,

$$b_1 = \frac{\ln kx/c + 1/2 v^2 (t^*-t)}{v\sqrt{(t^*-t)}}$$

$$b_2 = \frac{\ln kx/c - 1/2 v^2 (t^*-t)}{v\sqrt{(t^*-t)}}$$

Where,

$x$  = stock price

$c$  = Exercise price

$t^*$  = Maturity date

$t$  = Current date

$v^2$  = Variance rate of the return on the stock

$\ln$  = Natural logarithm

$N(b)$  = Cumulative normal density function

$k, k^*$  = Unknown parameters

Sprenkle (1961) defined  $k$  as the ratio of the expected value of the stock price at the time the warrant matures to the current stock price, and  $k^*$  as the discount factor that depends on the risk of the stock. He tried to estimate the values of  $k$  and  $k^*$  empirically but was unable to do so.

*Samuelson* (1965) had unknown parameters  $\alpha$  and  $\beta$  where  $\alpha$  is the rate of expected return on the stock and  $\beta$  is the rate of expected return on the warrant or the discount rate to be applied to the warrant. He assumed that the distribution of possible values of stock when the warrant matures is lognormal and took the expected value of this distribution, cutting it off at the exercise price. He then discounted this expected value to the present value at the rate  $\beta$ . Unfortunately, there is no model of the pricing of securities under conditions of capital market equilibrium that would make this an appropriate procedure for determining the value of a warrant.

*Samuelson and Merton* (1969) subsequently recognized the fact that discounting the expected value of the distribution of possible values of the warrant when it is exercised is not an appropriate procedure. They advanced the theory by treating the option price as a function of the stock price. They also recognized that the discount rates are determined in part by the requirement that investors be willing to hold all of the outstanding amounts of both the stock and the option. They, however, did not make use of the fact that investors must hold other assets as well, so that the risk of an option or stock that affects its discount rate is only that part of the risk that cannot be diversified away. Their final formula depended on the shape of the utility function that they assumed for the typical investor.



There are two main types of option pricing models that have been developed in the recent past, the Black and Scholes model (1973) and the binomial model developed in 1979 by Cox, Ross and Rubinstein. This research project focuses on the Black and Scholes model which to date remains the cornerstone of option pricing in the world.

## 2.2 The Black and Scholes option pricing model

The Black and Scholes option pricing model, commonly referred to as the B-S Model was developed in 1973 by Fischer Black and Myron Scholes. The model gives the expression for the value of an option in an infinite number of subperiods before the expiration of the option, assuming continuous trading, and is in the following format:

$$C = S * N(d1) - E * N(d2) / e^{rt}$$

*Where:*

*C = Price of the option*

*S = Current price of the stock*

*E = Exercise price (or striking price)*

*t = Time remaining before expiration of the option usually expressed as a proportion of a year.*

*r = Continuously compounded riskless rate of interest per period*

*e = Base of the natural logarithm, or 2.71818*

*N(d) = The probability that a normally distributed random variable with a mean of zero and a standard deviation equal to one will have a value less than or equal to d*

$$d1 = \frac{\ln(S/E) + (R + 0.5 v^2) t}{v \sqrt{t}}$$

$$d2 = d1 - v \sqrt{t}$$

Where  $v$  = standard deviation of the continuously compounded rate of return on the stock, in other words, stock volatility

In arriving at the formula, Black and Scholes assumed “ideal conditions” in the market for the stock and for the option. These included the following:

- The short term interest rate is known and is constant through time
- The stock price follows a random walk in continuous time with a variance proportional to the square of the stock price. Thus the distribution of possible stock prices at the end of any finite interval is lognormal. The variance rate of the return on the stock is constant.
- The stock pays no dividends or other distributions
- The option is “European”; that is, it can be exercised only at maturity
- There are no transaction costs in buying or selling the stock or the option
- It is possible to borrow any fraction of the price of a security to buy it or to hold it, at the short-term interest rate.
- There are no penalties to short selling. A seller who does not own a security will simply accept the price of the security from a buyer, and will agree to settle with the buyer on some future date by paying him an amount equal to the price of the security on that date.

The B-S model assumes that stock price movements can be described by a statistical process known as *geometric Brownian Motion*. Ultimately, this process is summarized by the volatility factor,  $v$ , which is analogous to the investor's stock price forecasts in previous models. That is, a stock's return from the present through any future period has both an expected component and a "noise" component, where  $u$  is the mean return and  $e$  is the standard normally distributed random error term.

Under the above assumptions, the value of the option will depend only on the price of the stock and time and on variables that are taken to be known constants. Thus, it is possible to create a hedged position, consisting of a long position in the stock and a short position in the option, whose value will not depend on the price of the stock, but will depend only on time and the values of known constants. (*Black and Scholes-1973*)

### 2.3 Extensions of the model

*Merton* (1973) showed that the option value as given by the B-S equation increases continuously as any one of  $t^*$ ,  $r$ , or  $v^2$  increases. In each case, it approaches a maximum value equal to the stock price.

The B-S valuation model was derived under the assumption that the option can only be exercised at time  $t^*$  (i.e, a European Option). However, *Merton* (1973) has since shown that the value of the option is always greater than

the value it would have if it were exercised immediately. Thus, a rational investor will not exercise a call option before maturity, and the value of an American option call is the same value as a European call option.

*Merton* (1973) has also shown that the value of an American option will be greater than the value of a European put option. This is true because it is sometimes advantageous to exercise a put option before maturity, if it is possible to do so. For example, suppose the stock price falls almost to zero and that the probability that the price will exceed the exercise price before the option expires is negligible. Then it will pay to exercise the option immediately, so that the exercise price will be received sooner rather than later. The investor thus gains the interest on the exercise price for the period up to the time he would otherwise have exercised it.

The uncertainty over the possibility of early exercise makes the derivation of an exact closed-form analog of the B-S Equation an elusive goal. Instead, *Roll, Geske and Whaley* have designed elaborate approximation procedures for estimating the value of American style calls, which have proven quite useful in practice. A formal summary of these models is beyond the scope of this project: however, the following fundamental properties could be observed.

An American put or call has to be at least as valuable as its European style counterpart because, by definition, the American option gives the holder more chances than the simpler contract. In other words, the American contract holder can exercise at the same time as the European option owner (ie at expiration) as well as any point prior to the terminal date. Since we have seen that an option's value ultimately derives from the choice to exercise the agreement or not, a better set of terms for that decision means a more valuable contract.

*Merton* (1973) also extended the model by assuming that dividends are paid on the underlying stock and that interest rates are variable over the life of the option. The Black and Scholes model assumed that no dividends were paid. There are three ways in which the model may be approximately adjusted to allow for dividends. The most obvious method is simply to subtract, from the underlying share price, the discounted value of the dividends which will be received by the shareholder before the option expires. This method may underestimate the value of the call if the option is exercised before it expires, and *Black* (1975) suggests the alternative method of reducing the exercise price by the present value of the dividends expected between the date at which the option is exercised and the expiration of the option. The third method proposed by *Merton* (1973) assumes that dividends are paid continuously over the life the option at a

constant dividend yield. The adjustment involves replacing the share prices by  $Se^{-DT}$

Where D is the dividend yield and T is the life of the option

All the above methods are approximations only because the payment of dividends introduces an ambiguity into the time at which the option will be exercised. In the absence of dividend payments it will always be optimal to wait until the day on which the option expires and the valuation of 'American' and 'European' -type options will coincide. More generally, traded options are 'American' and thus the formulae have to be interpreted either as lower bounds or approximations to the valuation. (C Ward-1985)

## 2.4 Empirical tests of the Black and Scholes Option Pricing Model

### The Black and Scholes study

The earliest empirical test of the Black-Scholes Option Pricing Model (OPM) was done by Black and Scholes themselves (1973). They used data from over-the-counter option market (OTCOM) for contracts written on 545 securities between 1966 and 1969. Options traded on the OTCOM did not have standardized exercise prices or maturity dates; however, they were 'dividend protected'. Whenever the common stock went ex-dividend, the

exercise prices on outstanding options were lowered by the amount of the dividend.

The secondary market in nonstandardized OTCOM options was virtually non-existent. Therefore Black and Scholes adopted a test procedure that used the OPM to generate the expected prices of each option on each trading day. By comparing the model prices with actual prices at the issuing date, they divided options into those "overvalued" and those "undervalued" by the market. For each option bought (if undervalued) and sold (if overvalued) a perfectly risk-free hedge portfolio was formed by selling or buying shares in the underlying stock.

Black and Scholes computed the systematic risk of the hedge portfolio by regressing its excess returns against a market index. The results verified that it has a beta not significantly different from zero (even though the hedge was not adjusted continuously).

Their results showed that (given *ex post* estimates of actual variances of the returns on the underlying stock over the holding period), in the absence of transaction costs, buying undervalued contracts and selling overvalued contracts at model prices produced insignificant average profits. However, when *ex ante* variances were estimated from the past stock price histories, buying undervalued contracts and selling overvalued contracts at model

prices resulted in significant negative excess portfolio returns. The same procedures, when repeated using market prices, yielded substantial positive excess returns. These results indicate that the market uses more than past price histories to estimate the *ex ante* instantaneous variance of stock returns. But when actual variances are used in the model, it matches actual option prices quite accurately.

When the transaction costs of trading in options were included, the implied profits vanished. Therefore even though the option market does not appear to be efficient before transaction costs are taken into account, there is no opportunity for traders to take advantage of this inefficiency.

### **The Galai Study**

*Galai* (1977) used data from the CBOE for each option traded between April 26, 1973 and November 30, 1973. Option contracts on the CBOE have standardized striking prices and expiration dates. Although the options are not dividend protected, the standardization of contracts has resulted in a substantial volume of trading and lower transaction costs.

The fact that option prices are listed every day allowed *Galai* to extend the Black-Scholes procedure. Black and Scholes established an initial option position and then maintained a hedge position by buying or selling shares of stock. They could not adjust the option position because they did not



have market prices for the options. They were unable to exploit all the information available in the daily deviation of the option's actual prices from the model prices.

*Galai* duplicated the Black-Scholes tests and extended them by adjusting the option position every day. Undervalued options were bought and overvalued options were sold at the end of each day; in addition, the hedged position was maintained by buying or selling the appropriate number of shares in common stock. *Galai* used two tests: (1) an *ex post* test that assumed that traders can use the closing price on day  $t$  to determine whether the option is over or undervalued and that they could transact at the closing prices on day  $t$  and (2) a more realistic *ex ante* test that assumed that the trading rule is determined from closing prices on day  $t$  but the transaction is not executed until the closing price at day  $t+1$ . Both tests used various estimates of the variance of common stock rates of return that were based on data gathered before the trading rule was executed.

The main results of the test were:

- Using the *ex post* hedge returns, trading strategies (in the absence of transaction costs) that were based on the Black-Scholes model earned significant excess returns;
- Given 1 % transaction costs, the excess returns vanished;

- The results were robust to changes in various parameters such as the risk-free rate or instantaneous variance;
- The results were sensitive to dividend adjustment. Trading in options written on common stock paying high dividend yielded lower profits than trading in options written on low-dividend stocks. This result, however, simply reflects the fact that the Black-Scholes formula assumes no dividend payments;
- Deviations from the model's specification led to worse performance.

*Bhattacharya* (1983) used CBOE transaction data from August 1976 to June 1977. He looked at three different boundary conditions. An immediate exercise test was composed of situations where the trader could earn more from exercising immediately than from keeping his or her option alive. For a sample of 86,137 transactions there were 1,120 immediate exercise opportunities assuming zero transaction costs. However, after transaction costs, even a member of the CBOE or NYSE would have realized negative average trading profits. Similar results were obtained for tests of dividend-adjusted lower bounds using the lower bound for European call options and for pseudo-American call options.

Taken together, the two studies mentioned above seem to indicate that the Black-Scholes OPM predicts option prices very well indeed. So well in fact that excess returns can only be earned in the absence of transaction

costs. However, once transaction costs are introduced into the trading strategies, excess profits vanish. This confirms the usual result that nonmember traders cannot beat the market. Prices are efficiently determined down to the level of transaction costs.

### **The Bhattacharya study**

If one is empirically testing the null hypothesis that observed market prices and the Black-Scholes theoretical prices exhibit no systematic differences, the null hypothesis can be rejected for any of three reasons:

1. Inputs to the Black-Scholes model have been incorrectly measured or;
2. The option market is inefficient or;
3. The mathematical structure of the Black-Scholes model is incorrect.

*Bhattacharya* (1980) avoids difficulties (1) and (2) by creating hypothetical hedge portfolios based on simulated B-S option values. If a neutral hedge is adjusted daily (continuously would even be better), the excess return should be zero if the B-S formula is correct. The only observed data inputs are the stock price, the stock price variance estimated directly from stock data during the life of the hedge, and the risk-free rate. *Bhattacharya's* results show no operationally significant mispricing by the B-S formula except for at-the-money options very close to maturity where the B-S model overvalues options.

### **The Macbeth/Merville and Becker Studies**

Using CBOE daily closing prices between December 31, 1975 and December 31, 1976, for all call options listed for six major companies (AT&T, Avon, Kodak, Exxon, IBM, and Xerox), *Macbeth* and *Merville* (1979) tested the Black-Scholes model to see whether or not it over or underpriced options. Also (1980), using the same data set, they tested the Black-Scholes model against an alternative constant elasticity of variance (CEV) model derived by Cox (1975) and Cox and Ross (1976).

In their first paper (1979), *Macbeth* and *Merville* estimate the implied standard deviation of the rate of return for the underlying common stock by employing the Black-Scholes model. Then, by assuming that the B-S model correctly prices at the money options with at least 90 days to expiration, they are able to estimate the percent deviation of observed call prices from B-S call prices. They conclude that:

- The Black-Scholes model prices are on average less (greater) than market prices for in-the-money (out-of-the money) options.
- The extent to which the Black-Scholes model underprices (overprices) an in-the-money (out-of-the-money) option increases with the extent to which the option is in-the-money ( out-of-the-money) and decreases as the time to expiration decreases.

- The Black-Scholes model prices of out-of-the-money options with less than 90 days to expiration are, on the average, greater than market prices; but there does not appear to be any consistent relationship between the extent to which these options are overpriced by the B-S model and the degree to which these options are out-of-the-money or the time to expiration.

The second *Macbeth* and *Merville* paper (1980) compares the Black-Scholes model against the constant elasticity of variance (CEV) model. The primary difference between the two models is that the B-S model assumes that variance of returns on the underlying assets remain constant, whereas the constant elasticity of variance model assumes the variance changes when the stock price does. Empirical evidence on the relationship between the level of stock prices and the rate of return variance is somewhat mixed. *Blattberg* and *Gonedes* (1974) suggest that the variance may change randomly through time. *Rosenberg* (1973) finds that it follows an autoregressive scheme. And *Black* (1976) observes that the variance of returns varies inversely with stock prices. For the six securities that *Macbeth* and *Merville* studied the variance relative to the stock price seem to decrease as the stock price rises. Using their estimates of the constant elasticity of variance, they find that the Cox model fits the data better than the Black-Scholes model. Their empirical results were also consistent with the compound option model of *Geske* (1979).

*Beckers* (1980) also compares the constant elasticity of variance model with the Black-Scholes model. First, however, he uses 1,253 daily observations (September 18,1972, to September 7,1977) for 47 different stocks to test the Black-Scholes assumption that the stock variance is not a function of the stock price. The data reject this hypothesis. The variance was an inverse function of the stock price for 38 of the 47 stocks- a result consistent with the constant elasticity of variance model. This is sometimes called the volatility bias. When testing simulated Black-Scholes call prices against the constant elasticity of variance prices, *Beckers* found that the CEV model gives higher option prices than B-S for in-the money options. This is consistent with the empirical work of *Macbeth* and *Merville*, who found that the B-S model undervalues in-the-money options.

*Geske* and *Roll* (1984) used transaction data for all options traded at midday on August 24,1976 (a sample of 667 different options on 85 stocks). A subsample of 119 options on 28 different stocks with zero scheduled dividends during their remaining life was identified within the main sample. Using regression analysis, *Geske* and *Roll* demonstrate that the original time, in versus out-of-the-money , and volatility biases are present in the entire sample. Next, they show that in the non-dividend sample the time and "money" biases are significantly reduced but the volatility bias remains large. However, by correcting the volatility estimates

of all stocks using a "Stein shrinker" technique, the volatility bias is reduced. *Geske* and *Roll* conclude that the time and money biases may be related to improper model treatment of early exercise (the dividend problem), whereas the volatility bias problem may be more related to statistical errors in variance parameter estimates.

### The Whaley Study

A study in the United States by *Whaley* (1982) examined 91 dividend paying stocks and their respective options over the period January 1975 to February 1978. He valued the options using the Black and Scholes's model, after adjusting the common stock price for the present value of dividends paid during the life of the option. The average quoted price of his sample of options was \$4.1288 (standard deviation was \$5.2400). Using the standard deviation implied by the price of the call option from a previous period, he calculated an average option price of \$4.1071 (standard deviation was \$5.1036 using the Black and Scholes model). The average of the model's prices was within approximately \$.03 of the average of actual option prices.

*Whaley* showed also that the profits from buying the individual apparently undervalued options and selling the individual apparently overvalued options were insufficient to cover the market maker's spread, let alone other

transaction costs, such as commissions and transfer fees. This evidence suggests that the results obtained from Black and Scholes's model provide a good approximation to actual prices, and that it is not possible to make money by trading on the basis of any mispricing implied by the model.

(Robert E Whaley-1982)

### **Rubinstein-Nonparametric Test of Alternative Option Pricing Models**

The extensions of the Black and Scholes option pricing model discussed above, have been compared by *Rubinstein* (1985). He used the MDR (market data report) data base of the Chicago Board of Options Exchange, which has been consolidated into the Berkeley Options Database. The data is a time-stamped record, to the nearest second, including option trade prices, quotes, and volume, coupled with the stock price at the corresponding time during the day.

*Rubinstein's* experimental design was to select matched pairs of options, e.g all options belonging to the same stock, observed on the same day during the same constant stock price interval, having the same exercise price, and falling within a predetermined range of out-of-the-money values (e.g  $S/X = .75$  to  $.85$ ). Pairing in this case was on the basis of different times to maturity. For example, an option might fall within the 71 to 120 day range and another on the 171 to 220 day range. There were actually 373 of these particular matched pairs (overall there were 19,094 pairs



based on differences on time to expiration and 12,239 pairs based on equal time to maturity but different exercise prices). If the Black-Scholes formula is unbiased there would be a 50/50 chance that the implied option variance for the shorter maturity option is higher than the longer maturity option. In fact, 94.1% of the shorter maturity options had higher variance. Thus in this case the Black-Scholes formula could be rejected.

Non-parametric tests of options paired either by differences in time to maturity or in exercise prices were performed for two time periods: (1) August 21,1976 to October 21,1977, and (2) October 24 1977 to August 31,1978. Two interesting conclusions were found. First, if the time to maturity is held constant, then the Black-Scholes model is biased, but the direction of the bias is different in the two time periods that were investigated. During the 1976-1977 interval in-the-money options were undervalued by the Black-Scholes formula. This confirms the work of *Macbeth and Merville (1979)*. The direction of the bias is reversed during the 1977-1978 period. No one knows why the bias should reverse. The second conclusion was that although some of the alternative option pricing models(eg, the displaced diffusion model) were more compatible with the empirical results, none of them were superior in both time periods.

## 2.5 Summary of the empirical work

Studies that have used different versions of the option pricing model to try and find economically exploitable biases have been unsuccessful in doing so when transaction costs were deducted from trading rule profits. From this one can conclude that the option pricing models fit observed prices well in an economic sense. Also, the results are consistent with market efficiency.

On the other hand, there are statistically significant biases in the Black-Scholes model. This suggests that some alternative (perhaps composite) model can do better. Much work remains to be done in testing the OPM. *Rubinstein's* (1985) study suggests that none of the alternative models (the jump model, the mixed-diffusion-jump model, the constant elasticity of variance model, the compound option model, or the displaced diffusion model) can explain all the biases all the time. Also, it remains unclear which of the observed biases are caused by model misspecification and which are due to statistical problems in estimating the model parameters. However, as yet no single superior model has been found.

Other empirical test observations of the B-S model include the following:

- Any violation of the assumptions upon which the B-S Model is based could lead to a misvaluation of the option contract. For example, stock prices do not change continuously meaning that stocks that are less actively traded might have options that are priced differently in the market than those stocks that trade frequently.
- *Figlewski* has noted how such market imperfections such as brokerage fees, bid-ask spreads and inflexible position sizes can create arbitrageable differences between option values and prices and have thus cautioned that the B-S values are best viewed as approximations, best suited for comparing prices of different contracts.
- *Black* has noted that other conditions of the model are almost certain to be violated in practice, such as the assumptions of the risk free rate and volatility level remaining constant until the expiration date. However, empirical studies by *Galai* (1983) concluded that the model performed relatively well despite the evidence that the standard deviation of returns on shares is not constant over time.

The conclusions drawn from the various empirical tests have often been contradictory, but, in a review of the tests, *Galai* (1983) concluded that the Black and Scholes model performed relatively well despite the evidence that the standard deviation of returns on shares is not constant over time.

The option pricing model developed by Black and Scholes is a path breaking work in the area of contingent claim pricing. Of the five variables which are necessary to specify the model, all are normally directly observable except the standard deviations from the underlying stock. Due to its rigorous theoretical underpinnings and minimum reliance on subjectively determined inputs, the model has gained a great deal of popularity in both the academic and investment communities in the Western world where trading in options is a daily reality.

*(Henry A Latane and Richard J Rendleman, Jr-1976)*

## CHAPTER 3- RESEARCH METHODOLOGY

### 3.1 Population and sample design:

The study was based on analysis of all the firms quoted on the Nairobi Stock Exchange between 1997 to 2000. The following stocks were however excluded due to inactivity and therefore lack of accurate monthly share prices: Theta Group, Ol Pejeta, Hutchings Bemier, Kenya Orchards and Regent Undervalued Assets. In addition for 1997, Athi River Mining Company and TPS-Serena were not tested as they became listed in that year. The same applied for Africa Lakes Corporation, in 2000.

### 3.2 Data description and collection:

The data required to use the Black and Scholes model are:

- Share price and dividends
- Stock volatility
- Exercise prices
- Time to expiration of option
- Riskless rate of return
- Cumulative probability function

The above were determined as follows:

### 3.2.1 Share price and dividends

Monthly share prices and dividends paid in the intervening periods were collected and tabulated for each of the firms listed of the Exchange for the period 1997-2000, from the Nairobi Stock Exchange.

### 3.2.2 Stock volatility

Recall that volatility was defined as a measure of the amount by which an asset price fluctuates in a given time with statistical/historical volatility being a measure of actual asset price changes over specific period of time and implied volatility being a measure of how much the “market place” expects asset prices to move, for an option price. For the purpose of this research, historical volatilities were used.

#### Historical volatility

To estimate the volatility of a stock price empirically, the stock price is usually observed at fixed intervals of time (eg every day, week, or month). Ceteris paribus, more data generally lead to more accuracy. However, volatility does change over time and data that are too old may not be relevant for predicting the future (thus the restriction of the project to the period 1997-2000). An often used rule of thumb is to set the time period over which the volatility is measured equal to the time period over which it is applied. Thus if

the volatility is to be used to value a 6 month option, 6 months historical data are used.

The stock volatility was estimated from the historical data thus:

The stock price was observed at fixed intervals of time (monthly) where:

$n+1$ : number of observations

$S_i$ : stock price at end of  $i$ th interval ( $i=0,1, \dots, n-1$ )

$r$ : length of time intervals in years

$u_i$ :  $\ln(S_i/S_{i-1})$ , for  $i=1,2, \dots, n$

Since  $S_i = S_{i-1} e^{u_i}$ ,  $u_i$  is the continuously compounded return (not annualized) in the  $i$ th interval of  $i=1,2, \dots, n$ . An unbiased estimate,  $s$ , of the standard deviation of the  $u_i$ 's is given by

$$s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (u_i - \bar{u})^2}$$

$$\text{or } s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n u_i^2 - \frac{1}{n(n-1)} \left( \sum_{i=1}^n u_i \right)^2}$$

Where  $\bar{u}$  is the mean of the  $u_i$ 's

## Illustration

Estimating volatility from historical data (Source: John Hull, Options, Futures and other derivatives, 4<sup>TH</sup> Edition, Chapter 11)

Day	Closing stock price Sh	Price relative $S_i/S_{i-1}$	Daily return $u_i : \ln(S_i/S_{i-1})$
0	20		
1	20.125	1.00625	0.00623
2	19.875	0.98758	-0.01250
3	20	1.00629	0.00627
4	20.5	1.02500	0.02469
5	20.25	0.98781	-0.01227
6	20.875	1.03086	0.03040
7	20.875	1.0000	0.00000
8	20.875	1.0000	0.00000
9	20.75	0.99401	-0.00601
10	20.75	1.0000	0.00000
11	21	1.01205	0.01198
12	21.125	1.00595	0.00593
13	20.875	0.98817	-0.01190
14	20.875	1.00000	0.00000
15	21.25	1.01796	0.01780
16	21.375	1.00588	0.00587
17	21.375	1.00000	0.0000
18	21.25	0.99415	-0.00587
19	21.75	1.02353	0.02326
20	22	1.01149	0.01143

Since

$$\sum u_i = 0.09531 \text{ and } \sum u_i^2 = 0.00333$$

an estimate of the standard deviation of the daily return is

$$\sqrt{0.00333/19 - 0.09531^2/380} = 0.0123$$

Assuming that time is measured in trading days<sup>1</sup>, and that there are 250 trading days per year.  $r = 1/250$  and the data give an estimate for the volatility p.a of  $0.0123/\sqrt{250} = 0.194$ . The estimated volatility is 19.5% p.a. The standard error in the estimate is  $0.194/\sqrt{2*20} = 0.0031$  or 3.1% p.a



### 3.2.3 Exercise prices

Recall that when an investor anticipates a bullish market (share prices having an upward trend) he would invest in a call option to benefit from the upward movement while limiting losses to the option premium paid if prices decrease. On the other hand, if a bearish market is anticipated, he would invest in a put option, a strategy that would allow the investor to benefit from downward price movements while limiting losses to the premium paid if prices increase.

To determine appropriate exercise prices based on current share prices, the model explained in John Hull, Options, Futures and Other derivatives, 4<sup>th</sup> Edition, Chapter 11, and summarized below, was used:

If a stock price,  $S$ , follows geometric Brownian motions,

$$dS = \mu S dt + \sigma S dz$$

Then

$$d \ln S = \left( \mu - \frac{\sigma^2}{2} \right) dt + \sigma dz$$

The variable  $\ln S$  follows a generalized Wiener process. The change in  $\ln$

$S$  between time 0 and  $T$  is normally distributed so that

$$\ln S_T \sim \ln S_0 + \phi \left[ \left( \mu - \frac{\sigma^2}{2} \right) T, \sigma \sqrt{T} \right]$$

From this it follows that

$$\ln \frac{S_T}{S_0} \sim \phi \left[ \left( \mu - \frac{\sigma^2}{2} \right) T, \sigma \sqrt{T} \right]$$

And

$$\ln S_T \sim \Phi \left[ \ln S_0 + \left( \mu - \frac{\sigma^2}{2} \right) T, \sigma \sqrt{T} \right]$$

Where  $S_T$  is the stock price at a future time  $T$ ,  $S_0$  is the stock price at time 0, and  $\Phi$  denotes a normal distribution with mean  $m$  and standard deviation  $s$ .  $S_T$  has a lognormal distribution.

### ILLUSTRATION

Consider a stock with an initial price of \$40, an expected return of 16% per annum and a volatility of 20% per annum. The probability distribution of the stock price  $S_T$ , in 6 months time is given by

$$\ln S_T \sim \left( \ln 40 + (0.16 - 0.22/2) * 0.5, 0.2 \sqrt{0.5} \right)$$

$$\ln S_T \sim (3.759, 0.141)$$

There is a 95% probability that a normally distributed variable has a value within 1.96 standard deviations of its mean. Hence, with 95% confidence,

$$3.759 - 1.96 * 0.141 < \ln S_T < 3.759 + 1.96 * 0.141$$

this can be written

$$e^{3.759 - 1.96 * 0.141} < S_T < e^{3.759 + 1.96 * 0.141}$$

thus, there is a 95% probability that the stock price in six months will lie between 32.55 and 56.56.

using the properties of lognormal distribution, it can be shown that the expected value of  $S_T$   $E(S_T)$  is given by  $E(S_T) = S_0 e^{\mu T}$  while the variance of  $S_T$ ,  $\text{var}(S_T)$  is given by  $\text{VAR}(S_T) = S_0^2 e^{2\mu T} [e^{\sigma^2 T} - 1]$

The above model was used to estimate the exercise prices for the stocks for the period under study. Expected return was determined using  $P1 - P0 + \text{DIV}/P0$  as summarized in appendix 2.

### 3.2.4 Time to expiration

For consistency and effective comparison, the time to expiration for options was assumed to be 6 months (January-June and July-December).

### 3.2.5 Riskless rates of return

The interest rate offered on government securities, treasury bills, was assumed to be the riskless rates of return. Treasury bill rates for the years 1997-2000 was collected from The Central Bank of Kenya.

### 3.2.6 $N(d)$

Represents the cumulative probability of observing a value drawn from the standard normal distribution (ie with a mean of zero and a standard

deviation of one) equal to or less than  $d$ . These were determined from the standard probability distribution tables and are already included in the Black and Scholes computation software used as explained further under data analysis.

### 3.3 Data analysis

To estimate the possible range of option values and the range of exercise prices that derive in the money options, the Black and Scholes model as indicated below was applied:

$$C = S * N(d1) - E * N(d2) / e^{rt}$$

Where:

$C$  = Price of the option

$S$  = Current price of the stock

$E$  = Exercise price (or striking price)

$t$  = Time remaining before expiration of the option usually expressed as a proportion of a year.

$r$  = Continuously compounded riskless rate of interest

$e$  = Base of the natural logarithm, or 2.71818

$N(d)$  = The probability that a normally distributed random variable with a mean of zero and a standard deviation equal to one will have a value less than or equal to  $d$

$$d1 = \frac{\ln(S/E) + (R + 0.5 v^2) t}{v \sqrt{t}}$$

$$d2 = \frac{\ln(S/E) + (R - 0.5 v^2) t}{v \sqrt{t}}$$

$$d2 = d1 - v \cdot \sqrt{t}$$

where  $v$  = standard deviation of the continuously compounded rate of return on the stock, in other words, stock volatility

A Black and Scholes computation software, *derivagem* (the particular program, *bopscol*), was used to compute the option values. This software can be downloaded from the website <http://www.prenhall.com/financecenter>. The program, on insertion of the stock price, exercise/strike price, risk-free rate and stock volatility, generates the call and put price and the "Greek" letters which are explained below, for European options. Each Greek letter measures a different dimension of the risk in an option position and the aim of a trader is to manage the Greeks so that all risks are acceptable. While a detailed study of the Greek letters is beyond the scope of this research project, they can be broadly defined as follows:

### *Delta*

The delta of an option is defined as the rate of change of the option price with respect to the price of the underlying asset. It is the slope of the curve that relates the option price to the underlying asset price. Suppose that the delta of a call option on a stock is 0.6. This means that when the stock price changes by a small amount, the option price changes by 60% of that amount.

### *Theta*

The theta of a portfolio of derivatives is the rate of change of the portfolio value with respect to the passage of time when all else remains the same. Equivalently, it is the rate of change of the portfolio value with respect to a decrease in the times to maturity of the derivatives in the portfolio.

Theta is usually negative for an option. (An exception to this could be an in-the-money European put option on a non-dividend-paying stock or an in-the-money European call option on a currency with a very high interest rate). This is because as time passes, the option tends to become less valuable. Thus theta is also sometimes referred to as the time decay of the portfolio.

### *Gamma*

The gamma of a portfolio of derivatives on an underlying asset is the rate of change of the portfolio's delta with respect to the price of the underlying asset. If gamma is small, delta changes slowly and adjustments to keep the portfolio delta neutral need only be made relatively infrequently. However if gamma is large in absolute terms, delta is highly sensitive to the price of the underlying asset.

### *Vega*

The vega of a portfolio of derivatives is the rate of change of the value of the portfolio with respect to the volatility of the underlying asset. If vega is high in absolute terms, the portfolio's value is very sensitive to small changes in volatility. If vega is low in absolute terms, volatility changes have relatively little impact on the value of the portfolio.

### *Rho*

The *rho* of a portfolio of derivatives is the rate of change of the portfolio value with respect to the interest rate. It measures the sensitivity of the portfolio value to interest rates.

Having determined the exercise price ranges, the option values were simulated as follows: Assuming the determined exercise range is 17 to 94, option values were simulated for 17, 27, 37, 47, 57, etc. Suppose that option values changed from negative to positive in the range of 47 to 57, simulation was further done starting with  $47+5$  (ie 52) until the exact exercise price at which the option value becomes positive, is determined.

In summary, the research determined the following for the stocks quoted on the Nairobi Stock Exchange, for the period 1997 to 2000:

- The expected returns for the individual stocks;
- The stock volatility/share price movement during this period
- Mathematically determined exercise price ranges for options on these stocks
- Option values, using the Black and Scholes option pricing model, and the range for in the money European call and put options on these stocks.

A summary of the research findings are provided in chapter 4.

TABLE 4.2: Summary of expected returns, volatility and Dividend & Payout Ratios

SECTOR	COMPANY	1997	1998	1999	2000
TELECOM	Kenya Telecom Limited	12%	12%	12%	12%
	Orange Kenya	12%	12%	12%	12%
	Kenya Wireless and Kenya	12%	12%	12%	12%
	Indelco Ltd	12%	12%	12%	12%
	Kenya Power Co Ltd	12%	12%	12%	12%
	Kenya Tea Co Ltd	12%	12%	12%	12%
	Kenya Tea & Coffee Ltd	12%	12%	12%	12%
FINANCIAL	Kenya Bank Ltd	12%	12%	12%	12%
	The Bank Ltd	12%	12%	12%	12%
	Kenya Trust Bank Kenya	12%	12%	12%	12%
	Kenya Finance Co Ltd	12%	12%	12%	12%
	Kenya Investments Co Ltd	12%	12%	12%	12%
	Kenya Insurance Co Ltd	12%	12%	12%	12%
	Kenya Commercial Bank Ltd	12%	12%	12%	12%
	Kenya Bank of Kenya Ltd	12%	12%	12%	12%
	National Industrial Credit	12%	12%	12%	12%
	Kenya Development Agency	12%	12%	12%	12%
	Kenya Life Insurance Ltd	12%	12%	12%	12%
	Kenya Commercial Bank	12%	12%	12%	12%



## CHAPTER 4: RESEARCH FINDINGS AND INTERPRETATION

### 4.1: Expected returns

The agricultural sector registered the highest expected returns in 1998, with George Williamson Kenya registering an all-time high of 74%. This can be explained by the fact that the tea companies (which dominate the sector) registered record crop output following the El Nino rains. Significant improvement in world tea prices also resulted in exceptional earnings. The situation, however, changed drastically in 1999 when all stocks, with the exception of Kapchorua Tea Company, registered negative returns.

The highest return by the finance and investment sector was registered by Pan Africa Insurance Ltd in 1999, followed by ICDCI in 1998. The lowest return was recorded by KCB in 1999 (due to the significant bad debt provisioning that seriously dented its annual results).

**Table 4.1.1: Summary of expected returns-Agricultural and Finance & Investment Sectors**

SECTOR	COMPANY	1997	1998	1999	2000
Agricultural	<i>Brooke Bond Kenya Limited</i>	-26%	28%	-25%	-4%
	<i>Eaagads Limited</i>	61%	16%	-37%	-18%
	<i>George Williamson Kenya</i>	19%	74%	-33%	8%
	<i>Kakuzi Ltd</i>	0%	49%	-36%	-38%
	<i>Kapchorua Tea Co Ltd</i>	2%	46%	61%	2%
	<i>Limuru Tea Co Ltd</i>	40%	13%	-7%	8%
	<i>Rea Vipingo Ltd</i>	-3%	-22%	-20%	-37%
	<i>Sasini Tea &amp; Coffee Ltd</i>	62%	16%	-35%	-19%
Finance & Investment	<i>Barclays Bank Ltd</i>	9%	16%	-10%	3%
	<i>City Trust Ltd</i>	8%	-17%	-15%	15%
	<i>CFC Bank Ltd</i>	-21%	-6%	4%	-3%
	<i>Diamond Trust Bank Kenya</i>	-40%	0%	20%	-45%
	<i>Housing Finance Co (K) Ltd</i>	-18%	16%	-28%	-46%
	<i>ICDC Investments Co Ltd</i>	-8%	28%	27%	1%
	<i>Jubilee Insurance Co Ltd</i>	-2%	3%	-18%	9%
	<i>Kenya Commercial Bank Ltd</i>	-7%	-12%	-49%	17%
	<i>National Bank of Kenya Ltd</i>	-16%	-28%	-42%	-37%
	<i>National Industrial Credit</i>	4%	-24%	-5%	-28%
	<i>Regent Undervalued Assets</i>	0%	0%	0%	0%
	<i>Pan Africa Insurance Ltd</i>	-14%	-34%	66%	-58%
<i>Standard Chartered Bank</i>	-8%	12%	11%	44%	

The expected returns of the commercial and services sector and the industrial and allied sector, for the period of study, significantly deteriorated. This is perhaps expected as the companies in this sector were hardest hit by the factors contributing to the down turn in Kenya's economic performance, alluded to earlier. These include poor state of infrastructure, inadequate power supply, declined level of tourism and high levels of interest rates.

**Table 4.1.2: Summary of expected returns-Commercial and Industrial & Allied Sectors**

SECTOR	COMPANY	1997	1998	1999	2000
Commercial &	<i>A Baumann &amp; Co Ltd</i>	-49%	13%	-4%	-30%
	<i>CMC Holdings Ltd</i>	15%	-14%	-7%	-49%
	<i>Car &amp; General (K) Ltd</i>	-20%	-25%	-25%	11%
	<i>Express Kenya Ltd</i>	-17%	-45%	-34%	-5%
	<i>Kenya Airways Ltd</i>	0%	22%	-4%	31%
	<i>Lonhro Motors (EA) Ltd</i>	-70%	-44%	-40%	Delisted
	<i>Marshalls (EA) Ltd</i>	-5%	-1%	-6%	-21%
	<i>Nation Media Group Ltd</i>	19%	6%	-26%	-30%
	<i>Pearl Drycleaners Ltd</i>	10%	-5%	-70%	-32%
	<i>Standard Newspapers Ltd</i>	47%	-30%	-53%	44%
	<i>Tourism Promotion Services</i>	Not listed	4%	11%	-50%
	<i>Uchumi Supermarkets Ltd</i>	7%	17%	0%	29%
	Industrial and Allied	<i>Athi River Mining Ltd</i>	Not listed	29%	-5%
<i>Bamburi Cement Ltd</i>		-7%	-1%	-23%	33%
<i>British American Tobacco</i>		-33%	19%	1%	17%
<i>B O C Gases Ltd</i>		-1%	7%	-20%	-21%
<i>Carbacid Investments Ltd</i>		-17%	53%	6%	-24%
<i>Crown Berger Ltd</i>		-12%	-6%	48%	-10%
<i>Dunlop Kenya Ltd</i>		-64%	3%	-49%	-31%
<i>EA Cables Ltd</i>		-15%	-31%	-10%	6%
<i>EA Packaging Ltd</i>		-30%	-68%	-55%	-40%
<i>EA Portland Cement Ltd</i>		-16%	3%	-36%	4%
<i>Firestone East Africa Ltd</i>		-14%	11%	7%	-20%
<i>East Africa Breweries Ltd</i>		5%	56%	12%	24%
<i>Kenya National Mills Ltd</i>		16%	15%	-44%	-26%
<i>Kenya Oil Co Ltd</i>		-27%	19%	23%	19%
<i>Kenya Power &amp; Lighting Ltd</i>		109%	3%	-20%	-54%
<i>Total Kenya Ltd</i>		-41%	-10%	4%	21%
<i>Unga Group Ltd</i>		8%	141%	-45%	-39%

## 4.2 Stock Volatilities

Volatility is a measure of the amount by which an asset price fluctuates in a given time. Mathematically, volatility is the annualized standard deviation of the asset daily price changes. For the purposes of this research, statistical volatility, a measure of actual asset price changes over specific period of time (annually) was determined using the model described earlier under chapter 3.

Options are valuable precisely because of the risk of the underlying common stock. An investor would not invest in an option to purchase a completely riskless common stock with an exercise price equal to the current market price. Thus the more volatile the underlying stock, the more valuable the option.

One of the objectives of this research was to find out which stocks quoted on the Nairobi Stock Exchange have share prices volatile enough to make it worthwhile for investors to hedge against such movements through options contracts. The tables below summarizes, by sector, the volatilities of the Nairobi Stock Exchange stocks for the period 1997-2000:

### 4.2.1: Agricultural sector

The agricultural sector exhibited fairly wide fluctuations in stock volatility with the highest recorded amount being 68% (George Williamson Kenya

Ltd) in 1997 and the lowest, 0% (Kapchorua Tea Company) in the same year and in the year 2000, when Limuru Tea Company also had volatility of 0%. In 2000, the share prices of these two stocks remained virtually constant. The highest standard deviation and mean (as summarized in table 4.2) were recorded in 1997 followed by 1999, with 1998 and 2000 figures being fairly close.

**Table 4.2.1a-Summary of stock volatilities-Agricultural Sector**

<b>COMPANY</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
<i>Brooke Bond Kenya Limited</i>	14%	23%	39%	28%
<i>Eaagads Limited</i>	51%	30%	60%	21%
<i>George Williamson Kenya Ltd</i>	68%	23%	22%	43%
<i>Kakuzi Ltd</i>	51%	26%	27%	29%
<i>Kapchorua Tea Co Ltd</i>	0%	22%	24%	0%
<i>Limuru Tea Co Ltd</i>	31%	2%	16%	0%
<i>Rea Vipingo Ltd</i>	27%	16%	20%	22%
<i>Sasini Tea &amp; Coffee Ltd</i>	38%	44%	27%	30%

The widest range in volatility of the stocks in this sector was witnessed in 1998, followed by 1999 then 2000 and 1997. Stock volatilities for this sector was highest in 1997 which registered the highest mean, median and mode. Other statistical data are as summarized in table 4.2.1b below:

**TABLE 4.2.1b-Summary of decriptive statistics- Agricultural Sector**

AGRICULTURAL SECTOR	1997	1998	1999	2000
Mean	0.35	0.2325	0.2937	0.2162
Standard Error	0.0774	0.0420	0.0498	0.0527
Median	0.345	0.23	0.255	0.25
Mode	0.51	0.23	0.27	0
Standard Deviation	0.2189	0.1189	0.1410	0.1492
Sample Variance	0.0479	0.0141	0.0199	0.0222
Kurtosis	-0.4004	1.8637	3.1804	-0.3614
Skewness	-0.1552	-0.0812	1.7537	-0.5285
Range	0.68	0.42	0.44	0.43
Minimum	0	0.02	0.16	0
Maximum	0.68	0.44	0.6	0.43
Sum	2.8	1.86	2.35	1.73
Count	8	8	8	8
Confidence Level(95.0%)	0.1830	0.0994	0.1179	0.1247

**4.2.2: Finance and investment sector**

The highest volatility in this sector was registered by City Trust (77%) in 1997 (an otherwise fairly stable stock) followed by ICDC Investment Company (76%) in the same year. Regent Undervalued Assets Africa Fund which is included in this sector but was never traded registered 0% volatility for all the 4 years. The highest mean volatility for the sector was registered in 2000, a year characterized with turbulence and uncertainty for the banking sector as a motion in Parliament sought to regulate the level of interest rates that banks can charge. Other statistical data are as summarized in table 4.2.2a below.

**Table 4.2.2a-Summary of stock volatilities-Finance & Investment Sector**

<b>COMPANY</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
<i>Barclays Bank Ltd</i>	17%	40%	20%	36%
<i>City Trust Ltd</i>	14%	77%	14%	19%
<i>CFC Bank Ltd</i>	38%	24%	43%	40%
<i>Diamond Trust Bank Kenya Ltd</i>	25%	20%	25%	29%
<i>Housing Finance Co (K) Ltd</i>	14%	32%	28%	111%
<i>ICDC Investments Co Ltd</i>	76%	37%	8%	27%
<i>Jubilee Insurance Co Ltd</i>	28%	19%	23%	24%
<i>Kenya Commercial Bank Ltd</i>	34%	23%	23%	34%
<i>National Bank of Kenya Ltd</i>	31%	60%	29%	51%
<i>National Industrial Credit Ltd</i>	24%	54%	14%	39%
<i>Regent Undervalued Assets</i>	0%	0%	0%	0%
<i>Pan Africa Insurance Ltd</i>	34%	18%	109%	39%
<i>Standard Chartered Bank Ltd</i>	13%	34%	15%	51%

**TABLE 4.2.2b-Summary of descriptive statistics-Finance & Investment Sector**

	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Mean	0.2677	0.3369	0.27	0.3846
Standard Error	0.0507	0.0568	0.0744	0.0711
Median	0.25	0.32	0.23	0.36
Mode	0.14	#N/A	0.14	0.51
Standard Deviation	0.1828	0.2047	0.2683	0.2565
Sample Variance	0.0334	0.0419	0.0720	0.0658
Kurtosis	4.0987	0.4897	8.3071	5.6768
Skewness	1.5247	0.6675	2.6617	1.8441
Range	0.76	0.77	1.09	1.11
Minimum	0	0	0	0
Maximum	0.76	0.77	1.09	1.11
Sum	3.48	4.38	3.51	5
Count	13	13	13	13
Confidence Level(95.0%)	0.1105	0.1237	0.1622	0.1549

### 4.2.3: Commercial and services sector

The stocks with the highest volatilities in this sector were Lonhro Motors in 1997 (120%) and Pearl DryCleaners in 1999 (120%), followed closely by Marshalls (EA) Ltd in 1997 (118%), while the lowest volatilities were registered by A Baumann & Co Ltd (12%) in 1999 followed by Kenya Airways Ltd (13%) in 1997 and Express Kenya Limited in 2000 (13%). It therefore follows that the highest range was in 1999 followed by 1997.

**Table 4.2.3a-Summary of stock volatilities-Commercial and Services Sector**

<b>COMPANY</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
<i>Africa Lakes Corporation Plc</i>				
<i>A Baumann &amp; Co Ltd</i>	57%	11%	12%	22%
<i>CMC Holdings Ltd</i>	38%	29%	16%	27%
<i>Car &amp; General (K) Ltd</i>	23%	43%	105%	94%
<i>Express Kenya Ltd</i>	19%	36%	49%	13%
<i>Kenya Airways Ltd</i>	13%	25%	39%	25%
<i>Lonhro Motors (EA) Ltd</i>	120%	25%	38%	
<i>Marshalls (EA) Ltd</i>	118%	17%	19%	20%
<i>Nation Media Group Ltd</i>	56%	81%	22%	17%
<i>Pearl Drycleaners Ltd</i>	18%	4%	120%	26%
<i>Standard Newspapers Ltd</i>	70%	92%	112%	110%
<i>Tourism Promotion Services</i>		31%	16%	97%
<i>Uchumi Supermarkets Ltd</i>	45%	31%	27%	17%

This sector witnessed the initial public offering of shares in Tourism Promotion Services (Serena) in 1997 and Africa Lakes Corporation in mid 2000 and the suspension of trading in shares of Lonhro East Africa in 2000 following the placement of the company under receivership. Other statistical data are as summarized in table 4.2.3b below:

**TABLE 4.2.3.b-summary of descriptive statistics-Commercial & Services Sector**

	1997	1998	1999	2000
Mean	0.5245	0.3542	0.4792	0.4254
Standard Error	0.1136	0.0757	0.1168	0.1132
Median	0.45	0.3	0.325	0.25
Mode	#N/A	0.25	0.16	0.17
Standard Deviation	0.3767	0.2621	0.4047	0.3754
Sample Variance	0.1419	0.0687	0.1637	0.1409
Kurtosis	-0.0492	1.3227	-0.5323	-0.5875
Skewness	0.9748	1.3438	1.0864	1.1818
Range	1.07	0.88	1.08	0.97
Minimum	0.13	0.04	0.12	0.13
Maximum	1.2	0.92	1.2	1.1
Sum	5.77	4.25	5.75	4.68
Count	11	12	12	11
Confidence Level(95.0%)	0.2531	0.1665	0.2571	0.2522

#### **4.2.4: Industrial and allied sector**

The highest volatility registered in this sector during the four years under review was by Dunlop Kenya Ltd (161%) in 1997, followed by EA Portland Cement (107%) in 1999. The highest volatilities by the sector as a whole was in 1997, with a mean of 49.75% and the lowest in 1998, with a mean of 41.29%. A summary of other statistical data is as indicated in table 4.2.4b below:



**Table 4.2.4a-Summary of stock volatilities-Industrial & Allied Sector**

COMPANY	1997	1998	1999	2000	
<i>Athi River Mining Ltd</i>	Share listed	not	48%	42%	42%
<i>Bamburi Cement Ltd</i>	45%	46%	31%	14%	
<i>British American Tobacco</i>	30%	9%	27%	52%	
<i>B O C Gases Ltd</i>	110%	46%	31%	30%	
<i>Carbacid Investments Ltd</i>	19%	34%	29%	40%	
<i>Crown Berger Ltd</i>	37%	44%	69%	34%	
<i>Dunlop Kenya Ltd</i>	161%	72%	57%	22%	
<i>EA Cables Ltd</i>	28%	29%	16%	62%	
<i>EA Packaging Ltd</i>	49%	43%	51%	86%	
<i>EA Portland Cement Ltd</i>	58%	25%	107%	24%	
<i>Firestone East Africa Ltd</i>	35%	29%	24%	30%	
<i>East Africa Breweries Ltd</i>	25%	36%	20%	17%	
<i>Kenya National Mills Ltd</i>	34%	58%	77%	80%	
<i>Kenya Oil Co Ltd</i>	22%	22%	42%	23%	
<i>Kenya Power &amp; Lighting Ltd</i>	47%	27%	25%	46%	
<i>Total Kenya Ltd</i>	57%	39%	25%	43%	
<i>Unga Group Ltd</i>	39%	95%	103%	73%	

Athi River Mining Company was listed on the exchange during 1997 and has since become (2001) an associated company of another stock in the same sector (Bamburi Cement). The volatility (share price movement) of Athi River Mining Company has been fairly stable.

**TABLE 4.2.4b-Summary of descriptive statistics-Industrial & Allied Sector**

	1997	1998	1999	2000
Mean	0.4975	0.4129	0.4565	0.4223
Standard Error	0.0915	0.0488	0.0683	0.0532
Median	0.38	0.39	0.31	0.4
Mode	#N/A	0.46	0.42	0.3
Standard Deviation	0.3659	0.2012	0.2815	0.2195
Sample Variance	0.1339	0.0405	0.0792	0.0482
Kurtosis	5.6614	2.2719	0.4549	-0.4127
Skewness	2.3348	1.1879	1.1960	0.7452
Range	1.42	0.86	0.91	0.72
Minimum	0.19	0.09	0.16	0.14
Maximum	1.61	0.95	1.07	0.86
Sum	7.96	7.02	7.76	7.18
Count	16	17	17	17
Confidence Level(95.0%)	0.1950	0.1035	0.1447	0.1128

### 4.3: Exercise price ranges

Tables 4.3.1 through to table 4.3.8 provide a summary of the *mathematically* determined exercise price ranges for each stock, during the period under study and the range for in-the-money 6-month European options, (January to June and July to December) which were determined using the Black and Scholes option pricing model. The detailed option values are as indicated in appendix 6.

The results indicate that, for the period 1997 to 2000, the exchange has been largely bearish (market prices on a decline) making the most appropriate hedging strategy using options to be the investment in put options. For example, during the period July to December 1997 there were nil in-the-money call options for the Finance and Investment, Commercial and Services and Industrial and Allied sectors (See table 4.3.2). The same

applied for the period July to December 1999 (See table 4.3.6). A review of the other periods indicates that, generally, in-the-money call options were more of the exception than the rule for the four years reviewed.

The computed exercise price ranges consistently fell within the actual share price movements for the six month options. For example, the actual share prices for Brooke Bond between January and June 1997 were Sh 124 and Sh 149 while the computed exercise price ranges were Sh 107 to Sh 159. Similarly, the actual share prices for Kenya Airways in July and December 1999 were Sh 7.8 and Sh 8 while the computed exercise price ranges were Sh 4 to Sh 13. Whichever stock selected, the results are consistent with those illustrated above.

An almost linear relationship between the level of volatility and the range of exercise prices was observed, that is, the higher the volatility, the wider the exercise price range and vice versa. For example George Williamson Kenya Ltd had the highest volatility in the agricultural sector in 1997 and an exercise price range of Sh 28 to Sh 185. Kapchorua Tea Company which had the lowest volatility of 0% in the same year had the exercise price range of Sh 70 to Sh 71. Similarly the stock with the highest volatility in the commercial and services sector was Lonhro Motors in 1997 with a volatility of 120% and an exercise price range of Sh 12 to Sh 332, whereas the stock with the lowest volatility in the same sector was Express Kenya in 2000 with a volatility of 13% and an exercise price range of Sh 15 to Sh 22.

**TABLE 4.3.1**  
**Exercise Price Ranges- January- June 1997**

SECTOR	COMPANY	Exercise price		
		In the money range	In the money call option	In the money put option
Agricultural	Brooke Bond Kenya Limited	107 to 159	Nil	125 to 159
	Eaagads Limited	17 to 70	Nil	30 to 70
	George Williamson Kenya Ltd	28 to 185	Nil	87 to 185
	Kakuzi Ltd	45 to 185	Nil	125 to 185
	Kapchorua Tea Co Ltd	70 to 71	Nil	70 to 71
	Limuru Tea Co Ltd	677 to 1595	Nil	1005 to 1595
	Rea Vipingo Ltd	7 to 15	Nil	10 to 15
	Sasini Tea & Coffee Ltd	47 to 133	47 to 82	Nil
Finance & Investment	Barclays Bank Ltd	95 to 151	Nil	111 to 151
	City Trust Ltd	28 to 42	Nil	38 to 42
	CFC Bank Ltd	12 to 33	12 to 21	Nil
	Diamond Trust Bank Kenya	21 to 42	Nil	31 to 42
	Housing Finance Co (K) Ltd	18 to 26	Nil	24 to 26
	ICDC Investments Co Ltd	12 to 95	12 to 39	Nil
	Jubilee Insurance Co Ltd	25 to 55	25 to 27	47 to 55
	Kenya Commercial Bank Ltd	53 to 135	53 to 109	Nil
	National Bank of Kenya Ltd	9 to 22	Nil	16 to 22
	National Industrial Credit Ltd	36 to 70	36 to 57	Nil
	Pan Africa Insurance Ltd	29 to 74	29 to 58	Nil
	Standard Chartered Bank Ltd	43 to 62	Nil	48 to 62
Commercial & Services	A Baumann & Co Ltd	11 to 53	Nil	28 to 53
	CMC Holdings Ltd	43 to 123	43 to 72	123
	Car & General (K) Ltd	13 to 24	Nil	18 to 24
	Express Kenya Ltd	53 to 89	Nil	72 to 89
	Kenya Airways Ltd	7 to 10	Nil	9 to 10
	Lonhro Motors (EA) Ltd	12 to 332	Nil	104 to 332
	Marshalls (EA) Ltd	6 to 167	6 to 64	Nil
	Nation Media Group Ltd	53 to 249	Nil	144 to 249
	Pearl Drycleaners Ltd	8 to 13	Nil	11 to 13
	Standard Newspapers Ltd	36 to 254	Nil	150 to 254
	Uchumi Supermarkets Ltd	21 to 73	Nil	46 to 73
	Industrial and Allied	Bamburi Cement Ltd	20 to 69	Nil
British American Tobacco Ltd		45 to 104	Nil	62 to 104
B O C Gases Ltd		11 to 236	11 to 33	Nil
Carbacid Investments Ltd		57 to 97	Nil	87 to 97
Crown Berger Ltd		7 to 19	Nil	11 to 19
Dunlop Kenya Ltd		11 to 973		
EA Cables Ltd		23 to 49	Nil	34 to 49
EA Packaging Ltd		29 to 112	Nil	76 to 112
EA Portland Cement Ltd		9 to 46	9 to 43	Nil
Firestone East Africa Ltd		17 to 44	Nil	30 to 44
East Africa Breweries Ltd		37 to 75	37 to 53	Nil
Kenya National Mills Ltd		23 to 59	23 to 45	Nil
Kenya Oil Co Ltd		45 to 83	Nil	72 to 83
Kenya Power & Lighting Ltd		76 to 283	76 to 170	Nil
Total Kenya Ltd		32 to 155	Nil	95 to 155
Unga Group Ltd		70 to 206	70 to 138	Nil

TABLE 4.3.2

## Exercise Price Ranges- July-December 1997

SECTOR	COMPANY	Exercise price range	In the money call option	In the money put option	
Agricultural	<i>Brooke Bond Kenya Limited</i>	89 to 132	Nil	124 to 132	
	<i>Eaagads Limited</i>	16 to 67	16 to 40	Nil	
	<i>George Williamson Kenya Ltd</i>	27 to 176	27 to 68	163 to 176	
	<i>Kakuzi Ltd</i>	47 to 193	Nil	108 to 193	
	<i>Kapchorua Tea Co Ltd</i>	70 to 71	Nil	70 to 71	
	<i>Limuru Tea Co Ltd</i>	521 to 1227	Nil	751-1227	
	<i>Rea Vipingo Ltd</i>	6 to 13	Nil	10 to 13	
	<i>Sasini Tea &amp; Coffee Ltd</i>	66 to 188	66 to 71	117 to 188	
Finance & Investment	<i>Barclays Bank Ltd</i>	90 to 144	Nil	119 to 144	
	<i>City Trust Ltd</i>	30 to 45	Nil	35 to 45	
	<i>CFC Bank Ltd</i>	13 to 38	Nil	19 to 38	
	<i>Diamond Trust Bank Kenya Ltd</i>	17 to 34	Nil	23 to 34	
	<i>Housing Finance Co (K) Ltd</i>	17 to 26	Nil	20 to 25	
	<i>ICDC Investments Co Ltd</i>	14 to 119	Nil	38 to 119	
	<i>Jubilee Insurance Co Ltd</i>	27 to 59	Nil	36 to 59	
	<i>Kenya Commercial Bank Ltd</i>	68 to 172	Nil	78 to 172	
	<i>National Bank of Kenya Ltd</i>	9 to 21	Nil	14 to 21	
	<i>National Industrial Credit Ltd</i>	43 to 84	Nil	51 to 84	
	<i>Pan Africa Insurance Ltd</i>	35 to 92	Nil	43 to 92	
	<i>Standard Chartered Bank Ltd</i>	38 to 54	Nil	47 to 54	
Commercial & Services	<i>A Baumann &amp; Co Ltd</i>	8 to 41	Nil	17 to 41	
	<i>CMC Holdings Ltd</i>	51 to 145	Nil	86 to 145	
	<i>Car &amp; General (K) Ltd</i>	11 to 21	Nil	17 to 21	
	<i>Express Kenya Ltd</i>	50 to 84	Nil	60 to 84	
	<i>Kenya Airways Ltd</i>	7 to 10	Nil	9 to 10	
	<i>Lonhro Motors (EA) Ltd</i>	8 to 214	Nil	44 to 214	
	<i>Marshalls (EA) Ltd</i>	10 to 271	Nil	48 to 271	
	<i>Nation Media Group Ltd</i>	55 to 255	Nil	189 to 255	
	<i>Pearl Drycleaners Ltd</i>	8 to 14	Nil	12 to 14	
	<i>Standard Newspapers Ltd</i>	100 to 701	Nil	264 to 701	
	<i>Uchumi Supermarkets Ltd</i>	21 to 73	Nil	44 to 73	
	Industrial and Allied	<i>Bamburi Cement Ltd</i>	18 to 64	Nil	40 to 64
		<i>British American Tobacco Ltd</i>	33 to 77	Nil	51 to 77
<i>B O C Gases Ltd</i>		12 to 256	Nil	96 to 256	
<i>Carbacid Investments Ltd</i>		58 to 100	Nil	67 to 100	
<i>Crown Berger Ltd</i>		6 to 16	Nil	11 to 16	
<i>Dunlop Kenya Ltd</i>		11 to 955	Nil	122 to 955	
<i>EA Cables Ltd</i>		20 to 44	Nil	30 to 44	
<i>EA Packaging Ltd</i>		27 to 107	Nil	51 to 107	
<i>EA Portland Cement Ltd</i>		17 to 84	Nil	21 to 84	
<i>Firestone East Africa Ltd</i>		15 to 41	Nil	25 to 41	
<i>East Africa Breweries Ltd</i>		42 to 86	Nil	50 to 86	
<i>Kenya National Mills Ltd</i>		31 to 79	Nil	38 to 79	
<i>Kenya Oil Co Ltd</i>		45 to 82	Nil	49 to 82	
<i>Kenya Power &amp; Lighting Ltd</i>		144 to 538	Nil	218 to 538	
<i>Total Kenya Ltd</i>		29 to 139	Nil	54 to 139	
<i>Unga Group Ltd</i>		88 to 257	Nil	123 to 257	

TABLE 4.3.3

## Exercise Price Ranges- January-June 1998

SECTOR	COMPANY	Exercise price range	In the money call option	In the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	91 to 172	91 to 125	Nil
	<i>Eaagads Limited</i>	29 to 66	Nil	38 to 66
	<i>George Williamson Kenya Ltd</i>	89 to 169	89 to 140	Nil
	<i>Kakuzi Ltd</i>	83 to 174	83 to 141	Nil
	<i>Kapchorua Tea Co Ltd</i>	64 to 119	Nil	82 to 119
	<i>Limuru Tea Co Ltd</i>	780 to 820	Nil	780-820
	<i>Rea Vipingo Ltd</i>	6 to 9	Nil	7 to 9
	<i>Sasini Tea &amp; Coffee Ltd</i>	34 to 118	34 to 66	Nil
Finance & Investment	<i>Barclays Bank Ltd</i>	69 to 209	Nil	105 to 209
	<i>City Trust Ltd</i>	9 to 78	Nil	40 to 78
	<i>CFC Bank Ltd</i>	12 to 23	Nil	18 to 23
	<i>Diamond Trust Bank Kenya</i>	17 to 29	Nil	23 to 29
	<i>Housing Finance Co (K) Ltd</i>	10 to 25	Nil	18 to 25
	<i>ICDC Investments Co Ltd</i>	23 to 65	23 to 30	49 to 65
	<i>Jubilee Insurance Co Ltd</i>	24 to 41	Nil	31 to 41
	<i>Kenya Commercial Bank Ltd</i>	53 to 102	Nil	71 to 102
	<i>National Bank of Kenya Ltd</i>	4 to 23	Nil	16 to 23
	<i>National Industrial Credit Ltd</i>	15 to 71	Nil	36 to 71
	<i>Pan Africa Insurance Ltd</i>	18 to 30	Nil	21 to 30
<i>Standard Chartered Bank Ltd</i>	31 to 78	Nil	44 to 78	
Commercial & Services	<i>A Baumann &amp; Co Ltd</i>	14 to 19	Nil	16 to 19
	<i>CMC Holdings Ltd</i>	24 to 53	Nil	36 to 53
	<i>Car &amp; General (K) Ltd</i>	7 to 24	Nil	12 to 24
	<i>Express Kenya Ltd</i>	28 to 76	Nil	28 to 76
	<i>Kenya Airways Ltd</i>	6 to 11	Nil	8 to 11
	<i>Lonhro Motors (EA) Ltd</i>	22 to 44	Nil	27 to 44
	<i>Marshalls (EA) Ltd</i>	20 to 33	Nil	30 to 33
	<i>Nation Media Group Ltd</i>	37 to 348	Nil	138 to 348
	<i>Pearl Drycleaners Ltd</i>	9 to 11	Nil	11
	<i>Standard Newspapers Ltd</i>	6 to 80	Nil	42 to 80
	<i>Tourism Promotion Services</i>	9 to 21	Nil	14 to 21
	<i>Uchumi Supermarkets Ltd</i>	28 to 66	28 to 37	55 to 66
Industrial and Allied	<i>Athi River Mining Ltd</i>	4 to 15	Nil	11 to 15
	<i>Bamburi Cement Ltd</i>	18 to 66	Nil	39 to 66
	<i>British American Tobacco Ltd</i>	63 to 82	Nil	68 to 82
	<i>B O C Gases Ltd</i>	19 to 69	Nil	39 to 69
	<i>Carbacid Investments Ltd</i>	40 to 100	Nil	47 to 100
	<i>Crown Berger Ltd</i>	5 to 17	Nil	11 to 17
	<i>Dunlop Kenya Ltd</i>	6 to 48	6 to 28	Nil
	<i>EA Cables Ltd</i>	16 to 36	Nil	23 to 36
	<i>EA Packaging Ltd</i>	18 to 60	Nil	21 to 60
	<i>EA Portland Cement Ltd</i>	14 to 28	14 to 17	25 to 28
	<i>Firestone East Africa Ltd</i>	11 to 25	Nil	20 to 25
	<i>East Africa Breweries Ltd</i>	37 to 102	37 to 45	71 to 102
	<i>Kenya National Mills Ltd</i>	6 to 33	6 to 23	Nil
	<i>Kenya Oil Co Ltd</i>	39 to 73	39 to 50	66 to 73
	<i>Kenya Power &amp; Lighting Ltd</i>	83 to 176	Nil	142 to 176
	<i>Total Kenya Ltd</i>	28 to 83	Nil	43 to 83
	<i>Unga Group Ltd</i>	9 to 120	9 to 120	Nil

**TABLE 4.3.4**  
**Exercise Price Ranges- July- December 1998**

<b>SECTOR</b>	<b>COMPANY</b>	<b>Exercise price range</b>	<b>In the money call option</b>	<b>In the money put option</b>
<b>Agricultural</b>	<i>Brooke Bond Kenya Limited</i>	109 to 206	Nil	149 to 206
	<i>Eaagads Limited</i>	26 to 59	Nil	40 to 59
	<i>George Williamson Kenya Ltd</i>	146 to 277	Nil	147 to 277
	<i>Kakuzi Ltd</i>	123 to 256	Nil	145 to 256
	<i>Kapchorua Tea Co Ltd</i>	69 to 128	69 to 92	Nil
	<i>Limuru Tea Co Ltd</i>	785 to 826	Nil	785 to 826
	<i>Rea Vipingo Ltd</i>	4 to 7	Nil	7
	<i>Sasini Tea &amp; Coffee Ltd</i>	42 to 143	Nil	76 to 143
<b>Finance &amp; Investment</b>	<i>Barclays Bank Ltd</i>	63 to 179	61 to 109	Nil
	<i>City Trust Ltd</i>	9 to 72	Nil	31 to 72
	<i>CFC Bank Ltd</i>	11 to 22	Nil	16 to 22
	<i>Diamond Trust Bank Kenya</i>	16 to 28	Nil	22 to 28
	<i>Housing Finance Co (K) Ltd</i>	10 to 26	Nil	18 to 26
	<i>ICDC Investments Co Ltd</i>	26 to 72	Nil	49 to 72
	<i>Jubilee Insurance Co Ltd</i>	23 to 40	Nil	31 to 40
	<i>Kenya Commercial Bank Ltd</i>	47 to 90	Nil	62 to 90
	<i>National Bank of Kenya Ltd</i>	4 to 23	Nil	9 to 23
	<i>National Industrial Credit Ltd</i>	13 to 58	Nil	32 to 58
	<i>Pan Africa Insurance Ltd</i>	13 to 21	Nil	17 to 21
<i>Standard Chartered Bank Ltd</i>	27 to 69	27 to 47	Nil	
<b>Commercial Services &amp;</b>	<i>A Baumann &amp; Co Ltd</i>	14 to 19	14 to 16	Nil
	<i>CMC Holdings Ltd</i>	21 to 47	Nil	34 to 47
	<i>Car &amp; General (K) Ltd</i>	5 to 17	5 to 7	15 to 17
	<i>Express Kenya Ltd</i>	14 to 38	Nil	31 to 38
	<i>Kenya Airways Ltd</i>	5 to 11	5 to 7	10 to 11
	<i>Lonhro Motors (EA) Ltd</i>	14 to 28	Nil	23 to 28
	<i>Marshall's (EA) Ltd</i>	22 to 35	Nil	26 to 35
	<i>Nation Media Group Ltd</i>	32 to 302	32 to 98	251 to 302
	<i>Pearl Drycleaners Ltd</i>	9 to 11	Nil	11
	<i>Standard Newspapers Ltd</i>	5 to 75	Nil	25 to 75
	<i>Tourism Promotion Services</i>	8 to 20	Nil	15 to 20
	<i>Uchumi Supermarkets Ltd</i>	31 to 74	Nil	47 to 74
<b>Industrial Allied and</b>	<i>Athi River Mining Ltd</i>	4 to 14	Nil	7 to 14
	<i>Bamburi Cement Ltd</i>	17 to 63	Nil	42 to 63
	<i>British American Tobacco Ltd</i>	65 to 84	Nil	72 to 84
	<i>B O C Gases Ltd</i>	18 to 65	Nil	42 to 65
	<i>Carbacid Investments Ltd</i>	36 to 90	36 to 73	Nil
	<i>Crown Berger Ltd</i>	5 to 16	Nil	9 to 16
	<i>Dunlop Kenya Ltd</i>	10 to 74	Nil	20 to 74
	<i>EA Cables Ltd</i>	12 to 28	Nil	21 to 28
	<i>EA Packaging Ltd</i>	7 to 25	Nil	16 to 25
	<i>EA Portland Cement Ltd</i>	15 to 31	Nil	18 to 31
	<i>Firestone East Africa Ltd</i>	12 to 26	Nil	17 to 26
	<i>East Africa Breweries Ltd</i>	42 to 116	42 to 64	Nil
	<i>Kenya National Mills Ltd</i>	11 to 54	Nil	17 to 54
	<i>Kenya Oil Co Ltd</i>	39 to 73	Nil	57 to 73
	<i>Kenya Power &amp; Lighting Ltd</i>	89 to 188	Nil	123 to 188
	<i>Total Kenya Ltd</i>	22 to 65	Nil	54 to 65
	<i>Unga Group Ltd</i>	26 to 354	Nil	59 to 354

TABLE 4.3.5

## Exercise Price Ranges-January-June 1999

SECTOR	COMPANY	Exercise price range	In the money call option	In the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	70 to 206	70 to 87	184 to 206
	<i>Eaagads Limited</i>	14 to 76	Nil	55 to 76
	<i>George Williamson Kenya Ltd</i>	87 to 161	Nil	153 to 161
	<i>Kakuzi Ltd</i>	80 to 167	Nil	123 to 176
	<i>Kapchorua Tea Co Ltd</i>	91 to 176	91 to 149	Nil
	<i>Limuru Tea Co Ltd</i>	588 to 908	Nil	651 to 908
	<i>Rea Vipingo Ltd</i>	4 to 7	Nil	7
	<i>Sasini Tea &amp; Coffee Ltd</i>	40 to 83	Nil	55 to 83
Finance & Investment	<i>Barclays Bank Ltd</i>	90 to 157	Nil	111 to 158
	<i>City Trust Ltd</i>	20 to 29	Nil	23 to 29
	<i>CFC Bank Ltd</i>	8 to 28	Nil	18 to 27
	<i>Diamond Trust Bank Kenya</i>	17 to 34	17 to 20	32 to 34
	<i>Housing Finance Co (K) Ltd</i>	9 to 20	Nil	14 to 20
	<i>ICDC Investments Co Ltd</i>	43 to 54	43 to 48	Nil
	<i>Jubilee Insurance Co Ltd</i>	20 to 37	Nil	30 to 37
	<i>Kenya Commercial Bank Ltd</i>	34 to 65	Nil	44 to 65
	<i>National Bank of Kenya Ltd</i>	4 to 10	Nil	7 to 10
	<i>National Industrial Credit Ltd</i>	24 to 35	Nil	29 to 35
Commercial & Services	<i>Pan Africa Insurance Ltd</i>	4 to 78	4 to 19	
	<i>Standard Chartered Bank Ltd</i>	44 to 66	Nil	50 to 67
	<i>A Baumann &amp; Co Ltd</i>	14 to 19	Nil	18 to 19
	<i>CMC Holdings Ltd</i>	25 to 39	Nil	29 to 39
	<i>Car &amp; General (K) Ltd</i>	2 to 34	Nil	15 to 34
	<i>Express Kenya Ltd</i>	11 to 45	Nil	29 to 45
	<i>Kenya Airways Ltd</i>	4 to 13	Nil	10 to 13
	<i>Lonhro Motors (EA) Ltd</i>	10 to 29	Nil	18 to 29
	<i>Marshalls (EA) Ltd</i>	18 to 31	Nil	23 to 31
	<i>Nation Media Group Ltd</i>	88 to 162	Nil	134 to 162
Industrial and Allied	<i>Pearl Drycleaners Ltd</i>	1 to 26	Nil	22 to 26
	<i>Standard Newspapers Ltd</i>	2 to 56	Nil	18 to 56
	<i>Tourism Promotion Services</i>	12 to 19	12 to 15	Nil
	<i>Uchumi Supermarkets Ltd</i>	30 to 63	30 to 42	Nil
	<i>Athi River Mining Ltd</i>	3 to 10	Nil	7 to 10
	<i>Bamburi Cement Ltd</i>	20 to 48	Nil	27 to 48
	<i>British American Tobacco Ltd</i>	48 to 102	Nil	78 to 102
	<i>B O C Gases Ltd</i>	21 to 49	Nil	27 to 49
	<i>Carbacid Investments Ltd</i>	52 to 115	51 to 92	Nil
	<i>Crown Berger Ltd</i>	3 to 24	3 to 4	14 to 24
<i>Dunlop Kenya Ltd</i>	7 to 32	Nil	16 to 32	
<i>EA Cables Ltd</i>	7 to 43	Nil	28 to 43	
<i>EA Packaging Ltd</i>	5 to 22	Nil	16 to 22	
<i>EA Portland Cement Ltd</i>	2 to 48	Nil	22 to 48	
<i>Firestone East Africa Ltd</i>	12 to 23	Nil	19 to 23	
<i>East Africa Breweries Ltd</i>	55 to 95	55 to 72	Nil	
<i>Kenya National Mills Ltd</i>	4 to 34	Nil	18 to 34	
<i>Kenya Oil Co Ltd</i>	33 to 106	33 to 73	Nil	
<i>Kenya Power &amp; Lighting Ltd</i>	79 to 158	Nil	114 to 158	
<i>Total Kenya Ltd</i>	35 to 70	Nil	49 to 70	
<i>Unga Group Ltd</i>	7 to 120	Nil	38 to 120	



TABLE 4.3.6

## Exercise Price Ranges -July-December 1999

SECTOR	COMPANY	Exercise price		
		In the money range	In the money call option	In the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	73 to 214	Nil	106 to 214
	<i>Eaagads Limited</i>	14 to 74	Nil	27 to 74
	<i>George Williamson Kenya Ltd</i>	88 to 163	Nil	93 to 163
	<i>Kakuzi Ltd</i>	68 to 143	Nil	88 to 143
	<i>Kapchorua Tea Co Ltd</i>	145 to 278	Nil	160 to 278
	<i>Limuru Tea Co Ltd</i>	502 to 775	Nil	668 to 775
	<i>Rea Vipingo Ltd</i>	4 to 7	Nil	5 to 7
	<i>Sasini Tea &amp; Coffee Ltd</i>	31 to 65	Nil	46 to 64
Finance & Investment	<i>Barclays Bank Ltd</i>	78 to 136	Nil	105 to 136
	<i>City Trust Ltd</i>	17 to 25	Nil	23 to 25
	<i>CFC Bank Ltd</i>	8 to 27	Nil	17 to 27
	<i>Diamond Trust Bank Kenya</i>	18 to 37	17 to 22	Nil
	<i>Housing Finance Co (K) Ltd</i>	7 to 16	Nil	11 to 16
	<i>ICDC Investments Co Ltd</i>	49 to 62	Nil	53 to 62
	<i>Jubilee Insurance Co Ltd</i>	19 to 35	Nil	24 to 34
	<i>Kenya Commercial Bank Ltd</i>	25 to 47	Nil	32 to 47
	<i>National Bank of Kenya Ltd</i>	3 to 7	Nil	6 to 7
	<i>National Industrial Credit Ltd</i>	23 to 34	Nil	28 to 34
	<i>Pan Africa Insurance Ltd</i>	5 to 112	Nil	68 to 112
Commercial & Services	<i>Standard Chartered Bank Ltd</i>	42 to 63	45 to 54	Nil
	<i>A Baumann &amp; Co Ltd</i>	14 to 19	Nil	15 to 19
	<i>CMC Holdings Ltd</i>	21 to 33	22 to 26	Nil
	<i>Car &amp; General (K) Ltd</i>	1 to 29	Nil	15 to 29
	<i>Express Kenya Ltd</i>	10 to 40	Nil	20 to 40
	<i>Kenya Airways Ltd</i>	4 to 13	Nil	9 to 13
	<i>Lonhro Motors (EA) Ltd</i>	8 to 23	Nil	14 to 23
	<i>Marshall's (EA) Ltd</i>	16 to 27	16 to 20	Nil
	<i>Nation Media Group Ltd</i>	83 to 153	Nil	101 to 153
	<i>Pearl Drycleaners Ltd</i>	1 to 26	Nil	4 to 26
	<i>Standard Newspapers Ltd</i>	2 to 37	Nil	14 to 37
	<i>Tourism Promotion Services</i>	10 to 15	Nil	Nil
	<i>Uchumi Supermarkets Ltd</i>	32 to 69	Nil	40 to 69
	Industrial and Allied	<i>Athi River Mining Ltd</i>	3 to 9	Nil
<i>Bamburi Cement Ltd</i>		15 to 35	Nil	30 to 35
<i>British American Tobacco Ltd</i>		48 to 102	Nil	67 to 102
<i>B O C Gases Ltd</i>		15 to 35	Nil	30 to 35
<i>Carbacid Investments Ltd</i>		64 to 144	Nil	77 to 144
<i>Crown Berger Ltd</i>		4 to 25	4 to 7	Nil
<i>Dunlop Kenya Ltd</i>		5 to 24	Nil	11 to 24
<i>EA Cables Ltd</i>		6 to 43	Nil	19 to 43
<i>EA Packaging Ltd</i>		5 to 20	Nil	8 to 20
<i>EA Portland Cement Ltd</i>		2 to 40	Nil	16 to 40
<i>Firestone East Africa Ltd</i>		12 to 23	Nil	17 to 23
<i>East Africa Breweries Ltd</i>		61 to 107	Nil	71 to 107
<i>Kenya National Mills Ltd</i>		3 to 28	Nil	11 to 28
<i>Kenya Oil Co Ltd</i>		45 to 146	Nil	74 to 146
<i>Kenya Power &amp; Lighting Ltd</i>		70 to 140	Nil	94 to 140
<i>Total Kenya Ltd</i>		33 to 67	Nil	53 to 67
<i>Unga Group Ltd</i>		4 to 79	Nil	38 to 80

TABLE 4.3.7

## Exercise Price Ranges- January-June 2000

SECTOR	COMPANY	Exercise price range	In the money call option	In the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	68 to 148	Nil	75 to 148
	<i>Eaagads Limited</i>	17 to 30	Nil	27 to 30
	<i>George Williamson Kenya Ltd</i>	50 to 166	Nil	79 to 166
	<i>Kakuzi Ltd</i>	50 to 112	Nil	67 to 112
	<i>Kapchorua Tea Co Ltd</i>	151	Nil	151
	<i>Limuru Tea Co Ltd</i>	678	Nil	650 to 678
	<i>Rea Vipingo Ltd</i>	3 to 5	Nil	4 to 5
	<i>Sasini Tea &amp; Coffee Ltd</i>	26 to 60	Nil	36 to 60
Finance & Investment	<i>Barclays Bank Ltd</i>	49 to 134	49 to 50	106 to 134
	<i>City Trust Ltd</i>	18 to 30	Nil	21 to 30
	<i>CFC Bank Ltd</i>	6 to 18	Nil	11 to 18
	<i>Diamond Trust Bank Kenya</i>	14 to 30	Nil	21 to 30
	<i>Housing Finance Co (K) Ltd</i>	1 to 28	Nil	10 to 28
	<i>ICDC Investments Co Ltd</i>	34 to 71	Nil	54 to 71
	<i>Jubilee Insurance Co Ltd</i>	18 to 36	Nil	23 to 36
	<i>Kenya Commercial Bank Ltd</i>	14 to 37	14 to 27	Nil
	<i>National Bank of Kenya Ltd</i>	2 to 7	Nil	4 to 7
	<i>National Industrial Credit Ltd</i>	13 to 39	Nil	22 to 39
	<i>Pan Africa Insurance Ltd</i>	11 to 33	Nil	21 to 33
<i>Standard Chartered Bank Ltd</i>	21 to 87	21 to 44	Nil	
Commercial & Services	<i>A Baumann &amp; Co Ltd</i>	9 to 17	Nil	15 to 17
	<i>CMC Holdings Ltd</i>	16 to 33	Nil	17 to 33
	<i>Car &amp; General (K) Ltd</i>	2 to 28	2 to 6	24 to 28
	<i>Express Kenya Ltd</i>	15 to 22	Nil	20 to 22
	<i>Kenya Airways Ltd</i>	6 to 13	Nil	9 to 13
	<i>Marshalls (EA) Ltd</i>	16 to 28	Nil	19 to 28
	<i>Nation Media Group Ltd</i>	68 to 109	Nil	76 to 109
	<i>Pearl Drycleaners Ltd</i>	2 to 4	Nil	3 to 4
	<i>Standard Newspapers Ltd</i>	2 to 46	Nil	8 to 46
	<i>Tourism Promotion Services</i>	3 to 38	Nil	29 to 38
	<i>Uchumi Supermarkets Ltd</i>	36 to 58	36 to 37	50 to 58
	Industrial and Allied	<i>Athi River Mining Ltd</i>	2 to 8	Nil
<i>Bamburi Cement Ltd</i>		25 to 37	25 to 28	Nil
<i>British American Tobacco Ltd</i>		26 to 110	Nil	74 to 110
<i>B O C Gases Ltd</i>		37 to 85	Nil	48 to 85
<i>Carbacid Investments Ltd</i>		27 to 83	Nil	54 to 83
<i>Crown Berger Ltd</i>		6 to 16	11 to 16	Nil
<i>Dunlop Kenya Ltd</i>		6 to 11	Nil	8 to 11
<i>EA Cables Ltd</i>		5 to 29	Nil	11 to 29
<i>EA Packaging Ltd</i>		2 to 28	2 to 6	Nil
<i>EA Portland Cement Ltd</i>		8 to 16	8 to 11	Nil
<i>Firestone East Africa Ltd</i>		9 to 21	Nil	14 to 21
<i>East Africa Breweries Ltd</i>		58 to 93	Nil	68 to 93
<i>Kenya National Mills Ltd</i>		2 to 21	2 to 6	Nil
<i>Kenya Oil Co Ltd</i>		53 to 101	53 to 80	Nil
<i>Kenya Power &amp; Lighting Ltd</i>		35 to 126	Nil	52 to 126
<i>Total Kenya Ltd</i>		28 to 93	28 to 35	71 to 93
<i>Unga Group Ltd</i>		6 to 45	Nil	17 to 45

TABLE 4.3.8

## Exercise Price Ranges – July-December 2000

SECTOR	COMPANY	Exercise price range	In the money call option	In the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	48 to 105	48 to 95	Nil
	<i>Eaagads Limited</i>	17 to 30	Nil	21 to 30
	<i>George Williamson Kenya Ltd</i>	41 to 135	41 to 91	Nil
	<i>Kakuzi Ltd</i>	36 to 80	Nil	56 to 80
	<i>Kapchorua Tea Co Ltd</i>	151	Nil	151
	<i>Limuru Tea Co Ltd</i>	678	Nil	650 to 678
	<i>Rea Vipingo Ltd</i>	2 to 4	Nil	4
	<i>Sasini Tea &amp; Coffee Ltd</i>	20 to 47	Nil	37 to 47
Finance & Investment	<i>Barclays Bank Ltd</i>	51 to 139	Nil	80 to 139
	<i>City Trust Ltd</i>	16 to 28	16 to 22	Nil
	<i>CFC Bank Ltd</i>	5 to 16	Nil	13 to 16
	<i>Diamond Trust Bank Kenya</i>	10 to 23	Nil	15 to 23
	<i>Housing Finance Co (K) Ltd</i>	1 to 19	Nil	8 to 19
	<i>ICDC Investments Co Ltd</i>	33 to 70	Nil	49 to 70
	<i>Jubilee Insurance Co Ltd</i>	16 to 31	Nil	30 to 31
	<i>Kenya Commercial Bank Ltd</i>	18 to 47	Nil	27 to 47
	<i>National Bank of Kenya Ltd</i>	1 to 5	Nil	4 to 5
	<i>National Industrial Credit Ltd</i>	10 to 30	Nil	19 to 30
	<i>Pan Africa Insurance Ltd</i>	8 to 25	Nil	12 to 25
<i>Standard Chartered Bank Ltd</i>	28 to 113	Nil	68 to 113	
Commercial & Services	<i>A Baumann &amp; Co Ltd</i>	9 to 16	Nil	10 to 16
	<i>CMC Holdings Ltd</i>	9 to 19	Nil	16 to 19
	<i>Car &amp; General (K) Ltd</i>	2 to 31	Nil	18 to 31
	<i>Express Kenya Ltd</i>	15 to 22	Nil	18 to 22
	<i>Kenya Airways Ltd</i>	6 to 13	6 to 8	Nil
	<i>Marshalls (EA) Ltd</i>	13 to 23	Nil	20 to 23
	<i>Nation Media Group Ltd</i>	51 to 81	Nil	70 to 81
	<i>Pearl Drycleaners Ltd</i>	1 to 3	Nil	3
	<i>Standard Newspapers Ltd</i>	1 to 25	Nil	16 to 25
	<i>Tourism Promotion Services)</i>	2 to 38	Nil	8 to 38
	<i>Uchumi Supermarkets Ltd</i>	39 to 62	39 to 47	Nil
	Industrial and Allied	<i>Athi River Mining Ltd</i>	2 to 7	Nil
<i>Bamburi Cement Ltd</i>		28 to 42	28 to 33	Nil
<i>British American Tobacco Ltd</i>		28 to 119	28 to 40	91 to 119
<i>B O C Gases Ltd</i>		27 to 63	Nil	53 to 63
<i>Carbacid Investments Ltd</i>		24 to 74	Nil	41 to 74
<i>Crown Berger Ltd</i>		7 to 18	Nil	10 to 18
<i>Dunlop Kenya Ltd</i>		4 to 9	Nil	7 to 9
<i>EA Cables Ltd</i>		3 to 18	3 to 7	Nil
<i>EA Packaging Ltd</i>		3 to 39	Nil	9 to 39
<i>EA Portland Cement Ltd</i>		9 to 17	Nil	13 to 17
<i>Firestone East Africa Ltd</i>		7 to 17	Nil	12 to 17
<i>East Africa Breweries Ltd</i>		58 to 93	58 to 72	Nil
<i>Kenya National Mills Ltd</i>		3 to 24	Nil	8 to 24
<i>Kenya Oil Co Ltd</i>		29 to 270	Nil	75 to 264
<i>Kenya Power &amp; Lighting Ltd</i>		20 to 70	Nil	42 to 70
<i>Total Kenya Ltd</i>		30 to 98	30 to 42	Nil
<i>Unga Group Ltd</i>		4 to 30	Nil	19 to 30

#### 4.4: Summary of in the money options

Tables 4.4.1 through to 4.4.4 gives a sector by sector summary of the number of in-the-money options when the exercise price ranges per section 4.3 are simulated using the Black and Scholes option pricing model.

##### 4.4.1: Agricultural sector

This sector, other than in the period January to June 1998, consistently has only in the money put option, implying a general fall in market share prices. The stocks traded in this sector are basically tea and coffee companies and fall in share prices is attributed to among other factors, fall in world market prices (the bulk of these companies' tea/coffee stocks are sold in overseas markets) and first drought and then El Nino which drastically affected crop output by these companies and in turn, overall sales and profitability.

**Table 4.4.1-Summary of in-the-money options - agricultural sector**

Year	Period	Total no of firms in the sector	No with in the money call options	No with in the money put options	No of firms with both in the money Call and put options
1997	January-June	8	1	7	0
	July-December	8	3	7	2
1998	January-June	8	4	4	0
	July-December	8	1	7	0
1999	January-June	8	2	7	1
	July-December	8	0	8	0
2000	January-June	8	2	8	2
	July-December	8	2	6	0

#### 4.4.2: Finance and investment sector

While the stocks in this sector also largely exhibit in the money put options, the exercise price ranges are much lower (See appendix 7) implying lower volatility in share price movements. Decline in share prices is attributed to factors such as higher provisioning for bad and doubtful debts following more stringent requirements by the Central Bank of Kenya which has resulted in the banks (which dominate this sector) reporting much lower profits. In addition, companies in this sector would make high earnings by largely investing in risk-free treasury bills. As the rates on the later have continued to decline, so have the reported earnings by the companies.

**Table 4.4.2-Summary of in-the-money options – Finance & Investment sector**

Year	Period	Total no of firms in the sector	No with in the money call options	No with in the money put options	No of firms with both in the money Call and put options
1997	January-June	12	6	7	1
	July-December	12	0	12	0
1998	January-June	12	1	12	1
	July-December	12	2	10	0
1999	January-June	12	3	10	1
	July-December	12	2	10	0
2000	January-June	12	3	10	1
	July-December	12	1	11	0

#### 4.4.3: Commercial and services sector

This sector has a mixture of motor, retail, travel and media companies. Over the last 4 years, the motor industry has been plagued by the influx of cheap second-hand vehicles, popularly referred to as 'mitumbas' which have significantly impaired their performance. In the year 2000, one of these companies was put under receivership. The other companies in the sector have had somewhat mixed performance thus resulting in wide fluctuations in share price movements and thus the exercise ranges for in-the-money European options. Through the use of options, investors would have hedged/cushioned their investments against the decline in the performance of the stocks.

**Table 4.4.3-Summary of results of in-the-money options – Commercial & Services sector**

Year	Period	Total no of firms in the sector	No with in the money call options	No with in the money put options	No of firms with both in the money Call and put options
1997	January-June	11*	2	10	0
	July-December	11*	0	11	0
1998	January-June	12	1	12	1
	July-December	12	4	11	1
1999	January-June	12	2	10	0
	July-December	12	2	10	0
2000	January-June	11**	2	11	2
	July-December	12	2	9	0

\* TPS-Serena excluded as not listed for a full year.

\*\* 1 company in this sector was excluded as trading on the Exchange was suspended during the year, following the placement of the company under receivership.

#### 4.4.4: Industrial and allied sector

This sector largely comprises manufacturing concerns which have endured the full impact of the liberalization of the Kenyan economy which has resulted in an influx of imported, low priced commodities) power-rationing, high interest rates on loan and overdraft facilities, to mention but a few. The overall result has a general deterioration in their profitability and thus their share price performance. Again, through the use of options, investors would have hedged/cushioned their investments against the decline in the performance of the stocks.

**Table 4.4.4-Summary of results of in-the-money options – Industrial & Allied sector**

Year	Period	Total no of firms in the sector	No with in the money call options	No with in the money put options	No of firms with both in the money Call and put options
1997	January-June	16***	6	9	0
	July-December	16***	0	16	0
1998	January-June	17	6	14	2
	July-December	17	2	15	0
1999	January-June	17	4	14	1
	July-December	17	1	16	0
2000	January-June	17	7	11	1
	July-December	17	5	13	1

\*\*\* Athi River Mining Company excluded as not listed for a full year

#### **4.5: Possible pay-offs using options**

The literature review indicated that if an investor anticipates a certain directional movement in the price of a stock, the right to buy or sell that stock at a predetermined price, for a specific duration of time can offer an attractive investment opportunity. The decision as to what type of option to buy is dependent on whether the investor's outlook for the respective security is positive (bullish) or negative (bearish). If the outlook is positive, buying a call option creates the opportunity to share in the upside potential of a stock without having to risk more than a fraction of its market value. Conversely, if a downward movement is anticipated, buying a put option will enable one to protect against the downside risk without limiting profit potential. Purchasing options offers one the ability to position oneself according to your market expectations in a manner such that you can both profit and protect with limited risk.

Based on the option values simulated for the period 1997 to 2000, possible pay-offs for investors with stock options on the Nairobi Stock Exchange during that period are summarised below. Nil transaction costs have been assumed. The results thus indicate possibilities of investors having profited through hedging using options. The study by Whaley (1982) on the New York Stock Exchange however indicated that profits from buying individual apparently undervalued options and selling individual apparently overvalued options were insufficient to cover the market maker's spread, let alone



other transaction costs, such as commissions and transfer fees and that it is not possible to make money by trading on the basis of any mispricing implied by the Black and Scholes model. In the absence of an operational options exchange in Kenya, it is difficult to estimate what the transaction costs would be and eliminate them in the working hereunder. It may be assumed that the results of the Whaley study would apply in the Kenyan context, until proved otherwise.

#### 4.5.1: Agricultural sector

The stocks with the highest volatility, for the 4 years under review, per table 4.2.1a, was George Williamson Kenya (GWK) in 1997. Using options, an investor would have hedged as follows. (See appendix 6-1997 data): The share price for GWK at the beginning of the period July-December 1997 was Sh 70. Assuming a bullish market, an investor may have invested in a call option which allowed him to buy the shares at Sh 67 per share at the end of December 1997. The actual share price at the end of December 1997 was Sh 86. Thus the investor's gain would be as follows:

- Exercise the call option thus buying the GWK shares at Sh 67 (Say 100 shares at Sh 67 = Sh 6,700)
- The true value of the option would be Sh 6,700 less the cost of buying the option (that is, the call price which was Sh 18.0323 per share thus Sh 1,803.23) which adds up to Sh 4,896.77.

- The investor would then sell the shares at the ruling price of Sh 86 per share thus making a gain of Sh 3,703,23 (100 shares @ 86 minus Sh 4,896.77) assuming nil transaction costs. In an active options market, transaction costs (eg brokerage fees) would need to be taken into account.

#### 4.5.2: Finance and Investment sector

The stocks with the highest volatility, for the 4 years under review, per table 4.2.2a, were City Trust and ICDC Investment (ICDCI) in 1997 and 1998. Using options, an investor would have hedged as follows. (See appendix 6-1997 data): The share price for ICDCI at the beginning of the period January-June 1997 was Sh 40. Assuming a bullish market, an investor may have invested in a call option which allowed him to buy the shares at Sh 40 per share at the end of June 1997. The actual share price at the end of June 1997 was Sh 50. Thus the investor's gain would be as follows:

- Exercise the call option thus buying the ICDCI shares at Sh 40 (Say 100 shares at Sh 40= Sh 4,000)
- The true value of the option would be Sh 4,000 less the cost of buying the option (that is, the call price which was Sh 10.3207 per share thus Sh 1,032.07) which adds up to Sh 2,967.93.
- The investor would then sell the shares at the ruling price of Sh 50 per share thus making a gain of Sh 2,032.07 (100 shares @

86 minus Sh 2,967.93) assuming nil transaction costs. In an active options market, transaction costs (eg brokerage fees) would need to be taken into account.

#### 4.5.4: Industrial & Allied Sector

#### 4.5.3: Commercial & Services sector

The stocks with the highest volatility, for the 4 years under review, per table 4.2.3a, were Lonhro Motors and Marshalls (EA) in 1997 and Pearl Dry Cleaners in 1999. Using options, an investor would have hedged, for example, on the Pearl Dry Cleaners share price movement as follows. (See appendix 6-1999 data): The share price for Pearl Dry Cleaners at the beginning of the period July-December 1999 was Sh 10. Assuming a bearish market, an investor may have invested in a put option which allowed him to buy the shares at Sh 6 per share at the end of December 1999. The actual share price at the end of December was Sh 3. Thus the investor's gain would be as follows:

- Exercise the call option thus buying the Pearl Dry Cleaners shares at Sh 6 (Say 100 shares at Sh 6 = Sh 600)
- The true value of the option would be Sh 600 less the cost of buying the option (that is, the put price which was Sh 0.8931 per share thus Sh 89.31) which adds up to Sh 510.69.
- Had the investor not hedged against the share price movement and he wanted to sell off the shares in December 1999, the market value would have been Sh 300 (100 shares @ Sh 3, the

ruling market price). Using options, the investor has gained Sh 210.69, assuming nil transaction costs.

#### 4.5.4: Industrial & Allied Sector

The stocks with the highest volatility, for the 4 years under review, per table 4.2.4a, were Dunlop in 1997 and East Africa Portland Cement (EAPCC) in 1999. Using options, an investor would have hedged, for example, on the EAPCC share price movement as follows. (See appendix 6-1999 data): The share price for EAPCC at the beginning of the period July-December 1999 was Sh 14.5. Assuming a bearish market, an investor may have invested in a put option which allowed him to buy the shares at Sh 16 per share at the end of December 1999. The actual share price at the end of December was Sh 11.2. Thus the investor's gain would be as follows:

- Exercise the call option thus buying the EAPCC shares at Sh 16 (Say 100 shares at Sh 16 = Sh 1,600)
- The true value of the option would be Sh 1,600 less the cost of buying the option (that is, the put price which was Sh 3.9776 per share thus Sh 397.76) which adds up to Sh 1,202.24.
- Had the investor not hedged against the share price movement and he wanted to sell off the shares in December 1999, the market value would have been Sh 1,120 (100 shares @ Sh 11.2, the ruling market price). Using options, the investor has gained Sh 82.24, assuming nil transaction costs.

## CHAPTER 5: RESEARCH CONCLUSION

### 5.1 Conclusion

The results of the study indicate that the returns on quoted stocks for the period 1997 to 2000 were markedly poor as share prices continued to decline in line with poor earnings reported by the majority of quoted stocks.

This study also revealed that shares on the Nairobi Stock Exchange have share price movements that are volatile enough to make it worthwhile to hedge against such movements. With the exception of three firms (Kapchorua Tea Company, Limuru Tea Company and Regent Undervalued Assets Fund) all the other shares had significant enough volatilities that one could have hedged against in order to better manage risk.

The study shows that exercise price ranges can be mathematically determined and for the period under study, these were reasonable in so far as they fell within the actual share price ranges and were consistent with individual stock volatilities.

The study revealed that the Black and Scholes model can be applied to determine option values in a Kenyan context. The possible pay-offs, based

on hedging strategies, indicated that investors could profit, assuming nil transaction costs, through use of options. This results of studies done elsewhere, in particular that done by Whaley in 1982 on New York Exchange stock indicate transaction costs virtually wipe off any profits and/or mispricing by the B-S model. In the absence of other evidence, it would be reasonable to assume that the same would apply in Kenya once an options exchange is operationalized.

## 5.2 Limitations of study

Due to the time constraints under which the project was undertaken, monthly, as opposed to daily, share prices were used to compute stock volatility. Daily share prices, although entailing voluminous data processing, are likely to give more accurate volatility for individual stock. This is especially so when non-trading days (as tested by Eugene Fama and Kenneth French) are eliminated. The study by Fama and French suggested that volatility is far larger when the exchange is open than when it is closed. In other words, days when the exchange is closed should be ignored for the purpose of the volatility calculation.

Nil dividend was assumed in the computation of option values. That is the Black and Scholes model was used in its purest form. It would be insightful to assess the effect of dividend adjustment on the option values.

Annual average Central Bank of Kenya rates were used as the risk free rates for the years under review. Use of six-month figures may result in variation of the option values obtained.

### **5.3 Suggestions for further research**

Option pricing being a virtually untested area by Kenya academia, there is a lot of areas for further research. These include but are not limited to the following areas:

1. Analysis of the underlying characteristic/differentiating factors for the shares that have both in the money call and puts. This research suggested that this was limited to just a few stocks on the Exchange.
2. Incorporation of dividend payments (as suggested by Merton in 1973 whilst researching on the extensions of the Black and Scholes model) in the Black and Scholes model and assessment of the impact on option values and range for in the money option prices;
3. Use of daily share prices, appropriately adjusted for days when the Exchange was closed and the assessment of the impact on the computation of stock volatility. Perhaps the study could be limited to one sector of the Exchange.

4. As and when an Options Exchange is established in Kenya, a comparative study of mathematically generated exercise price ranges and the actual ranges quoted by the Exchange, and the reasons for the variations;

*Robert C. Merton, Journal of Finance, June 1973*

5. Detailed study of the Greek letters in option values.

*Robert C. Merton, M. Empirical Properties of the Black-Scholes Formula under Ideal Conditions, Journal of Finance and Quantitative Analysis, December 1980*

*Robert C. Merton, American Law: Impact on the Efficiency of the Chicago Board of Contract Exchange, Journal of Financial Economics, August 1983*

*Black Fisher, Studies of Stock Price Volatility Changes, Proceedings of the Meetings of the American Statistical Association, Business and Economic Statistics Section, Chicago, 1976*

*Black Fisher and Myron Scholes, The Pricing of Options and Corporate Equities, Journal of Political Economy (May/June 1973)*

*William R. East and Gordon, A Comparison of the Black-Scholes and Student-t Distributions in Speculating Models of Stock Prices, Journal of Business, 1974*



## 5.0 REFERENCES

- Beckers, S, *The Constant Elasticity of Variance Model and Its Implications for Option Pricing*, Journal of Finance, June 1980
- Bhattacharya, M, *Empirical Properties of the Black-Scholes Formula under Ideal Conditions*, Journal of Finance and Quantitative Analysis, December 1980
- Bhattacharya, M, *Transaction Data Tests on the Efficiency of the Chicago Board of Options Exchange*, Journal of Financial Economics, August 1983
- Black Fisher, *Studies of Stock Price Volatility Changes*, Proceedings of the Meetings of the American Statistical Association, Business and Economic Statistics Section, Chicago, 1976
- Black Fischer and Myron Scholes , *The pricing of options and corporate liabilities*, Journal of Political Economy (May/June 1973)
- Blatterg, R and N Gonedes, *A Comparison of the Stable and Student Distributions as Stochastic Models of Stock Prices*, Journal of Business, 1974

Brown C Keith and Reilly K Frank , Investment analysis and portfolio management, Sixth edition, Chapters 8, 22 and 24, The Dryden Press

Capital Markets Authority, A reform strategy paper on proposed fundamental reorganization of Kenya's capital market, March 2000

Capital Markets Authority, June 2000 Annual Report

Chicago Board Options Exchange (CBOE), Options education, equity options basics, CBOE website, [www.cboe.com](http://www.cboe.com)

Cox, J and S Ross, The Valuation of Options for Alternative Stochastic Processes, The Journal of Financial Economics, January-March 1976

Figlewski S, Margins and market Integrity: Margin Setting for Stock Index Futures and Options, Journal of Futures Markets, 1984

Galai, D, Tests of Market Efficiency on the Chicago Board of Options Exchange, Journal of Business, April 1977

Geske R, and R Roll, On Valuing American Call Options with the Black-Scholes European Formula, Journal of Finance, 1984

Gibson Rajna and Zimmerman Heinz *The benefits and risks of derivative instruments: An Economic Perspective*, December 1994

Hull John, *Options, futures and other derivatives*, 4<sup>th</sup> Edition, Prentice Hall International Editions

Iraki W N, *Prospects of a futures market in Kenya*, Unpublished MBA research paper, 1996

Macbeth J and L Merville, *An Empirical Examination of the Black-Scholes Call Option Pricing Model*, Journal of Finance, December 1979

Macbeth J and L Merville, *Tests of the Black-Scholes and Cox Call Option Valuation Models*, Journal of Finance, May 1980

Merton R, *The theory of Rational Option Pricing*, Bell Journal of Economics and Management Science, 1973

Merton R, *On the Pricing of Corporate Debt: The Risk Structure of Interest Rates*, Journal of Finance, 1974

Merton R, *Option Pricing When Underlying Stock Returns Are Discontinuous*, Journal of Financial Economics, 1976

Pandey I M , Financial Management, 8<sup>th</sup> edition, Chapter 10

Rendelman J Richard JR and Latane Henry , Standard deviations of stock price ratios implied in option prices, Journal of Finance, May 1976

Roll R, An Analytic Valuation Formula for Unprotected American Call Options on Stocks with Known Dividends, Journal of Financial Economics, November 1977

Rosenberg B, The Behavior of Random Variables with Nonstationary Variance and the Distribution of Security Prices, manuscript, University of California, Berkeley, 1973

Rubinstein, M, Nonparametric Tests of Alternative Option Pricing Models, Journal of Finance, June 1985

Samuelson P, Proof that Properly Anticipated Prices Fluctuate Randomly, Industrial Management Review, 1965

Samuelson P, Proof That Properly Discounted Present Values of Assets Vibrate Randomly, in Nagatani and Crowley,eds, Collected Scientific Papers of Paul A Samuelson, VOL IV, MIT Press, Cambridge, Mass., 1977

Sharaway H S , World Wide Options, Geocities Website

Ward C, Option pricing, 1985

Whaley R, On the valuation of American Call Options on Stocks with Known Dividends, Journal of Financial Economics, June 1981

Whaley R, Valuation of American Call Options on Dividend Paying Stocks: Empirical Tests, Journal of Financial Economics, 1982

Whaley Robert E , Stoll R Hans, Futures and options, theory and applications, 1993

**APPENDIX 1- COMPUTATION OF MONTHLY RETURNS**

## AGRICULTURAL SECTOR

1997

## COMPANY

Brooke Bond Kenya Limited

Month	Closing stock price	Price relative	Monthly return	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	149			0.0000
February	150	1.0067	0.0067	0.0000
March	135	0.9000	-0.1054	0.0111
April	124	0.9185	-0.0850	0.0072
May	124	1.0000	0.0000	0.0000
June	124	1.0000	0.0000	0.0000
July	123	0.9919	-0.0081	0.0001
August	123	1.0000	0.0000	0.0000
September	121	0.9837	-0.0164	0.0003
October	120	0.9917	-0.0083	0.0001
November	110	0.9167	-0.0870	0.0076
December	110	1.0000	0.0000	0.0000
			<b>-0.3035</b>	<b>0.0263</b>

## Eaagads Limited

January	27.25			0.0000
February	25.75	0.9450	-0.0566	0.0032
March	26	1.0097	0.0097	0.0001
April	26	1.0000	0.0000	0.0000
May	26	1.0000	0.0000	0.0000
June	26	1.0000	0.0000	0.0000
July	26	1.0000	0.0000	0.0000
August	26	1.0000	0.0000	0.0000
September	26	1.0000	0.0000	0.0000
October	43	1.6538	0.5031	0.2531
November	41.5	0.9651	-0.0355	0.0013
December	42	1.0120	0.0120	0.0001
			<b>0.4326</b>	<b>0.2578</b>

## George Williamson Kenya Ltd

January	73.5			0.0000
February	73.5	1.0000	0.0000	0.0000
March	73.5	1.0000	0.0000	0.0000
April	70.5	0.9592	-0.0417	0.0017
May	69	0.9787	-0.0215	0.0005
June	70	1.0145	0.0144	0.0002
July	72	1.0286	0.0282	0.0008
August	76.5	1.0625	0.0606	0.0037
September	129	1.6863	0.5225	0.2730
October	126	0.9767	-0.0235	0.0006
November	86	0.6825	-0.3819	0.1459
December	86	1.0000	0.0000	0.0000
			<b>0.1571</b>	<b>0.4263</b>

## Kakuzi Ltd

January	98			0.0000
February	101	1.0306	0.0302	0.0009
March	101	1.0000	0.0000	0.0000
April	101	1.0000	0.0000	0.0000
May	102	1.0099	0.0099	0.0001
June	102	1.0000	0.0000	0.0000
July	106	1.0392	0.0385	0.0015
August	130	1.2264	0.2041	0.0417
September	150	1.1538	0.1431	0.0205
October	145	0.9667	-0.0339	0.0011
November	96	0.6621	-0.4124	0.1701
December	96	1.0000	0.0000	0.0000
			<b>-0.0206</b>	<b>0.2358</b>

## Kapchorua Tea Co Ltd

January	70			0.0000
February	70	1.0000	0.0000	0.0000
March	70	1.0000	0.0000	0.0000
April	70	1.0000	0.0000	0.0000

May	70	1.0000	0.0000	0.0000
June	70	1.0000	0.0000	0.0000
July	70	1.0000	0.0000	0.0000
August	70	1.0000	0.0000	0.0000
September	70	1.0000	0.0000	0.0000
October	70	1.0000	0.0000	0.0000
November	70	1.0000	0.0000	0.0000
December	70	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.0000</b>

**Limuru Tea Co Ltd**

January	1300			0.0000
February	1300	1.0000	0.0000	0.0000
March	1300	1.0000	0.0000	0.0000
April	1300	1.0000	0.0000	0.0000
May	1300	1.0000	0.0000	0.0000
June	1000	0.7692	-0.2624	0.0688
July	845	0.8450	-0.1684	0.0284
August	850	1.0059	0.0059	0.0000
September	850	1.0000	0.0000	0.0000
October	750	0.8824	-0.1252	0.0157
November	750	1.0000	0.0000	0.0000
December	750	1.0000	0.0000	0.0000
			<b>-0.5500</b>	<b>0.1129</b>

**Rea Vipingo Ltd**

January	11			0.0000
February	10.3	0.9364	-0.0658	0.0043
March	9	0.8738	-0.1349	0.0182
April	8.4	0.9333	-0.0690	0.0048
May	9	1.0714	0.0690	0.0048
June	9.3	1.0333	0.0328	0.0011
July	8.3	0.8925	-0.1138	0.0129
August	8.65	1.0422	0.0413	0.0017
September	9.05	1.0462	0.0452	0.0020
October	8.1	0.8950	-0.1109	0.0123
November	8.75	1.0802	0.0772	0.0060
December	9	1.0286	0.0282	0.0008
			<b>-0.2007</b>	<b>0.0689</b>

**Sasini Tea & Coffee Ltd**

January	60			0.0000
February	82	1.3667	0.3124	0.0976
March	75	0.9146	-0.0892	0.0080
April	76	1.0133	0.0132	0.0002
May	75.5	0.9934	-0.0066	0.0000
June	85	1.1258	0.1185	0.0140
July	80	0.9412	-0.0606	0.0037
August	87	1.0875	0.0839	0.0070
September	98	1.1264	0.1191	0.0142
October	94	0.9592	-0.0417	0.0017
November	94	1.0000	0.0000	0.0000
December	94	1.0000	0.0000	0.0000
			<b>0.4490</b>	<b>0.1464</b>



## COMPANY

A. Baumann & Co Ltd	Closing stock price	Price relative	Monthly return	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	33			0.0000
February	42	1.2727	0.2412	0.0582
March	40.5	0.9643	-0.0364	0.0013
April	40.5	1.0000	0.0000	0.0000
May	26	0.6420	-0.4432	0.1964
June	26	1.0000	0.0000	0.0000
July	25	0.9615	-0.0392	0.0015
August	20	0.8000	-0.2231	0.0498
September	19	0.9500	-0.0513	0.0026
October	18.4	0.9684	-0.0321	0.0010
November	15.55	0.8451	-0.1683	0.0283
December	16	1.0289	0.0285	0.0008
			<b>-0.7239</b>	<b>0.3400</b>
<b>C M C Holdings Ltd</b>				
January	70			0.0000
February	80	1.1429	0.1335	0.0178
March	81	1.0125	0.0124	0.0002
April	70	0.8642	-0.1460	0.0213
May	72.5	1.0357	0.0351	0.0012
June	82.5	1.1379	0.1292	0.0167
July	90	1.0909	0.0870	0.0076
August	80	0.8889	-0.1178	0.0139
September	80	1.0000	0.0000	0.0000
October	68	0.8500	-0.1625	0.0264
November	80	1.1765	0.1625	0.0264
December	80	1.0000	0.0000	0.0000
			<b>0.1335</b>	<b>0.1315</b>
<b>Car &amp; General (K) Ltd</b>				
January	20			0.0000
February	20	1.0000	0.0000	0.0000
March	20	1.0000	0.0000	0.0000
April	20	1.0000	0.0000	0.0000
May	16.1	0.8050	-0.2169	0.0471
June	17	1.0559	0.0544	0.0030
July	16.25	0.9559	-0.0451	0.0020
August	16	0.9846	-0.0155	0.0002
September	16	1.0000	0.0000	0.0000
October	16	1.0000	0.0000	0.0000
November	16.1	1.0063	0.0062	0.0000
December	16	0.9938	-0.0062	0.0000
			<b>-0.2231</b>	<b>0.0524</b>
<b>Express Kenya Ltd</b>				
January	76			0.0000
February	83.5	1.0987	0.0941	0.0089
March	82	0.9820	-0.0181	0.0003
April	75	0.9146	-0.0892	0.0080
May	75	1.0000	0.0000	0.0000
June	71	0.9467	-0.0548	0.0030
July	68	0.9577	-0.0432	0.0019
August	65	0.9559	-0.0451	0.0020
September	58	0.8923	-0.1139	0.0130
October	58.5	1.0086	0.0086	0.0001
November	59	1.0085	0.0085	0.0001
December	59	1.0000	0.0000	0.0000
			<b>-0.2532</b>	<b>0.0372</b>
<b>Kenya Airways Ltd</b>				

January	8.5			0.0000
February	8	0.9412	-0.0606	0.0037
March	8.35	1.0438	0.0428	0.0018
April	8.4	1.0060	0.0060	0.0000
May	8.2	0.9762	-0.0241	0.0006
June	8.2	1.0000	0.0000	0.0000
July	8	0.9756	-0.0247	0.0006
August	8	1.0000	0.0000	0.0000
September	7.6	0.9500	-0.0513	0.0026
October	7.25	0.9539	-0.0471	0.0022
November	7.5	1.0345	0.0339	0.0011
December	8	1.0667	0.0645	0.0042
			<b>-0.0606</b>	<b>0.0169</b>

#### Lonhro Motors (EA) Ltd

January	128			0.0000
February	125	0.9766	-0.0237	0.0006
March	200	1.6000	0.4700	0.2209
April	200	1.0000	0.0000	0.0000
May	72.5	0.3625	-1.0147	1.0297
June	82.5	1.1379	0.1292	0.0167
July	60	0.7273	-0.3185	0.1014
August	50	0.8333	-0.1823	0.0332
September	47	0.9400	-0.0619	0.0038
October	39	0.8298	-0.1866	0.0348
November	39	1.0000	0.0000	0.0000
December	39	1.0000	0.0000	0.0000
			<b>-1.1885</b>	<b>1.4411</b>

#### Marshalls (EA) Ltd

January	47.5			0.0000
February	47.75	1.0053	0.0052	0.0000
March	48	1.0052	0.0052	0.0000
April	50	1.0417	0.0408	0.0017
May	66	1.3200	0.2776	0.0771
June	77	1.1667	0.1542	0.0238
July	88	1.1429	0.1335	0.0178
August	86	0.9773	-0.0230	0.0005
September	32	0.3721	-0.9886	0.9774
October	47.25	1.4766	0.3897	0.1519
November	41	0.8677	-0.1419	0.0201
December	41	1.0000	0.0000	0.0000
			<b>-0.1472</b>	<b>1.2703</b>

#### Nation Media Group Ltd

January	113			0.0000
February	109	0.9646	-0.0360	0.0013
March	111	1.0183	0.0182	0.0003
April	160	1.4414	0.3656	0.1337
May	168	1.0500	0.0488	0.0024
June	116	0.6905	-0.3704	0.1372
July	112	0.9655	-0.0351	0.0012
August	122	1.0893	0.0855	0.0073
September	126	1.0328	0.0323	0.0010
October	127	1.0079	0.0079	0.0001
November	131	1.0315	0.0310	0.0010
December	131	1.0000	0.0000	0.0000
			<b>0.1478</b>	<b>0.2855</b>

#### Pearl Drycleaners Ltd

January	10			0.0000
February	10	1.0000	0.0000	0.0000
March	10	1.0000	0.0000	0.0000
April	10.25	1.0250	0.0247	0.0006

May	10.25	1.0000	0.0000	0.0000
June	10.25	1.0000	0.0000	0.0000
July	9	0.8780	-0.1301	0.0169
August	9.2	1.0222	0.0220	0.0005
September	10	1.0870	0.0834	0.0070
October	10	1.0000	0.0000	0.0000
November	10.5	1.0500	0.0488	0.0024
December	11	1.0476	0.0465	0.0022
			<b>0.0953</b>	<b>0.0295</b>

#### Standard Newspapers Ltd

January	9.05			0.0000
February	14.55	1.6077	0.4748	0.2255
March	14.25	0.9794	-0.0208	0.0004
April	13.25	0.9298	-0.0728	0.0053
May	14.5	1.0943	0.0902	0.0081
June	25	1.7241	0.5447	0.2967
July	32.5	1.3000	0.2624	0.0688
August	41.25	1.2692	0.2384	0.0568
September	50	1.2121	0.1924	0.0370
October	48	0.9600	-0.0408	0.0017
November	53	1.1042	0.0991	0.0098
December	53	1.0000	0.0000	0.0000
			<b>1.7675</b>	<b>0.7102</b>

#### Tourism Promotion Services (Serena)

January	Not listed	0.0000		0.0000
February	Not listed	0.0000		0.0000
March	Not listed	0.0000		0.0000
April	Not listed	0.0000		0.0000
May	16.5	0.0000		0.0000
June	17.25	1.0455	0.0445	0.0020
July	17.05	0.9884	-0.0117	0.0001
August	15	0.8798	-0.1281	0.0164
September	16.5	1.1000	0.0953	0.0091
October	13.8	0.8364	-0.1787	0.0319
November	14	1.0145	0.0144	0.0002
December	14	1.0000	0.0000	0.0000
			<b>-0.1643</b>	<b>0.0597</b>

#### Uchumi Supermarkets Ltd

January	39.75			0.0000
February	41.5	1.0440	0.0431	0.0019
March	35.25	0.8494	-0.1632	0.0266
April	39	1.1064	0.1011	0.0102
May	40.25	1.0321	0.0315	0.0010
June	40	0.9938	-0.0062	0.0000
July	39	0.9750	-0.0253	0.0006
August	40	1.0256	0.0253	0.0006
September	50	1.2500	0.2231	0.0498
October	37	0.7400	-0.3011	0.0907
November	39	1.0541	0.0526	0.0028
December	39	1.0000	0.0000	0.0000
			<b>-0.0190</b>	<b>0.1843</b>

## FINANCE AND INVESTMENT SECTOR

1997

## COMPANY

Barclays Bank Ltd	Closing stock price	Price relative	Monthly return	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	115			0.0000
February	114	0.9913	-0.0087	0.0001
March	102	0.8947	-0.1112	0.0124
April	108	1.0588	0.0572	0.0033
May	115	1.0648	0.0628	0.0039
June	110	0.9565	-0.0445	0.0020
July	109	0.9909	-0.0091	0.0001
August	108	0.9908	-0.0092	0.0001
September	107	0.9907	-0.0093	0.0001
October	108	1.0093	0.0093	0.0001
November	115	1.0648	0.0628	0.0039
December	115	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.0259</b>
<b>City Trust Ltd</b>				
January	33			0.0000
February	36	1.0909	0.0870	0.0076
March	33	0.9167	-0.0870	0.0076
April	34	1.0303	0.0299	0.0009
May	35	1.0294	0.0290	0.0008
June	35.75	1.0214	0.0212	0.0004
July	35	0.9790	-0.0212	0.0004
August	35	1.0000	0.0000	0.0000
September	34	0.9714	-0.0290	0.0008
October	34	1.0000	0.0000	0.0000
November	34	1.0000	0.0000	0.0000
December	34	1.0000	0.0000	0.0000
			<b>0.0299</b>	<b>0.0186</b>
<b>CFC Bank Ltd</b>				
January	22.75			0.0000
February	23	1.0110	0.0109	0.0001
March	21	0.9130	-0.0910	0.0083
April	19.5	0.9286	-0.0741	0.0055
May	20	1.0256	0.0253	0.0006
June	26	1.3000	0.2624	0.0688
July	22	0.8462	-0.1671	0.0279
August	20	0.9091	-0.0953	0.0091
September	20	1.0000	0.0000	0.0000
October	20	1.0000	0.0000	0.0000
November	17.6	0.8800	-0.1278	0.0163
December	18	1.0227	0.0225	0.0005
			<b>-0.2342</b>	<b>0.1372</b>
<b>Diamond Trust Bank Kenya Ltd</b>				
January	36.5			0.0000
February	37	1.0137	0.0136	0.0002
March	30.25	0.8176	-0.2014	0.0406
April	30	0.9917	-0.0083	0.0001
May	31.25	1.0417	0.0408	0.0017
June	30.25	0.9680	-0.0325	0.0011
July	29.75	0.9835	-0.0167	0.0003
August	26	0.8739	-0.1347	0.0182
September	25.5	0.9808	-0.0194	0.0004
October	22.5	0.8824	-0.1252	0.0157
November	21.75	0.9667	-0.0339	0.0011
December	22	1.0115	0.0114	0.0001

**-0.5063    0.0793**

**Housing Finance Co (K) Ltd**

January	24			0.0000
February	24	1.0000	0.0000	0.0000
March	24	1.0000	0.0000	0.0000
April	24	1.0000	0.0000	0.0000
May	24	1.0000	0.0000	0.0000
June	23.5	0.9792	-0.0211	0.0004
July	23.5	1.0000	0.0000	0.0000
August	20.5	0.8723	-0.1366	0.0187
September	20	0.9756	-0.0247	0.0006
October	19	0.9500	-0.0513	0.0026
November	19.05	1.0026	0.0026	0.0000
December	19	0.9974	-0.0026	0.0000
			<b>-0.2336</b>	<b>0.0224</b>

**ICDC Investments Co Ltd**

January	40			0.0000
February	43.5	1.0875	0.0839	0.0070
March	46.25	1.0632	0.0613	0.0038
April	40	0.8649	-0.1452	0.0211
May	45	1.1250	0.1178	0.0139
June	50	1.1111	0.1054	0.0111
July	60	1.2000	0.1823	0.0332
August	66	1.1000	0.0953	0.0091
September	34.25	0.5189	-0.6560	0.4303
October	34.25	1.0000	0.0000	0.0000
November	34.5	1.0073	0.0073	0.0001
December	35	1.0145	0.0144	0.0002
			<b>-0.1335</b>	<b>0.5297</b>

**Jubilee Insurance Co Ltd**

January	38.5			0.0000
February	44	1.1429	0.1335	0.0178
March	41.25	0.9375	-0.0645	0.0042
April	39	0.9455	-0.0561	0.0031
May	35.5	0.9103	-0.0940	0.0088
June	41.5	1.1690	0.1562	0.0244
July	38	0.9157	-0.0881	0.0078
August	38	1.0000	0.0000	0.0000
September	37	0.9737	-0.0267	0.0007
October	35	0.9459	-0.0556	0.0031
November	36.75	1.0500	0.0488	0.0024
December	37	1.0068	0.0068	0.0000
			<b>-0.0397</b>	<b>0.0724</b>

**Kenya Commercial Bank Ltd**

January	90			0.0000
February	98.4	1.0933	0.0892	0.0080
March	94	0.9553	-0.0457	0.0021
April	86	0.9149	-0.0889	0.0079
May	96	1.1163	0.1100	0.0121
June	115	1.1979	0.1806	0.0326
July	105	0.9130	-0.0910	0.0083
August	98	0.9333	-0.0690	0.0048
September	98	1.0000	0.0000	0.0000
October	89	0.9082	-0.0963	0.0093
November	77	0.8652	-0.1448	0.0210
December	77	1.0000	0.0000	0.0000
			<b>-0.1560</b>	<b>0.1060</b>

**National Bank of Kenya Ltd**

January	16			0.0000
February	15.7	0.9813	-0.0189	0.0004
March	15.7	1.0000	0.0000	0.0000
April	15.65	0.9968	-0.0032	0.0000
May	16	1.0224	0.0221	0.0005
June	15.2	0.9500	-0.0513	0.0026
July	16	1.0526	0.0513	0.0026
August	13.6	0.8500	-0.1625	0.0264
September	13.1	0.9632	-0.0375	0.0014
October	15.1	1.1527	0.1421	0.0202
November	12.5	0.8278	-0.1890	0.0357
December	13	1.0400	0.0392	0.0015
			<b>-0.2076</b>	<b>0.0914</b>

**National Industrial Credit Ltd**

January	50			0.0000
February	47	0.9400	-0.0619	0.0038
March	48.75	1.0372	0.0366	0.0013
April	49.25	1.0103	0.0102	0.0001
May	55	1.1168	0.1104	0.0122
June	60	1.0909	0.0870	0.0076
July	61	1.0167	0.0165	0.0003
August	52	0.8525	-0.1596	0.0255
September	50	0.9615	-0.0392	0.0015
October	49	0.9800	-0.0202	0.0004
November	50	1.0204	0.0202	0.0004
December	50	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.0531</b>

**Pan Africa Insurance Ltd**

January	51			0.0000
February	51.5	1.0098	0.0098	0.0001
March	53	1.0291	0.0287	0.0008
April	50	0.9434	-0.0583	0.0034
May	55	1.1000	0.0953	0.0091
June	63	1.1455	0.1358	0.0184
July	57	0.9048	-0.1001	0.0100
August	50	0.8772	-0.1310	0.0172
September	40	0.8000	-0.2231	0.0498
October	42	1.0500	0.0488	0.0024
November	41.75	0.9940	-0.0060	0.0000
December	42	1.0060	0.0060	0.0000
			<b>-0.1942</b>	<b>0.1113</b>

**Standard Chartered Bank Ltd**

January	54			0.0000
February	51	0.9444	-0.0572	0.0033
March	46.75	0.9167	-0.0870	0.0076
April	45.25	0.9679	-0.0326	0.0011
May	46.25	1.0221	0.0219	0.0005
June	47	1.0162	0.0161	0.0003
July	47	1.0000	0.0000	0.0000
August	47	1.0000	0.0000	0.0000
September	45	0.9574	-0.0435	0.0019
October	44	0.9778	-0.0225	0.0005
November	46	1.0455	0.0445	0.0020
December	46	1.0000	0.0000	0.0000
			<b>-0.1603</b>	<b>0.0170</b>

## INDUSTRIAL AND ALLIED SECTOR

1997

## COMPANY

Ahi River Mining Ltd	Closing stock price Price relative Monthly return			
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	Not listed on NSE			
February	Not listed on NSE			
March	Not listed on NSE			
April	Not listed on NSE			
May	Not listed on NSE			
June	Not listed on NSE			
July	Not listed on NSE			
August	11.05		0.0000	
September	11.5	1.0407	0.0399	0.0016
October	9	0.7826	-0.2451	0.0601
November	9	1.0000	0.0000	0.0000
December	9	1.0000	0.0000	0.0000
			<b>-0.2052</b>	<b>0.0617</b>
<b>Bamburi Cement Ltd</b>				
January	40		0.0000	0.0000
February	49.75	1.2438	-0.2181	0.0476
March	40	0.8040	-0.2181	0.0476
April	41.5	1.0375	0.0368	0.0014
May	39.75	0.9578	-0.0431	0.0019
June	37.5	0.9434	-0.0583	0.0034
July	40.25	1.0733	0.0708	0.0050
August	45	1.1180	0.1116	0.0124
September	42	0.9333	-0.0690	0.0048
October	37	0.8810	-0.1268	0.0161
November	31.25	0.8446	-0.1689	0.0285
December	36	1.1520	0.1415	0.0200
			<b>-0.1054</b>	<b>0.1886</b>
<b>British American Tobacco Ltd</b>				
January	83		0.0000	0.0000
February	62	0.7470	-0.2917	0.0851
March	62	1.0000	0.0000	0.0000
April	61	0.9839	-0.0163	0.0003
May	63	1.0328	0.0323	0.0010
June	61	0.9683	-0.0323	0.0010
July	61	1.0000	0.0000	0.0000
August	56	0.9180	-0.0855	0.0073
September	51	0.9107	-0.0935	0.0087
October	51	1.0000	0.0000	0.0000
November	50	0.9804	-0.0198	0.0004
December	50	1.0000	0.0000	0.0000
			<b>-0.5068</b>	<b>0.1039</b>
<b>B O C Gases Ltd</b>				
January	70		0.0000	0.0000
February	74	1.0571	0.0556	0.0031
March	40	0.5405	-0.6152	0.3785
April	89	2.2250	0.7998	0.6396
May	69	0.7753	-0.2545	0.0648
June	76	1.1014	0.0966	0.0093
July	75	0.9868	-0.0132	0.0002
August	70	0.9333	-0.0690	0.0048
September	71	1.0143	0.0142	0.0002
October	70	0.9859	-0.0142	0.0002
November	70	1.0000	0.0000	0.0000
December	66	0.9429	-0.0588	0.0035
			<b>-0.0588</b>	<b>1.1041</b>
<b>Carbacid Investments Ltd</b>				

January	82		0.0000	0.0000
February	86	1.0488	0.0476	0.0023
March	85.5	0.9942	-0.0058	0.0000
April	87	1.0175	0.0174	0.0003
May	83.5	0.9598	-0.0411	0.0017
June	84	1.0060	0.0060	0.0000
July	77	0.9167	-0.0870	0.0076
August	77	1.0000	0.0000	0.0000
September	75	0.9740	-0.0263	0.0007
October	69	0.9200	-0.0834	0.0070
November	61.5	0.8913	-0.1151	0.0132
December	66	1.0732	0.0706	0.0050
			<b>-0.2171</b>	<b>0.0378</b>

#### Crown Berger Ltd

January	12.5		0.0000	0.0000
February	9.9	0.7920	-0.2332	0.0544
March	10.4	1.0505	0.0493	0.0024
April	11	1.0577	0.0561	0.0031
May	11	1.0000	0.0000	0.0000
June	10.5	0.9545	-0.0465	0.0022
July	11	1.0476	0.0465	0.0022
August	11.75	1.0682	0.0660	0.0044
September	11.5	0.9787	-0.0215	0.0005
October	9.05	0.7870	-0.2396	0.0574
November	9.6	1.0608	0.0590	0.0035
December	10	1.0417	0.0408	0.0017
			<b>-0.2231</b>	<b>0.1316</b>

#### Dunlop Kenya Ltd

January	275		0.0000	0.0000
February	300	1.0909	0.0870	0.0076
March	295	0.9833	-0.0168	0.0003
April	285	0.9661	-0.0345	0.0012
May	285	1.0000	0.0000	0.0000
June	270	0.9474	-0.0541	0.0029
July	270	1.0000	0.0000	0.0000
August	270	1.0000	0.0000	0.0000
September	455	1.6852	0.5219	0.2724
October	455	1.0000	0.0000	0.0000
November	104	0.2286	-1.4759	2.1783
December	100	0.9615	-0.0392	0.0015
			<b>-1.0116</b>	<b>2.4642</b>

#### EA Cables Ltd

January	37		0.0000	0.0000
February	36	0.9730	-0.0274	0.0008
March	29.5	0.8194	-0.1991	0.0397
April	30.5	1.0339	0.0333	0.0011
May	32.5	1.0656	0.0635	0.0040
June	33	1.0154	0.0153	0.0002
July	32	0.9697	-0.0308	0.0009
August	32	1.0000	0.0000	0.0000
September	32	1.0000	0.0000	0.0000
October	32	1.0000	0.0000	0.0000
November	27.25	0.8516	-0.1607	0.0258
December	29	1.0642	0.0622	0.0039
			<b>-0.2436</b>	<b>0.0764</b>

#### EA Packaging Ltd

January	70		0.0000	0.0000
February	70	1.0000	0.0000	0.0000
March	67.5	0.9643	-0.0364	0.0013
April	50.5	0.7481	-0.2902	0.0842



May	67	1.3267	0.2827	0.0799
June	67	1.0000	0.0000	0.0000
July	67	1.0000	0.0000	0.0000
August	60	0.8955	-0.1103	0.0122
September	57.5	0.9583	-0.0426	0.0018
October	63	1.0957	0.0913	0.0083
November	60.5	0.9603	-0.0405	0.0016
December	49	0.8099	-0.2108	0.0444
			<b>-0.3567</b>	<b>0.2339</b>

#### EA Portland Cement Ltd

January	24.5		0.0000	0.0000
February	30	1.2245	0.2025	0.0410
March	36.5	1.2167	0.1961	0.0385
April	39	1.0685	0.0662	0.0044
May	46.5	1.1923	0.1759	0.0309
June	44	0.9462	-0.0553	0.0031
July	44	1.0000	0.0000	0.0000
August	42.25	0.9602	-0.0406	0.0016
September	35	0.8284	-0.1883	0.0354
October	35	1.0000	0.0000	0.0000
November	25.5	0.7286	-0.3167	0.1003
December	20	0.7843	-0.2429	0.0590
			<b>-0.2029</b>	<b>0.3142</b>

#### Firestone East Africa Ltd

January	30		0.0000	0.0000
February	31.25	1.0417	0.0408	0.0017
March	26	0.8320	-0.1839	0.0338
April	27	1.0385	0.0377	0.0014
May	28	1.0370	0.0364	0.0013
June	28	1.0000	0.0000	0.0000
July	30.5	1.0893	0.0855	0.0073
August	25.5	0.8361	-0.1790	0.0321
September	25.75	1.0098	0.0098	0.0001
October	21.5	0.8350	-0.1804	0.0325
November	22.5	1.0465	0.0455	0.0021
December	24	1.0667	0.0645	0.0042
			<b>-0.2231</b>	<b>0.1165</b>

#### East Africa Breweries Ltd

January	52.5		0.0000	0.0000
February	62	1.1810	0.1663	0.0277
March	62	1.0000	0.0000	0.0000
April	58.5	0.9435	-0.0581	0.0034
May	58.5	1.0000	0.0000	0.0000
June	60	1.0256	0.0253	0.0006
July	57	0.9500	-0.0513	0.0026
August	50.5	0.8860	-0.1211	0.0147
September	47.25	0.9356	-0.0665	0.0044
October	47	0.9947	-0.0053	0.0000
November	50.5	1.0745	0.0718	0.0052
December	49	0.9703	-0.0302	0.0009
			<b>-0.0690</b>	<b>0.0595</b>

#### Kenya National Mills Ltd

January	34.75		0.0000	0.0000
February	36	1.0360	0.0353	0.0012
March	36	1.0000	0.0000	0.0000
April	35	0.9722	-0.0282	0.0008
May	35.25	1.0071	0.0071	0.0001
June	47	1.3333	0.2877	0.0828
July	41.5	0.8830	-0.1245	0.0155
August	40	0.9639	-0.0368	0.0014
September	41.5	1.0375	0.0368	0.0014

October	40	0.9639	-0.0368	0.0014
November	38	0.9500	-0.0513	0.0026
December	37	0.9737	-0.0267	0.0007
			<b>0.0627</b>	<b>0.1078</b>

#### Kenya Oil Co Ltd

January	71		0.0000	0.0000
February	70	0.9859	-0.0142	0.0002
March	68	0.9714	-0.0290	0.0008
April	65.5	0.9632	-0.0375	0.0014
May	61.5	0.9389	-0.0630	0.0040
June	70	1.1382	0.1295	0.0168
July	67.5	0.9643	-0.0364	0.0013
August	63	0.9333	-0.0690	0.0048
September	58.5	0.9286	-0.0741	0.0055
October	51	0.8718	-0.1372	0.0188
November	48.5	0.9510	-0.0503	0.0025
December	48	0.9897	-0.0104	0.0001
			<b>-0.3915</b>	<b>0.0562</b>

#### Kenya Power & Lighting Ltd

January	90		0.0000	0.0000
February	120	1.3333	0.2877	0.0828
March	113	0.9417	-0.0601	0.0036
April	124	1.0973	0.0929	0.0086
May	170	1.3710	0.3155	0.0996
June	171	1.0059	0.0059	0.0000
July	175	1.0234	0.0231	0.0005
August	168	0.9600	-0.0408	0.0017
September	175	1.0417	0.0408	0.0017
October	189	1.0800	0.0770	0.0059
November	160	0.8466	-0.1666	0.0277
December	180	1.1250	0.1178	0.0139
			<b>0.6931</b>	<b>0.2460</b>

#### Total Kenya Ltd

January	94		0.0000	0.0000
February	94	1.0000	0.0000	0.0000
March	62	0.6596	-0.4162	0.1732
April	64	1.0323	0.0317	0.0010
May	71.5	1.1172	0.1108	0.0123
June	84.5	1.1818	0.1671	0.0279
July	63	0.7456	-0.2936	0.0862
August	58	0.9206	-0.0827	0.0068
September	57	0.9828	-0.0174	0.0003
October	51	0.8947	-0.1112	0.0124
November	52	1.0196	0.0194	0.0004
December	53	1.0192	0.0190	0.0004
			<b>-0.5730</b>	<b>0.3208</b>

#### Unga Group Ltd

January	120		0.0000	0.0000
February	113	0.9417	-0.0601	0.0036
March	111	0.9823	-0.0179	0.0003
April	113	1.0180	0.0179	0.0003
May	122	1.0796	0.0766	0.0059
June	150	1.2295	0.2066	0.0427
July	150	1.0000	0.0000	0.0000
August	160	1.0667	0.0645	0.0042
September	164	1.0250	0.0247	0.0006
October	159	0.9695	-0.0310	0.0010
November	120	0.7547	-0.2814	0.0792
December	120	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.1377</b>

## AGRICULTURAL SECTOR

1998

## COMPANY

Brooke Bond Kenya Limited	Closing stock price	Price relative	Monthly return	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	130.00			0.0000
February	123.20	0.9477	-0.0537	0.0029
March	120.00	0.9740	-0.0263	0.0007
April	117.10	0.9758	-0.0245	0.0006
May	120.20	1.0265	0.0261	0.0007
June	131.70	1.0957	0.0914	0.0083
July	143.20	1.0873	0.0837	0.0070
August	149.60	1.0447	0.0437	0.0019
September	148.00	0.9893	-0.0108	0.0001
October	140.00	0.9459	-0.0556	0.0031
November	125.20	0.8943	-0.1117	0.0125
December	139.60	1.1150	0.1089	0.0119
			<b>0.0712</b>	<b>0.0497</b>
<b>Eugads Limited</b>				
January	39.90			0.0000
February	37.00	0.9273	-0.0755	0.0057
March	37.00	1.0000	0.0000	0.0000
April	37.00	1.0000	0.0000	0.0000
May	37.00	1.0000	0.0000	0.0000
June	37.00	1.0000	0.0000	0.0000
July	37.00	1.0000	0.0000	0.0000
August	37.00	1.0000	0.0000	0.0000
September	47.80	1.2919	0.2561	0.0656
October	43.20	0.9038	-0.1012	0.0102
November	43.20	1.0000	0.0000	0.0000
December	43.20	1.0000	0.0000	0.0000
			<b>0.0795</b>	<b>0.0815</b>
<b>George Williamson Kenya Ltd</b>				
January	110.00			0.0000
February	121.70	1.1064	0.1011	0.0102
March	136.00	1.1175	0.1111	0.0123
April	151.80	1.1162	0.1099	0.0121
May	155.10	1.0217	0.0215	0.0005
June	141.00	0.9091	-0.0953	0.0091
July	130.10	0.9227	-0.0805	0.0065
August	130.20	1.0008	0.0008	0.0000
September	132.00	1.0138	0.0137	0.0002
October	132.10	1.0008	0.0008	0.0000
November	136.00	1.0295	0.0291	0.0008
December	142.00	1.0441	0.0432	0.0019
			<b>0.2553</b>	<b>0.0536</b>
<b>Kakuzi Ltd</b>				
January	111.00			0.0000
February	129.00	1.1622	0.1503	0.0226
March	130.20	1.0093	0.0093	0.0001
April	120.00	0.9217	-0.0816	0.0067
May	120.00	1.0000	0.0000	0.0000
June	141.90	1.1825	0.1676	0.0281
July	139.90	0.9859	-0.0142	0.0002
August	150.00	1.0722	0.0697	0.0049
September	140.00	0.9333	-0.0690	0.0048
October	139.80	0.9986	-0.0014	0.0000
November	136.30	0.9750	-0.0254	0.0006
December	140.00	1.0271	0.0268	0.0007
			<b>0.2321</b>	<b>0.0686</b>
<b>Kapchorua Tea Co Ltd</b>				
January	70.00			0.0000
February	75.50	1.0786	0.0756	0.0057
March	75.50	1.0000	0.0000	0.0000
April	75.50	1.0000	0.0000	0.0000
May	75.50	1.0000	0.0000	0.0000
June	75.50	1.0000	0.0000	0.0000
July	94.00	1.2450	0.2192	0.0480
August	94.00	1.0000	0.0000	0.0000
September	94.00	1.0000	0.0000	0.0000
October	94.00	1.0000	0.0000	0.0000
November	95.00	1.0106	0.0106	0.0001
December	95.00	1.0000	0.0000	0.0000
			<b>0.3054</b>	<b>0.0539</b>
<b>Limuru Tea Co Ltd</b>				
January	755.00			0.0000
February	755.00	1.0000	0.0000	0.0000
March	751.70	0.9956	-0.0044	0.0000
April	755.00	1.0044	0.0044	0.0000
May	755.00	1.0000	0.0000	0.0000

June	755.00	1.0000	0.0000	0.0000
July	749.00	0.9921	-0.0080	0.0001
August	749.00	1.0000	0.0000	0.0000
September	760.00	1.0147	0.0146	0.0002
October	760.00	1.0000	0.0000	0.0000
November	760.00	1.0000	0.0000	0.0000
December	760.00	1.0000	0.0000	0.0000
			<b>0.0066</b>	<b>0.0003</b>

**Rea Vipingo Ltd**

January	7.50			0.0000
February	7.90	1.0533	0.0520	0.0027
March	7.10	0.8987	-0.1068	0.0114
April	7.00	0.9859	-0.0142	0.0002
May	7.00	1.0000	0.0000	0.0000
June	6.40	0.9143	-0.0896	0.0080
July	6.30	0.9844	-0.0157	0.0002
August	6.30	1.0000	0.0000	0.0000
September	6.40	1.0159	0.0157	0.0002
October	6.00	0.9375	-0.0645	0.0042
November	6.00	1.0000	0.0000	0.0000
December	6.00	1.0000	0.0000	0.0000
			<b>-0.2231</b>	<b>0.0270</b>

**Sasini Tea & Coffee Ltd**

January	61.70			0.0000
February	80.40	1.3031	0.2647	0.0701
March	89.60	1.1144	0.1083	0.0117
April	70.20	0.7835	-0.2440	0.0595
May	76.00	1.0826	0.0794	0.0063
June	75.10	0.9882	-0.0119	0.0001
July	76.70	1.0213	0.0211	0.0004
August	75.00	0.9778	-0.0224	0.0005
September	77.90	1.0387	0.0379	0.0014
October	75.00	0.9628	-0.0379	0.0014
November	64.50	0.8600	-0.1508	0.0227
December	69.80	1.0822	0.0790	0.0062
			<b>0.1234</b>	<b>0.1806</b>

COMMERCIAL AND SERVICES SECTOR

1998

COMPANY

A Baumann & Co Ltd	Closing stock price	Price relative	Monthly return	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	15.60			0.0000
February	15.70	1.0064	0.0064	0.0000
March	16.00	1.0191	0.0189	0.0004
April	16.00	1.0000	0.0000	0.0000
May	16.30	1.0188	0.0186	0.0003
June	15.50	0.9509	-0.0503	0.0025
July	15.50	1.0000	0.0000	0.0000
August	15.50	1.0000	0.0000	0.0000
September	15.50	1.0000	0.0000	0.0000
October	17.00	1.0968	0.0924	0.0085
November	17.00	1.0000	0.0000	0.0000
December	16.90	0.9941	-0.0059	0.0000
			<b>0.0800</b>	<b>0.0118</b>
<b>CNC Holdings Ltd</b>				
January	58.70			0.0000
February	49.00	0.8348	-0.1806	0.0326
March	44.60	0.9102	-0.0941	0.0089
April	35.20	0.7892	-0.2367	0.0560
May	34.90	0.9915	-0.0086	0.0001
June	35.00	1.0029	0.0029	0.0000
July	35.30	1.0086	0.0085	0.0001
August	35.40	1.0028	0.0028	0.0000
September	36.00	1.0169	0.0168	0.0003
October	35.50	0.9861	-0.0140	0.0002
November	35.20	0.9915	-0.0085	0.0001
December	33.00	0.9375	-0.0645	0.0042
			<b>-0.5759</b>	<b>0.1024</b>
<b>Car &amp; General (K) Ltd</b>				
January	20.30			0.0000
February	20.00	0.9852	-0.0149	0.0002
March	13.20	0.6600	-0.4155	0.1727
April	13.00	0.9848	-0.0153	0.0002
May	11.80	0.9077	-0.0968	0.0094
June	11.10	0.9407	-0.0612	0.0037
July	12.00	1.0811	0.0780	0.0061
August	12.00	1.0000	0.0000	0.0000
September	12.00	1.0000	0.0000	0.0000
October	12.00	1.0000	0.0000	0.0000
November	12.00	1.0000	0.0000	0.0000
December	12.00	1.0000	0.0000	0.0000
			<b>-0.5257</b>	<b>0.1923</b>
<b>Express Kenya Ltd</b>				
January	72.50			0.0000
February	55.00	0.7586	-0.2763	0.0763
March	50.30	0.9145	-0.0893	0.0080
April	45.80	0.9105	-0.0937	0.0088
May	36.00	0.7860	-0.2408	0.0580
June	30.00	0.8333	-0.1823	0.0332
July	30.00	1.0000	0.0000	0.0000
August	30.50	1.0167	0.0165	0.0003
September	30.00	0.9836	-0.0165	0.0003
October	31.30	1.0433	0.0424	0.0018
November	30.30	0.9681	-0.0325	0.0011
December	28.60	0.9439	-0.0577	0.0033
			<b>-0.9302</b>	<b>0.1910</b>
<b>Kenya Airways Ltd</b>				
January	7.50			0.0000
February	7.60	1.0133	0.0132	0.0002
March	8.00	1.0526	0.0513	0.0026
April	7.10	0.8875	-0.1193	0.0142
May	7.00	0.9859	-0.0142	0.0002
June	7.00	1.0000	0.0000	0.0000
July	7.90	1.1286	0.1210	0.0146
August	7.00	0.8861	-0.1210	0.0146
September	7.10	1.0143	0.0142	0.0002
October	7.30	1.0282	0.0278	0.0008
November	7.20	0.9863	-0.0138	0.0002
December	8.00	1.1111	0.1054	0.0111
			<b>0.0645</b>	<b>0.0588</b>
<b>Lonrho Motors (EA) Ltd</b>				
January	41.90			0.0000
February	39.80	0.9499	-0.0514	0.0026
March	35.20	0.8844	-0.1228	0.0151
April	35.10	0.9972	-0.0028	0.0000
May	28.20	0.8034	-0.2189	0.0479

June	26.30	0.9326	-0.0698	0.0049
July	26.90	1.0228	0.0226	0.0005
August	27.00	1.0037	0.0037	0.0000
September	25.60	0.9481	-0.0532	0.0028
October	22.30	0.8711	-0.1380	0.0190
November	21.80	0.9776	-0.0227	0.0005
December	22.00	1.0092	0.0091	0.0001
			<b>-0.6442</b>	<b>0.0935</b>

**Marshalls (EA) Ltd**

January	29.00			0.0000
February	28.00	0.9655	-0.0351	0.0012
March	28.00	1.0000	0.0000	0.0000
April	27.50	0.9821	-0.0180	0.0003
May	27.50	1.0000	0.0000	0.0000
June	28.30	1.0291	0.0287	0.0008
July	25.30	0.8940	-0.1121	0.0126
August	27.50	1.0870	0.0834	0.0070
September	25.30	0.9200	-0.0834	0.0070
October	25.00	0.9881	-0.0119	0.0001
November	25.30	1.0120	0.0119	0.0001
December	25.00	0.9881	-0.0119	0.0001
			<b>-0.1484</b>	<b>0.0293</b>

**Nation Media Group Ltd**

January	132.80			0.0000
February	135.00	1.0166	0.0164	0.0003
March	147.00	1.0889	0.0852	0.0073
April	205.40	1.3973	0.3345	0.1119
May	104.30	0.5078	-0.6777	0.4593
June	113.20	1.0853	0.0819	0.0067
July	115.90	1.0239	0.0236	0.0006
August	124.00	1.0699	0.0676	0.0046
September	124.80	1.0065	0.0064	0.0000
October	121.10	0.9704	-0.0301	0.0009
November	125.30	1.0347	0.0341	0.0012
December	135.80	1.0838	0.0805	0.0065
			<b>0.0223</b>	<b>0.5991</b>

**Pearl Drycleaners Ltd**

January	10.00			0.0000
February	10.00	1.0000	0.0000	0.0000
March	10.00	1.0000	0.0000	0.0000
April	10.00	1.0000	0.0000	0.0000
May	10.00	1.0000	0.0000	0.0000
June	10.30	1.0300	0.0296	0.0009
July	10.00	0.9709	-0.0296	0.0009
August	10.00	1.0000	0.0000	0.0000
September	10.00	1.0000	0.0000	0.0000
October	10.00	1.0000	0.0000	0.0000
November	10.00	1.0000	0.0000	0.0000
December	10.00	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.0017</b>

**Standard Newspapers Ltd**

January	36.10			0.0000
February	32.00	0.8864	-0.1206	0.0145
March	39.40	1.2313	0.2080	0.0433
April	33.00	0.8376	-0.1773	0.0314
May	25.20	0.7636	-0.2697	0.0727
June	29.90	1.1865	0.1710	0.0292
July	20.00	0.6689	-0.4021	0.1617
August	19.90	0.9950	-0.0050	0.0000
September	12.00	0.6030	-0.5058	0.2558
October	18.10	1.5083	0.4110	0.1689
November	18.00	0.9945	-0.0055	0.0000
December	21.30	1.1833	0.1683	0.0283
			<b>-0.5276</b>	<b>0.8061</b>

**Tourism Promotion Services (Serena)**

January	15.70			0.0000
February	16.60	1.0573	0.0557	0.0031
March	13.90	0.8373	-0.1775	0.0315
April	14.00	1.0072	0.0072	0.0001
May	13.90	0.9929	-0.0072	0.0001
June	13.00	0.9353	-0.0669	0.0045
July	13.00	1.0000	0.0000	0.0000
August	12.70	0.9769	-0.0233	0.0005
September	11.20	0.8819	-0.1257	0.0158
October	11.50	1.0268	0.0264	0.0007
November	11.40	0.9913	-0.0087	0.0001
December	13.60	1.1930	0.1765	0.0311
			<b>-0.1436</b>	<b>0.0875</b>

**Uchumi Supermarkets Ltd**

January	42.50			0.0000
---------	-------	--	--	--------

February	44.70	1.0518	0.0505	0.0025
March	40.20	0.8993	-0.1061	0.0113
April	40.20	1.0000	0.0000	0.0000
May	45.50	1.1318	0.1238	0.0153
June	45.50	1.0000	0.0000	0.0000
July	42.00	0.9231	-0.0800	0.0064
August	42.50	1.0119	0.0118	0.0001
September	42.50	1.0000	0.0000	0.0000
October	43.80	1.0306	0.0301	0.0009
November	37.60	0.8584	-0.1526	0.0233
December	44.60	1.1862	0.1707	0.0291
			<b>0.0482</b>	<b>0.0890</b>

## FINANCE AND INVESTMENT SECTOR

1998

## COMPANY

	Closing stock price Sh	Price relative		Monthly return U1*U1
		S1/S1-1	U1=ln (S1/S1-1)	
<b>Barclays Bank Ltd</b>				
January	115.20			0.0000
February	127.30	1.1050	0.0999	0.0100
March	95.70	0.7518	-0.2853	0.0814
April	91.40	0.9551	-0.0460	0.0021
May	104.30	1.1411	0.1320	0.0174
June	101.50	0.9732	-0.0272	0.0007
July	97.90	0.9645	-0.0361	0.0013
August	99.80	1.0194	0.0192	0.0004
September	98.00	0.9820	-0.0182	0.0003
October	99.00	1.0102	0.0102	0.0001
November	102.60	1.0364	0.0357	0.0013
December	122.20	1.1910	0.1748	0.0306
			<b>0.0590</b>	<b>0.1456</b>
<b>City Trust Ltd</b>				
January	74.50			0.0000
February	34.80	0.4671	-0.7612	0.5794
March	35.00	1.0057	0.0057	0.0000
April	35.00	1.0000	0.0000	0.0000
May	32.80	0.9371	-0.0649	0.0042
June	31.60	0.9634	-0.0373	0.0014
July	25.50	0.8070	-0.2145	0.0460
August	25.50	1.0000	0.0000	0.0000
September	25.50	1.0000	0.0000	0.0000
October	26.10	1.0235	0.0233	0.0005
November	26.10	1.0000	0.0000	0.0000
December	26.10	1.0000	0.0000	0.0000
			<b>-1.0489</b>	<b>0.6316</b>
<b>CFC Bank Ltd</b>				
January	19.90			0.0000
February	20.00	1.0050	0.0050	0.0000
March	21.00	1.0500	0.0488	0.0024
April	16.90	0.8048	-0.2172	0.0472
May	17.30	1.0237	0.0234	0.0005
June	16.90	0.9769	-0.0234	0.0005
July	16.00	0.9467	-0.0547	0.0030
August	16.00	1.0000	0.0000	0.0000
September	15.50	0.9688	-0.0317	0.0010
October	15.00	0.9677	-0.0328	0.0011
November	15.00	1.0000	0.0000	0.0000
December	15.60	1.0400	0.0392	0.0015
			<b>-0.2434</b>	<b>0.0573</b>
<b>Diamond Trust Bank Kenya Ltd</b>				
January	22.20			0.0000
February	22.50	1.0135	0.0134	0.0002
March	22.10	0.9822	-0.0179	0.0003
April	20.50	0.9276	-0.0752	0.0056
May	22.20	1.0829	0.0797	0.0063
June	22.00	0.9910	-0.0090	0.0001
July	20.00	0.9091	-0.0953	0.0091
August	18.60	0.9300	-0.0726	0.0053
September	20.00	1.0753	0.0726	0.0053
October	20.40	1.0200	0.0198	0.0004
November	20.10	0.9853	-0.0148	0.0002
December	21.10	1.0498	0.0486	0.0024
			<b>-0.0508</b>	<b>0.0352</b>
<b>Housing Finance Co (K) Ltd</b>				
January	16.60			0.0000
February	16.70	1.0060	0.0060	0.0000
March	18.10	1.0838	0.0805	0.0065
April	15.40	0.8508	-0.1615	0.0261
May	17.30	1.1234	0.1163	0.0135
June	16.00	0.9249	-0.0781	0.0061
July	16.90	1.0563	0.0547	0.0030
August	15.60	0.9231	-0.0800	0.0064
September	13.90	0.8910	-0.1154	0.0133
October	14.20	1.0216	0.0214	0.0005
November	14.20	1.0000	0.0000	0.0000
December	16.30	1.1479	0.1379	0.0190
			<b>-0.0182</b>	<b>0.0944</b>
<b>ICDC Investments Co Ltd</b>				
January	48.70			0.0000
February	41.50	0.8522	-0.1600	0.0256
March	35.70	0.8602	-0.1505	0.0227



April	35.10	0.9832	-0.0169	0.0003
May	38.20	1.0853	0.0846	0.0072
June	39.10	1.0236	0.0233	0.0005
July	37.80	0.9668	-0.0338	0.0011
August	35.70	0.9444	-0.0572	0.0033
September	35.00	0.9804	-0.0198	0.0004
October	33.00	0.9429	-0.0588	0.0035
November	32.60	0.9879	-0.0122	0.0001
December	41.80	1.2822	0.2486	0.0618
			<b>-0.1528</b>	<b>0.1265</b>

**Jubilee Insurance Co Ltd**

January	33.90			0.0000
February	36.20	1.0678	0.0656	0.0043
March	37.40	1.0331	0.0326	0.0011
April	37.50	1.0027	0.0027	0.0000
May	33.20	0.8853	-0.1218	0.0148
June	30.20	0.9096	-0.0947	0.0090
July	31.00	1.0265	0.0261	0.0007
August	30.00	0.9677	-0.0328	0.0011
September	30.00	1.0000	0.0000	0.0000
October	30.00	1.0000	0.0000	0.0000
November	28.70	0.9567	-0.0443	0.0020
December	30.30	1.0557	0.0543	0.0029
			<b>-0.1123</b>	<b>0.0358</b>

**Kenya Commercial Bank Ltd**

January	82.30			0.0000
February	81.10	0.9854	-0.0147	0.0002
March	68.80	0.8483	-0.1645	0.0271
April	70.00	1.0174	0.0173	0.0003
May	70.90	1.0129	0.0128	0.0002
June	70.00	0.9873	-0.0128	0.0002
July	70.60	1.0086	0.0085	0.0001
August	69.60	0.9858	-0.0143	0.0002
September	62.50	0.8980	-0.1076	0.0116
October	58.40	0.9344	-0.0679	0.0046
November	55.40	0.9486	-0.0527	0.0028
December	61.40	1.1083	0.1028	0.0106
			<b>-0.2930</b>	<b>0.0577</b>

**National Bank of Kenya Ltd**

January	12.50			0.0000
February	12.80	1.0240	0.0237	0.0006
March	10.40	0.8125	-0.2076	0.0431
April	10.20	0.9808	-0.0194	0.0004
May	10.10	0.9902	-0.0099	0.0001
June	12.80	1.2673	0.2369	0.0561
July	9.80	0.7656	-0.2671	0.0713
August	9.00	0.9184	-0.0852	0.0073
September	8.90	0.9889	-0.0112	0.0001
October	8.00	0.8989	-0.1066	0.0114
November	6.30	0.7875	-0.2389	0.0571
December	8.60	1.3651	0.3112	0.0969
			<b>-0.3740</b>	<b>0.3443</b>

**NIC Bank Ltd**

January	41.00			0.0000
February	42.30	1.0317	0.0312	0.0010
March	38.10	0.9007	-0.1046	0.0109
April	28.60	0.7507	-0.2868	0.0823
May	34.00	1.1888	0.1730	0.0299
June	33.10	0.9735	-0.0268	0.0007
July	35.30	1.0665	0.0643	0.0041
August	26.20	0.7422	-0.2981	0.0889
September	26.50	1.0115	0.0114	0.0001
October	26.60	1.0038	0.0038	0.0000
November	23.30	0.8759	-0.1325	0.0175
December	28.90	1.2403	0.2154	0.0464
			<b>-0.3497</b>	<b>0.2819</b>

**Pan Africa Insurance Ltd**

January	24.40			0.0000
February	23.30	0.9549	-0.0461	0.0021
March	22.70	0.9742	-0.0261	0.0007
April	20.00	0.8811	-0.1266	0.0160
May	19.90	0.9950	-0.0050	0.0000
June	20.00	1.0050	0.0050	0.0000
July	20.00	1.0000	0.0000	0.0000
August	19.30	0.9650	-0.0356	0.0013
September	18.30	0.9482	-0.0532	0.0028
October	16.00	0.8743	-0.1343	0.0180
November	16.50	1.0313	0.0308	0.0009
December	16.70	1.0121	0.0120	0.0001

Standard Chartered Bank Ltd

-0.3792 0.0421

January	47.40			0.0000
February	41.20	0.8692	-0.1402	0.0197
March	43.30	1.0510	0.0497	0.0025
April	39.40	0.9099	-0.0944	0.0089
May	42.60	1.0812	0.0781	0.0061
June	42.10	0.9883	-0.0118	0.0001
July	40.00	0.9501	-0.0512	0.0026
August	39.70	0.9925	-0.0075	0.0001
September	39.00	0.9824	-0.0178	0.0003
October	38.90	0.9974	-0.0026	0.0000
November	40.20	1.0334	0.0329	0.0011
December	51.70	1.2861	0.2516	0.0633
			<b>0.0868</b>	<b>0.1046</b>

## INDUSTRIAL AND ALLIED SECTOR

1998

COMPANY	Closing stock price Sh	Price relative S1/S1-1	Monthly return	
			U1=ln (S1/S1-1)	U1*U1
<b>Ahi River Mining Ltd</b>				
January	9.50			0.0000
February	9.50	1.0000	0.0000	0.0000
March	9.50	1.0000	0.0000	0.0000
April	6.90	0.7263	-0.3198	0.1023
May	7.60	1.1014	0.0966	0.0093
June	9.00	1.1842	0.1691	0.0286
July	6.80	0.7556	-0.2803	0.0786
August	6.50	0.9559	-0.0451	0.0020
September	6.30	0.9692	-0.0313	0.0010
October	6.40	1.0159	0.0157	0.0002
November	6.00	0.9375	-0.0645	0.0042
December	6.20	1.0333	0.0328	0.0011
			<b>-0.4267</b>	<b>0.2272</b>
<b>Bamburi Cement Ltd</b>				
January	40.00			0.0000
February	36.00	0.9000	-0.1054	0.0111
March	39.90	1.1083	0.1029	0.0106
April	33.30	0.8346	-0.1808	0.0327
May	35.00	1.0511	0.0498	0.0025
June	35.10	1.0029	0.0029	0.0000
July	29.50	0.8405	-0.1738	0.0302
August	27.90	0.9458	-0.0558	0.0031
September	28.00	1.0036	0.0036	0.0000
October	27.70	0.9893	-0.0108	0.0001
November	26.10	0.9422	-0.0595	0.0035
December	36.00	1.3793	0.3216	0.1034
			<b>-0.1054</b>	<b>0.1973</b>
<b>British American Tobacco Ltd</b>				
January	65.00			0.0000
February	69.30	1.0662	0.0641	0.0041
March	69.00	0.9957	-0.0043	0.0000
April	68.00	0.9855	-0.0146	0.0002
May	66.20	0.9735	-0.0268	0.0007
June	67.50	1.0196	0.0194	0.0004
July	70.00	1.0370	0.0364	0.0013
August	68.00	0.9714	-0.0290	0.0008
September	70.00	1.0294	0.0290	0.0008
October	71.00	1.0143	0.0142	0.0002
November	71.10	1.0014	0.0014	0.0000
December	71.20	1.0014	0.0014	0.0000
			<b>0.0911</b>	<b>0.0086</b>
<b>B O C Gases Ltd</b>				
January	40.00			0.0000
February	36.00	0.9000	-0.1054	0.0111
March	39.90	1.1083	0.1029	0.0106
April	33.30	0.8346	-0.1808	0.0327
May	35.00	1.0511	0.0498	0.0025
June	35.10	1.0029	0.0029	0.0000
July	29.50	0.8405	-0.1738	0.0302
August	27.90	0.9458	-0.0558	0.0031
September	28.00	1.0036	0.0036	0.0000
October	27.70	0.9893	-0.0108	0.0001
November	26.10	0.9422	-0.0595	0.0035
December	36.00	1.3793	0.3216	0.1034
			<b>-0.1054</b>	<b>0.1973</b>
<b>Carbacid Investments Ltd</b>				
January	50.70			0.0000
February	50.30	0.9921	-0.0079	0.0001
March	44.90	0.8926	-0.1136	0.0129
April	44.30	0.9866	-0.0135	0.0002
May	44.90	1.0135	0.0135	0.0002
June	44.90	1.0000	0.0000	0.0000
July	45.00	1.0022	0.0022	0.0000
August	47.70	1.0600	0.0583	0.0034
September	50.60	1.0608	0.0590	0.0035
October	55.10	1.0889	0.0852	0.0073
November	55.20	1.0018	0.0018	0.0000
December	74.20	1.3442	0.2958	0.0875
			<b>0.3808</b>	<b>0.1150</b>
<b>Crown Berger Ltd</b>				
January	12.10			0.0000
February	13.10	1.0826	0.0794	0.0063
March	10.00	0.7634	-0.2700	0.0729
April	9.90	0.9900	-0.0101	0.0001
May	9.50	0.9596	-0.0412	0.0017

January	9.40	0.9895	-0.0106	0.0001
February	9.50	1.0106	0.0106	0.0001
March	9.00	0.9474	-0.0541	0.0029
April	10.00	1.1111	0.1054	0.0111
May	7.50	0.7500	-0.2877	0.0828
June	8.40	1.1200	0.1133	0.0128
July	8.10	0.9643	-0.0364	0.0013
August			<b>-0.4013</b>	<b>0.1922</b>

**Unloper Kenya Ltd**

January	20.70			0.0000
February	20.00	0.9662	-0.0344	0.0012
March	19.40	0.9700	-0.0305	0.0009
April	19.20	0.9897	-0.0104	0.0001
May	17.00	0.8854	-0.1217	0.0148
June	30.80	1.8118	0.5943	0.3532
July	28.00	0.9091	-0.0953	0.0091
August	26.20	0.9357	-0.0664	0.0044
September	20.00	0.7634	-0.2700	0.0729
October	17.60	0.8800	-0.1278	0.0163
November	18.20	1.0341	0.0335	0.0011
December	18.50	1.0165	0.0163	0.0003
			<b>-0.1124</b>	<b>0.4744</b>

**EA Cables Ltd**

January	29.90			0.0000
February	29.00	0.9699	-0.0306	0.0009
March	22.50	0.7759	-0.2538	0.0644
April	24.00	1.0667	0.0645	0.0042
May	24.20	1.0083	0.0083	0.0001
June	22.10	0.9132	-0.0908	0.0082
July	20.00	0.9050	-0.0998	0.0100
August	19.50	0.9750	-0.0253	0.0006
September	20.00	1.0256	0.0253	0.0006
October	19.20	0.9600	-0.0408	0.0017
November	19.20	1.0000	0.0000	0.0000
December	20.00	1.0417	0.0408	0.0017
			<b>-0.4021</b>	<b>0.0924</b>

**EA Packaging Ltd**

January	47.30			0.0000
February	35.90	0.7590	-0.2758	0.0761
March	32.90	0.9164	-0.0873	0.0076
April	33.30	1.0122	0.0121	0.0001
May	28.30	0.8498	-0.1627	0.0265
June	20.00	0.7067	-0.3471	0.1205
July	19.70	0.9850	-0.0151	0.0002
August	19.50	0.9898	-0.0102	0.0001
September	19.80	1.0154	0.0153	0.0002
October	16.20	0.8182	-0.2007	0.0403
November	15.80	0.9753	-0.0250	0.0006
December	15.60	0.9873	-0.0127	0.0002
			<b>-1.1092</b>	<b>0.2724</b>

**EA Portland Cement Ltd**

January	30.00			0.0000
February	29.90	0.9967	-0.0033	0.0000
March	25.00	0.8361	-0.1790	0.0320
April	22.00	0.8800	-0.1278	0.0163
May	20.00	0.9091	-0.0953	0.0091
June	22.10	1.1050	0.0998	0.0100
July	20.10	0.9095	-0.0949	0.0090
August	20.00	0.9950	-0.0050	0.0000
September	19.30	0.9650	-0.0356	0.0013
October	18.20	0.9430	-0.0587	0.0034
November	17.90	0.9835	-0.0166	0.0003
December	17.60	0.9832	-0.0169	0.0003
			<b>-0.5333</b>	<b>0.0817</b>

**Firestone East Africa Ltd**

January	19.80			0.0000
February	23.00	1.1616	0.1498	0.0224
March	19.70	0.8565	-0.1549	0.0240
April	17.20	0.8731	-0.1357	0.0184
May	17.50	1.0174	0.0173	0.0003
June	17.10	0.9771	-0.0231	0.0005
July	18.10	1.0585	0.0568	0.0032
August	16.90	0.9337	-0.0686	0.0047
September	16.20	0.9586	-0.0423	0.0018
October	15.30	0.9444	-0.0572	0.0033
November	15.10	0.9869	-0.0132	0.0002
December	16.10	1.0662	0.0641	0.0041
			<b>-0.2069</b>	<b>0.0830</b>

**East Africa Breweries Ltd**

January	51.00			0.0000
---------	-------	--	--	--------

February	50.60	0.9922	-0.0079	0.0001
March	50.90	1.0059	0.0059	0.0000
April	48.30	0.9489	-0.0524	0.0027
May	50.70	1.0497	0.0485	0.0024
June	54.80	1.0809	0.0778	0.0060
July	56.80	1.0365	0.0358	0.0013
August	56.00	0.9859	-0.0142	0.0002
September	52.50	0.9375	-0.0645	0.0042
October	46.40	0.8838	-0.1235	0.0153
November	51.20	1.1034	0.0984	0.0097
December	68.80	1.3438	0.2955	0.0873
			<b>0.2994</b>	<b>0.1291</b>

**Kenya National Mills Ltd**

January	19.80			0.0000
February	17.70	0.8939	-0.1121	0.0126
March	25.20	1.4237	0.3533	0.1248
April	25.00	0.9921	-0.0080	0.0001
May	28.30	1.1320	0.1240	0.0154
June	24.30	0.8587	-0.1524	0.0232
July	20.20	0.8313	-0.1848	0.0341
August	20.10	0.9950	-0.0050	0.0000
September	19.70	0.9801	-0.0201	0.0004
October	17.10	0.8680	-0.1415	0.0200
November	13.60	0.7953	-0.2290	0.0524
December	16.30	1.1985	0.1811	0.0328
			<b>-0.1945</b>	<b>0.3159</b>

**Kenya Oil Co Ltd**

January	64.10			0.0000
February	67.30	1.0499	0.0487	0.0024
March	66.40	0.9866	-0.0135	0.0002
April	55.00	0.8283	-0.1884	0.0355
May	52.40	0.9527	-0.0484	0.0023
June	56.10	1.0706	0.0682	0.0047
July	58.00	1.0339	0.0333	0.0011
August	58.00	1.0000	0.0000	0.0000
September	58.50	1.0086	0.0086	0.0001
October	56.30	0.9624	-0.0383	0.0015
November	55.00	0.9769	-0.0234	0.0005
December	55.00	1.0000	0.0000	0.0000
			<b>-0.1531</b>	<b>0.0482</b>

**Kenya Power & Lighting Ltd**

January	124.30			0.0000
February	132.80	1.0684	0.0661	0.0044
March	121.50	0.9149	-0.0889	0.0079
April	111.60	0.9185	-0.0850	0.0072
May	120.80	1.0824	0.0792	0.0063
June	129.60	1.0728	0.0703	0.0049
July	132.80	1.0247	0.0244	0.0006
August	130.60	0.9834	-0.0167	0.0003
September	120.90	0.9257	-0.0772	0.0060
October	127.10	1.0513	0.0500	0.0025
November	110.60	0.8702	-0.1391	0.0193
December	120.20	1.0868	0.0832	0.0069
			<b>-0.0335</b>	<b>0.0663</b>

**Total Kenya Ltd**

January	63.50			0.0000
February	59.80	0.9417	-0.0600	0.0036
March	50.40	0.8428	-0.1710	0.0292
April	44.40	0.8810	-0.1268	0.0161
May	40.20	0.9054	-0.0994	0.0099
June	41.40	1.0299	0.0294	0.0009
July	40.50	0.9783	-0.0220	0.0005
August	40.90	1.0099	0.0098	0.0001
September	37.80	0.9242	-0.0788	0.0062
October	36.40	0.9630	-0.0377	0.0014
November	34.00	0.9341	-0.0682	0.0047
December	44.90	1.3206	0.2781	0.0773
			<b>-0.3466</b>	<b>0.1499</b>

**Unga Group Ltd**

January	22.30			0.0000
February	26.20	1.1749	0.1612	0.0260
March	56.80	2.1679	0.7738	0.5987
April	54.00	0.9507	-0.0506	0.0026
May	67.50	1.2500	0.2231	0.0498
June	58.80	0.8711	-0.1380	0.0190
July	59.80	1.0170	0.0169	0.0003
August	55.30	0.9247	-0.0782	0.0061
September	52.20	0.9439	-0.0577	0.0033
October	37.70	0.7222	-0.3254	0.1059
November	36.40	0.9655	-0.0351	0.0012
December	47.00	1.2912	0.2556	0.0653
			<b>0.7456</b>	<b>0.8783</b>

AGRICULTURAL SECTOR

1999

COMPANY

	<i>Closing stock price</i>	<i>Price relative</i>	<i>Monthly return</i>	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
<b>Brooke Bond Kenya Limited</b>				
January	142			0.0000
February	141.4	0.9958	-0.0042	0.0000
March	143.1	1.0120	0.0120	0.0001
April	145.1	1.0140	0.0139	0.0002
May	146.1	1.0069	0.0069	0.0000
June	146.9	1.0055	0.0055	0.0000
July	147.2	1.0020	0.0020	0.0000
August	147	0.9986	-0.0014	0.0000
September	100.2	0.6816	-0.3833	0.1469
October	102	1.0180	0.0178	0.0003
November	103	1.0098	0.0098	0.0001
December	104	1.0097	0.0097	0.0001
			<b>-0.3114</b>	<b>0.1478</b>
<b>Eaagads Limited</b>				
January	42.1			0.0000
February	42.1	1.0000	0.0000	0.0000
March	42.1	1.0000	0.0000	0.0000
April	42.1	1.0000	0.0000	0.0000
May	42.1	1.0000	0.0000	0.0000
June	42.1	1.0000	0.0000	0.0000
July	42.5	1.0095	0.0095	0.0001
August	24	0.5647	-0.5715	0.3266
September	27.8	1.1583	0.1470	0.0216
October	27.8	1.0000	0.0000	0.0000
November	27.8	1.0000	0.0000	0.0000
December	26	0.9353	-0.0669	0.0045
			<b>-0.4820</b>	<b>0.3527</b>
<b>George Williamson Kenya Ltd</b>				
January	143			0.0000
February	141.6	0.9902	-0.0098	0.0001
March	140	0.9887	-0.0114	0.0001
April	141	1.0071	0.0071	0.0001
May	142	1.0071	0.0071	0.0000
June	143	1.0070	0.0070	0.0000
July	140	0.9790	-0.0212	0.0004
August	140	1.0000	0.0000	0.0000
September	115	0.8214	-0.1967	0.0387
October	110	0.9565	-0.0445	0.0020
November	96	0.8727	-0.1361	0.0185
December	92	0.9583	-0.0426	0.0018
			<b>-0.4411</b>	<b>0.0618</b>
<b>Kakuzi Ltd</b>				
January	141			0.0000

Computation of monthly returns-Agricultural sector-1999

February	145	1.0284	0.0280	0.0008
March	143	0.9862	-0.0139	0.0002
April	117.7	0.8231	-0.1947	0.0379
May	120	1.0195	0.0194	0.0004
June	120.4	1.0033	0.0033	0.0000
July	121	1.0050	0.0050	0.0000
August	121	1.0000	0.0000	0.0000
September	100	0.8264	-0.1906	0.0363
October	99.1	0.9910	-0.0090	0.0001
November	93.6	0.9445	-0.0571	0.0033
December	87	0.9295	-0.0731	0.0053
			<b>-0.4829</b>	<b>0.0843</b>

**Kapchorua Tea Co Ltd**

January	102			0.0000
February	125	1.2255	0.2033	0.0413
March	125	1.0000	0.0000	0.0000
April	144	1.1520	0.1415	0.0200
May	150	1.0417	0.0408	0.0017
June	150	1.0000	0.0000	0.0000
July	150	1.0000	0.0000	0.0000
August	150	1.0000	0.0000	0.0000
September	150	1.0000	0.0000	0.0000
October	150	1.0000	0.0000	0.0000
November	150	1.0000	0.0000	0.0000
December	150	1.0000	0.0000	0.0000
			<b>0.3857</b>	<b>0.0630</b>

**Limuru Tea Co Ltd**

January	760			0.0000
February	760	1.0000	0.0000	0.0000
March	760	1.0000	0.0000	0.0000
April	760	1.0000	0.0000	0.0000
May	760	1.0000	0.0000	0.0000
June	650	0.8553	-0.1563	0.0244
July	650	1.0000	0.0000	0.0000
August	650	1.0000	0.0000	0.0000
September	650	1.0000	0.0000	0.0000
October	650	1.0000	0.0000	0.0000
November	650	1.0000	0.0000	0.0000
December	650	1.0000	0.0000	0.0000
			<b>-0.1563</b>	<b>0.0244</b>

**Rea Vipingo Ltd**

January	6.5			0.0000
February	6	0.9231	-0.0800	0.0064
March	5.6	0.9333	-0.0690	0.0048
April	5.5	0.9821	-0.0180	0.0003
May	5.5	1.0000	0.0000	0.0000
June	6	1.0909	0.0870	0.0076
July	5.6	0.9333	-0.0690	0.0048
August	5	0.8929	-0.1133	0.0128

September	5	1.0000	0.0000	0.0000
October	4.6	0.9200	-0.0834	0.0070
November	4.7	1.0217	0.0215	0.0005
December	4.8	1.0213	0.0211	0.0004
			<b>-0.3032</b>	<b>0.0445</b>

**Sasini Tea & Coffee Ltd**

January	70			0.0000
February	60.2	0.8600	-0.1508	0.0227
March	59.2	0.9834	-0.0168	0.0003
April	57.2	0.9662	-0.0344	0.0012
May	51	0.8916	-0.1147	0.0132
June	54	1.0588	0.0572	0.0033
July	54	1.0000	0.0000	0.0000
August	55.2	1.0222	0.0220	0.0005
September	55.5	1.0054	0.0054	0.0000
October	53.9	0.9712	-0.0293	0.0009
November	44.1	0.8182	-0.2007	0.0403
December	44.9	1.0181	0.0180	0.0003
			<b>-0.4441</b>	<b>0.0826</b>



## COMMERCIAL AND SERVICES SECTOR

1999

## COMPANY

	<i>Closing stock price</i>	<i>Price relative</i>	<i>Monthly return</i>	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
<b>Baumann &amp; Co Ltd</b>				
January	16.9			0.0000
February	16.9	1.0000	0.0000	0.0000
March	16.9	1.0000	0.0000	0.0000
April	16.9	1.0000	0.0000	0.0000
May	16.9	1.0000	0.0000	0.0000
June	16.9	1.0000	0.0000	0.0000
July	16.9	1.0000	0.0000	0.0000
August	16.9	1.0000	0.0000	0.0000
September	16.9	1.0000	0.0000	0.0000
October	15	0.8876	-0.1193	0.0142
November	15	1.0000	0.0000	0.0000
December	14.9	0.9933	-0.0067	0.0000
			<b>-0.1260</b>	<b>0.0143</b>
<b>CMC Holdings Ltd</b>				
January	33.2			0.0000
February	29.1	0.8765	-0.1318	0.0174
March	28	0.9622	-0.0385	0.0015
April	28	1.0000	0.0000	0.0000
May	28	1.0000	0.0000	0.0000
June	28	1.0000	0.0000	0.0000
July	29.9	1.0679	0.0657	0.0043
August	30	1.0033	0.0033	0.0000
September	30	1.0000	0.0000	0.0000
October	30	1.0000	0.0000	0.0000
November	30	1.0000	0.0000	0.0000
December	30	1.0000	0.0000	0.0000
			<b>-0.1014</b>	<b>0.0232</b>
<b>Car &amp; General (K) Ltd</b>				
January	12			0.0000
February	12.5	1.0417	0.0408	0.0017
March	12.8	1.0240	0.0237	0.0006
April	12.8	1.0000	0.0000	0.0000
May	12.5	0.9766	-0.0237	0.0006
June	10	0.8000	-0.2231	0.0498
July	5	0.5000	-0.6931	0.4805
August	5	1.0000	0.0000	0.0000
September	5	1.0000	0.0000	0.0000
October	10	2.0000	0.6931	0.4805
November	9	0.9000	-0.1054	0.0111
December	9	1.0000	0.0000	0.0000
			<b>-0.2877</b>	<b>1.0246</b>
<b>Express Kenya Ltd</b>				
January	39			0.0000

February	38.8	0.9949	-0.0051	0.0000
March	29	0.7474	-0.2911	0.0848
April	34	1.1724	0.1591	0.0253
May	25.1	0.7382	-0.3035	0.0921
June	25.5	1.0159	0.0158	0.0002
July	25.5	1.0000	0.0000	0.0000
August	22.2	0.8706	-0.1386	0.0192
September	18.3	0.8243	-0.1932	0.0373
October	18.3	1.0000	0.0000	0.0000
November	18	0.9836	-0.0165	0.0003
December	18.9	1.0500	0.0488	0.0024
			<b>-0.7244</b>	<b>0.2616</b>

**Kenya Airways Ltd**

January	8.1			0.0000
February	7.4	0.9136	-0.0904	0.0082
March	7.6	1.0270	0.0267	0.0007
April	8	1.0526	0.0513	0.0026
May	8.1	1.0125	0.0124	0.0002
June	8	0.9877	-0.0124	0.0002
July	6.9	0.8625	-0.1479	0.0219
August	6.2	0.8986	-0.1070	0.0114
September	5.4	0.8710	-0.1382	0.0191
October	6	1.1111	0.1054	0.0111
November	7.7	1.2833	0.2495	0.0622
December	7.8	1.0130	0.0129	0.0002
			<b>-0.0377</b>	<b>0.1377</b>

**Lonhro Motors (EA) Ltd**

January	20			0.0000
February	22.2	1.1100	0.1044	0.0109
March	22	0.9910	-0.0090	0.0001
April	16.2	0.7364	-0.3060	0.0937
May	16.8	1.0370	0.0364	0.0013
June	17	1.0119	0.0118	0.0001
July	17.5	1.0294	0.0290	0.0008
August	15	0.8571	-0.1542	0.0238
September	15.2	1.0133	0.0132	0.0002
October	13.5	0.8882	-0.1186	0.0141
November	13.3	0.9852	-0.0149	0.0002
December	13.3	1.0000	0.0000	0.0000
			<b>-0.4080</b>	<b>0.1452</b>

**Marshalls (EA) Ltd**

January	25.7			0.0000
February	25.7	1.0000	0.0000	0.0000
March	26.1	1.0156	0.0154	0.0002
April	24.3	0.9310	-0.0715	0.0051
May	22	0.9053	-0.0994	0.0099
June	22	1.0000	0.0000	0.0000
July	22	1.0000	0.0000	0.0000
August	25	1.1364	0.1278	0.0163

September	25	1.0000	0.0000	0.0000
October	25	1.0000	0.0000	0.0000
November	23.6	0.9440	-0.0576	0.0033
December	23.6	1.0000	0.0000	0.0000
			<b>-0.0852</b>	<b>0.0349</b>

**Nation Media Group Ltd**

January	135.2			0.0000
February	138.7	1.0259	0.0256	0.0007
March	135.9	0.9798	-0.0204	0.0004
April	136.9	1.0074	0.0073	0.0001
May	132.1	0.9649	-0.0357	0.0013
June	130	0.9841	-0.0160	0.0003
July	129.9	0.9992	-0.0008	0.0000
August	105.1	0.8091	-0.2119	0.0449
September	107.7	1.0247	0.0244	0.0006
October	108.6	1.0084	0.0083	0.0001
November	101.1	0.9309	-0.0716	0.0051
December	100.4	0.9931	-0.0069	0.0000
			<b>-0.2976</b>	<b>0.0534</b>

**Pearl Drycleaners Ltd**

January	10			0.0000
February	10	1.0000	0.0000	0.0000
March	10	1.0000	0.0000	0.0000
April	10	1.0000	0.0000	0.0000
May	10	1.0000	0.0000	0.0000
June	10	1.0000	0.0000	0.0000
July	10	1.0000	0.0000	0.0000
August	10	1.0000	0.0000	0.0000
September	3	0.3000	-1.2040	1.4496
October	3	1.0000	0.0000	0.0000
November	3	1.0000	0.0000	0.0000
December	3	1.0000	0.0000	0.0000
			<b>-1.2040</b>	<b>1.4496</b>

**Standard Newspapers Ltd**

January	25.5			0.0000
February	24	0.9412	-0.0606	0.0037
March	10.5	0.4375	-0.8267	0.6834
April	19.9	1.8952	0.6393	0.4088
May	19	0.9548	-0.0463	0.0021
June	14	0.7368	-0.3054	0.0933
July	12	0.8571	-0.1542	0.0238
August	12	1.0000	0.0000	0.0000
September	11.1	0.9250	-0.0780	0.0061
October	10.2	0.9189	-0.0846	0.0071
November	10	0.9804	-0.0198	0.0004
December	9.9	0.9900	-0.0101	0.0001
			<b>-0.9461</b>	<b>1.2287</b>

**Tourism Promotion Services (Serena)**

January	12.8			0.0000
February	12.5	0.9766	-0.0237	0.0006
March	12.6	1.0080	0.0080	0.0001
April	13.5	1.0714	0.0690	0.0048
May	13.5	1.0000	0.0000	0.0000
June	13.2	0.9778	-0.0225	0.0005
July	14	1.0606	0.0588	0.0035
August	14.1	1.0071	0.0071	0.0001
September	16.1	1.1418	0.1326	0.0176
October	16	0.9938	-0.0062	0.0000
November	16.1	1.0063	0.0062	0.0000
December	16.1	1.0000	0.0000	0.0000
			<b>0.2294</b>	<b>0.0271</b>

#### Uchumi Supermarkets Ltd

January	44			0.0000
February	48.5	1.1023	0.0974	0.0095
March	50.9	1.0495	0.0483	0.0023
April	48	0.9430	-0.0587	0.0034
May	48.1	1.0021	0.0021	0.0000
June	48.2	1.0021	0.0021	0.0000
July	50.4	1.0456	0.0446	0.0020
August	51.1	1.0139	0.0138	0.0002
September	49.1	0.9609	-0.0399	0.0016
October	41.6	0.8473	-0.1658	0.0275
November	36.8	0.8846	-0.1226	0.0150
December	39.3	1.0679	0.0657	0.0043
			<b>-0.1130</b>	<b>0.0659</b>

## FINANCE AND INVESTMENT SECTOR

1999

## COMPANY

	<i>Closing stock price</i>		<i>Price relative</i>		<i>Monthly return</i>	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1		
<b>Barclays Bank Ltd</b>						
January	120.2			0.0000		
February	122.3	1.0175	0.0173	0.0003		
March	108.6	0.8880	-0.1188	0.0141		
April	106.1	0.9770	-0.0233	0.0005		
May	109.3	1.0302	0.0297	0.0009		
June	109.6	1.0027	0.0027	0.0000		
July	118.3	1.0794	0.0764	0.0058		
August	108.5	0.9172	-0.0865	0.0075		
September	98.6	0.9088	-0.0957	0.0092		
October	103	1.0446	0.0437	0.0019		
November	103.2	1.0019	0.0019	0.0000		
December	103.1	0.9990	-0.0010	0.0000		
			<b>-0.1535</b>	<b>0.0402</b>		
<b>City Trust Ltd</b>						
January	26.8			0.0000		
February	26.8	1.0000	0.0000	0.0000		
March	26.1	0.9739	-0.0265	0.0007		
April	24.5	0.9387	-0.0633	0.0040		
May	22.5	0.9184	-0.0852	0.0073		
June	22.5	1.0000	0.0000	0.0000		
July	23.5	1.0444	0.0435	0.0019		
August	23	0.9787	-0.0215	0.0005		
September	21.3	0.9261	-0.0768	0.0059		
October	21.3	1.0000	0.0000	0.0000		
November	22.1	1.0376	0.0369	0.0014		
December	22.1	1.0000	0.0000	0.0000		
			<b>-0.1928</b>	<b>0.0216</b>		
<b>CFC Bank Ltd</b>						
January	20.1			0.0000		
February	18.3	0.9104	-0.0938	0.0088		
March	14.1	0.7705	-0.2607	0.0680		
April	14.3	1.0142	0.0141	0.0002		
May	14	0.9790	-0.0212	0.0004		
June	15.1	1.0786	0.0756	0.0057		
July	15.1	1.0000	0.0000	0.0000		
August	14.6	0.9669	-0.0337	0.0011		
September	15	1.0274	0.0270	0.0007		
October	17.9	1.1933	0.1768	0.0312		
November	14	0.7821	-0.2457	0.0604		
December	14.3	1.0214	0.0212	0.0004		
			<b>-0.3405</b>	<b>0.1771</b>		
<b>Diamond Trust Bank Kenya Ltd</b>						

January	25			0.0000
February	26	1.0400	0.0392	0.0015
March	25	0.9615	-0.0392	0.0015
April	25	1.0000	0.0000	0.0000
May	23.2	0.9280	-0.0747	0.0056
June	23.9	1.0302	0.0297	0.0009
July	23.9	1.0000	0.0000	0.0000
August	21	0.8787	-0.1294	0.0167
September	20.8	0.9905	-0.0096	0.0001
October	23.5	1.1298	0.1220	0.0149
November	23.1	0.9830	-0.0172	0.0003
December	26	1.1255	0.1183	0.0140

**0.0392 0.0555**

***Housing Finance Co (K) Ltd***

January	14.6			0.0000
February	14.6	1.0000	0.0000	0.0000
March	14.2	0.9726	-0.0278	0.0008
April	13.4	0.9437	-0.0580	0.0034
May	12.9	0.9627	-0.0380	0.0014
June	13.1	1.0155	0.0154	0.0002
July	12.6	0.9618	-0.0389	0.0015
August	11.9	0.9444	-0.0572	0.0033
September	9.3	0.7815	-0.2465	0.0608
October	10	1.0753	0.0726	0.0053
November	9.6	0.9600	-0.0408	0.0017
December	10.3	1.0729	0.0704	0.0050

**-0.3489 0.0833**

***ICDC Investments Co Ltd***

January	42			0.0000
February	43.3	1.0310	0.0305	0.0009
March	45.3	1.0462	0.0452	0.0020
April	48	1.0596	0.0579	0.0034
May	48	1.0000	0.0000	0.0000
June	48.3	1.0063	0.0062	0.0000
July	50.3	1.0414	0.0406	0.0016
August	51.3	1.0199	0.0197	0.0004
September	50.4	0.9825	-0.0177	0.0003
October	50.1	0.9940	-0.0060	0.0000
November	50	0.9980	-0.0020	0.0000
December	51	1.0200	0.0198	0.0004

**0.1942 0.0091**

***Jubilee Insurance Co Ltd***

January	33.9			0.0000
February	32.4	0.9558	-0.0453	0.0020
March	33	1.0185	0.0183	0.0003
April	33	1.0000	0.0000	0.0000

May	33	1.0000	0.0000	0.0000
June	28.4	0.8606	-0.1501	0.0225
July	30.1	1.0599	0.0581	0.0034
August	29.7	0.9867	-0.0134	0.0002
September	28.7	0.9663	-0.0342	0.0012
October	25.1	0.8746	-0.1340	0.0180
November	25.9	1.0319	0.0314	0.0010
December	23	0.8880	-0.1187	0.0141
			<b>-0.3879</b>	<b>0.0627</b>

**Kenya Commercial Bank Ltd**

January	63.4			0.0000
February	61	0.9621	-0.0386	0.0015
March	49.6	0.8131	-0.2069	0.0428
April	44.5	0.8972	-0.1085	0.0118
May	44	0.9888	-0.0113	0.0001
June	43.9	0.9977	-0.0023	0.0000
July	44.1	1.0046	0.0045	0.0000
August	39.4	0.8934	-0.1127	0.0127
September	35.1	0.8909	-0.1156	0.0134
October	35	0.9972	-0.0029	0.0000
November	33.5	0.9571	-0.0438	0.0019
December	31.4	0.9373	-0.0647	0.0042
			<b>-0.7027</b>	<b>0.0884</b>

**National Bank of Kenya Ltd**

January	8.5			0.0000
February	7.4	0.8706	-0.1386	0.0192
March	6.4	0.8649	-0.1452	0.0211
April	6	0.9375	-0.0645	0.0042
May	5.9	0.9833	-0.0168	0.0003
June	6.3	1.0678	0.0656	0.0043
July	5.6	0.8889	-0.1178	0.0139
August	5.1	0.9107	-0.0935	0.0087
September	5.1	1.0000	0.0000	0.0000
October	4.5	0.8824	-0.1252	0.0157
November	5	1.1111	0.1054	0.0111
December	5	1.0000	0.0000	0.0000
			<b>-0.5306</b>	<b>0.0984</b>

**NIC Bank Ltd**

January	26.5			0.0000
February	28.4	1.0717	0.0692	0.0048
March	28.7	1.0106	0.0105	0.0001
April	27.6	0.9617	-0.0391	0.0015
May	29.5	1.0688	0.0666	0.0044
June	28.7	0.9729	-0.0275	0.0008
July	28.3	0.9861	-0.0140	0.0002
August	28.8	1.0177	0.0175	0.0003
September	28.3	0.9826	-0.0175	0.0003

October	28.9	1.0212	0.0210	0.0004
November	26.8	0.9273	-0.0754	0.0057
December	26.9	1.0037	0.0037	0.0000
			<b>0.0150</b>	<b>0.0186</b>

**Pan Africa Insurance Ltd**

January	16.2			0.0000
February	16.7	1.0309	0.0304	0.0009
March	16.7	1.0000	0.0000	0.0000
April	16.7	1.0000	0.0000	0.0000
May	22.7	1.3593	0.3070	0.0942
June	24	1.0573	0.0557	0.0031
July	24	1.0000	0.0000	0.0000
August	24.3	1.0125	0.0124	0.0002
September	24.1	0.9918	-0.0083	0.0001
October	52	2.1577	0.7690	0.5914
November	27	0.5192	-0.6554	0.4296
December	26.9	0.9963	-0.0037	0.0000
			<b>0.5071</b>	<b>1.1195</b>

**Standard Chartered Bank Ltd**

January	45.2			0.0000
February	47.1	1.0420	0.0412	0.0017
March	47.7	1.0127	0.0127	0.0002
April	45.8	0.9602	-0.0406	0.0017
May	47.8	1.0437	0.0427	0.0018
June	48.9	1.0230	0.0228	0.0005
July	53.7	1.0982	0.0936	0.0088
August	55.2	1.0279	0.0275	0.0008
September	54.6	0.9891	-0.0109	0.0001
October	58.2	1.0659	0.0639	0.0041
November	59.7	1.0258	0.0254	0.0006
December	55.8	0.9347	-0.0676	0.0046
			<b>0.2107</b>	<b>0.0248</b>



## INDUSTRIAL AND ALLIED SECTOR

1999

## COMPANY

**Athi River Mining Ltd****Closing stock price Price relative Monthly return**

	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	6			0.0000
February	6.3	1.0500	0.0488	0.0024
March	5.1	0.8095	-0.2113	0.0447
April	6	1.1765	0.1625	0.0264
May	5.6	0.9333	-0.0690	0.0048
June	5.7	1.0179	0.0177	0.0003
July	6.1	1.0702	0.0678	0.0046
August	5.5	0.9016	-0.1035	0.0107
September	5.6	1.0182	0.0180	0.0003
October	6	1.0714	0.0690	0.0048
November	5	0.8333	-0.1823	0.0332
December	5.9	1.1800	0.1655	0.0274
			<b>-0.0168</b>	<b>0.1596</b>

**Bamburi Cement Ltd**

January	36.9			0.0000
February	30.2	0.8184	-0.2004	0.0401
March	30	0.9934	-0.0066	0.0000
April	25.8	0.8600	-0.1508	0.0227
May	24.8	0.9612	-0.0395	0.0016
June	26	1.0484	0.0473	0.0022
July	30.3	1.1654	0.1531	0.0234
August	29.1	0.9604	-0.0404	0.0016
September	26.6	0.9141	-0.0898	0.0081
October	26.3	0.9887	-0.0113	0.0001
November	26	0.9886	-0.0115	0.0001
December	26.3	1.0115	0.0115	0.0001
			<b>-0.3386</b>	<b>0.1003</b>

**British American Tobacco Ltd**

January	75.6			0.0000
February	61.4	0.8122	-0.2080	0.0433
March	71	1.1564	0.1453	0.0211
April	69.7	0.9817	-0.0185	0.0003
May	71	1.0187	0.0185	0.0003
June	71.5	1.0070	0.0070	0.0000
July	71	0.9930	-0.0070	0.0000
August	70.1	0.9873	-0.0128	0.0002
September	70	0.9986	-0.0014	0.0000
October	68	0.9714	-0.0290	0.0008
November	68	1.0000	0.0000	0.0000
December	64.5	0.9485	-0.0528	0.0028
			<b>-0.1588</b>	<b>0.0690</b>

**B O C Gases Ltd**

January	36.9			0.0000
---------	------	--	--	--------

Computation of monthly returns- Industrial and Allied sector-1999

February	30.2	0.8184	-0.2004	0.0401
March	30	0.9934	-0.0066	0.0000
April	25.8	0.8600	-0.1508	0.0227
May	24.8	0.9612	-0.0395	0.0016
June	26	1.0484	0.0473	0.0022
July	30.3	1.1654	0.1531	0.0234
August	29.1	0.9604	-0.0404	0.0016
September	26.6	0.9141	-0.0898	0.0081
October	26.3	0.9887	-0.0113	0.0001
November	26	0.9886	-0.0115	0.0001
December	26.3	1.0115	0.0115	0.0001
			<b>-0.3386</b>	<b>0.1003</b>

**Carbacid Investments Ltd**

January	72.5			0.0000
February	82	1.1310	0.1231	0.0152
March	82.9	1.0110	0.0109	0.0001
April	95.8	1.1556	0.1446	0.0209
May	95.6	0.9979	-0.0021	0.0000
June	95.6	1.0000	0.0000	0.0000
July	79.7	0.8337	-0.1819	0.0331
August	79.5	0.9975	-0.0025	0.0000
September	84.5	1.0629	0.0610	0.0037
October	83.9	0.9929	-0.0071	0.0001
November	79.8	0.9511	-0.0501	0.0025
December	76	0.9524	-0.0488	0.0024
			<b>0.0471</b>	<b>0.0780</b>

**Crown Berger Ltd**

January	10			0.0000
February	7	0.7000	-0.3567	0.1272
March	8.5	1.2143	0.1942	0.0377
April	8.2	0.9647	-0.0359	0.0013
May	8.6	1.0488	0.0476	0.0023
June	8.5	0.9884	-0.0117	0.0001
July	9.1	1.0706	0.0682	0.0047
August	13.8	1.5165	0.4164	0.1734
September	12	0.8696	-0.1398	0.0195
October	13.4	1.1167	0.1103	0.0122
November	10.7	0.7985	-0.2250	0.0506
December	10	0.9346	-0.0677	0.0046
			<b>0.0000</b>	<b>0.4336</b>

**Dunlop Kenya Ltd**

January	27.6			0.0000
February	24.9	0.9022	-0.1029	0.0106
March	18.9	0.7590	-0.2757	0.0760
April	17	0.8995	-0.1059	0.0112
May	15.8	0.9294	-0.0732	0.0054
June	15	0.9494	-0.0520	0.0027
July	15	1.0000	0.0000	0.0000
August	14	0.9333	-0.0690	0.0048

September	13.8	0.9857	-0.0144	0.0002
October	12.9	0.9348	-0.0674	0.0045
November	8	0.6202	-0.4778	0.2283
December	9.8	1.2250	0.2029	0.0412
			<b>-1.0354</b>	<b>0.3849</b>

**EA Cables Ltd**

January	30.1			0.0000
February	16	0.5316	-0.6319	0.3993
March	19	1.1875	0.1719	0.0295
April	19.5	1.0263	0.0260	0.0007
May	19	0.9744	-0.0260	0.0007
June	19.6	1.0316	0.0311	0.0010
July	19.6	1.0000	0.0000	0.0000
August	19.6	1.0000	0.0000	0.0000
September	18.7	0.9541	-0.0470	0.0022
October	18.7	1.0000	0.0000	0.0000
November	16	0.8556	-0.1559	0.0243
December	16	1.0000	0.0000	0.0000
			<b>-0.6319</b>	<b>0.4577</b>

**EA Packaging Ltd**

January	19.6			0.0000
February	18.7	0.9541	-0.0470	0.0022
March	18.5	0.9893	-0.0108	0.0001
April	18	0.9730	-0.0274	0.0008
May	18	1.0000	0.0000	0.0000
June	14	0.7778	-0.2513	0.0632
July	13.7	0.9786	-0.0217	0.0005
August	14	1.0219	0.0217	0.0005
September	10	0.7143	-0.3365	0.1132
October	10	1.0000	0.0000	0.0000
November	10.3	1.0300	0.0296	0.0009
December	7	0.6796	-0.3862	0.1492
			<b>-1.0296</b>	<b>0.3304</b>

**EA Portland Cement Ltd**

January	20			0.0000
February	20.2	1.0100	0.0100	0.0001
March	20	0.9901	-0.0100	0.0001
April	9	0.4500	-0.7985	0.6376
May	14.4	1.6000	0.4700	0.2209
June	14.5	1.0069	0.0069	0.0000
July	14.4	0.9931	-0.0069	0.0000
August	14.1	0.9792	-0.0211	0.0004
September	11.5	0.8156	-0.2038	0.0415
October	8.6	0.7478	-0.2906	0.0844
November	11.7	1.3605	0.3078	0.0948
December	11.2	0.9573	-0.0437	0.0019
			<b>-0.5798</b>	<b>1.0819</b>

**Firestone East Africa Ltd**

January	20			0.0000
February	18.9	0.9450	-0.0566	0.0032
March	17	0.8995	-0.1059	0.0112
April	17	1.0000	0.0000	0.0000
May	17	1.0000	0.0000	0.0000
June	16.5	0.9706	-0.0299	0.0009
July	17	1.0303	0.0299	0.0009
August	15.5	0.9118	-0.0924	0.0085
September	13.8	0.8903	-0.1162	0.0135
October	14.3	1.0362	0.0356	0.0013
November	14.1	0.9860	-0.0141	0.0002
December	16	1.1348	0.1264	0.0160
			<b>-0.2231</b>	<b>0.0557</b>

**East Africa Breweries Ltd**

January	59.2			0.0000
February	65.2	1.1014	0.0965	0.0093
March	70.4	1.0798	0.0767	0.0059
April	76.9	1.0923	0.0883	0.0078
May	78.3	1.0182	0.0180	0.0003
June	77.1	0.9847	-0.0154	0.0002
July	79.8	1.0350	0.0344	0.0012
August	85	1.0652	0.0631	0.0040
September	83.8	0.9859	-0.0142	0.0002
October	77.9	0.9296	-0.0730	0.0053
November	73.8	0.9474	-0.0541	0.0029
December	69.9	0.9472	-0.0543	0.0029
			<b>0.1661</b>	<b>0.0401</b>

**Kenya National Mills Ltd**

January	20.3			0.0000
February	17.5	0.8621	-0.1484	0.0220
March	14	0.8000	-0.2231	0.0498
April	13	0.9286	-0.0741	0.0055
May	13.9	1.0692	0.0669	0.0045
June	14	1.0072	0.0072	0.0001
July	13.8	0.9857	-0.0144	0.0002
August	7.5	0.5435	-0.6098	0.3718
September	10	1.3333	0.2877	0.0828
October	8.2	0.8200	-0.1985	0.0394
November	9.4	1.1463	0.1366	0.0187
December	9.5	1.0106	0.0106	0.0001
			<b>-0.7593</b>	<b>0.5948</b>

**Kenya Oil Co Ltd**

January	60.8			0.0000
February	56	0.9211	-0.0822	0.0068
March	59.3	1.0589	0.0573	0.0033
April	60	1.0118	0.0117	0.0001
May	76	1.2667	0.2364	0.0559
June	76	1.0000	0.0000	0.0000
July	70.4	0.9263	-0.0765	0.0059

August	64	0.9091	-0.0953	0.0091
September	55	0.8594	-0.1515	0.0230
October	55	1.0000	0.0000	0.0000
November	70	1.2727	0.2412	0.0582
December	67.8	0.9686	-0.0319	0.0010
			<b>0.1090</b>	<b>0.1631</b>

**Kenya Power & Lighting Ltd**

January	129.8			0.0000
February	128.8	0.9923	-0.0077	0.0001
March	115	0.8929	-0.1133	0.0128
April	117.9	1.0252	0.0249	0.0006
May	113	0.9584	-0.0424	0.0018
June	111.3	0.9850	-0.0152	0.0002
July	111	0.9973	-0.0027	0.0000
August	106.3	0.9577	-0.0433	0.0019
September	97.3	0.9153	-0.0885	0.0078
October	82.5	0.8479	-0.1650	0.0272
November	81.4	0.9867	-0.0134	0.0002
December	92.5	1.1364	0.1278	0.0163
			<b>-0.3388</b>	<b>0.0690</b>

**Total Kenya Ltd**

January	50.3			0.0000
February	42	0.8350	-0.1803	0.0325
March	41.5	0.9881	-0.0120	0.0001
April	45.9	1.1060	0.1008	0.0102
May	46.9	1.0218	0.0216	0.0005
June	47	1.0021	0.0021	0.0000
July	50	1.0638	0.0619	0.0038
August	52	1.0400	0.0392	0.0015
September	48	0.9231	-0.0800	0.0064
October	47	0.9792	-0.0211	0.0004
November	48	1.0213	0.0211	0.0004
December	48	1.0000	0.0000	0.0000
			<b>-0.0468</b>	<b>0.0559</b>

**Unga Group Ltd**

January	45.5			0.0000
February	42.2	0.9275	-0.0753	0.0057
March	34.9	0.8270	-0.1899	0.0361
April	33.5	0.9599	-0.0409	0.0017
May	27.2	0.8119	-0.2083	0.0434
June	31.1	1.1434	0.1340	0.0180
July	25.1	0.8071	-0.2143	0.0459
August	22.1	0.8805	-0.1273	0.0162
September	19	0.8597	-0.1511	0.0228
October	12	0.6316	-0.4595	0.2112
November	26	2.1667	0.7732	0.5978
December	26	1.0000	0.0000	0.0000
			<b>-0.5596</b>	<b>0.9988</b>

Computation of monthly returns- Industrial and Allied sector-1999

AGRICULTURAL SECTOR

2000

COMPANY

<i>Brooke Bond Kenya Limited</i>	Closing stock price Sh	Price relative S1/S1-1	Monthly return	
			U1=ln (S1/S1-1)	U1*U1
January	104			
February	104	1.0000	0.0000	0.0000
March	88	0.8462	-0.1671	0.0279
April	78	0.8864	-0.1206	0.0146
May	76	0.9744	-0.0260	0.0007
June	74	0.9737	-0.0267	0.0007
July	74	1.0000	0.0000	0.0000
August	73.5	0.9932	-0.0068	0.0000
September	82	1.1156	0.1094	0.0120
October	92	1.1220	0.1151	0.0132
November	97	1.0543	0.0529	0.0028
December	97	1.0000	0.0000	0.0000
			<b>-0.0697</b>	<b>0.0719</b>

*Eaagads Limited*

January	26			
February	25	0.9615	-0.0392	0.0015
March	25	1.0000	0.0000	0.0000
April	25	1.0000	0.0000	0.0000
May	25	1.0000	0.0000	0.0000
June	25	1.0000	0.0000	0.0000
July	24.5	0.9800	-0.0202	0.0004
August	24.5	1.0000	0.0000	0.0000
September	24.5	1.0000	0.0000	0.0000
October	20	0.8163	-0.2029	0.0412
November	20.5	1.0250	0.0247	0.0006
December	20.5	1.0000	0.0000	0.0000
			<b>-0.2377</b>	<b>0.0437</b>

*George Williamson Kenya Ltd*

January	93			
February	87	0.9355	-0.0667	0.0044
March	87	1.0000	0.0000	0.0000
April	90	1.0345	0.0339	0.0011
May	77	0.8556	-0.1560	0.0243
June	75	0.9740	-0.0263	0.0007
July	71.5	0.9533	-0.0478	0.0023
August	59	0.8252	-0.1922	0.0369
September	71	1.2034	0.1851	0.0343
October	91	1.2817	0.2482	0.0616
November	90.5	0.9945	-0.0055	0.0000
December	97	1.0718	0.0694	0.0048
			<b>0.0421</b>	<b>0.1705</b>

*Kakuzi Ltd*

January	97.5			
---------	------	--	--	--

February	77.5	0.7949	-0.2296	0.0527
March	70	0.9032	-0.1018	0.0104
April	67	0.9571	-0.0438	0.0019
May	67	1.0000	0.0000	0.0000
June	66.5	0.9925	-0.0075	0.0001
July	63	0.9474	-0.0541	0.0029
August	63	1.0000	0.0000	0.0000
September	53	0.8413	-0.1728	0.0299
October	51	0.9623	-0.0385	0.0015
November	55	1.0784	0.0755	0.0057
December	55	1.0000	0.0000	0.0000
			<b>-0.5725</b>	<b>0.1050</b>

**Kapchorua Tea Co Ltd**

January	150			
February	150	1.0000	0.0000	0.0000
March	150	1.0000	0.0000	0.0000
April	150	1.0000	0.0000	0.0000
May	150	1.0000	0.0000	0.0000
June	150	1.0000	0.0000	0.0000
July	150	1.0000	0.0000	0.0000
August	150	1.0000	0.0000	0.0000
September	150	1.0000	0.0000	0.0000
October	150	1.0000	0.0000	0.0000
November	150	1.0000	0.0000	0.0000
December	150	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.0000</b>

**Limuru Tea Co Ltd**

January	650			
February	650	1.0000	0.0000	0.0000
March	650	1.0000	0.0000	0.0000
April	650	1.0000	0.0000	0.0000
May	650	1.0000	0.0000	0.0000
June	650	1.0000	0.0000	0.0000
July	650	1.0000	0.0000	0.0000
August	650	1.0000	0.0000	0.0000
September	650	1.0000	0.0000	0.0000
October	650	1.0000	0.0000	0.0000
November	650	1.0000	0.0000	0.0000
December	650	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.0000</b>

**Rea Vipingo Ltd**

January	4.7			
February	4.2	0.8936	-0.1125	0.0127
March	4.05	0.9643	-0.0364	0.0013
April	4	0.9877	-0.0124	0.0002
May	4.05	1.0125	0.0124	0.0002
June	3.85	0.9506	-0.0506	0.0026
July	3.6	0.9351	-0.0671	0.0045
August	3.7	1.0278	0.0274	0.0008

September	3.7	1.0000	0.0000	0.0000
October	3.75	1.0135	0.0134	0.0002
November	3.75	1.0000	0.0000	0.0000
December	3.1	0.8267	-0.1904	0.0362
			<b>-0.4162</b>	<b>0.0585</b>

**Sasini Tea & Coffee Ltd**

January	45			
February	36	0.8000	-0.2231	0.0498
March	35.5	0.9861	-0.0140	0.0002
April	31.75	0.8944	-0.1116	0.0125
May	36.5	1.1496	0.1394	0.0194
June	35	0.9589	-0.0420	0.0018
July	34	0.9714	-0.0290	0.0008
August	34	1.0000	0.0000	0.0000
September	34.75	1.0221	0.0218	0.0005
October	34	0.9784	-0.0218	0.0005
November	35	1.0294	0.0290	0.0008
December	34	0.9714	-0.0290	0.0008
			<b>-0.2803</b>	<b>0.0871</b>

11.9				
12	1.0000	0.0000	0.0000	0.0000
22	1.0000	0.0000	0.0000	0.0000
25	1.0000	0.0000	0.0000	0.0000
26	1.0000	0.0000	0.0000	0.0000
30	1.0000	0.0000	0.0000	0.0000
31	1.0000	0.0000	0.0000	0.0000
2	1.0000	0.0000	0.0000	0.0000
24	1.0000	0.0000	0.0000	0.0000
23.25	1.0000	0.0000	0.0000	0.0000
23.26	1.0000	0.0000	0.0000	0.0000
23.25	1.0000	0.0000	0.0000	0.0000
			0.0783	0.0000
14.25				
14	0.9804	-0.0218	0.0000	
13.15	1.0021	0.0218	0.0000	
13	1.0000	0.0000	0.0000	
13.45	0.9801	-0.0218	0.0000	
12	0.9714	-0.0290	0.0000	
10.4	1.0000	0.0000	0.0000	
10.1	1.0000	0.0000	0.0000	
10	0.9714	-0.0290	0.0000	
10	1.0000	0.0000	0.0000	
10.1	0.9714	-0.0290	0.0000	
10.05	1.0000	0.0000	0.0000	
			-0.0000	0.0000



## FINANCE AND INVESTMENT SECTOR

2000

## COMPANY

<i>Barclays Bank Ltd</i>	<i>Closing stock price</i>	<i>Price relative</i>	<i>Monthly return</i>	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	101			
February	115	1.1386	0.1298	0.0169
March	90	0.7826	-0.2451	0.0601
April	90	1.0000	0.0000	0.0000
May	87	0.9667	-0.0339	0.0011
June	86	0.9885	-0.0116	0.0001
July	82	0.9535	-0.0476	0.0023
August	87	1.0610	0.0592	0.0035
September	88.5	1.0172	0.0171	0.0003
October	96.5	1.0904	0.0865	0.0075
November	80.5	0.8342	-0.1813	0.0329
December	75.5	0.9379	-0.0641	0.0041
			<b>-0.2910</b>	<b>0.1287</b>
<i>City Trust Ltd</i>				
January	21.5			
February	22	1.0233	0.0230	0.0005
March	22	1.0000	0.0000	0.0000
April	22	1.0000	0.0000	0.0000
May	20	0.9091	-0.0953	0.0091
June	20	1.0000	0.0000	0.0000
July	20	1.0000	0.0000	0.0000
August	20	1.0000	0.0000	0.0000
September	20	1.0000	0.0000	0.0000
October	23.25	1.1625	0.1506	0.0227
November	23.25	1.0000	0.0000	0.0000
December	23.25	1.0000	0.0000	0.0000
			<b>0.0783</b>	<b>0.0323</b>
<i>CFC Bank Ltd</i>				
January	14.05			
February	14	0.9964	-0.0036	0.0000
March	15.15	1.0821	0.0789	0.0062
April	16	1.0561	0.0546	0.0030
May	13.65	0.8531	-0.1588	0.0252
June	9.8	0.7179	-0.3314	0.1098
July	10.5	1.0714	0.0690	0.0048
August	10.9	1.0381	0.0374	0.0014
September	10	0.9174	-0.0862	0.0074
October	10	1.0000	0.0000	0.0000
November	9.75	0.9750	-0.0253	0.0006
December	10.05	1.0308	0.0303	0.0009
			<b>-0.3350</b>	<b>0.1594</b>
<i>Diamond Trust Bank Kenya Ltd</i>				

January	25			
February	28	1.1200	0.1133	0.0128
March	26.75	0.9554	-0.0457	0.0021
April	24.75	0.9252	-0.0777	0.0060
May	21.25	0.8586	-0.1525	0.0232
June	20	0.9412	-0.0606	0.0037
July	19.95	0.9975	-0.0025	0.0000
August	18	0.9023	-0.1029	0.0106
September	15	0.8333	-0.1823	0.0332
October	16	1.0667	0.0645	0.0042
November	14.5	0.9063	-0.0984	0.0097
December	14	0.9655	-0.0351	0.0012

**-0.5798 0.1068**

***Housing Finance Co (K) Ltd***

January	25			
February	8.55	0.3420	-1.0729	1.1512
March	9.45	1.1053	0.1001	0.0100
April	7.75	0.8201	-0.1983	0.0393
May	8	1.0323	0.0317	0.0010
June	7.05	0.8813	-0.1264	0.0160
July	7	0.9929	-0.0071	0.0001
August	6.25	0.8929	-0.1133	0.0128
September	7.8	1.2480	0.2215	0.0491
October	7	0.8974	-0.1082	0.0117
November	6.2	0.8857	-0.1214	0.0147
December	5.5	0.8871	-0.1198	0.0144

**-1.5141 1.3203**

***ICDC Investments Co Ltd***

January	50			
February	45	0.9000	-0.1054	0.0111
March	40.5	0.9000	-0.1054	0.0111
April	46.25	1.1420	0.1328	0.0176
May	47	1.0162	0.0161	0.0003
June	49.5	1.0532	0.0518	0.0027
July	45.25	0.9141	-0.0898	0.0081
August	50	1.1050	0.0998	0.0100
September	50	1.0000	0.0000	0.0000
October	50	1.0000	0.0000	0.0000
November	51	1.0200	0.0198	0.0004
December	46.5	0.9118	-0.0924	0.0085

**-0.0726 0.0697**

***Jubilee Insurance Co Ltd***

January	25.5			
February	26.5	1.0392	0.0385	0.0015
March	26.25	0.9906	-0.0095	0.0001
April	25.5	0.9714	-0.0290	0.0008

May	21.25	0.8333	-0.1823	0.0332
June	22	1.0353	0.0347	0.0012
July	22	1.0000	0.0000	0.0000
August	19.7	0.8955	-0.1104	0.0122
September	18	0.9137	-0.0902	0.0081
October	19	1.0556	0.0541	0.0029
November	19	1.0000	0.0000	0.0000
December	18.5	0.9737	-0.0267	0.0007
			<b>-0.3209</b>	<b>0.0608</b>

**Kenya Commercial Bank Ltd**

January	35			
February	31.5	0.9000	-0.1054	0.0111
March	25	0.7937	-0.2311	0.0534
April	26.5	1.0600	0.0583	0.0034
May	27.5	1.0377	0.0370	0.0014
June	28	1.0182	0.0180	0.0003
July	23.75	0.8482	-0.1646	0.0271
August	25	1.0526	0.0513	0.0026
September	27	1.0800	0.0770	0.0059
October	27	1.0000	0.0000	0.0000
November	28	1.0370	0.0364	0.0013
December	25.5	0.9107	-0.0935	0.0087
			<b>-0.3167</b>	<b>0.1153</b>

**National Bank of Kenya Ltd**

January	5			
February	4	0.8000	-0.2231	0.0498
March	3.55	0.8875	-0.1193	0.0142
April	4.1	1.1549	0.1440	0.0207
May	3.95	0.9634	-0.0373	0.0014
June	3.6	0.9114	-0.0928	0.0086
July	4	1.1111	0.1054	0.0111
August	4.05	1.0125	0.0124	0.0002
September	4.1	1.0123	0.0123	0.0002
October	5	1.2195	0.1985	0.0394
November	3.95	0.7900	-0.2357	0.0556
December	3.15	0.7975	-0.2263	0.0512
			<b>-0.4620</b>	<b>0.2524</b>

**National Industrial Credit Ltd**

January	25.5			
February	26	1.0196	0.0194	0.0004
March	27	1.0385	0.0377	0.0014
April	27	1.0000	0.0000	0.0000
May	27.75	1.0278	0.0274	0.0008
June	21	0.7568	-0.2787	0.0777
July	25	1.1905	0.1744	0.0304
August	26	1.0400	0.0392	0.0015
September	24.5	0.9423	-0.0594	0.0035

October	23	0.9388	-0.0632	0.0040
November	20	0.8696	-0.1398	0.0195
December	17.75	0.8875	-0.1193	0.0142
			<b>-0.3623</b>	<b>0.1535</b>

**Pan Africa Insurance Ltd**

January	25.5			
February	21	0.8235	-0.1942	0.0377
March	21	1.0000	0.0000	0.0000
April	21.75	1.0357	0.0351	0.0012
May	21	0.9655	-0.0351	0.0012
June	20	0.9524	-0.0488	0.0024
July	19.45	0.9725	-0.0279	0.0008
August	19	0.9769	-0.0234	0.0005
September	17.75	0.9342	-0.0681	0.0046
October	17.75	1.0000	0.0000	0.0000
November	16	0.9014	-0.1038	0.0108
December	11	0.6875	-0.3747	0.1404
			<b>-0.8408</b>	<b>0.1997</b>

**Standard Chartered Bank Ltd**

January	57			
February	75.5	1.3246	0.2811	0.0790
March	52.5	0.6954	-0.3633	0.1320
April	47.75	0.9095	-0.0948	0.0090
May	47	0.9843	-0.0158	0.0003
June	48	1.0213	0.0211	0.0004
July	51	1.0625	0.0606	0.0037
August	54	1.0588	0.0572	0.0033
September	55	1.0185	0.0183	0.0003
October	55	1.0000	0.0000	0.0000
November	49.5	0.9000	-0.1054	0.0111
December	49.5	1.0000	0.0000	0.0000
			<b>-0.1411</b>	<b>0.2391</b>

## COMMERCIAL AND SERVICES SECTOR

2000

## COMPANY

Africa Lakes Corporation Plc	Closing stock price Sh	Price relative S1/S1-1	Monthly return	
			U1=ln (S1/S1-1)	U1*U1
January	Not listed			0.0000
February	Not listed			0.0000
March	128			0.0000
April	120	0.9375	-0.0645	0.0042
May	97	0.8083	-0.2128	0.0453
June	61	0.6289	-0.4638	0.2151
July	61	1.0000	0.0000	0.0000
August	65.5	1.0738	0.0712	0.0051
September	57	0.8702	-0.1390	0.0193
October	57	1.0000	0.0000	0.0000
November	57	1.0000	0.0000	0.0000
December	34.5	0.6053	-0.5021	0.2521
			<b>-1.3111</b>	<b>0.5411</b>
<b>A Baumann &amp; Co Ltd</b>				
January	14.7			0.0000
February	14.7	1.0000	0.0000	0.0000
March	14.3	0.9728	-0.0276	0.0008
April	14	0.9790	-0.0212	0.0004
May	14	1.0000	0.0000	0.0000
June	13.8	0.9857	-0.0144	0.0002
July	13	0.9420	-0.0597	0.0036
August	12	0.9231	-0.0800	0.0064
September	11.8	0.9833	-0.0168	0.0003
October	9.5	0.8051	-0.2168	0.0470
November	9.5	1.0000	0.0000	0.0000
December	9.5	1.0000	0.0000	0.0000
			<b>-0.4366</b>	<b>0.0587</b>
<b>C M C Holdings Ltd</b>				
January	30			0.0000
February	30	1.0000	0.0000	0.0000
March	25	0.8333	-0.1823	0.0332
April	19.75	0.7900	-0.2357	0.0556
May	17.8	0.9013	-0.1040	0.0108
June	16.8	0.9438	-0.0578	0.0033
July	16.75	0.9970	-0.0030	0.0000
August	16.4	0.9791	-0.0211	0.0004
September	16	0.9756	-0.0247	0.0006
October	16	1.0000	0.0000	0.0000
November	15.7	0.9813	-0.0189	0.0004
December	15.25	0.9713	-0.0291	0.0008
			<b>-0.6766</b>	<b>0.1052</b>
<b>Car &amp; General (K) Ltd</b>				
January	10			0.0000

February	10	1.0000	0.0000	0.0000
March	10	1.0000	0.0000	0.0000
April	10	1.0000	0.0000	0.0000
May	10.25	1.0250	0.0247	0.0006
June	10.05	0.9805	-0.0197	0.0004
July	19	1.8905	0.6369	0.4056
August	19	1.0000	0.0000	0.0000
September	19	1.0000	0.0000	0.0000
October	10	0.5263	-0.6419	0.4120
November	10	1.0000	0.0000	0.0000
December	10	1.0000	0.0000	0.0000
			<b>0.0000</b>	<b>0.8186</b>

**Express Kenya Ltd**

January	19.1			0.0000
February	19.35	1.0131	0.0130	0.0002
March	19.65	1.0155	0.0154	0.0002
April	19.65	1.0000	0.0000	0.0000
May	19.05	0.9695	-0.0310	0.0010
June	19.05	1.0000	0.0000	0.0000
July	17.5	0.9186	-0.0849	0.0072
August	17	0.9714	-0.0290	0.0008
September	16.75	0.9853	-0.0148	0.0002
October	18	1.0746	0.0720	0.0052
November	17.9	0.9944	-0.0056	0.0000
December	17.9	1.0000	0.0000	0.0000
			<b>-0.0649</b>	<b>0.0148</b>

**Kenya Airways Ltd**

January	7.5			0.0000
February	7.1	0.9467	-0.0548	0.0030
March	7.5	1.0563	0.0548	0.0030
April	7.65	1.0200	0.0198	0.0004
May	8.1	1.0588	0.0572	0.0033
June	8	0.9877	-0.0124	0.0002
July	7	0.8750	-0.1335	0.0178
August	8.2	1.1714	0.1582	0.0250
September	8.7	1.0610	0.0592	0.0035
October	8.95	1.0287	0.0283	0.0008
November	8.7	0.9721	-0.0283	0.0008
December	9	1.0345	0.0339	0.0011
			<b>0.1823</b>	<b>0.0589</b>

**Marshalls (EA) Ltd**

January	23.5			0.0000
February	23.5	1.0000	0.0000	0.0000
March	23.5	1.0000	0.0000	0.0000
April	23.5	1.0000	0.0000	0.0000
May	23.5	1.0000	0.0000	0.0000
June	19.3	0.8213	-0.1969	0.0388
July	19.3	1.0000	0.0000	0.0000
August	19.3	1.0000	0.0000	0.0000

September	19.3	1.0000	0.0000	0.0000
October	18.6	0.9637	-0.0369	0.0014
November	18.6	1.0000	0.0000	0.0000
December	18.6	1.0000	0.0000	0.0000
			<b>-0.2338</b>	<b>0.0401</b>

***Nation Media Group Ltd***

January	93			0.0000
February	90.5	0.9731	-0.0272	0.0007
March	87.5	0.9669	-0.0337	0.0011
April	75	0.8571	-0.1542	0.0238
May	74	0.9867	-0.0134	0.0002
June	75	1.0135	0.0134	0.0002
July	75	1.0000	0.0000	0.0000
August	69	0.9200	-0.0834	0.0070
September	68.5	0.9928	-0.0073	0.0001
October	70	1.0219	0.0217	0.0005
November	69	0.9857	-0.0144	0.0002
December	69	1.0000	0.0000	0.0000
			<b>-0.2985</b>	<b>0.0337</b>

***Pearl Drycleaners Ltd***

January	3			0.0000
February	3	1.0000	0.0000	0.0000
March	3	1.0000	0.0000	0.0000
April	3	1.0000	0.0000	0.0000
May	3	1.0000	0.0000	0.0000
June	2.4	0.8000	-0.2231	0.0498
July	2.4	1.0000	0.0000	0.0000
August	2.4	1.0000	0.0000	0.0000
September	2.05	0.8542	-0.1576	0.0248
October	2.05	1.0000	0.0000	0.0000
November	2.05	1.0000	0.0000	0.0000
December	2.05	1.0000	0.0000	0.0000
			<b>-0.3808</b>	<b>0.0746</b>

***Standard Newspapers Ltd***

January	10.75			0.0000
February	10.5	0.9767	-0.0235	0.0006
March	10.05	0.9571	-0.0438	0.0019
April	8.05	0.8010	-0.2219	0.0492
May	8.75	1.0870	0.0834	0.0070
June	6.1	0.6971	-0.3608	0.1302
July	16	2.6230	0.9643	0.9299
August	17.1	1.0688	0.0665	0.0044
September	16.4	0.9591	-0.0418	0.0017
October	16.5	1.0061	0.0061	0.0000
November	16.6	1.0061	0.0060	0.0000
December	15.8	0.9518	-0.0494	0.0024
			<b>0.3851</b>	<b>1.1274</b>

***Tourism Promotion Services (Serena)***

January	16.15			0.0000
February	16.15	1.0000	0.0000	0.0000
March	17.95	1.1115	0.1057	0.0112
April	17	0.9471	-0.0544	0.0030
May	16.2	0.9529	-0.0482	0.0023
June	15.95	0.9846	-0.0156	0.0002
July	6.3	0.3950	-0.9289	0.8629
August	6.25	0.9921	-0.0080	0.0001
September	7.4	1.1840	0.1689	0.0285
October	7.2	0.9730	-0.0274	0.0008
November	7.5	1.0417	0.0408	0.0017
December	7.15	0.9533	-0.0478	0.0023
			<b>-0.8148</b>	<b>0.9129</b>

**Uchumi Supermarkets Ltd**

January	40			0.0000
February	43.5	1.0875	0.0839	0.0070
March	43.25	0.9943	-0.0058	0.0000
April	43.25	1.0000	0.0000	0.0000
May	42.25	0.9769	-0.0234	0.0005
June	42.75	1.0118	0.0118	0.0001
July	41.5	0.9708	-0.0297	0.0009
August	44	1.0602	0.0585	0.0034
September	45.25	1.0284	0.0280	0.0008
October	50	1.1050	0.0998	0.0100
November	46.5	0.9300	-0.0726	0.0053
December	49	1.0538	0.0524	0.0027
			<b>0.2029</b>	<b>0.0308</b>



## INDUSTRIAL AND ALLIED SECTOR

2000

## COMPANY

*Athi River Mining Ltd*

	<i>Closing stock price</i>	<i>Price relative</i>	<i>Monthly return</i>	
	Sh	S1/S1-1	U1=ln (S1/S1-1)	U1*U1
January	4.75			0.0000
February	4.8	1.0105	0.0105	0.0001
March	6.3	1.3125	0.2719	0.0739
April	6.4	1.0159	0.0157	0.0002
May	6	0.9375	-0.0645	0.0042
June	4.55	0.7583	-0.2766	0.0765
July	4.5	0.9890	-0.0110	0.0001
August	4.6	1.0222	0.0220	0.0005
September	4.5	0.9783	-0.0220	0.0005
October	4.5	1.0000	0.0000	0.0000
November	4.35	0.9667	-0.0339	0.0011
December	4	0.9195	-0.0839	0.0070
			<b>-0.1719</b>	<b>0.1643</b>

*Bamburi Cement Ltd*

January	26.25			0.0000
February	26	0.9905	-0.0096	0.0001
March	27.5	1.0577	0.0561	0.0031
April	26.5	0.9636	-0.0370	0.0014
May	28.5	1.0755	0.0728	0.0053
June	29.25	1.0263	0.0260	0.0007
July	32	1.0940	0.0899	0.0081
August	31.75	0.9922	-0.0078	0.0001
September	32.25	1.0157	0.0156	0.0002
October	34	1.0543	0.0528	0.0028
November	33.25	0.9779	-0.0223	0.0005
December	33.75	1.0150	0.0149	0.0002
			<b>0.2513</b>	<b>0.0225</b>

*British American Tobacco Ltd*

January	73			0.0000
February	94	1.2877	0.2528	0.0639
March	64	0.6809	-0.3844	0.1478
April	62	0.9688	-0.0317	0.0010
May	61	0.9839	-0.0163	0.0003
June	57	0.9344	-0.0678	0.0046
July	60	1.0526	0.0513	0.0026
August	64.5	1.0750	0.0723	0.0052
September	70	1.0853	0.0818	0.0067
October	71	1.0143	0.0142	0.0002
November	67	0.9437	-0.0580	0.0034
December	60.5	0.9030	-0.1020	0.0104
			<b>-0.1878</b>	<b>0.2461</b>

*B O C Gases Ltd*

January	64			0.0000
---------	----	--	--	--------

February	64	1.0000	0.0000	0.0000
March	65	1.0156	0.0155	0.0002
April	63	0.9692	-0.0313	0.0010
May	50.5	0.8016	-0.2212	0.0489
June	47.25	0.9356	-0.0665	0.0044
July	48.25	1.0212	0.0209	0.0004
August	41	0.8497	-0.1628	0.0265
September	43	1.0488	0.0476	0.0023
October	44	1.0233	0.0230	0.0005
November	44.5	1.0114	0.0113	0.0001
December	47.25	1.0618	0.0600	0.0036
			<b>-0.3034</b>	<b>0.0880</b>

**Carbacid Investments Ltd**

January	67			0.0000
February	70	1.0448	0.0438	0.0019
March	70.4	1.0057	0.0057	0.0000
April	69	0.9801	-0.0201	0.0004
May	56.5	0.8188	-0.1999	0.0399
June	50	0.8850	-0.1222	0.0149
July	49	0.9800	-0.0202	0.0004
August	48	0.9796	-0.0206	0.0004
September	50	1.0417	0.0408	0.0017
October	59	1.1800	0.1655	0.0274
November	46.5	0.7881	-0.2381	0.0567
December	40	0.8602	-0.1506	0.0227
			<b>-0.5158</b>	<b>0.1665</b>

**Crown Berger Ltd**

January	10			0.0000
February	9.65	0.9650	-0.0356	0.0013
March	10.4	1.0777	0.0748	0.0056
April	11.85	1.1394	0.1305	0.0170
May	12.8	1.0802	0.0771	0.0059
June	12.5	0.9766	-0.0237	0.0006
July	11.05	0.8840	-0.1233	0.0152
August	11.4	1.0317	0.0312	0.0010
September	10.65	0.9342	-0.0681	0.0046
October	8.5	0.7981	-0.2255	0.0508
November	8.55	1.0059	0.0059	0.0000
December	9	1.0526	0.0513	0.0026
			<b>-0.1054</b>	<b>0.1047</b>

**Dunlop Kenya Ltd**

January	9.75			0.0000
February	8.55	0.8769	-0.1313	0.0172
March	8	0.9357	-0.0665	0.0044
April	7.8	0.9750	-0.0253	0.0006
May	8.5	1.0897	0.0859	0.0074
June	7.5	0.8824	-0.1252	0.0157
July	7.5	1.0000	0.0000	0.0000
August	7.5	1.0000	0.0000	0.0000

September	7.5	1.0000	0.0000	0.0000
October	7	0.9333	-0.0690	0.0048
November	6.4	0.9143	-0.0896	0.0080
December	6.4	1.0000	0.0000	0.0000
			<b>-0.4210</b>	<b>0.0582</b>

**EA Cables Ltd**

January	12.7			0.0000
February	11.75	0.9252	-0.0777	0.0060
March	9.5	0.8085	-0.2126	0.0452
April	9.55	1.0053	0.0052	0.0000
May	9.5	0.9948	-0.0052	0.0000
June	8	0.8421	-0.1719	0.0295
July	6	0.7500	-0.2877	0.0828
August	6.9	1.1500	0.1398	0.0195
September	9.7	1.4058	0.3406	0.1160
October	9.7	1.0000	0.0000	0.0000
November	8	0.8247	-0.1927	0.0371
December	9.25	1.1563	0.1452	0.0211
			<b>-0.3170</b>	<b>0.3573</b>

**EA Packaging Ltd**

January	11			0.0000
February	12.35	1.1227	0.1158	0.0134
March	12.8	1.0364	0.0358	0.0013
April	13.05	1.0195	0.0193	0.0004
May	13	0.9962	-0.0038	0.0000
June	13.2	1.0154	0.0153	0.0002
July	14.1	1.0682	0.0660	0.0044
August	14.5	1.0284	0.0280	0.0008
September	14.5	1.0000	0.0000	0.0000
October	14.3	0.9862	-0.0139	0.0002
November	6.4	0.4476	-0.8040	0.6464
December	7.5	1.1719	0.1586	0.0252
			<b>-0.3830</b>	<b>0.6921</b>

**EA Portland Cement Ltd**

January	11.35			0.0000
February	11.5	1.0132	0.0131	0.0002
March	10.05	0.8739	-0.1348	0.0182
April	11.55	1.1493	0.1391	0.0194
May	11.1	0.9610	-0.0397	0.0016
June	12.4	1.1171	0.1108	0.0123
July	12.65	1.0202	0.0200	0.0004
August	12.5	0.9881	-0.0119	0.0001
September	12.5	1.0000	0.0000	0.0000
October	12	0.9600	-0.0408	0.0017
November	11.75	0.9792	-0.0211	0.0004
December	11.7	0.9957	-0.0043	0.0000
			<b>0.0304</b>	<b>0.0542</b>

**Firestone East Africa Ltd**

January	16			0.0000
February	12.9	0.8063	-0.2154	0.0464
March	12.6	0.9767	-0.0235	0.0006
April	12.5	0.9921	-0.0080	0.0001
May	11.5	0.9200	-0.0834	0.0070
June	12.95	1.1261	0.1187	0.0141
July	12	0.9266	-0.0762	0.0058
August	11.05	0.9208	-0.0825	0.0068
September	12	1.0860	0.0825	0.0068
October	12.5	1.0417	0.0408	0.0017
November	12	0.9600	-0.0408	0.0017
December	11.5	0.9583	-0.0426	0.0018
			<b>-0.3302</b>	<b>0.0926</b>

**East Africa Breweries Ltd**

January	66.5			0.0000
February	70	1.0526	0.0513	0.0026
March	70	1.0000	0.0000	0.0000
April	69	0.9857	-0.0144	0.0002
May	66.5	0.9638	-0.0369	0.0014
June	65.5	0.9850	-0.0152	0.0002
July	68	1.0382	0.0375	0.0014
August	76	1.1176	0.1112	0.0124
September	79	1.0395	0.0387	0.0015
October	80	1.0127	0.0126	0.0002
November	81	1.0125	0.0124	0.0002
December	74.5	0.9198	-0.0837	0.0070
			<b>0.1136</b>	<b>0.0270</b>

**Kenya National Mills Ltd**

January	9.4			0.0000
February	9.05	0.9628	-0.0379	0.0014
March	16.7	1.8453	0.6126	0.3753
April	12.5	0.7485	-0.2897	0.0839
May	11.5	0.9200	-0.0834	0.0070
June	10.5	0.9130	-0.0910	0.0083
July	8.5	0.8095	-0.2113	0.0447
August	8	0.9412	-0.0606	0.0037
September	9.3	1.1625	0.1506	0.0227
October	7.6	0.8172	-0.2019	0.0407
November	7.05	0.9276	-0.0751	0.0056
December	7	0.9929	-0.0071	0.0001
			<b>-0.2948</b>	<b>0.5934</b>

**Kenya Oil Co Ltd**

January	70			0.0000
February	79	1.1286	0.1210	0.0146
March	76	0.9620	-0.0387	0.0015
April	84	1.1053	0.1001	0.0100
May	76.5	0.9107	-0.0935	0.0087
June	82	1.0719	0.0694	0.0048
July	80	0.9756	-0.0247	0.0006

August	78	0.9750	-0.0253	0.0006
September	81	1.0385	0.0377	0.0014
October	79	0.9753	-0.0250	0.0006
November	78	0.9873	-0.0127	0.0002
December	73	0.9359	-0.0662	0.0044
			<b>0.0420</b>	<b>0.0476</b>

**Kenya Power & Lighting Ltd**

January	93.5			0.0000
February	91.5	0.9786	-0.0216	0.0005
March	88	0.9617	-0.0390	0.0015
April	78	0.8864	-0.1206	0.0146
May	50	0.6410	-0.4447	0.1977
June	51.5	1.0300	0.0296	0.0009
July	50.5	0.9806	-0.0196	0.0004
August	46.5	0.9208	-0.0825	0.0068
September	44	0.9462	-0.0553	0.0031
October	41	0.9318	-0.0706	0.0050
November	44.75	1.0915	0.0875	0.0077
December	40	0.8939	-0.1122	0.0126
			<b>-0.8491</b>	<b>0.2506</b>

**Total Kenya Ltd**

January	49			0.0000
February	65	1.3265	0.2826	0.0798
March	48.75	0.7500	-0.2877	0.0828
April	49	1.0051	0.0051	0.0000
May	49	1.0000	0.0000	0.0000
June	51	1.0408	0.0400	0.0016
July	55	1.0784	0.0755	0.0057
August	56.5	1.0273	0.0269	0.0007
September	56.5	1.0000	0.0000	0.0000
October	56	0.9912	-0.0089	0.0001
November	57	1.0179	0.0177	0.0003
December	55	0.9649	-0.0357	0.0013
			<b>0.1155</b>	<b>0.1723</b>

**Unga Group Ltd**

January	18.6			0.0000
February	18.6	1.0000	0.0000	0.0000
March	24.75	1.3306	0.2857	0.0816
April	30.25	1.2222	0.2007	0.0403
May	27.75	0.9174	-0.0863	0.0074
June	15.4	0.5550	-0.5889	0.3468
July	14.5	0.9416	-0.0602	0.0036
August	13.5	0.9310	-0.0715	0.0051
September	14.95	1.1074	0.1020	0.0104
October	14.75	0.9866	-0.0135	0.0002
November	14.5	0.9831	-0.0171	0.0003
December	13.9	0.9586	-0.0423	0.0018
			<b>-0.2913</b>	<b>0.4975</b>

## **APPENDIX 2- COMPUTATION OF ESTIMATED VOLATILITIES**

## ESTIMATED VOLATILITY 1997

SECTOR	COMPANY	u12	n-1	$\frac{a}{u12/n-1}$	u1	$\frac{u1^2}{u1^2/n-1}$	n(n-1)	$\frac{b}{u1^2/n(n-1)}$	a-b	c	$\frac{c}{\sqrt{a-b}}$	Trading months	d	Volatility	Volatility
Agricultural	Brooke Bond Kenya Limited	0.0263436	11	0.002395	-0.30346594	0.092092	132	0.000698	0.001697209	0.041197	12	3.464102	0.142711	14%	
	Eaagads Limited	0.25781642	11	0.023438	0.432616097	0.187157	132	0.001418	0.022020002	0.148391	12	3.464102	0.514043	51%	
	George Williamson Kenya Ltd	0.42633173	11	0.038757	0.15706189	0.024668	132	0.000187	0.038570548	0.196394	12	3.464102	0.680328	68%	
	Kakuzi Ltd	0.23582985	11	0.021439	-0.020619287	0.000425	132	3.22E-06	0.021435857	0.14641	12	3.464102	0.507179	51%	
	Kapchorua Tea Co Ltd	0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
	Limuru Tea Co Ltd	0.11290047	11	0.010264	-0.550046337	0.302551	132	0.002292	0.007971626	0.089284	12	3.464102	0.309289	31%	
	Rea Vipingo Ltd	0.06886309	11	0.00626	-0.200670695	0.040269	132	0.000305	0.005955215	0.07717	12	3.464102	0.267325	27%	
	Sasini Tea & Coffee Ltd	0.146429	11	0.013312	0.44895022	0.201556	132	0.001527	0.011784785	0.108558	12	3.464102	0.376055	38%	
	Finance & Investment	Barclays Bank Ltd	0.02591979	11	0.002356	1.80411E-16	3.25E-32	132	2.47E-34	0.002356344	0.048542	12	3.464102	0.168155	17%
		City Trust Ltd	0.01861278	11	0.001692	0.029852963	0.000891	132	6.75E-06	0.001685319	0.041053	12	3.464102	0.142211	14%
		CFC Bank Ltd	0.1372008	11	0.012473	-0.234193388	0.054847	132	0.000416	0.012057296	0.109806	12	3.464102	0.380378	38%
		Diamond Trust Bank Kenya Ltd	0.07930236	11	0.007209	-0.506269807	0.256309	132	0.001942	0.005267569	0.072578	12	3.464102	0.251418	25%
		Housing Finance Co (K) Ltd	0.02235066	11	0.002032	-0.233614851	0.054576	132	0.000413	0.001618425	0.04023	12	3.464102	0.13936	14%
		ICDC Investments Co Ltd	0.52972471	11	0.048157	-0.133531393	0.017831	132	0.000135	0.048021712	0.219139	12	3.464102	0.759118	76%
		Jubilee Insurance Co Ltd	0.07235804	11	0.006578	-0.039740329	0.001579	132	1.2E-05	0.006566039	0.081031	12	3.464102	0.2807	28%
Kenya Commercial Bank Ltd		0.10596887	11	0.009634	-0.156004248	0.024337	132	0.000184	0.00944916	0.097207	12	3.464102	0.336734	34%	
National Bank of Kenya Ltd		0.09136901	11	0.008306	-0.207639365	0.043114	132	0.000327	0.007979652	0.089329	12	3.464102	0.309444	31%	
National Industrial Credit Ltd		0.05314311	11	0.004831	-3.29597E-16	1.09E-31	132	8.23E-34	0.004831192	0.069507	12	3.464102	0.240779	24%	
Regent Undervalued Assets Africa Fund		0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
Pan Africa Insurance Ltd		0.11127072	11	0.010116	-0.194156014	0.037697	132	0.000286	0.00982994	0.099146	12	3.464102	0.343452	34%	
Standard Chartered Bank Ltd		0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
Commercial & Services		Africa Lakes Corporation Plc	Not listed												
		A Baumann & Co Ltd	0.34004016	11	0.030913	-0.723918839	0.524058	132	0.00397	0.026942602	0.164142	12	3.464102	0.568605	57%
		CMC Holdings Ltd	0.1314832	11	0.011953	0.133531393	0.017831	132	0.000135	0.011817937	0.10871	12	3.464102	0.376584	38%
		Car & General (K) Ltd	0.05236384	11	0.004476	-0.223143551	0.049793	132	0.000377	0.004383129	0.066205	12	3.464102	0.229342	23%
		Express Kenya Ltd	0.03718115	11	0.00338	-0.253195896	0.064108	132	0.000486	0.002894437	0.0538	12	3.464102	0.186369	19%
	Kenya Airways Ltd	0.01690331	11	0.001537	-0.060624622	0.003675	132	2.78E-05	0.001508821	0.038844	12	3.464102	0.134558	13%	
	Lonhro Motors (EA) Ltd	1.44113698	11	0.131012	-1.188468618	1.412458	132	0.0107	0.120312016	0.34686	12	3.464102	1.201559	120%	
	Marshall's (EA) Ltd	1.27028396	11	0.11548	-0.147157644	0.021655	132	0.000164	0.115316304	0.339583	12	3.464102	1.176348	118%	
	Nation Media Group Ltd	0.28549228	11	0.025954	0.147809504	0.021848	132	0.000166	0.025788331	0.160587	12	3.464102	0.556291	56%	
	Pearl Drycleaners Ltd	0.0295037	11	0.002682	0.09531018	0.009084	132	6.88E-05	0.002613336	0.051121	12	3.464102	0.177088	18%	
	Standard Newspapers Ltd	0.71021006	11	0.064565	1.767527156	3.124152	132	0.023668	0.040896731	0.202229	12	3.464102	0.700543	70%	
	Tourism Promotion Services (Serena)	Not listed for a full year													
	Uchumi Supermarkets Ltd	0.18426475	11	0.016751	-0.019048195	0.000363	132	2.75E-06	0.016748592	0.129416	12	3.464102	0.448311	45%	
	Industrial and Allied	Athi River Mining Ltd	Not listed for a full year												
		Bamburi Cement Ltd	0.18859608	11	0.017145	-0.105360516	0.011101	132	8.41E-05	0.017061001	0.130618	12	3.464102	0.452473	45%
		British American Tobacco Ltd	0.10389176	11	0.009445	-0.506817602	0.256864	132	0.001946	0.007498766	0.086595	12	3.464102	0.299975	30%
B O C Gases Ltd		1.10407477	11	0.10037	-0.0588405	0.003462	132	2.62E-05	0.100344204	0.316772	12	3.464102	1.097329	110%	
Carbacid Investments Ltd		0.03777046	11	0.003434	-0.217064505	0.047117	132	0.000357	0.003076731	0.055468	12	3.464102	0.192148	19%	
Crown Berger Ltd		0.13164115	11	0.011967	-0.223143551	0.049793	132	0.000377	0.011590158	0.107658	12	3.464102	0.372937	37%	
Dunlop Kenya Ltd		2.46415833	11	0.224014	-1.011600912	1.023336	132	0.007753	0.216261846	0.46504	12	3.464102	1.610944	161%	
EA Cables Ltd		0.07642113	11	0.006947	-0.243622083	0.059352	132	0.00045	0.006497741	0.080609	12	3.464102	0.279236	28%	
EA Packaging Ltd		0.23386101	11	0.02126	-0.356674944	0.127217	132	0.000964	0.020296326	0.142465	12	3.464102	0.493514	49%	
EA Portland Cement Ltd		0.31424768	11	0.028568	-0.202940844	0.041185	132	0.000312	0.028255963	0.168095	12	3.464102	0.582299	58%	
Firestone East Africa Ltd		0.11647808	11	0.010589	-0.223143551	0.049793	132	0.000377	0.010211696	0.101053	12	3.464102	0.350058	35%	
East Africa Breweries Ltd		0.05949239	11	0.005408	-0.068992871	0.004476	132	3.61E-05	0.005372338	0.073296	12	3.464102	0.253906	25%	
Kenya National Mills Ltd		0.10775095	11	0.009796	0.062738341	0.003936	132	2.98E-05	0.009765722	0.098822	12	3.464102	0.342328	34%	
Kenya Oil Co Ltd		0.05620698	11	0.00511	-0.391478866	0.153256	132	0.001161	0.003948697	0.062839	12	3.464102	0.217679	22%	
Kenya Power & Lighting Ltd		0.24599799	11	0.022363	0.693147181	0.480453	132	0.00364	0.018723658	0.136834	12	3.464102	0.474008	47%	
Total Kenya Ltd		0.32084661	11	0.029168	-0.573002869	0.328332	132	0.002487	0.026680508	0.163342	12	3.464102	0.565832	57%	
Unga Group Ltd		0.13773895	11	0.012522	-1.11022E-16	1.23E-32	132	9.34E-35	0.012521723	0.111901	12	3.464102	0.387635	39%	

## ESTIMATED VOLATILITY-1998

SECTOR	COMPANY	u12	n-1	a	u1	u1*u1	n(n-1)	b	a-b	c	Trading months	d	Volatility	Volatility	
				u12/n-1				u1*u1/n(n-1)		sqrt(a-b)					
Agricultural	<i>Brooke Bond Kenya Limited</i>	0.049668	11	0.004515	0.07124674	0.005076	132	3.85E-05	0.004477	0.066909	12	3.464102	0.23178	23%	
	<i>Eaagads Limited</i>	0.081524	11	0.007411	0.079464171	0.006315	132	4.78E-05	0.007363	0.08581	12	3.464102	0.297255	30%	
	<i>George Williamson Kenya Ltd</i>	0.053559	11	0.004869	0.255346692	0.065202	132	0.000494	0.004375	0.066144	12	3.464102	0.22913	23%	
	<i>Kakuzi Ltd</i>	0.068609	11	0.006237	0.232112221	0.053876	132	0.000408	0.005829	0.076348	12	3.464102	0.264477	26%	
	<i>Kapchorua Tea Co Ltd</i>	0.053865	11	0.004897	0.30538165	0.093258	132	0.000706	0.00419	0.064733	12	3.464102	0.224241	22%	
	<i>Limuru Tea Co Ltd</i>	0.000315	11	2.86E-05	0.006600684	4.36E-05	132	3.3E-07	2.83E-05	0.005317	12	3.464102	0.018418	2%	
	<i>Rea Vipingo Ltd</i>	0.026992	11	0.002454	-0.223143551	0.049793	132	0.000377	0.002077	0.04557	12	3.464102	0.157858	16%	
	<i>Sasini Tea &amp; Coffee Ltd</i>	0.180612	11	0.016419	0.123350079	0.015215	132	0.000115	0.016304	0.127687	12	3.464102	0.442321	44%	
	Finance & Investment	<i>Barclays Bank Ltd</i>	0.145619	11	0.013238	0.058989298	0.00348	132	2.84E-05	0.013212	0.114942	12	3.464102	0.398171	40%
		<i>City Trust Ltd</i>	0.631576	11	0.057416	-1.048863811	1.100115	132	0.008334	0.049082	0.221544	12	3.464102	0.767451	77%
		<i>CFC Bank Ltd</i>	0.057296	11	0.005209	-0.243448817	0.059267	132	0.000449	0.00476	0.068991	12	3.464102	0.238991	24%
		<i>Diamond Trust Bank Kenya Ltd</i>	0.035165	11	0.003197	-0.050819248	0.002583	132	1.96E-05	0.003177	0.056367	12	3.464102	0.195261	20%
		<i>Housing Finance Co (K) Ltd</i>	0.094444	11	0.008586	-0.018237588	0.000333	132	2.52E-06	0.008583	0.092646	12	3.464102	0.320936	32%
<i>ICDC Investments Co Ltd</i>		0.126459	11	0.011496	-0.152782691	0.023343	132	0.000177	0.011319	0.106393	12	3.464102	0.368555	37%	
<i>Jubilee Insurance Co Ltd</i>		0.035847	11	0.003259	-0.112267302	0.012604	132	9.55E-05	0.003163	0.056243	12	3.464102	0.194833	19%	
<i>Kenya Commercial Bank Ltd</i>		0.057707	11	0.005246	-0.292961273	0.085826	132	0.00065	0.004596	0.067793	12	3.464102	0.234842	23%	
<i>National Bank of Kenya Ltd</i>		0.344264	11	0.031297	-0.373966441	0.139851	132	0.001059	0.030237	0.173889	12	3.464102	0.602368	60%	
<i>National Industrial Credit Ltd</i>		0.281901	11	0.025627	-0.349730472	0.122311	132	0.000927	0.024701	0.157165	12	3.464102	0.544434	54%	
<i>Regent Undervalued Assets Africa Fu</i>		0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
<i>Pan Africa Insurance Ltd</i>		0.042126	11	0.00383	-0.379174413	0.143773	132	0.001089	0.00274	0.05235	12	3.464102	0.181345	18%	
<i>Standard Chartered Bank Ltd</i>		0.104646	11	0.009513	0.086835553	0.00754	132	5.71E-05	0.009456	0.097243	12	3.464102	0.336858	34%	
Commercial & Services		<i>Africa Lakes Corporation Plc</i>	NOT LISTED												
		<i>A Baumann &amp; Co Ltd</i>	0.011844	11	0.001077	0.080042708	0.006407	132	4.85E-05	0.001028	0.032066	12	3.464102	0.11108	11%
	<i>CMC Holdings Ltd</i>	0.102374	11	0.009307	-0.575932165	0.331698	132	0.002513	0.006794	0.082425	12	3.464102	0.285529	29%	
	<i>Car &amp; General (K) Ltd</i>	0.192306	11	0.017482	-0.525714236	0.276375	132	0.002094	0.015389	0.124051	12	3.464102	0.429724	43%	
	<i>Express Kenya Ltd</i>	0.191022	11	0.017366	-0.930179844	0.865235	132	0.006555	0.010811	0.103975	12	3.464102	0.360181	36%	
	<i>Kenya Airways Ltd</i>	0.058774	11	0.005343	0.064538521	0.004165	132	3.16E-05	0.005312	0.072881	12	3.464102	0.252465	25%	
	<i>Lonhro Motors (EA) Ltd</i>	0.093511	11	0.008501	-0.644243374	0.41505	132	0.003144	0.005357	0.07319	12	3.464102	0.253536	25%	
	<i>Marshall's (EA) Ltd</i>	0.029267	11	0.002661	-0.148420005	0.022028	132	0.000167	0.002494	0.049938	12	3.464102	0.172989	17%	
	<i>Nation Media Group Ltd</i>	0.5991	11	0.054464	0.022338978	0.000499	132	3.78E-06	0.05446	0.233366	12	3.464102	0.808405	81%	
	<i>Pearl Drycleaners Ltd</i>	0.001747	11	0.000159	-7.63278E-17	5.83E-33	132	4.41E-35	0.000159	0.012604	12	3.464102	0.043661	4%	
	<i>Standard Newspapers Ltd</i>	0.806066	11	0.073279	-0.527585793	0.278347	132	0.002109	0.07117	0.266777	12	3.464102	0.924143	92%	
	<i>Tourism Promotion Services (Serena)</i>	0.087457	11	0.007951	-0.14359092	0.020618	132	0.000156	0.007794	0.088286	12	3.464102	0.305831	31%	
	<i>Uchumi Supermarkets Ltd</i>	0.089043	11	0.008095	0.048229783	0.002326	132	1.76E-05	0.008077	0.089873	12	3.464102	0.311329	31%	
Industrial and Allied	<i>Athi River Mining Ltd</i>	0.227247	11	0.020659	-0.426742507	0.182109	132	0.00138	0.019279	0.13885	12	3.464102	0.480989	48%	
	<i>Bamburi Cement Ltd</i>	0.197268	11	0.017933	-0.105360516	0.011101	132	8.41E-05	0.017849	0.133601	12	3.464102	0.462809	46%	
	<i>British American Tobacco Ltd</i>	0.008642	11	0.000786	0.091105549	0.0083	132	6.29E-05	0.000723	0.026883	12	3.464102	0.093127	9%	
	<i>B O C Gases Ltd</i>	0.197268	11	0.017933	-0.105360516	0.011101	132	8.41E-05	0.017849	0.133601	12	3.464102	0.462809	46%	
	<i>Carbacid Investments Ltd</i>	0.114966	11	0.010451	0.38083824	0.145038	132	0.001099	0.009353	0.096709	12	3.464102	0.335011	34%	
	<i>Crown Berger Ltd</i>	0.192197	11	0.017472	-0.401341391	0.161075	132	0.00122	0.016252	0.127484	12	3.464102	0.441618	44%	
	<i>Dunlop Kenya Ltd</i>	0.474369	11	0.043124	-0.112362968	0.012625	132	9.56E-05	0.043029	0.207434	12	3.464102	0.718572	72%	
	<i>EA Cables Ltd</i>	0.092397	11	0.0084	-0.402126207	0.161705	132	0.001225	0.007175	0.084703	12	3.464102	0.293421	29%	
	<i>EA Packaging Ltd</i>	0.272402	11	0.024764	-1.109239381	1.230412	132	0.009321	0.015443	0.124268	12	3.464102	0.430477	43%	
	<i>EA Portland Cement Ltd</i>	0.081738	11	0.007431	-0.53329848	0.284407	132	0.002155	0.005276	0.072637	12	3.464102	0.251622	25%	
	<i>Firestone East Africa Ltd</i>	0.082958	11	0.007542	-0.206862666	0.042792	132	0.000324	0.007217	0.084956	12	3.464102	0.294295	29%	
	<i>East Africa Breweries Ltd</i>	0.129142	11	0.01174	0.299378112	0.089627	132	0.000679	0.011061	0.105172	12	3.464102	0.364326	36%	
	<i>Kenya National Mills Ltd</i>	0.315885	11	0.028717	-0.19451683	0.037837	132	0.000287	0.02843	0.168613	12	3.464102	0.584091	58%	
	<i>Kenya Oil Co Ltd</i>	0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
	<i>Kenya Power &amp; Lighting Ltd</i>	0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
	<i>Total Kenya Ltd</i>	0.025977	11	0.002362	0.161172732	0.025977	132	0.000197	0.002165	0.046527	12	3.464102	0.161173	16%	
	<i>Unga Group Ltd</i>	0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	



## ESTIMATED VOLATILITY-1999

SECTOR	COMPANY	u12	a			b			a-b	c	Trading months	d	Volatility	Volatility	
			n-1	u12/n-1	u1	u1*u1	n(n-1)	u1*u1/n(n-1)							sqrt(a-b)
Agricultural	Brooke Bond Kenya Limited	0.147834	11	0.013439	-0.31143616	0.096992	132	0.000735	0.012705	0.112715	12	3.464102	0.390455	39%	
	Eaagads Limited	0.352729	11	0.032066	-0.4819512	0.232277	132	0.00176	0.030307	0.174088	12	3.464102	0.603059	60%	
	George Williamson Kenya Ltd	0.06184	11	0.005622	-0.44105605	0.19453	132	0.001474	0.004148	0.064405	12	3.464102	0.223107	22%	
	Kakuzi Ltd	0.084321	11	0.007666	-0.48285177	0.233146	132	0.001766	0.005899	0.076807	12	3.464102	0.266067	27%	
	Kapchorua Tea Co Ltd	0.063036	11	0.005731	0.385662481	0.148736	132	0.001127	0.004604	0.067851	12	3.464102	0.235043	24%	
	Limuru Tea Co Ltd	0.024444	11	0.002222	-0.15634607	0.024444	132	0.000185	0.002037	0.045133	12	3.464102	0.156346	16%	
	Rea Vipingo Ltd	0.044524	11	0.004048	-0.30318626	0.091922	132	0.000696	0.003351	0.05789	12	3.464102	0.200537	20%	
	Sasini Tea & Coffee Ltd	0.082599	11	0.007509	-0.44405745	0.197187	132	0.001494	0.006015	0.077557	12	3.464102	0.268667	27%	
											12				
	Finance & Investment	Barclays Bank Ltd	0.040225	11	0.003657	-0.15345763	0.023549	132	0.000178	0.003478	0.058978	12	3.464102	0.204307	20%
		City Trust Ltd	0.021564	11	0.00196	-0.19282428	0.037181	132	0.000282	0.001679	0.040971	12	3.464102	0.141929	14%
		CFC Bank Ltd	0.177094	11	0.016099	-0.34046028	0.115913	132	0.000878	0.015221	0.123375	12	3.464102	0.427382	43%
		Diamond Trust Bank Kenya Ltd	0.055545	11	0.00505	0.039220713	0.001538	132	1.17E-05	0.005038	0.070978	12	3.464102	0.245875	25%
		Housing Finance Co (K) Ltd	0.083259	11	0.007569	-0.34887763	0.121716	132	0.000922	0.006647	0.081529	12	3.464102	0.282423	28%
		ICDC Investments Co Ltd	0.009137	11	0.000831	0.194156014	0.037697	132	0.000286	0.000545	0.023347	12	3.464102	0.080878	8%
		Jubilee Insurance Co Ltd	0.062702	11	0.0057	-0.3879208	0.150483	132	0.00114	0.00456	0.067529	12	3.464102	0.233927	23%
		Kenya Commercial Bank Ltd	0.088389	11	0.008035	-0.70265597	0.493725	132	0.00374	0.004295	0.065536	12	3.464102	0.227024	23%
National Bank of Kenya Ltd		0.098421	11	0.008947	-0.53062825	0.281566	132	0.002133	0.006814	0.082549	12	3.464102	0.285958	29%	
National Industrial Credit Ltd		0.018576	11	0.001689	0.014981554	0.000224	132	1.7E-06	0.001687	0.041074	12	3.464102	0.142283	14%	
Pan Africa Insurance Ltd		1.119452	11	0.101768	0.507115044	0.257166	132	0.001948	0.09982	0.315943	12	3.464102	1.094459	109%	
Standard Chartered Bank Ltd		0.024787	11	0.002253	0.210676783	0.044385	132	0.000336	0.001917	0.043785	12	3.464102	0.151676	15%	
											12				
Commercial & Services		Africa Lakes Corporation Plc	NOT LISTED												
		A Baumann & Co Ltd	0.014269	11	0.001297	-0.12595241	0.015864	132	0.00012	0.001177	0.034307	12	3.464102	0.118842	12%
		CMC Holdings Ltd	0.023181	11	0.002107	-0.10135249	0.010272	132	7.78E-05	0.00203	0.04505	12	3.464102	0.156058	16%
		Car & General (K) Ltd	1.024591	11	0.093145	-0.28768207	0.082761	132	0.000627	0.092518	0.304167	12	3.464102	1.053666	105%
	Express Kenya Ltd	0.261622	11	0.023784	-0.72439972	0.524755	132	0.003975	0.019808	0.140742	12	3.464102	0.487546	49%	
	Kenya Airways Ltd	0.137727	11	0.012521	-0.03774033	0.001424	132	1.08E-05	0.01251	0.111847	12	3.464102	0.387451	39%	
	Lonhro Motors (EA) Ltd	0.145159	11	0.013196	-0.40796824	0.166438	132	0.001261	0.011935	0.109249	12	3.464102	0.37845	38%	
	Marshall's (EA) Ltd	0.034894	11	0.003172	-0.08524428	0.007267	132	5.5E-05	0.003117	0.055832	12	3.464102	0.193407	19%	
	Nation Media Group Ltd	0.053371	11	0.004852	-0.29759296	0.088562	132	0.000671	0.004181	0.064661	12	3.464102	0.223992	22%	
	Pearl Drycleaners Ltd	1.449551	11	0.131777	-1.2039728	1.449551	132	0.010981	0.120796	0.347557	12	3.464102	1.203973	120%	
	Standard Newspapers Ltd	1.228718	11	0.111702	-0.9461437	0.895188	132	0.006782	0.10492	0.323913	12	3.464102	1.122069	112%	
	Tourism Promotion Services (Serena)	0.027076	11	0.002461	0.229374101	0.052612	132	0.000399	0.002063	0.045419	12	3.464102	0.157336	16%	
	Uchumi Supermarkets Ltd	0.065868	11	0.005988	-0.11296512	0.012761	132	9.67E-05	0.005891	0.076755	12	3.464102	0.265887	27%	
											12				
	Industrial and Allied	Athi River Mining Ltd	0.159559	11	0.014505	-0.01680712	0.000282	132	2.14E-06	0.014503	0.120429	12	3.464102	0.41718	42%
		Bamburi Cement Ltd	0.100254	11	0.009114	-0.33864261	0.114679	132	0.000869	0.008245	0.090803	12	3.464102	0.314551	31%
		British American Tobacco Ltd	0.068966	11	0.00627	-0.15879106	0.025215	132	0.000191	0.006079	0.077965	12	3.464102	0.27008	27%
B O C Gases Ltd		0.100254	11	0.009114	-0.33864261	0.114679	132	0.000869	0.008245	0.090803	12	3.464102	0.314551	31%	
Carbacid Investments Ltd		0.077959	11	0.007087	0.047146778	0.002223	132	1.68E-05	0.00707	0.084085	12	3.464102	0.291281	29%	
Crown Berger Ltd		0.433564	11	0.039415	0	0	132	0	0.039415	0.198532	12	3.464102	0.687735	69%	
Dunlop Kenya Ltd		0.384875	11	0.034989	-1.03543339	1.072122	132	0.008122	0.026867	0.16391	12	3.464102	0.567801	57%	
EA Cables Ltd		0.457717	11	0.041611	-0.63193645	0.399344	132	0.003025	0.038585	0.196432	12	3.464102	0.680459	68%	
EA Packaging Ltd		0.330437	11	0.03004	-1.02961942	1.060116	132	0.008031	0.022009	0.148353	12	3.464102	0.513909	51%	
EA Portland Cement Ltd		1.081905	11	0.098355	-0.5798185	0.336189	132	0.002547	0.095808	0.309529	12	3.464102	1.072239	107%	
Firestone East Africa Ltd		0.055682	11	0.005062	-0.22314355	0.049793	132	0.000377	0.004685	0.068445	12	3.464102	0.237102	24%	
East Africa Breweries Ltd		0.040144	11	0.003649	0.166144107	0.027604	132	0.000209	0.00344	0.058654	12	3.464102	0.203184	20%	
Kenya National Mills Ltd		0.594776	11	0.054071	-0.75932909	0.576581	132	0.004368	0.049702	0.22294	12	3.464102	0.772289	77%	
Kenya Oil Co Ltd		0.163148	11	0.014832	0.108972406	0.011875	132	9E-05	0.014742	0.121415	12	3.464102	0.420594	42%	
Kenya Power & Lighting Ltd		0.069007	11	0.006273	-0.33878616	0.114776	132	0.00087	0.005404	0.073511	12	3.464102	0.25465	25%	
Total Kenya Ltd		0.055948	11	0.005086	-0.04680407	0.002191	132	1.66E-05	0.00507	0.071201	12	3.464102	0.246649	25%	
Unga Group Ltd		0.998754	11	0.090796	-0.55961579	0.31317	132	0.002372	0.088423	0.297361	12	3.464102	1.030087	103%	

## ESTIMATED VOLATILITY-2000

SECTOR	COMPANY	u12	a			b			c			d			
			n-1	u12/n-1	u1	u1*u1	n(n-1)	u1*u1/n(n-1)	a-t	sqrt(a-b)	Trading months	Volatility	Volatility		
Agricultural	Brooke Bond Kenya Limited	0.071908	11	0.008537	-0.069879921	0.004855	132	3.68E-05	0.0065	0.080624	12	3.464102	0.279291	28%	
	Eaagads Limited	0.043741	11	0.003976	-0.237671852	0.056488	132	0.000428	0.003549	0.05957	12	3.464102	0.206355	21%	
	George Williamson Kenya Ltd	0.170549	11	0.015504	0.042111485	0.001773	132	1.34E-05	0.015491	0.124463	12	3.464102	0.431152	43%	
	Kakuzi Ltd	0.105018	11	0.009547	-0.572519193	0.327778	132	0.002483	0.007064	0.084047	12	3.464102	0.291148	29%	
	Kapchorua Tea Co Ltd	0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
	Limuru Tea Co Ltd	0	11	0	0	0	132	0	0	0	12	3.464102	0	0%	
	Rea Vipingo Ltd	0.05852	11	0.00532	-0.416160397	0.173189	132	0.001312	0.004008	0.063309	12	3.464102	0.219308	22%	
	Sasini Tea & Coffee Ltd	0.087124	11	0.00792	-0.280301965	0.078569	132	0.000595	0.007325	0.085587	12	3.464102	0.296482	30%	
	Finance & Investment	Barclays Bank Ltd	0.128749	11	0.011704	-0.290987861	0.084674	132	0.000641	0.011063	0.105181	12	3.464102	0.364356	36%
		City Trust Ltd	0.032285	11	0.002935	0.078252197	0.006123	132	4.64E-05	0.002889	0.053746	12	3.464102	0.18618	19%
		CFC Bank Ltd	0.159399	11	0.014491	-0.335049761	0.112258	132	0.00085	0.01364	0.116792	12	3.464102	0.40458	40%
Diamond Trust Bank Kenya Ltd		0.106804	11	0.009709	-0.579818495	0.336189	132	0.002547	0.007163	0.084632	12	3.464102	0.293174	29%	
Housing Finance Co (K) Ltd		1.320313	11	0.120028	-1.514127733	2.292583	132	0.017368	0.10266	0.320407	12	3.464102	1.109921	111%	
ICDC Investments Co Ltd		0.069719	11	0.006338	-0.072570693	0.005267	132	3.99E-05	0.006298	0.079361	12	3.464102	0.274915	27%	
Jubilee Insurance Co Ltd		0.060826	11	0.00553	-0.32090772	0.102982	132	0.00078	0.00475	0.068917	12	3.464102	0.238734	24%	
Kenya Commercial Bank Ltd		0.11533	11	0.010485	-0.316669609	0.10028	132	0.00076	0.009725	0.098614	12	3.464102	0.341611	34%	
National Bank of Kenya Ltd		0.252353	11	0.022941	-0.46203546	0.213477	132	0.001617	0.021324	0.146027	12	3.464102	0.505853	51%	
National Industrial Credit Ltd		0.15347	11	0.013952	-0.362292936	0.131256	132	0.000994	0.012957	0.113831	12	3.464102	0.394322	39%	
Pan Africa Insurance Ltd		0.199666	11	0.018151	-0.840783179	0.706916	132	0.005355	0.012796	0.113119	12	3.464102	0.391857	39%	
Standard Chartered Bank Ltd		0.239075	11	0.021734	-0.141078598	0.019903	132	0.000151	0.021583	0.146913	12	3.464102	0.50892	51%	
Commercial & Services		Africa Lakes Corporation Plc	Not listed for a full year												
		A Baumann & Co Ltd	0.058679	11	0.005334	-0.436555695	0.190581	132	0.001444	0.003891	0.062375	12	3.464102	0.216074	22%
		CMC Holdings Ltd	0.105224	11	0.009566	-0.676617879	0.457812	132	0.003468	0.006098	0.078087	12	3.464102	0.270501	27%
		Car & General (K) Ltd	0.818573	11	0.074416	-1.11022E-16	1.23E-32	132	9.34E-35	0.074416	0.272792	12	3.464102	0.944981	94%
	Express Kenya Ltd	0.014841	11	0.001349	-0.064887622	0.00421	132	3.19E-05	0.001317	0.036294	12	3.464102	0.125726	13%	
	Kenya Airways Ltd	0.058945	11	0.005359	0.182321557	0.033241	132	0.000252	0.005107	0.071462	12	3.464102	0.247551	25%	
	Marshall's (EA) Ltd	0.040133	11	0.003648	-0.23383884	0.054681	132	0.000414	0.003234	0.05687	12	3.464102	0.197003	20%	
	Nation Media Group Ltd	0.033683	11	0.003062	-0.298492989	0.089098	132	0.000675	0.002387	0.048858	12	3.464102	0.16925	17%	
	Pearl Drycleaners Ltd	0.07464	11	0.006785	-0.380772496	0.144988	132	0.001098	0.005687	0.075413	12	3.464102	0.261237	26%	
	Standard Newspapers Ltd	1.127371	11	0.102488	0.385104185	0.148305	132	0.001124	0.101365	0.318378	12	3.464102	1.102895	110%	
	Tourism Promotion Services (Serena)	0.912852	11	0.082987	-0.814807693	0.663912	132	0.00503	0.077957	0.279208	12	3.464102	0.967204	97%	
	Uchumi Supermarkets Ltd	0.030815	11	0.002801	0.202940844	0.041185	132	0.000312	0.002489	0.049894	12	3.464102	0.172836	17%	
	Industrial and Allied	Athi River Mining Ltd	0.16427	11	0.014934	-0.171850257	0.029533	132	0.000224	0.01471	0.121284	12	3.464102	0.420141	42%
		Bamburi Cement Ltd	0.022471	11	0.002043	0.251314428	0.063159	132	0.000478	0.001564	0.039552	12	3.464102	0.13701	14%
		British American Tobacco Ltd	0.246106	11	0.022373	-0.187816076	0.035275	132	0.000267	0.022106	0.148681	12	3.464102	0.515046	52%
		B O C Gases Ltd	0.088025	11	0.008002	-0.303430429	0.09207	132	0.000698	0.007305	0.085468	12	3.464102	0.29607	30%
Carbacid Investments Ltd		0.1665	11	0.015135	-0.5158	0.266063	132	0.002016	0.01312	0.114542	12	3.464102	0.396784	40%	
Crown Berger Ltd		0.104736	11	0.009521	-0.105360516	0.011101	132	8.41E-05	0.009437	0.097146	12	3.464102	0.336524	34%	
Dunlop Kenya Ltd		0.058153	11	0.005287	-0.420969295	0.177215	132	0.001343	0.003944	0.062802	12	3.464102	0.217553	22%	
EA Cables Ltd		0.357326	11	0.032484	-0.316978442	0.100475	132	0.000761	0.031723	0.178109	12	3.464102	0.616989	62%	
EA Packaging Ltd		0.692139	11	0.062922	-0.382992252	0.146683	132	0.001111	0.06181	0.248617	12	3.464102	0.861235	86%	
EA Portland Cement Ltd		0.054203	11	0.004928	0.030371098	0.000922	132	6.99E-06	0.004921	0.070146	12	3.464102	0.242994	24%	
Firestone East Africa Ltd		0.092605	11	0.008419	-0.330241687	0.10906	132	0.000826	0.007592	0.087135	12	3.464102	0.301843	30%	
East Africa Breweries Ltd		0.027012	11	0.002456	0.113597178	0.012904	132	9.78E-05	0.002358	0.048558	12	3.464102	0.168211	17%	
Kenya National Mills Ltd		0.593358	11	0.053942	-0.29479954	0.086907	132	0.000658	0.053283	0.230832	12	3.464102	0.799624	80%	
Kenya Oil Co Ltd		0.047564	11	0.004324	0.041964199	0.001761	132	1.33E-05	0.004311	0.065656	12	3.464102	0.227437	23%	
Kenya Power & Lighting Ltd		0.250645	11	0.022786	-0.849081982	0.72094	132	0.005462	0.017324	0.131622	12	3.464102	0.455951	46%	
Total Kenya Ltd		0.172325	11	0.015666	0.115512887	0.013343	132	0.000101	0.015565	0.124759	12	3.464102	0.432178	43%	
Unga Group Ltd		0.49748	11	0.045225	-0.291272741	0.08484	132	0.000643	0.044583	0.211146	12	3.464102	0.731432	73%	

**APPENDIX 3- COMPUTATION OF EXPECTED RETURNS**

## EXPECTED RETURN-1997

SECTOR	COMPANY	p1	p0	div	p1-p0+div	E(R) pi-p0+div/p0	%	
Agricultural	Brooke Bond Kenya Limited	110	149	0.8	-38.2	-0.256375839	-26%	
	Eaagads Limited	42	27.25	2	16.75	0.614678899	61%	
	George Williamson Kenya Ltd	86	73.5	1.5	14	0.19047619	19%	
	Kakuzi Ltd	96	98	2.4	0.4	0.004081633	0%	
	Kapchorua Tea Co Ltd	70	70	1.5	1.5	0.021428571	2%	
	Limuru Tea Co Ltd	750	1300	27.5	-522.5	-0.401923077	-40%	
	Rea Vipingo Ltd	9	11	1.7	-0.3	-0.027272727	-3%	
	Sasini Tea & Coffee Ltd	94	60	3	37	0.616666667	62%	
	Finance & Investment	Barclays Bank Ltd	115	115	10	10	0.086956522	9%
City Trust Ltd		34	33	1.5	2.5	0.075757576	8%	
CFC Bank Ltd		18	22.75	0	-4.75	-0.208791209	-21%	
Diamond Trust Bank Kenya Ltd		22	36.5	0	-14.5	-0.397260274	-40%	
Housing Finance Co (K) Ltd		19	24	0.75	-4.25	-0.177083333	-18%	
ICDC Investments Co Ltd		35	40	2	-3	-0.075	-8%	
Jubilee Insurance Co Ltd		37	38.5	0.75	-0.75	-0.019480519	-2%	
Kenya Commercial Bank Ltd		77	90	7	-6	-0.066666667	-7%	
National Bank of Kenya Ltd		13	16	0.5	-2.5	-0.15625	-16%	
National Industrial Credit Ltd		50	50	1.75	1.75	0.035	4%	
Regent Undervalued Assets Africa Fund		580	580	0	0	0	0%	
Pan Africa Insurance Ltd		42	51	1.75	-7.25	-0.142156863	-14%	
Standard Chartered Bank Ltd		46	54	3.75	-4.25	-0.078703704	-8%	
Commercial & Services		Africa Lakes Corporation Plc	Not listed					
		A Baumann & Co Ltd	16	33	0.75	-16.25	-0.492424242	-49%
	CMC Holdings Ltd	80	70	0.5	10.5	0.15	15%	
	Car & General (K) Ltd	16	20	0	-4	-0.2	-20%	
	Express Kenya Ltd	59	76	4.14	-12.86	-0.169210526	-17%	
	Kenya Airways Ltd	8	8.5	0.5	0	0	0%	
	Lonhro Motors (EA) Ltd	39	128	0	-89	-0.6953125	-70%	
	Marshalls (EA) Ltd	41	47.5	4	-2.5	-0.052631579	-5%	
	Nation Media Group Ltd	131	113	3.125	21.125	0.186946903	19%	
	Pearl Drycleaners Ltd	11	10	0	1	0.1	10%	
	Standard Newspapers Ltd	53	9.05	1	44.95	4.966850829	497%	
	Tourism Promotion Services (Serena)	Not listed for a full year						
	Uchumi Supermarkets Ltd	39	39.75	3.35	2.6	0.065408805	7%	
Industrial and Allied	Athi River Mining Ltd	Not listed for a full year						
	Bamburi Cement Ltd	36	40	1.25	-2.75	-0.06875	-7%	
	British American Tobacco Ltd	50	83	6	-27	-0.325301205	-33%	
	B O C Gases Ltd	66	70	3.35	-0.65	-0.009285714	-1%	
	Carbacid Investments Ltd	66	82	2	-14	-0.170731707	-17%	
	Crown Berger Ltd	10	12.5	1	-1.5	-0.12	-12%	
	Dunlop Kenya Ltd	100	275	0	-175	-0.636363636	-64%	
	EA Cables Ltd	29	37	2.5	-5.5	-0.148648649	-15%	
	EA Packaging Ltd	49	70	0	-21	-0.3	-30%	
	EA Portland Cement Ltd	20	24.5	0.67	-3.83	-0.156326531	-16%	
	Firestone East Africa Ltd	24	30	1.8	-4.2	-0.14	-14%	
	East Africa Breweries Ltd	49	52.5	6	2.5	0.047619048	5%	
	Kenya National Mills Ltd	37	34.75	3.2	5.45	0.156834532	16%	
	Kenya Oil Co Ltd	48	71	4	-19	-0.267605634	-27%	
	Kenya Power & Lighting Ltd	180	90	8	98	1.088888889	109%	
	Total Kenya Ltd	53	94	2.5	-38.5	-0.409574468	-41%	
Unga Group Ltd	120	120	9.8	9.8	0.081666667	8%		

EXPECTED RETURN-1998		E(R)						
SECTOR	COMPANY	p1	p0	div	p1-p0+div	pi-p0+div/p0	%	
Agricultural	<i>Brooke Bond Kenya Limited</i>	139.6	110	1.7	31.3	0.284545455	28%	
	<i>Eaagads Limited</i>	43.2	41.5	4.75	6.45	0.155421687	16%	
	<i>George Williamson Kenya Ltd</i>	142	85.8	7.5	63.7	0.742424242	74%	
	<i>Kakuzi Ltd</i>	140	96	2.75	46.75	0.486979167	49%	
	<i>Kapchorua Tea Co Ltd</i>	95	70	7.5	32.5	0.464285714	46%	
	<i>Limuru Tea Co Ltd</i>	760	750	87.5	97.5	0.13	13%	
	<i>Rea Vipingo Ltd</i>	6	8.2	0.4	-1.8	-0.2195122	-22%	
	<i>Sasini Tea &amp; Coffee Ltd</i>	69.8	61.7	2	10.1	0.1636953	16%	
	Finance & Investment	<i>Barclays Bank Ltd</i>	122.2	116	12	18.2	0.156896552	16%
		<i>City Trust Ltd</i>	26.1	34	2	-5.9	-0.17352941	-17%
<i>CFC Bank Ltd</i>		15.6	17.4	0.67	-1.13	-0.06494253	-6%	
<i>Diamond Trust Bank Kenya Ltd</i>		21.1	22.1	1	0	0	0%	
<i>Housing Finance Co (K) Ltd</i>		16.3	15.3	1.5	2.5	0.163398693	16%	
<i>ICDC Investments Co Ltd</i>		41.8	35.1	3	9.7	0.276353276	28%	
<i>Jubilee Insurance Co Ltd</i>		30.3	31	1.75	1.05	0.033870968	3%	
<i>Kenya Commercial Bank Ltd</i>		61.4	79.1	8	-9.7	-0.12262958	-12%	
<i>National Bank of Kenya Ltd</i>		8.6	12.6	0.5	-3.5	-0.27777778	-28%	
<i>National Industrial Credit Ltd</i>		28.9	40.4	1.75	-9.75	-0.24133663	-24%	
<i>Regent Undervalued Assets Africa Fund</i>		580	580	0	0	0	0%	
<i>Pan Africa Insurance Ltd</i>		16.7	27.8	1.75	-9.35	-0.33633094	-34%	
<i>Standard Chartered Bank Ltd</i>		51.7	47.6	1.75	5.85	0.12289916	12%	
Commercial & Services		<i>Africa Lakes Corporation Plc</i>	Not listed					
	<i>A Baumann &amp; Co Ltd</i>	16.9	15.6	0.75	2.05	0.131410256	13%	
	<i>CMC Holdings Ltd</i>	33	39	0.5	-5.5	-0.14102564	-14%	
	<i>Car &amp; General (K) Ltd</i>	12	16.1	0	-4.1	-0.25465839	-25%	
	<i>Express Kenya Ltd</i>	28.6	60	4.4	-27	-0.45	-45%	
	<i>Kenya Airways Ltd</i>	8	7.4	1	1.6	0.216216216	22%	
	<i>Lonhro Motors (EA) Ltd</i>	22	39	0	-17	-0.43589744	-44%	
	<i>Marshalls (EA) Ltd</i>	25	26.2	1	-0.2	-0.00763359	-1%	
	<i>Nation Media Group Ltd</i>	135.8	130	2.3	8.1	0.062307692	6%	
	<i>Pearl Drycleaners Ltd</i>	10	10.5	0	-0.5	-0.04761905	-5%	
	<i>Standard Newspapers Ltd</i>	21.3	32	1	-9.7	-0.303125	-30%	
	<i>Tourism Promotion Services (Serena)</i>	13.6	14	1	0.6	0.042857143	4%	
	<i>Uchumi Supermarkets Ltd</i>	44.6	40.6	3.05	7.05	0.17364532	17%	
	Industrial and Allied	<i>Athi River Mining Ltd</i>	6.2	9.2	0.3	-2.7	-0.29347826	-29%
<i>Bamburi Cement Ltd</i>		36	37	0.625	-0.375	-0.01013514	-1%	
<i>British American Tobacco Ltd</i>		71.2	65.5	6.5	12.2	0.186259542	19%	
<i>B O C Gases Ltd</i>		36	37	3.5	2.5	0.067567568	7%	
<i>Carbacid Investments Ltd</i>		74.2	50	2.2	26.4	0.528	53%	
<i>Crown Berger Ltd</i>		8.1	10	1.35	-0.55	-0.055	-6%	
<i>Dunlop Kenya Ltd</i>		18.5	20	2	0.5	0.025	3%	
<i>EA Cables Ltd</i>		20	29	0	-9	-0.31034483	-31%	
<i>EA Packaging Ltd</i>		15.6	49	0	-33.4	-0.68163265	-68%	
<i>EA Portland Cement Ltd</i>		17.6	20	3	0.6	0.03	3%	
<i>Firestone East Africa Ltd</i>		16.1	15.9	1.5	1.7	0.106918239	11%	
<i>East Africa Breweries Ltd</i>		68.8	48	6	26.8	0.558333333	56%	
<i>Kenya National Mills Ltd</i>		16.3	14.9	0.8	2.2	0.147651007	15%	
<i>Kenya Oil Co Ltd</i>		55	49.5	4	9.5	0.191919192	19%	
<i>Kenya Power &amp; Lighting Ltd</i>		120.2	121.2	5	4	0.0330033	3%	
<i>Total Kenya Ltd</i>		44.9	52.5	2.6	-5	-0.0952381	-10%	
<i>Unga Group Ltd</i>		47	20	1.2	28.2	1.41	141%	

EXPECTED RETURN-1999		E(R)					
SECTOR	COMPANY	p1	p0	div	p1-p0+div	pi-p0+div/p0	%
Agricultural	Brooke Bond Kenya Limited	104	141	2.3	-34.7	-0.24609929	-25%
	Eaagads Limited	26	43.2	1.25	-15.95	-0.36921296	-37%
	George Williamson Kenya Ltd	92	141	2.5	-46.5	-0.32978723	-33%
	Kakuzi Ltd	87	141	2.75	-51.25	-0.36347518	-36%
	Kapchorua Tea Co Ltd	150	95	2.5	57.5	0.605263158	61%
	Limuru Tea Co Ltd	650	760	60	-50	-0.06578947	-7%
	Rea Vipingo Ltd	4.8	6	0	-1.2	-0.2	-20%
	Sasini Tea & Coffee Ltd	44.9	69.8	0.5	-24.4	-0.3495702	-35%
Finance & Investment	Barclays Bank Ltd	103.1	126.3	10.5	-12.7	-0.10055424	-10%
	City Trust Ltd	22.1	26.1	0	-4	-0.1532567	-15%
	CFC Bank Ltd	14.3	15.6	2	0.7	0.044871795	4%
	Diamond Trust Bank Kenya Ltd	26	22	0.4	4.4	0.2	20%
	Housing Finance Co (K) Ltd	10.3	16.1	1.25	-4.55	-0.2826087	-28%
	ICDC Investments Co Ltd	51	42	2.5	11.5	0.273809524	27%
	Jubilee Insurance Co Ltd	23	30.3	1.75	-5.55	-0.18316832	-18%
	Kenya Commercial Bank Ltd	31.4	61.6	0	-30.2	-0.49025974	-49%
	National Bank of Kenya Ltd	5	8.6	0	-3.6	-0.41860465	-42%
	National Industrial Credit Ltd	26.9	30	1.75	-1.35	-0.045	-5%
	Regent Undervalued Assets Africa Fund	580	580	0	0	0	0%
	Pan Africa Insurance Ltd	26.9	16.7	0.75	10.95	0.655688623	66%
	Standard Chartered Bank Ltd	55.8	51.6	1.25	5.45	0.105620155	11%
Commercial & Services	Africa Lakes Corporation Plc	Not listed					
	A Baumann & Co Ltd	14.9	16.9	1.25	-0.75	-0.0443787	-4%
	CMC Holdings Ltd	30	33	0.75	-2.25	-0.06818182	-7%
	Car & General (K) Ltd	9	12	0	-3	-0.25	-25%
	Express Kenya Ltd	18.9	28.6	0	-9.7	-0.33916084	-34%
	Kenya Airways Ltd	7.8	8.1	0	-0.3	-0.03703704	-4%
	Lonhro Motors (EA) Ltd	13.3	22	0	-8.7	-0.39545455	-40%
	Marshall's (EA) Ltd	23.6	25	0	-1.4	-0.056	-6%
	Nation Media Group Ltd	100.4	137.7	1.65	-35.65	-0.25889615	-26%
	Pearl Drycleaners Ltd	3	10	0	-7	-0.7	-70%
	Standard Newspapers Ltd	9.9	21.3	0.1	-11.3	-0.53051643	-53%
	Tourism Promotion Services (Serena)	16.1	14.5	0	1.6	0.110344828	11%
Uchumi Supermarkets Ltd	39.3	44	4.6	-0.1	-0.00227273	0%	
Industrial and Allied	Athi River Mining Ltd	5.9	6.2	0	-0.3	-0.0483871	-5%
	Bamburi Cement Ltd	26.3	36	1.25	-8.45	-0.23472222	-23%
	British American Tobacco Ltd	64.5	71.2	7.5	0.8	0.01235955	1%
	B O C Gases Ltd	26.3	36	2.55	-7.15	-0.19861111	-20%
	Carbacid Investments Ltd	76	76.5	5	4.5	0.058823529	6%
	Crown Berger Ltd	10	8.1	2	3.9	0.481481481	48%
	Dunlop Kenya Ltd	9.8	20	0.4	-9.8	-0.49	-49%
	EA Cables Ltd	16	20	2	-2	-0.1	-10%
	EA Packaging Ltd	7	15.5	0	-8.5	-0.5483871	-55%
	EA Portland Cement Ltd	11.2	17.6	0	-6.4	-0.36363636	-36%
	Firestone East Africa Ltd	16	16.1	1.2	1.1	0.068322981	7%
	East Africa Breweries Ltd	69.9	68.8	7	8.1	0.117732558	12%
	Kenya National Mills Ltd	9.5	17	0	-7.5	-0.44117647	-44%
	Kenya Oil Co Ltd	67.8	55	0	12.8	0.232727273	23%
	Kenya Power & Lighting Ltd	92.5	124.9	8	-24.4	-0.19535629	-20%
	Total Kenya Ltd	48	49	3	2	0.040816327	4%
Unga Group Ltd	26	47	0	-21	-0.44680851	-45%	

EXPECTED RETURN-2000

SECTOR	COMPANY	p1	p0	div	p1-p0+div	E(R) pi-p0+div/p0	%	
Agricultural	Brooke Bond Kenya Limited	97	104.7	4	-3.7	-0.035339064	-4%	
	Eaagads Limited	20.5	25	0	-4.5	-0.18	-18%	
	George Williamson Kenya Ltd	97	92	2.5	7.5	0.081521739	8%	
	Kakuzi Ltd	55	91.5	1.4	-35.1	-0.383606557	-38%	
	Kapchorua Tea Co Ltd	150	150	2.5	2.5	0.016666667	2%	
	Limuru Tea Co Ltd	650	650	55	55	0.084615385	8%	
	Rea Vipingo Ltd	3.1	4.95	0	-1.85	-0.373737374	-37%	
	Sasini Tea & Coffee Ltd	34	44.9	2.2	-8.7	-0.19376392	-19%	
	Finance & Investment	Barclays Bank Ltd	75.5	82.95	10	2.55	0.03074141	3%
		City Trust Ltd	23.25	22	2	3.25	0.147727273	15%
CFC Bank Ltd		10.05	11	0.67	-0.28	-0.025454545	-3%	
Diamond Trust Bank Kenya Ltd		14	26	0.4	-11.6	-0.446153846	-45%	
Housing Finance Co (K) Ltd		5.5	10.6	0.25	-4.85	-0.45754717	-46%	
ICDC Investments Co Ltd		46.5	50	3	-0.5	-0.01	-1%	
Jubilee Insurance Co Ltd		25.5	25.1	1.75	2.15	0.085657371	9%	
Kenya Commercial Bank Ltd		25.5	21.8	0	3.7	0.169724771	17%	
National Bank of Kenya Ltd		3.15	5	0	-1.85	-0.37	-37%	
National Industrial Credit Ltd		17.75	27	1.8	-7.45	-0.275925926	-28%	
Pan Africa Insurance Ltd		11	26.5	0	-15.5	-0.58490566	-58%	
Standard Chartered Bank Ltd		49.5	37.5	4.4	16.4	0.437333333	44%	
Commercial & Services		Africa Lakes Corporation Plc	Not listed for a full year					
	A Baumann & Co Ltd	9.5	15	1	-4.5	-0.3	-30%	
	CMC Holdings Ltd	15.25	30	0	-14.75	-0.491666667	-49%	
	Car & General (K) Ltd	10	9	0	1	0.111111111	11%	
	Express Kenya Ltd	17.9	18.9	0	-1	-0.052910053	-5%	
	Kenya Airways Ltd	9	7.85	1.25	2.4	0.305732484	31%	
	Marshalls (EA) Ltd	18.6	23.6	0	-5	-0.211864407	-21%	
	Nation Media Group Ltd	69	101	1.75	-30.25	-0.29950495	-30%	
	Pearl Drycleaners Ltd	2.05	3	0	-0.95	-0.316666667	-32%	
	Standard Newspapers Ltd	15.8	11	0	4.8	0.436363636	44%	
	Tourism Promotion Services (Serena)	7.15	16.2	1	-8.05	-0.49691358	-50%	
	Uchumi Supermarkets Ltd	49	40.2	3	11.8	0.293532338	29%	
	Industrial and Allied	Athi River Mining Ltd	4	5.6	0	-1.6	-0.285714286	-29%
Bamburi Cement Ltd		33.75	26	0.75	8.5	0.326923077	33%	
British American Tobacco Ltd		60.5	57	6.25	9.75	0.171052632	17%	
B O C Gases Ltd		47.25	64	3.55	-13.2	-0.20625	-21%	
Carbacid Investments Ltd		40	56	2.75	-13.25	-0.236607143	-24%	
Crown Berger Ltd		9	11.05	1	-1.05	-0.095022624	-10%	
Dunlop Kenya Ltd		6.4	9.8	0.4	-3	-0.306122449	-31%	
EA Cables Ltd		9.25	12.95	4.5	0.8	0.061776062	6%	
EA Packaging Ltd		7.5	12.5	0	-5	-0.4	-40%	
EA Portland Cement Ltd		11.7	11.2	0	0.5	0.044642857	4%	
Firestone East Africa Ltd		11.5	15.6	1	-3.1	-0.198717949	-20%	
East Africa Breweries Ltd		74.5	65.95	7.5	16.05	0.243366187	24%	
Kenya National Mills Ltd		7	9.5	0	-2.5	-0.263157895	-26%	
Kenya Oil Co Ltd		73	67.75	7.5	12.75	0.188191882	19%	
Kenya Power & Lighting Ltd		40	92.2	2	-50.2	-0.544468547	-54%	
Total Kenya Ltd		55	48.25	3.4	10.15	0.210362694	21%	
Unga Group Ltd	13.9	22.85	0	-8.95	-0.391684902	-39%		

**APPENDIX 4 – ESTIMATION OF EXERCISE PRICES**



## ESTIMATION OF EXERCISE PRICES-January-June 1997

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V2/2	(E(R)-V2/2)*0.5	LN(p0)+(E(R)-V2/2)*0.5	SQRT(0.5 V*SQRT(0.5	
	<i>Brooke Bond Kenya Limited</i>	149	-26%	14%	5.003946	-0.26	0.14	0.010183	-0.135091627	4.868854678	0.707107	0.10091211
	<i>Eaagads Limited</i>	27.25	61%	51%	3.305054	0.61	0.51	0.13212	0.238939993	3.543993514	0.707107	0.36348317
	<i>George Williamson Kenya Ltd</i>	73.5	19%	68%	4.297285	0.19	0.68	0.231423	-0.020711644	4.276573763	0.707107	0.48106474
	<i>Kakuzi Ltd</i>	98	0%	51%	4.584967	0.00	0.51	0.128615	-0.06430757	4.520659909	0.707107	0.35862953
	<i>Kapchorua Tea Co Ltd</i>	70	2%	0%	4.248495	0.02	0.00	0	0.01	4.258495242	0.707107	0
	<i>Limuru Tea Co Ltd</i>	1300	-40%	31%	7.17012	-0.40	0.31	0.04783	-0.223914878	6.946204665	0.707107	0.21870015
	<i>Rea Vipingo Ltd</i>	11	-3%	27%	2.397895	-0.03	0.27	0.035731	-0.032865645	2.365029627	0.707107	0.18902722
	<i>Sasini Tea &amp; Coffee Ltd</i>	60	62%	38%	4.094345	0.62	0.38	0.070709	0.274645644	4.368990207	0.707107	0.2659111
Finance & Investment	<i>Barclays Bank Ltd</i>	115	9%	17%	4.744932	0.09	0.17	0.014138	0.037930967	4.782863096	0.707107	0.1189036
	<i>City Trust Ltd</i>	33	8%	14%	3.496508	0.08	0.14	0.010112	0.034944042	3.531451603	0.707107	0.10055803
	<i>CFC Bank Ltd</i>	22.75	-21%	38%	3.124565	-0.21	0.38	0.072344	-0.1411171887	2.983393259	0.707107	0.26896798
	<i>Diamond Trust Bank Kenya Ltd</i>	36.5	-40%	25%	3.597312	-0.40	0.25	0.031605	-0.215802708	3.381509552	0.707107	0.17777912
	<i>Housing Finance Co (K) Ltd</i>	24	-18%	14%	3.178054	-0.18	0.14	0.009711	-0.094855274	3.083198556	0.707107	0.09854212
	<i>ICDC Investments Co Ltd</i>	40	-8%	76%	3.688879	-0.08	0.76	0.28813	-0.184065135	3.504814319	0.707107	0.53677767
	<i>Jubilee Insurance Co Ltd</i>	38.5	-2%	28%	3.650658	-0.02	0.28	0.039396	-0.029698117	3.620960124	0.707107	0.19848485
	<i>Kenya Commercial Bank Ltd</i>	90	-7%	34%	4.49981	-0.07	0.34	0.056695	-0.06334748	4.43646219	0.707107	0.23810704
	<i>National Bank of Kenya Ltd</i>	16	-16%	31%	2.772589	-0.16	0.31	0.047878	-0.103938955	2.668649768	0.707107	0.21881021
	<i>National Industrial Credit Ltd</i>	50	4%	24%	3.912023	0.04	0.24	0.028987	0.005506424	3.917529429	0.707107	0.17025614
	<i>Regent Undervalued Assets Africa Func</i>	0	0%	0%	#NUM!	0.00	0.00	0	0	#NUM!	0.707107	0
	<i>Pan Africa Insurance Ltd</i>	51	-14%	34%	3.931826	-0.14	0.34	0.05898	-0.099489821	3.832335812	0.707107	0.24285724
	<i>Standard Chartered Bank Ltd</i>	54	-8%	13%	3.988984	-0.08	0.13	0.00811	-0.044054804	3.944929243	0.707107	0.09005336
Commercial & Services	<i>Africa Lakes Corporation Pic</i>	Not listed										
	<i>A Baumann &amp; Co Ltd</i>	33	-49%	57%	3.496508	-0.49	0.57	0.161656	-0.325827805	3.170679757	0.707107	0.40206419
	<i>CMC Holdings Ltd</i>	70	15%	38%	4.248495	0.15	0.38	0.070908	0.039546188	4.28804143	0.707107	0.26628486
	<i>Car &amp; General (K) Ltd</i>	20	-20%	23%	2.995732	-0.20	0.23	0.026299	-0.113149387	2.882582887	0.707107	0.16216897
	<i>Express Kenya Ltd</i>	76	-17%	19%	4.330733	-0.17	0.19	0.017367	-0.09368331	4.237050031	0.707107	0.13178247
	<i>Kenya Airways Ltd</i>	8.5	0%	13%	2.140066	0.00	0.13	0.009053	-0.004526464	2.135539699	0.707107	0.09514688
	<i>Lonhro Motors (EA) Ltd</i>	128	-70%	120%	4.85203	-0.70	1.20	0.721872	-0.710936047	4.141094217	0.707107	0.84963056
	<i>Marshall's (EA) Ltd</i>	47.5	-5%	118%	3.86073	-0.05	1.18	0.691898	-0.370948912	3.489780799	0.707107	0.83180396
	<i>Nation Media Group Ltd</i>	113	19%	56%	4.727388	0.19	0.56	0.15473	0.017635006	4.745022825	0.707107	0.39335733
	<i>Pearl Drycleaners Ltd</i>	10	10%	18%	2.302585	0.10	0.18	0.01568	0.042159992	2.344745085	0.707107	0.12521987
	<i>Standard Newspapers Ltd</i>	9.05	497%	70%	2.202765	4.97	0.70	0.24538	2.362309806	4.565074564	0.707107	0.49535885
	<i>Tourism Promotion Services (Serena)</i>	Not listed for a full year										
	<i>Uchumi Supermarkets Ltd</i>	39.75	7%	45%	3.68261	0.07	0.45	0.100492	-0.015245777	3.667364064	0.707107	0.31700403
Industrial and Allied	<i>Athi River Mining Ltd</i>	Not listed for the full six months										
	<i>Bamburi Cement Ltd</i>	40	-7%	45%	3.688879	-0.07	0.45	0.102366	-0.086183002	3.602696453	0.707107	0.31994688
	<i>British American Tobacco Ltd</i>	83	-33%	30%	4.418841	-0.33	0.30	0.044993	-0.187496297	4.231344311	0.707107	0.21211458
	<i>B O C Gases Ltd</i>	70	-1%	110%	4.248495	-0.01	1.10	0.602065	-0.306032613	3.942462629	0.707107	0.77592862
	<i>Carbacid Investments Ltd</i>	82	-17%	19%	4.406719	-0.17	0.19	0.01846	-0.094230193	4.312489055	0.707107	0.135869
	<i>Crown Berger Ltd</i>	12.5	-12%	37%	2.525729	-0.12	0.37	0.069541	-0.094770473	2.430958171	0.707107	0.26370617
	<i>Dunlop Kenya Ltd</i>	275	-64%	161%	5.616771	-0.64	1.61	1.297571	-0.968785537	4.647985561	0.707107	1.13910977
	<i>EA Cables Ltd</i>	37	-15%	28%	3.610918	-0.15	0.28	0.038986	-0.094493223	3.51642469	0.707107	0.19744985
	<i>EA Packaging Ltd</i>	70	-30%	49%	4.248495	-0.30	0.49	0.121778	-0.210888979	4.037606263	0.707107	0.34896699
	<i>EA Portland Cement Ltd</i>	24.5	-16%	58%	3.198673	-0.16	0.58	0.169536	-0.16476789	3.033905228	0.707107	0.41174723
	<i>Firestone East Africa Ltd</i>	30	-14%	35%	3.401197	-0.14	0.35	0.06127	-0.100635089	3.300562292	0.707107	0.24752814
	<i>East Africa Breweries Ltd</i>	52.5	5%	25%	3.960813	0.05	0.25	0.032234	0.008882985	3.969696155	0.707107	0.17953838
	<i>Kenya National Mills Ltd</i>	34.75	16%	34%	3.54818	0.16	0.34	0.058594	0.050702835	3.598882407	0.707107	0.24206266
	<i>Kenya Oil Co Ltd</i>	71	-27%	22%	4.26268	-0.27	0.22	0.023692	-0.146846091	4.115833786	0.707107	0.15392265
	<i>Kenya Power &amp; Lighting Ltd</i>	90	109%	47%	4.49981	1.09	0.47	0.112342	0.488829025	4.988638695	0.707107	0.33517451
	<i>Total Kenya Ltd</i>	94	-41%	57%	4.543295	-0.41	0.57	0.160083	-0.285041523	4.25825326	0.707107	0.40010379
	<i>Unga Group Ltd</i>	120	8%	39%	4.787492	0.08	0.39	0.07513	0.0020434832	4.789926575	0.707107	0.27409913

## ESTIMATION OF EXERCISE PRICES-JULY-DECEMBER 1997

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V2/2	(E(R)-V2/2)*0.5	LN(p0)+(E(R)-V2/2)*0.5	SQRT(0.5	V*SQRT(0.5)	
Agricultural	Brooke Bond Kenya Limited	124	-26%	14%	4.820282	-0.26	0.14	0.010183	-0.135091627	4.685189938	0.707107	0.10091211	
	Eaagads Limited	26	61%	51%	3.258097	0.61	0.51	0.13212	0.238939993	3.497036531	0.707107	0.36348317	
	George Williamson Kenya Ltd	70	19%	68%	4.248495	0.19	0.68	0.231423	-0.020711644	4.227783599	0.707107	0.48106474	
	Kakuzi Ltd	102	0%	51%	4.624973	0.00	0.51	0.128615	-0.06430757	4.560665244	0.707107	0.35862953	
	Kapchorua Tea Co Ltd	70	2%	0%	4.248495	0.02	0.00	0	0.01	4.258495242	0.707107	0	
	Limuru Tea Co Ltd	1000	-40%	31%	6.907755	-0.40	0.31	0.04783	-0.223914878	6.683840401	0.707107	0.21870015	
	Rea Vipingo Ltd	9.3	-3%	27%	2.230014	-0.03	0.27	0.035731	-0.032865645	2.197148755	0.707107	0.18902722	
	Sasini Tea & Coffee Ltd	85	62%	38%	4.442651	0.62	0.38	0.070709	0.274645644	4.717296901	0.707107	0.2659111	
	Finance & Investment	Barclays Bank Ltd	110	9%	17%	4.70048	0.09	0.17	0.014138	0.037930967	4.738411333	0.707107	0.1189036
		City Trust Ltd	35.75	8%	14%	3.57655	0.08	0.14	0.010112	0.034944042	3.611494311	0.707107	0.10055803
		CFC Bank Ltd	26	-21%	38%	3.258097	-0.21	0.38	0.072344	-0.141171887	3.116924651	0.707107	0.26896798
		Diamond Trust Bank Kenya Ltd	30.25	-40%	25%	3.409496	-0.40	0.25	0.031605	-0.215802708	3.193693476	0.707107	0.17777912
		Housing Finance Co (K) Ltd	23.5	-18%	14%	3.157	-0.18	0.14	0.009711	-0.094855274	3.062145147	0.707107	0.09854212
ICDC Investments Co Ltd		50	-8%	76%	3.912023	-0.08	0.76	0.28813	-0.184065135	3.72795787	0.707107	0.53677767	
Jubilee Insurance Co Ltd		41.5	-2%	28%	3.725693	-0.02	0.28	0.039396	-0.029698117	3.69599531	0.707107	0.19848485	
Kenya Commercial Bank Ltd		115	-7%	34%	4.744932	-0.07	0.34	0.056695	-0.06334748	4.681584648	0.707107	0.23810704	
National Bank of Kenya Ltd		15.2	-16%	31%	2.721295	-0.16	0.31	0.047878	-0.103938955	2.617356473	0.707107	0.21881021	
National Industrial Credit Ltd		60	4%	24%	4.094345	0.04	0.24	0.028987	0.005506424	4.099850986	0.707107	0.17025614	
Regent Undervalued Assets Africa Fund		580	0%	0%	6.363028	0.00	0.00	0	0	6.363028104	0.707107	0	
Pan Africa Insurance Ltd		63	-14%	34%	4.143135	-0.14	0.34	0.05898	-0.099489821	4.043644906	0.707107	0.24285724	
Standard Chartered Bank Ltd		47	-8%	13%	3.850148	-0.08	0.13	0.00811	-0.044054804	3.806092798	0.707107	0.09005336	
Commercial & Services		Africa Lakes Corporation Plc											
		A Baumann & Co Ltd	26	-49%	57%	3.258097	-0.49	0.57	0.161656	-0.325827805	2.932268734	0.707107	0.40206419
	CMC Holdings Ltd	82.5	15%	38%	4.412798	0.15	0.38	0.070908	0.039546188	4.452344481	0.707107	0.26628486	
	Car & General (K) Ltd	17	-20%	23%	2.833213	-0.20	0.23	0.026299	-0.113149387	2.720063957	0.707107	0.16216897	
	Express Kenya Ltd	71	-17%	19%	4.26268	-0.17	0.19	0.017367	-0.09368331	4.168996567	0.707107	0.13178247	
	Kenya Airways Ltd	8.2	0%	13%	2.104134	0.00	0.13	0.009053	-0.004526464	2.09960769	0.707107	0.09514688	
	Lonhro Motors (EA) Ltd	82.5	-70%	120%	4.412798	-0.70	1.20	0.721872	-0.710936047	3.701862247	0.707107	0.84963056	
	Marshall's (EA) Ltd	77	-5%	118%	4.343805	-0.05	1.18	0.691898	-0.370948912	3.97285651	0.707107	0.83180396	
	Nation Media Group Ltd	116	19%	56%	4.75359	0.19	0.56	0.15473	0.017635006	4.771225197	0.707107	0.39335733	
	Pearl Drycleaners Ltd	10.25	10%	18%	2.327278	0.10	0.18	0.01568	0.042159992	2.369437698	0.707107	0.12521987	
	Standard Newspapers Ltd	25	497%	70%	3.218876	4.97	0.70	0.24538	2.362309806	5.581185631	0.707107	0.49535885	
	Tourism Promotion Services (Serena)	Not listed for the full year											
	Uchumi Supermarkets Ltd	40	7%	45%	3.688879	0.07	0.45	0.100492	-0.015245777	3.673633677	0.707107	0.31700403	
	Industrial and Allied	Athi River Mining Ltd	Not listed for the full year										
Bamburi Cement Ltd		37.5	-7%	45%	3.624341	-0.07	0.45	0.102366	-0.086183002	3.538157931	0.707107	0.31994688	
British American Tobacco Ltd		61	-33%	30%	4.110874	-0.33	0.30	0.044993	-0.187496297	3.923377568	0.707107	0.21211458	
B O C Gases Ltd		76	-1%	110%	4.330733	-0.01	1.10	0.602065	-0.306032613	4.024700727	0.707107	0.77592862	
Carbacid Investments Ltd		84	-17%	19%	4.430817	-0.17	0.19	0.01846	-0.094230193	4.336586606	0.707107	0.135869	
Crown Berger Ltd		10.5	-12%	37%	2.351375	-0.12	0.37	0.069541	-0.094770473	2.256604784	0.707107	0.26370617	
Dunlop Kenya Ltd		270	-64%	161%	5.598422	-0.64	1.61	1.297571	-0.968785537	4.629636422	0.707107	1.13910977	
EA Cables Ltd		33	-15%	28%	3.496508	-0.15	0.28	0.038986	-0.094493223	3.402014339	0.707107	0.19744985	
EA Packaging Ltd		67	-30%	49%	4.204693	-0.30	0.49	0.121778	-0.210888979	3.993803641	0.707107	0.34896699	
EA Portland Cement Ltd		44	-16%	58%	3.78419	-0.16	0.58	0.169536	-0.16476789	3.619421744	0.707107	0.41174723	
Firestone East Africa Ltd		28	-14%	35%	3.332205	-0.14	0.35	0.06127	-0.100635089	3.231569421	0.707107	0.24752814	
East Africa Breweries Ltd		60	5%	25%	4.094345	0.05	0.25	0.032234	0.008882985	4.103227547	0.707107	0.17953838	
Kenya National Mills Ltd		47	16%	34%	3.850148	0.16	0.34	0.058594	0.050702835	3.900850437	0.707107	0.24206266	
Kenya Oil Co Ltd		70	-27%	22%	4.248495	-0.27	0.22	0.023692	-0.146846091	4.101649151	0.707107	0.15392265	
Kenya Power & Lighting Ltd		171	109%	47%	5.141664	1.09	0.47	0.112342	0.488829025	5.630492581	0.707107	0.33517451	
Total Kenya Ltd		84.5	-41%	57%	4.436752	-0.41	0.57	0.160083	-0.285041523	4.151710012	0.707107	0.40010379	
Unga Group Ltd	150	8%	39%	5.010635	0.08	0.39	0.07513	0.002434832	5.013070127	0.707107	0.27409913		

## ESTIMATION OF EXERCISE PRICES-January-June 1998

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V/2	(E(R)-V/2)*0.5	LN(p0)+(E(R)-V/2)*0.5	SORT(0.5)	V*SQRT(0.5)	
Agricultural	Brooke Bond Kenya Limited	110	28%	23%	4.70048	0.28	0.23	0.026861	0.128842219	4.829322585	0.7071068	0.16389331	
	Eagads Limited	41.5	16%	30%	3.725693	0.16	0.30	0.04418	0.055620654	3.781314081	0.7071068	0.21019129	
	George Williamson Kenya Ltd	85.8	74%	23%	4.452019	0.74	0.23	0.02625	0.358086972	4.810105978	0.7071068	0.16201944	
	Kakuzi Ltd	96	49%	26%	4.564348	0.49	0.26	0.034974	0.226002555	4.790350746	0.7071068	0.18701352	
	Kapchorua Tea Co Ltd	70	46%	22%	4.248495	0.46	0.22	0.025142	0.219571891	4.468067133	0.7071068	0.15856207	
	Limuru Tea Co Ltd	750	13%	2%	6.620073	0.13	0.02	0.00017	0.064915191	6.684988397	0.7071068	0.01302376	
	Rea Vipingo Ltd	8.2	-22%	16%	2.104134	-0.22	0.16	0.01246	-0.115985892	1.988148262	0.7071068	0.11162253	
	Sasini Tea & Coffee Ltd	61.7	16%	44%	4.122284	0.16	0.44	0.097824	0.032935583	4.155219514	0.7071068	0.3127685	
	Finance & Investment	Barclays Bank Ltd	116	16%	40%	4.75359	0.16	0.40	0.07927	0.03881322	4.792403411	0.7071068	0.28154948
		City Trust Ltd	34	-17%	77%	3.526361	-0.17	0.77	0.29645	-0.234989706	3.291370819	0.7071068	0.54447222
		CFC Bank Ltd	17.4	-6%	24%	2.85647	-0.06	0.24	0.0288	-0.046871264	2.809598942	0.7071068	0.16970563
Diamond Trust Bank Kenya Ltd		22.1	0%	20%	3.095578	0.00	0.20	0.02	-0.01	3.085577609	0.7071068	0.14142136	
Housing Finance Co (K) Ltd		15.3	16%	32%	2.727853	0.16	0.32	0.0512	0.056099346	2.783952175	0.7071068	0.22627417	
ICDC Investments Co Ltd		35.1	28%	37%	3.558201	0.28	0.37	0.06845	0.103951638	3.662152769	0.7071068	0.26162951	
Jubilee Insurance Co Ltd		31	3%	19%	3.433987	0.03	0.19	0.01805	0.007910484	3.441897688	0.7071068	0.13435029	
Kenya Commercial Bank Ltd		79.1	-12%	23%	4.370713	-0.12	0.23	0.02645	-0.074539791	4.296173083	0.7071068	0.16263456	
National Bank of Kenya Ltd		12.6	-28%	60%	2.533697	-0.28	0.60	0.18	-0.228888889	2.304807925	0.7071068	0.42426407	
National Industrial Credit Ltd		40.4	-24%	54%	3.69883	-0.24	0.54	0.1458	-0.193568317	3.505261468	0.7071068	0.38183766	
Regent Undervalued Assets Africa Func		580	0%	0%	6.363028	0.00	0.00	0	0	6.363028104	0.7071068	0	
Pan Africa Insurance Ltd		27.8	-34%	18%	3.325036	-0.34	0.18	0.0162	-0.176265468	3.148770553	0.7071068	0.12727922	
Standard Chartered Bank Ltd		47.6	12%	34%	3.862833	0.12	0.34	0.0578	0.03254958	3.895382341	0.7071068	0.24041631	
Commercial & Services		Africa Lakes Corporation Plc	Not listed										
		A Baumann & Co Ltd	15.6	13%	11%	2.747271	0.13	0.11	0.006169	0.062620438	2.809891353	0.7071068	0.0785454
		CMC Holdings Ltd	39	-14%	29%	3.663562	-0.14	0.29	0.04205	-0.091537821	3.572023826	0.7071068	0.20506097
	Car & General (K) Ltd	16.1	-25%	43%	2.778819	-0.25	0.43	0.09245	-0.173554193	2.605265079	0.7071068	0.30405592	
	Express Kenya Ltd	60	-45%	36%	4.094345	-0.45	0.36	0.0648	-0.2574	3.836944562	0.7071068	0.25455844	
	Kenya Airways Ltd	7.4	22%	25%	2.00148	0.22	0.25	0.03125	0.092483108	2.093963108	0.7071068	0.1767767	
	Lonhro Motors (EA) Ltd	39	-44%	25%	3.663562	-0.44	0.25	0.03125	-0.233573718	3.429987928	0.7071068	0.1767767	
	Marshall's (EA) Ltd	26.2	-1%	17%	3.265759	-0.01	0.17	0.01445	-0.011041794	3.254717617	0.7071068	0.12020815	
	Nation Media Group Ltd	130	6%	81%	4.867534	0.06	0.81	0.326759	-0.132225847	4.735308604	0.7071068	0.57162871	
	Pearl Drycleaners Ltd	10.5	-5%	4%	2.351375	-0.05	0.04	0.0008	-0.024209524	2.327165733	0.7071068	0.02828427	
	Standard Newspapers Ltd	32	-30%	92%	3.465736	-0.30	0.92	0.4232	-0.3631625	3.102573403	0.7071068	0.65053824	
	Tourism Promotion Services (Serena)	14	4%	31%	2.639057	0.04	0.31	0.04805	-0.002596429	2.636460901	0.7071068	0.2192031	
	Uchumi Supermarkets Ltd	40.6	17%	31%	3.703768	0.17	0.31	0.04805	0.06279766	3.766565727	0.7071068	0.2192031	
	Industrial and Allied	Athi River Mining Ltd	9.2	-29%	48%	2.219203	-0.29	0.48	0.1152	-0.20433913	2.014864354	0.7071068	0.33941125
Bamburi Cement Ltd		37	-1%	46%	3.610918	-0.01	0.46	0.1058	-0.057967568	3.552950345	0.7071068	0.32526912	
British American Tobacco Ltd		65.5	19%	9%	4.18205	0.19	0.09	0.00405	0.091104771	4.273154914	0.7071068	0.06363961	
B O C Gases Ltd		37	7%	46%	3.610918	0.07	0.46	0.1058	-0.019116216	3.591801696	0.7071068	0.32526912	
Carbacid Investments Ltd		50	53%	34%	3.912023	0.53	0.34	0.0578	0.2351	4.147123005	0.7071068	0.24041631	
Crown Berger Ltd		10	-6%	44%	2.302585	-0.06	0.44	0.0968	-0.0759	2.226685093	0.7071068	0.31112698	
Dunlop Kenya Ltd		20	3%	72%	2.995732	0.03	0.72	0.2592	-0.1171	2.878632274	0.7071068	0.50911688	
EA Cables Ltd		29	-31%	29%	3.367296	-0.31	0.29	0.04205	-0.176197414	3.191098416	0.7071068	0.20506097	
EA Packaging Ltd		49	-68%	43%	3.89182	-0.68	0.43	0.09245	-0.387041327	3.504778972	0.7071068	0.30405592	
EA Portland Cement Ltd		20	3%	25%	2.995732	0.03	0.25	0.03125	-0.000625	2.995107274	0.7071068	0.1767767	
Firestone East Africa Ltd		15.9	11%	29%	2.766319	0.11	0.29	0.04205	0.032434119	2.798753229	0.7071068	0.20506097	
East Africa Breweries Ltd		48	56%	36%	3.871201	0.56	0.36	0.0648	0.246766667	4.117967678	0.7071068	0.25455844	
Kenya National Mills Ltd		14.9	15%	58%	2.701361	0.15	0.58	0.1682	-0.010274497	2.691086716	0.7071068	0.41012193	
Kenya Oil Co Ltd		49.5	19%	22%	3.901973	0.19	0.22	0.0242	0.083859596	3.985832266	0.7071068	0.15556349	
Kenya Power & Lighting Ltd		121.2	3%	27%	4.797442	0.03	0.27	0.03645	-0.00172335	4.795718724	0.7071068	0.19091883	
Total Kenya Ltd		52.5	-10%	39%	3.960813	-0.10	0.39	0.07605	-0.085644048	3.875169122	0.7071068	0.27577164	
Unga Group Ltd		20	141%	95%	2.995732	1.41	0.95	0.45125	0.479375	3.475107274	0.7071068	0.67175144	

## ESTIMATION OF EXERCISE PRICES-JULY-DEC 1998

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V/2	(E(R)-V/2)*0.5	LN(p0)+(E(R)-V/2)*0.5	SQRT(0.5)	V*SQRT(0.5)	
Agricultural	Brooke Bond Kenya Limited	131.7	28%	23%	4.880527	0.28	0.23	0.026861	0.128842219	5.009368828	0.7071068	0.16389331	
	Eaagads Limited	37	16%	30%	3.610918	0.16	0.30	0.04418	0.055620654	3.666538667	0.7071068	0.21019129	
	George Williamson Kenya Ltd	141	74%	23%	4.94876	0.74	0.23	0.02625	0.358086972	5.306846862	0.7071068	0.16201944	
	Kakuzi Ltd	141.9	49%	26%	4.955123	0.49	0.26	0.034974	0.226002555	5.181125139	0.7071068	0.18701352	
	Kapchorua Tea Co Ltd	75.5	46%	22%	4.324133	0.46	0.22	0.025142	0.219571891	4.543704548	0.7071068	0.15856207	
	Limuru Tea Co Ltd	755	13%	2%	6.626718	0.13	0.02	0.00017	0.064915191	6.69163294	0.7071068	0.01302376	
	Rea Vipingo Ltd	6.4	-22%	16%	1.856298	-0.22	0.16	0.01246	-0.115985892	1.740312098	0.7071068	0.11162253	
	Sasini Tea & Coffee Ltd	75.1	16%	44%	4.318821	0.16	0.44	0.097824	0.032935583	4.351756142	0.7071068	0.3127685	
	Finance & Investment	Barclays Bank Ltd	101.5	16%	40%	4.620059	0.16	0.40	0.07927	0.03881322	4.658872019	0.7071068	0.28154948
		City Trust Ltd	31.6	-17%	77%	3.453157	-0.17	0.77	0.29645	-0.234989706	3.218167415	0.7071068	0.54447222
		CFC Bank Ltd	16.9	-6%	24%	2.827314	-0.06	0.24	0.0288	-0.046871264	2.780442358	0.7071068	0.16970563
		Diamond Trust Bank Kenya Ltd	22	0%	20%	3.091042	0.00	0.20	0.02	-0.01	3.081042453	0.7071068	0.14142136
		Housing Finance Co (K) Ltd	16	16%	32%	2.772589	0.16	0.32	0.0512	0.056099346	2.828688069	0.7071068	0.22627417
		ICDC Investments Co Ltd	39.1	28%	37%	3.666122	0.28	0.37	0.06845	0.103951638	3.770074105	0.7071068	0.26162951
Jubilee Insurance Co Ltd		30.2	3%	19%	3.407842	0.03	0.19	0.01805	0.007910484	3.415752408	0.7071068	0.13435029	
Kenya Commercial Bank Ltd		70	-12%	23%	4.248495	-0.12	0.23	0.02645	-0.074539791	4.173955451	0.7071068	0.16263456	
National Bank of Kenya Ltd		12.8	-28%	60%	2.549445	-0.28	0.60	0.18	-0.228888889	2.320556282	0.7071068	0.42426407	
National Industrial Credit Ltd		33.1	-24%	54%	3.499533	-0.24	0.54	0.1458	-0.193568317	3.305964966	0.7071068	0.38183766	
Regent Undervalued Assets Africa Func		580	0%	0%	6.363028	0.00	0.00	0	0	6.363028104	0.7071068	0	
Pan Africa Insurance Ltd		20	-34%	18%	2.995732	-0.34	0.18	0.0162	-0.176265468	2.819466806	0.7071068	0.12727922	
Standard Chartered Bank Ltd		42.1	12%	34%	3.740048	0.12	0.34	0.0578	0.03254958	3.772597321	0.7071068	0.24041631	
Commercial & Services		Africa Lakes Corporation Plc											
		A Baumann & Co Ltd	15.5	13%	11%	2.74084	0.13	0.11	0.006169	0.062620438	2.803460462	0.7071068	0.0785454
		CMC Holdings Ltd	35	-14%	29%	3.555348	-0.14	0.29	0.04205	-0.091537821	3.463810241	0.7071068	0.20506097
		Car & General (K) Ltd	11.1	-25%	43%	2.406945	-0.25	0.43	0.09245	-0.173554193	2.233390916	0.7071068	0.30405592
	Express Kenya Ltd	30	-45%	36%	3.401197	-0.45	0.36	0.0648	-0.2574	3.143797382	0.7071068	0.25455844	
	Kenya Airways Ltd	7	22%	25%	1.94591	0.22	0.25	0.03125	0.092483108	2.038393257	0.7071068	0.1767767	
	Lonhro Motors (EA) Ltd	26.3	-44%	25%	3.269569	-0.44	0.25	0.03125	-0.233573718	3.035995221	0.7071068	0.1767767	
	Marshalls (EA) Ltd	28.3	-1%	17%	3.342862	-0.01	0.17	0.01445	-0.011041794	3.331820011	0.7071068	0.12020815	
	Nation Media Group Ltd	113.2	6%	81%	4.729156	0.06	0.81	0.326759	-0.132225847	4.596930319	0.7071068	0.57162871	
	Pearl Drycleaners Ltd	10.3	-5%	4%	2.332144	-0.05	0.04	0.0008	-0.024209524	2.307934371	0.7071068	0.02828427	
	Standard Newspapers Ltd	29.9	-30%	92%	3.397858	-0.30	0.92	0.4232	-0.3631625	3.03469598	0.7071068	0.65053824	
	Tourism Promotion Services (Serena)	13	4%	31%	2.564949	0.04	0.31	0.04805	-0.002596429	2.562352929	0.7071068	0.2192031	
	Uchumi Supermarkets Ltd	45.5	17%	31%	3.817712	0.17	0.31	0.04805	0.06279766	3.880509986	0.7071068	0.2192031	
	Industrial and Allied	Athi River Mining Ltd	9	-29%	48%	2.197225	-0.29	0.48	0.1152	-0.20433913	1.992885447	0.7071068	0.33941125
Bamburi Cement Ltd		35.1	-1%	46%	3.558201	-0.01	0.46	0.1058	-0.057967568	3.500233563	0.7071068	0.32526912	
British American Tobacco Ltd		67.5	19%	9%	4.212128	0.19	0.09	0.00405	0.091104771	4.303232369	0.7071068	0.06363961	
B O C Gases Ltd		35.1	7%	46%	3.558201	0.07	0.46	0.1058	-0.019116216	3.539084914	0.7071068	0.32526912	
Carbacid Investments Ltd		44.9	53%	34%	3.804438	0.53	0.34	0.0578	0.2351	4.039537795	0.7071068	0.24041631	
Crown Berger Ltd		9.4	-6%	44%	2.24071	-0.06	0.44	0.0968	-0.0759	2.164809689	0.7071068	0.31112698	
Dunlop Kenya Ltd		30.8	3%	72%	3.427515	0.03	0.72	0.2592	-0.1171	3.31041469	0.7071068	0.50911688	
EA Cables Ltd		22.1	-31%	29%	3.095578	-0.31	0.29	0.04205	-0.176197414	2.919380195	0.7071068	0.20506097	
EA Packaging Ltd		20	-68%	43%	2.995732	-0.68	0.43	0.09245	-0.387041327	2.608690947	0.7071068	0.30405592	
EA Portland Cement Ltd		22.1	3%	25%	3.095578	0.03	0.25	0.03125	-0.000625	3.094952609	0.7071068	0.1767767	
Firestone East Africa Ltd		17.1	11%	29%	2.839078	0.11	0.29	0.04205	0.032434119	2.871512583	0.7071068	0.20506097	
East Africa Breweries Ltd		54.8	56%	36%	4.00369	0.56	0.36	0.0648	0.246766667	4.250456861	0.7071068	0.25455844	
Kenya National Mills Ltd		24.3	15%	58%	3.190476	0.15	0.58	0.1682	-0.010274497	3.180201854	0.7071068	0.41012193	
Kenya Oil Co Ltd		49.5	19%	22%	3.901973	0.19	0.22	0.0242	0.083859596	3.985832266	0.7071068	0.15556349	
Kenya Power & Lighting Ltd		129.6	3%	27%	4.864453	0.03	0.27	0.03645	-0.00172335	4.862729434	0.7071068	0.19091883	
Total Kenya Ltd		41.4	-10%	39%	3.723281	-0.10	0.39	0.07605	-0.085644048	3.637636833	0.7071068	0.27577164	
Unga Group Ltd		58.8	141%	95%	4.074142	1.41	0.95	0.45125	0.479375	4.553516855	0.7071068	0.67175144	

## ESTIMATION OF EXERCISE PRICES-January-June 1999

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V2/2	(E(R)-V2/2)*0.5	LN(p0)+(E(R)-V2/2)*0.5	SQRT(0.5 V*SQRT(0.5))		
Agricultural	Brooke Bond Kenya Limited	141	-25%	39%	4.94876	-0.25	0.39	0.076228	-0.161163508	4.787596383	0.707107	0.276093688	
	Eaagads Limited	43.2	-37%	60%	3.76584	-0.37	0.60	0.18184	-0.275526404	3.490314091	0.707107	0.426426835	
	George Williamson Kenya Ltd	141	-33%	22%	4.94876	-0.33	0.22	0.024888	-0.177337789	4.771422101	0.707107	0.157760403	
	Kakuzi Ltd	141	-36%	27%	4.94876	-0.36	0.27	0.035396	-0.199435472	4.749324418	0.707107	0.188137627	
	Kapchorua Tea Co Ltd	95	61%	24%	4.553877	0.61	0.24	0.027623	0.288820271	4.842697162	0.707107	0.166200531	
	Limuru Tea Co Ltd	760	-7%	16%	6.633318	-0.07	0.16	0.012222	-0.03900576	6.594312673	0.707107	0.110553367	
	Rea Vipingo Ltd	6	-20%	20%	1.791759	-0.20	0.20	0.020108	-0.110053819	1.681705651	0.707107	0.141801401	
	Sasini Tea & Coffee Ltd	69.8	-35%	27%	4.245634	-0.35	0.27	0.036091	-0.192830584	4.052803426	0.707107	0.189976229	
	Finance & Investment	Barclays Bank Ltd	126.3	-10%	20%	4.83866	-0.10	0.20	0.02	-0.060277118	4.778382911	0.707107	0.141421356
		City Trust Ltd	26.1	-15%	14%	3.261935	-0.15	0.14	0.0098	-0.081528352	3.180406962	0.707107	0.098994949
CFC Bank Ltd		15.6	4%	43%	2.747271	0.04	0.43	0.09245	-0.023789103	2.723481812	0.707107	0.304055916	
Diamond Trust Bank Kenya Ltd		22	20%	25%	3.091042	0.20	0.25	0.03125	0.084375	3.175417453	0.707107	0.176776695	
Housing Finance Co (K) Ltd		16.1	-28%	28%	2.778819	-0.28	0.28	0.0392	-0.160904348	2.617914924	0.707107	0.197989899	
ICDC Investments Co Ltd		42	27%	8%	3.73767	0.27	0.08	0.0032	0.135304762	3.872974738	0.707107	0.056568542	
Jubilee Insurance Co Ltd		30.3	-18%	23%	3.411148	-0.18	0.23	0.02645	-0.104809158	3.306338554	0.707107	0.16263456	
Kenya Commercial Bank Ltd		61.6	-49%	23%	4.120662	-0.49	0.23	0.02645	-0.25835487	3.862307	0.707107	0.16263456	
National Bank of Kenya Ltd		8.6	-42%	29%	2.151762	-0.42	0.29	0.04205	-0.230327326	1.921434878	0.707107	0.205060967	
National Industrial Credit Ltd		30	-5%	14%	3.401197	-0.05	0.14	0.0098	-0.0274	3.373797382	0.707107	0.098994949	
Regent Undervalued Assets Africa Fund		580	0%	-1%	6.363028	0.00	-0.01	5.94E-05	-2.97025E-05	6.362998401	0.707107	-0.007707464	
Pan Africa Insurance Ltd		16.7	66%	109%	2.815409	0.66	1.09	0.59405	0.030819311	2.846228031	0.707107	0.770746391	
Standard Chartered Bank Ltd		51.6	11%	15%	3.943522	0.11	0.15	0.01125	0.047185078	3.99070675	0.707107	0.106066017	
Commercial & Services		Africa Lakes Corporation Plc	Not listed										
		A Baumann & Co Ltd	16.9	-4%	12%	2.827314	-0.04	0.12	0.0072	-0.025789349	2.801524273	0.707107	0.084852814
		CMC Holdings Ltd	33	-7%	16%	3.496508	-0.07	0.16	0.0128	-0.040490909	3.456016652	0.707107	0.113137085
	Car & General (K) Ltd	12	-25%	105%	2.484907	-0.25	1.05	0.55125	-0.400625	2.08428165	0.707107	0.74246212	
	Express Kenya Ltd	28.6	-34%	49%	3.353407	-0.34	0.49	0.12005	-0.22960542	3.123801298	0.707107	0.346482323	
	Kenya Airways Ltd	8.1	-4%	39%	2.091864	-0.04	0.39	0.07605	-0.056543519	2.035320543	0.707107	0.275771645	
	Lonhro Motors (EA) Ltd	22	-40%	38%	3.091042	-0.40	0.38	0.0722	-0.233827273	2.857215181	0.707107	0.268700577	
	Marshalls (EA) Ltd	25	-6%	19%	3.218876	-0.06	0.19	0.01805	-0.037025	3.181850825	0.707107	0.134350288	
	Nation Media Group Ltd	137.7	-26%	22%	4.925077	-0.26	0.22	0.0242	-0.141548076	4.78352933	0.707107	0.155563492	
	Pearl Drycleaners Ltd	10	-70%	120%	2.302585	-0.70	1.20	0.72	-0.71	1.592585093	0.707107	0.848528137	
	Standard Newspapers Ltd	21.3	-53%	112%	3.058707	-0.53	1.12	0.6272	-0.578858216	2.479848857	0.707107	0.791959595	
	Tourism Promotion Services (Serena)	14.5	11%	16%	2.674149	0.11	0.16	0.0128	0.048772414	2.722921063	0.707107	0.113137085	
	Uchumi Supermarkets Ltd	44	0%	27%	3.78419	0.00	0.27	0.03645	-0.019361364	3.76482827	0.707107	0.190918831	
	Industrial and Allied	Athi River Mining Ltd	6.2	-5%	42%	1.824549	-0.05	0.42	0.0882	-0.068293548	1.756255744	0.707107	0.296984848
Bamburi Cement Ltd		36	-23%	31%	3.583519	-0.23	0.31	0.04805	-0.141386111	3.442132827	0.707107	0.219203102	
British American Tobacco Ltd		71.2	1%	27%	4.265493	0.01	0.27	0.03645	-0.012607022	4.252885796	0.707107	0.190918831	
B O C Gases Ltd		36	-20%	31%	3.583519	-0.20	0.31	0.04805	-0.123330556	3.460188383	0.707107	0.219203102	
Carbacid Investments Ltd		76.5	6%	29%	4.337291	0.06	0.29	0.04205	0.008386765	4.345677506	0.707107	0.205060967	
Crown Berger Ltd		8.1	48%	69%	2.091864	0.48	0.69	0.23805	0.120975	2.212839062	0.707107	0.487903679	
Dunlop Kenya Ltd		20	-49%	57%	2.995732	-0.49	0.57	0.16245	-0.326225	2.669507274	0.707107	0.403050865	
EA Cables Ltd		20	-10%	68%	2.995732	-0.10	0.68	0.2312	-0.1656	2.830132274	0.707107	0.480832611	
EA Packaging Ltd		15.5	-55%	51%	2.74084	-0.55	0.51	0.13005	-0.339218548	2.401621476	0.707107	0.360624458	
EA Portland Cement Ltd		17.6	-36%	107%	2.867899	-0.36	1.07	0.57245	-0.468043182	2.39985572	0.707107	0.756604256	
Firestone East Africa Ltd		16.1	7%	24%	2.778819	0.07	0.24	0.0288	0.019761491	2.798580763	0.707107	0.169705627	
East Africa Breweries Ltd		68.8	12%	20%	4.231204	0.12	0.20	0.02	0.048866279	4.280070024	0.707107	0.141421356	
Kenya National Mills Ltd		17	-44%	77%	2.833213	-0.44	0.77	0.29645	-0.368813235	2.464400109	0.707107	0.544472222	
Kenya Oil Co Ltd		55	23%	42%	4.007333	0.23	0.42	0.0882	0.072263636	4.079596822	0.707107	0.296984848	
Kenya Power & Lighting Ltd		124.9	-20%	25%	4.827513	-0.20	0.25	0.03125	-0.113303143	4.714210275	0.707107	0.176776695	
Total Kenya Ltd		49	4%	25%	3.89182	0.04	0.25	0.03125	0.004783163	3.896603461	0.707107	0.176776695	
Unga Group Ltd	47	-45%	103%	3.850148	-0.45	1.03	0.53045	-0.488629255	3.361518346	0.707107	0.728319985		

## ESTIMATION OF EXERCISE PRICES-JULY-DECEMBER 1999

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V2/2	(E(R)-V2/2)*0.5	LN(p0)+(E(R)-V2/2)*0.5	SQRT(0.5 V*SQRT(0.5		
Agricultural	Brooke Bond Kenya Limited	146.9	-25%	39%	4.989752	-0.25	0.39	0.076228	-0.163113862	4.826638221	0.707107	0.276093688	
	Eaagads Limited	42.1	-37%	60%	3.740048	-0.37	0.60	0.18184	-0.275919923	3.464127818	0.707107	0.426426835	
	George Williamson Kenya Ltd	143	-33%	22%	4.962845	-0.33	0.22	0.024888	-0.177444172	4.785400458	0.707107	0.157760403	
	Kakuzi Ltd	120.4	-36%	27%	4.79082	-0.36	0.27	0.035396	-0.197697883	4.593121649	0.707107	0.188137627	
	Kapchorua Tea Co Ltd	150	61%	24%	5.010635	0.61	0.24	0.027623	0.291188692	5.301823986	0.707107	0.166200531	
	Limuru Tea Co Ltd	650	-7%	16%	6.476972	-0.07	0.16	0.012222	-0.041111023	6.435861339	0.707107	0.110553367	
	Rea Vipingo Ltd	6	-20%	20%	1.791759	-0.20	0.20	0.020108	-0.110053819	1.681705651	0.707107	0.141801401	
	Sasini Tea & Coffee Ltd	54	-35%	27%	3.988984	-0.35	0.27	0.036091	-0.193045484	3.795938563	0.707107	0.189976229	
	Finance & Investment	Barclays Bank Ltd	109.6	-10%	20%	4.696837	-0.10	0.20	0.02	-0.06	4.636837375	0.707107	0.141421356
		City Trust Ltd	22.5	-15%	14%	3.113515	-0.15	0.14	0.0098	-0.0799	3.033615309	0.707107	0.098994949
CFC Bank Ltd		15.1	4%	43%	2.714695	0.04	0.43	0.09245	-0.026225	2.688469744	0.707107	0.304055916	
Diamond Trust Bank Kenya Ltd		23.9	20%	25%	3.173878	0.20	0.25	0.03125	0.084375	3.258253459	0.707107	0.176776695	
Housing Finance Co (K) Ltd		13.1	-28%	28%	2.572612	-0.28	0.28	0.0392	-0.1596	2.41301223	0.707107	0.197989899	
ICDC Investments Co Ltd		48.3	27%	8%	3.877432	0.27	0.08	0.0032	0.1334	4.010831561	0.707107	0.056568542	
Jubilee Insurance Co Ltd		28.4	-18%	23%	3.346389	-0.18	0.23	0.02645	-0.103225	3.243164145	0.707107	0.16263456	
Kenya Commercial Bank Ltd		43.9	-49%	23%	3.781914	-0.49	0.23	0.02645	-0.258225	3.52368932	0.707107	0.16263456	
National Bank of Kenya Ltd		6.3	-42%	29%	1.84055	-0.42	0.29	0.04205	-0.231025	1.609524633	0.707107	0.205060967	
National Industrial Credit Ltd		28.7	-5%	14%	3.356897	-0.05	0.14	0.0098	-0.0299	3.326997123	0.707107	0.098994949	
Pan Africa Insurance Ltd		24	66%	109%	3.178054	0.66	1.09	0.59405	0.032975	3.21102883	0.707107	0.770746391	
Standard Chartered Bank Ltd		48.9	11%	15%	3.889777	0.11	0.15	0.01125	0.049375	3.939152396	0.707107	0.106066017	
Commercial & Services		Africa Lakes Corporation Plc											
		A Baumann & Co Ltd	16.9	-4%	12%	2.827314	-0.04	0.12	0.0072	-0.0236	2.803713622	0.707107	0.084852814
	CMC Holdings Ltd	28	-7%	16%	3.332205	-0.07	0.16	0.0128	-0.0414	3.29080451	0.707107	0.113137085	
	Car & General (K) Ltd	10	-25%	105%	2.302585	-0.25	1.05	0.55125	-0.400625	1.901960093	0.707107	0.74246212	
	Express Kenya Ltd	25.5	-34%	49%	3.238678	-0.34	0.49	0.12005	-0.230025	3.008653452	0.707107	0.346482323	
	Kenya Airways Ltd	8	-4%	39%	2.079442	-0.04	0.39	0.07605	-0.058025	2.021416542	0.707107	0.275771645	
	Lonhro Motors (EA) Ltd	17	-40%	38%	2.833213	-0.40	0.38	0.0722	-0.2361	2.597113344	0.707107	0.268700577	
	Marshall's (EA) Ltd	22	-6%	19%	3.091042	-0.06	0.19	0.01805	-0.039025	3.052017453	0.707107	0.134350288	
	Nation Media Group Ltd	130	-26%	22%	4.867534	-0.26	0.22	0.0242	-0.1421	4.72543445	0.707107	0.155563492	
	Pearl Drycleaners Ltd	10	-70%	120%	2.302585	-0.70	1.20	0.72	-0.71	1.592585093	0.707107	0.848528137	
	Standard Newspapers Ltd	14	-53%	112%	2.639057	-0.53	1.12	0.6272	-0.5786	2.06045733	0.707107	0.791959595	
	Tourism Promotion Services (Serena)	13.2	-11%	16%	2.580217	-0.11	0.16	0.0128	-0.0614	2.51881683	0.707107	0.113137085	
	Uchumi Supermarkets Ltd	48.2	0%	27%	3.875359	0.00	0.27	0.03645	-0.018225	3.857134021	0.707107	0.190918831	
Industrial and Allied	Athi River Mining Ltd	5.7	-5%	42%	1.740466	-0.05	0.42	0.0882	-0.0691	1.671366175	0.707107	0.296984848	
	Bamburi Cement Ltd	26	-23%	31%	3.258097	-0.23	0.31	0.04805	-0.139025	3.119071538	0.707107	0.219203102	
	British American Tobacco Ltd	71.5	1%	27%	4.269697	0.01	0.27	0.03645	-0.013225	4.25647245	0.707107	0.190918831	
	B O C Gases Ltd	26	-20%	31%	3.258097	-0.20	0.31	0.04805	-0.124025	3.134071538	0.707107	0.219203102	
	Carbacid Investments Ltd	95.6	6%	29%	4.560173	0.06	0.29	0.04205	0.008975	4.56914782	0.707107	0.205060967	
	Crown Berger Ltd	8.5	48%	69%	2.140066	0.48	0.69	0.23805	0.120975	2.261041163	0.707107	0.487903679	
	Dunlop Kenya Ltd	15	-49%	57%	2.70805	-0.49	0.57	0.16245	-0.326225	2.381825201	0.707107	0.403050865	
	EA Cables Ltd	19.6	-10%	68%	2.97553	-0.10	0.68	0.2312	-0.1656	2.809929566	0.707107	0.480832611	
	EA Packaging Ltd	14	-55%	51%	2.639057	-0.55	0.51	0.13005	-0.340025	2.29903233	0.707107	0.380624458	
	EA Portland Cement Ltd	14.5	-36%	107%	2.674149	-0.36	1.07	0.57245	-0.466225	2.207923649	0.707107	0.756604256	
	Firestone East Africa Ltd	16.5	7%	24%	2.80336	0.07	0.24	0.0288	0.0206	2.823960381	0.707107	0.169705627	
	East Africa Breweries Ltd	77.1	12%	20%	4.345103	0.12	0.20	0.02	0.05	4.395103281	0.707107	0.141421356	
	Kenya National Mills Ltd	14	-44%	77%	2.639057	-0.44	0.77	0.29645	-0.368225	2.27083233	0.707107	0.544472222	
	Kenya Oil Co Ltd	76	23%	42%	4.330733	0.23	0.42	0.0882	0.0709	4.40163334	0.707107	0.296984848	
	Kenya Power & Lighting Ltd	111.3	-20%	25%	4.712229	-0.20	0.25	0.03125	-0.115625	4.596604258	0.707107	0.176776695	
	Total Kenya Ltd	47	4%	25%	3.850148	0.04	0.25	0.03125	0.004375	3.854522602	0.707107	0.176776695	
	Unga Group Ltd	31.1	-45%	103%	3.437208	-0.45	1.03	0.53045	-0.490225	2.946982819	0.707107	0.728319985	

## ESTIMATION OF EXERCISE PRICES- January-June 2000

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V2/2	(E(R)-V2/2)*0.5	LN(p0)+(E(R)-V2/2)*0.5	SQRT(0.5)	V*SQRT(0.5)	
Agricultural	Brooke Bond Kenya Limited	104.7	-4%	28%	4.651099	-0.04	0.28	0.039002	-0.037170337	4.61392878	0.707107	0.19748826	
	Eaagads Limited	25	-18%	21%	3.218876	-0.18	0.21	0.021291	-0.100645584	3.118230241	0.707107	0.14591493	
	George Williamson Kenya Ltd	92	8%	43%	4.521789	0.08	0.43	0.092946	-0.005712072	4.516076505	0.707107	0.30487027	
	Kakuzi Ltd	91.5	-36%	29%	4.516339	-0.36	0.29	0.042383	-0.20292932	4.313409652	0.707107	0.20587244	
	Kapchorua Tea Co Ltd	150	2%	0%	5.010635	0.02	0.00	0	0.008333333	5.018968627	0.707107	0	
	Limuru Tea Co Ltd	650	8%	0%	6.476972	0.08	0.00	0	0.042307692	6.519280055	0.707107	0	
	Rea Vipingo Ltd	4.95	-37%	22%	1.599388	-0.37	0.22	0.024048	-0.198892682	1.400494895	0.707107	0.15507414	
	Sasini Tea & Coffee Ltd	44.9	-19%	30%	3.804438	-0.19	0.30	0.045	-0.11938196	3.685055835	0.707107	0.21213203	
	Finance & Investment	Barclays Bank Ltd	82.95	3%	36%	4.418238	0.03	0.36	0.0648	-0.017029295	4.401208722	0.707107	0.25455844
		City Trust Ltd	22	15%	19%	3.091042	0.15	0.19	0.01805	0.064838636	3.15588109	0.707107	0.13435029
CFC Bank Ltd		11	-3%	40%	2.397895	-0.03	0.40	0.08	-0.052727273	2.345168	0.707107	0.28284271	
Diamond Trust Bank Kenya Ltd		26	-45%	29%	3.258097	-0.45	0.29	0.04205	-0.244101923	3.013994615	0.707107	0.20506097	
Housing Finance Co (K) Ltd		10.6	-46%	111%	2.360854	-0.46	1.11	0.61605	-0.536798585	1.824055416	0.707107	0.78488853	
ICDC Investments Co Ltd		50	-1%	27%	3.912023	-0.01	0.27	0.03645	-0.023225	3.888798005	0.707107	0.19091883	
Jubilee Insurance Co Ltd		25.1	9%	24%	3.222868	0.09	0.24	0.0288	0.028428685	3.251296531	0.707107	0.16970563	
Kenya Commercial Bank Ltd		21.8	17%	34%	3.08191	0.17	0.34	0.0578	0.055962385	3.137872355	0.707107	0.24041631	
National Bank of Kenya Ltd		5	-37%	51%	1.609438	-0.37	0.51	0.13005	-0.250025	1.359412912	0.707107	0.36062446	
National Industrial Credit Ltd		27	-28%	39%	3.295837	-0.28	0.39	0.07605	-0.175987963	3.119848903	0.707107	0.27577164	
Pan Africa Insurance Ltd		26.5	-58%	39%	3.277145	-0.58	0.39	0.07605	-0.33047783	2.946666903	0.707107	0.27577164	
Standard Chartered Bank Ltd		37.5	44%	51%	3.624341	0.44	0.51	0.13005	0.153641667	3.7779826	0.707107	0.36062446	
Commercial & Services		Africa Lakes Corporation Plc	Not listed for a full year										
		A Baumann & Co Ltd	15	-30%	22%	2.70805	-0.30	0.22	0.0242	-0.1621	2.545950201	0.707107	0.15556349
		CMC Holdings Ltd	30	-49%	27%	3.401197	-0.49	0.27	0.03645	-0.264058333	3.137139048	0.707107	0.19091883
		Car & General (K) Ltd	9	11%	94%	2.197225	0.11	0.94	0.4418	-0.165344444	2.031880133	0.707107	0.66468037
	Express Kenya Ltd	18.9	-5%	13%	2.939162	-0.05	0.13	0.00845	-0.030680026	2.908481896	0.707107	0.09192388	
	Kenya Airways Ltd	7.85	31%	25%	2.060514	0.31	0.25	0.03125	0.137241242	2.197754774	0.707107	0.1767767	
	Marshalls (EA) Ltd	23.6	-21%	20%	3.161247	-0.21	0.20	0.02	-0.115932203	3.045314509	0.707107	0.14142136	
	Nation Media Group Ltd	101	-30%	17%	4.615121	-0.30	0.17	0.01445	-0.156977475	4.458143042	0.707107	0.12020815	
	Pearl Drycleaners Ltd	3	-32%	26%	1.098612	-0.32	0.26	0.0338	-0.175233333	0.923378955	0.707107	0.18384776	
	Standard Newspapers Ltd	11	44%	110%	2.397895	0.44	1.10	0.605	-0.084318182	2.313577091	0.707107	0.77781746	
	Tourism Promotion Services (Serena)	16.2	-50%	97%	2.785011	-0.50	0.97	0.47045	-0.48368179	2.301329452	0.707107	0.68589358	
	Uchumi Supermarkets Ltd	40.2	29%	17%	3.693867	0.29	0.17	0.01445	0.139541169	3.833408165	0.707107	0.12020815	
	Industrial and Allied	Athi River Mining Ltd	5.6	-29%	42%	1.722767	-0.29	0.42	0.0882	-0.186957143	1.535809455	0.707107	0.29698485
Bamburi Cement Ltd		26	33%	14%	3.258097	0.33	0.14	0.0098	0.158561538	3.416658076	0.707107	0.09899495	
British American Tobacco Ltd		57	1%	52%	4.043051	0.01	0.52	0.1352	-0.061982022	3.981069245	0.707107	0.36769553	
B O C Gases Ltd		64	-21%	30%	4.158883	-0.21	0.30	0.045	-0.125625	4.033258083	0.707107	0.21213203	
Carbacid Investments Ltd		56	-24%	40%	4.025352	-0.24	0.40	0.08	-0.158303571	3.867048119	0.707107	0.28284271	
Crown Berger Ltd		11.05	-10%	34%	2.40243	-0.10	0.34	0.0578	-0.0789	2.323530428	0.707107	0.24041631	
Dunlop Kenya Ltd		9.8	-31%	22%	2.282382	-0.31	0.22	0.0242	-0.165161224	2.117221161	0.707107	0.15556349	
EA Cables Ltd		12.95	6%	62%	2.561096	0.06	0.62	0.1922	-0.065211969	2.495883819	0.707107	0.4384062	
EA Packaging Ltd		12.5	-40%	86%	2.525729	-0.40	0.86	0.3698	-0.3849	2.140828644	0.707107	0.60811183	
EA Portland Cement Ltd		11.2	4%	24%	2.415914	0.04	0.24	0.0288	0.007921429	2.423835207	0.707107	0.16970563	
Firestone East Africa Ltd		15.6	-20%	30%	2.747271	-0.20	0.30	0.045	-0.121858974	2.62541194	0.707107	0.21213203	
East Africa Breweries Ltd		65.95	24%	17%	4.188897	0.24	0.17	0.01445	0.114458093	4.303354972	0.707107	0.12020815	
Kenya National Mills Ltd		9.5	-26%	80%	2.251292	-0.26	0.80	0.32	-0.291578947	1.959712851	0.707107	0.56568542	
Kenya Oil Co Ltd		67.75	19%	23%	4.215824	0.19	0.23	0.02645	0.080870941	4.296695401	0.707107	0.16263456	
Kenya Power & Lighting Ltd		92.2	-54%	46%	4.52396	-0.54	0.46	0.1058	-0.325134273	4.198825857	0.707107	0.32526912	
Total Kenya Ltd		48.25	21%	43%	3.876396	0.21	0.43	0.09245	0.058956347	3.935352175	0.707107	0.30405592	
Unga Group Ltd		22.85	-39%	73%	3.128951	-0.39	0.73	0.26645	-0.329067451	2.799883667	0.707107	0.51618795	

## ESTIMATION OF EXERCISE PRICES-JULY-DECEMBER 2000

SECTOR	COMPANY	p0	E(R)	Volatility	LN(p0)	E(R)	V	V2/2	(E(R)-V2/2)*0.5	LN(p0)+(E(R)-V2/2)*0.5	SQRT(0.5)	V*SQRT(0.5)		
Agricultural	Brooke Bond Kenya Limited	74	-4%	28%	4.304065	-0.04	0.28	0.039002	-0.037170337	4.266894756	0.7071068	0.197488255		
	Eaagads Limited	25	-18%	21%	3.218876	-0.18	0.21	0.021291	-0.100645584	3.118230241	0.7071068	0.145914933		
	George Williamson Kenya Ltd	75	8%	43%	4.317488	0.08	0.43	0.092946	-0.005712072	4.311776041	0.7071068	0.304870273		
	Kakuzi Ltd	66.5	-38%	29%	4.197202	-0.38	0.29	0.042383	-0.21299501	3.984206937	0.7071068	0.205872445		
	Kapchorua Tea Co Ltd	150	2%	0%	5.010635	0.02	0.00	0	0.008333333	5.018968627	0.7071068	0		
	Limuru Tea Co Ltd	650	8%	0%	6.476972	0.08	0.00	0	0.042307692	6.519280055	0.7071068	0		
	Rea Vipingo Ltd	3.85	-37%	22%	1.348073	-0.37	0.22	0.024048	-0.198892682	1.149180467	0.7071068	0.155074142		
	Sasini Tea & Coffee Ltd	35	-19%	30%	3.555348	-0.19	0.30	0.045	-0.11938196	3.435966102	0.7071068	0.212132034		
	Finance & Investment	Barclays Bank Ltd	86	3%	36%	4.454347	0.03	0.36	0.0648	-0.0174	4.436947296	0.7071068	0.254558441	
		City Trust Ltd	20	15%	19%	2.995732	0.15	0.19	0.01805	0.065975	3.061707274	0.7071068	0.134350288	
CFC Bank Ltd		9.8	-3%	40%	2.282382	-0.03	0.40	0.08	-0.055	2.227382386	0.7071068	0.282842712		
Diamond Trust Bank Kenya Ltd		20	-45%	29%	2.995732	-0.45	0.29	0.04205	-0.246025	2.749707274	0.7071068	0.205060967		
Housing Finance Co (K) Ltd		7.05	-46%	111%	1.953028	-0.46	1.11	0.61605	-0.538025	1.415002617	0.7071068	0.784888527		
ICDC Investments Co Ltd		49.5	-1%	27%	3.901973	-0.01	0.27	0.03645	-0.023225	3.87874767	0.7071068	0.190918831		
Jubilee Insurance Co Ltd		22	9%	24%	3.091042	0.09	0.24	0.0288	0.0306	3.121642453	0.7071068	0.169705627		
Kenya Commercial Bank Ltd		28	17%	34%	3.332205	0.17	0.34	0.0578	0.0561	3.38830451	0.7071068	0.240416306		
National Bank of Kenya Ltd		3.6	-37%	51%	1.280934	-0.37	0.51	0.13005	-0.250025	1.030908845	0.7071068	0.360624458		
National Industrial Credit Ltd		21	-28%	39%	3.044522	-0.28	0.39	0.07605	-0.178025	2.866497438	0.7071068	0.275771645		
Pan Africa Insurance Ltd		20	-58%	39%	2.995732	-0.58	0.39	0.07605	-0.328025	2.667707274	0.7071068	0.275771645		
Standard Chartered Bank Ltd		48	44%	51%	3.871201	0.44	0.51	0.13005	0.154975	4.026176011	0.7071068	0.360624458		
Commercial & Services		Africa Lakes Corporation Plc	Not listed for the full year											
		A Baumann & Co Ltd	13.8	-30%	22%	2.624669	-0.30	0.22	0.0242	-0.1621	2.462568592	0.7071068	0.155563492	
		CMC Holdings Ltd	16.8	-49%	27%	2.821379	-0.49	0.27	0.03645	-0.263225	2.558153886	0.7071068	0.190918831	
		Car & General (K) Ltd	10.05	11%	94%	2.307573	0.11	0.94	0.4418	-0.1659	2.141672635	0.7071068	0.664680374	
	Express Kenya Ltd	19.05	-5%	13%	2.947067	-0.05	0.13	0.00845	-0.029225	2.917842102	0.7071068	0.091923882		
	Kenya Airways Ltd	8	31%	25%	2.079442	0.31	0.25	0.03125	0.139375	2.218816542	0.7071068	0.176776695		
	Marshalls (EA) Ltd	19.3	-21%	20%	2.960105	-0.21	0.20	0.02	-0.115	2.845105096	0.7071068	0.141421356		
	Nation Media Group Ltd	75	-30%	17%	4.317488	-0.30	0.17	0.01445	-0.157225	4.160263114	0.7071068	0.120208153		
	Pearl Drycleaners Ltd	2.4	-32%	26%	0.875469	-0.32	0.26	0.0338	-0.1769	0.698568737	0.7071068	0.183847763		
	Standard Newspapers Ltd	6.1	44%	110%	1.808289	0.44	1.10	0.605	-0.0825	1.725788771	0.7071068	0.777817459		
	Tourism Promotion Services (Serena)	15.95	-50%	97%	2.769459	-0.50	0.97	0.47045	-0.485225	2.284233829	0.7071068	0.685893578		
Uchumi Supermarkets Ltd	42.75	29%	17%	3.755369	0.29	0.17	0.01445	0.137775	3.893144195	0.7071068	0.120208153			
Industrial and Allied	Athi River Mining Ltd	4.55	-29%	42%	1.515127	-0.29	0.42	0.0882	-0.1891	1.326027233	0.7071068	0.296984848		
	Bamburi Cement Ltd	29.25	33%	14%	3.37588	0.33	0.14	0.0098	0.1601	3.535979574	0.7071068	0.098994949		
	British American Tobacco Ltd	57	17%	52%	4.043051	0.17	0.52	0.1352	0.0174	4.060451268	0.7071068	0.367695526		
	B O C Gases Ltd	47.25	-21%	30%	3.855453	-0.21	0.30	0.045	-0.1275	3.727952654	0.7071068	0.212132034		
	Carbacid Investments Ltd	50	-24%	40%	3.912023	-0.24	0.40	0.08	-0.16	3.752023005	0.7071068	0.282842712		
	Crown Berger Ltd	12.5	-10%	34%	2.525729	-0.10	0.34	0.0578	-0.0789	2.446828644	0.7071068	0.240416306		
	Dunlop Kenya Ltd	7.5	-31%	22%	2.014903	-0.31	0.22	0.0242	-0.1671	1.847803021	0.7071068	0.155563492		
	EA Cables Ltd	8	6%	62%	2.079442	0.06	0.62	0.1922	-0.0661	2.013341542	0.7071068	0.438406204		
	EA Packaging Ltd	13.2	-40%	86%	2.580217	-0.40	0.86	0.3698	-0.3849	2.19531683	0.7071068	0.608111832		
	EA Portland Cement Ltd	12.4	4%	24%	2.517696	0.04	0.24	0.0288	0.0056	2.523296473	0.7071068	0.169705627		
	Firestone East Africa Ltd	12.95	-20%	30%	2.561096	-0.20	0.30	0.045	-0.1225	2.438595788	0.7071068	0.212132034		
	East Africa Breweries Ltd	65.5	24%	17%	4.18205	0.24	0.17	0.01445	0.112775	4.294825143	0.7071068	0.120208153		
	Kenya National Mills Ltd	10.5	-26%	80%	2.351375	-0.26	0.80	0.32	-0.29	2.061375257	0.7071068	0.565685425		
	Kenya Oil Co Ltd	82	19%	23%	4.406719	0.19	0.23	0.02645	0.081775	4.488494247	0.7071068	0.16263456		
	Kenya Power & Lighting Ltd	51.5	-54%	46%	3.941582	-0.54	0.46	0.1058	-0.3229	3.618681808	0.7071068	0.325269119		
	Total Kenya Ltd	51	21%	43%	3.931826	0.21	0.43	0.09245	0.058775	3.990600633	0.7071068	0.304055916		
	Unga Group Ltd	15.4	-39%	73%	2.734368	-0.39	0.73	0.26645	-0.328225	2.406142509	0.7071068	0.51618795		



**APPENDIX 5 – ESTIMATION OF EXERCISE PRICE RANGES**

ESTIMATION OF EXERCISE PRICE RANGE -January-June 1997  
 SECTOR COMPANY

SECTOR	COMPANY	a	b	c	d	e	f	g	h	i	j			
		$LN(p_0)+(E(R)-V/2)/\sigma^2 \cdot 0.5$	$V \cdot \sqrt{SQRT(0.5)}$	$b^2 \cdot \sigma$	$b^2 \cdot \sigma$	a-d	$LN(p_0)+(E(R)-V/2)/\sigma^2 \cdot 0.5$	$V \cdot \sqrt{SQRT(0.5)}$	$b^2 \cdot \sigma$	$b^2 \cdot \sigma$	i+1			
Agricultural	<i>Brooke Bond Kenya Limited</i>	4.868854678	1.96	0.10091211	0.197788	4.671067	106.8116	4.868854678	1.96	0.10091211	0.197788	5.066642	158.6408	
	<i>Eaagads Limited</i>	3.543993514	1.96	0.36348317	0.712427	2.831567	16.97203	3.543993514	1.96	0.36348317	0.712427	4.256421	70.56697	
	<i>George Williamson Kenya Ltd</i>	4.276573763	1.96	0.48106474	0.942887	3.333687	28.04154	4.276573763	1.96	0.48106474	0.942887	5.219461	184.8345	
	<i>Kakuzi Ltd</i>	4.520659909	1.96	0.35862953	0.702914	3.817746	45.50153	4.520659909	1.96	0.35862953	0.702914	5.223574	185.5963	
	<i>Kapchorua Tea Co Ltd</i>	4.258495242	1.96	0	0	4.258495	70.70351	4.258495242	1.96	0	0	4.258495	70.70351	
	<i>Limuru Tea Co Ltd</i>	6.946204665	1.96	0.21870015	0.428652	6.517552	676.9195	6.946204665	1.96	0.21870015	0.428652	7.374857	1595.364	
	<i>Rea Vipingo Ltd</i>	2.365029627	1.96	0.18902722	0.370493	1.994536	7.348794	2.365029627	1.96	0.18902722	0.370493	2.735523	15.4178	
	<i>Sasini Tea &amp; Coffee Ltd</i>	4.368990207	1.96	0.2659111	0.521186	3.847804	46.89	4.368990207	1.96	0.2659111	0.521186	4.890176	132.977	
	Finance & Investment	<i>Barclays Bank Ltd</i>	4.782863096	1.96	0.1189036	0.233051	4.549812	94.61462	4.782863096	1.96	0.1189036	0.233051	5.015914	150.7939
		<i>City Trust Ltd</i>	3.531451603	1.96	0.10055803	0.197094	3.334358	28.06036	3.531451603	1.96	0.10055803	0.197094	3.728545	41.61852
<i>CFC Bank Ltd</i>		2.983393259	1.96	0.26896798	0.527177	2.456216	11.6606	2.983393259	1.96	0.26896798	0.527177	3.51057	33.46736	
<i>Diamond Trust Bank Kenya Ltd</i>		3.381509552	1.96	0.17777912	0.348447	3.033062	20.76071	3.381509552	1.96	0.17777912	0.348447	3.729957	41.6773	
<i>Housing Finance Co (K) Ltd</i>		3.083198556	1.96	0.09854212	0.193143	2.890056	17.99432	3.083198556	1.96	0.09854212	0.193143	3.276341	26.47871	
<i>ICDC Investments Co Ltd</i>		3.504814319	1.96	0.53677767	1.052084	2.45273	11.62003	3.504814319	1.96	0.53677767	1.052084	4.556899	95.28749	
<i>Jubilee Insurance Co Ltd</i>		3.620960124	1.96	0.19848485	0.38903	3.23193	25.32849	3.620960124	1.96	0.19848485	0.38903	4.00999	55.14634	
<i>Kenya Commercial Bank Ltd</i>		4.43646219	1.96	0.23810704	0.46669	3.969772	52.92747	4.43646219	1.96	0.23810704	0.46669	4.903152	134.7137	
<i>National Bank of Kenya Ltd</i>		2.668649768	1.96	0.21881021	0.428868	2.239782	9.391281	2.668649768	1.96	0.21881021	0.428868	3.097518	22.14292	
<i>National Industrial Credit Ltd</i>		3.917529429	1.96	0.17025614	0.333702	3.583827	36.01111	3.917529429	1.96	0.17025614	0.333702	4.251231	70.1918	
<i>Regent Undervalued Assets Africa Fund</i>		#NUM!	1.96	0	0	#NUM!	#NUM!	#NUM!	1.96	0	0	#NUM!	#NUM!	
<i>Pan Africa Insurance Ltd</i>		3.832335812	1.96	0.24285724	0.476	3.356336	28.68389	3.832335812	1.96	0.24285724	0.476	4.308336	74.31672	
<i>Standard Chartered Bank Ltd</i>		3.944929243	1.96	0.09005336	0.176505	3.768425	43.31178	3.944929243	1.96	0.09005336	0.176505	4.121434	61.64757	
Commercial & Services		<i>Africa Lakes Corporation Plc</i>	Not listed					Not listed						
		<i>A Baumann &amp; Co Ltd</i>	3.170679757	1.96	0.40206419	0.788046	2.382634	10.8334	3.170679757	1.96	0.40206419	0.788046	3.958726	52.39051
		<i>CMC Holdings Ltd</i>	4.28804143	1.96	0.26628486	0.521918	3.766123	43.21221	4.28804143	1.96	0.26628486	0.521918	4.80996	122.7267
	<i>Car &amp; General (K) Ltd</i>	2.882582887	1.96	0.16216897	0.317851	2.564732	12.99717	2.882582887	1.96	0.16216897	0.317851	3.200434	24.54318	
	<i>Express Kenya Ltd</i>	4.237050031	1.96	0.13178247	0.258294	3.978756	53.45052	4.237050031	1.96	0.13178247	0.258294	4.495344	89.59896	
	<i>Kenya Airways Ltd</i>	2.135539699	1.96	0.09514688	0.186488	1.949052	7.022026	2.135539699	1.96	0.09514688	0.186488	2.322028	10.19633	
	<i>Lonhro Motors (EA) Ltd</i>	4.141094217	1.96	0.84963056	1.665276	2.475818	11.89143	4.141094217	1.96	0.84963056	1.665276	5.80637	332.4103	
	<i>Marshalls (EA) Ltd</i>	3.489780799	1.96	0.83180396	1.630336	1.859445	6.420173	3.489780799	1.96	0.83180396	1.630336	5.120117	167.3549	
	<i>Nation Media Group Ltd</i>	4.745022825	1.96	0.39335733	0.77098	3.974042	53.19915	4.745022825	1.96	0.39335733	0.77098	5.516003	248.6393	
	<i>Pearl Drycleaners Ltd</i>	2.344745085	1.96	0.12521987	0.245431	2.099314	8.160571	2.344745085	1.96	0.12521987	0.245431	2.590176	13.33212	
	<i>Standard Newspapers Ltd</i>	4.565074564	1.96	0.49535885	0.970903	3.594171	36.38553	4.565074564	1.96	0.49535885	0.970903	5.535978	253.6557	
	<i>Tourism Promotion Services (Serena)</i>	Not listed for the full 6 months												
	<i>Uchumi Supermarkets Ltd</i>	3.667364064	1.96	0.31700403	0.621328	3.046036	21.03181	3.667364064	1.96	0.31700403	0.621328	4.288692	72.87109	
Industrial and Allied	<i>Athi River Mining Ltd</i>	Not listed for the full 6 months												
	<i>Bamburi Cement Ltd</i>	3.602696453	1.96	0.31994688	0.627096	2.975601	19.60139	3.602696453	1.96	0.31994688	0.627096	4.229792	68.70296	
	<i>British American Tobacco Ltd</i>	4.231344311	1.96	0.21211458	0.415745	3.8156	45.40398	4.231344311	1.96	0.21211458	0.415745	4.647089	104.281	
	<i>B O C Gases Ltd</i>	3.942462629	1.96	0.77592862	1.52082	2.421643	11.26435	3.942462629	1.96	0.77592862	1.52082	5.463283	235.8705	
	<i>Carbacid Investments Ltd</i>	4.312489055	1.96	0.135869	0.266303	4.046186	57.17895	4.312489055	1.96	0.135869	0.266303	4.578792	97.3967	
	<i>Crown Berger Ltd</i>	2.430958171	1.96	0.26370617	0.516864	1.914094	6.780793	2.430958171	1.96	0.26370617	0.516864	2.947822	19.06439	
	<i>Dunlop Kenya Ltd</i>	4.647985561	1.96	1.13910977	2.232655	2.41533	11.19347	4.647985561	1.96	1.13910977	2.232655	6.880641	973.2497	
	<i>EA Cables Ltd</i>	3.51642469	1.96	0.19744985	0.387002	3.129423	22.86078	3.51642469	1.96	0.19744985	0.387002	3.903426	49.57201	
	<i>EA Packaging Ltd</i>	4.037606263	1.96	0.34896699	0.683975	3.353631	28.60641	4.037606263	1.96	0.34896699	0.683975	4.721582	112.3458	
	<i>EA Portland Cement Ltd</i>	3.033905228	1.96	0.411174723	0.807025	2.226881	9.270902	3.033905228	1.96	0.411174723	0.807025	3.84093	46.56875	
	<i>Firestone East Africa Ltd</i>	3.300562292	1.96	0.24752814	0.485155	2.815407	16.69997	3.300562292	1.96	0.24752814	0.485155	3.785717	44.06727	
	<i>East Africa Breweries Ltd</i>	3.969696155	1.96	0.17953838	0.351895	3.617801	37.25555	3.969696155	1.96	0.17953838	0.351895	4.321591	75.30838	
	<i>Kenya National Mills Ltd</i>	3.598882407	1.96	0.24206266	0.474443	3.12444	22.74714	3.598882407	1.96	0.24206266	0.474443	4.307325	58.752	
	<i>Kenya Oil Co Ltd</i>	4.115833786	1.96	0.15392265	0.301688	3.814145	45.33799	4.115833786	1.96	0.15392265	0.301688	4.417522	82.89064	
	<i>Kenya Power &amp; Lighting Ltd</i>	4.988638695	1.96	0.33517451	0.656942	4.331697	76.07325	4.988638695	1.96	0.33517451	0.656942	5.645581	283.0379	
	<i>Total Kenya Ltd</i>	4.25825326	1.96	0.40010379	0.784203	3.47405	32.26715	4.25825326	1.96	0.40010379	0.784203	5.042457	154.85	
<i>Unga Group Ltd</i>	4.789926575	1.96	0.27409913	0.537234	4.252692	70.29441	4.789926575	1.96	0.27409913	0.537234	5.327161	205.8527		

STIMATION OF EXERCISE PRICE RANGES-JULY-DECEMBER 1997											
SECTOR	COMPANY	a	b	c	d	e	f	g	h	i	j
Agricultural		$\ln(p_0)+\frac{(E(R)-V/2)^2}{0.5}$	$V \cdot \sqrt{\text{SQRT}(0.5)}$	$b^*$	$b^*c$	a-d	$\ln(p_0)+\frac{(E(R)-V/2)^2}{0.5}$	$V \cdot \sqrt{\text{SQRT}(0.5)}$	$b^*$	$b^*i$	j
	4.685189938	1.96	0.10091211	0.197788	4.487402	88.89023	4.685189938	1.96	0.10091211	0.197788	4.882978 132.0232
	Eaagads Limited	3.497036531	1.96	0.36348317	0.712427	2.78461	3.497036531	1.96	0.36348317	0.712427	4.209464 67.32042
	George Williamson Kenya Ltd	4.227783599	1.96	0.48106474	0.942887	3.284897	4.227783599	1.96	0.48106474	0.942887	5.17067 176.0328
	Kakuzi Ltd	4.560665244	1.96	0.35862953	0.702914	3.857751	4.560665244	1.96	0.35862953	0.702914	5.263579 193.1716
	Kapchorua Tea Co Ltd	4.258495242	1.96	0	0	4.258495	4.258495242	1.96	0	0	4.258495 70.70351
	Limuru Tea Co Ltd	6.683840401	1.96	0.21870015	0.428652	6.255188	6.683840401	1.96	0.21870015	0.428652	7.112493 1227.203
	Rea Vipingo Ltd	2.197148755	1.96	0.18902722	0.370493	1.826655	2.197148755	1.96	0.18902722	0.370493	2.567642 13.03505
	Sasini Tea & Coffee Ltd	4.717296901	1.96	0.2659111	0.521186	4.196111	4.717296901	1.96	0.2659111	0.521186	5.238483 188.384
Finance & Investment	Barclays Bank Ltd	4.738411333	1.96	0.1189036	0.233051	4.50536	4.738411333	1.96	0.1189036	0.233051	4.971462 144.2377
	City Trust Ltd	3.611494311	1.96	0.10055803	0.197094	3.414401	3.611494311	1.96	0.10055803	0.197094	3.808588 45.08673
	CFC Bank Ltd	3.116924651	1.96	0.26896798	0.527177	2.589747	3.116924651	1.96	0.26896798	0.527177	3.644102 38.24841
	Diamond Trust Bank Kenya Ltd	3.193693476	1.96	0.17777912	0.348447	2.845246	3.193693476	1.96	0.17777912	0.348447	3.542141 34.54078
	Housing Finance Co (K) Ltd	3.062145147	1.96	0.09854212	0.193143	2.869003	3.062145147	1.96	0.09854212	0.193143	3.255288 25.92707
	ICDC Investments Co Ltd	3.72795787	1.96	0.53677767	1.052084	2.675874	3.72795787	1.96	0.53677767	1.052084	4.780042 119.1094
	Jubilee Insurance Co Ltd	3.69599531	1.96	0.19848485	0.38903	3.306965	3.69599531	1.96	0.19848485	0.38903	4.085026 59.44346
	Kenya Commercial Bank Ltd	4.681584648	1.96	0.23810704	0.46669	4.214895	4.681584648	1.96	0.23810704	0.46669	5.148274 172.1342
	National Bank of Kenya Ltd	2.617356473	1.96	0.21881021	0.428868	2.188488	2.617356473	1.96	0.21881021	0.428868	3.046224 21.03577
	National Industrial Credit Ltd	4.099850986	1.96	0.17025614	0.333702	3.766149	4.099850986	1.96	0.17025614	0.333702	4.433553 84.23016
	Regent Undervalued Assets Africa Fund	6.363028104	1.96	0	0	6.363028	6.363028104	1.96	0	0	6.363028 580
	Pan Africa Insurance Ltd	4.043644906	1.96	0.24285724	0.476	3.567645	4.043644906	1.96	0.24285724	0.476	4.519645 91.80301
	Standard Chartered Bank Ltd	3.806092798	1.96	0.09005336	0.176505	3.629588	3.806092798	1.96	0.09005336	0.176505	3.982597 53.65622
Commercial & Services	Africa Lakes Corporation Plc			Not listed							
	A Baumann & Co Ltd	2.932268734	1.96	0.40206419	0.788046	2.144223	2.932268734	1.96	0.40206419	0.788046	3.720315 41.27738
	CMC Holdings Ltd	4.452344481	1.96	0.26628486	0.521918	3.930426	4.452344481	1.96	0.26628486	0.521918	4.974263 144.6422
	Car & General (K) Ltd	2.720063957	1.96	0.16216897	0.317851	2.402213	2.720063957	1.96	0.16216897	0.317851	3.037915 20.8617
	Express Kenya Ltd	4.168996567	1.96	0.13178247	0.258294	3.910703	4.168996567	1.96	0.13178247	0.258294	4.42729 83.70429
	Kenya Airways Ltd	2.09960769	1.96	0.09514688	0.186488	1.91312	2.09960769	1.96	0.09514688	0.186488	2.286096 9.836457
	Lonhro Motors (EA) Ltd	3.701862247	1.96	0.84963056	1.665276	2.036586	3.701862247	1.96	0.84963056	1.665276	5.367138 214.2488
	Marshalls (EA) Ltd	3.97285651	1.96	0.83180396	1.630336	2.342521	3.97285651	1.96	0.83180396	1.630336	5.603192 271.2911
	Nation Media Group Ltd	4.771225197	1.96	0.39335733	0.77098	4.000245	4.771225197	1.96	0.39335733	0.77098	5.542206 255.2403
	Pearl Drycleaners Ltd	2.369437698	1.96	0.12521987	0.245431	2.124007	2.369437698	1.96	0.12521987	0.245431	2.614869 13.66542
	Standard Newspapers Ltd	5.581185631	1.96	0.49535885	0.970903	4.610282	5.581185631	1.96	0.49535885	0.970903	6.552089 700.7064
	Tourism Promotion Services (Serena)			Not listed for the full year							
	Uchumi Supermarkets Ltd	3.673633677	1.96	0.31700403	0.621328	3.052306	3.673633677	1.96	0.31700403	0.621328	4.294962 73.3294
Industrial and Allied	Athi River Mining Ltd			Not listed for the full year							
	Bamburi Cement Ltd	3.538157931	1.96	0.31994688	0.627096	2.911062	3.538157931	1.96	0.31994688	0.627096	4.165254 64.40903
	British American Tobacco Ltd	3.923377568	1.96	0.21211458	0.415745	3.507633	3.923377568	1.96	0.21211458	0.415745	4.339122 76.64023
	B O C Gases Ltd	4.024700727	1.96	0.77592862	1.52082	2.503881	4.024700727	1.96	0.77592862	1.52082	5.545521 256.0879
	Carbacid Investments Ltd	4.336586606	1.96	0.135869	0.266303	4.070283	4.336586606	1.96	0.135869	0.266303	4.60289 99.77223
	Crown Berger Ltd	2.256604784	1.96	0.26370617	0.516864	1.739741	2.256604784	1.96	0.26370617	0.516864	2.773469 16.01409
	Dunlop Kenya Ltd	4.629636422	1.96	1.13910977	2.232655	2.396981	4.629636422	1.96	1.13910977	2.232655	6.862292 955.5543
	EA Cables Ltd	3.402014339	1.96	0.19744985	0.387002	3.015013	3.402014339	1.96	0.19744985	0.387002	3.789016 44.21288
	EA Packaging Ltd	3.993803641	1.96	0.34896699	0.683975	3.309828	3.993803641	1.96	0.34896699	0.683975	4.677779 107.531
	EA Portland Cement Ltd	3.619421744	1.96	0.41174723	0.807025	2.812397	3.619421744	1.96	0.41174723	0.807025	4.426446 83.63368
	Firestone East Africa Ltd	3.231569421	1.96	0.24752814	0.485155	2.746414	3.231569421	1.96	0.24752814	0.485155	3.716725 41.12946
	East Africa Breweries Ltd	4.103227547	1.96	0.17953838	0.351895	3.751332	4.103227547	1.96	0.17953838	0.351895	4.455123 86.06672
	Kenya National Mills Ltd	3.900850437	1.96	0.24206266	0.474443	3.426408	3.900850437	1.96	0.24206266	0.474443	4.375293 79.46314
	Kenya Oil Co Ltd	4.101649151	1.96	0.15392265	0.301688	3.799961	4.101649151	1.96	0.15392265	0.301688	4.403338 81.72317
	Kenya Power & Lighting Ltd	5.630492581	1.96	0.33517451	0.656942	4.973551	5.630492581	1.96	0.33517451	0.656942	6.287435 537.772
	Total Kenya Ltd	4.151710012	1.96	0.40010379	0.784203	3.367507	4.151710012	1.96	0.40010379	0.784203	4.935913 139.2002
	Unga Group Ltd	5.013070127	1.96	0.27409913	0.537234	4.475836	5.013070127	1.96	0.27409913	0.537234	5.550304 257.3159

## ESTIMATION OF EXERCISE PRICE RANGES-January-June 1998

SECTOR	COMPANY	a	b	c	d	e	f	g	h	i	j		
		LN(p0)+(E(R)-V2/2)*0.5	V*SQRT(0.5)	b*c	a-d		LN(p0)+(E(R)-V2/2)*0.5	V*SQRT(0.5)	f+i				
Agricultural	<i>Brooke Bond Kenya Limited</i>	4.829322585	1.96	0.16389331	0.321231	4.508092	4.829322585	1.96	0.16389331	0.321231	5.150553	172.527	
	<i>Eaagads Limited</i>	3.781314081	1.96	0.21019129	0.411975	3.369339	3.781314081	1.96	0.21019129	0.411975	4.193289	66.2403	
	<i>George Williamson Kenya Ltd</i>	4.810105978	1.96	0.16201944	0.317558	4.492548	4.810105978	1.96	0.16201944	0.317558	5.127664	168.6228	
	<i>Kakuzi Ltd</i>	4.790350746	1.96	0.18701352	0.366547	4.423804	4.790350746	1.96	0.18701352	0.366547	5.156897	173.6249	
	<i>Kapchorua Tea Co Ltd</i>	4.468067133	1.96	0.15856207	0.310782	4.157285	4.468067133	1.96	0.15856207	0.310782	4.778849	118.9673	
	<i>Limuru Tea Co Ltd</i>	6.684988397	1.96	0.01302376	0.025527	6.659462	6.684988397	1.96	0.01302376	0.025527	6.710515	820.9933	
	<i>Rea Vipingo Ltd</i>	1.988148262	1.96	0.11162253	0.21878	1.769368	1.988148262	1.96	0.11162253	0.21878	2.206928	9.08776	
	<i>Sasini Tea &amp; Coffee Ltd</i>	4.155219514	1.96	0.3127685	0.613026	3.542193	4.155219514	1.96	0.3127685	0.613026	4.768246	117.7126	
	Finance & Investment	<i>Barclays Bank Ltd</i>	4.792403411	1.96	0.28154948	0.551837	4.240566	4.792403411	1.96	0.28154948	0.551837	5.34424	209.3988
		<i>City Trust Ltd</i>	3.291370819	1.96	0.54447222	1.067166	2.224205	3.291370819	1.96	0.54447222	1.067166	4.358536	78.14268
		<i>CFC Bank Ltd</i>	2.809598942	1.96	0.16970563	0.332623	2.476976	2.809598942	1.96	0.16970563	0.332623	3.142222	23.15526
		<i>Diamond Trust Bank Kenya Ltd</i>	3.085577609	1.96	0.14142136	0.277186	2.808392	3.085577609	1.96	0.14142136	0.277186	3.362763	28.86886
<i>Housing Finance Co (K) Ltd</i>		2.783952175	1.96	0.22627417	0.443497	2.340455	2.783952175	1.96	0.22627417	0.443497	3.22745	25.21526	
<i>ICDC Investments Co Ltd</i>		3.662152769	1.96	0.26162951	0.512794	3.149359	3.662152769	1.96	0.26162951	0.512794	4.174947	65.03637	
<i>Jubilee Insurance Co Ltd</i>		3.441897688	1.96	0.13435029	0.263327	3.178571	3.441897688	1.96	0.13435029	0.263327	3.705224	40.65916	
<i>Kenya Commercial Bank Ltd</i>		4.296173083	1.96	0.16263456	0.318764	3.977409	4.296173083	1.96	0.16263456	0.318764	4.614937	100.9814	
<i>National Bank of Kenya Ltd</i>		2.304807925	1.96	0.42426407	0.831558	1.47325	2.304807925	1.96	0.42426407	0.831558	3.136365	23.02005	
<i>National Industrial Credit Ltd</i>		3.505261468	1.96	0.38183766	0.748402	2.75686	3.505261468	1.96	0.38183766	0.748402	4.253663	70.3627	
<i>Regent Undervalued Assets Africa Fund</i>		6.363028104	1.96	0	0	6.363028	6.363028104	1.96	0	0	6.363028	580	
<i>Pan Africa Insurance Ltd</i>		3.148770553	1.96	0.12727922	0.249467	2.899303	3.148770553	1.96	0.12727922	0.249467	3.398238	29.91134	
<i>Standard Chartered Bank Ltd</i>		3.895382341	1.96	0.24041631	0.471216	3.424166	3.895382341	1.96	0.24041631	0.471216	4.366598	78.77521	
Commercial & Services		<i>Africa Lakes Corporation Plc</i>	Not listed										
		<i>A Baumann &amp; Co Ltd</i>	2.809891353	1.96	0.0785454	0.153949	2.655942	2.809891353	1.96	0.0785454	0.153949	2.96384	19.37222
	<i>CMC Holdings Ltd</i>	3.572023826	1.96	0.20506097	0.401919	3.170104	3.572023826	1.96	0.20506097	0.401919	3.973943	53.19388	
	<i>Car &amp; General (K) Ltd</i>	2.605265079	1.96	0.30405592	0.59595	2.009315	2.605265079	1.96	0.30405592	0.59595	3.201215	24.56235	
	<i>Express Kenya Ltd</i>	3.836944562	1.96	0.25455844	0.498935	3.33801	3.836944562	1.96	0.25455844	0.498935	4.335879	76.39209	
	<i>Kenya Airways Ltd</i>	2.093963108	1.96	0.1767767	0.346482	1.747481	2.093963108	1.96	0.1767767	0.346482	2.440445	11.47815	
	<i>Lonhro Motors (EA) Ltd</i>	3.429987928	1.96	0.1767767	0.346482	3.083506	3.429987928	1.96	0.1767767	0.346482	3.77647	43.66165	
	<i>Marshall's (EA) Ltd</i>	3.254717617	1.96	0.12020815	0.235608	3.01911	3.254717617	1.96	0.12020815	0.235608	3.490326	32.79662	
	<i>Nation Media Group Ltd</i>	4.735308604	1.96	0.57162871	1.120392	3.614916	4.735308604	1.96	0.57162871	1.120392	5.855701	349.2196	
	<i>Pearl Drycleaners Ltd</i>	2.327165733	1.96	0.02828427	0.055437	2.271729	2.327165733	1.96	0.02828427	0.055437	2.382603	10.83306	
	<i>Standard Newspapers Ltd</i>	3.102573403	1.96	0.65053824	1.275055	1.827518	3.102573403	1.96	0.65053824	1.275055	4.377628	79.64891	
	<i>Tourism Promotion Services (Serena)</i>	2.636460901	1.96	0.2192031	0.429638	2.206823	2.636460901	1.96	0.2192031	0.429638	3.066099	21.45803	
	<i>Uchumi Supermarkets Ltd</i>	3.766565727	1.96	0.2192031	0.429638	3.336928	3.766565727	1.96	0.2192031	0.429638	4.196204	66.43366	
	Industrial and Allied	<i>Athi River Mining Ltd</i>	2.014864354	1.96	0.33941125	0.665246	1.349618	2.014864354	1.96	0.33941125	0.665246	2.68011	14.5867
		<i>Bamburi Cement Ltd</i>	3.552950345	1.96	0.32526912	0.637527	2.915423	3.552950345	1.96	0.32526912	0.637527	4.190478	66.05435
<i>British American Tobacco Ltd</i>		4.273154914	1.96	0.06363961	0.124734	4.148421	4.273154914	1.96	0.06363961	0.124734	4.397889	81.27907	
<i>B O C Gases Ltd</i>		3.591801696	1.96	0.32526912	0.637527	2.954274	3.591801696	1.96	0.32526912	0.637527	4.229329	68.67115	
<i>Carbacid Investments Ltd</i>		4.147123005	1.96	0.24041631	0.471216	3.675907	4.147123005	1.96	0.24041631	0.471216	4.618339	101.3256	
<i>Crown Berger Ltd</i>		2.226685093	1.96	0.31112698	0.609809	1.616876	2.226685093	1.96	0.31112698	0.609809	2.836494	17.05586	
<i>Dunlop Kenya Ltd</i>		2.878632274	1.96	0.50911688	0.997869	1.880763	2.878632274	1.96	0.50911688	0.997869	3.876501	48.25509	
<i>EA Cables Ltd</i>		3.191098416	1.96	0.20506097	0.401919	2.789179	3.191098416	1.96	0.20506097	0.401919	3.593018	36.34359	
<i>EA Packaging Ltd</i>		3.504778972	1.96	0.30405592	0.59595	2.908829	3.504778972	1.96	0.30405592	0.59595	4.100729	60.38427	
<i>EA Portland Cement Ltd</i>		2.995107274	1.96	0.1767767	0.346482	2.648625	2.995107274	1.96	0.1767767	0.346482	3.34159	28.26402	
<i>Firestone East Africa Ltd</i>		2.798753229	1.96	0.20506097	0.401919	2.396834	2.798753229	1.96	0.20506097	0.401919	3.200673	24.54904	
<i>East Africa Breweries Ltd</i>		4.117967678	1.96	0.25455844	0.498935	3.619033	4.117967678	1.96	0.25455844	0.498935	4.616902	101.1801	
<i>Kenya National Mills Ltd</i>		2.691086716	1.96	0.41012193	0.803839	1.887248	2.691086716	1.96	0.41012193	0.803839	3.494926	32.94784	
<i>Kenya Oil Co Ltd</i>		3.985832266	1.96	0.15556349	0.304904	3.680928	3.985832266	1.96	0.15556349	0.304904	4.290737	73.02024	
<i>Kenya Power &amp; Lighting Ltd</i>		4.795718724	1.96	0.19091883	0.374201	4.421518	4.795718724	1.96	0.19091883	0.374201	5.16992	175.9007	
<i>Total Kenya Ltd</i>		3.875169122	1.96	0.27577164	0.540512	3.334657	3.875169122	1.96	0.27577164	0.540512	4.415682	82.73821	
<i>Unga Group Ltd</i>		3.475107274	1.96	0.67175144	1.316633	2.158474	3.475107274	1.96	0.67175144	1.316633	4.79174	120.5109	

## ESTIMATION OF EXERCISE PRICE RANGES-JULY-DECEMBER 199:

SECTOR	COMPANY	a	b	c	d	e	f	g	h	i	j	
Agricultural		LN(p0)+(E(R)-V2/2*0.5	V*SQRT(0.5)	b*c	a-d		LN(p0)+(E(R)-V2/2*0.5	V*SQRT(0.5)	f+i			
	Brooke Bond Kenya Limited	5.009368828	1.96	0.16389331	0.321231	4.688138	5.009368828	1.96	0.16389331	0.321231	5.3306	206.5618
	Eagads Limited	3.666538567	1.96	0.21019129	0.411975	3.254564	3.666538567	1.96	0.21019129	0.411975	4.078513	59.05762
	George Williamson Kenya Ltd	5.306846862	1.96	0.16201944	0.317558	4.989289	5.306846862	1.96	0.16201944	0.317558	5.624405	277.1073
	Kakuzi Ltd	5.181125139	1.96	0.18701352	0.366547	4.814579	5.181125139	1.96	0.18701352	0.366547	5.547672	256.6393
	Kapchorua Tea Co Ltd	4.543704548	1.96	0.15856207	0.310782	4.232923	4.543704548	1.96	0.15856207	0.310782	4.854486	128.3147
	Limuru Tea Co Ltd	6.69163294	1.96	0.01302376	0.025527	6.666106	6.69163294	1.96	0.01302376	0.025527	6.71716	826.4666
	Rea Vipingo Ltd	1.740312098	1.96	0.11162253	0.21878	1.521532	1.740312098	1.96	0.11162253	0.21878	1.959092	7.092886
	Sasini Tea & Coffee Ltd	4.351756142	1.96	0.3127685	0.613026	3.73873	4.351756142	1.96	0.3127685	0.613026	4.964782	143.2774
Finance & Investment	Barclays Bank Ltd	4.658872019	1.96	0.28154948	0.551837	4.107035	4.658872019	1.96	0.28154948	0.551837	5.210709	183.2239
	City Trust Ltd	3.218167415	1.96	0.54447222	1.067166	2.151002	3.218167415	1.96	0.54447222	1.067166	4.285333	72.62673
	CFC Bank Ltd	2.780442358	1.96	0.16970563	0.332623	2.447819	2.780442358	1.96	0.16970563	0.332623	3.113065	22.48988
	Diamond Trust Bank Kenya Ltd	3.081042453	1.96	0.14142136	0.277186	2.803857	3.081042453	1.96	0.14142136	0.277186	3.358228	28.73823
	Housing Finance Co (K) Ltd	2.828688069	1.96	0.22627417	0.443497	2.385191	2.828688069	1.96	0.22627417	0.443497	3.272185	26.3689
	ICDC Investments Co Ltd	3.770074105	1.96	0.26162951	0.512794	3.25728	3.770074105	1.96	0.26162951	0.512794	4.282868	72.44792
	Jubilee Insurance Co Ltd	3.415752408	1.96	0.13435029	0.263327	3.152426	3.415752408	1.96	0.13435029	0.263327	3.679079	39.6099
	Kenya Commercial Bank Ltd	4.173955451	1.96	0.16263456	0.318764	3.855192	4.173955451	1.96	0.16263456	0.318764	4.492719	89.36411
	National Bank of Kenya Ltd	2.320556282	1.96	0.42426407	0.831558	1.488999	2.320556282	1.96	0.42426407	0.831558	3.152114	23.38545
	National Industrial Credit Ltd	3.305964966	1.96	0.38183766	0.748402	2.557563	3.305964966	1.96	0.38183766	0.748402	4.054367	57.64865
	Regent Undervalued Assets Africa Fund	6.363028104	1.96	0	0	6.363028	6.363028104	1.96	0	0	6.363028	580
	Pan Africa Insurance Ltd	2.819466806	1.96	0.12727922	0.249467	2.57	2.819466806	1.96	0.12727922	0.249467	3.068934	21.51895
	Standard Chartered Bank Ltd	3.772597321	1.96	0.24041631	0.471216	3.301381	3.772597321	1.96	0.24041631	0.471216	4.243813	69.67303
Commercial & Services	Africa Lakes Corporation Plc	Not listed										
	A Baumann & Co Ltd	2.803460462	1.96	0.0785454	0.153949	2.649511	2.803460462	1.96	0.0785454	0.153949	2.957409	19.24804
	CMC Holdings Ltd	3.463810241	1.96	0.20506097	0.401919	3.061891	3.463810241	1.96	0.20506097	0.401919	3.86573	47.7381
	Car & General (K) Ltd	2.233390916	1.96	0.30405592	0.59595	1.637441	2.233390916	1.96	0.30405592	0.59595	2.829341	16.93429
	Express Kenya Ltd	3.143797382	1.96	0.25455844	0.498935	2.644863	3.143797382	1.96	0.25455844	0.498935	3.642732	38.19604
	Kenya Airways Ltd	2.038393257	1.96	0.1767767	0.346482	1.691911	2.038393257	1.96	0.1767767	0.346482	2.384876	10.85771
	Lonhro Motors (EA) Ltd	3.035995221	1.96	0.1767767	0.346482	2.689513	3.035995221	1.96	0.1767767	0.346482	3.382478	29.44363
	Marshalls (EA) Ltd	3.331820011	1.96	0.12020815	0.235608	3.096212	3.331820011	1.96	0.12020815	0.235608	3.567428	35.42536
	Nation Media Group Ltd	4.596930319	1.96	0.57162871	1.120392	3.476538	4.596930319	1.96	0.57162871	1.120392	5.717323	304.0897
	Pearl Drycleaners Ltd	2.307934371	1.96	0.02828427	0.055437	2.252497	2.307934371	1.96	0.02828427	0.055437	3.263372	10.62672
	Standard Newspapers Ltd	3.03469598	1.96	0.65053824	1.275055	1.759641	3.03469598	1.96	0.65053824	1.275055	4.309751	74.42195
	Tourism Promotion Services (Serena)	2.562352929	1.96	0.2192031	0.429638	2.132715	2.562352929	1.96	0.2192031	0.429638	2.991991	19.92531
	Uchumi Supermarkets Ltd	3.880509986	1.96	0.2192031	0.429638	3.450872	3.880509986	1.96	0.2192031	0.429638	4.310148	74.45151
Industrial and Allied	Athi River Mining Ltd	1.992885447	1.96	0.33941125	0.665246	1.327639	1.992885447	1.96	0.33941125	0.665246	2.658132	14.2696
	Bamburi Cement Ltd	3.500233563	1.96	0.32526912	0.637527	2.862706	3.500233563	1.96	0.32526912	0.637527	4.137761	62.66237
	British American Tobacco Ltd	4.303232369	1.96	0.06363961	0.124734	4.178499	4.303232369	1.96	0.06363961	0.124734	4.427966	83.76087
	B O C Gases Ltd	3.539084914	1.96	0.32526912	0.637527	2.901557	3.539084914	1.96	0.32526912	0.637527	4.176612	65.14479
	Carbacid Investments Ltd	4.039537795	1.96	0.24041631	0.471216	3.568322	4.039537795	1.96	0.24041631	0.471216	4.510754	90.99038
	Crown Berger Ltd	2.164809689	1.96	0.31112698	0.609809	1.555001	2.164809689	1.96	0.31112698	0.609809	2.774619	16.03251
	Dunlop Kenya Ltd	3.31041469	1.96	0.50911688	0.997869	2.312546	3.31041469	1.96	0.50911688	0.997869	4.308284	74.31284
	EA Cables Ltd	2.919380195	1.96	0.20506097	0.401919	2.517461	2.919380195	1.96	0.20506097	0.401919	3.3213	27.69632
	EA Packaging Ltd	2.608690947	1.96	0.30405592	0.59595	2.012741	2.608690947	1.96	0.30405592	0.59595	3.204641	24.64664
	EA Portland Cement Ltd	3.094952609	1.96	0.1767767	0.346482	2.74847	3.094952609	1.96	0.1767767	0.346482	3.441435	31.23174
	Firestone East Africa Ltd	2.871512583	1.96	0.20506097	0.401919	2.469593	2.871512583	1.96	0.20506097	0.401919	3.273432	26.4018
	East Africa Breweries Ltd	4.250456861	1.96	0.25455844	0.498935	3.751522	4.250456861	1.96	0.25455844	0.498935	4.749391	115.514
	Kenya National Mills Ltd	3.180201854	1.96	0.41012193	0.803839	2.376363	3.180201854	1.96	0.41012193	0.803839	3.984041	53.73373
	Kenya Oil Co Ltd	3.985832266	1.96	0.15556349	0.304904	3.680928	3.985832266	1.96	0.15556349	0.304904	4.290737	73.02024
	Kenya Power & Lighting Ltd	4.862729434	1.96	0.19091883	0.374201	4.488529	4.862729434	1.96	0.19091883	0.374201	5.23693	188.0918
	Total Kenya Ltd	3.637636833	1.96	0.27577164	0.540512	3.097124	3.637636833	1.96	0.27577164	0.540512	4.178149	65.24499
	Unga Group Ltd	4.553516855	1.96	0.67175144	1.316633	3.236884	4.553516855	1.96	0.67175144	1.316633	5.87015	354.302

ESTIMATION OF EXERCISE PRICE RANGES-January-June 1999

SECTOR	COMPANY	a	b	c	d	e	f	g	h	i	j			
		LN(p0)+(E(R)-V2/2)*0.5	V*SQRT(0.5)	b*c	a-d		LN(p0)+(E(R)-V2/2)*0.5	V*SQRT(0.5)	f+i					
Agricultural	Brooke Bond Kenya Limited	4.787596383	1.96	0.27609369	0.541144	4.246453	69.85717	4.787596383	1.96	0.27609369	0.541144	5.32874	206.178	
	Eaagads Limited	3.490314091	1.96	0.42642684	0.835797	2.654517	14.21812	3.490314091	1.96	0.42642684	0.835797	4.326111	75.64949	
	George Williamson Kenya Ltd	4.771422101	1.96	0.15777604	0.30921	4.462212	86.67901	4.771422101	1.96	0.15777604	0.30921	5.080632	160.8758	
	Kakuzi Ltd	4.749324418	1.96	0.18813763	0.36875	4.380575	79.88393	4.749324418	1.96	0.18813763	0.36875	5.118074	167.0134	
	Kapchorua Tea Co Ltd	4.842697162	1.96	0.16620053	0.325753	4.516944	91.55539	4.842697162	1.96	0.16620053	0.325753	5.16845	175.6424	
	Limuru Tea Co Ltd	6.594312673	1.96	0.11055337	0.216685	6.377628	588.5301	6.594312673	1.96	0.11055337	0.216685	6.810997	907.7757	
	Rea Vipingo Ltd	1.681705651	1.96	0.1418014	0.277931	1.403775	4.070537	1.681705651	1.96	0.1418014	0.277931	1.959636	7.096746	
	Sasini Tea & Coffee Ltd	4.052803426	1.96	0.18997623	0.372353	3.68045	39.66424	4.052803426	1.96	0.18997623	0.372353	4.425157	83.52591	
	Finance & Investment	Barclays Bank Ltd	4.778382911	1.96	0.14142136	0.277186	4.501197	90.12495	4.778382911	1.96	0.14142136	0.277186	5.055569	156.8937
		City Trust Ltd	3.180406962	1.96	0.09899495	0.19403	2.986377	19.81376	3.180406962	1.96	0.09899495	0.19403	3.374437	29.20784
		CFC Bank Ltd	2.723481812	1.96	0.30405592	0.59595	2.127532	8.394126	2.723481812	1.96	0.30405592	0.59595	3.319431	27.64643
		Diamond Trust Bank Kenya Ltd	3.175417453	1.96	0.17677767	0.346482	2.828935	16.92743	3.175417453	1.96	0.17677767	0.346482	3.5219	33.84867
		Housing Finance Co (K) Ltd	2.617914924	1.96	0.1979899	0.38806	2.229855	9.298515	2.617914924	1.96	0.1979899	0.38806	3.005975	20.20591
		ICDC Investments Co Ltd	3.87297438	1.96	0.05656854	0.110874	3.7621	43.03871	3.87297438	1.96	0.05656854	0.110874	3.983849	53.7234
Jubilee Insurance Co Ltd		3.306338554	1.96	0.16263456	0.318764	2.987575	19.83751	3.306338554	1.96	0.16263456	0.318764	3.625102	37.52856	
Kenya Commercial Bank Ltd		3.862307	1.96	0.16263456	0.318764	3.543543	34.58926	3.862307	1.96	0.16263456	0.318764	4.181071	65.43588	
National Bank of Kenya Ltd		1.921434878	1.96	0.20506097	0.401919	1.519515	4.57001	1.921434878	1.96	0.20506097	0.401919	2.323354	10.20986	
National Industrial Credit Ltd		3.373797382	1.96	0.09899495	0.19403	3.179767	24.04116	3.373797382	1.96	0.09899495	0.19403	3.567827	35.43952	
Regent Undervalued Assets Africa Fund		6.362998401	1.96	-0.0077075	-0.01511	6.378105	588.8109	6.362998401	1.96	-0.0077075	-0.01511	6.347892	571.287	
Pan Africa Insurance Ltd		2.846228031	1.96	0.77074639	1.510663	1.335565	3.802144	2.846228031	1.96	0.77074639	1.510663	4.356891	78.01421	
Standard Chartered Bank Ltd		3.99070675	1.96	0.10606602	0.207889	3.782817	43.93966	3.99070675	1.96	0.10606602	0.207889	4.198596	66.59278	
Commercial & Services		Africa Lakes Corporation Plc	Not listed											
	A Baumann & Co Ltd	2.801524273	1.96	0.08485281	0.166312	2.635213	13.94628	2.801524273	1.96	0.08485281	0.166312	2.967836	19.44978	
	CMC Holdings Ltd	3.456016652	1.96	0.11313708	0.221749	3.234268	25.38778	3.456016652	1.96	0.11313708	0.221749	3.677765	39.5579	
	Car & General (K) Ltd	2.08428165	1.96	0.74246212	1.455226	0.629056	1.875839	2.08428165	1.96	0.74246212	1.455226	3.539507	34.44995	
	Express Kenya Ltd	3.123801298	1.96	0.34648232	0.679105	2.444696	11.52704	3.123801298	1.96	0.34648232	0.679105	3.802907	44.8313	
	Kenya Airways Ltd	2.035320543	1.96	0.27577164	0.540512	1.494808	4.458481	2.035320543	1.96	0.27577164	0.540512	2.575833	13.14226	
	Lonhro Motors (EA) Ltd	2.857215181	1.96	0.26870058	0.526653	2.330562	10.28372	2.857215181	1.96	0.26870058	0.526653	3.383868	29.48461	
	Marshalls (EA) Ltd	3.181850825	1.96	0.13435029	0.263327	2.918524	18.51395	3.181850825	1.96	0.13435029	0.263327	3.445177	31.34884	
	Nation Media Group Ltd	4.78352933	1.96	0.15556349	0.304904	4.478625	88.11342	4.78352933	1.96	0.15556349	0.304904	5.088434	162.1357	
	Pearl Drycleaners Ltd	1.592585093	1.96	0.84852814	1.663115	-0.07053	0.9319	1.592585093	1.96	0.84852814	1.663115	3.2557	25.93777	
	Standard Newspapers Ltd	2.479848857	1.96	0.79195959	1.552241	0.927608	2.528454	2.479848857	1.96	0.79195959	1.552241	4.03209	56.3786	
	Tourism Promotion Services (Serena)	2.722921063	1.96	0.11313708	0.221749	2.501172	12.19678	2.722921063	1.96	0.11313708	0.221749	2.94467	19.00439	
	Uchumi Supermarkets Ltd	3.76482827	1.96	0.19091883	0.374201	3.390627	29.68457	3.76482827	1.96	0.19091883	0.374201	4.139029	62.74188	
	Industrial and Allied	Athi River Mining Ltd	1.756255744	1.96	0.29698485	0.58209	1.174165	3.235442	1.756255744	1.96	0.29698485	0.58209	2.338346	10.36408
Bamburi Cement Ltd		3.442132827	1.96	0.2192031	0.429638	3.012495	20.33808	3.442132827	1.96	0.2192031	0.429638	3.871771	48.02736	
British American Tobacco Ltd		4.252885796	1.96	0.19091883	0.374201	3.878685	48.36057	4.252885796	1.96	0.19091883	0.374201	4.627087	102.2158	
B O C Gases Ltd		3.460188383	1.96	0.2192031	0.429638	3.03055	20.70863	3.460188383	1.96	0.2192031	0.429638	3.889826	48.9024	
Carbacid Investments Ltd		4.345677506	1.96	0.20506097	0.401919	3.943758	51.6122	4.345677506	1.96	0.20506097	0.401919	4.747597	115.3069	
Crown Berger Ltd		2.212839062	1.96	0.48790368	0.956291	1.256548	3.513272	2.212839062	1.96	0.48790368	0.956291	3.16913	23.78679	
Dunlop Kenya Ltd		2.669507274	1.96	0.40305087	0.78998	1.879528	6.55041	2.669507274	1.96	0.40305087	0.78998	3.459487	31.80066	
EA Cables Ltd		2.830132274	1.96	0.48083261	0.942432	1.8877	6.604164	2.830132274	1.96	0.48083261	0.942432	3.772564	43.49144	
EA Packaging Ltd		2.401621476	1.96	0.36062446	0.706824	1.694798	5.445543	2.401621476	1.96	0.36062446	0.706824	3.108445	22.38622	
EA Portland Cement Ltd		2.39985572	1.96	0.75660426	1.482944	0.916911	2.501552	2.39985572	1.96	0.75660426	1.482944	3.8828	48.56	
Firestone East Africa Ltd		2.798580763	1.96	0.16970563	0.332623	2.465958	11.77475	2.798580763	1.96	0.16970563	0.332623	3.131204	22.90153	
East Africa Breweries Ltd		4.280070024	1.96	0.14142136	0.277186	4.002884	54.75585	4.280070024	1.96	0.14142136	0.277186	4.557256	95.32155	
Kenya National Mills Ltd		2.464400109	1.96	0.54447222	1.067166	1.397235	4.044001	2.464400109	1.96	0.54447222	1.067166	3.531566	34.17744	
Kenya Oil Co Ltd		4.079596822	1.96	0.29698485	0.58209	3.497507	33.03298	4.079596822	1.96	0.29698485	0.58209	4.661687	105.8145	
Kenya Power & Lighting Ltd	4.714210275	1.96	0.17677767	0.346482	4.367728	78.86424	4.714210275	1.96	0.17677767	0.346482	5.060693	157.6997		
Total Kenya Ltd	3.896603461	1.96	0.17677767	0.346482	3.550121	34.81753	3.896603461	1.96	0.17677767	0.346482	4.243086	69.62236		
Unga Group Ltd	3.361518346	1.96	0.72831998	1.427507	1.934011	6.917201	3.361518346	1.96	0.72831998	1.427507	4.789026	120.1842		

ESTIMATION OF EXERCISE PRICE RANGES-JULY-DECEMBER, 199		a	b	c	d	e	f	g	h	i	j	
SECTOR	COMPANY	$LN(p_0)+E(R)-V/2*0.5$	$V*SQRT(0.5)$	$b*c$	$a-d$		$LN(p_0)+E(R)-V/2*0.5$	$V*SQRT(0.5)$	$f+i$			
Agricultural	Brooke Bond Kenya Limited	4.826638221	1.96	0.27609369	0.541144	4.285495	4.826638221	1.96	0.27609369	0.541144	5.367782	
	Eaagads Limited	3.464127818	1.96	0.42642684	0.835797	2.628331	3.464127818	1.96	0.42642684	0.835797	4.299924	
	George Williamson Kenya Ltd	4.785400458	1.96	0.1577604	0.30921	4.47619	4.785400458	1.96	0.1577604	0.30921	5.094611	
	Kakuzi Ltd	4.593121649	1.96	0.18813763	0.36875	4.224372	4.593121649	1.96	0.18813763	0.36875	4.961871	
	Kapchorua Tea Co Ltd	5.301823986	1.96	0.16620053	0.325753	4.976071	5.301823986	1.96	0.16620053	0.325753	5.627577	
	Limuru Tea Co Ltd	6.435861339	1.96	0.11055337	0.216685	6.219177	6.435861339	1.96	0.11055337	0.216685	6.652546	
	Rea Vipingo Ltd	1.681705651	1.96	0.1418014	0.277931	1.403775	1.681705651	1.96	0.1418014	0.277931	1.959636	
	Sasini Tea & Coffee Ltd	3.795938563	1.96	0.18997623	0.372353	3.423585	3.795938563	1.96	0.18997623	0.372353	4.168292	
	Finance & Investment	Barclays Bank Ltd	4.636837375	1.96	0.14142136	0.277186	4.359652	4.636837375	1.96	0.14142136	0.277186	4.914023
		City Trust Ltd	3.033615309	1.96	0.09899495	0.19403	2.839585	3.033615309	1.96	0.09899495	0.19403	3.227645
		CFC Bank Ltd	2.688469744	1.96	0.30405592	0.59595	2.09252	2.688469744	1.96	0.30405592	0.59595	3.284419
		Diamond Trust Bank Kenya Ltd	3.258253459	1.96	0.1767767	0.346482	2.911771	3.258253459	1.96	0.1767767	0.346482	3.604736
		Housing Finance Co (K) Ltd	2.41301223	1.96	0.1979899	0.38806	2.024952	2.41301223	1.96	0.1979899	0.38806	2.801072
ICDC Investments Co Ltd		4.010831561	1.96	0.05656854	0.110874	3.899957	4.010831561	1.96	0.05656854	0.110874	4.121706	
Jubilee Insurance Co Ltd		3.243164145	1.96	0.16263456	0.318764	2.9244	3.243164145	1.96	0.16263456	0.318764	3.561928	
Kenya Commercial Bank Ltd		3.52368932	1.96	0.16263456	0.318764	3.204926	3.52368932	1.96	0.16263456	0.318764	3.842453	
National Bank of Kenya Ltd		1.609524633	1.96	0.20560697	0.401919	1.207605	1.609524633	1.96	0.20560697	0.401919	2.011444	
National Industrial Credit Ltd		3.326997123	1.96	0.09899495	0.19403	3.132967	3.326997123	1.96	0.09899495	0.19403	3.521027	
Pan Africa Insurance Ltd		3.21102883	1.96	0.77074639	1.510663	1.700366	3.21102883	1.96	0.77074639	1.510663	4.721692	
Standard Chartered Bank Ltd		3.939152396	1.96	0.10606602	0.207889	3.731263	3.939152396	1.96	0.10606602	0.207889	4.147042	
Commercial & Services		Africa Lakes Corporation Plc	Not listed									
		A Baumann & Co Ltd	2.803713622	1.96	0.08485281	0.166312	2.637402	2.803713622	1.96	0.08485281	0.166312	2.970025
		CMC Holdings Ltd	3.29080451	1.96	0.11313708	0.221749	3.069056	3.29080451	1.96	0.11313708	0.221749	3.512553
	Car & General (K) Ltd	1.901960093	1.96	0.74246212	1.455226	0.446734	1.901960093	1.96	0.74246212	1.455226	3.357186	
	Express Kenya Ltd	3.008653452	1.96	0.34648232	0.679105	2.329548	3.008653452	1.96	0.34648232	0.679105	3.687759	
	Kenya Airways Ltd	2.021416542	1.96	0.27577164	0.540512	1.480904	2.021416542	1.96	0.27577164	0.540512	2.561929	
	Lonhro Motors (EA) Ltd	2.597113344	1.96	0.26870058	0.526653	2.07046	2.597113344	1.96	0.26870058	0.526653	3.123766	
	Marshalls (EA) Ltd	3.052017453	1.96	0.13435029	0.263327	2.788691	3.052017453	1.96	0.13435029	0.263327	3.315344	
	Nation Media Group Ltd	4.72543445	1.96	0.15556349	0.304904	4.42053	4.72543445	1.96	0.15556349	0.304904	5.030339	
	Pearl Drycleaners Ltd	1.592585093	1.96	0.84852814	1.663115	-0.07053	1.592585093	1.96	0.84852814	1.663115	3.2557	
	Standard Newspapers Ltd	2.06045733	1.96	0.79195959	1.552241	0.508217	2.06045733	1.96	0.79195959	1.552241	3.612698	
	Tourism Promotion Services (Serena)	2.51881683	1.96	0.11313708	0.221749	2.297068	2.51881683	1.96	0.11313708	0.221749	2.740566	
	Uchumi Supermarkets Ltd	3.857134021	1.96	0.19091883	0.374201	3.482933	3.857134021	1.96	0.19091883	0.374201	4.231335	
	Industrial and Allied	Athi River Mining Ltd	1.671366175	1.96	0.29698485	0.58209	1.089276	1.671366175	1.96	0.29698485	0.58209	2.253456
		Bamburi Cement Ltd	3.119071538	1.96	0.2192031	0.429638	2.689433	3.119071538	1.96	0.2192031	0.429638	3.54871
British American Tobacco Ltd		4.25647245	1.96	0.19091883	0.374201	3.882272	4.25647245	1.96	0.19091883	0.374201	4.630673	
B O C Gases Ltd		3.134071538	1.96	0.2192031	0.429638	2.704433	3.134071538	1.96	0.2192031	0.429638	3.56371	
Carbacid Investments Ltd		4.56914782	1.96	0.20560697	0.401919	4.167228	4.56914782	1.96	0.20560697	0.401919	4.971067	
Crown Berger Ltd		2.261041163	1.96	0.48790368	0.956291	1.30475	2.261041163	1.96	0.48790368	0.956291	3.217332	
Dunlop Kenya Ltd		2.381825201	1.96	0.40305087	0.78998	1.591846	2.381825201	1.96	0.40305087	0.78998	3.171805	
EA Cables Ltd		2.809929566	1.96	0.48083261	0.942432	1.867498	2.809929566	1.96	0.48083261	0.942432	3.752361	
EA Packaging Ltd		2.29903233	1.96	0.36062446	0.706824	1.592208	2.29903233	1.96	0.36062446	0.706824	3.005856	
EA Portland Cement Ltd		2.207923649	1.96	0.75660426	1.482944	0.724979	2.207923649	1.96	0.75660426	1.482944	3.690868	
Firestone East Africa Ltd		2.823960381	1.96	0.16970563	0.332623	2.491337	2.823960381	1.96	0.16970563	0.332623	3.156583	
East Africa Breweries Ltd		4.395103281	1.96	0.14142136	0.277186	4.117917	4.395103281	1.96	0.14142136	0.277186	4.672289	
Kenya National Mills Ltd		2.27083233	1.96	0.54447222	1.067166	1.203667	2.27083233	1.96	0.54447222	1.067166	3.337998	
Kenya Oil Co Ltd		4.40163334	1.96	0.29698485	0.58209	3.819543	4.40163334	1.96	0.29698485	0.58209	4.983724	
Kenya Power & Lighting Ltd		4.596604258	1.96	0.1767767	0.346482	4.250122	4.596604258	1.96	0.1767767	0.346482	4.943087	
Total Kenya Ltd		3.854522602	1.96	0.1767767	0.346482	3.50804	3.854522602	1.96	0.1767767	0.346482	4.201005	
Unga Group Ltd		2.946982819	1.96	0.72831998	1.427507	1.519476	2.946982819	1.96	0.72831998	1.427507	4.37449	

## ESTIMATION OF EXERCISE PRICE RANGES-January-June 2000

SECTOR	COMPANY	a LN(p0)+(E(R)-V2/2)*0.5	b	c V*SQRT(0.5)	d b*c	e a-d	f LN(p0)+(E(R)-V2/2)*0.5	g	h V*SQRT(0.5)	i	j f+i			
Agricultural	<i>Brooke Bond Kenya Limited</i>	4.61392878	1.96	0.19748826	0.387077	4.226852	68.50124	4.61392878	1.96	0.19748826	0.387077	5.001006	148.5625	
	<i>Eaagads Limited</i>	3.118230241	1.96	0.14591493	0.285993	2.832237	16.98341	3.118230241	1.96	0.14591493	0.285993	3.404224	30.09092	
	<i>George Williamson Kenya Ltd</i>	4.516076505	1.96	0.30487027	0.597546	3.918531	50.32645	4.516076505	1.96	0.30487027	0.597546	5.113622	166.2715	
	<i>Kakuzi Ltd</i>	4.313409652	1.96	0.20587244	0.40351	3.9099	49.89395	4.313409652	1.96	0.20587244	0.40351	4.71692	111.8233	
	<i>Kapchorua Tea Co Ltd</i>	5.018968627	1.96	0	0	5.018969	151.2552	5.018968627	1.96	0	0	5.018969	151.2552	
	<i>Limuru Tea Co Ltd</i>	6.519280055	1.96	0	0	6.51928	678.09	6.519280055	1.96	0	0	6.51928	678.09	
	<i>Rea Vipingo Ltd</i>	1.400494895	1.96	0.15507414	0.303945	1.09655	2.993818	1.400494895	1.96	0.15507414	0.303945	1.70444	5.498307	
	<i>Sasini Tea &amp; Coffee Ltd</i>	3.685055835	1.96	0.21213203	0.415779	3.269277	26.29232	3.685055835	1.96	0.21213203	0.415779	4.100835	60.39067	
	Finance & Investment	<i>Barclays Bank Ltd</i>	4.401208722	1.96	0.25455844	0.498935	3.902274	49.51493	4.401208722	1.96	0.25455844	0.498935	4.900143	134.309
		<i>City Trust Ltd</i>	3.15588109	1.96	0.13435029	0.263327	2.892555	18.03933	3.15588109	1.96	0.13435029	0.263327	3.419208	30.5452
		<i>CFC Bank Ltd</i>	2.345168	1.96	0.28284271	0.554372	1.790796	5.994224	2.345168	1.96	0.28284271	0.554372	2.89954	18.16578
		<i>Diamond Trust Bank Kenya Ltd</i>	3.013994615	1.96	0.20506097	0.401919	2.612075	13.6273	3.013994615	1.96	0.20506097	0.401919	3.415914	30.44477
		<i>Housing Finance Co (K) Ltd</i>	1.824055416	1.96	0.78488853	1.538382	0.285674	1.330658	1.824055416	1.96	0.78488853	1.538382	3.362437	28.85943
		<i>ICDC Investments Co Ltd</i>	3.888798005	1.96	0.19091883	0.374201	3.514597	33.60239	3.888798005	1.96	0.19091883	0.374201	4.262999	71.02266
		<i>Jubilee Insurance Co Ltd</i>	3.251296531	1.96	0.16970563	0.332623	2.918674	18.51671	3.251296531	1.96	0.16970563	0.332623	3.58392	36.01443
<i>Kenya Commercial Bank Ltd</i>		3.137872355	1.96	0.24041631	0.471216	2.666656	14.39177	3.137872355	1.96	0.24041631	0.471216	3.609088	36.93237	
<i>National Bank of Kenya Ltd</i>		1.359412912	1.96	0.36062446	0.706824	0.652589	1.920507	1.359412912	1.96	0.36062446	0.706824	2.066237	7.895057	
<i>National Industrial Credit Ltd</i>		3.119848903	1.96	0.27577164	0.540512	2.579336	13.18838	3.119848903	1.96	0.27577164	0.540512	3.660361	38.87539	
<i>Pan Africa Insurance Ltd</i>		2.946666903	1.96	0.27577164	0.540512	2.406154	11.09123	2.946666903	1.96	0.27577164	0.540512	3.487179	32.6936	
<i>Standard Chartered Bank Ltd</i>		3.7779826	1.96	0.36062446	0.706824	3.071159	21.56688	3.7779826	1.96	0.36062446	0.706824	4.484807	88.6598	
Commercial & Services		<i>Africa Lakes Corporation Plc</i>	Not listed for a full year											
		<i>A Baumann &amp; Co Ltd</i>	2.545950201	1.96	0.15556349	0.304904	2.241046	9.40316	2.545950201	1.96	0.15556349	0.304904	2.850855	17.30256
		<i>CMC Holdings Ltd</i>	3.137139048	1.96	0.19091883	0.374201	2.762938	15.84633	3.137139048	1.96	0.19091883	0.374201	3.51134	33.49312
	<i>Car &amp; General (K) Ltd</i>	2.031880133	1.96	0.66468037	1.302774	0.729107	2.073228	2.031880133	1.96	0.66468037	1.302774	3.334654	28.06866	
	<i>Express Kenya Ltd</i>	2.908481896	1.96	0.09192388	0.180171	2.728311	15.30701	2.908481896	1.96	0.09192388	0.180171	3.088653	21.94749	
	<i>Kenya Airways Ltd</i>	2.197754774	1.96	0.17677767	0.346482	1.851272	6.367917	2.197754774	1.96	0.17677767	0.346482	2.544237	12.73351	
	<i>Marshalls (EA) Ltd</i>	3.045314509	1.96	0.14142136	0.277186	2.768129	15.9288	3.045314509	1.96	0.14142136	0.277186	3.3225	27.7296	
	<i>Nation Media Group Ltd</i>	4.458143042	1.96	0.12020815	0.235608	4.222535	68.20617	4.458143042	1.96	0.12020815	0.235608	4.693751	109.2623	
	<i>Pearl Drycleaners Ltd</i>	0.923378955	1.96	0.18384776	0.360342	0.563037	1.755998	0.923378955	1.96	0.18384776	0.360342	1.283721	3.610046	
	<i>Standard Newspapers Ltd</i>	2.313577091	1.96	0.77781746	1.524522	0.789055	2.201315	2.313577091	1.96	0.77781746	1.524522	3.838099	46.43713	
	<i>Tourism Promotion Services (Serena)</i>	2.301329452	1.96	0.68589358	1.344351	0.956978	2.603816	2.301329452	1.96	0.68589358	1.344351	3.645681	38.30885	
	<i>Uchumi Supermarkets Ltd</i>	3.833408165	1.96	0.12020815	0.235608	3.5978	36.51781	3.833408165	1.96	0.12020815	0.235608	4.069016	58.49938	
	Industrial and Allied	<i>Athi River Mining Ltd</i>	1.535809455	1.96	0.29698485	0.58209	0.953719	2.595344	1.535809455	1.96	0.29698485	0.58209	2.1179	8.313658
		<i>Bamburi Cement Ltd</i>	3.416658076	1.96	0.09899495	0.19403	3.222628	25.09398	3.416658076	1.96	0.09899495	0.19403	3.610688	36.9915
		<i>British American Tobacco Ltd</i>	3.981069245	1.96	0.36769553	0.720683	3.260386	26.05959	3.981069245	1.96	0.36769553	0.720683	4.701752	110.14
<i>B O C Gases Ltd</i>		4.033258083	1.96	0.21213203	0.415779	3.617479	37.24357	4.033258083	1.96	0.21213203	0.415779	4.449037	85.54451	
<i>Carbacid Investments Ltd</i>		3.867048119	1.96	0.28284271	0.554372	3.312676	27.45852	3.867048119	1.96	0.28284271	0.554372	4.42142	83.21435	
<i>Crown Berger Ltd</i>		2.323530428	1.96	0.24041631	0.471216	1.852314	6.374556	2.323530428	1.96	0.24041631	0.471216	2.794746	16.35848	
<i>Dunlop Kenya Ltd</i>		2.117221161	1.96	0.15556349	0.304904	1.812317	6.12462	2.117221161	1.96	0.15556349	0.304904	2.422126	11.26979	
<i>EA Cables Ltd</i>		2.495883819	1.96	0.4384062	0.859276	1.636608	5.137711	2.495883819	1.96	0.4384062	0.859276	3.35516	28.65019	
<i>EA Packaging Ltd</i>		2.140828644	1.96	0.60811183	1.191899	0.948929	2.582943	2.140828644	1.96	0.60811183	1.191899	3.332728	28.01466	
<i>EA Portland Cement Ltd</i>		2.423835207	1.96	0.16970563	0.332623	2.091212	8.094721	2.423835207	1.96	0.16970563	0.332623	2.756458	15.74398	
<i>Firestone East Africa Ltd</i>		2.62541194	1.96	0.21213203	0.415779	2.209633	9.112373	2.62541194	1.96	0.21213203	0.415779	3.041191	20.93015	
<i>East Africa Breweries Ltd</i>		4.303354972	1.96	0.12020815	0.235608	4.067747	58.42518	4.303354972	1.96	0.12020815	0.235608	4.538963	93.59369	
<i>Kenya National Mills Ltd</i>		1.959712851	1.96	0.56568542	1.108743	0.850969	2.341916	1.959712851	1.96	0.56568542	1.108743	3.068456	21.50867	
<i>Kenya Oil Co Ltd</i>		4.296695401	1.96	0.16263456	0.318764	3.977932	53.40646	4.296695401	1.96	0.16263456	0.318764	4.615459	101.0342	
<i>Kenya Power &amp; Lighting Ltd</i>		4.198825857	1.96	0.32526912	0.637527	3.561298	35.20888	4.198825857	1.96	0.32526912	0.637527	4.836353	126.009	
<i>Total Kenya Ltd</i>	3.935352175	1.96	0.30405592	0.59595	3.339403	28.20227	3.935352175	1.96	0.30405592	0.59595	4.531302	92.87939		
<i>Unga Group Ltd</i>	2.799883667	1.96	0.51618795	1.011728	1.788155	5.978414	2.799883667	1.96	0.51618795	1.011728	3.811612	45.22328		



ESTIMATION OF EXERCISE PRICE RANGES-JULY-DECEMBER			a	b	c	d	e	f	g	h	i	j	
SECTOR	COMPANY	LN(p0)+E(R)-V2/2*0.5	V*SQR(0.5)	b*c	a-d		LN(p0)+E(R)-V2/2*0.5	V*SQR(0.5)	f+1				
Agricultural	Brooke Bond Kenya Limited	4.266894756	1.96	0.19748826	0.387077	3.879818	4.266894756	1.96	0.19748826	0.387077	4.653972	105.0012	
	Eaagads Limited	3.118230241	1.96	0.14591493	0.285993	3.822327	3.118230241	1.96	0.14591493	0.285993	3.404224	30.09092	
	George Williamson Kenya Ltd	4.311776041	1.96	0.30487027	0.597546	3.71423	4.311776041	1.96	0.30487027	0.597546	4.909322	135.5475	
	Kakuzi Ltd	3.984206937	1.96	0.20587244	0.40351	3.580697	3.984206937	1.96	0.20587244	0.40351	4.387717	80.45652	
	Kapchorua Tea Co Ltd	5.018968627	1.96	0	0	5.018969	5.018968627	1.96	0	0	5.018969	151.2552	
	Limuru Tea Co Ltd	6.519280055	1.96	0	0	6.51928	6.519280055	1.96	0	0	6.51928	678.09	
	Rea Vipingo Ltd	1.149180467	1.96	0.15507414	0.303945	0.845235	1.149180467	1.96	0.15507414	0.303945	1.453126	4.276461	
	Sasini Tea & Coffee Ltd	3.435966102	1.96	0.21213203	0.415779	3.020187	3.435966102	1.96	0.21213203	0.415779	3.851745	47.07513	
	Finance & Investment	Barclays Bank Ltd	4.436947296	1.96	0.25455844	0.498935	3.938013	4.436947296	1.96	0.25455844	0.498935	4.935882	139.1958
		City Trust Ltd	3.061707274	1.96	0.13435029	0.263327	2.798381	3.061707274	1.96	0.13435029	0.263327	3.325034	27.79994
		CFC Bank Ltd	2.227382386	1.96	0.28284271	0.554372	1.673011	2.227382386	1.96	0.28284271	0.554372	2.781754	16.14732
		Diamond Trust Bank Kenya Ltd	2.749707274	1.96	0.20506097	0.401919	2.347788	2.749707274	1.96	0.20506097	0.401919	3.151627	23.37406
		Housing Finance Co (K) Ltd	1.415002617	1.96	0.78488853	1.538382	-0.12338	1.415002617	1.96	0.78488853	1.538382	2.953384	19.17072
ICDC Investments Co Ltd		3.87874767	1.96	0.19091883	0.374201	3.504547	3.87874767	1.96	0.19091883	0.374201	4.252949	70.31243	
Jubilee Insurance Co Ltd		3.121642453	1.96	0.16970563	0.332623	2.789019	3.121642453	1.96	0.16970563	0.332623	3.454265	31.63504	
Kenya Commercial Bank Ltd		3.38830451	1.96	0.24041631	0.471216	2.917089	3.38830451	1.96	0.24041631	0.471216	3.85952	47.4426	
National Bank of Kenya Ltd		1.030908845	1.96	0.36062446	0.706824	0.324085	1.030908845	1.96	0.36062446	0.706824	1.737733	5.684441	
National Industrial Credit Ltd		2.866497438	1.96	0.27577164	0.540512	2.325985	2.866497438	1.96	0.27577164	0.540512	3.40701	30.17488	
Pan Africa Insurance Ltd		2.667707274	1.96	0.27577164	0.540512	2.127195	2.667707274	1.96	0.27577164	0.540512	3.20822	24.73501	
Standard Chartered Bank Ltd		4.026176011	1.96	0.36062446	0.706824	3.193352	4.026176011	1.96	0.36062446	0.706824	4.733	113.636	
Commercial & Services		Africa Lakes Corporation Plc	Not listed for a full year										
	A Baumann & Co Ltd	2.462568592	1.96	0.15556349	0.304904	2.157664	2.462568592	1.96	0.15556349	0.304904	2.767473	15.91836	
	CMC Holdings Ltd	2.558153886	1.96	0.19091883	0.374201	2.183953	2.558153886	1.96	0.19091883	0.374201	2.932355	18.77178	
	Car & General (K) Ltd	2.141672635	1.96	0.66468037	1.302774	0.838899	2.141672635	1.96	0.66468037	1.302774	3.444446	31.32593	
	Express Kenya Ltd	2.917842102	1.96	0.09192388	0.180171	2.737671	2.917842102	1.96	0.09192388	0.180171	3.098013	22.15389	
	Kenya Airways Ltd	2.218816542	1.96	0.1767767	0.346482	1.872334	2.218816542	1.96	0.1767767	0.346482	2.565299	13.00454	
	Marshall's (EA) Ltd	2.845105096	1.96	0.14142136	0.277186	2.567919	2.845105096	1.96	0.14142136	0.277186	3.122291	22.69832	
	Nation Media Group Ltd	4.160263114	1.96	0.12020815	0.235608	3.924655	4.160263114	1.96	0.12020815	0.235608	4.395871	81.11526	
	Pearl Drycleaners Ltd	0.698568737	1.96	0.18384776	0.360342	0.338227	0.698568737	1.96	0.18384776	0.360342	1.05891	2.883228	
	Standard Newspapers Ltd	1.725788771	1.96	0.77781746	1.524522	0.201267	1.725788771	1.96	0.77781746	1.524522	3.250311	25.79836	
	Tourism Promotion Services (Serena)	2.284233829	1.96	0.68589358	1.344351	0.939882	2.284233829	1.96	0.68589358	1.344351	3.628585	37.6595	
	Uchumi Supermarkets Ltd	3.893144195	1.96	0.12020815	0.235608	3.657536	3.893144195	1.96	0.12020815	0.235608	4.128752	62.10038	
	Industrial and Allied	Athi River Mining Ltd	1.326027233	1.96	0.29698485	0.58209	0.743937	1.326027233	1.96	0.29698485	0.58209	1.908118	6.740388
Bamburi Cement Ltd		3.535979574	1.96	0.09899495	0.19403	3.341949	3.535979574	1.96	0.09899495	0.19403	3.73001	41.67951	
British American Tobacco Ltd		4.060451268	1.96	0.36769553	0.720683	3.339768	4.060451268	1.96	0.36769553	0.720683	4.781134	119.2396	
B O C Gases Ltd		3.727952654	1.96	0.21213203	0.415779	3.312174	3.727952654	1.96	0.21213203	0.415779	4.143731	63.0376	
Carbacid Investments Ltd		3.752023005	1.96	0.28284271	0.554372	3.197651	3.752023005	1.96	0.28284271	0.554372	4.306395	74.17259	
Crown Berger Ltd		2.446828644	1.96	0.24041631	0.471216	1.975613	2.446828644	1.96	0.24041631	0.471216	2.918045	18.50507	
Dunlop Kenya Ltd		1.847803021	1.96	0.15556349	0.304904	1.542899	1.847803021	1.96	0.15556349	0.304904	2.152707	8.608133	
EA Cables Ltd		2.013341542	1.96	0.4384062	0.859276	1.154065	2.013341542	1.96	0.4384062	0.859276	2.872618	17.68325	
EA Packaging Ltd		2.19531683	1.96	0.60811183	1.191899	1.003418	2.19531683	1.96	0.60811183	1.191899	3.387216	29.58348	
EA Portland Cement Ltd		2.523296473	1.96	0.16970563	0.332623	2.190673	2.523296473	1.96	0.16970563	0.332623	2.85592	17.39042	
Firestone East Africa Ltd		2.438595788	1.96	0.21213203	0.415779	2.022817	2.438595788	1.96	0.21213203	0.415779	2.854375	17.36357	
East Africa Breweries Ltd		4.294825143	1.96	0.12020815	0.235608	4.059217	4.294825143	1.96	0.12020815	0.235608	4.530433	92.79875	
Kenya National Mills Ltd		2.061375257	1.96	0.56568542	1.108743	0.952632	2.061375257	1.96	0.56568542	1.108743	3.170119	23.81031	
Kenya Oil Co Ltd	4.488494247	1.96	0.56568542	1.108743	3.379751	4.488494247	1.96	0.56568542	1.108743	5.597238	269.6804		
Kenya Power & Lighting Ltd	3.618681808	1.96	0.32526912	0.637527	2.981154	3.618681808	1.96	0.32526912	0.637527	4.256209	70.54207		
Total Kenya Ltd	3.990600633	1.96	0.30405592	0.59595	3.394651	3.990600633	1.96	0.30405592	0.59595	4.58655	98.15523		
Unga Group Ltd	2.406142509	1.96	0.51618795	1.011728	1.394414	2.406142509	1.96	0.51618795	1.011728	3.417871	30.5044		

**APPENDIX 6 – SIMULATION OF OPTION VALUES USING  
BOPSCOL**

**SIMULATION OF OPTION VALUES USING BOPSCOL  
AGRICULTURAL SECTOR—JANUARY TO JUNE 1997**

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.97	Value of European call option	Value of European put option		
Brooke Bond	149	107	22.49	14	0.5	53.38	1	-21.5	0	0	0.478	0	0	-0.0001	0	0	0	124	-36.38	-17		
		117				44.4444	0.9999	-23.5179	0	0.0006	0.5227	0.0005	-0.0001	-0.0033	0	0.0006	-0.0001	124	-37.4444	-7.0005		
		127				35.519	0.9974	-25.553	0.0005	0.0084	0.5655	0.0116	-0.0026	-0.0286	0.0005	0.0084	-0.002	124	-38.519	2.9884		
		118				43.551	0.9998	-23.7199	0.0001	0.0008	0.5271	0.0008	-0.0002	-0.0043	0.0001	0.0008	-0.0002	124	-37.551	-6.0008		
		119				42.6576	0.9997	-23.9222	0.0001	0.0011	0.5315	0.001	-0.0003	-0.0056	0.0001	0.0011	-0.0002	124	-37.6576	-5.001		
		120				41.7644	0.9996	-24.1248	0.0001	0.0014	0.5359	0.0015	-0.0004	-0.0072	0.0001	0.0014	-0.0003	124	-37.7644	-4.0015		
		121				40.8713	0.9995	-24.3277	0.0001	0.0019	0.5403	0.002	-0.0005	-0.0091	0.0001	0.0019	-0.0004	124	-37.8713	-3.002		
		122				39.9784	0.9993	-24.5309	0.0002	0.0025	0.5446	0.0028	-0.0007	-0.0114	0.0002	0.0025	-0.0005	124	-37.9784	-2.0028		
		123				39.0858	0.9991	-24.7346	0.0002	0.0032	0.5489	0.0037	-0.0009	-0.014	0.0002	0.0032	-0.0007	124	-38.0858	-1.0037		
		124				38.1934	0.9988	-24.9387	0.0003	0.0041	0.5532	0.005	-0.0012	-0.0171	0.0003	0.0041	-0.0009	124	-38.1934	-0.005		
		125				37.3014	0.9985	-25.1431	0.0003	0.0053	0.5573	0.0067	-0.0015	-0.0206	0.0003	0.0053	-0.0012	124	-38.3014	0.9933		
		Eaagads Ltd	27.25	17	22.49	51	0.5	12.2187	0.9641	-3.9357	0.008	0.0152	0.0703	0.1606	-0.0359	-0.519	0.008	0.0152	-0.0057	26	-3.2187	-9.1606
				27				5.4415	0.6977	-6.4806	0.0355	0.0672	0.0678	2.3198	-0.3023	-1.0541	0.0355	0.0672	-0.0528	26	-6.4415	-1.3198
				37				2.0053	0.3609	-5.4405	0.0381	0.0722	0.0391	7.82	-0.6391	1.9957	0.0381	0.0722	-0.1262	26	-13.0053	3.18
				28				4.9568	0.6616	-6.5341	0.0372	0.0705	0.0654	2.7288	-0.3384	-0.9066	0.0372	0.0705	-0.0598	26	-6.9568	-0.7288
29						4.5074	0.6253	-6.544	0.0386	0.073	0.0627	3.173	-0.3747	-0.7156	0.0386	0.073	-0.0669	26	-7.5074	-0.173		
30						4.092	0.5892	-6.5127	0.0396	0.0749	0.0598	3.6513	-0.4108	-0.4833	0.0396	0.0749	-0.0742	26	-8.092	0.3487		
George Williamson	73.5			28	22.49	68	0.5	48.5656	0.9935	-6.1485	0.0005	0.0095	0.1223	0.0875	-0.0065	-0.521	0.0005	0.0095	-0.0028	70	-6.5656	-42.0875
		38				40.0806	0.9676	-9.5445	0.0021	0.0377	0.1552	0.539	-0.0324	-1.9072	0.0021	0.0377	-0.0146	70	-8.0806	-32.539		
		48				32.3522	0.9132	-13.4072	0.0045	0.0822	0.1738	1.747	-0.0868	-3.7601	0.0045	0.0822	-0.0407	70	-10.3522	-23.747		
		58				25.6562	0.8332	-16.8376	0.0071	0.1299	0.1779	3.9874	-0.1668	-5.1808	0.0071	0.1299	-0.0812	70	-13.6562	-15.9874		
		68				20.084	0.7376	-19.1933	0.0092	0.1694	0.1707	7.3516	-0.2624	-5.5267	0.0092	0.1694	-0.1332	70	-18.084	-9.3516		
		78				15.5828	0.6371	-20.2849	0.0106	0.195	0.1562	11.7869	-0.3629	-4.6084	0.0106	0.195	-0.1923	70	-23.5828	-3.7869		
		88				12.0223	0.5398	-20.2475	0.0112	0.2063	0.1382	17.1628	-0.4602	-2.5612	0.0112	0.2063	-0.255	70	-30.0223	0.8372		
		79				15.187	0.6271	-20.3279	0.0107	0.1967	0.1545	12.2847	-0.3729	-4.4505	0.0107	0.1967	-0.1985	70	-24.187	-3.2847		
		80				14.8004	0.6172	-20.3598	0.0108	0.1983	0.1528	12.7917	-0.3828	-4.2814	0.0108	0.1983	-0.2047	70	-24.8004	-2.7917		
		81				14.4229	0.6073	-20.3808	0.0109	0.1998	0.1511	13.3079	-0.3927	-4.1015	0.0109	0.1998	-0.2109	70	-25.4229	-2.3079		
		82				14.0544	0.5974	-20.3913	0.011	0.2011	0.1493	13.833	-0.4026	-3.9109	0.011	0.2011	-0.2171	70	-26.0544	-1.833		
		83				13.6946	0.5876	-20.3914	0.011	0.2023	0.1475	14.3669	-0.4124	-3.71	0.011	0.2023	-0.2234	70	-26.6946	-1.3669		
		84				13.3435	0.5779	-20.3814	0.0111	0.2034	0.1457	14.9095	-0.4221	-3.4991	0.0111	0.2034	-0.2297	70	-27.3435	-0.9095		
		85				13.0009	0.5683	-20.3618	0.0111	0.2043	0.1438	15.4605	-0.4317	-3.2785	0.0111	0.2043	-0.236	70	-28.0009	-0.4605		
86				12.6666	0.5587	-20.3327	0.0112	0.2051	0.142	16.0198	-0.4413	-3.0484	0.0112	0.2051	-0.2423	70	-28.6666	-0.0198				
87				12.3405	0.5492	-20.2945	0.0112	0.2058	0.1401	16.5873	-0.4508	-2.8092	0.0112	0.2058	-0.2486	70	-29.3405	0.4127				
Kakuzi Ltd	98	45	22.49	51	0.5	57.8352	0.996	-9.3651	0.0003	0.0082	0.1989	0.0491	-0.004	-0.321	0.0003	0.0082	-0.0022	102	-0.8352	-57.0491		
		55				49.1134	0.9819	-12.1694	0.0013	0.0309	0.2355	0.2637	-0.0181	-1.1155	0.0013	0.0309	-0.0102	102	-2.1134	-47.2637		
		65				40.7951	0.9485	-15.4614	0.003	0.0732	0.2608	0.8818	-0.0515	-2.3977	0.003	0.0732	-0.0296	102	-3.7951	-37.8818		
		75				33.1507	0.8914	-18.7762	0.0053	0.1291	0.271	2.1738	-0.1086	-3.7027	0.0053	0.1291	-0.0641	102	-6.1507	-29.1738		
		85				26.3973	0.8124	-21.4843	0.0076	0.1866	0.2661	4.3569	-0.1876	-4.4009	0.0076	0.1866	-0.1137	102	-9.3973	-21.3569		
		95				20.6474	0.7185	-23.1197	0.0095	0.2339	0.2488	7.5434	-0.2815	-4.0266	0.0095	0.2339	-0.1757	102	-13.6474	-14.5434		
		105				15.9071	0.6182	-23.5236	0.0108	0.2642	0.2234	11.7395	-0.3818	-2.4207	0.0108	0.2642	-0.2458	102	-18.9071	-8.7395		
		115				12.103	0.5194	-22.8074	0.0113	0.2761	0.194	16.8718	-0.4806	-3.0503	0.0113	0.2761	-0.3199	102	-25.103	-3.8718		
		125				9.1164	0.4275	-21.2385	0.0111	0.2719	0.1639	22.8216	-0.5725	3.884	0.0111	0.2719	-0.3946	102	-32.1164	0.1784		
		124				9.3821	0.4363	-21.4248	0.0111	0.2729	0.1669	22.1937	-0.5637	3.4968	0.0111	0.2729	-0.3872	102	-31.3821	-0.1937		

Kapchorua Tea Co	70	70	22.49	0	0.5	7.4451	0	1	-14.0686	0	0	0.3128	0	0	0	0	0	0	0	0	0	0	70	-7.4451	0
							0	0	0	0	0	1.4914	0	-1	16.0784	0	0	0	-0.3575	0	0	0	70	-10	8.5086
Limuru Tea Co	1300	677	22.49	31	0.5	695.0161	0.9998	%-136.189	0	0.0056	3.0239	0.0118	-0.0002	-0.1256	0	0.0056	-0.0011	1000	-372.0161	-323.0118					
		687				686.0834	0.9998	%-138.231	0	0.0072	3.0682	0.0155	-0.0002	-0.1584	0	0.0072	-0.0014	1000	-373.0834	-313.0155					
		697				677.1516	0.9997	%-140.281	0	0.0009	3.1125	0.0201	-0.0003	-0.198	0	0.0009	-0.0018	1000	-374.1516	-303.0201					
		707				668.221	0.9997	%-142.338	0	0.0111	3.1567	0.0259	-0.0003	-0.2457	0	0.0113	-0.0023	1000	-375.221	-292.9997					
		717				659.2919	0.9996	%-144.405	0	0.014	3.2008	0.0332	-0.0004	-0.3027	0	0.014	-0.0029	1000	-376.2919	-283.0332					
		727				650.3646	0.9995	%-146.482	0	0.0172	3.2447	0.0423	-0.0005	-0.3701	0	0.0172	-0.0037	1000	-377.3646	-273.0423					
		737				641.4393	0.9993	%-148.571	0	0.0211	3.2885	0.0535	-0.0007	-0.4495	0	0.0211	-0.0046	1000	-378.4393	-263.0535					
		747				632.5165	0.9992	%-150.674	0	0.0257	3.3321	0.0672	-0.0008	-0.5422	0	0.0257	-0.0056	1000	-379.5165	-253.0672					
		757				623.5968	0.999	%-152.791	0	0.031	3.3755	0.0838	-0.001	-0.6497	0	0.031	-0.0069	1000	-380.5968	-243.0838					
		767				614.6805	0.9988	%-154.928	0	0.0373	3.4186	0.104	-0.0012	-0.7736	0	0.0373	-0.0085	1000	-381.6805	-233.104					
		777				605.7684	0.9985	%-157.077	0	0.0445	3.4615	0.1282	-0.0015	-0.9155	0	0.0445	-0.0103	1000	-382.7684	-223.1282					
		787				596.861	0.9982	%-159.248	0	0.0528	3.504	0.1573	-0.0018	-1.0771	0	0.0528	-0.0125	1000	-383.861	-213.1573					
		797				587.9591	0.9978	%-161.441	0	0.0624	3.5462	0.1918	-0.0022	-1.2598	0	0.0624	-0.015	1000	-384.9591	-203.1918					
		807				579.0635	0.9974	%-163.656	0	0.0732	3.588	0.2326	-0.0026	-1.4653	0	0.0732	-0.0179	1000	-386.0635	-193.2326					
		817				570.1752	0.9969	%-165.895	0	0.0856	3.6292	0.2808	-0.0031	-1.6951	0	0.0856	-0.0213	1000	-387.1752	-183.2808					
		827				561.2952	0.9964	%-168.161	0	0.0995	3.67	0.3372	-0.0036	-1.9505	0	0.0995	-0.0252	1000	-388.2952	-173.3372					
		837				552.4246	0.9957	%-170.453	0	0.1151	3.7102	0.403	-0.0043	-2.2328	0	0.1151	-0.0297	1000	-389.4246	-163.403					
		847				543.5646	0.995	%-172.773	0.0001	0.1325	3.7498	0.4794	-0.005	-2.5432	0.0001	0.1325	-0.0348	1000	-390.5646	-153.4794					
		857				534.7165	0.9942	%-175.122	0.0001	0.1519	3.7887	0.5677	-0.0058	-2.8825	0.0001	0.1519	-0.0406	1000	-391.7165	-143.5677					
		867				525.8818	0.9933	%-177.501	0.0001	0.1734	3.8267	0.6694	-0.0067	-3.2514	0.0001	0.1734	-0.0472	1000	-392.8818	-133.6694					
		877				517.0619	0.9922	%-179.910	0.0001	0.197	3.864	0.786	-0.0078	-3.6506	0.0001	0.197	-0.0546	1000	-394.0619	-123.786					
		887				508.2586	0.991	%-182.349	0.0001	0.223	3.9004	0.9191	-0.009	-4.08	0.0001	0.223	-0.063	1000	-395.2586	-113.9191					
		897				499.4735	0.9897	%-184.818	0.0001	0.2513	3.9357	1.0705	-0.0103	-4.5397	0.0001	0.2513	-0.0723	1000	-396.4735	-104.0705					
		907				490.7087	0.9882	%-187.318	0.0001	0.2822	3.97	1.242	-0.0118	-5.0291	0.0001	0.2822	-0.0827	1000	-397.7087	-94.242					
		917				481.966	0.9866	%-189.846	0.0001	0.3156	4.0032	1.4358	-0.0134	-5.5475	0.0001	0.3156	-0.0942	1000	-398.966	-84.4358					
		927				473.2475	0.9848	%-192.402	0.0001	0.3518	4.0351	1.6537	-0.0152	-6.0936	0.0001	0.3518	-0.107	1000	-400.2475	-74.6537					
		937				464.5554	0.9828	%-194.984	0.0001	0.3906	4.0657	1.898	-0.0172	-6.6659	0.0001	0.3906	-0.121	1000	-401.5554	-64.898					
		947				455.892	0.9807	%-197.590	0.0002	0.4323	4.0949	2.171	-0.0193	-7.2623	0.0002	0.4323	-0.1365	1000	-402.892	-55.171					
		957				447.2598	0.9783	%-200.218	0.0002	0.4767	4.1227	2.4752	-0.0217	-7.8805	0.0002	0.4767	-0.1534	1000	-404.2598	-45.4752					
		967				438.6611	0.9757	%-202.865	0.0002	0.5241	4.1489	2.813	-0.0243	-8.5177	0.0002	0.5241	-0.1718	1000	-405.6611	-35.813					
		977				430.0986	0.9729	%-205.528	0.0002	0.5743	4.1735	3.1869	-0.0271	-9.1706	0.0002	0.5743	-0.1919	1000	-407.0986	-26.1869					
		987				421.5749	0.9699	%-208.202	0.0002	0.6274	4.1964	3.5996	-0.0301	-9.8354	0.0002	0.6274	-0.2137	1000	-408.5749	-16.5996					
		997				413.0929	0.9666	%-210.885	0.0003	0.6833	4.2175	4.054	-0.0334	-10.5082	0.0003	0.6833	-0.2373	1000	-410.0929	-7.054					
		1007				404.655	0.9631	%-213.571	0.0003	0.742	4.2368	4.5525	-0.0369	-11.1844	0.0003	0.742	-0.2627	1000	-411.655	2.4475					
		998				412.2469	0.9663	%-211.153	0.0003	0.689	4.2195	4.1017	-0.0337	-10.5758	0.0003	0.689	-0.2397	1000	-410.2469	-6.1017					
		999				411.4016	0.9659	%-211.422	0.0003	0.6948	4.2215	4.15	-0.0341	-10.6434	0.0003	0.6948	-0.2422	1000	-410.4016	-5.15					
		1000				410.5567	0.9656	%-211.691	0.0003	0.7006	4.2235	4.1987	-0.0344	-10.711	0.0003	0.7006	-0.2447	1000	-410.5567	-4.1987					
		1001				409.7122	0.9652	%-211.959	0.0003	0.7064	4.2255	4.2478	-0.0348	-10.7786	0.0003	0.7064	-0.2472	1000	-410.7122	-3.2478					
		1002				408.8682	0.9649	%-212.228	0.0003	0.7123	4.2274	4.2975	-0.0351	-10.8462	0.0003	0.7123	-0.2498	1000	-410.8682	-2.2975					
		1003				408.0246	0.9645	%-212.496	0.0003	0.7182	4.2293	4.3476	-0.0355	-10.9139	0.0003	0.7182	-0.2523	1000	-411.0246	-1.3476					
		1004				407.1815	0.9642	%-212.765	0.0003	0.7241	4.2312	4.3981	-0.0358	-10.9815	0.0003	0.7241	-0.2549	1000	-411.1815	-0.3981					
		1005				406.3389	0.9638	%-213.034	0.0003	0.73	4.2331	4.4491	-0.0362	-11.0492	0.0003	0.73	-0.2575	1000	-411.3389	0.5509					
Rea Vipingo Ltd	11	7	22.49	27	0.5	4.7452	0.9989	-1.4118	0.0018	0.0003	0.0312	0.0007	-0.0011	-0.005	0.0018	0.0003	-0.0001	9.3	-2.4452	-2.3007					
		12				0.9715	0.5904	-2.0584	0.1851	0.0302	0.0276	0.6952	-0.4096	0.3533	0.1851	0.0302	-0.026	9.3	-3.6715	2.0048					
		8				3.8579	0.9907	-1.6359	0.0119	0.002	0.0352	0.007	-0.0093	-0.028	0.0119	0.002	-0.0005	9.3	-2.5579	-1.307					
		9				2.995	0.9587	-1.8839	0.0421	0.0069	0.0378	0.0378	-0.0413	-0.0751	0.0421	0.0069	-0.0025	9.3	-2.695	-0.3378					
		10				2.1961	0.8817	-2.1032	0.0943	0.0154	0.0375	0.1326	-0.1183	-0.0934	0.0943	0.0154	-0.0072	9.3	-2.8961	0.5674					
Sasini Tea & Coffe	60	47	22.49	38	0.5	18.5745	0.9281	-10.5562	0.0085	0.0582	0.1856	0.5757	-0.0719	-1.1102	0.0085	0.0582	-0.0245	85	19.4255	-38.5757					

57	11.5179	0.7715	-12.6977	0.0188	0.1284	0.1739	2.4555	-0.2285	-1.2418	0.0188	0.1284	-0.0808	85	16.4821	-30.4555
67	6.4689	0.5565	-12.422	0.0245	0.1676	0.1346	6.3429	-0.4435	1.0436	0.0245	0.1676	-0.1648	85	11.5311	-24.3429
77	3.347	0.3536	-10.0129	0.0231	0.1577	0.0894	12.1575	-0.6464	5.4626	0.0231	0.1577	-0.2547	85	4.653	-20.1575
87	1.6265	0.2033	-6.9349	0.0175	0.1199	0.0529	19.3734	-0.7967	10.5503	0.0175	0.1199	-0.3359	85	-3.6265	-17.3734
97	0.7553	0.1084	-4.2938	0.0115	0.079	0.0288	27.4386	-0.8916	15.2012	0.0115	0.079	-0.4047	85	-12.7553	-15.4386
107	0.3398	0.0548	-2.4511	0.0069	0.0471	0.0147	35.9595	-0.9452	19.0538	0.0069	0.0471	-0.4634	85	-22.3398	-13.9595
117	0.1497	0.0266	-1.3198	0.0038	0.0262	0.0072	44.7058	-0.9734	22.1949	0.0038	0.0262	-0.5155	85	-32.1497	-12.7058
127	0.0651	0.0126	-0.6816	0.002	0.0138	0.0035	53.5576	-0.9874	24.8429	0.002	0.0138	-0.564	85	-42.0651	-11.5576
82	2.3489	0.271	-8.4699	0.0205	0.1405	0.0696	15.6275	-0.729	8.0105	0.0205	0.1405	-0.2968	85	0.6511	-18.6275
83	2.1846	0.2563	-8.1578	0.02	0.1366	0.066	16.3569	-0.7437	8.5235	0.02	0.1366	-0.3049	85	-0.1846	-18.3569

Case 2 (continued)

57	11.5179	0.7715	-12.6977	0.0188	0.1284	0.1739	2.4555	-0.2285	-1.2418	0.0188	0.1284	-0.0808	85	16.4821	-30.4555
67	6.4689	0.5565	-12.422	0.0245	0.1676	0.1346	6.3429	-0.4435	1.0436	0.0245	0.1676	-0.1648	85	11.5311	-24.3429
77	3.347	0.3536	-10.0129	0.0231	0.1577	0.0894	12.1575	-0.6464	5.4626	0.0231	0.1577	-0.2547	85	4.653	-20.1575
87	1.6265	0.2033	-6.9349	0.0175	0.1199	0.0529	19.3734	-0.7967	10.5503	0.0175	0.1199	-0.3359	85	-3.6265	-17.3734
97	0.7553	0.1084	-4.2938	0.0115	0.079	0.0288	27.4386	-0.8916	15.2012	0.0115	0.079	-0.4047	85	-12.7553	-15.4386
107	0.3398	0.0548	-2.4511	0.0069	0.0471	0.0147	35.9595	-0.9452	19.0538	0.0069	0.0471	-0.4634	85	-22.3398	-13.9595
117	0.1497	0.0266	-1.3198	0.0038	0.0262	0.0072	44.7058	-0.9734	22.1949	0.0038	0.0262	-0.5155	85	-32.1497	-12.7058
127	0.0651	0.0126	-0.6816	0.002	0.0138	0.0035	53.5576	-0.9874	24.8429	0.002	0.0138	-0.564	85	-42.0651	-11.5576
82	2.3489	0.271	-8.4699	0.0205	0.1405	0.0696	15.6275	-0.729	8.0105	0.0205	0.1405	-0.2968	85	0.6511	-18.6275
83	2.1846	0.2563	-8.1578	0.02	0.1366	0.066	16.3569	-0.7437	8.5235	0.02	0.1366	-0.3049	85	-0.1846	-18.3569

Case 3 (continued)

57	11.5179	0.7715	-12.6977	0.0188	0.1284	0.1739	2.4555	-0.2285	-1.2418	0.0188	0.1284	-0.0808	85	16.4821	-30.4555
67	6.4689	0.5565	-12.422	0.0245	0.1676	0.1346	6.3429	-0.4435	1.0436	0.0245	0.1676	-0.1648	85	11.5311	-24.3429
77	3.347	0.3536	-10.0129	0.0231	0.1577	0.0894	12.1575	-0.6464	5.4626	0.0231	0.1577	-0.2547	85	4.653	-20.1575
87	1.6265	0.2033	-6.9349	0.0175	0.1199	0.0529	19.3734	-0.7967	10.5503	0.0175	0.1199	-0.3359	85	-3.6265	-17.3734
97	0.7553	0.1084	-4.2938	0.0115	0.079	0.0288	27.4386	-0.8916	15.2012	0.0115	0.079	-0.4047	85	-12.7553	-15.4386
107	0.3398	0.0548	-2.4511	0.0069	0.0471	0.0147	35.9595	-0.9452	19.0538	0.0069	0.0471	-0.4634	85	-22.3398	-13.9595
117	0.1497	0.0266	-1.3198	0.0038	0.0262	0.0072	44.7058	-0.9734	22.1949	0.0038	0.0262	-0.5155	85	-32.1497	-12.7058
127	0.0651	0.0126	-0.6816	0.002	0.0138	0.0035	53.5576	-0.9874	24.8429	0.002	0.0138	-0.564	85	-42.0651	-11.5576
82	2.3489	0.271	-8.4699	0.0205	0.1405	0.0696	15.6275	-0.729	8.0105	0.0205	0.1405	-0.2968	85	0.6511	-18.6275
83	2.1846	0.2563	-8.1578	0.02	0.1366	0.066	16.3569	-0.7437	8.5235	0.02	0.1366	-0.3049	85	-0.1846	-18.3569

Case 4 (continued)

57	11.5179	0.7715	-12.6977	0.0188	0.1284	0.1739	2.4555	-0.2285	-1.2418	0.0188	0.1284	-0.0808	85	16.4821	-30.4555
67	6.4689	0.5565	-12.422	0.0245	0.1676	0.1346	6.3429	-0.4435	1.0436	0.0245	0.1676	-0.1648	85	11.5311	-24.3429
77	3.347	0.3536	-10.0129	0.0231	0.1577	0.0894	12.1575	-0.6464	5.4626	0.0231	0.1577	-0.2547	85	4.653	-20.1575
87	1.6265	0.2033	-6.9349	0.0175	0.1199	0.0529	19.3734	-0.7967	10.5503	0.0175	0.1199	-0.3359	85	-3.6265	-17.3734
97	0.7553	0.1084	-4.2938	0.0115	0.079	0.0288	27.4386	-0.8916	15.2012	0.0115	0.079	-0.4047	85	-12.7553	-15.4386
107	0.3398	0.0548	-2.4511	0.0069	0.0471	0.0147	35.9595	-0.9452	19.0538	0.0069	0.0471	-0.4634	85	-22.3398	-13.9595
117	0.1497	0.0266	-1.3198	0.0038	0.0262	0.0072	44.7058	-0.9734	22.1949	0.0038	0.0262	-0.5155	85	-32.1497	-12.7058
127	0.0651	0.0126	-0.6816	0.002	0.0138	0.0035	53.5576	-0.9874	24.8429	0.002	0.0138	-0.564	85	-42.0651	-11.5576
82	2.3489	0.271	-8.4699	0.0205	0.1405	0.0696	15.6275	-0.729	8.0105	0.0205	0.1405	-0.2968	85	0.6511	-18.6275
83	2.1846	0.2563	-8.1578	0.02	0.1366	0.066	16.3569	-0.7437	8.5235	0.02	0.1366	-0.3049	85	-0.1846	-18.3569

## SIMULATION OF OPTION VALUES USING BOPSCOL

## COMMERCIAL AND SERVICES SECTOR-JANUARY TO JUNE 1997

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price	Value of	Value of						
																		at expiration	European call option	European put option						
A Baumann & Co	33	11	22.49	57	0.5	23.1726	0.9993	-2.2363	0.0002	0.0005	0.049	0.0027	-0.0007	-0.0255	0.0002	0.0005	-0.0001	26	-8.1726	-15.0027						
						14.5957	0.9454	-5.2048	0.0083	0.0258	0.083	0.3622	-0.0546	-0.9842	0.0083	0.0258	-0.0108	26	-9.5957	-5.3622						
						7.9383	0.7375	-8.0237	0.0245	0.0761	0.082	2.6412	-0.2625	-1.7933	0.0245	0.0761	-0.0565	26	-12.9383	2.3588						
						13.8157	0.9314	-5.5633	0.0099	0.0308	0.0846	0.4758	-0.0686	-1.1418	0.0099	0.0308	-0.0137	26	-9.8157	-4.4758						
						13.058	0.9156	-5.917	0.0116	0.0361	0.0858	0.6118	-0.0844	-1.2945	0.0116	0.0361	-0.017	26	-10.058	-3.6118						
						12.3242	0.8981	-6.2605	0.0134	0.0415	0.0866	0.7716	-0.1019	-1.437	0.0134	0.0415	-0.0207	26	-10.3242	-2.7716						
						11.6157	0.8789	-6.5886	0.0151	0.047	0.0869	0.9568	-0.1211	-1.5641	0.0151	0.047	-0.0248	26	-10.6157	-1.9568						
						10.9336	0.8581	-6.8969	0.0169	0.0524	0.0869	1.1683	-0.1419	-1.6714	0.0169	0.0524	-0.0292	26	-10.9336	-1.1683						
						10.2786	0.8361	-7.1812	0.0186	0.0577	0.0866	1.407	-0.1639	-1.7548	0.0186	0.0577	-0.0341	26	-11.2786	-0.407						
						9.6514	0.8128	-7.4383	0.0202	0.0627	0.0859	1.6734	-0.1872	-1.8109	0.0202	0.0627	-0.0393	26	-11.6514	0.3266						
						CMC Holdings Ltd	70	43	22.49	38	0.5	31.6351	0.991	-8.9432	0.0013	0.012	0.1887	0.0617	-0.009	-0.3011	0.0013	0.012	-0.0035	82.5	7.8649	-39.5617
												23.137	0.9439	-11.7819	0.006	0.0559	0.2147	0.5001	-0.0561	-1.1299	0.006	0.0559	-0.0221	82.5	6.363	-30.0001
												15.68	0.8277	-14.3049	0.0136	0.1264	0.2113	1.9794	-0.1723	-1.6432	0.0136	0.1264	-0.0702	82.5	3.82	-21.4794
												9.8543	0.6542	-15.0188	0.0196	0.1825	0.1797	5.0902	-0.3458	-0.3472	0.0196	0.1825	-0.1465	82.5	-0.3543	-14.5902
5.795	0.4677	-13.5384	0.0211	0.1968	0.1347							9.9673	-0.5323	3.143	0.0211	0.1968	-0.2362	82.5	-6.295	-9.4673						
3.2277	0.307	-10.7137	0.0187	0.1739	0.0913							16.336	-0.693	7.9774	0.0187	0.1739	-0.3242	82.5	-13.7277	-5.8364						
1.7232	0.1882	-7.6494	0.0143	0.1335	0.0573							23.768	-0.8118	13.0515	0.0143	0.1335	-0.403	82.5	-22.2232	-3.2683						
0.8911	0.1095	-5.0471	0.01	0.0927	0.0339							31.873	-0.8905	17.6637	0.01	0.0927	-0.4711	82.5	-31.3911	-1.3726						
0.4502	0.0612	-3.1367	0.0064	0.0599	0.0192							40.368	-0.9388	21.5839	0.0064	0.0599	-0.5304	82.5	-40.9502	0.1319						
10.3557	0.6729	-15.0521	0.0192	0.1786	0.1837							4.6979	-0.3271	-0.5815	0.0192	0.1786	-0.138	82.5	0.1443	-15.1979						
0.4824	0.0649	-3.2968	0.0067	0.0627	0.0203							39.507	-0.9351	21.2227	0.0067	0.0627	-0.5248	82.5	-39.9824	-0.0067						
Car & General	20	13	22.49	23	0.5							8.3829	0.9997	-2.615	0.0004	0.0002	0.0581	0.0003	-0.0003	-0.0023	0.0004	0.0002	0	17	-4.3829	-4.0003
												1.0557	0.4655	-3.1491	0.1222	0.0562	0.0413	1.6095	-0.5345	1.4734	0.1222	0.0562	-0.0615	17	-7.0557	4.3905
												7.4905	0.9985	-2.8226	0.0015	0.0007	0.0624	0.0015	-0.0015	-0.0088	0.0015	0.0007	-0.0002	17	-4.4905	-3.0015
						6.6014	0.9945	-3.0399	0.0049	0.0022	0.0664	0.006	-0.0055	-0.0252	0.0049	0.0022	-0.0006	17	-4.6014	-2.006						
						5.7213	0.984	-3.2695	0.0123	0.0057	0.0698	0.0196	-0.016	-0.0538	0.0123	0.0057	-0.0017	17	-4.7213	-1.0196						
						4.861	0.9618	-3.5029	0.0255	0.0117	0.0719	0.0529	-0.0382	-0.0863	0.0255	0.0117	-0.0041	17	-4.861	-0.0529						
						4.0363	0.9223	-3.7137	0.0447	0.0206	0.072	0.1218	-0.0777	-0.0961	0.0447	0.0206	-0.0084	17	-5.0363	0.8782						
						Express Kenya Ltd	76	53	22.49	19	0.5	28.6374	0.9998	-10.6555	0.0001	0.0003	0.2367	0.0004	-0.0002	-0.0036	0.0001	0.0003	-0.0001	71	-10.6374	-18.0004
19.7395	0.9893	-12.7588	0.0028	0.0152	0.2772							0.039	-0.0107	-0.0971	0.0028	0.0152	-0.0043	71	-11.7395	-8.039						
11.3666	0.8857	-14.5557	0.0189	0.1039	0.2797							0.6024	-0.1143	0.1159	0.0189	0.1039	-0.0464	71	-13.3666	1.3976						
18.8616	0.9855	-12.9782	0.0036	0.0198	0.2802							0.0547	-0.0145	-0.1155	0.0036	0.0198	-0.0058	71	-11.8616	-7.0547						
17.9888	0.9807	-13.1966	0.0046	0.0253	0.2827							0.0755	-0.0193	-0.1329	0.0046	0.0253	-0.0077	71	-11.9888	-6.0755						
17.1223	0.9747	-13.412	0.0058	0.0318	0.2848							0.1026	-0.0253	-0.1473	0.0058	0.0318	-0.0101	71	-12.1223	-5.1026						
16.2634	0.9673	-13.6219	0.0072	0.0393	0.2863							0.1375	-0.0327	-0.1563	0.0072	0.0393	-0.0131	71	-12.2634	-4.1375						
15.4138	0.9584	-13.8231	0.0087	0.0478	0.2871							0.1815	-0.0416	-0.1565	0.0087	0.0478	-0.0167	71	-12.4138	-3.1815						
14.5751	0.9477	-14.012	0.0105	0.0574	0.2873							0.2364	-0.0523	-0.1444	0.0105	0.0574	-0.021	71	-12.5751	-2.2364						
13.7491	0.9353	-14.1843	0.0124	0.0679	0.2867							0.3041	-0.0647	-0.1157	0.0124	0.0679	-0.0261	71	-12.7491	-1.3041						
12.9377	0.9208	-14.3356	0.0144	0.0793	0.2852							0.3863	-0.0792	-0.066	0.0144	0.0793	-0.032	71	-12.9377	-0.3863						
12.1429	0.9043	-14.461	0.0166	0.0913	0.2829							0.4851	-0.0957	0.0096	0.0166	0.0913	-0.0388	71	-13.1429	0.5149						

Kenya Airways	8.5	7	22.49	13	0.5	2.2446	0.9996	-1.4072	0.0017	0.0001	0.0313	0.0001	-0.0004	-0.0003	0.0017	0.0001	0	8.2	-1.0446	-1.2001						
						1.3591	0.9731	-1.6031	0.0795	0.0037	0.0346	0.0083	-0.0269	0.0047	0.0795	0.0037	-0.0012	8.2	-1.1591	-0.2083						
						0.585	0.7413	-1.5384	0.414	0.0194	0.0286	0.1278	-0.2587	0.2705	0.414	0.0194	-0.0116	8.2	-1.385	0.6722						
Lonhro Motors	128	12	22.49	120	0.5	117.2909	0.9996	-2.557	0	0.0013	0.0533	0.0146	-0.0004	-0.1453	0	0.0013	-0.0003	82.5	-46.7909	-70.5146						
						108.529	0.9958	-5.6132	0.0001	0.0113	0.0946	0.1892	-0.0042	-1.1917	0.0001	0.0113	-0.0037	82.5	-48.029	-60.6892						
						100.1483	0.9858	-9.7876	0.0003	0.0328	0.1301	0.7448	-0.0142	-3.3562	0.0003	0.0328	-0.0128	82.5	-49.6483	-51.2448						
						92.294	0.9693	-14.6857	0.0006	0.0628	0.1589	1.8269	-0.0307	-6.2445	0.0006	0.0628	-0.0288	82.5	-51.794	-42.3269						
						85.029	0.9472	-19.8408	0.001	0.0975	0.1811	3.4983	-0.0528	-9.3898	0.001	0.0975	-0.0513	82.5	-54.529	-33.9983						
						78.3623	0.9209	-24.8969	0.0014	0.1334	0.1976	5.7681	-0.0791	-12.4361	0.0014	0.1334	-0.0795	82.5	-57.8623	-26.2681						
						72.273	0.8916	-29.6258	0.0017	0.1685	0.2092	8.6152	-0.1084	-15.1552	0.0017	0.1685	-0.1125	82.5	-61.773	-19.1152						
						66.7247	0.8603	-33.8999	0.002	0.2012	0.217	12.003	-0.1397	-17.4196	0.002	0.2012	-0.1494	82.5	-66.2247	-12.5034						
						61.675	0.8279	-37.6619	0.0023	0.2308	0.2215	15.89	-0.1721	-19.1717	0.0023	0.2308	-0.1896	82.5	-71.175	-6.3901						
						57.08	0.7951	-40.8995	0.0026	0.2571	0.2235	20.232	-0.2049	-20.3996	0.0026	0.2571	-0.2323	82.5	-76.58	-0.7315						
						52.897	0.7624	-43.6285	0.0028	0.2798	0.2235	24.985	-0.2376	-21.1187	0.0028	0.2798	-0.277	82.5	-82.397	4.5151						
						103	56.6438	0.7919	-41.1949	0.0026	0.2595	0.2236	20.689	-0.2081	-20.4939	0.0026	0.2595	-0.2367	82.5	-77.1438	-0.189					
						104	56.2117	0.7886	-41.4852	0.0027	0.2619	0.2236	21.151	-0.2114	-20.5832	0.0027	0.2619	-0.2411	82.5	-77.7117	0.3495					
						Marshalls EA Ltd	47.5	6	22.49	118	0.5	42.1554	0.9988	-1.3487	0.0001	0.0014	0.0264	0.0173	-0.0012	-0.1428	0.0001	0.0014	-0.0004	77	28.8446	-71.0173
33.8892	0.9683	-5.5463	0.0018	0.0239	0.0605							0.6875	-0.0317	-2.3307	0.0018	0.0239	-0.011	77	27.1108	-61.6875						
27.122	0.8987	-10.522	0.0045	0.0595	0.0778							2.8567	-0.1013	-5.2966	0.0045	0.0595	-0.0383	77	23.878	-53.8567						
21.8314	0.8117	-14.4569	0.0068	0.0906	0.0836							6.5025	-0.1883	-7.2217	0.0068	0.0906	-0.0772	77	19.1686	-47.5025						
17.7287	0.7225	-17.0139	0.0085	0.1126	0.083							11.336	-0.2775	-7.7688	0.0085	0.1126	-0.1226	77	13.2713	-42.3363						
14.533	0.6386	-18.4009	0.0095	0.1258	0.079							17.077	-0.3614	-7.146	0.0095	0.1258	-0.1712	77	6.467	-38.077						
12.0221	0.5627	-18.923	0.0099	0.1323	0.0735							23.502	-0.4373	-5.6583	0.0099	0.1323	-0.2214	77	-1.0221	-34.5024						
65	12.2475	0.5699	-18.9016	0.0099	0.1319							0.0741	22.834	-0.4301	-5.8379	0.0099	0.1319	-0.2163	77	-0.2475	-34.8342					
64	12.4782	0.5772	-18.8741	0.0099	0.1315							0.0747	22.171	-0.4228	-6.0113	0.0099	0.1315	-0.2113	77	0.5218	-35.1713					
Nation Media Group	113	53	22.49	56	0.5							65.7779	0.9917	-11.4252	0.0005	0.0182	0.2314	0.141	-0.0083	-0.7732	0.0005	0.0182	-0.0054	116	-2.7779	-63.141
						57.1922	0.9749	-14.5402	0.0013	0.0469	0.2648	0.4917	-0.0251	-1.8785	0.0013	0.0469	-0.0167	116	-4.1922	-53.4917						
						49.0282	0.9436	-18.0331	0.0025	0.0907	0.288	1.2641	-0.0564	-3.3615	0.0025	0.0907	-0.0382	116	-6.0282	-44.2641						
						41.4681	0.8964	-21.513	0.004	0.1439	0.2991	2.6404	-0.1036	-4.8317	0.004	0.1439	-0.0717	116	-8.4681	-35.6404						
						34.6486	0.8349	-24.5364	0.0055	0.1984	0.2985	4.7573	-0.1651	-5.8452	0.0055	0.1984	-0.117	116	-11.6486	-27.7573						
						28.6431	0.763	-26.7636	0.0069	0.2467	0.2879	7.6882	-0.237	-6.0627	0.0069	0.2467	-0.1723	116	-15.6431	-20.6882						
						23.4641	0.6851	-28.027	0.0079	0.2838	0.2698	11.446	-0.3149	-5.3163	0.0079	0.2838	-0.2352	116	-20.4641	-14.4456						
						19.0762	0.6056	-28.3219	0.0086	0.3075	0.2468	15.994	-0.3944	-3.6014	0.0086	0.3075	-0.3028	116	-26.0762	-8.9942						
						15.4131	0.5281	-27.7607	0.0089	0.318	0.2213	21.268	-0.4719	-1.0303	0.0089	0.318	-0.373	116	-32.4131	-4.2675						
						12.3916	0.4552	-26.5183	0.0089	0.3168	0.1952	27.182	-0.5448	2.2218	0.0089	0.3168	-0.4437	116	-39.3916	-0.1824						
						9.9235	0.3885	-24.7888	0.0086	0.3062	0.1699	33.651	-0.6115	5.9611	0.0086	0.3062	-0.5138	116	-46.9235	3.3493						
						144	12.1213	0.4482	-26.3641	0.0088	0.3161	0.1926	27.806	-0.5518	2.577	0.0088	0.3161	-0.4508	116	-40.1213	0.1943					
						Pearl Drycleaners	10	8	22.49	18	0.5	2.8523	0.9965	-1.613	0.0082	0.0007	0.0356	0.0014	-0.0035	-0.0051	0.0082	0.0007	-0.0002	10.25	-0.6023	-2.2514
												1.9775	0.962	-1.824	0.0649	0.0058	0.0382	0.0203	-0.038	-0.0152	0.0649	0.0058	-0.002	10.25	-0.7275	-1.2703
1.188	0.8282	-1.9197	0.2002	0.018	0.0355							0.1244	-0.1718	0.0901	0.2002	0.018	-0.0092	10.25	-0.938	-0.3744						
0.5926	0.5786	-1.6659	0.3073	0.0277	0.026							0.4227	-0.4214	0.5449	0.3073	0.0277	-0.0232	10.25	-1.3426	0.3273						
Standard Newspapers	9.05	36	22.49	70	0.5	0.0136	0.0103	-0.1405	0.0061	0.0018	0.0004	23.135	-0.9897	7.0947	0.0061	0.0018	-0.1605	25	-11.0136	-12.1347						
						0.0029	0.0025	-0.0389	0.0017	0.0005	0.0001	32.06	-0.9975	9.2062	0.0017	0.0005	-0.2054	25	-21.0029	-11.0604						
						0.0007	0.0007	-0.0116	0.0005	0.0001	0	40.995	-0.9993	11.2433	0.0005	0.0001	-0.2502	25	-31.0002	-18.9306						
						0.0002	0.0002	-0.0038	0.0002	0	0	49.931	-0.9998	13.2609	0.0002	0	-0.2949	25	-41.0002	-8.9306						
						0.0001	0.0001	-0.0013	0.0001	0	0	58.867	-0.9999	15.2732	0.0001	0	-0.3396	25	-51.0001	-7.8669						
						0	0	-0.0005	0	0	0	67.803	-1	17.2838	0	0	-0.3843	25	-61	-6.8032						

96	0	0	-0.0002	0	0	0	76.74	-1	19.2939	0	0	-0.4289	25	-71	-5.7396
106	0	0	-0.0001	0	0	0	85.676	-1	21.3038	0	0	-0.4736	25	-81	-4.6761
116	0	0	0	0	0	0	94.613	-1	23.3137	0	0	-0.5183	25	-91	-3.6125
126	0	0	0	0	0	0	103.55	-1	25.3235	0	0	-0.563	25	-101	-2.5489
136	0	0	0	0	0	0	112.49	-1	27.3333	0	0	-0.6077	25	-111	-1.4853
146	0	0	0	0	0	0	121.42	-1	29.3431	0	0	-0.6524	25	-121	-0.4217
156	0	0	0	0	0	0	130.36	-1	31.3529	0	0	-0.697	25	-131	0.6418
147	0	0	0	0	0	0	122.32	-1	29.5441	0	0	-0.6568	25	-122	-0.3154
148	0	0	0	0	0	0	123.21	-1	29.7451	0	0	-0.6613	25	-123	-0.209
149	0	0	0	0	0	0	124.1	-1	29.946	0	0	-0.6658	25	-124	-0.1027
150	0	0	0	0	0	0	125	-1	30.147	0	0	-0.6702	25	-125	0.0037

Uchumi Supermarkets 39.75

21	22.49	45	0.5	21.01	0.9941	-4.3739	0.0013	0.0047	0.0925	0.0265	-0.0059	-0.1533	0.0013	0.0047	-0.0013	40	-2.01	-19.0265
31				12.7176	0.9021	-7.3896	0.0137	0.0486	0.1157	0.6705	-0.0979	-1.1593	0.0137	0.0486	-0.0228	40	-3.7176	-9.6705
41				6.5395	0.661	-9.0677	0.0289	0.1029	0.0987	3.4288	-0.339	-0.8275	0.0289	0.1029	-0.0845	40	-7.5395	-2.4288
51				2.9657	0.3933	-7.7135	0.0304	0.1081	0.0633	8.7914	-0.6067	2.5365	0.0304	0.1081	-0.1645	40	-13.9657	2.2086
42				6.0717	0.6329	-9.0556	0.0298	0.1059	0.0954	3.8547	-0.3671	-0.6145	0.0298	0.1059	-0.0922	40	-8.0717	-1.8547
43				5.6305	0.6047	-9.0107	0.0304	0.1082	0.092	4.3071	-0.3953	-0.3686	0.0304	0.1082	-0.1001	40	-8.6305	-1.3071
44				5.2154	0.5766	-8.9346	0.031	0.1101	0.0885	4.7856	-0.4234	-0.0914	0.031	0.1101	-0.1081	40	-9.2154	-0.7856
45				4.8255	0.5488	-8.8291	0.0313	0.1113	0.0849	5.2894	-0.4512	0.215	0.0313	0.1113	-0.1161	40	-9.8255	-0.2894
46				4.46	0.5214	-8.6965	0.0315	0.112	0.0813	5.8175	-0.4786	0.5486	0.0315	0.112	-0.1242	40	-10.46	0.1825



SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JANUARY TO JUNE 1997

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.97	Value of European call option	Value of European put option	
Barclays Bank	115	95	22.49	17	0.5	30.126	0.9951	-19.1575	0.001	0.0115	0.4216	0.022	-0.0049	-0.0643	0.001	0.0115	-0.0029	110	-15.126	-15.022	
		105				21.4	0.9601	-21.2076	0.0062	0.0699	0.4451	0.2324	-0.0399	-0.1047	0.0062	0.0699	-0.0241	110	-16.4	-5.2324	
		115				13.4591	0.8403	-22.0652	0.0176	0.1976	0.4159	1.2279	-0.1597	1.0475	0.0176	0.1976	-0.098	110	-18.4591	3.7721	
	106					20.5561	0.9529	-21.3815	0.0071	0.08	0.4451	0.2821	-0.0471	-0.0776	0.0071	0.08	-0.0285	110	-16.5561	-4.2821	
		107				19.7206	0.9447	-21.5425	0.0081	0.0909	0.4446	0.3403	-0.0553	-0.0376	0.0081	0.0909	-0.0335	110	-16.7206	-3.3403	
		108				18.8944	0.9355	-21.6882	0.0091	0.1025	0.4434	0.4077	-0.0645	0.0176	0.0091	0.1025	-0.0391	110	-16.8944	-2.4077	
		109				18.0785	0.9253	-21.8162	0.0102	0.1148	0.4416	0.4855	-0.0747	0.0906	0.0102	0.1148	-0.0454	110	-17.0785	-1.4855	
		110				17.2741	0.9139	-21.9239	0.0114	0.1277	0.4391	0.5747	-0.0861	0.184	0.0114	0.1277	-0.0524	110	-17.2741	-0.5747	
		111				16.482	0.9015	-22.0084	0.0126	0.1412	0.4359	0.6763	-0.0985	0.3003	0.0126	0.1412	-0.06	110	-17.482	0.3237	
		City Trust Ltd	33	28	22.49	14	0.5	7.9802	0.9978	-5.6332	0.0021	0.0016	0.1247	0.0022	-0.0022	-0.0058	0.0021	0.0016	-0.0004	35.75	-0.2302
	38						0.8973	0.4053	-4.0725	0.1187	0.0905	0.0624	1.8557	-0.5947	3.5648	0.1187	0.0905	-0.1074	35.75	-3.1473	0.3943
37					1.2719	0.5118	-4.8154	0.1221	0.0931	0.0781	1.3367	-0.4882	2.6209	0.1221	0.0931	-0.0872	35.75	-2.5219	-0.0867		
CFC Bank	22.75	12	22.49	38	0.5	12.0295	0.9983	-2.4355	0.0009	0.0009	0.0534	0.0032	-0.0017	-0.0237	0.0009	0.0009	-0.0002	26	1.9705	-14.0032	
		22				4.135	0.751	-4.8509	0.0519	0.051	0.0648	1.0451	-0.249	-0.4294	0.0519	0.051	-0.0336	26	-0.135	-5.0451	
		32				0.748	0.2367	-2.9291	0.0505	0.0496	0.0232	6.5945	-0.7633	3.5022	0.0505	0.0496	-0.1198	26	-6.748	-0.5945	
		21				4.7511	0.8025	-4.7359	0.0454	0.0447	0.0675	0.7675	-0.1975	-0.5153	0.0454	0.0447	-0.0263	26	0.2489	-5.7675	
Diamond Trust Bank	36.5	21	22.49	25	0.5	17.7336	0.9999	-4.2216	0	0.0001	0.0938	0.0001	-0.0001	-0.001	0	0.0001	0	30.25	-8.4836	-9.2501	
		31				8.9402	0.9504	-6.4523	0.0159	0.0265	0.1287	0.1431	-0.0496	-0.222	0.0159	0.0265	-0.0098	30.25	-9.6902	0.6069	
	22				16.8402	0.9998	-4.4243	0.0001	0.0002	0.0983	0.0003	-0.0002	-0.0027	0.0001	0.0002	0	30.25	-8.5902	-8.2503		
	23				15.947	0.9996	-4.6287	0.0002	0.0004	0.1027	0.0007	-0.0004	-0.0062	0.0002	0.0004	-0.0001	30.25	-8.697	-7.2507		
	24				15.0544	0.999	-4.8364	0.0005	0.0009	0.107	0.0018	-0.001	-0.0129	0.0005	0.0009	-0.0002	30.25	-8.8044	-6.2518		
	25				14.1631	0.9979	-5.0489	0.001	0.0017	0.1113	0.0041	-0.0021	-0.0244	0.001	0.0017	-0.0004	30.25	-8.9131	-5.2541		
	26				13.274	0.9959	-5.2681	0.0019	0.0031	0.1154	0.0087	-0.0041	-0.0426	0.0019	0.0031	-0.0008	30.25	-9.024	-4.2587		
	27				12.3886	0.9924	-5.4951	0.0032	0.0054	0.1192	0.0169	-0.0076	-0.0686	0.0032	0.0054	-0.0015	30.25	-9.1386	-3.2669		
	28				11.5092	0.9869	-5.7301	0.0052	0.0087	0.1226	0.0312	-0.0131	-0.1027	0.0052	0.0087	-0.0025	30.25	-9.2592	-2.2812		
	29				10.6387	0.9786	-5.9714	0.0079	0.0132	0.1254	0.0544	-0.0214	-0.1429	0.0079	0.0132	-0.0042	30.25	-9.3887	-1.3044		
	30				9.7809	0.9667	-6.2145	0.0115	0.0192	0.1275	0.0902	-0.0333	-0.1851	0.0115	0.0192	-0.0065	30.25	-9.5309	-0.3402		
Housing Finance Co of Kenya	24	18	22.49	14	0.5	7.9145	1	-3.6177	0	0	0.0804	0	0	-0.0001	0	0	0	23.5	-2.4145	-5.5	
		19				7.0209	0.9998	-3.8193	0.0003	0.0001	0.0849	0.0001	-0.0002	-0.0007	0.0003	0.0001	0	23.5	-2.5209	-4.5001	
		20				6.128	0.9988	-4.0225	0.0017	0.0007	0.0892	0.0008	-0.0012	-0.0028	0.0017	0.0007	-0.0002	23.5	-2.628	-3.5008	
		21				5.2379	0.9944	-4.2274	0.0068	0.0027	0.0931	0.0044	-0.0056	-0.0068	0.0068	0.0027	-0.0007	23.5	-2.7379	-2.5044	
		22				4.3574	0.9805	-4.425	0.0199	0.008	0.0959	0.0175	-0.0195	-0.0034	0.0199	0.008	-0.0024	23.5	-2.8574	-1.5175	
		23				3.5015	0.9469	-4.5805	0.0455	0.0184	0.0961	0.0553	-0.0531	0.042	0.0455	0.0184	-0.0067	23.5	-3.0015	-0.5553	
		24				2.696	0.8821	-4.6242	0.0832	0.0335	0.0924	0.1434	-0.1179	0.1993	0.0832	0.0335	-0.0149	23.5	-3.196	0.3566	
		ICDC Investments Co Ltd	40	12	22.49	76	0.5	29.3016	0.9967	-2.5897	0.0005	0.0028	0.0528	0.0253	-0.0033	-0.178	0.0005	0.0028	-0.0008	50	8.6984
22						20.9787	0.9441	-6.1964	0.0052	0.0319	0.0839	0.6388	-0.0559	-1.7748	0.0052	0.0319	-0.0144	50	7.0213	-28.6388	
32						14.2917	0.8141	-9.8645	0.0125	0.0757	0.0914	2.8882	-0.1859	-3.4331	0.0125	0.0757	-0.0516	50	3.7083	-20.8882	
42						9.502	0.6507	-11.673	0.0172	0.1047	0.0826	7.0349	-0.3493	-3.2318	0.0172	0.1047	-0.105	50	-1.502	-15.0349	

				52				6.269	0.4959	-11.6265	0.0186	0.1128	0.0678	12.738	-0.5041	-1.1755	0.0186	0.1128	-0.1645	50	-8.269	-10.7384
				62				4.1426	0.3678	-10.4782	0.0175	0.1066	0.0529	19.548	-0.6322	1.9825	0.0175	0.1066	-0.2242	50	-16.1426	-7.5484
				72				2.7555	0.269	-8.8948	0.0154	0.0933	0.04	27.098	-0.731	5.5758	0.0154	0.0933	-0.2817	50	-24.7555	-5.0977
				41				9.9033	0.6671	-11.5859	0.0169	0.1028	0.0839	6.5426	-0.3329	-3.3457	0.0169	0.1028	-0.0993	50	-0.9033	-15.5426
				40				10.3207	0.6837	-11.4791	0.0166	0.1007	0.0851	6.0664	-0.3163	-3.4399	0.0166	0.1007	-0.0936	50	-0.3207	-16.0664
				39				10.7547	0.7002	-11.352	0.0162	0.0983	0.0863	5.6068	-0.2998	-3.5137	0.0162	0.0983	-0.088	50	<b>0.2453</b>	-16.6068
Jubilee Insurance Co Ltd	38.5	25	22.49	28	0.5	16.1642	0.9978	-5.057	0.0009	0.0019	0.1113	0.0052	-0.0022	-0.0325	0.0009	0.0019	-0.0004	41.5	<b>0.3358</b>	-16.5052		
		35				7.7415	0.8746	-7.4044	0.0271	0.0562	0.1297	0.519	-0.1254	-0.3701	0.0271	0.0562	-0.0267	41.5	-1.2415	-7.019		
		45				2.3212	0.4519	-6.4092	0.052	0.1078	0.0754	4.0351	-0.5481	2.6349	0.052	0.1078	-0.1257	41.5	-5.8212	-0.5351		
		55				0.4494	0.1283	-2.6075	0.0275	0.0571	0.0224	11.1	-0.8717	8.4464	0.0275	0.0571	-0.2233	41.5	-13.9494	<b>2.4003</b>		
		30				11.775	0.973	-6.2518	0.0082	0.017	0.1284	0.0843	-0.027	-0.2224	0.0082	0.017	-0.0056	41.5	-0.275	-11.5843		
		29				12.6374	0.9821	-5.9977	0.0058	0.012	0.1259	0.053	-0.0179	-0.1693	0.0058	0.012	-0.0037	41.5	-0.1374	-12.553		
		28				13.51	0.9886	-5.7496	0.0039	0.0082	0.1227	0.032	-0.0114	-0.1222	0.0039	0.0082	-0.0024	41.5	-0.01	-13.532		
		27				14.3901	0.993	-5.5099	0.0025	0.0053	0.1192	0.0184	-0.007	-0.0834	0.0025	0.0053	-0.0014	41.5	<b>0.1099</b>	-14.5184		
		46				2.0048	0.4083	-6.0444	0.0509	0.1057	0.0686	4.6124	-0.5917	3.2007	0.0509	0.1057	-0.137	41.5	-6.5048	-0.1124		
		47				1.7241	0.3667	-5.6569	0.0494	0.1025	0.062	5.2253	-0.6333	3.7891	0.0494	0.1025	-0.148	41.5	-7.2241	<b>0.2747</b>		
KCB Ltd	90	53	22.49	34	0.5	42.6552	0.9974	-10.7705	0.0004	0.0052	0.2355	0.0182	-0.0026	-0.1185	0.0004	0.0052	-0.0013	115	<b>19.3448</b>	-62.0182		
		63				33.865	0.9808	-13.247	0.0022	0.0297	0.2721	0.1645	-0.0192	-0.5852	0.0022	0.0297	-0.0094	115	<b>18.135</b>	-52.1645		
		73				25.5326	0.9277	-16.0138	0.0064	0.0876	0.2898	0.7684	-0.0723	-1.3422	0.0064	0.0876	-0.0364	115	<b>16.4674</b>	-42.7684		
		83				18.1602	0.8224	-18.1919	0.012	0.1656	0.2793	2.3325	-0.1776	-1.5105	0.012	0.1656	-0.0916	115	<b>13.8398</b>	-34.3325		
		93				12.1754	0.6742	-18.7038	0.0167	0.2293	0.2425	5.2841	-0.3258	-0.0126	0.0167	0.2293	-0.173	115	<b>9.8246</b>	-27.2841		
		103				7.7244	0.5107	-17.2283	0.0184	0.2538	0.1912	9.7696	-0.4893	3.4727	0.0184	0.2538	-0.269	115	<b>4.2756</b>	-21.7696		
		113				4.6676	0.3599	-14.3298	0.0173	0.2381	0.1386	15.649	-0.6401	8.3809	0.0173	0.2381	-0.3663	115	-2.6676	-17.6492		
		123				2.7062	0.2384	-10.9198	0.0143	0.1971	0.0938	22.624	-0.7616	13.8008	0.0143	0.1971	-0.4558	115	-10.7062	-14.6241		
		133				1.5162	0.15	-7.7395	0.0108	0.1484	0.0599	30.371	-0.85	18.9908	0.0108	0.1484	-0.5344	115	-19.5162	-12.3706		
		108				6.0385	0.4323	-15.9006	0.0182	0.2502	0.1644	12.552	-0.5677	5.8053	0.0182	0.2502	-0.3182	115	0.9615	-19.5518		
		109				5.7404	0.4173	-15.602	0.018	0.2484	0.1591	13.147	-0.5827	6.3048	0.018	0.2484	-0.3279	115	<b>0.2596</b>	-19.1474		
		110				5.4546	0.4026	-15.2947	0.0179	0.2463	0.1539	13.755	-0.5974	6.8132	0.0179	0.2463	-0.3376	115	-0.4546	-18.7552		
National Bank Ltd	16	9	22.49	31	0.5	7.9578	0.9994	-1.8138	0.0006	0.0002	0.0402	0.0006	-0.0006	-0.005	0.0006	0.0002	0	15.2	-1.7578	-6.2006		
		19				1.0018	0.4359	-2.7243	0.1123	0.0446	0.0299	1.981	-0.5641	1.0943	0.1123	0.0446	-0.055	15.2	-4.8018	<b>1.819</b>		
		15				2.9749	0.8204	-3.2021	0.0747	0.0296	0.0508	0.3795	-0.1796	-0.1874	0.0747	0.0296	-0.0163	15.2	-2.7749	-0.5795		
		16				2.3423	0.7332	-3.2643	0.0937	0.0372	0.0469	0.6406	-0.2668	-0.0486	0.0937	0.0372	-0.0245	15.2	-3.1423	<b>0.1594</b>		
		17				1.8029	0.6353	-3.1986	0.1071	0.0425	0.0418	0.9948	-0.3647	0.218	0.1071	0.0425	-0.0341	15.2	-3.6029	0.8052		
		18				1.3578	0.534	-3.0102	0.1133	0.045	0.0359	1.4433	-0.466	0.6074	0.1133	0.045	-0.0445	15.2	-4.1578	1.3567		
NIC Bank Ltd	50	36	22.49	24	0.5	17.8389	0.9964	-7.2846	0.0013	0.0039	0.1599	0.01	-0.0036	-0.0493	0.0013	0.0039	-0.001	60	<b>6.1611</b>	-24.01		
		46				9.3654	0.8923	-9.4991	0.0218	0.0655	0.1762	0.4729	-0.1077	-0.254	0.0218	0.0655	-0.0293	60	<b>4.6346</b>	-14.4729		
		56				3.3606	0.5318	-8.5982	0.0469	0.1406	0.1161	3.4046	-0.4682	2.6567	0.0469	0.1406	-0.1341	60	<b>0.6394</b>	-7.4046		
		66				0.8058	0.1871	-4.2043	0.0317	0.095	0.0428	9.7861	-0.8129	9.0604	0.0317	0.095	-0.2521	60	-6.8058	-3.7861		
		57				2.9644	0.4902	-8.2295	0.047	0.141	0.1077	3.902	-0.5098	3.2264	0.047	0.141	-0.147	60	<b>0.0356</b>	-6.902		
		58				2.6042	0.4494	-7.8261	0.0466	0.1399	0.0993	4.4355	-0.5506	3.8308	0.0466	0.1399	-0.1598	60	-0.6042	-6.4355		
Pan Africa Ins Co	51	29	22.49	34	0.5	25.0906	0.9983	-5.8736	0.0004	0.0019	0.1291	0.0063	-0.0017	-0.0452	0.0004	0.0019	-0.0005	63	<b>8.9094</b>	-34.0063		

39				16.3915	0.9558	-8.4221	0.0076	0.0337	0.1618	0.2436	-0.0442	-0.5839	0.0076	0.0337	-0.0125	63	<b>7.6085</b>	-24.2436			
49				9.0166	0.7747	-10.5379	0.0245	0.1082	0.1525	1.805	-0.2253	-0.6899	0.0245	0.1082	-0.0665	63	<b>4.9834</b>	-15.805			
59				4.147	0.4928	-9.61	0.0325	0.1438	0.1049	5.8719	-0.5072	2.2478	0.0325	0.1438	-0.1587	63	-0.147	-9.8719			
69				1.6436	0.2516	-6.4262	0.026	0.115	0.0559	12.305	-0.7484	7.4414	0.026	0.115	-0.2524	63	-7.6436	-6.3049			
50				8.4076	0.7487	-10.6036	0.026	0.1149	0.1489	2.0898	-0.2513	-0.5546	0.026	0.1149	-0.0745	63	<b>4.5924</b>	-15.0898			
51				7.8257	0.7217	-10.6331	0.0274	0.121	0.1449	2.4015	-0.2783	-0.3831	0.0274	0.121	-0.083	63	<b>4.1743</b>	-14.4015			
52				7.2712	0.694	-10.6258	0.0286	0.1265	0.1406	2.7406	-0.306	-0.1748	0.0286	0.1265	-0.0917	63	<b>3.7288</b>	-13.7406			
53				6.7441	0.6657	-10.5817	0.0297	0.1313	0.136	3.1072	-0.3343	0.0702	0.0297	0.1313	-0.1008	63	<b>3.2559</b>	-13.1072			
54				6.2446	0.6369	-10.5014	0.0306	0.1353	0.1312	3.5012	-0.3631	0.3515	0.0306	0.1353	-0.1101	63	<b>2.7554</b>	-12.5012			
55				5.7723	0.6079	-10.3859	0.0313	0.1386	0.1262	3.9226	-0.3921	0.668	0.0313	0.1386	-0.1196	63	<b>2.2277</b>	-11.9226			
56				5.3269	0.5788	-10.2369	0.0319	0.141	0.121	4.3709	-0.4212	1.018	0.0319	0.141	-0.1293	63	<b>1.6731</b>	-11.3709			
57				4.908	0.5499	-10.0563	0.0323	0.1427	0.1157	4.8456	-0.4501	1.3996	0.0323	0.1427	-0.139	63	<b>1.092</b>	-10.8456			
58				4.515	0.5211	-9.8464	0.0325	0.1437	0.1103	5.3462	-0.4789	1.8104	0.0325	0.1437	-0.1488	63	<b>0.485</b>	-10.3462			
59				4.147	0.4928	-9.61	0.0325	0.1438	0.1049	5.8719	-0.5072	2.2478	0.0325	0.1438	-0.1587	63	-0.147	-9.8719			
	Standard Chartered Bank Ltd	54	43	22.49	13	0.5	15.5735	0.9999	-8.6428	0.0001	0.0001	0.1921	0.0001	-0.0001	-0.0007	0.0001	0.0001	0	47	-11.5735	-4.0001
			53				6.7976	0.9296	-10.4301	0.0272	0.0515	0.217	0.1606	-0.0704	0.2218	0.0272	0.0515	-0.0198	47	-12.7976	<b>5.8394</b>
			44				14.68	0.9998	-8.8446	0.0002	0.0003	0.1965	0.0003	-0.0002	-0.0015	0.0002	0.0003	-0.0001	47	-11.68	-3.0003
			45				13.7869	0.9994	-9.047	0.0004	0.0008	0.2009	0.0008	-0.0006	-0.0029	0.0004	0.0008	-0.0002	47	-11.7869	-2.0008
			46				12.8943	0.9987	-9.2501	0.0009	0.0016	0.2052	0.0019	-0.0013	-0.005	0.0009	0.0016	-0.0004	47	-11.8943	-1.0019
			47				12.003	0.9973	-9.4537	0.0017	0.0032	0.2093	0.0042	-0.0027	-0.0076	0.0017	0.0032	-0.0008	47	-12.003	-0.0042
			48				11.1139	0.9946	-9.6564	0.0031	0.0059	0.213	0.0087	-0.0054	-0.0093	0.0031	0.0059	-0.0015	47	-12.1139	<b>0.9913</b>

**SIMULATION OF OPTION VALUES USING BOPSCOL  
INDUSTRIAL AND ALLIED SECTOR-JANUARY TO JUNE 1997**

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.97	Value of European call option	Value of European put option						
Bamburi Cement Ltd	40	20	22.49	25	0.5	22.1424	0.9964	-4.1201	0.0008	0.003	0.0886	0.0153	-0.0036	-0.1005	0.0008	0.003	-0.0008	37.5	-4.6424	-17.5153						
						13.7052	0.9217	-7.071	0.0115	0.0414	0.1158	0.5144	-0.0783	-1.0416	0.0115	0.0414	-0.0182	37.5	-6.2052	-8.0144						
						7.2076	0.6958	-9.0917	0.0275	0.099	0.1031	2.9533	-0.3042	-1.0524	0.0275	0.099	-0.0756	37.5	-9.7076	-0.4533						
						3.3288	0.4251	-8.0639	0.0308	0.1108	0.0684	8.0109	-0.5749	1.9851	0.0308	0.1108	-0.155	37.5	-15.8288	4.4891						
						6.7057	0.6682	-9.1224	0.0285	0.1027	0.1001	3.345	-0.3318	-0.8822	0.0285	0.1027	-0.0831	37.5	-10.2057	0.155						
BAT Ltd	83	45	22.49	30	0.5	42.7871	0.9998	-9.0541	0	0.0005	0.201	0.001	-0.0002	-0.01	0	0.0005	-0.0001	61	-26.7871	-16.001						
						33.8793	0.995	-11.2084	0.0008	0.0085	0.2435	0.0297	-0.005	-0.1545	0.0008	0.0085	-0.0022	61	-27.8793	-6.0297						
						25.1932	0.9632	-13.732	0.0046	0.0473	0.2737	0.2799	-0.0368	-0.6682	0.0046	0.0473	-0.0167	61	-29.1932	3.7201						
						32.9948	0.9936	-11.4429	0.001	0.0105	0.2474	0.0387	-0.0064	-0.188	0.001	0.0105	-0.0028	61	-27.9948	-5.0387						
						32.1124	0.992	-11.6819	0.0012	0.0129	0.2511	0.05	-0.008	-0.226	0.0012	0.0129	-0.0036	61	-28.1124	-4.05						
						31.2328	0.99	-11.9255	0.0015	0.0157	0.2547	0.064	-0.01	-0.2686	0.0015	0.0157	-0.0045	61	-28.2328	-3.064						
						30.3562	0.9876	-12.1735	0.0018	0.0188	0.2581	0.0811	-0.0124	-0.3157	0.0018	0.0188	-0.0055	61	-28.3562	-2.0811						
						29.4832	0.9848	-12.4258	0.0022	0.0224	0.2613	0.1018	-0.0152	-0.367	0.0022	0.0224	-0.0068	61	-28.4832	-1.1018						
						28.6144	0.9816	-12.682	0.0026	0.0265	0.2643	0.1266	-0.0184	-0.4223	0.0026	0.0265	-0.0083	61	-28.6144	-0.1266						
						27.7504	0.9779	-12.9416	0.003	0.031	0.2671	0.1562	-0.0221	-0.4808	0.003	0.031	-0.01	61	-28.7504	0.8438						
						BOC Gases Ltd	70	11	22.49	110	0.5	60.2056	0.9982	-2.4869	0.0001	0.0028	0.0483	0.0357	-0.0018	-0.2761	0.0001	0.0028	-0.0008	76	4.7944	-65.0357
												51.7297	0.9813	-6.3045	0.0008	0.0226	0.0848	0.4962	-0.0187	-2.0839	0.0008	0.0226	-0.009	76	3.2703	-55.4962
44.1549	0.943	-11.1436	0.0021	0.0566	0.1093							1.8578	-0.057	-4.9132	0.0021	0.0566	-0.0292	76	0.8451	-46.8578						
37.6353	0.889	-15.8362	0.0035	0.0937	0.123							4.2746	-0.111	-7.596	0.0035	0.0937	-0.0602	76	-2.6353	-39.2746						
32.1236	0.8265	-19.7439	0.0047	0.1269	0.1287							7.6993	-0.1735	-9.4939	0.0047	0.1269	-0.0992	76	-7.1236	-32.6993						
27.498	0.7613	-22.6774	0.0057	0.1534	0.129							12.01	-0.2387	-10.418	0.0057	0.1534	-0.1436	76	-12.498	-27.0102						
23.6231	0.6968	-24.6783	0.0064	0.1729	0.1258							17.072	-0.3032	-10.409	0.0064	0.1729	-0.1915	76	-18.6231	-22.0717						
20.3733	0.6353	-25.8795	0.0069	0.186	0.1205							22.758	-0.3647	-9.6001	0.0069	0.186	-0.2414	76	-25.3733	-17.7583						
17.6406	0.5778	-26.4357	0.0072	0.1937	0.114							28.962	-0.4222	-8.1465	0.0072	0.1937	-0.2926	76	-32.6406	-13.962						
15.3345	0.5248	-26.4921	0.0073	0.1971	0.107							35.592	-0.4752	-6.1932	0.0073	0.1971	-0.3443	76	-40.3345	-10.5923						
40.7633	0.9175	-13.5615	0.0028	0.0753	0.1173							2.9344	-0.0825	-6.3262	0.0028	0.0753	-0.0435	76	-0.7633	-42.9344						
41.4203	0.9229	-13.0869	0.0027	0.0716	0.1159							2.6978	-0.0771	-6.0526	0.0027	0.0716	-0.0405	76	-0.4203	-43.6978						
42.0879	0.9281	-12.607	0.0025	0.0678	0.1144							2.4717	-0.0719	-5.7737	0.0025	0.0678	-0.0375	76	-0.0879	-44.4717						
42.7662	0.9332	-12.1227	0.0024	0.0641	0.1128							2.2564	-0.0668	-5.4903	0.0024	0.0641	-0.0347	76	0.2338	-45.2564						
Carbacid Investments I	82	57	22.49	19	0.5							31.0628	0.9998	-11.4594	0.0001	0.0003	0.2546	0.0004	-0.0002	-0.0036	0.0001	0.0003	-0.0001	84	-4.0628	-27.0004
						22.1565	0.992	-13.5529	0.002	0.0127	0.2959	0.0305	-0.008	-0.0873	0.002	0.0127	-0.0034	84	-5.1565	-17.0305						
						13.6432	0.915	-15.5203	0.0141	0.0902	0.3069	0.4536	-0.085	-0.0449	0.0141	0.0902	-0.0371	84	-6.6432	-7.4536						
						6.7356	0.6785	-14.9458	0.0325	0.2077	0.2445	2.4825	-0.3215	2.5395	0.0325	0.2077	-0.1442	84	-9.7356	0.5175						
						7.3121	0.7087	-15.2045	0.0311	0.1989	0.254	2.1653	-0.2913	2.0798	0.0311	0.1989	-0.1302	84	-9.3121	-0.1653						
Crown Berger Ltd	12.5	7	22.49	37	0.5	6.2474	0.9973	-1.4261	0.0026	0.0007	0.0311	0.0029	-0.0027	-0.0192	0.0026	0.0007	-0.0002	10.5	-2.7474	-3.5029						
						0.4743	0.2694	-1.7308	0.101	0.0292	0.0145	3.1662	-0.7306	1.6859	0.101	0.0292	-0.0615	10.5	-6.9743	3.3338						
						5.3653	0.9883	-1.6717	0.0094	0.0027	0.0349	0.0144	-0.0117	-0.0639	0.0094	0.0027	-0.0008	10.5	-2.8653	-2.5144						
						4.5066	0.9653	-1.951	0.0234	0.0068	0.0378	0.0494	-0.0347	-0.1422	0.0234	0.0068	-0.0024	10.5	-3.0066	-1.5494						
						3.6934	0.9212	-2.2397	0.0449	0.013	0.0391	0.1298	-0.0788	-0.2299	0.0449	0.013	-0.0056	10.5	-3.1934	-0.6298						
						2.95	0.853	-2.4868	0.0703	0.0203	0.0386	0.2801	-0.147	-0.2761	0.0703	0.0203	-0.0106	10.5	-3.45	0.2199						

Dunlop Kenya Ltd	275	11	22.49	161	0.5	265.195	0.9998	-2.468	0	0.0017	0.0487	0.0255	-0.0002	-0.2572	0	0.0017	-0.0005	270	-6.1954	-259.0255
		21				256.454	0.9983	-5.7856	0	0.0107	0.0904	0.2208	-0.0017	-1.565	0	0.0107	-0.0035	270	-7.4543	-249.2208
		31				248.008	0.9951	-10.1868	0	0.0274	0.1283	0.7113	-0.0049	-3.9564	0	0.0274	-0.0102	270	-9.0084	-239.7113
		41				239.914	0.9904	-15.3812	0.0001	0.0502	0.1622	1.5535	-0.0096	-7.141	0.0001	0.0502	-0.021	270	-10.9142	-230.5535
		51				232.19	0.9841	-21.0817	0.0001	0.0772	0.1923	2.7653	-0.0159	-10.832	0.0001	0.0772	-0.0356	270	-13.1896	-221.7653
		61				224.833	0.9767	-27.0617	0.0002	0.1069	0.2189	4.3452	-0.0233	-14.802	0.0002	0.1069	-0.0537	270	-15.833	-213.3452
		71				217.833	0.9684	-33.1541	0.0002	0.1382	0.2423	6.2817	-0.0316	-18.885	0.0002	0.1382	-0.0749	270	-18.8331	-205.2817
		81				211.174	0.9592	-39.2386	0.0003	0.1702	0.2631	8.5587	-0.0408	-22.959	0.0003	0.1702	-0.0989	270	-22.1737	-197.5587
		91				204.837	0.9494	-45.2307	0.0003	0.2023	0.2813	11.158	-0.0506	-26.942	0.0003	0.2023	-0.1253	270	-25.8365	-190.1579
		101				198.803	0.9392	-51.0719	0.0004	0.2341	0.2973	14.061	-0.0608	-30.773	0.0004	0.2341	-0.1539	270	-29.8029	-183.0607
		111				193.055	0.9285	-56.7225	0.0004	0.2653	0.3115	17.249	-0.0715	-34.414	0.0004	0.2653	-0.1845	270	-34.0545	-176.2487
		121				187.574	0.9176	-62.157	0.0005	0.2956	0.3238	20.704	-0.0824	-37.838	0.0005	0.2956	-0.2168	270	-38.5736	-169.7043
		131				182.344	0.9065	-67.3598	0.0005	0.3249	0.3347	24.411	-0.0935	-41.031	0.0005	0.3249	-0.2506	270	-43.3437	-163.4108
		141				177.349	0.8952	-72.3227	0.0006	0.3531	0.3442	28.353	-0.1048	-43.985	0.0006	0.3531	-0.2858	270	-48.349	-157.3525
		151				172.575	0.8839	-77.0429	0.0006	0.3801	0.3525	32.515	-0.1161	-46.695	0.0006	0.3801	-0.3222	270	-53.575	-151.5149
		161				168.008	0.8725	-81.5212	0.0007	0.4059	0.3596	36.885	-0.1275	-49.164	0.0007	0.4059	-0.3597	270	-59.0081	-145.8845
		171				163.636	0.8611	-85.7615	0.0007	0.4305	0.3658	41.449	-0.1389	-51.394	0.0007	0.4305	-0.3982	270	-64.6358	-140.4486
		181				159.447	0.8498	-89.7692	0.0007	0.4539	0.3712	46.196	-0.1502	-53.392	0.0007	0.4539	-0.4376	270	-70.4465	-135.1957
		191				155.429	0.8385	-93.5513	0.0008	0.4761	0.3757	51.115	-0.1615	-55.164	0.0008	0.4761	-0.4777	270	-76.4293	-130.115
		201				151.574	0.8272	-97.1156	0.0008	0.4972	0.3796	56.196	-0.1728	-56.719	0.0008	0.4972	-0.5185	270	-82.5743	-125.1964
		211				147.872	0.8161	-100.47	0.0008	0.5171	0.3828	61.431	-0.1839	-58.064	0.0008	0.5171	-0.56	270	-88.8723	-120.4307
		221				144.315	0.8051	-103.62	0.0009	0.5359	0.3855	66.809	-0.1949	-59.208	0.0009	0.5359	-0.602	270	-95.3145	-115.8094
		231				140.893	0.7942	-106.58	0.0009	0.5537	0.3876	72.324	-0.2058	-60.16	0.0009	0.5537	-0.6446	270	-101.8931	-111.3244
		241				137.601	0.7835	-109.36	0.0009	0.5705	0.3892	77.968	-0.2165	-60.929	0.0009	0.5705	-0.6876	270	-108.6007	-106.9684
		251				134.43	0.7728	-111.96	0.001	0.5864	0.3905	83.735	-0.2272	-61.523	0.001	0.5864	-0.731	270	-115.4304	-102.7345
		261				131.376	0.7624	-114.40	0.001	0.6013	0.3914	89.616	-0.2376	-61.95	0.001	0.6013	-0.7748	270	-122.3756	-98.6162
		271				128.431	0.752	-116.68	0.001	0.6153	0.3919	95.608	-0.248	-62.219	0.001	0.6153	-0.819	270	-129.4306	-94.6076
		281				125.59	0.7418	-118.81	0.001	0.6284	0.3921	101.7	-0.2582	-62.337	0.001	0.6284	-0.8635	270	-136.5897	-90.7031
		291				122.848	0.7318	-120.79	0.0011	0.6408	0.392	107.9	-0.2682	-62.313	0.0011	0.6408	-0.9082	270	-143.8476	-86.8975
E A Cables Ltd	37	23	22.49	28	0.5	16.4485	0.9989	-4.6395	0.0005	0.0009	0.1026	0.0023	-0.0011	-0.0169	0.0005	0.0009	-0.0002	33	-6.4485	-10.0023
		33				7.9181	0.8934	-7.0002	0.0251	0.0481	0.1257	0.4083	-0.1066	-0.3678	0.0251	0.0481	-0.0218	33	-7.9181	-0.4083
		43				2.3146	0.4633	-6.245	0.0542	0.1039	0.0741	3.7412	-0.5367	2.3972	0.0542	0.1039	-0.118	33	-12.3146	<b>6.2588</b>
		34				7.1728	0.863	-7.1748	0.0299	0.0574	0.1238	0.5566	-0.137	-0.3414	0.0299	0.0574	-0.0281	33	-8.1728	<b>0.4434</b>
E A Packaging Ltd	70	29	22.49	49	0.5	44.0932	0.9988	-5.9028	0.0002	0.0019	0.1291	0.0088	-0.0012	-0.0744	0.0002	0.0019	-0.0005	67	-6.0932	-38.0088
		39				35.2867	0.9856	-8.4674	0.0015	0.0181	0.1685	0.1388	-0.0144	-0.6292	0.0015	0.0181	-0.0057	67	-7.2867	-28.1388
	0.7741	49				26.9812	0.9366	-11.6921	0.0051	0.0615	0.1929	0.7697	-0.0634	-1.8441	0.0051	0.0615	-0.026	67	-8.9812	-18.7697
	0.1715	59				19.7045	0.8392	-14.7004	0.0101	0.1208	0.1952	2.4294	-0.1608	-2.8426	0.0101	0.1208	-0.0684	67	-11.7045	-10.4294
	-3.3273	69				13.8166	0.7052	-16.3603	0.0142	0.1707	0.1777	5.4779	-0.2948	-2.4927	0.0142	0.1707	-0.1306	67	-15.8166	-3.4779
	0.0253	79				9.3728	0.5591	-16.2635	0.0163	0.1953	0.1488	9.9705	-0.4409	-0.3861	0.0163	0.1953	-0.2042	67	-21.3728	<b>2.0295</b>
	0.0441	70				13.3088	0.6907	-16.4286	0.0145	0.1745	0.1752	5.8637	-0.3093	-2.36	0.0145	0.1745	-0.1376	67	-16.3088	-2.8637
	0.0171	71				12.8154	0.6761	-16.4788	0.0148	0.1779	0.1726	6.264	-0.3239	-2.2092	0.0148	0.1779	-0.1447	67	-16.8154	-2.264
	15.5944	72				12.3365	0.6615	-16.5111	0.0151	0.1811	0.1698	6.6788	-0.3385	-2.0405	0.0151	0.1811	-0.1519	67	-17.3365	-1.6788
	-0.8285	73				11.8719	0.6468	-16.5257	0.0153	0.1839	0.167	7.1077	-0.3532	-1.8541	0.0153	0.1839	-0.1592	67	-17.8719	-1.1077
	5.5159	74				11.4213	0.6321	-16.5229	0.0155	0.1865	0.1641	7.5508	-0.3679	-1.6504	0.0155	0.1865	-0.1665	67	-18.4213	-0.5508
	0.0253	75				10.9846	0.6174	-16.5031	0.0157	0.1889	0.1612	8.0078	-0.3826	-1.4296	0.0157	0.1889	-0.1739	67	-18.9846	-0.0078
	0.0441	76				10.5617	0.6027	-16.4668	0.0159	0.1909	0.1581	8.4785	-0.3973	-1.1923	0.0159	0.1909	-0.1814	67	-19.5617	<b>0.5215</b>
EA Portland Cement Li	24.5	9	22.49	58	0.5	16.4629	0.9983	-1.8542	0.0006	0.001	0.04	0.0057	-0.0017	-0.0454	0.0006	0.001	-0.0002	44	<b>18.5371</b>	-35.0057
		19				8.3592	0.8641	-5.0725	0.0217	0.0378	0.0641	0.8384	-0.1359	-1.2539	0.0217	0.0378	-0.0208	44	<b>16.6408</b>	-25.8384
		29				3.4257	0.5271	-6.1335	0.0396	0.069	0.0474	4.8413	-0.4729	-0.305	0.0396	0.069	-0.0821	44	<b>11.5743</b>	-19.8413



						18.7895	0.7393	-20.4539	0.0109	0.2067	0.2388	5.6427	-0.2607	-3.1696	0.0109	0.2067	-0.1455	171	66.2105	-90.6427
96						13.8245	0.6218	-20.8493	0.0127	0.2419	0.2107	9.6141	-0.3782	-1.5552	0.0127	0.2419	-0.2182	171	61.1755	-84.6141
106						9.9696	0.5049	-19.9083	0.0133	0.2539	0.1773	14.6966	-0.4951	1.3955	0.0133	0.2539	-0.2963	171	55.0304	-79.6957
116						7.0739	0.3978	-17.9994	0.0129	0.2455	0.1436	20.736	-0.6022	5.3143	0.0129	0.2455	-0.3747	171	47.9261	-75.7364
126						4.9552	0.3058	-15.5631	0.0117	0.2232	0.1128	27.554	-0.6942	9.7604	0.0117	0.2232	-0.4502	171	40.0448	-72.5541
136						3.4368	0.2303	-12.9794	0.0102	0.1934	0.0865	34.972	-0.7697	14.354	0.0102	0.1934	-0.5212	171	31.5632	-69.9721
146						2.3659	0.1708	-10.5145	0.0085	0.1615	0.065	42.838	-0.8292	18.829	0.0085	0.1615	-0.5874	171	22.6341	-67.8377
156						1.6199	0.125	-8.3208	0.0069	0.131	0.0481	51.028	-0.875	23.032	0.0069	0.131	-0.6489	171	13.3801	-66.0281
166						1.105	0.0905	-6.4624	0.0055	0.1038	0.0352	59.45	-0.9095	26.9	0.0055	0.1038	-0.7065	171	3.895	-64.4495
176						0.7519	0.0651	-4.944	0.0042	0.0808	0.0255	68.033	-0.9349	30.429	0.0042	0.0808	-0.7609	171	-5.7519	-63.0329
167						1.0633	0.0876	-6.2955	0.0053	0.1013	0.0341	60.302	-0.9124	27.268	0.0053	0.1013	-0.7121	171	2.9367	-64.3015
168						1.0232	0.0848	-6.1321	0.0052	0.0988	0.033	61.155	-0.9152	27.633	0.0052	0.0988	-0.7176	171	1.9768	-64.1551
169						0.9846	0.0821	-5.972	0.0051	0.0964	0.032	62.01	-0.9179	27.994	0.0051	0.0964	-0.7231	171	1.0154	-64.0101
170						0.9475	0.0794	-5.8153	0.0049	0.0941	0.031	62.867	-0.9206	28.351	0.0049	0.0941	-0.7286	171	0.0525	-63.8666
171						0.9117	0.0768	-5.6619	0.0048	0.0917	0.03	63.725	-0.9232	28.706	0.0048	0.0917	-0.7341	171	-0.9117	-63.7245
Total Kenya Ltd	94	32	22.49	57	0.5	65.4127	0.9992	-6.5168	0.0001	0.0018	0.1426	0.0093	-0.0008	-0.0854	0.0001	0.0018	-0.0004	84.5	-12.9127	-52.5093
42						56.559	0.9934	-8.9805	0.0005	0.0123	0.1841	0.092	-0.0066	-0.5393	0.0005	0.0123	-0.0036	84.5	-14.059	-42.592
52						47.9571	0.9744	-12.0737	0.0016	0.0397	0.2182	0.4265	-0.0256	-1.6227	0.0016	0.0397	-0.0142	84.5	-15.4571	-32.9265
62						39.8683	0.9349	-15.6087	0.0034	0.0844	0.24	1.2741	-0.0651	-3.148	0.0034	0.0844	-0.037	84.5	-17.3683	-23.7741
72						32.5421	0.8733	-19.0167	0.0055	0.1381	0.2477	2.8844	-0.1267	-4.5461	0.0055	0.1381	-0.074	84.5	-20.0421	-15.3844
82						26.1416	0.7937	-21.705	0.0075	0.1896	0.2423	5.4203	-0.2063	-5.2246	0.0075	0.1896	-0.1241	84.5	-23.6416	-7.9203
92						20.7227	0.7033	-23.3144	0.0091	0.2299	0.2269	8.9377	-0.2967	-4.8243	0.0091	0.2299	-0.1841	84.5	-28.2227	-1.4377
102						16.2522	0.6094	-23.7711	0.0101	0.2551	0.2052	13.404	-0.3906	-3.2712	0.0101	0.2551	-0.2506	84.5	-33.7522	4.0963
93						20.2341	0.6939	-23.411	0.0093	0.2332	0.225	9.3428	-0.3061	-4.7199	0.0093	0.2332	-0.1906	84.5	-28.7341	-0.8428
94						19.7549	0.6846	-23.496	0.0094	0.2363	0.223	9.7573	-0.3154	-4.6039	0.0094	0.2363	-0.197	84.5	-29.2549	-0.2573
95						19.2852	0.6752	-23.5694	0.0095	0.2392	0.2209	10.181	-0.3248	-4.4763	0.0095	0.2392	-0.2036	84.5	-29.7852	0.3188
Unga Group Ltd	120	70	22.49	39	0.5	57.5173	0.9938	-14.4647	0.0005	0.0149	0.3087	0.0722	-0.0062	-0.3961	0.0005	0.0149	-0.0041	150	22.4827	-80.0722
80						48.8053	0.9781	-17.151	0.0016	0.0444	0.3428	0.2967	-0.0219	-1.0726	0.0016	0.0444	-0.0146	150	21.1947	-70.2967
90						40.4533	0.944	-20.114	0.0034	0.0958	0.3641	0.8811	-0.056	-2.0258	0.0034	0.0958	-0.038	150	19.5467	-60.8811
100						32.7061	0.8862	-22.9362	0.0058	0.1634	0.3682	2.0703	-0.1138	-2.8382	0.0058	0.1634	-0.0786	150	17.2939	-52.0703
110						25.7903	0.8054	-25.0484	0.0083	0.2336	0.3543	4.091	-0.1946	-2.9406	0.0083	0.2336	-0.1372	150	14.2097	-44.091
120						19.856	0.7073	-26.0002	0.0104	0.2917	0.3251	7.093	-0.2927	-1.8826	0.0104	0.2917	-0.2111	150	10.144	-37.093
130						14.9525	0.6008	-25.6298	0.0117	0.3277	0.2857	11.126	-0.3992	0.4976	0.0117	0.3277	-0.2952	150	5.0475	-31.126
140						11.0379	0.4947	-24.0689	0.0121	0.3385	0.2416	16.148	-0.5053	4.0683	0.0121	0.3385	-0.3839	150	-1.0379	-26.1478
131						14.5179	0.59	-25.523	0.0117	0.3299	0.2814	11.585	-0.41	0.8054	0.0117	0.3299	-0.3039	150	4.4821	-30.585
132						14.0932	0.5793	-25.4044	0.0118	0.3318	0.2771	12.054	-0.4207	1.1249	0.0118	0.3318	-0.3127	150	3.9068	-30.0539
133						13.6782	0.5685	-25.2743	0.0119	0.3335	0.2727	12.533	-0.4315	1.456	0.0119	0.3335	-0.3215	150	3.3218	-29.5326
134						13.2729	0.5578	-25.1331	0.0119	0.3349	0.2683	13.021	-0.4422	1.7983	0.0119	0.3349	-0.3304	150	2.7271	-29.0209
135						12.8771	0.5472	-24.9809	0.012	0.3361	0.2639	13.519	-0.4528	2.1514	0.012	0.3361	-0.3393	150	2.1229	-28.5188
136						12.4908	0.5366	-24.8182	0.012	0.3371	0.2595	14.026	-0.4634	2.5151	0.012	0.3371	-0.3482	150	1.5092	-28.0261
137						12.1139	0.526	-24.6453	0.012	0.3378	0.255	14.543	-0.474	2.889	0.012	0.3378	-0.3571	150	0.8861	-27.5428
138						11.7462	0.5155	-24.4625	0.012	0.3383	0.2506	15.069	-0.4845	3.2727	0.012	0.3383	-0.366	150	0.2538	-27.0688
139						11.3875	0.5051	-24.2703	0.0121	0.3385	0.2461	15.604	-0.4949	3.666	0.0121	0.3385	-0.375	150	-0.3875	-26.6038

SIMULATION OF OPTION VALUES USING BOPSCOL AGRICULTURAL SECTOR-JULY-DECEMBER 1997															Stock price 31.12.97	Value of European call option	Value of European put option						
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho						
Brooke Bond	124	89	22.49	14	0.5	44.4659		1	-17.8873		0	0	0.3977		0	0	-0.0001		0	123	-10.4659	-34	
		99				35.5303	0.9997		-19.9016	0.0001	0.0009	0.4422	0.0009	-0.0003	-0.0046	0.0001	0.0009	-0.0002		123	-11.5303	-24.0009	
		109				26.6193	0.9936		-21.9435	0.0015	0.0158	0.4829	0.0263	-0.0064	-0.0367	0.0015	0.0158	-0.0041		123	-12.6193	-14.0263	
		119				17.9522	0.9453		-23.6846	0.009	0.0971	0.4963	0.2956	-0.0547	0.232	0.009	0.0971	-0.0354		123	-13.9522	-4.2956	
		129				10.3078	0.7841		-23.1438	0.0239	0.2568	0.4346	1.5876	-0.2159	2.7827	0.0239	0.2568	-0.1418		123	-16.3078	4.4124	
																					123	-14.7067	-0.6247
							14.7067	0.8975	-23.9145	0.0146	0.1567	0.4829	0.6247	-0.1025	0.806	0.0146	0.1567	-0.0667		123	-14.7067	-0.6247	
							13.9291	0.8821	-23.8918	0.0161	0.1733	0.4772	0.7407	-0.1179	1.0298	0.0161	0.1733	-0.0768		123	-14.9291	0.2593	
	Eaagads Ltd	26	16	22.49	51	0.5	11.8408	0.967	-3.6817	0.0079	0.0135	0.0665	0.139	-0.033	-0.466	0.0079	0.0135	-0.005		42	14.1592	-26.139	
			26				5.073	0.6887	-6.2001	0.0377	0.065	0.0642	2.3077	-0.3113	-0.9746	0.0377	0.065	-0.052		42	10.927	-18.3077	
36						1.7709	0.3408	-5.0333	0.0391	0.0674	0.0355	7.942	-0.6592	2.202	0.0391	0.0674	-0.1254		42	4.2291	-13.942		
46						0.5652	0.1379	-2.7442	0.0235	0.0405	0.0151	15.6728	-0.8621	6.5009	0.0235	0.0405	-0.1904		42	-4.5652	-11.6728		
																				42	0.8717	-12.874	
							1.1283	0.2412	-4.0795	0.0332	0.0573	0.0257	10.874	-0.7588	3.9597	0.0332	0.0573	-0.153		42	0.8717	-12.874	
							1.0065	0.2204	-3.8414	0.0316	0.0545	0.0236	11.6458	-0.7796	4.3988	0.0316	0.0545	-0.1596		42	-0.0065	-12.6458	
George Williamson		70	27	22.49	68	0.5	45.962	0.993	-5.9541	0.0006	0.0097	0.1177	0.0904	-0.007	-0.5276	0.0006	0.0097	-0.0029		86	13.038	-59.0904	
	37					37.5136	0.9641	-9.3969	0.0023	0.0391	0.1499	0.5783	-0.0359	-1.9607	0.0023	0.0391	-0.0155		86	11.4864	-49.5783		
	47					29.8896	0.9037	-13.2518	0.0051	0.0845	0.1668	1.8907	-0.0963	-3.8057	0.0051	0.0845	-0.0432		86	9.1104	-40.8907		
	57					23.372	0.8164	-16.5389	0.0079	0.1315	0.1689	4.3096	-0.1836	-5.0831	0.0079	0.1315	-0.0858		86	5.628	-33.3096		
	67					18.0323	0.7141	-18.6308	0.0101	0.1683	0.1598	7.9064	-0.2859	-5.1651	0.0101	0.1683	-0.1396		86	0.9677	-26.9064		
	77					13.7895	0.6087	-19.408	0.0114	0.1901	0.1441	12.5999	-0.3913	-3.9325	0.0114	0.1901	-0.1999		86	-4.7895	-21.5999		
																					86	-72.5453	-0.8471
							1.5453	0.114	-7.9388	0.0057	0.0955	0.0322	71.8471	-0.886	23.615	0.0057	0.0955	-0.6693		86	-72.5453	-0.8471	
							1.1874	0.0911	-6.6822	0.0049	0.0811	0.0259	80.4256	-0.9089	26.8815	0.0049	0.0811	-0.7202		86	-82.1874	0.5744	
																				86	0.4391	-26.3286	
							17.5609	0.7035	-18.7661	0.0103	0.1712	0.1584	8.3286	-0.2965	-5.0994	0.0103	0.1712	-0.1454		86	0.4391	-26.3286	
							17.1004	0.6929	-18.888	0.0104	0.1739	0.157	8.7617	-0.3071	-5.0204	0.0104	0.1739	-0.1513		86	-0.1004	-25.7617	
																				86	-77.354	-0.124	
							1.354	0.1019	-7.2881	0.0053	0.0881	0.0289	76.124	-0.8981	25.2707	0.0053	0.0881	-0.695		86	-77.354	-0.124	
						1.3188	0.0996	-7.1633	0.0052	0.0866	0.0283	76.9825	-0.9004	25.5964	0.0052	0.0866	-0.7		86	-78.3188	0.0175		
Kakuzi Ltd	102	47	22.49	51	0.5	60.0516	0.9959	-9.7884	0.0003	0.0088	0.2076	0.0527	-0.0041	-0.3423	0.0003	0.0088	-0.0024		96	-11.0516	-49.0527		
		57				51.3279	0.9824	-12.5905	0.0012	0.0313	0.2444	0.2655	-0.0176	-1.1346	0.0012	0.0313	-0.0103		96	-12.3279	-39.2655		
		67				42.9856	0.9513	-15.8701	0.0027	0.0728	0.2702	0.8596	-0.0487	-2.4044	0.0027	0.0728	-0.0291		96	-13.9856	-29.8596		
		77				35.2756	0.8983	-19.2092	0.0048	0.1282	0.2817	2.086	-0.1017	-3.7337	0.0048	0.1282	-0.0623		96	-16.2756	-21.086		
		87				28.4052	0.8246	-22.023	0.007	0.1862	0.2785	4.152	-0.1754	-4.5377	0.007	0.1862	-0.1102		96	-19.4052	-13.152		
		97				22.491	0.7361	-23.8505	0.0089	0.2357	0.263	7.1742	-0.2639	-4.3555	0.0089	0.2357	-0.1704		96	-23.491	-6.1742		
		107				17.5528	0.6404	-24.4988	0.0102	0.2697	0.2388	11.1725	-0.3596	-2.994	0.0102	0.2697	-0.2393		96	-28.5528	-0.1725		
	117				13.5347	0.5445	-24.0292	0.0108	0.2859	0.21	16.0908	-0.4555	-0.5145	0.0108	0.2859	-0.3128		96	-34.5347	4.9092			
																				96	-29.111	0.3757	
	Kapchorua Tea Co	70	70	22.49	0	0.5	7.4451	1	-14.0686		0	0	0.3128		0	0	0	0		70	-7.4451	0	
71						6.5514	1	-14.2696		0	0	0.3172		0	0	0	0	0		70	-7.5514	1	
Limuru Tea Co	1000							%-150.0477												750	-328.1501	-30.466	
		721	22.49	31	0.5	357.15	0.9828	%-150.0477	0.0002	0.3014	3.1282	1.466	-0.0172	-5.1411	0.0002	0.3014	-0.0934		750	-328.1501	-30.466		
		731				348.492	0.9799	%-152.6580	0.0002	0.3436	3.1571	1.7445	-0.0201	-5.7416	0.0002	0.3436	-0.1091		750	-329.4922	-20.7445		
		741				339.876	0.9767	%-155.2954	0.0003	0.3894	3.1842	2.0646	-0.0233	-6.3692	0.0003	0.3894	-0.1268		750	-330.8758	-11.0646		
		751				331.305	0.9731	%-157.9548	0.0003	0.439	3.2091	2.4304	-0.0269	-7.0188	0.0003	0.439	-0.1465		750	-332.3052	1.0269		
																			750	-332.1601	-2.3916		



Rea Vipingo Ltd	9.3	7	22.49	27	0.5	3.0545	0.9851	-1.4403	0.0212	0.0025	0.0305	0.01	-0.0149	-0.0335	0.0212	0.0025	-0.0007	9	-1.0545	-2.01
		15				0.0226	0.0344	-0.2023	0.0429	0.005	0.0015	4.1272	-0.9656	2.8124	0.0429	0.005	-0.0655	9	-6.0226	1.8728
		9				1.4692	0.8041	-1.8423	0.1557	0.0182	0.03	0.212	-0.1959	-0.0335	0.1557	0.0182	-0.0102	9	-1.4692	-0.212
		10				0.8903	0.6196	-1.7719	0.2145	0.025	0.0244	0.5267	-0.3804	0.2379	0.2145	0.025	-0.0203	9	-1.8903	0.4733
Sasini Tea & Coffee	85	66	22.49	38	0.5	26.7761	0.9325	-14.7865	0.0057	0.0785	0.2624	0.7565	-0.0675	-1.5218	0.0057	0.0785	-0.0325	94	1.2239	-28.7565
		76				19.3771	0.8338	-17.2775	0.0109	0.1499	0.2575	2.2939	-0.1662	-2.0031	0.0109	0.1499	-0.0821	94	-1.3771	-20.2939
		86				13.3191	0.6947	-18.2887	0.0153	0.2106	0.2287	5.1724	-0.3053	-1.0044	0.0153	0.2106	-0.1556	94	-5.3191	-13.1724
		96				8.7371	0.5398	-17.4204	0.0174	0.2386	0.1857	9.5267	-0.4602	1.8736	0.0174	0.2386	-0.2432	94	-10.7371	-7.5267
		106				5.5057	0.394	-15.0824	0.0168	0.2313	0.1399	15.2318	-0.606	6.2215	0.0168	0.2313	-0.3337	94	-17.5057	-3.2318
		116				3.356	0.2728	-12.0511	0.0146	0.1998	0.0992	22.0185	-0.7272	11.2626	0.0146	0.1998	-0.4191	94	-25.356	-0.185
		126				1.9916	0.1809	-9.0205	0.0115	0.1582	0.0669	29.5905	-0.8191	16.303	0.0115	0.1582	-0.4961	94	-33.9916	2.4095
		71				22.929	0.8893	-16.1581	0.0083	0.1136	0.2633	1.3776	-0.1107	-1.8885	0.0083	0.1136	-0.054	94	0.071	-24.3776
		72				22.1933	0.8791	-16.4069	0.0088	0.1209	0.2627	1.5356	-0.1209	-1.9363	0.0088	0.1209	-0.0591	94	-0.1933	-23.5356
		117				3.1889	0.2623	-11.7388	0.0143	0.1958	0.0955	22.745	-0.7377	11.7759	0.0143	0.1958	-0.4273	94	-26.1889	0.255

SIMULATION OF OPTION VALUES USING BOPSCOL COMMERCIAL AND SERVICES SECTOR-JUNE TO DECEMBER 1997																Stock price at expiration 31.12.97	Value of European call option	Value of European put option				
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho					
A Baumann & Co	26	9	22.49	57	0.5	17.96	0.9991	-1.8356	0.0003	0.0006	0.0401	0.003	-0.0009	-0.0268	0.0003	0.0006	-0.0001	16	-10.9602	-7.003		
						9.6445	0.8959	-4.963	0.0172	0.0332	0.0682	0.6237	-0.1041	-1.1444	0.0172	0.0332	-0.0166	16	-12.6445	2.3763		
							13.587	0.9781	-3.2111	0.005	0.0096	0.0592	0.0984	-0.0219	-0.3974	0.005	0.0096	-0.0033	16	-11.5874	-2.0984	
							12.751	0.9675	-3.5516	0.0069	0.0134	0.062	0.1553	-0.0325	-0.5369	0.0069	0.0134	-0.005	16	-11.7507	-1.1553	
							11.935	0.954	-3.9051	0.0092	0.0177	0.0643	0.233	-0.046	-0.6894	0.0092	0.0177	-0.0071	16	-11.9347	-0.233	
							11.143	0.9376	-4.2639	0.0117	0.0226	0.0662	0.335	-0.0624	-0.8473	0.0117	0.0226	-0.0098	16	-12.143	0.665	
CMC Holdings Ltd	82.5	51	22.49	38	0.5	37.002	0.9904	-10.623	0.0012	0.015	0.2235	0.078	-0.0096	-0.3734	0.0012	0.015	-0.0043	80	-8.0023	-29.078		
						28.464	0.9532	-13.453	0.0044	0.0571	0.2509	0.4763	-0.0468	-1.1934	0.0044	0.0571	-0.0217	80	-9.4641	-19.4763		
							14.288	0.7327	-17.674	0.0148	0.1919	0.2308	4.1734	-0.1332	-1.919	0.0097	0.1255	-0.0633	80	-11.7331	-10.6817	
							20.733	0.8668	-16.189	0.0097	0.1255	0.2539	1.6817	-0.2673	-1.3948	0.0148	0.1919	-0.1311	80	-15.2884	-3.1734	
							9.3559	0.5745	-17.245	0.0177	0.2287	0.1902	8.1773	-0.4255	1.0446	0.0177	0.2287	-0.2164	80	-20.3559	2.8227	
							12.132	0.6707	-17.737	0.0163	0.2111	0.216	5.5917	-0.3293	-0.6534	0.0163	0.2111	-0.1638	80	-17.1321	-0.5917	
							11.632	0.6548	-17.702	0.0166	0.215	0.2119	5.9848	-0.3452	-0.418	0.0166	0.215	-0.1723	80	-17.6316	0.0152	
Car & General	17	11	22.49	23	0.5	7.1701	0.9997	-2.2125	0.0004	0.0001	0.0491	0.0002	-0.0003	-0.0018	0.0004	0.0001	0	16	-2.1701	-5.0002		
						0.4829	0.2993	-1.9958	0.1256	0.0417	0.023	2.2494	-0.7007	2.2248	0.1256	0.0417	-0.0708	16	-5.4829	2.7506		
							2.888	0.874	-3.2644	0.0749	0.0249	0.0599	0.1863	-0.126	-0.0487	0.0749	0.0249	-0.0116	16	-2.888	-0.1863	
						2.1863	0.7802	-3.3094	0.107	0.0356	0.0554	0.3782	-0.2198	0.1073	0.107	0.0356	-0.0206	16	-3.1863	0.6218		
Express Kenya Ltd	71	50	22.49	19	0.5	26.318	0.9998	-10.053	0.0001	0.0004	0.2233	0.0005	-0.0002	-0.0043	0.0001	0.0004	-0.0001	59	-17.3184	-9.0005		
						17.437	0.9845	-12.171	0.0041	0.0196	0.2623	0.055	-0.0155	-0.1117	0.0041	0.0196	-0.0058	59	-18.4365	0.945		
							18.314	0.9888	-11.951	0.0031	0.0148	0.2594	0.0384	-0.0112	-0.0934	0.0031	0.0148	-0.0042	59	-18.3135	-0.0384	
Kenya Airways	8.2	7	22.49	13	0.5	1.9448	0.9986	-1.4077	0.006	0.0003	0.0312	0.0003	-0.0014	-0.0008	0.006	0.0003	-0.0001	8	-0.9448	-1.0003		
						1.0719	0.938	-1.5809	0.1622	0.0071	0.0331	0.021	-0.062	0.027	0.1622	0.0071	-0.0026	8	-1.0719	-0.021		
						0.3829	0.6012	-1.3137	0.5121	0.0224	0.0227	0.2257	-0.3988	0.4952	0.5121	0.0224	-0.0175	8	-1.3829	0.7743		
Lonhro Motors	82.5	8	22.49	120	0.5	75.362	0.9995	-1.7146	0	0.001	0.0355	0.011	-0.0005	-0.1067	0	0.001	-0.0002	39	-44.3618	-31.011		
						66.712	0.9906	-5.1384	0.0004	0.0147	0.0751	0.2972	-0.0094	-1.5207	0.0004	0.0147	-0.0053	39	-45.7116	-21.2972		
							58.787	0.9664	-9.9408	0.0011	0.0436	0.1047	1.309	-0.0336	-4.3133	0.0011	0.0436	-0.0204	39	-47.7871	-12.309	
							51.774	0.9293	-15.072	0.0019	0.079	0.1245	3.2324	-0.0707	-7.4351	0.0019	0.079	-0.0453	39	-50.774	-4.2324	
							45.667	0.884	-19.805	0.0028	0.114	0.1363	6.0613	-0.116	-10.158	0.0028	0.114	-0.0782	39	-54.6665	2.9387	
							48.611	0.9074	-17.517	0.0024	0.0968	0.1312	4.5379	-0.0926	-8.8744	0.0024	0.0968	-0.0609	39	-52.6113	-0.5379	
							48.005	0.9028	-17.988	0.0025	0.1003	0.1324	4.8255	-0.0972	-9.1448	0.0025	0.1003	-0.0642	39	-53.0052	0.1745	
Marshalls EA Ltd	77	10	22.49	118	0.5	68.095	0.9986	-2.2653	0.0001	0.0024	0.044	0.0316	-0.0014	-0.2555	0.0001	0.0024	-0.0007	41	-37.0952	-31.0316		
						59.595	0.9849	-6.0991	0.0006	0.0207	0.0812	0.4683	-0.0151	-2.0795	0.0006	0.0207	-0.0082	41	-38.5954	-21.4683		
							51.944	0.9537	-11.066	0.0015	0.0528	0.1074	1.7531	-0.0463	-5.0363	0.0015	0.0528	-0.0266	41	-40.9438	-12.7531	
							45.273	0.9094	-16.053	0.0025	0.0889	0.1237	4.0189	-0.0906	-8.0141	0.0025	0.0889	-0.055	41	-44.2733	-5.0189	
							39.54	0.8576	-20.426	0.0035	0.1226	0.1325	7.2218	-0.1424	-10.377	0.0035	0.1226	-0.0909	41	-48.5397	1.7782	
							40.074	0.8629	-20.026	0.0034	0.1194	0.1319	6.8622	-0.1371	-10.178	0.0034	0.1194	-0.0871	41	-48.0737	1.1378	

	48					40.616	0.8683	-19.616	0.0033	0.1162	0.1312	6.511	-0.1317	-9.9691	0.0033	0.1162	-0.0833	41	-47.6162	0.489	
	47					41.167	0.8736	-19.198	0.0032	0.1113	0.1305	6.1684	-0.1264	-9.7523	0.0032	0.1113	-0.0795	41	-47.1672	-0.1684	
Nation Media Group	116	55	22.49	56	0.5	67.007	0.991	-11.898	0.0005	0.0199	0.2398	0.1572	-0.009	-0.8445	0.0005	0.0199	-0.006	131	8.9931	-76.1572	
		65				58.436	0.9741	-15.036	0.0013	0.0494	0.2728	0.5223	-0.0259	-1.9726	0.0013	0.0494	-0.0176	131	7.5645	-66.5223	
		75				50.281	0.9433	-18.534	0.0025	0.0934	0.2957	1.3041	-0.0567	-3.4604	0.0025	0.0934	-0.0394	131	5.719	-57.3041	
		85				42.716	0.8975	-22.017	0.0039	0.1466	0.3069	2.6755	-0.1025	-4.9332	0.0039	0.1466	-0.0729	131	3.2841	-48.6755	
		95				35.87	0.838	-25.062	0.0053	0.2012	0.3067	4.7664	-0.162	-5.9687	0.0053	0.2012	-0.1178	131	0.1296	-40.7664	
		105				29.816	0.7684	-27.342	0.0066	0.25	0.2966	7.6487	-0.2316	-6.2395	0.0066	0.25	-0.1726	131	-3.8163	-33.6487	
		185				5.4939	0.243	-19.478	0.0068	0.2567	0.1135	54.818	-0.757	17.703	0.0068	0.2567	-0.7132	131	-59.4939	-0.8177	
		195				4.3926	0.2033	-17.305	0.0062	0.2319	0.096	62.653	-0.7967	21.886	0.0062	0.2319	-0.7753	131	-68.3926	1.3472	
		205				3.5099	0.1695	-15.236	0.0055	0.2072	0.0808	70.707	-0.8305	25.965	0.0055	0.2072	-0.8352	131	-77.5099	3.2935	
		215				2.8039	0.1409	-13.313	0.0049	0.1834	0.0677	78.937	-0.8591	29.898	0.0049	0.1834	-0.893	131	-86.8039	5.0631	
		225				2.24	0.1168	-11.558	0.0043	0.161	0.0565	87.31	-0.8832	33.662	0.0043	0.161	-0.9488	131	-96.24	6.6905	
		235				1.7902	0.0966	-9.9806	0.0037	0.1404	0.0471	95.796	-0.9034	37.25	0.0037	0.1404	-1.0029	131	-105.7902	8.2039	
		245				1.4315	0.0798	-8.579	0.0032	0.1218	0.0391	104.37	-0.9202	40.661	0.0032	0.1218	-1.0556	131	-115.4315	9.6262	
		255				1.1456	0.0659	-7.3461	0.0028	0.1051	0.0325	113.02	-0.9341	43.904	0.0028	0.1051	-1.1069	131	-125.1456	10.9757	
		96				35.229	0.8314	-25.328	0.0055	0.2064	0.3061	5.0184	-0.1686	-6.0343	0.0055	0.2064	-0.1229	131	-0.2288	-40.0184	
		188				5.1378	0.2304	-18.819	0.0066	0.2493	0.108	57.143	-0.7696	18.966	0.0066	0.2493	-0.7321	131	-62.1378	-0.1425	
		189				5.0242	0.2264	-18.6	0.0066	0.2469	0.1062	57.923	-0.7736	19.385	0.0066	0.2469	-0.7383	131	-63.0242	0.0775	
		190				4.913	0.2224	-18.382	0.0065	0.2444	0.1044	58.705	-0.7776	19.804	0.0065	0.2444	-0.7445	131	-63.913	0.295	
	Pearl Drycleaners	10.25	8	22.49	18	0.5	3.1515	0.9983	-1.6109	0.0041	0.0004	0.0357	0.0007	-0.0017	-0.0031	0.0041	0.0004	-0.0001	11	-0.1515	-3.0007
			14				0.0397	0.0716	-0.3359	0.1042	0.0099	0.0035	2.2507	-0.9284	2.4778	0.1042	0.0099	-0.0591	11	-3.0397	0.7493
		11				0.7796	0.6666	-1.8455	0.2774	0.0265	0.0304	0.3097	-0.3334	0.3653	0.2774	0.0265	-0.0187	11	-0.7796	-0.3097	
		12				0.348	0.4001	-1.3551	0.2947	0.0281	0.0189	0.7717	-0.5999	1.0567	0.2947	0.0281	-0.0348	11	-1.348	0.2283	
Standard Newspaper	25	100	22.49	70	0.5	0.0363	0.01	-0.3781	0.0022	0.0047	0.0011	64.401	-0.99	19.72	0.0022	0.0047	-0.4458	53	-47.0363	-17.4005	
		110				0.0204	0.0059	-0.2355	0.0014	0.003	0.0006	73.321	-0.9941	21.872	0.0014	0.003	-0.4909	53	-57.0204	-16.321	
		120				0.0117	0.0035	-0.1481	0.0009	0.0019	0.0004	82.249	-0.9965	23.97	0.0009	0.0019	-0.5358	53	-67.0117	-15.2487	
		130				0.0068	0.0021	-0.0941	0.0005	0.0012	0.0002	91.18	-0.9979	26.033	0.0005	0.0012	-0.5806	53	-77.0068	-14.1803	
		140				0.0041	0.0013	-0.0604	0.0004	0.0008	0.0001	100.11	-0.9987	28.077	0.0004	0.0008	-0.6254	53	-87.0041	-13.114	
		150				0.0025	0.0008	-0.0392	0.0002	0.0005	0.0001	109.05	-0.9992	30.108	0.0002	0.0005	-0.6701	53	-97.0025	-12.0488	
		160				0.0015	0.0005	-0.0257	0.0002	0.0003	0.0001	117.98	-0.9995	32.131	0.0002	0.0003	-0.7149	53	-107.0015	-10.9843	
		170				0.001	0.0003	-0.017	0.0001	0.0002	0	126.92	-0.9997	34.15	0.0001	0.0002	-0.7596	53	-117.001	-9.9201	
		180				0.0006	0.0002	-0.0114	0.0001	0.0001	0	135.86	-0.9998	36.165	0.0001	0.0001	-0.8043	53	-127.0006	-8.8562	
		190				0.0004	0.0001	-0.0077	0	0.0001	0	144.79	-0.9999	38.179	0	0.0001	-0.8489	53	-137.0004	-7.7924	
		200				0.0003	0.0001	-0.0053	0	0.0001	0	153.73	-0.9999	40.191	0	0.0001	-0.8936	53	-147.0003	-6.7287	
		210				0.0002	0.0001	-0.0036	0	0	0	162.67	-0.9999	42.202	0	0	-0.9383	53	-157.0002	-5.665	
		220				0.0001	0	-0.0025	0	0	0	171.6	-1	44.213	0	0	-0.983	53	-167.0001	-4.6014	
		230				0.0001	0	-0.0018	0	0	0	180.54	-1	46.224	0	0	-1.0277	53	-177.0001	-3.5378	
		240				0.0001	0	-0.0012	0	0	0	189.47	-1	48.234	0	0	-1.0724	53	-187.0001	-2.4741	
		250				0	0	-0.0009	0	0	0	198.41	-1	50.244	0	0	-1.1171	53	-197	-1.4105	
		260				0	0	-0.0006	0	0	0	207.35	-1	52.254	0	0	-1.1617	53	-207	-0.347	
		270				0	0	-0.0005	0	0	0	216.28	-1	54.264	0	0	-1.2064	53	-217	0.7166	
	263				0	0	-0.0006	0	0	0	210.03	-1	52.857	0	0	-1.1751	53	-210	-0.0279		
	264				0	0	-0.0006	0	0	0	210.92	-1	53.058	0	0	-1.1796	53	-211	0.0785		
	265				0	0	-0.0005	0	0	0	211.82	-1	53.259	0	0	-1.1841	53	-212	0.1848		
Uchumi Supermark	40	21	22.49	45	0.5	21.259	0.9944	-4.3677	0.0013	0.0045	0.0926	0.025	-0.0056	-0.1471	0.0013	0.0045	-0.0012	39	-3.2586	-18.025	

31		12.944	0.9055	-7.3778	0.0132	0.0476	0.1164	0.6465	-0.0945	-1.1474	0.0132	0.0476	-0.0221	39	-4.9436	-8.6465
41		6.7057	0.6682	-9.1224	0.0285	0.1027	0.1001	3.345	-0.3318	-0.8822	0.0285	0.1027	-0.0831	39	-8.7057	-1.345
51		3.0649	0.4009	-7.8375	0.0304	0.1093	0.0649	8.6407	-0.5991	2.4125	0.0304	0.1093	-0.163	39	-15.0649	3.3593
42		6.2308	0.6403	-9.119	0.0294	0.1058	0.0969	3.7638	-0.3597	-0.6779	0.0294	0.1058	-0.0908	39	-9.2308	-0.7638
43		5.7826	0.6123	-9.0827	0.0301	0.1083	0.0935	4.2093	-0.3877	-0.4405	0.0301	0.1083	-0.0986	39	-9.7826	-0.2093
44		5.3605	0.5843	-9.0148	0.0306	0.1103	0.0901	4.6807	-0.4157	-0.1717	0.0306	0.1103	-0.1065	39	-10.3605	0.3193

SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JULY-DECEMBER 1997

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.97	Value of European call option	Value of European put option	
Barclays Bank	110	90	22.5	17	0.5	29.589	0.9961	-18.1407	0.0009	0.0089	0.3999	0.0163	-0.0039	-0.0525	0.0009	0.0089	-0.0022	115	-4.5885	-25.0163	
		100				20.839	0.9631	-20.2065	0.0061	0.0627	0.4255	0.2031	-0.0369	-0.1085	0.0061	0.0627	-0.0213	115	-5.8389	-15.2031	
		110				12.874	0.8403	-21.1058	0.0184	0.189	0.3978	1.1745	-0.1597	1.002	0.0184	0.189	-0.0937	115	-7.8739	-6.1745	
		120				6.7032	0.6071	-18.5951	0.0291	0.2991	0.3004	3.9403	-0.3929	5.5226	0.0291	0.2991	0.2991	-0.2358	115	-11.7032	1.0597
		119				7.2161	0.6336	-19.0278	0.0285	0.2927	0.3124	3.5595	-0.3664	4.8888	0.0285	0.2927	0.2927	-0.2193	115	-11.2161	0.4405
		118				7.7532	0.6597	-19.4225	0.0277	0.2851	0.324	7.7532	-0.3403	4.2931	0.0277	0.2851	0.2851	-0.2032	115	-10.7532	-4.7532
		117																			
City Trust Ltd	35.75	30	22.5	14	0.5	8.9424	0.9984	-6.0344	0.0014	0.0013	0.1338	0.0016	-0.0016	-0.005	0.0014	0.0013	-0.0003	34	-4.9424	-4.0016	
		40				1.4134	0.5202	-5.2749	0.1126	0.1007	0.0859	1.4091	-0.4798	2.7643	0.1126	0.1007	-0.0928	34	-7.4134	4.5909	
		35				4.6078	0.9192	-6.8843	0.0423	0.0379	0.1413	0.1352	-0.0808	0.15	0.0423	0.0379	-0.0151	34	-5.6078	0.8648	
		34				5.4346	0.9547	-6.791	0.0269	0.0241	0.1435	0.0684	-0.0453	0.0423	0.0269	0.0241	-0.0084	34	-5.4346	-0.0684	
CFC Bank	26	13	22.5	38	0.5	14.384	0.9991	-2.6279	0.0004	0.0005	0.058	0.0018	-0.0009	-0.0152	0.0004	0.0005	-0.0001	18	-9.3844	-5.0018	
		23				6.0959	0.8435	-5.2366	0.0343	0.0441	0.0792	0.6496	-0.1565	-0.6141	0.0343	0.0441	-0.0236	18	-11.0959	4.3504	
		18				9.9949	0.9727	-3.8797	0.009	0.0116	0.0765	0.0805	-0.0273	-0.2621	0.009	0.0116	-0.004	18	-9.9949	-0.0805	
		19				9.1556	0.9573	-4.1734	0.013	0.0167	0.0787	0.1348	-0.0427	-0.3548	0.013	0.0167	-0.0062	18	-10.1556	0.8652	
Diamond Trust Bank	30.25	17	22.5	25	0.5	15.058	1	-3.4172	0	0	0.076	0	0	-0.0005	0	0	0	22	-10.0581	-5	
		24				8.8467	0.979	-4.9405	0.0094	0.0108	0.1038	0.0441	-0.021	-0.117	0.0094	0.0108	-0.0034	22	-10.8467	1.9559	
		20				12.379	0.9989	-4.0313	0.0007	0.0008	0.0892	0.0017	-0.0011	-0.0117	0.0007	0.0008	-0.0002	22	-10.3789	-2.0017	
		21				11.488	0.9974	-4.2452	0.0015	0.0017	0.0934	0.0044	-0.0026	-0.0247	0.0015	0.0017	-0.0004	22	-10.488	-1.0044	
		22				10.6	0.9942	-4.4678	0.0031	0.0035	0.0974	0.0104	-0.0058	-0.0462	0.0031	0.0035	-0.0009	22	-10.6003	-0.0104	
		23				9.7186	0.9885	-4.7001	0.0056	0.0064	0.1009	0.0223	-0.0115	-0.0775	0.0056	0.0064	-0.0018	22	-10.7186	0.9777	
Housing Finance Co of Kenya	23.5	17	22.5	14	0.5	8.3081	1	-3.4167	0	0	0.076	0	0	0	0	0	0	19	-6.3081	-2	
		26				1.0612	0.5652	-3.6642	0.1692	0.0654	0.0611	0.7959	-0.4348	1.5613	0.1692	0.0654	-0.0551	19	-8.0612	6.2041	
		18				7.4145	0.9999	-3.6179	0.0001	0	0.0804	0	-0.0001	-0.0002	0.0001	0	0	19	-6.4145	-1	
		19				6.5211	0.9996	-3.8199	0.0007	0.0003	0.0848	0.0003	-0.0004	-0.0013	0.0007	0.0003	-0.0001	19	-6.5211	-0.0003	
20				5.6289	0.9976	-4.024	0.0033	0.0013	0.0891	0.0017	-0.0024	-0.0044	0.0033	0.0013	-0.0003	19	-6.6289	0.9983			
ICDC Investments Co Ltd	50	14	22.5	76	0.5	37.51	0.9978	-2.9707	0.0003	0.0025	0.0619	0.0205	-0.0022	-0.157	0.0003	0.0025	-0.0007	35	-16.5095	-21.0205	
		24				28.975	0.9674	-6.3208	0.0027	0.0258	0.097	0.4224	-0.0326	-1.4972	0.0027	0.0258	-0.0103	35	-17.975	-11.4224	
		34				21.574	0.8841	-10.3348	0.0073	0.069	0.1131	1.9578	-0.1159	-3.5015	0.0073	0.069	-0.0388	35	-20.574	-2.9578	
		44				15.703	0.7629	-13.3445	0.0115	0.1092	0.1122	5.0236	-0.2371	-4.5014	0.0115	0.1092	-0.0844	35	-24.7033	3.9764	
		39				18.443	0.8265	-12.0352	0.0095	0.0907	0.1144	3.2955	-0.1735	-4.197	0.0095	0.0907	-0.0599	35	-22.4434	0.7045	
		38				19.038	0.8386	-11.7239	0.0091	0.0865	0.1145	2.9964	-0.1614	-4.0866	0.0091	0.0865	-0.0553	35	-22.038	0.0036	
37				19.648	0.8504	-11.3973	0.0087	0.0823	0.1144	2.713	-0.1496	-3.9611	0.0087	0.0823	-0.051	35	-21.6482	-0.713			
Jubilee Insurance Co Ltd	41.5	27	22.5	28	0.5	17.378	0.9977	-5.4624	0.0009	0.0021	0.1201	0.0058	-0.0023	-0.0359	0.0009	0.0021	-0.0005	35	-9.3775	-8.0058	
		37				8.8914	0.8937	-7.8489	0.0223	0.0538	0.141	0.4561	-0.1063	-0.4127	0.0223	0.0538	-0.0243	35	-10.8914	1.5439	
		36				9.667	0.917	-7.6405	0.0186	0.0449	0.1419	0.3381	-0.083	-0.4052	0.0186	0.0449	-0.0189	35	-10.667	0.6619	
35				10.467	0.9367	-7.4091	0.0151	0.0365	0.142	0.2448	-0.0633	-0.3748	0.0151	0.0365	-0.0144	35	-10.4673	-0.2448			

KCB Ltd	115	67	22.5	34	0.5	55.146	0.9977	-13.6002	0.0003	0.0058	0.298	0.02	-0.0023	-0.1345	0.0003	0.0058	-0.0014	77	-45.146	-10.02	
						46.314	0.988	-16.0015	0.0011	0.0254	0.3365	0.1244	-0.012	-0.526	0.0011	0.0254	-0.0075	77	-46.3139	-0.1244	
						37.745	0.9598	-18.7269	0.0031	0.0703	0.3632	0.4914	-0.0402	-1.2417	0.0031	0.0703	-0.0256	77	-47.7446	9.5086	
						78	45.441	0.9862	-16.2616	0.0013	0.0287	0.3399	0.1453	-0.0138	-0.5852	0.0013	0.0287	-0.0087	77	-46.4412	0.8547
National Bank Ltd	15.2	9	22.5	31	0.5	7.1585	0.9987	-1.8183	0.0013	0.0005	0.0401	0.0013	-0.0013	-0.0095	0.0013	0.0005	-0.0001	13	-3.1585	-4.0013	
						0.3305	0.1971	-1.5242	0.0833	0.0298	0.0133	3.8969	-0.8029	2.6964	0.0833	0.0298	-0.0805	13	-8.3305	4.1031	
						14	2.9981	0.8408	-3.008	0.0728	0.0261	0.0489	0.3091	-0.1592	-0.1943	0.0728	0.0261	-0.0136	13	-3.9981	0.6909
						13	3.7368	0.9092	-2.8123	0.0491	0.0176	0.0504	0.1542	-0.0908	-0.1996	0.0491	0.0176	-0.0077	13	-3.7368	-0.1542
NIC Bank Ltd	60	43	22.5	24	0.5	21.584	0.9966	-8.6975	0.001	0.0043	0.1911	0.011	-0.0034	-0.0553	0.001	0.0043	-0.0011	50	-14.5843	-7.011	
						53	12.973	0.9304	-10.9985	0.0131	0.0567	0.2142	0.3356	-0.0696	-0.3466	0.0131	0.0567	-0.0226	50	-15.9725	2.6644
						48	17.183	0.9804	-9.8497	0.0047	0.0202	0.2082	0.0774	-0.0196	-0.2026	0.0047	0.0202	-0.0063	50	-15.1826	-2.0774
						49	16.319	0.9739	-10.0889	0.006	0.0257	0.2106	0.1074	-0.0261	-0.2408	0.006	0.0257	-0.0084	50	-15.319	-1.1074
						50	15.464	0.9658	-10.3268	0.0075	0.0322	0.2124	0.1464	-0.0342	-0.2778	0.0075	0.0322	-0.011	50	-15.4643	-0.1464
						51	14.62	0.9559	-10.5603	0.0092	0.0396	0.2137	0.1961	-0.0441	-0.3103	0.0092	0.0396	-0.0142	50	-15.6203	0.8039
Pan Africa Ins Co	63	35	22.5	34	0.5	31.728	0.9988	-7.0767	0.0003	0.0018	0.156	0.0055	-0.0012	-0.0424	0.0003	0.0018	-0.0004	42	-24.728	-7.0055	
						45	22.931	0.9766	-9.5179	0.0037	0.0247	0.193	0.1448	-0.0234	-0.4738	0.0037	0.0247	-0.0081	42	-25.9309	2.8552
						40	27.289	0.9934	-8.2184	0.0012	0.0083	0.1765	0.0351	-0.0066	-0.1792	0.0012	0.0083	-0.0023	42	-25.2894	-2.0351
						41	26.409	0.9912	-8.4653	0.0016	0.0106	0.1802	0.048	-0.0088	-0.2251	0.0016	0.0106	-0.003	42	-25.4087	-1.048
						42	25.532	0.9885	-8.719	0.002	0.0134	0.1837	0.0646	-0.0115	-0.2778	0.002	0.0134	-0.0039	42	-25.5317	-0.0646
						43	24.659	0.9852	-8.9793	0.0025	0.0166	0.1871	0.0858	-0.0148	-0.3372	0.0025	0.0166	-0.0051	42	-25.6591	0.9142
Standard Chartered Bank Ltd	47	38	22.5	13	0.5	13.042	0.9998	-7.6382	0.0002	0.0002	0.1698	0.0002	-0.0002	-0.001	0.0002	0.0002	0	46	-5.0418	-8.0002	
						48	4.4526	0.8509	-8.9961	0.0538	0.0772	0.1777	0.3474	-0.1491	0.651	0.0538	0.0772	-0.0368	46	-6.4526	1.6526
						47	5.2171	0.8978	-9.0872	0.0413	0.0592	0.1849	0.2182	-0.1022	0.3589	0.0413	0.0592	-0.0251	46	-6.2171	0.7818
						46	6.0228	0.9336	-9.0709	0.0298	0.0428	0.1893	0.1303	-0.0664	0.1742	0.0298	0.0428	-0.0163	46	-6.0228	-0.1303

**SIMULATION OF OPTION VALUES USING BOPSCOL**

**INDUSTRIAL AND ALLIED SECTOR-JULY-DECEMBER 1997**

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.97	Value of European call option	Value of European put option
Bamburi Cement Ltd	37.5	18	22.49	45	0.5	21.4238	0.9976	-3.6847	0.0006	0.002	0.0799	0.0093	-0.0024	-0.0671	0.0006	0.002	-0.0005	36	-3.4238	-18.0093
		28				12.9453	0.9237	-6.59	0.012	0.038	0.1085	0.4673	-0.0763	-0.9625	0.012	0.038	-0.0166	36	-4.9453	-8.4673
		38				6.503	0.6811	-8.5428	0.0299	0.0947	0.0952	2.9614	-0.3189	-0.9056	0.0299	0.0947	-0.0746	36	-8.503	-0.9614
		48				2.826	0.3962	-7.3037	0.0323	0.1022	0.0601	8.2209	-0.6038	2.3434	0.0323	0.1022	-0.1543	36	-14.826	3.7791
		43				4.3496	0.5328	-8.2598	0.0333	0.1054	0.0782	5.2762	-0.4672	0.3824	0.0333	0.1054	-0.114	36	-11.3496	1.7238
		42				4.726	0.5621	-8.3804	0.033	0.1045	0.0818	4.7589	-0.4379	0.0608	0.033	0.1045	-0.1059	36	-10.726	1.2411
		41				5.1286	0.5918	-8.4712	0.0325	0.103	0.0853	4.268	-0.4082	-0.231	0.0325	0.103	-0.0979	36	-10.1286	0.732
		40				5.5585	0.6216	-8.5297	0.0319	0.1008	0.0888	3.8042	-0.3784	-0.4905	0.0319	0.1008	-0.09	36	-9.5585	<b>0.1958</b>
		39				6.0164	0.6514	-8.5541	0.031	0.0981	0.0921	3.3685	-0.3486	-0.7159	0.031	0.0981	-0.0822	36	-9.0164	-0.3685
		BAT Ltd				61	33	22.49	30	0.5	31.5105	0.9998	-6.6394	0.0001	0.0003	0.1474	0.0007	-0.0002	-0.0071	0.0001
43	22.6265		0.9888	-8.8567	0.0023		0.0127				0.1885	0.0531	-0.0112	-0.2146	0.0023	0.0127	-0.0037	50	-15.6265	-7.0531
53	14.2837		0.903	-11.3966	0.0133		0.074				0.204	0.6467	-0.097	-0.7447	0.0133	0.074	-0.0328	50	-17.2837	2.3533
52	15.0621		0.9175	-11.1684	0.0118		0.0656				0.2045	0.5315	-0.0825	-0.7175	0.0118	0.0656	-0.0278	50	-17.0621	1.4685
51	15.8566		0.9306	-10.9267	0.0103		0.0575				0.2045	0.4324	-0.0694	-0.6767	0.0103	0.0575	-0.0233	50	-16.8566	<b>0.5676</b>
50	16.6659		0.9422	-10.6747	0.0089		0.0499				0.204	0.348	-0.0578	-0.6257	0.0089	0.0499	-0.0194	50	-16.6659	-0.348
BOC Gases Ltd	76	12	22.49	110	0.5	65.3158	0.9982	-2.7169	0.0001	0.0031	0.0527	0.0396	-0.0018	-0.3051	0.0001	0.0031	-0.0009	66	-11.3158	-54.0396
		22				56.8126	0.9833	-6.4842	0.0007	0.0223	0.0896	0.4727	-0.0167	-2.0626	0.0007	0.0223	-0.0087	66	-12.8126	-44.4727
		32				49.1215	0.9501	-11.2813	0.0017	0.0554	0.1154	1.718	-0.0499	-4.8499	0.0017	0.0554	-0.0276	66	-15.1215	-35.718
		42				42.3991	0.9025	-16.0741	0.0029	0.0926	0.131	3.9321	-0.0975	-7.6329	0.0029	0.0926	-0.0567	66	-18.3991	-27.9321
		52				36.6254	0.8465	-20.2292	0.004	0.1273	0.1385	7.0948	-0.1535	-9.7783	0.004	0.1273	-0.0938	66	-22.6254	-21.0938
		62				31.706	0.7868	-23.507	0.0049	0.1563	0.1404	11.1118	-0.2132	-11.0463	0.0049	0.1563	-0.1366	66	-27.706	-15.1118
		72				27.5262	0.7267	-25.894	0.0056	0.1788	0.1385	15.8684	-0.2733	-11.4234	0.0056	0.1788	-0.1832	66	-33.5262	-9.8684
		82				23.9743	0.6685	-27.4813	0.0061	0.195	0.1342	21.253	-0.3315	-11.001	0.0061	0.195	-0.2322	66	-39.9743	-5.253
		92				20.9509	0.6133	-28.3965	0.0065	0.2057	0.1283	27.166	-0.3867	-9.9063	0.0065	0.2057	-0.2828	66	-46.9509	-1.166
		102				18.3705	0.5617	-28.7695	0.0067	0.2118	0.1216	33.522	-0.4383	-8.2695	0.0067	0.2118	-0.3342	66	-54.3705	2.478
		97				19.6101	0.587	-28.643	0.0066	0.2093	0.125	30.2934	-0.413	-9.1479	0.0066	0.2093	-0.3084	66	-50.6101	0.7066
		96				19.8699	0.5922	-28.6038	0.0066	0.2086	0.1257	29.6595	-0.4078	-9.3097	0.0066	0.2086	-0.3033	66	-49.8699	<b>0.3405</b>
		95				20.1338	0.5974	-28.5596	0.0065	0.208	0.1263	29.0298	-0.4026	-9.4665	0.0065	0.208	-0.2981	66	-49.1338	-0.0298
Carbacid Investment	84	58	22.49	19	0.5	32.1691	0.9999	-11.6599	0	0.0003	0.2591	0.0004	-0.0001	-0.0031	0	0.0003	-0.0001	66	-24.1691	-8.0004
		68				23.2576	0.9934	-13.7453	0.0016	0.011	0.3009	0.0253	-0.0066	-0.0786	0.0016	0.011	-0.0029	66	-25.2576	1.9747
		67				24.1439	0.9952	-13.5287	0.0012	0.0083	0.2972	0.0179	-0.0048	-0.063	0.0012	0.0083	-0.0021	66	-25.1439	<b>0.9821</b>
		66				25.0321	0.9965	-13.3141	0.0009	0.0062	0.2934	0.0125	-0.0035	-0.0494	0.0009	0.0062	-0.0015	66	-25.0321	-0.0125
Crown Berger Ltd	10.5	6	22.49	37	0.5	5.1413	0.9965	-1.2256	0.0038	0.0008	0.0266	0.0031	-0.0035	-0.0198	0.0038	0.0008	-0.0002	10	-1.1413	-2.7744
		16				0.1862	0.147	-0.9372	0.0837	0.0171	0.0068	3.9845	-0.853	2.2785	0.0837	0.0171	-0.0647	10	-6.1862	2.0155
		11				1.4261	0.6491	-2.2305	0.135	0.0275	0.0269	0.7562	-0.3509	-0.0197	0.135	0.0275	-0.0222	10	-2.4261	<b>0.2438</b>
10	1.9779	0.7725	-2.2084	0.1099	0.0224	0.0307	0.4143	-0.2275	-0.1986	0.1099	0.0224	-0.014	10	-1.9779	-0.4143					
Dunlop Kenya Ltd	270	11	22.49	161	0.5	260.1966	0.9997	-2.4778	0	0.0018	0.0487	0.0267	-0.0003	-0.2671	0	0.0018	-0.0005	100	-171.1966	-89.0267
		21				251.4631	0.9982	-5.8301	0	0.011	0.0903	0.2296	-0.0018	-1.6096	0	0.011	-0.0036	100	-172.4631	-79.2296
		31				243.0333	0.9949	-10.2762	0	0.0281	0.128	0.7362	-0.0051	-4.0458	0	0.0281	-0.0106	100	-174.0333	-69.7362
		41				234.9635	0.9899	-15.5122	0.0001	0.0512	0.1616	1.6028	-0.0101	-7.272	0.0001	0.0512	-0.0216	100	-175.9635	-60.6028
		51				227.2704	0.9835	-21.2441	0.0001	0.0785	0.1914	2.8462	-0.0165	-10.9941	0.0001	0.0785	-0.0365	100	-178.2704	-51.8462
		61				219.9515	0.9758	-27.2424	0.0002	0.1084	0.2176	4.4637	-0.0242	-14.9826	0.0002	0.1084	-0.0549	100	-180.9515	-43.4637
		71				212.9941	0.9672	-33.3393	0.0002	0.1398	0.2408	6.4427	-0.0328	-19.0697	0.0002	0.1398	-0.0765	100	-183.9941	-35.4427

					81		206.3811	0.9578	-39.4151	0.0003	0.1719		8.7661	-0.0422	-23.1357	0.0003	0.1719	-0.1008	100	-187.3811	-27.7661
					91		200.0935	0.9477	-45.3864	0.0003	0.204	0.279	11.415	-0.0523	-27.0972	0.0003	0.204	-0.1276	100	-181.0935	-20.415
					101		194.1119	0.9372	-51.1961	0.0004	0.2357	0.2947	14.3698	-0.0628	-30.8971	0.0004	0.2357	-0.1566	100	-195.1119	-13.3698
					111		188.4174	0.9263	-56.8059	0.0005	0.2667	0.3084	17.6116	-0.0737	-34.4971	0.0005	0.2667	-0.1876	100	-199.4174	-6.6116
					121		182.9918	0.9151	-62.1916	0.0005	0.2968	0.3205	21.1224	-0.0849	-37.873	0.0005	0.2968	-0.2202	100	-203.9918	-0.1224
					131		177.818	0.9038	-67.339	0.0006	0.3258	0.331	24.8851	-0.0962	-41.0106	0.0006	0.3258	-0.2544	100	-208.818	6.1149
					122		182.4633	0.914	-62.7173	0.0005	0.2997	0.3216	21.4876	-0.086	-38.1977	0.0005	0.2997	-0.2235	100	-204.4633	0.5124
E A Cables Ltd	33	20	22.49	28	0.5	15.1285	0.9993	-4.0299	0.0004	0.0006	0.0892	0.0013	-0.0007	-0.0103	0.0004	0.0006	-0.0001	29	-6.1285	-9.0013	
		30				6.6356	0.8746	-6.3467	0.0316	0.0481	0.1111	0.4448	-0.1254	-0.3173	0.0316	0.0481	-0.0229	29	-7.6356	0.5552	
		29				7.3947	0.9065	-6.1561	0.0256	0.039	0.1126	0.3103	-0.0935	-0.3277	0.0256	0.039	-0.017	29	-7.3947	-0.3103	
E A Packaging Ltd	67	27	22.49	49	0.5	42.878	0.9991	-5.4825	0.0001	0.0015	0.1203	0.0063	-0.0009	-0.0561	0.0001	0.0015	-0.0003	49	-20.878	-22.0063	
		37				34.0587	0.9865	-8.008	0.0015	0.0164	0.1602	0.1234	-0.0135	-0.5717	0.0015	0.0164	-0.0051	49	-22.0587	-12.1234	
		47				25.7462	0.9359	-11.2243	0.0054	0.0594	0.1848	0.7474	-0.0641	-1.7782	0.0054	0.0594	-0.0252	49	-23.7462	-2.7474	
		57				18.5124	0.8326	-14.1993	0.0108	0.1187	0.1863	2.45	-0.1674	-2.7435	0.0108	0.1187	-0.0683	49	-26.5124	5.55	
		52				21.2445	0.8799	-13.1277	0.0086	0.0948	0.1885	1.6075	-0.1201	-2.4757	0.0086	0.0948	-0.0483	49	-24.2445	1.3925	
		51				22.6944	0.9007	-12.5218	0.0075	0.0827	0.1882	1.2701	-0.0993	-2.2719	0.0075	0.0827	-0.0396	49	-24.6944	0.7299	
		50				23.4391	0.9103	-12.206	0.007	0.0768	0.1877	1.1212	-0.0897	-2.157	0.007	0.0768	-0.0357	49	-24.4391	-0.1212	
EA Portland Cement	44	17	22.49	58	0.5	28.8237	0.9974	-3.5313	0.0004	0.0025	0.0753	0.0156	-0.0026	-0.1147	0.0004	0.0025	-0.0006	20	-25.8237	-3.0156	
		27				20.2893	0.9525	-6.648	0.0055	0.0308	0.1081	0.4177	-0.0475	-1.2216	0.0055	0.0308	-0.0125	20	-27.2893	6.5823	
		22				24.4507	0.985	-4.9324	0.0021	0.0118	0.0944	0.1108	-0.015	-0.5109	0.0021	0.0118	-0.0039	20	-26.4507	1.8892	
		21				25.3132	0.9888	-4.6234	0.0016	0.0092	0.091	0.0797	-0.0112	-0.4028	0.0016	0.0092	-0.0029	20	-26.3132	0.9203	
		20				26.1829	0.9918	-4.3288	0.0012	0.0069	0.0873	0.0558	-0.0082	-0.3092	0.0012	0.0069	-0.0021	20	-26.1829	-0.0558	
Firestone EA Ltd	28	15	22.49	35	0.5	14.5973	0.999	-3.0308	0.0005	0.0006	0.0669	0.002	-0.001	-0.0161	0.0005	0.0006	-0.0001	24	-5.5973	-9.002	
		25				6.2639	0.8499	-5.5597	0.0337	0.0462	0.0877	0.6049	-0.1501	-0.5352	0.0337	0.0462	-0.024	24	-7.2639	0.3951	
		24				6.9857	0.8851	-5.3468	0.028	0.0384	0.089	0.4331	-0.1149	-0.5232	0.028	0.0384	-0.0182	24	-6.9857	-0.4331	
EABL	60	42	22.49	25	0.5	22.4773	0.9969	-8.4962	0.0009	0.0039	0.1867	0.0103	-0.0031	-0.0551	0.0009	0.0039	-0.001	49	-15.4773	-7.0103	
		52				13.8391	0.9375	-10.8427	0.0116	0.0522	0.2121	0.3084	-0.0625	-0.3917	0.0116	0.0522	-0.0203	49	-16.8391	2.6916	
		51				14.662	0.9499	-10.6161	0.0097	0.0438	0.2117	0.2378	-0.0501	-0.3662	0.0097	0.0438	-0.0162	49	-16.662	1.7622	
		50				15.4985	0.9604	-10.3804	0.0081	0.0362	0.2106	0.1806	-0.0396	-0.3314	0.0081	0.0362	-0.0128	49	-16.4985	0.8194	
		49				16.3465	0.9693	-10.1392	0.0065	0.0294	0.209	0.135	-0.0307	-0.2912	0.0065	0.0294	-0.0099	49	-16.3465	-0.135	
Kenya National Mills	47	31	22.49	34	0.5	19.3394	0.9898	-6.4194	0.0024	0.009	0.1359	0.0423	-0.0102	-0.1891	0.0024	0.009	-0.0026	37	-13.3394	-6.0423	
		41				11.1331	0.8762	-9.0684	0.0181	0.068	0.1502	0.7725	-0.1238	-0.8282	0.0181	0.068	-0.033	37	-15.1331	3.2275	
		36				15.0571	0.9551	-7.7781	0.0084	0.0314	0.1492	0.2283	-0.0449	-0.5428	0.0084	0.0314	-0.0117	37	-14.0571	-1.2283	
		37				14.2359	0.9433	-8.0569	0.0101	0.0379	0.1505	0.3006	-0.0567	-0.6207	0.0101	0.0379	-0.0148	37	-14.2359	-0.3006	
		38				13.4309	0.9295	-8.33	0.0119	0.0449	0.1513	0.3893	-0.0705	-0.6927	0.0119	0.0449	-0.0185	37	-14.4309	0.6107	
Kenya Oil Co Ltd	70	45	22.49	22	0.5	29.7865	0.9999	-9.0476	0	0.0003	0.201	0.0004	-0.0001	-0.0035	0	0.0003	0	48	-26.7865	-3.0004	
		55				20.8857	0.9906	-11.1724	0.0023	0.0125	0.2423	0.036	-0.0094	-0.1185	0.0023	0.0125	-0.0035	48	-27.8857	6.964	
		50				25.3228	0.9985	-10.0778	0.0005	0.0024	0.2229	0.0049	-0.0015	-0.0288	0.0005	0.0024	-0.0006	48	-27.3228	1.9951	
		49				26.2146	0.999	-9.8681	0.0003	0.0017	0.2186	0.0031	-0.001	-0.02	0.0003	0.0017	-0.0004	48	-27.2146	0.9969	
		48				27.1071	0.9994	-9.6606	0.0002	0.0011	0.2142	0.0019	-0.0006	-0.0136	0.0002	0.0011	-0.0002	48	-27.1071	-0.0019	



KPLC	171	144	22.49	47	0.5	47.6397	0.8465	-35.2952	0.0042	0.2863	0.4856	5.3242	-0.1535	-6.354	0.0042	0.2863	-0.1578	180	-11.6397	-41.3242					
		154				41.1956	0.7938	-37.4661	0.005	0.3448	0.4727	7.8165	-0.2062	-6.5152	0.005	0.3448	-0.2154	180	-15.1956	-33.8165					
		164				35.3681	0.7357	-38.9287	0.0058	0.3955	0.4522	10.9254	-0.2643	-5.9679	0.0058	0.3955	-0.2806	180	-19.3681	-26.9254					
		174				30.1645	0.6744	-39.6219	0.0063	0.4355	0.4258	14.6582	-0.3256	-4.6514	0.0063	0.4355	-0.3516	180	-24.1645	-20.6582					
		184				25.5716	0.6118	-39.5536	0.0067	0.4633	0.3952	19.0018	-0.3882	-2.5732	0.0067	0.4633	-0.4269	180	-29.5716	-15.0018					
		194				21.5602	0.5497	-38.7861	0.007	0.4786	0.3622	23.9267	-0.4503	0.204	0.007	0.4786	-0.5047	180	-35.5602	-9.9267					
		204				18.0893	0.4895	-37.4194	0.007	0.4822	0.328	29.3923	-0.5105	3.5806	0.007	0.4822	-0.5835	180	-42.0893	-5.3923					
		214				15.1113	0.4323	-35.5735	0.0069	0.4754	0.2941	35.3507	-0.5677	7.4363	0.0069	0.4754	-0.6621	180	-49.1113	-1.3507					
		224				12.575	0.3791	-33.3741	0.0067	0.4601	0.2613	41.7509	-0.6209	11.6454	0.0067	0.4601	-0.7396	180	-56.575	2.2491					
		219				13.7912	0.4052	-34.5102	0.0068	0.4687	0.2775	38.4988	-0.5948	9.5044	0.0068	0.4687	-0.701	180	-52.7912	0.5012					
		218				14.0467	0.4105	-34.7292	0.0068	0.4702	0.2808	37.8607	-0.5895	9.0845	0.0068	0.4702	-0.6933	180	-52.0467	<b>0.1393</b>					
		217				14.3064	0.4159	-34.9451	0.0069	0.4716	0.2841	37.2267	-0.5841	8.6676	0.0069	0.4716	-0.6855	180	-51.3064	-0.2267					
		Total Kenya Ltd				84.5	29	22.49	57	0.5	58.5934	0.9991	-5.9101	0.0001	0.0018	0.1292	0.009	-0.0009	-0.0817	0.0001	0.0018	-0.0004	53	-34.5934	-24.009
							39				49.7539	0.9918	-8.4229	0.0007	0.0134	0.1703	0.106	-0.0082	-0.5847	0.0007	0.0134	-0.004	53	-35.7539	-14.106
							49				41.2331	0.9666	-11.6299	0.0022	0.0445	0.2022	0.5215	-0.0334	-1.7819	0.0022	0.0445	-0.0167	53	-37.2331	-4.5215
59	33.3573		0.9149	-15.1883	0.0046		0.093				0.2198	1.5822	-0.0851	-3.3304	0.0046	0.093	-0.0439	53	-39.3573	4.4178					
54	37.1945		0.9442	-13.409	0.0033		0.0672				0.213	0.9511	-0.0558	-2.5561	0.0033	0.0672	-0.0283	53	-38.1945	<b>0.0489</b>					
53	37.9872		0.9493	-13.0499	0.0031		0.0623				0.2111	0.8503	-0.0507	-2.398	0.0031	0.0623	-0.0257	53	-37.9872	-0.8503					
Unga Group Ltd	150	88	22.49	39	0.5	71.4558	0.9934	-18.2057	0.0004	0.0196	0.3878	0.0963	-0.0066	-0.5195	0.0004	0.0196	-0.0054	120	-39.4558	-32.0963					
		98				62.7263	0.9817	-20.87	0.0011	0.0477	0.4226	0.3032	-0.0183	-1.174	0.0011	0.0477	-0.0153	120	-40.7263	-22.3032					
		108				54.2543	0.9588	-23.7947	0.0021	0.0936	0.4478	0.7677	-0.0412	-2.0889	0.0021	0.0936	-0.0347	120	-42.2543	-12.7677					
		118				46.1943	0.9216	-26.758	0.0035	0.1553	0.4602	1.644	-0.0784	-3.0423	0.0035	0.1553	-0.067	120	-44.1943	-3.644					
		128				38.7041	0.8688	-29.4108	0.0051	0.2258	0.4581	3.0903	-0.1312	-3.6853	0.0051	0.2258	-0.1138	120	-46.7041	4.9097					
		123				42.3688	0.8971	-28.1471	0.0043	0.19	0.461	2.2867	-0.1029	-3.4265	0.0043	0.19	-0.0886	120	-45.3688	<b>0.7133</b>					
		122				43.1215	0.9023	-27.8778	0.0042	0.183	0.4611	2.1459	-0.0977	-3.3582	0.0042	0.183	-0.084	120	-45.1215	-0.1459					

SIMULATION OF OPTION VALUES USING BOPSCOL																	Stock price	Value of	Value of			
AGRICULTURAL SECTOR-JANUARY TO JUNE 1998																	at expiration	European	European			
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	30.6.98	call option	put option		
Brooke Bond	110	91	23.32	23	0.5	29.1923	0.9752	-19.2463	0.0032	0.0451	0.3904	0.1769	-0.0248	-0.3607	0.0032	0.0451	-0.0145	132	11.8077	-41.1769		
		97				24.1494	0.942	-20.6077	0.0065	0.0903	0.3973	0.4737	-0.058	-0.4769	0.0065	0.0903	-0.0343	132	10.8506	-35.4737		
		107				16.4848	0.8335	-22.004	0.014	0.1942	0.376	1.7085	-0.1665	0.2022	0.014	0.1942	-0.1001	132	8.5152	-26.7085		
		117				10.2679	0.6624	-21.1339	0.0204	0.2842	0.313	4.391	-0.3376	3.1476	0.0204	0.2842	-0.2077	132	4.7321	-19.391		
		127				5.8157	0.466	-17.7084	0.0222	0.3092	0.222	8.8383	-0.534	8.6485	0.0222	0.3092	-0.3379	132	-0.8157	-13.8383		
		137				3.0058	0.2907	-12.8861	0.0192	0.2665	0.1448	14.9277	-0.7093	15.5461	0.0192	0.2665	-0.4648	132	-8.0058	-9.9277		
		147				1.4284	0.1624	-8.2287	0.0137	0.1911	0.0822	22.2498	-0.8376	22.2788	0.0137	0.1911	-0.5719	132	-16.4284	-7.2498		
		157				0.6302	0.0824	-4.6852	0.0085	0.1182	0.0422	30.3509	-0.9176	27.8976	0.0085	0.1182	-0.6564	132	-25.6302	-5.3509		
		167				0.2607	0.0385	-2.4185	0.0047	0.0649	0.0198	38.8808	-0.9615	32.2397	0.0047	0.0649	-0.7233	132	-35.2607	-3.8808		
				126			6.1819	0.4853	-18.1406	0.0223	0.3101	0.236	8.3145	-0.5147	8.0088	0.0223	0.3101	-0.3246	132	-0.1819	-14.3145	
				125			6.5651	0.5049	-18.5568	0.0223	0.3103	0.2449	7.8078	-0.4951	7.385	0.0223	0.3103	-0.3114	132	0.4349	-14.8078	
		Eaagads Ltd	41.5	28	23.32	30	0.5	16.5999	0.994	-5.8986	0.0019	0.005	0.1233	0.0182	-0.006	-0.0877	0.0019	0.005	-0.0013	37	-7.5999	-9.0182
				38				8.3872	0.8579	-8.326	0.0255	0.066	0.1361	0.7049	-0.1421	-0.4397	0.0255	0.066	-0.033	37	-9.3872	0.2951
				37				9.1182	0.8843	-8.1479	0.0221	0.0572	0.1379	0.546	-0.1157	-0.4691	0.0221	0.0572	-0.0267	37	-9.1182	-0.546
		George Williamson	85.8	94	23.32	23	0.5	6.6303	0.5937	-15.7452	0.0278	0.2353	0.2215	4.4847	-0.4063	3.763	0.0278	0.2353	-0.1967	141	40.3697	-51.4847
				104				3.0171	0.3503	-11.4749	0.0266	0.2248	0.1352	9.771	-0.6497	10.1087	0.0266	0.2248	-0.3276	141	33.9829	-46.771
114						1.1902	0.1713	-6.6979	0.0182	0.1543	0.0675	16.8434	-0.8287	16.961	0.0182	0.1543	-0.4397	141	25.8098	-43.8434		
124						0.4149	0.0713	-3.2306	0.0098	0.0826	0.0285	24.9676	-0.9287	22.5037	0.0098	0.0826	-0.5232	141	16.5851	-41.9676		
134						0.1305	0.026	-1.333	0.0043	0.0367	0.0105	33.5826	-0.974	26.4766	0.0043	0.0367	-0.5858	141	6.8695	-40.5826		
144						0.0378	0.0085	-0.4853	0.0017	0.0141	0.0035	42.3893	-0.9915	29.3996	0.0017	0.0141	-0.6373	141	-3.0378	-39.3893		
135						0.1157	0.0234	-1.2111	0.004	0.0335	0.0094	34.4577	-0.9766	26.806	0.004	0.0335	-0.5913	141	5.8843	-40.4577		
136						0.1025	0.021	-1.0991	0.0036	0.0306	0.0085	35.3344	-0.979	27.1256	0.0036	0.0306	-0.5967	141	4.8975	-40.3344		
137						0.0907	0.0188	-0.9962	0.0033	0.0279	0.0076	36.2126	-0.9812	27.436	0.0033	0.0279	-0.602	141	3.9093	-40.2126		
138						0.0802	0.0168	-0.9019	0.003	0.0254	0.0068	37.0921	-0.9832	27.7378	0.003	0.0254	-0.6072	141	2.9198	-40.0921		
139						0.0708	0.0151	-0.8156	0.0027	0.0231	0.0061	37.9727	-0.9849	28.0317	0.0027	0.0231	-0.6124	141	1.9292	-39.9727		
140						0.0626	0.0135	-0.7367	0.0025	0.0209	0.0055	38.8543	-0.9865	28.3181	0.0025	0.0209	-0.6175	141	0.9374	-39.8543		
141						0.0552	0.012	-0.6648	0.0022	0.019	0.0049	39.7369	-0.988	28.5976	0.0022	0.019	-0.6225	141	-0.0552	-39.7369		
Kakuzi Ltd	96			87	23.32	26	0.5	19.5185	0.8965	-18.6944	0.0102	0.1222	0.3327	0.9433	-0.1035	-0.6389	0.0102	0.1222	-0.0544	141.9	35.3815	-55.8433
		97				12.5951	0.7485	-19.446	0.0181	0.2164	0.2963	2.9194	-0.2515	0.6848	0.0181	0.2164	-0.1353	141.9	32.3049	-47.8194		
		107				7.3977	0.5541	-17.6563	0.0224	0.2683	0.229	6.6214	-0.4459	4.5498	0.0224	0.2683	-0.2471	141.9	27.5023	-41.5214		
		117				3.9685	0.3632	-13.8289	0.0213	0.2547	0.1545	12.0916	-0.6368	10.4526	-0.3661	0.2547	-0.3661	141.9	20.9315	-36.9916		
		127				1.9612	0.213	-9.4409	0.0165	0.1973	0.0924	18.9838	-0.787	16.9159	0.0165	0.1973	-0.4727	141.9	12.9388	-33.8838		
		137				0.9026	0.1135	-5.7234	0.0109	0.1305	0.05	26.8245	-0.8865	22.7088	0.0109	0.1305	-0.5597	141.9	3.9974	-31.7245		
		147				0.3911	0.0558	-3.1416	0.0064	0.0763	0.0248	35.2124	-0.9442	27.366	0.0064	0.0763	-0.6293	141.9	-5.4911	-30.1124		
		138				0.8323	0.1061	-5.4126	0.0104	0.1243	0.0467	27.6442	-0.8939	23.2271	0.0104	0.1243	-0.5673	141.9	3.0677	-31.5442		
		139				0.767	0.099	-5.1138	0.0099	0.1183	0.0437	28.4688	-0.901	23.7335	0.0099	0.1183	-0.5748	141.9	2.133	-31.3688		
		140				0.7064	0.0924	-4.8268	0.0094	0.1124	0.0408	29.2982	-0.9076	24.228	0.0094	0.1124	-0.5821	141.9	1.1936	-31.1982		
		141				0.6503	0.0862	-4.5517	0.0089	0.1067	0.0381	30.132	-0.9138	24.7106	0.0089	0.1067	-0.5893	141.9	0.2497	-31.032		
		142				0.5982	0.0803	-4.2883	0.0084	0.1012	0.0355	30.9699	-0.9197	25.1815	0.0084	0.1012	-0.5963	141.9	-0.6982	-30.8699		
		Kapchorua Tea Co	70	64	23.32	22	0.5	13.4663	0.9197	-13.4964	0.0137	0.0738	0.2546	0.4225	-0.0803	-0.2142	0.0137	0.0738	-0.0302	75.5	-1.9663	-11.9225
				74				6.6028	0.6809	-13.4643	0.0328	0.1768	0.2053	2.4585	-0.3191	1.8932	0.0328	0.1768	-0.124	75.5	-5.1028	-3.9585
84						2.5034	0.3652	-9.4708	0.0345	0.1861	0.1153	7.2584	-0.6348	7.9621	0.0345	0.1861	-0.2585	75.5	-11.0034	1.2416		
75						6.0627	0.6494	-13.2234	0.034	0.1834	0.197	2.8083	-0.3506	2.3416	0.034	0.1834	-0.1367	75.5	-5.5627	-3.3083		
76						5.5523	0.6174	-12.9385	0.035	0.1889	0.1883	3.1878	-0.3826	2.8341	0.035	0.1889	-0.1498	75.5	-6.0523	-2.6878		
77						5.0715	0.585	-12.6118	0.0358	0.193	0.1794	3.597	-0.415	3.3683	0.0358	0.193	-0.1632	75.5	-6.5715	-2.097		
78						4.6203	0.5524	-12.2464	0.0363	0.1958	0.1702	4.0357	-0.4476	3.9412	0.0363	0.1958	-0.1768	75.5	-7.1203	-1.5357		

79	4.1984	0.5199	-11.846	0.0366	0.1972	0.161	4.5037	-0.4801	4.5492	0.0366	0.1972	-0.1906	75.5	-7.8984	-1.0037
80	3.8051	0.4876	-11.4146	0.0366	0.1974	0.1516	5.0004	-0.5124	5.1882	0.0366	0.1974	-0.2043	75.5	-8.3051	-0.5004
81	3.4399	0.4558	-10.9566	0.0364	0.1963	0.1423	5.5251	-0.5442	5.8537	0.0364	0.1963	-0.2181	75.5	-8.9399	-0.0251
82	3.1019	0.4247	-10.4768	0.036	0.1939	0.1331	6.0771	-0.5753	6.541	0.036	0.1939	-0.2317	75.5	-9.6019	0.4229

Limuru Tea Co	750	782	23.32	2	0.5	54.0661	1	%-162.2918	0	0	3.4797	0	0	0	0	0	0	75.5	-81.0661	27
		792				45.1667	1	%-164.3665	0	0.0001	3.5241	0	0	0.0007	0	0.0001	0	75.5	-82.1667	37
		802				36.2678	0.9998	%-166.4123	0.0001	0.0044	3.5678	0.0006	-0.0002	0.0302	0.0001	0.0044	-0.0008	75.5	-83.2678	46.9994
		812				27.3817	0.9958	%-167.9113	0.0012	0.0656	3.5973	0.0139	-0.0042	0.6065	0.0012	0.0656	-0.0158	75.5	-84.3817	56.9861
		822				18.6325	0.9616	%-164.7297	0.0079	0.4417	3.513	0.1641	-0.0384	5.8634	0.0079	0.4417	-0.1447	75.5	-85.6325	66.8359

Rea Vipingo Ltd	8.2	5	23.32	16	0.5	3.7503	1	-1.0377	0	0	0.0222	0	0	0	0	0	0	6.4	-2.3503	-1.4
		6				2.8604	0.9999	-1.2453	0.0003	0	0.0267	0	-0.0001	-0.0001	0.0003	0	0	6.4	-2.4604	-0.4
		7				1.9724	0.9935	-1.4568	0.0196	0.0011	0.0309	0.002	-0.0065	-0.004	0.0196	0.0011	-0.0003	6.4	-2.5724	0.598
		8				1.1243	0.9041	-1.6246	0.1834	0.0099	0.0314	0.0438	-0.0959	0.0357	0.1834	0.0099	-0.0041	6.4	-2.7243	1.5562

Sasini Tea & Coffee	61.7	34	23.32	44	0.5	31.4922	0.9928	-7.3253	0.001	0.0087	0.1488	0.0502	-0.0072	-0.2691	0.001	0.0087	-0.0025	75.1	9.6078	-41.1502
		44				23.0274	0.9471	-10.3286	0.0056	0.0471	0.177	0.4849	-0.0529	-1.1971	0.0056	0.0471	-0.0188	75.1	8.0726	-31.5849
		54				15.6538	0.8312	-13.1451	0.0131	0.1099	0.1781	2.0106	-0.1688	-1.9382	0.0131	0.1099	-0.0621	75.1	5.4462	-23.1106
		64				9.9452	0.6601	-14.2115	0.0191	0.1598	0.1539	5.2015	-0.3399	-0.9293	0.0191	0.1598	-0.1309	75.1	1.1548	-16.3015
		74				5.9775	0.4785	-13.138	0.0208	0.1738	0.1177	10.1331	-0.5215	2.2195	0.0208	0.1738	-0.2116	75.1	-4.8775	-11.2331
		84				3.4445	0.3223	-10.7191	0.0187	0.1565	0.0822	16.4995	-0.6777	6.7138	0.0187	0.1565	-0.2916	75.1	-12.3445	-7.5995
		94				1.9254	0.2053	-7.9638	0.0148	0.1241	0.0537	23.8799	-0.7947	11.5444	0.0148	0.1241	-0.3646	75.1	-20.8254	-4.9799
		104				1.054	0.1255	-5.5237	0.0108	0.0901	0.0335	31.9078	-0.8745	16.0599	0.0108	0.0901	-0.4293	75.1	-29.954	-3.0078
		114				0.5691	0.0745	-3.644	0.0073	0.0615	0.0201	40.3224	-0.9255	20.0149	0.0073	0.0615	-0.4871	75.1	-39.4691	-1.4224
		65				9.4731	0.6416	-14.1935	0.0195	0.163	0.1506	5.6193	-0.3584	-0.7038	0.0195	0.163	-0.1386	75.1	0.6269	-15.7193
		66				9.0185	0.6232	-14.1536	0.0198	0.1657	0.1472	6.0546	-0.3768	-0.4563	0.0198	0.1657	-0.1465	75.1	0.0815	-15.1546
		67				8.5812	0.6047	-14.0923	0.0201	0.168	0.1436	6.5072	-0.3953	-0.1875	0.0201	0.168	-0.1545	75.1	-0.4812	-14.6072

UNIVERSITY OF NAIROBI  
LOWER KABETE LIBRARY

SIMULATION OF OPTION VALUES USING BOPSCOL  
 COMMERCIAL AND SERVICES SECTOR-JANUARY TO JUNE 1998

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.98	Value of European call option	Value of European put option
A Baumann & Co	15.6	14	23.32	11	0.5	3.1414	0.9983	-2.9058	0.0045	0.0006	0.0622	0.0006	-0.0017	-0.0003	0.0045	0.0006	-0.0001	15.5	-1.6414	-1.5006
		15				2.2603	0.9794	-3.0962	0.0409	0.0055	0.0651	0.0094	-0.0206	0.0169	0.0409	0.0055	-0.0017	15.5	-1.7603	-0.5094
		16				1.4296	0.8873	-3.1268	0.1576	0.0211	0.0621	0.0686	-0.1127	0.1938	0.1576	0.0211	-0.0091	15.5	-1.9296	0.4314
CMC Holdings Ltd	39	31	23.32	29	0.5	11.5379	0.9633	-6.7127	0.01	0.0221	0.1302	0.1261	-0.0367	-0.2791	0.01	0.0221	-0.0078	35	-7.5379	-4.1261
		41				4.499	0.6654	-7.9147	0.0455	0.1004	0.1073	1.9866	-0.3346	0.5942	0.0455	0.1004	-0.0752	35	-10.499	4.0134
		51				1.1486	0.262	-4.7198	0.0407	0.0898	0.0454	7.5356	-0.738	5.8644	0.0407	0.0898	-0.1816	35	-17.1486	8.4644
		61				0.212	0.0655	-1.5662	0.0159	0.0352	0.0117	15.4984	-0.9345	11.0934	0.0159	0.0352	-0.2597	35	-26.212	10.5016
		71				0.0317	0.0122	-0.3572	0.004	0.0087	0.0022	24.2176	-0.9878	14.3778	0.004	0.0087	-0.3137	35	-36.0317	11.7824
		35				8.3444	0.8847	-7.6554	0.0243	0.0536	0.1308	0.4923	-0.1153	-0.3917	0.0243	0.0536	-0.0249	35	-8.3444	-0.4923
		36				7.6126	0.8558	-7.8241	0.0284	0.0626	0.1288	0.6505	-0.1442	-0.3528	0.0284	0.0626	-0.0314	35	-8.6126	0.3495
Car & General	16.1	8	23.32	43	0.5	8.9841	0.9977	-1.6859	0.0015	0.0008	0.0354	0.0036	-0.0023	-0.0256	0.0015	0.0008	-0.0002	11.1	-5.8841	-3.1036
		19				1.6155	0.4963	-3.4396	0.0815	0.0454	0.0319	2.4244	-0.5037	0.5035	0.0815	0.0454	-0.0527	11.1	-9.5155	5.4756
		29				0.1598	0.0808	-0.999	0.0306	0.017	0.0057	9.8681	-0.9192	5.0195	0.0306	0.017	-0.1233	11.1	-18.0598	8.0319
		9				8.1032	0.9928	-1.9354	0.0041	0.0023	0.0394	0.0127	-0.0072	-0.0676	0.0041	0.0023	-0.0006	11.1	-6.0032	-2.1127
		10				7.2356	0.9822	-2.2149	0.009	0.005	0.0429	0.035	-0.0178	-0.1396	0.009	0.005	-0.0016	11.1	-6.1356	-1.135
		11				6.3914	0.9631	-2.5203	0.0165	0.0092	0.0456	0.0807	-0.0369	-0.2374	0.0165	0.0092	-0.0034	11.1	-6.2914	-0.1807
		12				5.5824	0.9335	-2.8349	0.0264	0.0147	0.0472	0.1617	-0.0665	-0.3445	0.0264	0.0147	-0.0062	11.1	-6.4824	0.7383
Express Kenya Ltd	60	32	23.32	36	0.5	31.527	0.9989	-6.6815	0.0002	0.0016	0.142	0.0051	-0.0011	-0.0404	0.0002	0.0016	-0.0004	30	-33.527	1.9949
		42				22.7696	0.9765	-9.2006	0.0036	0.0235	0.1791	0.1471	-0.0235	-0.4842	0.0036	0.0235	-0.0078	30	-34.7696	11.8529
		52				14.7927	0.8744	-11.9395	0.0135	0.0876	0.1884	1.0697	-0.1256	-1.1478	0.0135	0.0876	-0.043	30	-36.7927	20.9303
		62				8.5558	0.676	-12.9535	0.0235	0.1525	0.16	3.7321	-0.324	-0.0864	0.0235	0.1525	-0.1159	30	-40.5558	28.2679
		72				4.4524	0.4479	-11.2704	0.0259	0.1678	0.1121	8.5281	-0.5521	3.6721	0.0259	0.1678	-0.2083	30	-46.4524	33.4719
Kenya Airways	7.4	5	23.32	25	0.5	2.9509	0.9985	-1.0413	0.0038	0.0003	0.0222	0.0006	-0.0015	-0.0037	0.0038	0.0003	-0.0001	7	-0.9509	-2.0006
		6				2.0744	0.9735	-1.2765	0.047	0.0032	0.0256	0.0141	-0.0265	-0.0313	0.047	0.0032	-0.0011	7	-1.0744	-1.0141
		7				1.2752	0.856	-1.4766	0.1735	0.0119	0.0253	0.1048	-0.144	-0.0238	0.1735	0.0119	-0.0059	7	-1.2752	-0.1048
		8				0.6637	0.6206	-1.414	0.2909	0.0199	0.0196	0.3832	-0.3794	0.2463	0.2909	0.0199	-0.016	7	-1.6637	0.6168
Lonhro Motors	39	23	23.32	25	0.5	18.5315	0.9999	-4.775	0.0001	0.0001	0.1023	0.0002	-0.0001	-0.0017	0.0001	0.0001	0	26.3	-15.2315	-3.3002
		33				9.7691	0.9548	-7.0615	0.0138	0.0262	0.1373	0.1372	-0.0452	-0.2128	0.0138	0.0262	-0.0095	26.3	-16.4691	6.5628
		24				17.6418	0.9998	-4.9847	0.0001	0.0002	0.1067	0.0004	-0.0002	-0.0039	0.0001	0.0002	0	26.3	-15.3418	-2.3004
		25				16.7519	0.9998	-5.1919	0.0001	0.0003	0.1112	0.0004	-0.0002	-0.0036	0.0001	0.0003	0	26.3	-15.4519	-1.3004
		26				15.8626	0.9994	-5.4035	0.0003	0.0006	0.1156	0.001	-0.0006	-0.0076	0.0003	0.0006	-0.0001	26.3	-15.5626	-0.301
		27				14.974	0.9987	-5.6182	0.0006	0.0012	0.1199	0.0024	-0.0013	-0.0148	0.0006	0.0012	-0.0003	26.3	-15.674	0.6976
Marshalls EA Ltd	26.2	20	23.32	17	0.5	8.4016	0.9995	-4.1532	0.0006	0.0003	0.0889	0.0005	-0.0005	-0.0025	0.0006	0.0003	-0.0001	28.3	-0.1016	-8.3005
		21				7.5132	0.998	-4.3657	0.0021	0.0012	0.0932	0.002	-0.002	-0.0074	0.0021	0.0012	-0.0003	28.3	-0.2132	-7.302
		31				0.7118	0.3559	-3.1822	0.1183	0.069	0.0431	2.1	-0.6441	3.2513	0.1183	0.069	-0.0949	28.3	-3.4118	0.6
		30				1.034	0.4615	-3.8293	0.1261	0.0736	0.0553	1.5323	-0.5385	2.3968	0.1261	0.0736	-0.0782	28.3	-2.734	0.1677
		29				1.4519	0.5735	-4.4007	0.1245	0.0726	0.0679	1.0602	-0.4265	1.6178	0.1245	0.0726	-0.0612	28.3	-2.1519	-0.3602

Nation Media Group		129.9	38	23.32	80	0.5	96.1873	0.9961	-8.5923	0.0002	0.0106	0.166	0.1051	-0.0039	-0.706	0.0002	0.0106	-0.003	113.2	-20.9873	-75.3051
			48				87.5624	0.9877	-11.8399	0.0004	0.0292	0.2037	0.3796	-0.0123	-1.8782	0.0004	0.0292	-0.0099	113.2	-22.3624	-65.5796
			58				79.2533	0.9722	-15.6605	0.0009	0.0586	0.2352	0.9699	-0.0278	-3.6235	0.0009	0.0586	-0.0229	113.2	-24.0533	-56.1699
			68				71.3773	0.9488	-19.8213	0.0014	0.0966	0.2593	1.9933	-0.0512	-5.7089	0.0014	0.0966	-0.0432	113.2	-26.1773	-47.1933
			78				64.0203	0.9178	-24.0212	0.0021	0.1393	0.276	3.5357	-0.0822	-7.8336	0.0021	0.1393	-0.071	113.2	-28.8203	-38.7357
			88				57.2332	0.8805	-27.9834	0.0027	0.1832	0.2857	5.6481	-0.1195	-9.7204	0.0027	0.1832	-0.1059	113.2	-32.0332	-30.8481
			98				51.0357	0.8382	-31.4997	0.0033	0.2251	0.2892	8.3499	-0.1618	-11.1614	0.0033	0.2251	-0.1468	113.2	-35.8357	-23.5499
			108				45.4227	0.7926	-34.4413	0.0039	0.2628	0.2877	11.6363	-0.2074	-12.0276	0.0039	0.2628	-0.1929	113.2	-40.2227	-16.8363
			118				40.3721	0.745	-36.7494	0.0044	0.295	0.282	15.4851	-0.255	-12.2604	0.0044	0.295	-0.2431	113.2	-45.1721	-10.6851
			128				35.8505	0.6967	-38.4197	0.0048	0.3209	0.2733	19.863	-0.3033	-11.8553	0.0048	0.3209	-0.2963	113.2	-50.6505	-5.063
			138				31.8185	0.6488	-39.4855	0.005	0.3407	0.2623	24.7303	-0.3512	-10.8457	0.005	0.3407	-0.3518	113.2	-56.6185	0.0697
			137				32.2008	0.6535	-39.4046	0.005	0.339	0.2635	24.2228	-0.3465	-10.9724	0.005	0.339	-0.3461	113.2	-56.0008	-0.4228
Pearl Drycleaners		10.5	9	23.32	4	0.5	2.4905	1	-1.8678	0	0	0.04	0	0	0	0	0	0	10.3	-1.1905	-1.3
			10				1.6006	1	-2.0753	0	0	0.0445	0	0	0	0	0	0	10.3	-1.3006	-0.3
			11				0.7113	0.9936	-2.2725	0.0602	0.0013	0.0486	0.0006	-0.0064	0.0104	0.0602	0.0013	-0.0003	10.3	-1.4113	0.6994
Standard Newspaper		32	6	23.32	92	0.5	26.6676	0.999	-1.3086	0.0002	0.0008	0.0265	0.0072	-0.001	-0.0634	0.0002	0.0008	-0.0002	29.9	-2.7676	-23.9072
			16				18.4461	0.9418	-5.1479	0.0056	0.0263	0.0585	0.6851	-0.0582	-1.8274	0.0056	0.0263	-0.0127	29.9	-4.5461	-14.5851
			26				12.2785	0.7949	-8.9845	0.0137	0.0643	0.0658	3.417	-0.2051	-3.5886	0.0137	0.0643	-0.0499	29.9	-8.3785	-7.317
			36				8.1466	0.6268	-10.6594	0.0182	0.0857	0.0596	8.1845	-0.3732	-3.1882	0.0182	0.0857	-0.1006	29.9	-14.2466	-2.0845
			46				5.4635	0.4787	-10.5914	0.0191	0.0901	0.0493	14.4008	-0.5213	-1.0448	0.0191	0.0901	-0.1554	29.9	-21.5635	1.6992
			37				7.8228	0.6108	-10.7162	0.0184	0.0868	0.0586	8.7506	-0.3892	-3.0374	0.0184	0.0868	-0.106	29.9	-14.9228	-1.6506
			38				7.5128	0.595	-10.7563	0.0186	0.0877	0.0576	9.3306	-0.405	-2.87	0.0186	0.0877	-0.1115	29.9	-15.6128	-1.2306
			39				7.216	0.5794	-10.7808	0.0188	0.0885	0.0566	9.9237	-0.4206	-2.687	0.0188	0.0885	-0.1169	29.9	-16.316	-0.8237
			40				6.9318	0.5641	-10.7907	0.0189	0.0891	0.0556	10.5295	-0.4359	-2.4893	0.0189	0.0891	-0.1224	29.9	-17.0318	-0.4295
			41				6.6598	0.5492	-10.7867	0.019	0.0896	0.0546	11.1474	-0.4508	-2.2778	0.019	0.0896	-0.1279	29.9	-17.7598	-0.0474
			42				6.3993	0.5345	-10.7699	0.0191	0.0899	0.0535	11.7768	-0.4655	-2.0535	0.0191	0.0899	-0.1334	29.9	-18.4993	0.3232
TPS Serena		14	9	23.32	31	0.5	5.9945	0.9961	-1.8899	0.0038	0.0012	0.0398	0.004	-0.0039	-0.0221	0.0038	0.0012	-0.0003	13	-1.9945	-4.004
			19				0.3622	0.2261	-1.5769	0.098	0.0298	0.014	3.271	-0.7739	2.3663	0.098	0.0298	-0.0705	13	-6.3622	2.729
			10				5.1178	0.9852	-2.1377	0.0122	0.0037	0.0434	0.0173	-0.0148	-0.0624	0.0122	0.0037	-0.0011	13	-2.1178	-3.0173
			11				4.2657	0.9592	-2.4055	0.0285	0.0087	0.0458	0.055	-0.0408	-0.1227	0.0285	0.0087	-0.0031	13	-2.2657	-2.055
			12				3.46	0.9106	-2.6619	0.0526	0.016	0.0464	0.1393	-0.0894	-0.1715	0.0526	0.016	-0.007	13	-2.46	-1.1393
			13				2.7256	0.8364	-2.8526	0.0805	0.0244	0.0449	0.2948	-0.1636	-0.1547	0.0805	0.0244	-0.0129	13	-2.7256	-0.2948
			14				2.0838	0.7394	-2.9247	0.1058	0.0321	0.0413	0.5429	-0.2606	-0.0192	0.1058	0.0321	-0.021	13	-3.0838	0.4571
Uchumi Supermark		40.6	28	23.32	31	0.5	15.713	0.9903	-5.9431	0.0029	0.0075	0.1225	0.0314	-0.0097	-0.1322	0.0029	0.0075	-0.0021	45.5	1.787	-17.5314
			38				7.6984	0.8273	-8.3124	0.0287	0.0734	0.1294	0.9162	-0.1727	-0.4261	0.0287	0.0734	-0.0396	45.5	-0.1984	-8.4162
			48				2.6741	0.4513	-7.1736	0.0445	0.1137	0.0783	4.7912	-0.5487	2.7881	0.0445	0.1137	-0.1353	45.5	-5.1741	-2.2912
			58				0.6924	0.1622	-3.5583	0.0276	0.0705	0.0295	11.709	-0.8378	8.4787	0.0276	0.0705	-0.2286	45.5	-13.1924	0.791
			68				0.1465	0.0435	-1.1989	0.0104	0.0265	0.0081	20.0625	-0.9565	12.9134	0.0104	0.0265	-0.2945	45.5	-22.6465	2.4375
			33				11.4644	0.9437	-7.2696	0.0127	0.0325	0.1343	0.2325	-0.0563	-0.4209	0.0127	0.0325	-0.0126	45.5	1.0356	-12.7325
			34				10.6609	0.9266	-7.5261	0.0156	0.04	0.1348	0.3189	-0.0734	-0.4699	0.0156	0.04	-0.0165	45.5	0.8391	-11.8189
			35				9.8796	0.9064	-7.7657	0.0188	0.048	0.1346	0.4276	-0.0936	-0.502	0.0188	0.048	-0.0211	45.5	0.6204	-10.9276
			36				9.1236	0.883	-7.9813	0.0221	0.0564	0.1336	0.5615	-0.117	-0.51	0.0221	0.0564	-0.0266	45.5	0.3764	-10.0615
			37				8.3957	0.8566	-8.1656	0.0254	0.0649	0.1319	0.7236	-0.1434	-0.4869	0.0254	0.0649	-0.0327	45.5	0.1043	-9.2236
			57				0.801	0.1824	-3.8948	0.0297	0.076	0.033	10.9276	-0.8176	7.9347	0.0297	0.076	-0.2206	45.5	-12.301	0.5724
			56				0.9247	0.2045	-4.2461	0.0319	0.0815	0.0369	10.1614	-0.7955	7.3758	0.0319	0.0815	-0.2123	45.5	-11.4247	0.3386



SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JANUARY TO JUNE 1998

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.98	Value of European call option	Value of European put option	
Barclays Bank	116	71	23.3	38	0.5	52.9079	0.9917	-15.1944	0.0007	0.0186	0.3106	0.0937	-0.0083	-0.4595	0.0007	0.0186	-0.0053	101.5	-22.4079	-30.5937	
		81				44.2898	0.9716	-17.9809	0.0021	0.0533	0.3421	0.3751	-0.0284	-1.1706	0.0021	0.0533	-0.0183	101.5	-23.7898	-20.8751	
		91				36.1032	0.9294	-20.9339	0.0043	0.1108	0.3586	1.0879	-0.0706	-2.0483	0.0043	0.1108	-0.0464	101.5	-25.6032	-11.5879	
		101				28.6173	0.8607	-23.5231	0.0071	0.1819	0.3561	2.5013	-0.1393	-2.5622	0.0071	0.1819	-0.0933	101.5	-28.1173	-3.0013	
		111				22.0611	0.768	-25.141	0.0098	0.2503	0.3351	4.8445	-0.232	-2.1047	0.0098	0.2503	-0.1588	101.5	-31.5611	4.6555	
	City Trust Ltd	34	9	23.3	77	0.5	26.0012	0.9983	-1.9535	0.0003	0.0013	0.0397	0.0107	-0.0017	-0.0857	0.0003	0.0013	-0.0003	31.6	-3.4012	-22.6107
16						20.0328	0.9693	-4.2973	0.0037	0.0167	0.0646	0.0219	-0.0307	-0.9767	0.0037	0.0167	-0.0066	31.6	-4.4328	-15.8719	
26						12.9736	0.8362	-8.1779	0.0133	0.0594	0.0773	2.112	-0.1638	-2.782	0.0133	0.0594	-0.0384	31.6	-7.3736	-7.712	
36						8.1067	0.6486	-10.1189	0.02	0.0892	0.0697	6.1446	-0.3514	-2.6476	0.02	0.0892	-0.0905	31.6	-12.5067	-1.7446	
46						5.0207	0.4726	-9.9439	0.0215	0.0957	0.0552	11.958	-0.5274	-0.3974	0.0215	0.0957	-0.1495	31.6	-19.4207	2.442	
CFC Bank	17.4	12	23.3	24	0.5	6.7221	0.9985	-2.4986	0.0017	0.0006	0.0533	0.0014	-0.0015	-0.0082	0.0017	0.0006	-0.0001	16.9	-1.8221	-4.9014	
		22				0.4503	0.2708	-1.9718	0.1121	0.0407	0.0213	2.629	-0.7292	2.594	0.1121	0.0407	-0.0766	16.9	-5.5503	2.471	
	Diamond Trust Banl	22.1	16	23.3	20	0.5	7.8616	0.9993	-3.3246	0.0008	0.0004	0.0711	0.0006	-0.0007	-0.004	0.0008	0.0004	-0.0001	22	-1.8616	-6.0006
26						0.8224	0.3998	-3.0757	0.1236	0.0604	0.0401	1.8608	-0.6002	2.3202	0.1236	0.0604	-0.0756	22	-4.8224	2.1392	
Housing Finance Cc of Kenya		15.3	10	23.3	32	0.5	6.4078	0.9939	-2.1115	0.005	0.0019	0.044	0.0073	-0.0061	-0.0361	0.005	0.0019	-0.0005	16	-0.4078	-6.0073
	20					0.5605	0.2893	-2.0852	0.0988	0.037	0.0193	3.0593	-0.7107	2.0655	0.0988	0.037	-0.0697	16	-4.5605	0.9407	
ICDC Investments Co Ltd	35.1	27	23.3	37	0.5	11.3202	0.9429	-6.1305	0.0125	0.0285	0.1089	0.2486	-0.0571	-0.527	0.0125	0.0285	-0.0113	39.1	0.7798	-12.3486	
		37				4.7306	0.6462	-7.6007	0.0405	0.0923	0.0897	2.5584	-0.3538	0.078	0.0405	0.0923	-0.0749	39.1	-2.6306	-4.6584	

					47	1.4988	0.2948	-5.2311	0.0376	0.0856	0.0442	8.226	-0.7052	4.523	0.0376	0.0856	-0.1649	39.1	-9.3988	-0.326
					57	0.3957	0.1009	-2.3549	0.0192	0.0438	0.0157	16.0224	-0.8991	9.4746	0.0192	0.0438	-0.2379	39.1	-18.2957	1.8776
					28	10.5248	0.9251	-6.4164	0.0154	0.0351	0.1097	0.3432	-0.0749	-0.6055	0.0154	0.0351	-0.0149	39.1	0.5752	-11.4432
					29	9.7536	0.9043	-6.6882	0.0185	0.0422	0.1099	0.4619	-0.0957	-0.6697	0.0185	0.0422	-0.0191	39.1	0.3464	-10.5619
					30	9.0095	0.8803	-6.9382	0.0217	0.0496	0.1094	0.6078	-0.1197	-0.7122	0.0217	0.0496	-0.024	39.1	<b>0.0905</b>	-9.7078
					31	8.2951	0.8534	-7.1594	0.025	0.057	0.1083	0.7833	-0.1466	-0.7259	0.025	0.057	-0.0296	39.1	-0.1951	-8.8833
					48	1.3207	0.2677	-4.9062	0.0358	0.0817	0.0404	8.9379	-0.7323	5.0554	0.0358	0.0817	-0.1732	39.1	-10.2207	-0.0379
					49	1.1618	0.2424	-4.5832	0.034	0.0776	0.0367	9.6689	-0.7576	5.586	0.034	0.0776	-0.1813	39.1	-11.0618	<b>0.2311</b>
Jubilee Insurance Co Ltd	31	24	23.3	19	0.5	9.6443	0.9977	-4.9933	0.0017	0.0015	0.1064	0.0029	-0.0023	-0.0125	0.0017	0.0015	-0.0004	30.2	-3.4443	-6.2029
		34				2.038	0.5977	-5.4573	0.0929	0.0848	0.0825	1.296	-0.4023	1.5988	0.0929	0.0848	-0.0688	30.2	-5.838	2.504
		25				8.7592	0.9944	-5.2127	0.0038	0.0035	0.1103	0.0078	-0.0056	-0.0243	0.0038	0.0035	-0.0009	30.2	-3.5592	-5.2078
		26				7.8803	0.9876	-5.4357	0.0077	0.007	0.1137	0.0187	-0.0124	-0.0398	0.0077	0.007	-0.002	30.2	-3.6803	-4.2187
		27				7.0125	0.9752	-5.6564	0.0139	0.0127	0.1161	0.0409	-0.0248	-0.053	0.0139	0.0127	-0.004	30.2	-3.8125	-3.2409
		28				6.1632	0.9547	-5.8614	0.0229	0.0209	0.1172	0.0816	-0.0453	-0.0504	0.0229	0.0209	-0.0074	30.2	-3.9632	-2.2816
		29				5.3421	0.9238	-6.0293	0.0344	0.0314	0.1165	0.1504	-0.0762	-0.0108	0.0344	0.0314	-0.0126	30.2	-4.1421	-1.3504
		30				4.5604	0.8808	-6.1333	0.0478	0.0436	0.1137	0.2586	-0.1192	0.0928	0.0478	0.0436	-0.0198	30.2	-4.3604	-0.4586
		31				3.8296	0.8251	-6.145	0.0619	0.0565	0.1087	0.4178	-0.1749	0.2885	0.0619	0.0565	-0.0292	30.2	-4.6296	<b>0.3822</b>
KCB Ltd	79.1	54	23.3	23	0.5	31.0462	0.9992	-11.2273	0.0002	0.0016	0.2399	0.003	-0.0008	-0.0205	0.0002	0.0016	-0.0003	70	-15.0462	-16.003
		64				22.2315	0.9822	-13.4977	0.0034	0.0246	0.2773	0.0877	-0.0178	-0.2155	0.0034	0.0246	-0.0075	70	-16.2315	-6.0877
		74				14.0065	0.8865	-15.5599	0.0149	0.1076	0.2806	0.7621	-0.1135	-0.2024	0.0149	0.1076	-0.0487	70	-18.0065	3.2379
		65				21.3677	0.9775	-13.7359	0.0042	0.0299	0.2798	0.1139	-0.0225	-0.2462	0.0042	0.0299	-0.0095	70	-16.3677	-5.1139
		66				20.5101	0.972	-13.973	0.005	0.0359	0.2819	0.1462	-0.028	-0.2757	0.005	0.0359	-0.0118	70	-16.5101	-4.1462
		67				19.6597	0.9656	-14.2072	0.0059	0.0427	0.2836	0.1857	-0.0344	-0.3024	0.0059	0.0427	-0.0146	70	-16.6597	-3.1857
		68				18.8175	0.958	-14.4364	0.007	0.0501	0.2848	0.2335	-0.042	-0.3241	0.007	0.0501	-0.0178	70	-16.8175	-2.2335
		69				17.9848	0.9493	-14.6584	0.0081	0.0583	0.2855	0.2907	-0.0507	-0.3385	0.0081	0.0583	-0.0215	70	-16.9848	-1.2907
		70				17.1627	0.9394	-14.8704	0.0093	0.0671	0.2857	0.3586	-0.0606	-0.343	0.0093	0.0671	-0.0258	70	-17.1627	-0.3586
		71				16.3525	0.9282	-15.0696	0.0106	0.0766	0.2853	0.4383	-0.0718	-0.3346	0.0106	0.0766	-0.0306	70	-17.3525	<b>0.5617</b>
National Bank Ltd	12.6	4	23.3	60	0.5	9.0414	0.9993	-0.8409	0.0005	0.0002	0.0177	0.0011	-0.0007	-0.0108	0.0005	0.0002	-0.0001	12.8	-0.2414	-8.8011
		14				2.1761	0.5943	-3.3116	0.0725	0.0345	0.0266	2.0352	-0.4057	-0.4061	0.0725	0.0345	-0.0357	12.8	-3.3761	-0.8352
		15				1.825	0.5303	-3.2591	0.0744	0.0354	0.0243	2.5741	-0.4697	-0.1461	0.0744	0.0354	-0.0425	12.8	-4.025	-0.3741
		16				1.5264	0.4697	-3.1505	0.0744	0.0354	0.022	3.1654	-0.5303	0.17	0.0744	0.0354	-0.0492	12.8	-4.7264	<b>0.0346</b>
NIC Bank Ltd	40.4	15	23.3	54	0.5	27.0556	0.999	-3.1543	0.0002	0.001	0.0665	0.0047	-0.001	-0.0413	0.0002	0.001	-0.0002	33.1	-8.9556	-18.1047
		25				18.4383	0.9602	-6.0701	0.0056	0.0245	0.1018	0.2868	-0.0398	-0.8817	0.0056	0.0245	-0.0095	33.1	-10.3383	-8.3868
		35				11.2297	0.8084	-9.2051	0.0177	0.0779	0.1072	1.9776	-0.1916	-1.9414	0.0177	0.0779	-0.0486	33.1	-13.1297	-0.0776
		45				6.2682	0.5847	-10.0617	0.0253	0.1114	0.0868	5.9156	-0.4153	-0.7227	0.0253	0.1114	-0.1135	33.1	-18.1682	5.9844
		36				10.6292	0.7876	-9.4169	0.0188	0.0829	0.106	2.2671	-0.2124	-1.9457	0.0188	0.0829	-0.0542	33.1	-13.5292	<b>0.6329</b>
Pan Africa Ins Co	27.8	16	23.3	18	0.5	13.5609	1	-3.3205	0	0	0.0712	0	0	0	0	0	0	20	-9.5609	-4
		26				4.7692	0.9339	-5.3968	0.0363	0.0252	0.106	0.1077	-0.0661	-0.0009	0.0363	0.0252	-0.0097	20	-10.7692	5.8923
		17				12.671	1	-3.5281	0	0	0.0756	0	0	0	0	0	0	20	-9.671	-3
		18				11.7811	1	-3.7357	0	0	0.0801	0	0	-0.0001	0	0	0	20	-9.7811	-2
		19				10.8911	1	-3.9434	0	0	0.0845	0	0	-0.0003	0	0	0	20	-9.8911	-1
		20				10.0013	0.9998	-4.1519	0.0002	0.0001	0.089	0.0002	-0.0002	-0.0012	0.0002	0.0001	0	20	-10.0013	-0.0002
		21				9.112	0.9993	-4.3622	0.0007	0.0005	0.0933	0.0007	-0.0007	-0.004	0.0007	0.0005	-0.0001	20	-10.112	<b>0.9993</b>





SIMULATION OF OPTION VALUES USING BOPSCOL																	Stock price	Value of	Value of	
INDUSTRIAL AND ALLIED SECTOR-JANUARY TO JUNE 1998																	at expiration	European call	European	
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	30.6.98	option	put option
Athi River Mining Ltd	9.2	4	23.32	48	0.5	5.6417	0.9985	-0.8418	0.0016	0.0003	0.0177	0.0015	-0.0015	-0.0117	0.0016	0.0003	-0.0001	9	-0.6417	-5.0015
						0.3661	0.2346	-1.3766	0.0983	0.02	0.009	3.6253	-0.7654	1.5288	0.0983	0.02	-0.0533	9	-5.3661	1.3747
		13	23.32	48	0.5	0.5176	0.3066	-1.6335	0.1124	0.0228	0.0115	2.8868	-0.6934	1.0644	0.1124	0.0228	-0.0463	9	-4.5176	1.1132
						0.7255	0.3937	-1.8768	0.1232	0.025	0.0145	2.2048	-0.6063	0.6136	0.1232	0.025	-0.0389	9	-3.7255	0.7952
						1.0059	0.4947	-2.0724	0.1277	0.026	0.0177	1.5953	-0.5053	0.2104	0.1277	0.026	-0.0312	9	-3.0059	<b>0.4047</b>
						1.3756	0.6055	-2.1802	0.1233	0.025	0.021	1.075	-0.3945	-0.1048	0.1233	0.025	-0.0235	9	-2.3756	-0.075
Bamburi Cement Ltd	37	18	23.32	46	0.5	20.9935	0.9969	-3.8195	0.0008	0.0025	0.0795	0.0125	-0.0031	-0.0839	0.0008	0.0025	-0.0006	35.1	-3.8935	-17.1125
						12.6138	0.9159	-6.8191	0.0128	0.0404	0.1064	0.5321	-0.0841	-1.0082	0.0128	0.0404	-0.0182	35.1	-5.5138	-7.6321
		38	23.32	46	0.5	6.3378	0.6697	-8.6605	0.0301	0.0948	0.0922	3.1556	-0.3303	-0.7742	0.0301	0.0948	-0.0769	35.1	-9.2378	-0.2556
						2.7799	0.3901	-7.3354	0.0319	0.1004	0.0583	8.4971	-0.6099	2.6263	0.0319	0.1004	-0.1553	35.1	-15.6799	4.4029
		39	23.32	46	0.5	5.8667	0.6403	-8.6578	0.0311	0.0979	0.0891	3.5744	-0.3597	-0.564	0.0311	0.0979	-0.0844	35.1	-9.7667	<b>0.3256</b>
BAT Ltd	65.5	63	23.32	9	0.5	9.4429	0.9933	-13.0486	0.0045	0.0086	0.2781	0.0092	-0.0067	0.0261	0.0045	0.0086	-0.0022	67.5	-4.9429	-4.5092
						1.9367	0.5638	-9.8013	0.0945	0.1824	0.1749	1.4024	-0.4362	5.3487	0.0945	0.1824	-0.1499	67.5	-7.4367	4.0976
		67	23.32	9	0.5	5.9969	0.9343	-13.4051	0.0307	0.0592	0.276	0.1229	-0.0657	0.4997	0.0307	0.0592	-0.0221	67.5	-5.4969	-0.6229
						5.1893	0.8989	-13.2578	0.0424	0.0819	0.2684	0.2053	-0.1011	0.8545	0.0424	0.0819	-0.0341	67.5	-5.6893	<b>0.2947</b>
BOC Gases Ltd	37	19	23.32	46	0.5	20.1125	0.9949	-4.0709	0.0012	0.0038	0.0835	0.0214	-0.0051	-0.1277	0.0012	0.0038	-0.001	35.1	-4.0125	-16.1214
						11.8654	0.898	-7.1243	0.0148	0.0466	0.1068	0.6737	-0.102	-1.1058	0.0148	0.0466	-0.0222	35.1	-5.7654	-6.7737
		39	23.32	46	0.5	5.8667	0.6403	-8.6578	0.0311	0.0979	0.0891	3.5744	-0.3597	-0.564	0.0311	0.0979	-0.0844	35.1	-9.7667	<b>0.3256</b>
		38	23.32	46	0.5	6.3378	0.6697	-8.6605	0.0301	0.0948	0.0922	3.1556	-0.3303	-0.7742	0.0301	0.0948	-0.0769	35.1	-9.2378	-0.2556
						6.8374	0.6989	-8.6272	0.0289	0.0911	0.0951	2.7653	-0.3011	-0.9484	0.0289	0.0911	-0.0695	35.1	-8.7374	-0.8653
Carbacid Investment	50	40	23.32	34	0.5	14.7618	0.9374	-8.9678	0.0102	0.0435	0.1605	0.3594	-0.0626	-0.6664	0.0102	0.0435	-0.0174	44.9	-9.8618	-5.2594
						7.7906	0.7275	-10.6587	0.0276	0.1174	0.1429	2.2876	-0.2725	-0.282	0.0276	0.1174	-0.0796	44.9	-12.8906	2.8124
		46	23.32	34	0.5	10.2931	0.8295	-10.3192	0.0211	0.0897	0.1559	1.2304	-0.1705	-0.7727	0.0211	0.0897	-0.0488	44.9	-11.3931	-0.1304
						9.628	0.8058	-10.4564	0.0229	0.0972	0.1533	1.4552	-0.1942	-0.7023	0.0229	0.0972	-0.0558	44.9	-11.728	<b>0.6448</b>
Crown Berger Ltd	10	5	23.32	44	0.5	5.5533	0.9971	-1.0579	0.0029	0.0006	0.0221	0.003	-0.0029	-0.0202	0.0029	0.0006	-0.0002	9.4	-1.1533	-4.403
						0.34	0.2198	-1.354	0.0951	0.0209	0.0093	3.6891	-0.7802	1.759	0.0951	0.0209	-0.0575	9.4	-5.94	1.9109
		10	23.32	44	0.5	1.7988	0.7021	-2.2961	0.1114	0.0245	0.0261	0.6982	-0.2979	-0.2208	0.1114	0.0245	-0.0184	9.4	-2.3988	-0.0982
						1.3314	0.5886	-2.2726	0.125	0.0275	0.0228	1.1207	-0.4114	0.0102	0.125	0.0275	-0.0262	9.4	-2.9314	<b>0.4793</b>
Dunlop Kenya Ltd	20	6	23.32	72	0.5	14.668	0.9978	-1.3035	0.0007	0.001	0.0264	0.0076	-0.0022	-0.0583	0.0007	0.001	-0.0003	30.8	<b>10.132</b>	-24.8076
						7.0347	0.8217	-4.8478	0.0256	0.0369	0.047	1.2738	-0.1783	-1.5273	0.0256	0.0369	-0.0242	30.8	<b>7.7653</b>	-16.0738
		26	23.32	72	0.5	2.9371	0.4873	-5.6481	0.0392	0.0564	0.034	6.0755	-0.5127	-0.2522	0.0392	0.0564	-0.0242	30.8	<b>1.8629</b>	-10.8755
						1.2104	0.2511	-4.1324	0.0313	0.045	0.0191	13.2483	-0.7489	3.3388	0.0313	0.045	-0.1411	30.8	-6.4104	-8.0483
		46	23.32	72	0.5	0.5141	0.1246	-2.5523	0.0202	0.029	0.0099	21.4514	-0.8754	6.9943	0.0202	0.029	-0.1948	30.8	-15.7141	-6.2514
						2.4572	0.4296	-5.4296	0.0386	0.0555	0.0307	7.3756	-0.5704	0.3814	0.0386	0.0555	-0.0939	30.8	<b>0.3428</b>	-10.1756
29	23.32	72	0.5	2.2477	0.4027	-5.2951	0.038	0.0547	0.029	8.0559	-0.5973	0.7234	0.038	0.0547	-0.1	30.8	-0.4477	-9.8559		
E A Cables Ltd	29	16	23.32	29	0.5	14.7612	0.9998	-3.3233	0.0001	0.0001	0.0712	0.0003	-0.0002	-0.0028	0.0001	0.0001	0	22.1	-8.6612	-6.1003

Simulation of option values:Industrial and Allied sector;January-June 1998

					26	6.224	0.8856	-5.6877	0.0325	0.0396	0.0973	0.3624	-0.1144	-0.2918	0.0325	0.0396	-0.0184	22.1	-10.124	3.5376
					20	11.2146	0.9935	-4.2122	0.0031	0.0037	0.088	0.0134	-0.0065	-0.0616	0.0031	0.0037	-0.001	22.1	-9.1146	-2.1134
					21	10.3385	0.9876	-4.4589	0.0054	0.0066	0.0915	0.0273	-0.0124	-0.1007	0.0054	0.0066	-0.0019	22.1	-9.2385	-1.1273
					22	9.4729	0.9782	-4.7159	0.0088	0.0107	0.0945	0.0516	-0.0218	-0.1501	0.0088	0.0107	-0.0034	22.1	-9.3729	-0.1516
					23	8.6226	0.9642	-4.978	0.0132	0.0161	0.0967	0.0912	-0.0358	-0.2048	0.0132	0.0161	-0.0056	22.1	-9.5226	<b>0.8088</b>
E A Packaging Ltd	49	18	23.32	43	0.5	32.9813	0.9999	-3.7387	0	0.0001	0.0801	0.0002	-0.0001	-0.0031	0	0.0001	0	20	-30.9813	-2.0002
		28				24.1297	0.9912	-6.0531	0.0016	0.0082	0.1222	0.048	-0.0088	-0.2421	0.0016	0.0082	-0.0024	20	-32.1297	7.952
		20				31.2022	0.9998	-4.1614	0.0001	0.0003	0.0889	0.001	-0.0002	-0.0107	0.0001	0.0003	-0.0001	20	-31.2022	-0.001
		21				30.3131	0.9996	-4.3765	0.0001	0.0006	0.0933	0.0019	-0.0004	-0.0183	0.0001	0.0006	-0.0001	20	-31.3131	<b>0.9981</b>
EA Portland Cement	20	14	23.32	25	0.5	7.544	0.9972	-2.9223	0.0025	0.0012	0.062	0.0032	-0.0028	-0.0168	0.0025	0.0012	-0.0003	22.1	<b>0.556</b>	-8.1032
		24				0.8764	0.3884	-2.9623	0.1084	0.0542	0.0345	2.235	-0.6116	2.0186	0.1084	0.0542	-0.0723	22.1	-2.7764	-0.335
		15				6.6618	0.9912	-3.1536	0.0067	0.0034	0.0658	0.011	-0.0088	-0.0405	0.0067	0.0034	-0.0009	22.1	0.4382	-7.111
		16				5.792	0.9778	-3.3968	0.015	0.0075	0.0688	0.0311	-0.0222	-0.0762	0.015	0.0075	-0.0024	22.1	0.308	-6.1311
		17				4.9459	0.9523	-3.6394	0.0281	0.0141	0.0705	0.0749	-0.0477	-0.1113	0.0281	0.0141	-0.0051	22.1	<b>0.1541</b>	-5.1749
		18				4.1388	0.9105	-3.8532	0.0457	0.0229	0.0704	0.1578	-0.0895	-0.1175	0.0457	0.0229	-0.0097	22.1	-0.0388	-4.2578
		19				3.3882	0.8504	-3.999	0.0658	0.0329	0.0681	0.297	-0.1496	-0.0559	0.0658	0.0329	-0.0164	22.1	-0.2882	-3.397
		20				2.7101	0.7728	-4.0385	0.0853	0.0427	0.0637	0.5089	-0.2272	0.1122	0.0853	0.0427	-0.0253	22.1	-0.6101	-2.6089
		25				0.6249	0.3035	-2.5056	0.0989	0.0494	0.0272	2.8734	-0.6965	2.6827	0.0989	0.0494	-0.084	22.1	-3.5249	<b>0.0266</b>
Firestone EA Ltd	15.9	11	23.32	29	0.5	6.1183	0.9932	-2.3178	0.0058	0.0021	0.0484	0.0077	-0.0068	-0.0349	0.0058	0.0021	-0.0006	17.1	-0.0183	-6.1077
		21				0.4326	0.2465	-1.8415	0.0967	0.0355	0.0174	3.2213	-0.7535	2.5168	0.0967	0.0355	-0.076	17.1	-4.3326	0.6787
		16				2.2342	0.7391	-3.2789	0.0997	0.0365	0.0476	0.5733	-0.2609	0.0416	0.0997	0.0365	-0.0236	17.1	-1.1342	-1.6733
		17				1.8894	0.6349	-3.1859	0.1153	0.0423	0.042	0.9184	-0.3651	0.3422	0.1153	0.0423	-0.0336	17.1	-1.5894	-1.0184
		18				1.2447	0.5264	-2.9594	0.1221	0.0448	0.0356	1.3636	-0.4736	0.7762	0.1221	0.0448	-0.0445	17.1	-2.1447	-0.4636
		19				0.8948	0.4217	-2.6307	0.12	0.044	0.0291	1.9037	-0.5783	1.3125	0.12	0.044	-0.0555	17.1	-2.7948	-0.0037
		20				0.6287	0.3272	-2.2434	0.1107	0.0406	0.0229	2.5276	-0.6728	1.9073	0.1107	0.0406	-0.0661	17.1	-3.5287	<b>0.3724</b>
EABL	48	37	23.32	36	0.5	15.3804	0.9461	-8.3416	0.009	0.0372	0.1502	0.3082	-0.0539	-0.6628	0.009	0.0372	-0.0145	54.8	<b>2.4196</b>	-18.1082
		47				8.2798	0.7479	-10.341	0.0261	0.1083	0.1381	2.1071	-0.2521	-0.5869	0.0261	0.1083	-0.071	54.8	-0.4798	-9.9071
		57				3.7529	0.4642	-9.1763	0.0325	0.1349	0.0927	6.4795	-0.5358	2.6531	0.0325	0.1349	-0.161	54.8	-5.9529	-4.2795
		67				1.4849	0.2343	-6.0251	0.0251	0.1041	0.0488	13.111	-0.7657	7.8797	0.0251	0.1041	-0.2493	54.8	-13.6849	-0.911
		77				0.534	0.1018	-3.188	0.0146	0.0604	0.0218	21.0595	-0.8982	12.7921	0.0146	0.0604	-0.3209	54.8	-22.734	1.1405
		44				10.1632	0.8231	-10.0147	0.0212	0.0881	0.1467	1.3206	-0.1769	-0.8832	0.0212	0.0881	-0.0491	54.8	0.6368	-12.1206
		45				9.5091	0.7992	-10.1574	0.023	0.0952	0.1443	1.5564	-0.2008	-0.8184	0.023	0.0952	-0.056	54.8	<b>0.2909</b>	-11.3564
		46				8.8811	0.7741	-10.2668	0.0246	0.102	0.1414	1.8184	-0.2259	-0.7202	0.0246	0.102	-0.0633	54.8	-0.0811	-10.6184
		72				0.8991	0.1568	-4.4805	0.0197	0.0815	0.0331	16.9749	-0.8432	10.462	0.0197	0.0815	-0.2872	54.8	-18.0991	0.2251
		71				0.9957	0.1704	-4.7721	0.0207	0.086	0.0359	16.1815	-0.8296	9.9628	0.0207	0.086	-0.28	54.8	-17.1957	<b>0.0185</b>
		70				1.1018	0.1849	-5.0734	0.0218	0.0906	0.0389	15.3976	-0.8151	9.454	0.0218	0.0906	-0.2726	54.8	-16.3018	-0.1976
Kenya National Mills	14.9	6	23.32	58	0.5	9.5675	0.9966	-1.2942	0.0017	0.0011	0.0264	0.0072	-0.0034	-0.049	0.0017	0.0011	-0.0003	24.3	<b>8.7325</b>	-18.3072
		16				2.7119	0.6239	-3.8547	0.0621	0.04	0.0329	2.051	-0.3761	-0.5342	0.0621	0.04	-0.0383	24.3	<b>5.5881</b>	-10.351
		26				0.5434	0.1927	-2.2152	0.0448	0.0288	0.0116	8.7818	-0.8073	3.1807	0.0448	0.0288	-0.1041	24.3	-2.2434	-7.0818
		22				1.0477	0.3225	-3.0685	0.0587	0.0378	0.0188	5.7264	-0.6775	1.4973	0.0587	0.0378	-0.0791	24.3	1.2523	-8.0264
		23				0.8898	0.2846	-2.8548	0.0555	0.0357	0.0168	6.4584	-0.7154	1.9185	0.0555	0.0357	-0.0856	24.3	<b>0.4102</b>	-7.7584
		24				0.7552	0.2505	-2.6382	0.0521	0.0335	0.0149	7.2137	-0.7495	2.3427	0.0521	0.0335	-0.0919	24.3	-0.4552	-7.5137

Kenya Oil Co Ltd	49.5	39	23.32	22	0.5	14.8171	0.9909	-8.1723	0.0032	0.0086	0.1712	0.0248	-0.0091	-0.0784	0.0032	0.0086	-0.0024	56.1	<b>2.2829</b>	-17.1248	
						49	6.7377	0.814	-9.8872	0.0348	0.0938	0.1678	0.8449	-0.186	0.2819	0.0348	0.0938	-0.0503	56.1	<b>0.3623</b>	-7.9449
						59	1.8828	0.3816	-6.9017	0.0495	0.1334	0.085	4.8893	-0.6184	5.3428	0.0495	0.1334	-0.1775	56.1	-4.7828	-1.9893
						69	0.324	0.0955	-2.333	0.022	0.0594	0.022	12.2299	-0.9045	11.9868	0.022	0.0594	-0.285	56.1	-13.224	0.6701
						50	6.0712	0.7772	-9.8522	0.0387	0.1044	0.162	1.0682	-0.2228	0.5245	0.0387	0.1044	-0.0605	56.1	<b>0.0288</b>	-7.1682
						51	5.4425	0.7374	-9.7536	0.0423	0.1141	0.1553	1.3295	-0.2626	0.8307	0.0423	0.1141	-0.0716	56.1	-0.3425	-6.4295
						65	0.6901	0.1778	-3.8962	0.0338	0.0911	0.0406	9.0363	-0.8222	9.5935	0.0338	0.0911	-0.2487	56.1	-9.5901	-0.1363
						66	0.5747	0.1534	-3.459	0.0307	0.0828	0.0351	9.8108	-0.8466	10.2382	0.0307	0.0828	-0.2586	56.1	-10.4747	<b>0.0892</b>
						67	0.4767	0.1316	-3.0517	0.0277	0.0747	0.0302	10.6027	-0.8684	10.8531	0.0277	0.0747	-0.2679	56.1	-11.3767	0.2973
						KPLC	121.2	83	23.32	27	0.5	47.3617	0.9964	-17.3661	0.0005	0.0092	0.367	0.0269	-0.0036	-0.1408	0.0005
93	38.5982	0.9818	-19.7815	0.0019	0.0382							0.402	0.1627	-0.0182	-0.4808	0.0019	0.0382	-0.0118	129.6	-1.9982	-36.7627
103	30.1753	0.9404	-22.2842	0.0051	0.1015							0.419	0.6392	-0.0596	-0.9081	0.0051	0.1015	-0.0393	129.6	-3.5753	-27.2392
113	22.4635	0.8584	-24.2133	0.0097	0.1922							0.4079	1.8268	-0.1416	-0.7619	0.0097	0.1922	-0.0949	129.6	-5.8635	-18.4268
123	15.8541	0.7353	-24.6602	0.0141	0.2805							0.3663	4.1168	-0.2647	0.8665	0.0141	0.2805	-0.181	129.6	-9.2541	-10.7168
133	10.5981	0.5869	-23.1278	0.0168	0.3338							0.3027	7.7603	-0.4131	4.4743	0.0168	0.3338	-0.2891	129.6	-13.9981	-4.3603
143	6.723	0.4364	-19.8795	0.017	0.3375							0.2308	12.7845	-0.5636	9.7979	0.017	0.3375	-0.4055	129.6	-20.123	0.6155
140	7.7475	0.4804	-20.9919	0.0172	0.3415							0.2524	11.1393	-0.5196	8.0629	0.0172	0.3415	-0.3706	129.6	-18.1475	-0.7393
141	7.3934	0.4656	-20.6318	0.0172	0.3406							0.2452	11.6751	-0.5344	8.6305	0.0172	0.3406	-0.3822	129.6	-18.7934	-0.2751
142	7.0519	0.4509	-20.2607	0.0171	0.3393							0.238	12.2236	-0.5491	9.2091	0.0171	0.3393	-0.3939	129.6	-19.4519	<b>0.1764</b>
Total Kenya Ltd	52.5	28	23.32	39	0.5	27.5921	0.9977	-5.8833	0.0005	0.0026	0.1239	0.0104	-0.0023	-0.0723	0.0005	0.0026	-0.0006	41.4	-14.1921	-13.4104	
						38	18.9537	0.9584	-8.6012	0.0061	0.033	0.1568	0.2714	-0.0416	-0.7149	0.0061	0.033	-0.0123	41.4	-15.5537	-3.6714
						48	11.493	0.8121	-11.1644	0.0186	0.1001	0.1557	1.7102	-0.1879	-1.2027	0.0186	0.1001	-0.0579	41.4	-18.093	4.8898
						42	15.7599	0.9146	-9.7828	0.0108	0.058	0.1613	0.6375	-0.0854	-1.0664	0.0108	0.058	-0.0256	41.4	-16.3599	-0.0375
						43	15.0005	0.9005	-10.0581	0.0121	0.0649	0.1614	0.768	-0.0995	-1.1342	0.0121	0.0649	-0.03	41.4	-16.6005	<b>0.832</b>
Unga Group Ltd	20	9	19	26	12.316	0.9553	-2.8508	0.007	0.0133	0.0339	0.3255	-0.0447	-0.983	0.007	0.0133	-0.0061	58.8	37.484	-50.1255		
					6.5445	0.721	-6.3513	0.025	0.0475	0.0394	3.4534	-0.279	-2.4081	0.025	0.0475	-0.0452	58.8	33.2555	-43.2534		
					4.2321	0.5473	-6.8878	0.0295	0.056	0.0336	7.3705	-0.4527	-1.4919	0.0295	0.056	-0.0821	58.8	28.5679	-40.1705		

## SIMULATION OF OPTION VALUES USING OPSCOL

## AGRICULTURAL SECTOR-JULY TO DECEMBER 1998

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.98	Value of European call option	Value of European put option
Brooke Bond	131.7	109	23.32	23	0.5	34.9098	0.9751	-23.0545	0.0027	0.0543	0.4675	0.2134	-0.0249	-0.4333	0.0027	0.0543	-0.0175	139.6	-4.3098	-30.8134
		119				26.5971	0.9225	-25.2384	0.0068	0.1352	0.4744	0.8001	-0.0775	-0.5418	0.0068	0.1352	-0.0551	139.6	-5.9971	-21.4001
		129				19.1149	0.8227	-26.3764	0.0121	0.2421	0.4462	2.2174	-0.1773	0.3955	0.0121	0.2421	-0.1279	139.6	-8.5149	-12.8174
		139				12.8805	0.6796	-25.5319	0.0167	0.3332	0.3831	4.8823	-0.3204	3.3154	0.0167	0.3332	-0.2354	139.6	-12.2805	-5.4823
		149				8.1216	0.5157	-22.483	0.0186	0.3712	0.299	9.0228	-0.4843	8.4396	0.0186	0.3712	-0.364	139.6	-17.5216	0.3772
		148				8.5302	0.5322	-22.8729	0.0186	0.3703	0.3078	8.5415	-0.4678	7.8422	0.0186	0.3703	-0.3508	139.6	-16.9302	-0.1415
Eaagads Ltd	37	26	23.32	30	0.5	13.8906	0.9898	-5.5139	0.0035	0.0071	0.1137	0.0291	-0.0102	-0.118	0.0035	0.0071	-0.002	37	-2.8906	-11.0291
		36				6.0402	0.7837	-7.655	0.0374	0.0767	0.1148	1.0781	-0.2163	-0.1838	0.0374	0.0767	-0.0454	37	-5.0402	-2.0781
		46				1.6884	0.3555	-5.5967	0.0475	0.0974	0.0573	5.6257	-0.6445	3.9499	0.0475	0.0974	-0.1474	37	-10.6884	3.3743
		39				4.3108	0.6582	-7.5557	0.0468	0.0961	0.1002	2.0185	-0.3418	0.5382	0.0468	0.0961	-0.0733	37	-6.3108	-0.0185
		40				3.8179	0.6134	-7.4063	0.0488	0.1001	0.0944	2.4155	-0.3866	0.8951	0.0488	0.1001	-0.0836	37	-6.8179	0.5845
		41				3.3666	0.5682	-7.203	0.0501	0.1028	0.0883	2.8542	-0.4318	1.3059	0.0501	0.1028	-0.0942	37	-7.3666	1.1458
George Williamson	141	146	23.32	23	0.5	15.3972	0.7204	-27.8107	0.0147	0.3354	0.4309	4.3286	-0.2796	2.4893	0.0147	0.3354	-0.2188	142	-19.3972	-0.3286
		156				10.1936	0.5701	-25.3754	0.0171	0.3916	0.351	8.0244	-0.4299	7	0.0171	0.3916	-0.3432	142	-24.1936	5.9756
		147				14.8138	0.7061	-27.6614	0.015	0.3434	0.4237	4.6352	-0.2939	2.8462	0.015	0.3434	-0.2304	142	-19.8138	0.3648
Kakuzi Ltd	141.9	123	23.32	26	0.5	33.2536	0.9337	-26.5016	0.0049	0.1293	0.4962	0.8163	-0.0663	-0.9749	0.0049	0.1293	-0.0511	140	-16.2536	-17.8163
		133				25.5689	0.8596	-28.3002	0.0085	0.2238	0.482	2.0311	-0.1404	-0.6981	0.0085	0.2238	-0.1098	140	-18.5689	-9.0311
		143				18.849	0.7531	-28.7599	0.0121	0.3168	0.44	4.2106	-0.2469	0.9175	0.0121	0.3168	-0.1963	140	-21.849	-1.2106
		153				13.3072	0.6242	-27.4508	0.0145	0.3807	0.3763	7.5682	-0.3758	4.3019	0.0145	0.3807	-0.3045	140	-26.3072	5.4318
		144				18.2396	0.7409	-28.7112	0.0124	0.3249	0.4345	4.4911	-0.2591	1.1737	0.0124	0.3249	-0.2063	140	-22.2396	-0.4911
		145				17.6422	0.7286	-28.6443	0.0127	0.3326	0.4287	4.7836	-0.2714	1.4482	0.0127	0.3326	-0.2165	140	-22.6422	0.2164
Kapchorua Tea Co	75.5	69	23.32	22	0.5	14.5471	0.9201	-14.5519	0.0126	0.0793	0.2746	0.453	-0.0799	-0.2321	0.0126	0.0793	-0.0324	95	11.4529	-26.453
		79				7.5824	0.704	-14.6859	0.0294	0.1845	0.2279	2.3877	-0.296	1.7093	0.0294	0.1845	-0.1237	95	8.4176	-18.3877
		89				3.1684	0.409	-11.0251	0.0331	0.2074	0.1385	6.8732	-0.591	7.4455	0.0331	0.2074	-0.2575	95	2.8316	-12.8732
		99				1.0703	0.1802	-6.0068	0.0224	0.1402	0.0627	13.6745	-0.8198	14.5391	0.0224	0.1402	-0.2575	95	-5.0703	-9.6745
		109				0.3008	0.0626	-2.4786	0.0105	0.0657	0.0221	21.8044	-0.9374	20.1426	0.0105	0.0657	-0.4629	95	-14.3008	-7.8044
		119				0.0727	0.018	-0.8189	0.0038	0.0236	0.0064	30.4757	-0.982	23.8777	0.0038	0.0236	-0.5231	95	-24.0727	-6.4757
		129				0.0156	0.0044	-0.2276	0.0011	0.007	0.0016	39.318	-0.9956	26.5443	0.0011	0.007	-0.5724	95	-34.0156	-5.318
		92				2.3371	0.3288	-9.491	0.0308	0.1931	0.1124	8.7117	-0.6712	9.6022	0.0308	0.1931	-0.2969	95	0.6629	-11.7117
		93				2.1029	0.3041	-8.9715	0.0298	0.1867	0.1043	9.3674	-0.6959	10.3292	0.0298	0.1867	-0.3096	95	-0.1029	-11.3674
		Limuru Tea Co	755	785	23.32	2	0.5	56.3962	1	%-162.9144	0	0	3.493	0	0	0	0	0	0	760
795						47.4969	1	%-164.9895	0	0.0001	3.5375	0	0	0.0003	0	0.0001	0	760	-82.4969	35
805						38.5977	0.9999	%-167.0516	0	0.0021	3.5816	0.0003	-0.0001	0.0135	0	0.0021	-0.0004	760	-83.5977	44.9997
815						29.705	0.9978	%-168.8219	0.0007	0.0373	3.6181	0.007	-0.0022	0.3185	0.0007	0.0373	-0.0084	760	-84.705	54.993
825						20.8941	0.9763	%-167.6141	0.0052	0.2986	3.581	0.0955	-0.0237	3.6016	0.0052	0.2986	-0.09	760	-85.8941	64.9045
Rea Vipingo Ltd	6.4	4	23.32	16	0.5	2.8402	1	-0.8301	0	0	0.0178	0	0	0	0	0	0	6	-0.8402	-2
		5				1.9504	0.9995	-1.0382	0.0026	0.0001	0.0222	0.0001	-0.0005	-0.0006	0.0026	0.0001	0	6	-0.9504	-1.0001
		6				1.0757	0.9513	-1.2421	0.1395	0.0046	0.0251	0.0153	-0.0487	0.0031	0.1395	0.0046	-0.0016	6	-1.0757	-0.0153
		7				0.3781	0.616	-1.1078	0.5275	0.0173	0.0178	0.2077	-0.384	0.3449	0.5275	0.0173	-0.0133	6	-1.3781	0.7923

Simulation of option values: Agricultural sector July-December, 1998

Sasini Tea & Coffee	75.1	42	23.32	44	0.5	37.7931	0.9918	-9.0812	0.001	0.0119	0.1834	0.0706	-0.0082	-0.3648	0.001	0.0119	-0.0034	69.8	-9.9931	-27.8706
		52				29.2912	0.9565	-12.0752	0.0039	0.049	0.2127	0.4682	-0.0435	-1.2834	0.0039	0.049	-0.0187	69.8	-11.4912	-18.2682
		62				21.6085	0.8742	-15.1025	0.0088	0.1098	0.2202	1.6849	-0.1258	-2.2353	0.0088	0.1098	-0.0557	69.8	-13.8085	-9.4849
		72				15.1994	0.7472	-17.0104	0.0137	0.1697	0.2046	4.1751	-0.2528	-2.068	0.0137	0.1697	-0.1158	69.8	-17.3994	-1.9751
		82				10.2537	0.5979	-17.119	0.0166	0.2054	0.1732	8.1289	-0.4021	-0.1012	0.0166	0.2054	-0.1916	69.8	-22.4537	4.0711
		75				13.5614	0.7035	-17.2391	0.0148	0.1836	0.1964	5.207	-0.2965	-1.674	0.0148	0.1836	-0.1374	69.8	-18.7614	-0.007
		76				13.0452	0.6887	-17.2773	0.0151	0.1877	0.1934	5.5807	-0.3113	-1.5047	0.0151	0.1877	-0.1448	69.8	-19.2452	<b>0.6193</b>
		77				12.5437	0.6737	-17.2966	0.0154	0.1915	0.1902	5.9692	-0.3263	-1.3164	0.0154	0.1915	-0.1524	69.8	-19.7437	1.2308

Simulation of option values:Commercial and Services sector:July-December,1998

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31/12/98	Value of European call option	Value of European put option
A Baumann & Co	15.5	14	23.32	11	0.5	1.8058	0.9457	-0.6469	0.0913	0.0121	0.0643	0.0286	-0.0543	-0.0979	0.0913	0.0121	-0.0044	16.9	1.0942	-2.9286
		15				0.9709	0.7635	-0.8063	0.2558	0.0338	0.0543	0.1738	-0.2365	-0.2182	0.2558	0.0338	-0.0192	16.9	0.9291	-2.0738
		16				0.3976	0.4553	-0.7444	0.3288	0.0435	0.0333	0.5808	-0.5447	-0.117	0.3288	0.0435	-0.0451	16.9	0.5024	-1.4808
		17				0.1186	0.1863	-0.434	0.2224	0.0294	0.0138	1.282	-0.8137	0.2325	0.2224	0.0294	-0.0695	16.9	-0.2186	-1.182
CMC Holdings Ltd	35	21	23.32	29	0.5	16.3128	0.9992	-4.3707	0.0004	0.0007	0.0933	0.0016	-0.0008	-0.0125	0.0004	0.0007	-0.0001	33	-4.3128	-12.0016
		31				7.7979	0.8967	-6.7901	0.025	0.0445	0.1179	0.3861	-0.1033	-0.3565	0.025	0.0445	-0.02	33	-5.7979	-2.3861
		41				2.2349	0.46	-6.0821	0.0553	0.0982	0.0693	3.7225	-0.54	2.4268	0.0553	0.0982	-0.1131	33	-10.2349	4.2775
		33				6.3455	0.831	-7.1122	0.0351	0.0624	0.1137	0.7135	-0.169	-0.2635	0.0351	0.0624	-0.0331	33	-6.3455	-0.7135
		34				5.6767	0.7917	-7.1968	0.04	0.071	0.1102	0.9347	-0.2083	-0.1406	0.04	0.071	-0.0411	33	-6.6767	0.0653
		33				6.3455	0.831	-7.1122	0.0351	0.0624	0.1137	0.7135	-0.169	-0.2635	0.0351	0.0624	-0.0331	33	-6.3455	-0.7135
Car & General	11.1	5	23.32	43	0.5	6.6511	0.9992	-1.0446	0.0008	0.0002	0.0222	0.0008	-0.0008	-0.0069	0.0008	0.0002	0	12	0.3489	-7.0008
		15				0.6136	0.3246	-1.9114	0.1066	0.0282	0.0149	2.8627	-0.6754	1.2016	0.1066	0.0282	-0.0518	12	-3.6136	0.1373
		6				5.7665	0.9947	-1.2812	0.0045	0.0012	0.0264	0.0062	-0.0053	-0.0359	0.0045	0.0012	-0.0003	12	0.2335	-6.0062
		7				4.8981	0.9799	-1.5583	0.0144	0.0038	0.0299	0.0277	-0.0201	-0.1056	0.0144	0.0038	-0.0013	12	0.1019	-5.0277
		8				4.0664	0.9466	-1.8688	0.0322	0.0085	0.0322	0.0859	-0.0534	-0.2086	0.0322	0.0085	-0.0034	12	-0.0664	-4.0859
		14				0.8444	0.4099	-2.176	0.1152	0.0305	0.0185	2.2036	-0.5901	0.7295	0.1152	0.0305	-0.0438	12	-2.8444	-0.2036
		14				0.8444	0.4099	-2.176	0.1152	0.0305	0.0185	2.2036	-0.5901	0.7295	0.1152	0.0305	-0.0438	12	-2.8444	-0.2036
Express Kenya Ltd	30	14	23.32	36	0.5	17.5412	0.9998	-2.9092	0.0001	0.0001	0.0623	0.0003	-0.0002	-0.0037	0.0001	0.0001	0	28.6	-2.9412	-14.6003
		24				8.9123	0.9281	-5.4612	0.0179	0.0291	0.0947	0.2709	-0.0719	-0.4804	0.0179	0.0291	-0.0121	28.6	-4.3123	-4.8709
		34				2.9242	0.5373	-6.1103	0.052	0.0843	0.066	3.1822	-0.4627	0.9458	0.052	0.0843	-0.0853	28.6	-8.3242	2.2178
		30				4.8161	0.7208	-6.4868	0.044	0.0713	0.084	1.5144	-0.2792	-0.2608	0.044	0.0713	-0.0494	28.6	-6.2161	-0.1144
		31				4.2779	0.676	-6.4768	0.0471	0.0763	0.08	1.8661	-0.324	-0.0432	0.0471	0.0763	-0.0579	28.6	-6.6779	0.5339
		31				4.2779	0.676	-6.4768	0.0471	0.0763	0.08	1.8661	-0.324	-0.0432	0.0471	0.0763	-0.0579	28.6	-6.6779	0.5339
Kenya Airways	7	5	23.32	25	0.5	2.5519	0.996	-1.0454	0.0096	0.0006	0.0221	0.0016	-0.004	-0.0078	0.0096	0.0006	-0.0001	8	0.4481	-3.0016
		6				1.6897	0.9474	-1.2854	0.0868	0.0053	0.0247	0.0294	-0.0526	-0.0402	0.0868	0.0053	-0.002	8	0.3103	-2.0294
		7				0.9485	0.7728	-1.4135	0.2437	0.0149	0.0223	0.1781	-0.2272	0.0393	0.2437	0.0149	-0.0088	8	0.0515	-1.1781
		8				0.4397	0.4971	-1.2025	0.3224	0.0197	0.0152	0.5593	-0.5029	0.4578	0.3224	0.0197	-0.0204	8	-0.4397	-0.5593
		9				0.1696	0.2503	-0.7624	0.2569	0.0157	0.0079	1.1791	-0.7497	1.1054	0.2569	0.0157	-0.0321	8	-1.1696	-0.1791
		10				0.0559	0.1021	-0.3741	0.144	0.0088	0.0033	1.9553	-0.8979	1.7012	0.144	0.0088	-0.0412	8	-2.0559	0.0447
Lonhro Motors	26.3	14	23.32	25	0.5	13.8408	1	-2.9056	0	0	0.0623	0	0	-0.0001	0	0	0	22	-5.8408	-8
		24				5.187	0.8972	-5.1256	0.0385	0.0333	0.092	0.2456	-0.1028	-0.1447	0.0385	0.0333	-0.0147	22	-7.187	1.7544
		20				8.5194	0.9892	-4.2128	0.0061	0.0053	0.0875	0.0182	-0.0108	-0.0621	0.0061	0.0053	-0.0015	22	-6.5194	-2.0182
		21				7.6509	0.9784	-4.4569	0.0111	0.0096	0.0904	0.0397	-0.0216	-0.0987	0.0111	0.0096	-0.003	22	-6.6509	-1.0397
		22				6.8001	0.9606	-4.7015	0.0183	0.0158	0.0923	0.0788	-0.0394	-0.1357	0.0183	0.0158	-0.0056	22	-6.8001	-0.0788
		23				5.9755	0.934	-4.9314	0.0276	0.0239	0.0929	0.1441	-0.066	-0.1581	0.0276	0.0239	-0.0094	22	-7.8001	0.8559
		23				5.9755	0.934	-4.9314	0.0276	0.0239	0.0929	0.1441	-0.066	-0.1581	0.0276	0.0239	-0.0094	22	-7.8001	0.8559
		23				5.9755	0.934	-4.9314	0.0276	0.0239	0.0929	0.1441	-0.066	-0.1581	0.0276	0.0239	-0.0094	22	-7.8001	0.8559
Marshalls EA Ltd	28.3	22	23.32	17	0.5	8.7222	0.9991	-4.57	0.0009	0.0006	0.0978	0.0009	-0.0009	-0.0042	0.0009	0.0006	-0.0001	25	-5.7222	-3.0009
		32				1.2734	0.5032	-4.3808	0.1173	0.0798	0.0648	1.4515	-0.4968	2.2603	0.1173	0.0798	-0.0776	25	-8.2734	5.5485
		25				6.0769	0.9804	-5.215	0.014	0.0095	0.1083	0.0255	-0.0196	-0.0266	0.014	0.0095	-0.0029	25	-6.0769	-0.0255
		26				5.2212	0.9587	-5.4102	0.026	0.0177	0.1095	0.0597	-0.0413	-0.0144	0.026	0.0177	-0.0061	25	-6.2212	0.9403
		26				5.2212	0.9587	-5.4102	0.026	0.0177	0.1095	0.0597	-0.0413	-0.0144	0.026	0.0177	-0.0061	25	-6.2212	0.9403

	27			4.3966	0.9224	-5.5563	0.0427	0.0291	0.1085	0.125	-0.0776	0.0471	0.0427	0.0291	-0.0116	25	-6.3966	1.875			
Nation Media Group	113.2	32	23.32	80	0.5	84.7969	0.9968	-7.1661	0.0002	0.0078	0.1402	0.075	-0.0032	-0.525	0.0002	0.0078	-0.0022	135.8	19.0031	-103.875	
		42				76.1604	0.9875	-10.3787	0.0005	0.0259	0.1781	0.3379	-0.0125	-1.6623	0.0005	0.0259	-0.0088	135.8	17.6396	-94.1379	
		52				67.8887	0.9688	-14.2394	0.0011	0.0562	0.2089	0.9656	-0.0312	-3.4477	0.0011	0.0562	-0.0225	135.8	15.9113	-84.7656	
		62				60.1322	0.9398	-18.4334	0.0019	0.0956	0.2313	2.1085	-0.0602	-5.5662	0.0019	0.0956	-0.0446	135.8	13.6678	-75.9085	
		72				52.9929	0.9013	-22.5672	0.0027	0.1392	0.2452	3.8686	-0.0987	-7.6248	0.0027	0.1392	-0.0752	135.8	10.8071	-67.6686	
		82				46.5211	0.8552	-26.309	0.0036	0.1823	0.2514	6.2963	-0.1448	-9.2912	0.0036	0.1823	-0.1134	135.8	7.2789	-60.0963	
		92				40.7246	0.8039	-29.4409	0.0043	0.2215	0.2514	9.3992	-0.1961	-10.3477	0.0043	0.2215	-0.158	135.8	3.0754	-53.1992	
		102				35.5806	0.7496	-31.8575	0.005	0.2546	0.2464	13.1546	-0.2504	-10.689	0.005	0.2546	-0.2075	135.8	-1.7806	-46.9546	
		97				38.0733	0.777	-30.7414	0.0047	0.2389	0.2494	11.1976	-0.223	-10.6106	0.0047	0.2389	-0.1822	135.8	0.7267	-49.9976	
		98				37.5622	0.7715	-30.9794	0.0047	0.2422	0.2489	11.5765	-0.2285	-10.6411	0.0047	0.2422	-0.1872	135.8	0.2378	-49.3765	
		99				37.0575	0.7661	-31.21	0.0048	0.2454	0.2483	11.9617	-0.2339	-10.6641	0.0048	0.2454	-0.1922	135.8	-0.2575	-48.7617	
		242				5.4836	0.1965	-21.6468	0.0043	0.2217	0.0838	107.6493	-0.8035	28.5765	0.0043	0.2217	-0.993	135.8	-111.6836	-1.4493	
		252				4.8361	0.1773	-20.1958	0.0041	0.208	0.0762	115.9012	-0.8227	32.1028	0.0041	0.208	-1.0452	135.8	-121.0361	0.2988	
		262				4.2706	0.16	-18.8069	0.0038	0.1947	0.0692	124.2352	-0.84	35.567	0.0038	0.1947	-1.0966	135.8	-130.4706	1.9648	
		272				3.7763	0.1444	-17.4861	0.0035	0.1819	0.0629	132.6402	-0.8556	38.9632	0.0035	0.1819	-1.1475	135.8	-139.9763	3.5598	
		282				3.3435	0.1304	-16.2365	0.0033	0.1697	0.0571	141.1069	-0.8696	42.2881	0.0033	0.1697	-1.1977	135.8	-149.5435	5.0931	
		292				2.9641	0.1178	-15.0596	0.0031	0.158	0.0518	149.6269	-0.8822	45.5404	0.0031	0.158	-1.2475	135.8	-159.1641	6.5731	
		302				2.6311	0.1064	-13.9553	0.0029	0.147	0.0471	158.1933	-0.8936	48.7201	0.0029	0.147	-1.2967	135.8	-168.8311	8.0067	
		250				4.9586	0.181	-20.4813	0.0041	0.2108	0.0776	114.2439	-0.819	31.4023	0.0041	0.2108	-1.0348	135.8	-119.1586	-0.0439	
251				4.897	0.1791	-20.3382	0.0041	0.2094	0.0769	115.0722	-0.8209	31.7529	0.0041	0.2094	-1.04	135.8	-120.097	0.1278			
Pearl Drycleaners	10.3	9	23.32	4	0.5	2.2905	1	-1.8678	0	0	0.04	0	0	0	0	0	0	10	-1.2905	-1	
		10				1.4006	1	-2.0753	0	0	0.0445	0	0	0	0	0	0	0	10	-1.4006	0
		11				0.5147	0.965	-2.2204	0.2652	0.0056	0.0471	0.0041	-0.035	0.0625	0.2652	0.0056	-0.0018	10	-1.5147	0.9959	
Standard Newspaper	29.9	5	23.32	92	0.5	25.4538	0.9994	-1.0719	0.0001	0.0004	0.0221	0.0035	-0.0006	-0.0342	0.0001	0.0004	-0.0001	21.3	-9.1538	-16.3035	
		15				17.199	0.9412	-4.8327	0.006	0.0248	0.0547	0.6481	-0.0588	-1.7197	0.006	0.0248	-0.012	21.3	-10.899	-6.9481	
		25				11.1208	0.7822	-8.5868	0.0151	0.0622	0.0613	3.4693	-0.2178	-3.3985	0.0151	0.0622	-0.0499	21.3	-14.8208	0.2307	
		24				11.6224	0.8002	-8.3114	0.0144	0.0592	0.0615	3.081	-0.1998	-3.3305	0.0144	0.0592	-0.0453	21.3	-14.3224	-0.381	
TPS Serena	13	8	23.32	31	0.5	5.8824	0.9979	-1.6726	0.0024	0.0006	0.0354	0.0019	-0.0021	-0.0123	0.0024	0.0006	-0.0001	13.6	-0.2824	-5.6019	
		18				0.2871	0.1996	-1.335	0.0981	0.0257	0.0115	3.306	-0.8004	2.4006	0.0981	0.0257	-0.0686	13.6	-4.6871	1.094	
		13				1.9349	0.7394	-2.7158	0.114	0.0299	0.0384	0.5042	-0.2606	-0.0178	0.114	0.0299	-0.0195	13.6	-1.3349	-1.1042	
		14				1.4021	0.6192	-2.636	0.1337	0.035	0.0332	0.8613	-0.3808	0.2695	0.1337	0.035	-0.0291	13.6	-1.8021	-0.4613	
		15				0.9836	0.4955	-2.4095	0.14	0.0367	0.0273	1.3327	-0.5045	0.7035	0.14	0.0367	-0.0395	13.6	-2.3836	0.0673	
Uchumi Supermark	45.5	31	23.32	31	0.5	17.9416	0.9916	-6.5654	0.0023	0.0073	0.1359	0.0298	-0.0084	-0.1318	0.0023	0.0073	-0.0021	44.6	-4.3416	-13.6298	
		41				9.7439	0.8679	-9.07	0.0214	0.0688	0.1487	0.7314	-0.1321	-0.5611	0.0214	0.0688	-0.0337	44.6	-6.1439	-4.3314	
		51				4.0228	0.5481	-8.8279	0.0397	0.1274	0.1046	3.9098	-0.4519	1.7564	0.0397	0.1274	-0.1223	44.6	-10.4228	2.4902	
		46				6.481	0.723	-9.4997	0.0336	0.1077	0.1321	1.9183	-0.277	0.0468	0.0336	0.1077	-0.0726	44.6	-7.881	-0.5183	
		47				5.9233	0.6892	-9.4541	0.0354	0.1136	0.1272	2.2505	-0.3108	0.3	0.0354	0.1136	-0.082	44.6	-8.881	0.1495	



SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JULY-DECEMBER 1998

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.98	Value of European call option	Value of European put option
Barclays Bank	101.5	63	23.3	38	0.5	45.5296	0.9904	-13.5248	0.0009	0.0184	0.275	0.0959	-0.0096	-0.4502	0.0009	0.0184	-0.0053	122.2	13.6704	-59.2959
		73				36.9704	0.9637	-16.3613	0.0029	0.0572	0.3042	0.4361	-0.0363	-1.2113	0.0029	0.0572	-0.0206	122.2	12.2296	-49.6361
		83				28.9787	0.9061	-19.2595	0.0061	0.1203	0.315	1.3438	-0.0939	-2.0342	0.0061	0.1203	-0.0544	122.2	10.2213	-40.5438
		93				21.8969	0.8143	-21.4651	0.0098	0.192	0.3038	3.1614	-0.1857	-2.1644	0.0098	0.192	-0.1101	122.2	7.3031	-32.3614
		103				15.9689	0.6963	-22.2921	0.0128	0.2509	0.2735	6.1328	-0.3037	-0.916	0.0128	0.2509	-0.1848	122.2	3.2311	-25.3328
		113				11.2724	0.567	-21.5195	0.0144	0.2823	0.2314	10.3358	-0.433	1.9319	0.0144	0.2823	-0.2714	122.2	-2.0724	-19.5358
		123				7.7314	0.4417	-19.4153	0.0145	0.2833	0.1855	15.6941	-0.5583	6.1114	0.0145	0.2833	-0.3618	122.2	-8.5314	-14.8941
		133				5.1731	0.3308	-16.5111	0.0133	0.2602	0.142	22.0353	-0.6692	11.0909	0.0133	0.2602	-0.4498	122.2	-15.9731	-11.2353
		143				3.3899	0.2397	-13.3537	0.0114	0.2229	0.1047	29.1515	-0.7603	16.3237	0.0114	0.2229	-0.5316	122.2	-24.1899	-8.3515
		153				2.1834	0.1688	-10.3557	0.0092	0.1808	0.0747	36.8444	-0.8312	21.397	0.0092	0.1808	-0.6061	122.2	-32.9834	-6.0444
		163				1.3866	0.1161	-7.7556	0.0072	0.1403	0.052	44.947	-0.8839	26.0725	0.0072	0.1403	-0.6733	122.2	-42.1866	-4.147
		173				0.8707	0.0784	-5.6432	0.0054	0.105	0.0354	53.3305	-0.9216	30.2603	0.0054	0.105	-0.7344	122.2	-51.6707	-2.5305
								13.0052	0.619	-22.0122	0.014	0.2735	0.2491	8.5088	-0.381	0.609	0.014	0.2735	-0.2359	122.2
						12.5541	0.606	-21.9108	0.0141	0.2762	0.2448	8.9476	-0.394	0.9179	0.0141	0.2762	-0.2447	122.2	-0.3541	-21.1476
City Trust Ltd	31.6	9	23.3	77	0.5	23.6063	0.9974	-1.9837	0.0005	0.0018	0.0396	0.0158	-0.0026	-0.1159	0.0005	0.0018	-0.0005	26.1	-6.5063	-17.1158
		19				15.4561	0.9223	-5.6941	0.0085	0.0325	0.0684	0.765	-0.0777	-1.751	0.0085	0.0325	-0.0161	26.1	-8.3561	-7.865
		29				9.4635	0.7402	-8.8262	0.0188	0.0724	0.0696	3.6718	-0.2598	-2.8077	0.0188	0.0724	-0.0594	26.1	-12.3635	-0.7718
		39				5.6623	0.5398	-9.4872	0.0231	0.0887	0.057	8.77	-0.4602	-1.3934	0.0231	0.0887	-0.1166	26.1	-18.5623	4.13
		30				8.9943	0.7197	-9.0009	0.0196	0.0753	0.0687	4.0925	-0.2803	-2.7749	0.0196	0.0753	-0.0648	26.1	-12.8943	-0.1925
		31				8.5468	0.699	-9.149	0.0202	0.0778	0.0677	4.535	-0.301	-2.7155	0.0202	0.0778	-0.0702	26.1	-13.4468	<b>0.365</b>
CFC Bank	16.9	11	23.3	24	0.5	7.111	0.9995	-2.2858	0.0006	0.0002	0.0489	0.0004	-0.0005	-0.0029	0.0006	0.0002	0	15.6	-2.511	-4.6004
		21				0.5137	0.3057	-2.0908	0.1223	0.0419	0.0233	2.3024	-0.6943	2.2674	0.1223	0.0419	-0.0702	15.6	-5.9137	3.0976
		15				3.6462	0.9299	-3.2	0.0469	0.0161	0.0603	0.0953	-0.0701	-0.087	0.0469	0.0161	-0.0064	15.6	-3.0462	-0.6953
		16				2.8758	0.8631	-3.3596	0.0764	0.0262	0.0586	0.2149	-0.1369	-0.0391	0.0764	0.0262	-0.0126	15.6	-3.2758	<b>0.1851</b>
Diamond Trust Banl	22	16	23.3	20	0.5	7.7617	0.9992	-3.3249	0.0009	0.0004	0.0711	0.0007	-0.0008	-0.0044	0.0009	0.0004	-0.0001	21.1	-2.6617	-5.1007
		26				0.783	0.3874	-2.9965	0.1231	0.0596	0.0387	1.9215	-0.6126	2.3994	0.1231	0.0596	-0.077	21.1	-5.683	2.9785
		21				3.4878	0.8896	-4.3371	0.0606	0.0293	0.0804	0.1766	-0.1104	0.0211	0.0606	0.0293	-0.013	21.1	-3.3878	-0.2766
		22				2.7586	0.8147	-4.3677	0.0859	0.0416	0.0758	0.3373	-0.1853	0.1981	0.0859	0.0416	-0.0221	21.1	-3.6586	<b>0.5627</b>
Housing Finance Cr of Kenya	16	10	23.3	32	0.5	7.1046	0.9966	-2.0988	0.0028	0.0012	0.0442	0.004	-0.0034	-0.0235	0.0028	0.0012	-0.0003	16.3	-0.8046	-6.304
		20				0.7877	0.3603	-2.5154	0.1034	0.0423	0.0249	2.5865	-0.6397	1.6353	0.1034	0.0423	-0.0641	16.3	-4.4877	1.1135
		15				3.0465	0.8196	-3.2989	0.0726	0.0297	0.0503	0.3956	-0.1804	-0.1859	0.0726	0.0297	-0.0164	16.3	-1.7465	-1.6956
		16				2.4183	0.7351	-3.3645	0.0904	0.037	0.0467	0.6574	-0.2649	-0.044	0.0904	0.037	-0.0245	16.3	-2.1183	-0.9574
		17				1.88	0.6408	-3.3059	0.1033	0.0423	0.0419	1.009	-0.3592	0.2222	0.1033	0.0423	-0.0338	16.3	-2.58	-0.309
		18				1.4327	0.543	-3.1278	0.1096	0.0449	0.0363	1.4516	-0.457	0.6079	0.1096	0.0449	-0.0438	16.3	-3.1327	<b>0.2484</b>
ICDC Investments Co Ltd	39.1	26	23.3	37	0.5	16.027	0.9837	-5.6485	0.004	0.0113	0.1122	0.0654	-0.0163	-0.2526	0.004	0.0113	-0.0035	41.8	-0.227	-15.8654
		36				8.2471	0.8139	-8.2387	0.0262	0.0741	0.1179	1.185	-0.1861	-0.7675	0.0262	0.0741	-0.0423	41.8	-2.4471	-6.985
		46				3.31	0.4822	-7.7016	0.039	0.1102	0.0777	5.1473	-0.5178	1.845	0.039	0.1102	-0.127	41.8	-7.51	-0.9473
		56				1.097	0.2129	-4.6566	0.0284	0.0803	0.0361	11.8337	-0.7871	6.9653	0.0284	0.0803	-0.2131	41.8	-15.297	2.3663
		47				2.986	0.4495	-7.4507	0.0387	0.1094	0.0729	5.7132	-0.5505	2.3034	0.0387	0.1094	-0.1362	41.8	-8.186	-0.5132
		48				2.6887	0.4179	-7.1774	0.0382	0.108	0.0682	6.3059	-0.5821	2.7843	0.0382	0.108	-0.1453	41.8	-8.8887	-0.1059

					49	2.4168	0.3874	-6.8858	0.0374	0.1059	0.0636	6.9239	-0.6126	3.2834	0.0374	0.1059	-0.1544	41.8	-9.6168	<b>0.2761</b>
Jubilee Insurance Co Ltd	30.2	23	23.3	19	0.5	9.7332	0.9985	-4.7822	0.0012	0.0011	0.1021	0.0018	-0.0015	-0.0089	0.0012	0.0011	-0.0002	30.3	-2.4332	-7.3018
		33				2.0454	0.6084	-5.3662	0.0947	0.082	0.0816	1.2135	-0.3916	1.4825	0.0947	0.082	-0.0652	30.3	-4.7454	1.4865
		28				5.4077	0.9329	-5.8363	0.032	0.0277	0.1138	0.126	-0.0671	-0.0254	0.032	0.0277	-0.0108	30.3	-3.1077	-2.426
		29				4.6152	0.8919	-5.9586	0.0458	0.0396	0.1116	0.2235	-0.1081	0.0599	0.0458	0.0396	-0.0174	30.3	-3.3152	-1.5235
		30				3.8724	0.8376	-5.9926	0.0606	0.0525	0.1071	0.3706	-0.1624	0.2334	0.0606	0.0525	-0.0264	30.3	-3.5724	-0.6706
		31				3.1907	0.7705	-5.9127	0.0747	0.0648	0.1004	0.5789	-0.2295	0.5208	0.0747	0.0648	-0.0376	30.3	-3.8907	<b>0.1211</b>
KCB Ltd	70	47	23.3	23	0.5	28.1746	0.9994	-9.7675	0.0002	0.001	0.2089	0.0018	-0.0006	-0.0134	0.0002	0.001	-0.0002	61.4	-13.7746	-14.4018
		57				19.3599	0.9804	-12.0314	0.0042	0.0236	0.2463	0.0865	-0.0196	-0.2019	0.0042	0.0236	-0.0073	61.4	-14.9599	-4.4865
		67				11.2706	0.8571	-13.9326	0.0198	0.1117	0.2436	0.8966	-0.1429	-0.0278	0.0198	0.1117	-0.0545	61.4	-16.8706	4.7034
		61				15.967	0.95	-12.9585	0.0091	0.0511	0.2527	0.2534	-0.05	-0.2989	0.0091	0.0511	-0.0188	61.4	-15.567	-0.6534
		62				15.1449	0.9388	-13.1705	0.0106	0.0599	0.2528	0.3212	-0.0612	-0.3034	0.0106	0.0599	-0.023	61.4	-15.7449	<b>0.2788</b>
National Bank Ltd	12.8	4	23.3	60	0.5	9.2412	0.9994	-0.8399	0.0004	0.0002	0.0178	0.001	-0.0006	-0.0097	0.0004	0.0002	0	8.6	-4.6412	-4.601
		14				2.2964	0.6086	-3.3669	0.0707	0.0348	0.0275	1.9555	-0.3914	-0.4614	0.0707	0.0348	-0.0348	8.6	-7.6964	3.4445
		8				5.8323	0.9446	-2.067	0.0206	0.0101	0.0313	0.1519	-0.0554	-0.4067	0.0206	0.0101	-0.0043	8.6	-5.2323	-0.7519
		9				5.0781	0.9061	-2.4304	0.0309	0.0152	0.0326	0.2876	-0.0939	-0.5626	0.0309	0.0152	-0.0074	8.6	-5.4781	<b>0.1124</b>
NIC Bank Ltd	33.1	13	23.3	54	0.5	21.5373	0.9984	-2.7501	0.0004	0.0012	0.0575	0.0065	-0.0016	-0.0521	0.0004	0.0012	-0.0003	28.9	-5.6373	-15.9065
		23				13.1189	0.9264	-5.8548	0.011	0.0326	0.0877	0.4875	-0.0736	-1.0815	0.011	0.0326	-0.0146	28.9	-7.2189	-6.3875
		33				6.8222	0.6929	-8.1981	0.0278	0.0822	0.0806	3.0903	-0.3071	-1.3495	0.0278	0.0822	-0.0663	28.9	-10.9222	1.0097
		31				7.8554	0.7479	-7.9752	0.0253	0.0747	0.0845	2.3436	-0.2521	-1.5417	0.0253	0.0747	-0.0534	28.9	-9.9554	-0.2436
		32				7.3246	0.7207	-8.1043	0.0266	0.0787	0.0826	2.7027	-0.2793	-1.4632	0.0266	0.0787	-0.0597	28.9	-10.4246	<b>0.3973</b>
Pan Africa Ins Co	20	13	23.3	18	0.5	8.4308	1	-2.698	0	0	0	0	0	0	0	0	0	16.7	-4.7308	-3.7
		22				1.2288	0.5913	-3.4601	0.1526	0.0549	0.053	0.8075	-0.4087	1.1056	0.1526	0.0549	-0.0449	16.7	-6.5288	4.4925
		16				5.7635	0.9969	-3.3296	0.0037	0.0013	0.0709	0.0025	-0.0031	-0.009	0.0037	0.0013	-0.0003	16.7	-5.0635	-0.7025
		17				4.882	0.988	-3.5491	0.0123	0.0044	0.0744	0.011	-0.012	-0.021	0.0123	0.0044	-0.0013	16.7	-5.182	<b>0.289</b>
		18				4.0184	0.9647	-3.7603	0.0306	0.011	0.0764	0.0374	-0.0353	-0.0247	0.0306	0.011	-0.0037	16.7	-5.3184	1.2626
Standard Chartered Bank Ltd	42.1	27	23.3	34	0.5	18.0969	0.9929	-5.7273	0.0019	0.0059	0.1185	0.0253	-0.0071	-0.1239	0.0019	0.0059	-0.0016	51.7	<b>6.6031</b>	-24.7253
		37				9.8838	0.8733	-8.3721	0.0205	0.0618	0.1344	0.7116	-0.1267	-0.6934	0.0205	0.0618	-0.0302	51.7	4.8162	-15.4116
		47				4.153	0.5585	-8.5094	0.039	0.1175	0.0968	3.8802	-0.4415	1.2447	0.039	0.1175	-0.1123	51.7	<b>0.547</b>	-8.5802
		57				1.3887	0.2562	-5.4494	0.0318	0.0958	0.047	10.0153	-0.7438	6.38	0.0318	0.0958	-0.2066	51.7	-6.6887	-4.7153
		67				0.3953	0.0922	-2.4858	0.0163	0.0492	0.0174	17.9213	-0.9078	11.419	0.0163	0.0492	-0.2807	51.7	-15.6953	-2.6213
		48				3.7565	0.5238	-8.2971	0.0393	0.1186	0.0915	4.3737	-0.4762	1.6645	0.0393	0.1186	-0.1221	51.7	-0.0565	-8.0737

SIMULATION OF OPTION VALUES USING BOPSCOL  
INDUSTRIAL AND ALLIED SECTOR-JULY TO DECEMBER 1998

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.98	Value of European call option	Value of European put option	
Athi River Mining Ltd	9	4	23.32	48	0.5	5.442	0.9981	-0.8439	0.0019	0.0004	0.0177	0.0018	-0.0019	-0.0137	0.0019	0.0004	-0.0001	6.2	-3.242	-2.2018	
						0.3211	0.2152	-1.2698	0.0957	0.0186	0.0081	3.7803	-0.7848	1.6357	0.0957	0.0186	-0.0542	6.2	-8.1211	4.0197	
						6	3.7229	0.9562	-1.4221	0.0304	0.0059	0.0244	0.0625	-0.0438	-0.1769	0.0304	0.0059	-0.0023	6.2	-3.5229	-0.2625
						7	2.9487	0.895	-1.7462	0.0595	0.0116	0.0255	0.1783	-0.105	-0.2935	0.0595	0.0116	-0.0056	6.2	-3.7487	<b>0.6217</b>
						8	2.2717	0.8052	-2.0019	0.0902	0.0175	0.0249	0.3913	-0.1948	-0.3416	0.0902	0.0175	-0.0107	6.2	-4.0717	1.4087
9	1.7076	0.6961	-2.131	0.1145	0.0223	0.0228	0.7171	-0.3039	-0.2632	0.1145	0.0223	-0.0173	6.2	-4.5076	2.0829						
Bamburi Cement Ltd	35.1	17	23.32	46	0.5	19.9823	0.997	-3.6049	0.0008	0.0023	0.0751	0.0113	-0.003	-0.0768	0.0008	0.0023	-0.0006	36	-0.9823	-19.0113	
						11.6356	0.9079	-6.6043	0.0145	0.041	0.1012	0.5641	-0.0921	-1.0008	0.0145	0.041	-0.019	36	-2.6356	-9.5641	
						37	5.5642	0.6402	-8.2132	0.0328	0.0928	0.0845	3.392	-0.3598	-0.5344	0.0328	0.0928	-0.0801	36	-6.5642	-2.392
						47	2.3023	0.3533	-6.5981	0.0326	0.0922	0.0505	9.0295	-0.6467	3.1561	0.0326	0.0922	-0.1586	36	-13.3023	1.9705
						41	3.9631	0.5173	-7.8607	0.0349	0.0989	0.071	5.3506	-0.4827	0.6482	0.0349	0.0989	-0.1115	36	-8.9631	-0.3506
42	3.6294	0.4878	-7.6988	0.0349	0.099	0.0675	5.907	-0.5122	1.0177	0.0349	0.099	-0.1194	36	-9.6294	<b>0.093</b>						
BAT Ltd	67.5	65	23.32	9	0.5	7.9132	0.9762	-13.7619	0.0131	0.0268	0.2899	0.0392	-0.0238	0.1429	0.0131	0.0268	-0.0082	71.2	-1.7132	-6.2392	
						75	2.1076	0.5826	-10.3554	0.0909	0.1863	0.1861	1.3531	-0.4174	5.2097	0.0909	0.1863	-0.1477	71.2	-5.9076	2.4469
						70	5.4082	0.9019	-13.6792	0.0403	0.0826	0.2774	0.2041	-0.0981	0.8482	0.0403	0.0826	-0.0341	71.2	-4.2082	-1.4041
						71	4.6361	0.8576	-13.3857	0.0524	0.1075	0.2663	0.3219	-0.1424	1.3492	0.0524	0.1075	-0.0497	71.2	-4.4361	-0.5219
						72	3.9114	0.8023	-12.9112	0.0647	0.1327	0.2512	0.4871	-0.1977	2.0313	0.0647	0.1327	-0.0692	71.2	-4.7114	<b>0.3129</b>
BOC Gases Ltd	35.1	18	23.32	46	0.5	19.1011	0.995	-3.8556	0.0013	0.0036	0.0791	0.02	-0.005	-0.12	0.0013	0.0036	-0.001	36	-1.1011	-18.02	
						28	10.8989	0.888	-6.9017	0.0167	0.0473	0.1013	0.7172	-0.112	-1.0907	0.0167	0.0473	-0.0232	36	-2.8989	-8.7172
						38	5.1218	0.6091	-8.1747	0.0336	0.0953	0.0813	3.8396	-0.3909	-0.2884	0.0336	0.0953	-0.0878	36	-7.1218	-1.8396
						48	2.0963	0.3295	-6.3409	0.0317	0.0898	0.0474	9.7135	-0.6705	3.6207	0.0317	0.0898	-0.1662	36	-14.0963	2.2865
						41	3.9631	0.5173	-7.8607	0.0349	0.0989	0.071	5.3506	-0.4827	0.6482	0.0349	0.0989	-0.1115	36	-8.9631	-0.3506
42	3.6294	0.4878	-7.6988	0.0349	0.099	0.0675	5.907	-0.5122	1.0177	0.0349	0.099	-0.1194	36	-9.6294	<b>0.093</b>						
43	3.3202	0.459	-7.5133	0.0348	0.0985	0.064	6.4877	-0.541	1.4107	0.0348	0.0985	-0.1274	36	-10.3202	0.5123						
Carbacid Investment	44.9	36	23.32	34	0.5	13.1919	0.9363	-8.075	0.0116	0.0396	0.1442	0.3298	-0.0637	-0.6037	0.0116	0.0396	-0.016	74.2	<b>25.0081</b>	-38.5298	
						46	6.3858	0.6931	-9.5594	0.0325	0.1115	0.1237	2.4231	-0.3069	-0.0128	0.0325	0.1115	-0.081	74.2	<b>21.8142</b>	-30.6231
						56	2.4815	0.3769	-7.4672	0.0352	0.1206	0.0722	7.4182	-0.6231	4.1547	0.0352	0.1206	-0.177	74.2	<b>15.7185</b>	-25.6182
						66	0.8147	0.1594	-4.0982	0.0225	0.077	0.0317	14.6509	-0.8406	9.5991	0.0225	0.077	-0.262	74.2	<b>7.3853</b>	-22.8509
						76	0.2386	0.0566	-1.7655	0.0105	0.0361	0.0115	22.9741	-0.9434	14.0071	0.0105	0.0361	-0.3267	74.2	-2.0386	-21.1741
71	0.4459	0.0967	-2.7559	0.0159	0.0543	0.0195	18.7317	-0.9033	11.979	0.0159	0.0543	-0.2965	74.2	2.7541	-21.9317						
72	0.3941	0.0871	-2.5301	0.0147	0.0503	0.0176	19.5699	-0.9129	12.4124	0.0147	0.0503	-0.3028	74.2	1.8059	-21.7699						
73	0.3481	0.0783	-2.3184	0.0136	0.0465	0.0158	20.4138	-0.9217	12.8316	0.0136	0.0465	-0.309	74.2	<b>0.8519</b>	-21.6138						
74	0.3071	0.0704	-2.1207	0.0125	0.0428	0.0143	21.2628	-0.9296	13.2368	0.0125	0.0428	-0.315	74.2	-0.1071	-21.4628						
Crown Berger Ltd	9.4	5	23.32	44	0.5	4.9557	0.9948	-1.069	0.0052	0.001	0.022	0.0054	-0.0052	-0.0314	0.0052	0.001	-0.0003	8.1	-1.8557	-3.1054	
						15	0.2247	0.1656	-1.0382	0.0851	0.0165	0.0067	4.1738	-0.8344	2.0748	0.0851	0.0165	-0.0601	8.1	-7.1247	2.7262
						8	2.5374	0.8528	-1.951	0.0787	0.0153	0.0274	0.257	-0.1472	-0.2907	0.0787	0.0153	-0.0082	8.1	-2.4374	-0.357
						9	1.9093	0.7486	-2.1279	0.109	0.0212	0.0256	0.5187	-0.2514	-0.2601	0.109	0.0212	-0.0144	8.1	-2.8093	<b>0.3813</b>
						10	1.3987	0.6298	-2.1589	0.1291	0.0251	0.0226	0.8981	-0.3702	-0.0835	0.1291	0.0251	-0.0219	8.1	-3.2987	1.0019
Dunlop Kenya Ltd	30.8	10	23.32	72	0.5	21.9204	0.9965	-2.2117	0.0007	0.0023	0.0439	0.0199	-0.0035	-0.1364	0.0007	0.0023	-0.0006	18.5	-13.4204	-8.5199	

Simulation of option values:Industrial and Allied sector;July-December,1998

					20	13.839	0.9085	-5.8757	0.0105	0.0358	0.0707	0.8378	-0.0915	-1.725	0.0105	0.0358	-0.0183	18.5	-15.339	0.6622
					19	14.5585	0.924	-5.484	0.0091	0.0311	0.0695	0.6673	-0.076	-1.5409	0.0091	0.0311	-0.015	18.5	-15.0585	-0.1673
E A Cables Ltd	22.1	12	23.32	29	0.5	11.4209	0.9999	-2.492	0.0001	0.0001	0.0534	0.0002	-0.0001	-0.0016	0.0001	0.0001	0	20	-3.4209	-8.0002
		22				3.2496	0.7559	-4.5598	0.0692	0.049	0.0673	0.7283	-0.2441	0.006	0.0692	0.049	-0.0306	20	-5.2496	1.2717
		20				4.6047	0.8766	-4.3685	0.045	0.0319	0.0738	0.3035	-0.1234	-0.2178	0.045	0.0319	-0.0152	20	-4.6047	-0.3035
		21				3.8953	0.8212	-4.5081	0.0576	0.0408	0.0713	0.4841	-0.1788	-0.1498	0.0576	0.0408	-0.0222	20	-4.8953	0.5159
E A Packaging Ltd	20	7	23.32	43	0.5	13.7705	1	-1.4534	0	0	0.0311	0	0	-0.0007	0	0	0	15.6	-5.1705	-8.6
		17				5.3812	0.8577	-4.114	0.037	0.0318	0.0589	0.5102	-0.1423	-0.5859	0.037	0.0318	-0.0168	15.6	-6.7812	0.8898
		15				6.8615	0.9308	-3.5505	0.0219	0.0188	0.0588	0.2106	-0.0692	-0.4375	0.0219	0.0188	-0.008	15.6	-6.2615	-0.8106
		16				6.0985	0.8979	-3.8493	0.0293	0.0252	0.0593	0.3376	-0.1021	-0.5287	0.0293	0.0252	-0.0119	15.6	-6.4985	0.0624
EA Portland Cement	22.1	15	23.32	25	0.5	8.7528	0.9984	-3.1248	0.0014	0.0008	0.0666	0.0019	-0.0016	-0.0118	0.0014	0.0008	-0.0002	17.6	-6.1528	-2.6019
		25				1.4886	0.5201	-3.8901	0.102	0.0623	0.05	1.6372	-0.4799	1.2983	0.102	0.0623	-0.0612	17.6	-8.8886	5.7628
		17				6.9895	0.9872	-3.5869	0.0085	0.0052	0.0741	0.0185	-0.0128	-0.0588	0.0085	0.0052	-0.0015	17.6	-6.3895	-0.6185
		18				6.126	0.9719	-3.8322	0.0165	0.0101	0.0768	0.045	-0.0281	-0.0966	0.0165	0.0101	-0.0033	17.6	-6.526	0.355
		19				5.2877	0.9455	-4.0712	0.0283	0.0173	0.078	0.0966	-0.0545	-0.128	0.0283	0.0173	-0.0065	17.6	-6.6877	1.3034
		20				4.4877	0.9054	-4.2779	0.0431	0.0263	0.0776	0.1866	-0.0946	-0.1272	0.0431	0.0263	-0.0114	17.6	-6.8877	2.2134
Firestone EA Ltd	17.1	12	23.32	29	0.5	6.4309	0.9918	-2.534	0.0064	0.0027	0.0526	0.0102	-0.0082	-0.0436	0.0064	0.0027	-0.0008	16.1	-2.3309	-4.1102
		22				0.5716	0.2886	-2.2149	0.0974	0.0413	0.0218	3.0503	-0.7114	2.3508	0.0974	0.0413	-0.0761	16.1	-6.4716	2.8497
		16				3.1855	0.8402	-3.4601	0.0693	0.0294	0.0559	0.3245	-0.1598	-0.1396	0.0693	0.0294	-0.0153	16.1	-3.0855	-0.4245
		17				2.5283	0.758	-3.5281	0.0891	0.0378	0.0522	0.5573	-0.242	0	0.0891	0.0378	-0.0235	16.1	-3.4283	0.3427
EABL	54.8	42	23.32	36	0.5	17.7558	0.9485	-9.4537	0.0076	0.0409	0.1711	0.3333	-0.0515	-0.7373	0.0076	0.0409	-0.0158	68.8	9.0442	-27.1333
		52				10.46	0.7856	-11.6696	0.0209	0.113	0.163	1.9369	-0.2144	-0.8779	0.0209	0.113	-0.0684	68.8	6.34	-18.7369
		62				5.3831	0.54	-11.1825	0.0285	0.1538	0.121	5.7594	-0.46	1.6846	0.0285	0.1538	-0.1548	68.8	1.4169	-12.5594
		72				2.4748	0.3131	-8.3672	0.0254	0.1373	0.0734	11.7505	-0.6869	6.5753	0.0254	0.1373	-0.247	68.8	-5.6748	-8.5505
		82				1.0451	0.1592	-5.1727	0.0174	0.094	0.0384	19.2203	-0.8408	11.8451	0.0174	0.094	-0.3265	68.8	-14.2451	-6.0203
		92				0.4156	0.0735	-2.788	0.01	0.054	0.0181	27.4902	-0.9265	16.3052	0.01	0.054	-0.3913	68.8	-23.6156	-4.2902
		102				0.1587	0.0318	-1.3645	0.0051	0.0277	0.0079	36.1327	-0.9682	19.804	0.0051	0.0277	-0.446	68.8	-33.3587	-2.9327
		112				0.059	0.0131	-0.6245	0.0024	0.0131	0.0033	44.9325	-0.9869	22.6193	0.0024	0.0131	-0.4951	68.8	-43.259	-1.7325
		64				4.6458	0.4903	-10.7458	0.0286	0.1545	0.1111	6.802	-0.5097	2.5364	0.0286	0.1545	-0.1737	68.8	0.1542	-11.602
		65				4.3089	0.466	-10.4958	0.0285	0.154	0.1061	7.3551	-0.534	2.9939	0.0285	0.154	-0.1831	68.8	-0.5089	-11.1551
		66				3.9923	0.4423	-10.2277	0.0283	0.153	0.1012	7.9284	-0.5577	3.4695	0.0283	0.153	-0.1925	68.8	-1.1923	-10.7284
		67				3.6952	0.4191	-9.9439	0.028	0.1514	0.0963	8.5213	-0.5809	3.9609	0.028	0.1514	-0.2018	68.8	-1.8952	-10.3213
Kenya National Mills	24.3	11	23.32	58	0.5	14.5396	0.9923	-2.4441	0.0021	0.0036	0.0479	0.029	-0.0077	-0.1612	0.0021	0.0036	-0.0011	16.3	-9.2396	-5.329
		21				6.9756	0.801	-5.694	0.028	0.048	0.0624	1.3644	-0.199	-1.3358	0.028	0.048	-0.031	16.3	-11.6756	3.3356
		16				10.4009	0.9343	-4.1435	0.0128	0.022	0.0615	0.34	-0.0657	-0.8229	0.0128	0.022	-0.0097	16.3	-10.1009	-0.64
		17				9.6473	0.9132	-4.5007	0.0159	0.0272	0.0627	0.4763	-0.0868	-0.9727	0.0159	0.0272	-0.0129	16.3	-10.3473	0.2237
Kenya Oil Co Ltd	56.1	39	23.32	22	0.5	21.3942	0.9992	-8.1065	0.0003	0.0011	0.1733	0.0019	-0.0008	-0.0127	0.0003	0.0011	-0.0002	55	-5.3942	-16.0019
		49				12.6633	0.9552	-10.3676	0.0108	0.0375	0.2046	0.1704	-0.0448	-0.1985	0.0108	0.0375	-0.0134	55	-6.6633	-6.1704
		59				5.463	0.6926	-10.8548	0.0403	0.1394	0.167	1.8695	-0.3074	1.3897	0.0403	0.1394	-0.0956	55	-9.463	2.1305
		54				8.7216	0.8583	-11.1532	0.0257	0.089	0.1971	0.6784	-0.1417	0.0537	0.0257	0.089	-0.0431	55	-7.7216	-1.6784

					55	8.0057	0.8301	-11.2005	0.029	0.1003	0.1928	0.8525	-0.1699	0.2139	0.029	0.1003	-0.0519	55	-8.0057	-0.8525		
					56	7.32	0.7992	-11.1977	0.0322	0.1113	0.1876	1.0567	-0.2008	0.4242	0.0322	0.1113	-0.0616	55	-8.32	-0.0567		
					57	6.6665	0.7658	-11.1406	0.0351	0.1217	0.1815	1.2932	-0.2342	0.6889	0.0351	0.1217	-0.0722	55	-8.6665	0.7068		
KPLC	129.6	89	23.32	27	0.5	50.4254	0.9963	-18.6265	0.0005	0.0102	0.3934	0.0301	-0.0037	-0.156	0.0005	0.0102	-0.0026	120.2	-19.2254	-31.2301		
		99				41.6588	0.9829	-21.0402	0.0017	0.0389	0.4286	0.1629	-0.0171	-0.4944	0.0017	0.0389	-0.0119	120.2	-20.4588	-21.3629		
		109				33.1973	0.9466	-23.556	0.0044	0.0996	0.4474	0.6009	-0.0534	-0.9347	0.0044	0.0996	-0.0376	120.2	-21.9973	-11.8009		
		119				25.3598	0.8756	-25.6254	0.0083	0.188	0.4406	1.6628	-0.1244	-0.9288	0.0083	0.188	-0.0889	120.2	-24.1598	-2.8628		
		129				18.4973	0.7675	-26.4405	0.0123	0.28	0.4048	3.6997	-0.2325	0.3314	0.0123	0.28	-0.1692	120.2	-27.2973	5.1003		
		122				23.1841	0.8468	-26.0365	0.0096	0.2167	0.4328	2.157	-0.1532	-0.7174	0.0096	0.2167	-0.1101	120.2	-24.9841	-0.357		
		123				22.4801	0.8364	-26.1444	0.01	0.2262	0.4296	2.3428	-0.1636	-0.6177	0.01	0.2262	-0.1177	120.2	-25.2801	0.4572		
		124				21.7871	0.8258	-26.2365	0.0104	0.2356	0.4262	2.5398	-0.1742	-0.5023	0.0104	0.2356	-0.1256	120.2	-25.5871	1.2602		
		Total Kenya Ltd	41.4	22	23.32	39	0.5	21.8291	0.9978	-4.6208	0.0006	0.002	0.0974	0.0078	-0.0022	-0.055	0.0006	0.002	-0.0005	44.9	1.0709	-22.9078
				32				13.301	0.9325	-7.3916	0.0114	0.0382	0.1265	0.3791	-0.0675	-0.7505	0.0114	0.0382	-0.0159	44.9	-0.401	-13.2791
				42				6.6222	0.6945	-9.1626	0.0307	0.1026	0.1106	2.5997	-0.3055	-0.4462	0.0307	0.1026	-0.0762	44.9	-3.7222	-5.4997
				52				2.7531	0.3951	-7.5693	0.0337	0.1127	0.068	7.63	-0.6049	3.2224	0.0337	0.1127	-0.1634	44.9	-9.8531	-0.53
62						1.0076	0.1831	-4.56	0.0232	0.0776	0.0329	14.7839	-0.8169	8.3071	0.0232	0.0776	-0.243	44.9	-18.1076	2.3161		
27						17.4504	0.9826	-5.908	0.0038	0.0126	0.1161	0.0788	-0.0174	-0.3046	0.0038	0.0126	-0.004	44.9	0.4496	-17.9788		
28						16.5948	0.9761	-6.1966	0.0049	0.0165	0.1191	0.1132	-0.0239	-0.3856	0.0049	0.0165	-0.0055	44.9	0.3052	-17.0132		
29						15.75	0.968	-6.4926	0.0063	0.021	0.1216	0.1583	-0.032	-0.4741	0.0063	0.021	-0.0074	44.9	0.15	-16.0583		
30						14.918	0.9581	-6.793	0.0078	0.0262	0.1237	0.2163	-0.0419	-0.567	0.0078	0.0262	-0.0098	44.9	-0.018	-15.1163		
53						2.5019	0.3688	-7.2834	0.033	0.1104	0.0638	8.2688	-0.6312	3.716	0.033	0.1104	-0.172	44.9	-10.6019	-0.1688		
54						2.2709	0.3436	-6.987	0.0322	0.1077	0.0598	8.9277	-0.6564	4.2198	0.0322	0.1077	-0.1805	44.9	-11.3709	0.1723		
Unga Group Ltd	58.8			26	23.32	95	0.5	36.5573	0.9577	-8.1703	0.0023	0.0375	0.0988	0.8957	-0.0423	-2.7744	0.0023	0.0375	-0.0169	47	-15.5573	-21.8957
		36				29.5705	0.8925	-12.6485	0.0047	0.0769	0.1145	2.8084	-0.1075	-5.1772	0.0047	0.0769	-0.0457	47	-18.5705	-13.8084		
		46				23.8164	0.8092	-16.2884	0.0069	0.1131	0.1188	5.9537	-0.1908	-6.7419	0.0069	0.1131	-0.0859	47	-22.8164	-6.9537		
		56				19.183	0.7197	-18.6979	0.0085	0.14	0.1157	10.2197	-0.2803	-7.076	0.0085	0.14	-0.1335	47	-28.183	-1.2197		
		66				15.49	0.6321	-19.941	0.0095	0.1567	0.1084	15.4261	-0.3679	-6.2438	0.0095	0.1567	-0.1853	47	-34.49	3.5739		
		58				18.3752	0.7019	-19.0335	0.0088	0.1441	0.1145	11.1918	-0.2981	-6.9965	0.0088	0.1441	-0.1436	47	-29.3752	-0.1918		
		59				17.9849	0.693	-19.1841	0.0089	0.1461	0.1138	11.6915	-0.307	-6.9396	0.0089	0.1461	-0.1487	47	-29.9849	0.3085		
		60				17.6035	0.6842	-19.3236	0.009	0.1479	0.1131	12.2	-0.3158	-6.8716	0.009	0.1479	-0.1539	47	-30.6035	0.8		
		61				17.2307	0.6754	-19.4522	0.0091	0.1496	0.1124	12.7171	-0.3246	-6.7926	0.0091	0.1496	-0.159	47	-31.2307	1.2829		

SIMULATION OF OPTION VALUES USING OPSCOL																	Stock price	Value of	Value of			
AGRICULTURAL SECTOR-JANUARY-JUNE 1999																	at expiration	European	European			
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	30.6.99	call option	put option		
Brooke Bond	141	70	13.29	39	0.5	75.5217	0.9982	-8.8886	0.0001	0.0056	0.3262	0.0214	-0.0018	-0.1837	0.0001	0.0056	-0.0013	146.9	1.3783	-76.9214		
		80				66.2474	0.9925	-10.5969	0.0005	0.0206	0.3685	0.1041	-0.0075	-0.6484	0.0005	0.0206	-0.0058	146.9	0.6526	-67.0041		
		90				57.1435	0.9776	-12.7959	0.0014	0.0531	0.4035	0.3573	-0.0224	-1.6039	0.0014	0.0531	-0.0176	146.9	-0.2435	-57.2573		
		100				48.3789	0.9479	-15.4771	0.0027	0.1063	0.4264	0.9499	-0.0521	-3.0415	0.0027	0.1063	-0.0415	146.9	-1.4789	-47.8499		
		110				40.1585	0.8996	-18.3651	0.0045	0.1755	0.4334	2.0865	-0.1004	-4.6859	0.0045	0.1755	-0.0812	146.9	-3.2585	-38.9865		
		120				32.6775	0.8324	-21.0059	0.0064	0.25	0.4234	3.9626	-0.1676	-6.0832	0.0064	0.25	-0.138	146.9	-5.7775	-30.8626		
		180				6.6282	0.3062	-18.5007	0.009	0.3498	0.1827	34.056	-0.6938	3.8833	0.009	0.3498	-0.6594	146.9	-39.7282	-0.956		
		190				4.8555	0.2411	-15.9915	0.008	0.3107	0.1457	41.6404	-0.7589	7.6361	0.008	0.3107	-0.7432	146.9	-47.9555	1.4596		
		200				3.5255	0.1871	-13.4885	0.0069	0.268	0.1143	49.6674	-0.8129	11.3827	0.0069	0.268	-0.8214	146.9	-56.6255	3.4326		
		85				61.6648	0.9866	-11.6295	0.0009	0.0343	0.3872	0.2002	-0.0134	-1.0592	0.0009	0.0343	-0.0105	146.9	0.2352	-62.1002		
		86				60.755	0.9851	-11.8521	0.001	0.0376	0.3907	0.226	-0.0149	-1.1575	0.001	0.0376	-0.0117	146.9	0.145	-61.126		
		87				59.8477	0.9834	-12.0801	0.0011	0.0412	0.3941	0.2545	-0.0166	-1.2611	0.0011	0.0412	-0.013	146.9	0.0523	-60.1545		
		88				58.9433	0.9816	-12.3134	0.0012	0.0449	0.3973	0.2857	-0.0184	-1.3701	0.0012	0.0449	-0.0144	146.9	-0.0433	-59.1857		
		183				6.0435	0.2855	-17.7586	0.0087	0.3388	0.1711	36.2784	-0.7145	4.9985	0.0087	0.3388	-0.6851	146.9	-42.1435	-0.1784		
		184				5.8591	0.2788	-17.5084	0.0086	0.3349	0.1673	37.0297	-0.7212	5.3731	0.0086	0.3349	-0.6936	146.9	-42.9591	0.0703		
		185				5.6798	0.2723	-17.257	0.0085	0.331	0.1635	37.7861	-0.7277	5.7488	0.0085	0.331	-0.702	146.9	-43.7798	0.3139		
		Eaagads Ltd	43.2	14	13.29	60	0.5	30.1073	0.9988	-1.8083	0.0002	0.0013	0.0652	0.0072	-0.0012	-0.0673	0.0002	0.0013	-0.0003	42.1	-2.0073	-28.1072
				24				21.0889	0.9603	-4.2804	0.0047	0.0262	0.102	0.3459	-0.0397	-1.2959	0.0047	0.0262	-0.0103	42.1	-2.9889	-18.4459
				34				13.5264	0.8246	-7.6675	0.0141	0.0788	0.1105	2.1405	-0.1754	-3.4394	0.0141	0.0788	-0.0486	42.1	-5.4264	-10.2405
				44				8.1462	0.6276	-9.4552	0.0206	0.1156	0.0948	6.1174	-0.3724	-3.9836	0.0206	0.1156	-0.111	42.1	-10.0462	-4.2174
54						4.7305	0.4375	-9.1055	0.0215	0.1204	0.0709	12.0588	-0.5625	-2.3903	0.0215	0.1204	-0.1818	42.1	-16.6305	-0.1588		
64						2.6994	0.2885	-7.5568	0.0186	0.1043	0.0488	19.3848	-0.7115	0.402	0.0186	0.1043	-0.2506	42.1	-24.5994	2.5152		
55						4.4749	0.4206	-8.9863	0.0213	0.1194	0.0685	12.7389	-0.5794	-2.1468	0.0213	0.1194	-0.1889	42.1	-17.3749	0.1611		
George Williamson	141			87	13.29	22	0.5	59.5941	0.9998	-10.829	0	0.0006	0.4069	0.0009	-0.0002	-0.01	0	0.0006	-0.0001	143	-3.5941	-56.0009
97							50.2482	0.9982	-12.154	0.0003	0.0058	0.4525	0.012	-0.0018	-0.0915	0.0003	0.0058	-0.0013	143	-4.2482	-46.012	
107							40.9689	0.9887	-13.734	0.0014	0.0297	0.4922	0.0899	-0.0113	-0.4279	0.0014	0.0297	-0.0084	143	-4.9689	-36.0899	
117					31.9428	0.9558	-15.7139	0.0043	0.0931	0.5142	0.4209	-0.0442	-1.1643	0.0043	0.0931	-0.0332	143	-5.9428	-26.4209			
127					23.5456	0.8804	-17.7457	0.0091	0.1989	0.503	1.3807	-0.1196	-1.9525	0.0091	0.1989	-0.0912	143	-7.5456	-17.3807			
137					16.2606	0.7549	-18.8818	0.0143	0.3135	0.4509	3.4529	-0.2451	-1.8451	0.0143	0.3135	-0.1901	143	-10.2606	-9.4529			
147					10.4692	0.5937	-18.2419	0.0177	0.3867	0.3662	7.0185	-0.4063	0.0384	0.0177	0.3867	-0.3215	143	-14.4692	-3.0185			
157					6.2797	0.4262	-15.7528	0.0179	0.3909	0.2691	12.1861	-0.5738	3.771	0.0179	0.3909	-0.4654	143	-20.2797	1.8139			
152					8.1795	0.5088	-17.1956	0.0182	0.3977	0.3178	9.4074	-0.4912	1.7064	0.0182	0.3977	-0.3933	143	-17.1795	-0.4074			
153					7.7691	0.492	-16.9354	0.0182	0.3977	0.308	9.9327	-0.508	2.091	0.0182	0.3977	-0.4078	143	-17.7691	0.0673			
Kakuzi Ltd	141	80	13.29	27	0.5	66.1456	0.9997	-9.974	0	0.0012	0.374	0.0023	-0.0003	-0.0255	0	0.0012	-0.0002	120.4	-25.7456	-40.4023		
		90				56.8081	0.9974	-11.3565	0.0003	0.008	0.4191	0.022	-0.0026	-0.1645	0.0003	0.008	-0.0019	120.4	-26.4081	-30.422		
		100				47.5528	0.9876	-13.0536	0.0012	0.0321	0.4585	0.1238	-0.0124	-0.618	0.0012	0.0321	-0.0094	120.4	-27.1528	-20.5238		
		110				38.5467	0.9594	-15.2028	0.0032	0.0869	0.4837	0.4748	-0.0406	-1.5236	0.0032	0.0869	-0.031	120.4	-28.1467	-10.8748		
		120				30.0785	0.9012	-17.5735	0.0065	0.1735	0.4849	1.3637	-0.0988	-2.6508	0.0065	0.1735	-0.0765	120.4	-29.6785	-1.7637		
		130				22.4979	0.8076	-19.5052	0.0102	0.2727	0.4568	3.1402	-0.1924	-3.3389	0.0102	0.2727	-0.1514	120.4	-32.0979	6.4598		
		122				28.4804	0.8852	-18.0207	0.0072	0.1932	0.4817	1.637	-0.1148	-2.8493	0.0072	0.1932	-0.0891	120.4	-30.0804	-0.037		
		123				27.6956	0.8767	-18.2357	0.0076	0.2032	0.4796	1.7879	-0.1233	-2.94	0.0076	0.2032	-0.0958	120.4	-30.2956	0.8121		
		124				26.9208	0.8679	-18.444	0.0079	0.2133	0.4773	1.9488	-0.1321	-3.0238	0.0079	0.2133	-0.1029	120.4	-30.5208	1.6512		
		125				26.1562	0.8587	-18.6446	0.0083	0.2233	0.4746	2.1199	-0.1413	-3.1001	0.0083	0.2233	-0.1102	120.4	-30.7562	2.4801		
Kapchorua Tea Co	95	91	13.29	24	0.5	12.2368	0.7673	-12.9887	0.019	0.2053	0.3033	2.3863	-0.2327	-1.6723	0.019	0.2053	-0.1225	150	46.7632	-61.3863		
		101				6.657	0.546	-12.3976	0.0246	0.2662	0.2261	6.1637	-0.454	0.1623	0.0246	0.2662	-0.2465	150	42.343	-55.1637		

111					3.197	0.3297	-9.5739	0.0225	0.2432	0.1406	12.0608	-0.6703	4.2296	0.0225	0.2432	-0.3787	150	35.803	-51.0608	
121					1.3709	0.1713	-6.08	0.0158	0.1708	0.0745	19.5918	-0.8287	8.9671	0.0158	0.1708	-0.4916	150	27.6291	-48.5918	
131					0.5331	0.0782	-3.2739	0.0091	0.0982	0.0345	28.111	-0.9218	13.0167	0.0091	0.0982	-0.5784	150	18.4669	-47.111	
141					0.191	0.0321	-1.541	0.0045	0.0484	0.0143	37.1261	-0.9679	15.9931	0.0045	0.0484	-0.6454	150	8.809	-46.1261	
151					0.064	0.0121	-0.651	0.002	0.0211	0.0054	46.3561	-0.9879	18.1267	0.002	0.0211	-0.701	150	-1.064	-45.3561	
149					0.08	0.0148	-0.7793	0.0023	0.0251	0.0066	44.5007	-0.9852	17.7497	0.0023	0.0251	-0.6905	150	<b>0.92</b>	-45.5007	
150					0.0716	0.0134	-0.7126	0.0021	0.0231	0.006	45.428	-0.9866	17.9408	0.0021	0.0231	-0.6958	150	-0.0716	-45.428	
Limuru Tea Co	760	589	13.29	16	0.5	208.9155	0.9981	-73.5653	0.0001	0.0323	2.7483	0.0486	-0.0019	-0.3197	0.0001	0.0323	-0.0074	650	-147.9155	-61.0486
		599				199.5902	0.997	-74.9618	0.0001	0.0491	2.7907	0.0803	-0.003	-0.4726	0.0001	0.0491	-0.0118	650	-148.5902	-51.0803
		609				190.2822	0.9954	-76.4098	0.0002	0.0727	2.831	0.1294	-0.0046	-0.6771	0.0002	0.0727	-0.0183	650	-149.2822	-41.1294
		619				180.9989	0.993	-77.9167	0.0002	0.1046	2.8684	0.2032	-0.007	-0.9405	0.0002	0.1046	-0.0276	650	-149.9989	-31.2032
		629				171.7499	0.9897	-79.4873	0.0003	0.1467	2.9022	0.3113	-0.0103	-1.2675	0.0003	0.1467	-0.0406	650	-150.7499	-21.3113
		639				162.5475	0.9852	-81.1213	0.0004	0.2006	2.9312	0.466	-0.0148	-1.658	0.0004	0.2006	-0.0584	650	-151.5475	-11.466
		649				153.4067	0.9793	-82.8121	0.0006	0.2679	2.9543	0.6823	-0.0207	-2.1052	0.0006	0.2679	-0.0821	650	-152.4067	-1.6823
		659				144.3458	0.9716	-84.5444	0.0008	0.3498	2.9702	0.9785	-0.0284	-2.5939	0.0008	0.3498	-0.113	650	-153.3458	8.0215
		650				152.4967	0.9786	-82.9838	0.0006	0.2754	2.9562	0.708	-0.0214	-2.1525	0.0006	0.2754	-0.0848	650	-152.4967	-0.708
		651				151.5875	0.9779	-83.1559	0.0006	0.2831	2.9581	0.7345	-0.0221	-2.2002	0.0006	0.2831	-0.0876	650	-152.5875	<b>0.2655</b>
Rea Vipingo Ltd	6	4	13.29	20	0.5	2.2572	0.9997	-0.4982	0.0014	0.0001	0.0187	0.0001	-0.0003	-0.0007	0.0014	0.0001	0	6	-0.2572	-2.0001
		5				1.3333	0.9664	-0.6568	0.0881	0.0032	0.0223	0.0118	-0.0336	-0.0351	0.0881	0.0032	-0.0011	6	-0.3333	-1.0118
		6				0.5556	0.7056	-0.7813	0.4062	0.0146	0.0184	0.1699	-0.2944	-0.0352	0.4062	0.0146	-0.0097	6	-0.5556	-0.1699
		7				0.1445	0.2914	-0.5042	0.4043	0.0146	0.008	0.6945	-0.7086	0.3663	0.4043	0.0146	-0.0247	6	-1.1445	<b>0.3055</b>
Sasini Tea & Coffea	69.8	40	13.29	27	0.5	32.373	0.9996	-4.9892	0.0001	0.0007	0.187	0.0014	-0.0004	-0.015	0.0001	0.0007	-0.0001	54	-18.373	-14.0014
		50				23.0857	0.9858	-6.5586	0.0027	0.0179	0.2286	0.0712	-0.0142	-0.3408	0.0027	0.0179	-0.0053	54	-19.0857	-4.0712
		60				14.4117	0.8918	-8.8339	0.0139	0.0917	0.2392	0.7543	-0.1082	-1.3726	0.0139	0.0917	-0.0415	54	-20.4117	5.2457
		54				19.4822	0.9631	-7.4203	0.0061	0.0398	0.2387	0.2105	-0.0369	-0.7051	0.0061	0.0398	-0.0139	54	-19.4822	-0.2105
		55				18.6034	0.9546	-7.6544	0.0072	0.0471	0.2402	0.2674	-0.0454	-0.8148	0.0072	0.0471	-0.0172	54	-19.6034	<b>0.7326</b>

SIMULATION OF OPTION VALUES USING BOPSCOL																	Stock price	Value of	Value of							
COMMERCIAL AND SERVICES SECTOR-JANUARY-JUNE 1999																	at expiration	European	European							
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	30.6.99	call option	put option						
A Baumann & Co	16.9	14	13.29	12	0.5	3.8005	0.9988	-1.7439	0.0027	0.0005	0.0654	0.0005	-0.0012	-0.0029	0.0027	0.0005	-0.0001	16.9	-0.9005	-2.9005						
						2.8709	0.9872	-1.8831	0.0231	0.004	0.0691	0.0066	-0.0128	-0.0178	0.0231	0.004	-0.0011	16.9	-0.9709	-1.9066						
						1.9751	0.9293	-2.0187	0.0944	0.0162	0.0686	0.0465	-0.0707	-0.029	0.0944	0.0162	-0.0062	16.9	-1.0751	-0.9465						
						1.1871	0.7752	-2.0132	0.209	0.0358	0.0596	0.1941	-0.2248	0.1009	0.209	0.0358	-0.02	16.9	-1.2871	-0.0941						
						0.6	0.5328	-1.6872	0.2773	0.0475	0.042	0.5428	-0.4672	0.5512	0.2773	0.0475	-0.02	16.9	-1.7	0.5572						
CMC Holdings Ltd	33	25	13.29	16	0.5	9.6083	0.999	-3.1168	0.0009	0.0008	0.1168	0.001	-0.001	-0.0079	0.0009	0.0008	-0.0002	28	-6.6083	-3.001						
						1.6115	0.5493	-3.6729	0.106	0.0924	0.0826	1.3613	-0.4507	0.6796	0.106	0.0924	-0.0812	28	-8.6115	5.6387						
						6.8255	0.982	-3.565	0.0119	0.0103	0.1279	0.0254	-0.018	-0.0831	0.0119	0.0103	-0.0031	28	-6.8255	-0.0254						
						5.922	0.9629	-3.7384	0.0217	0.0189	0.1293	0.0575	-0.0371	-0.1321	0.0217	0.0189	-0.0064	28	-6.922	0.9425						
						5.0468	0.9314	-3.9077	0.0354	0.0308	0.1284	0.1181	-0.0686	-0.177	0.0354	0.0308	-0.0119	28	-7.0468	1.8819						
Car & General	12	2	13.29	105	0.5	10.1352	0.998	-0.3018	0.0007	0.0005	0.0092	0.0066	-0.002	-0.0531	0.0007	0.0005	-0.0002	10	-2.1352	-8.0066						
						3.7613	0.6775	-3.7771	0.0403	0.0304	0.0218	2.9898	-0.3225	-2.2848	0.0403	0.0304	-0.0343	10	-5.7613	-0.9898						
						1.5314	0.361	-3.7088	0.042	0.0318	0.014	10.117	-0.639	-0.973	0.042	0.0318	-0.0889	10	-13.5314	1.883						
						3.1078	0.5999	-3.986	0.0434	0.0328	0.0205	4.2078	-0.4001	-2.2451	0.0434	0.0328	-0.045	10	-7.1078	-0.2078						
						2.8309	0.5636	-4.0317	0.0442	0.0334	0.0197	4.8666	-0.4364	-2.1664	0.0442	0.0334	-0.0505	10	-7.8309	0.1334						
						2.5824	0.5292	-4.0456	0.0447	0.0338	0.0188	5.5537	-0.4708	-2.0559	0.0447	0.0338	-0.056	10	-8.5824	0.4463						
						2.3589	0.4967	-4.0328	0.0448	0.0339	0.018	6.266	-0.5033	-1.9188	0.0448	0.0339	-0.0615	10	-9.3589	0.734						
Express Kenya Ltd	28.6	11	13.29	49	0.5	18.3099	0.9991	-1.3943	0.0003	0.0006	0.0513	0.0027	-0.0009	-0.0264	0.0003	0.0006	-0.0001	25.5	-3.8099	-14.5027						
						9.5269	0.8955	-3.933	0.0183	0.0366	0.0804	0.5769	-0.1045	-1.3215	0.0183	0.0366	-0.0178	25.5	-5.0269	-5.0769						
						3.7613	0.5527	-5.5196	0.0399	0.08	0.0602	4.1683	-0.4473	-1.6646	0.0399	0.08	-0.0848	25.5	-9.2613	1.3317						
						6.1603	0.7389	-5.2109	0.0328	0.0657	0.0749	1.8888	-0.2611	-1.9777	0.0328	0.0657	-0.0468	25.5	-6.6603	-1.3888						
						5.6042	0.7024	-5.3579	0.035	0.0701	0.0724	2.2683	-0.2976	-2.0003	0.035	0.0701	-0.0539	25.5	-7.1042	-0.7683						
						5.0873	0.665	-5.4616	0.0368	0.0737	0.0697	2.6871	-0.335	-1.9797	0.0368	0.0737	-0.0613	25.5	-7.5873	-0.1871						
						4.6087	0.6274	-5.5222	0.0382	0.0765	0.0667	3.1442	-0.3726	-1.9158	0.0382	0.0765	-0.069	25.5	-8.1087	0.3558						
Kenya Airways	8.1	4	13.29	39	0.5	4.3583	0.9983	-0.5074	0.0024	0.0003	0.0186	0.0011	-0.0017	-0.01	0.0024	0.0003	-0.0001	8	-0.3583	-4.0011						
						3.4361	0.9833	-0.6945	0.0186	0.0024	0.0226	0.0147	-0.0167	-0.0727	0.0186	0.0024	-0.0007	8	-0.4361	-3.0147						
						2.5648	0.9288	-0.9628	0.0609	0.0078	0.0248	0.079	-0.0712	-0.2167	0.0609	0.0078	-0.0033	8	-0.5648	-2.079						
						1.803	0.8181	-1.2311	0.1183	0.0151	0.0241	0.253	-0.1819	-0.3606	0.1183	0.0151	-0.0086	8	-0.803	-1.253						
						1.1963	0.6642	-1.3706	0.1633	0.0209	0.0209	0.582	-0.3358	-0.3757	0.1633	0.0209	-0.0165	8	-1.1963	-0.582						
						0.7542	0.4987	-1.3278	0.1786	0.0228	0.0164	1.0756	-0.5013	-0.2086	0.1786	0.0228	-0.0257	8	-1.7542	-0.0756						
						0.4557	0.35	-1.1436	0.1658	0.0212	0.0119	1.7128	-0.65	0.0999	0.1658	0.0212	-0.0349	8	-2.4557	0.2872						
						Lonhro Motors	22	10	13.29	38	0.5	12.6437	0.9995	-1.2518	0.0003	0.0003	0.0467	0.0008	-0.0005	-0.0082	0.0003	0.0003	-0.0001	17	-5.6437	-7.0008
												4.198	0.7692	-3.4895	0.0515	0.0473	0.0636	0.9122	-0.2308	-1.0024	0.0515	0.0473	-0.0299	17	-7.198	2.0878
												8.056	0.9646	-2.2106	0.0132	0.0121	0.0658	0.0917	-0.0354	-0.3452	0.0132	0.0121	-0.0044	17	-6.056	-2.0917
7.194	0.9414	-2.4875	0.0198	0.0182	0.0676							0.1653	-0.0586	-0.4978	0.0198	0.0182	-0.0073	17	-6.194	-1.1653						
6.3693	0.9101	-2.7738	0.0275	0.0252	0.0683							0.2764	-0.0899	-0.6597	0.0275	0.0252	-0.0113	17	-6.3693	-0.2764						
5.5905	0.8704	-3.0496	0.0357	0.0328	0.0678							0.4333	-0.1296	-0.8112	0.0357	0.0328	-0.0164	17	-6.5905	0.5667						
Marshall's EA Ltd	25	18	13.29	19	0.5	8.1585	0.9987	-2.2484	0.0013	0.0008	0.084	0.0013	-0.0013	-0.01	0.0013	0.0008	-0.0002	22	-4.1585	-4.0013						



					28	0.8536	0.3891	-2.467	0.1142	0.0678	0.0444	2.0535	-0.6109	1.0149	0.1142	0.0678	-0.0866	22	-6.8536	-3.9465			
					22	4.5151	0.9349	-2.9325	0.0378	0.0224	0.0943	0.1007	-0.0651	-0.1967	0.0378	0.0224	-0.0086	22	-4.5151	-0.1007			
					23	3.6858	0.8815	-3.1049	0.059	0.0351	0.0918	0.2072	-0.1185	-0.2447	0.059	0.0351	-0.0159	22	-4.6858	0.7928			
Nation Media Group	137.7				87	13.29	22	0.5	56.2948	0.9997	-10.8355	0	0.001	0.4068	0.0015	-0.0003	-0.0165	0	0.001	-0.0002	130	-13.2948	-43.0015
					97				46.9558	0.9971	-12.1975	0.0004	0.0087	0.4517	0.0197	-0.0029	-0.135	0.0004	0.0087	-0.0021	130	-13.9558	-33.0197
					107				37.7147	0.9833	-13.8728	0.0019	0.0405	0.4884	0.1357	-0.0167	-0.5667	0.0019	0.0405	-0.0122	130	-14.7147	-23.1357
					117				28.814	0.9397	-15.9294	0.0056	0.1165	0.5029	0.5921	-0.0603	-1.3798	0.0056	0.1165	-0.0445	130	-15.814	-13.5921
					127				20.6931	0.8473	-17.8099	0.011	0.2297	0.4799	1.8282	-0.1527	-2.0167	0.011	0.2297	-0.1143	130	-17.6931	-4.8282
					137				13.8508	0.7046	-18.4493	0.0161	0.3362	0.4159	4.3431	-0.2954	-1.4126	0.0161	0.3362	-0.2251	130	-20.8508	2.6569
					132				17.0854	0.7813	-18.3485	0.0138	0.2873	0.4525	2.8991	-0.2187	-1.9336	0.0138	0.2873	-0.165	130	-19.0854	-0.8991
					133				16.4073	0.7667	-18.4068	0.0143	0.298	0.4459	3.1567	-0.2333	-1.8675	0.0143	0.298	-0.1764	130	-19.4073	-0.1567
					134				15.7445	0.7518	-18.4466	0.0148	0.3083	0.4389	3.4296	-0.2482	-1.7829	0.0148	0.3083	-0.1881	130	-19.7445	0.5704
Pearl Drycleaners	10				1	13.29	120	0.5	9.0662	0.9994	-0.1424	0.0003	0.0002	0.0046	0.0019	-0.0006	-0.0181	0.0003	0.0002	0	10	-0.0662	-9.0019
					11				3.1898	0.6518	-3.5793	0.0436	0.0261	0.0166	3.4826	-0.3482	-2.2114	0.0436	0.0261	-0.0348	10	-4.1898	-2.4826
					21				1.3657	0.355	-3.4494	0.0439	0.0263	0.0109	11.0156	-0.645	-0.8379	0.0439	0.0263	-0.0873	10	-12.3657	-0.0156
					22				1.2665	0.3348	-3.3673	0.0429	0.0258	0.0104	11.8521	-0.6652	-0.6315	0.0429	0.0258	-0.0925	10	-13.2665	0.1479
Standard Newspaper	21.3				2	13.29	112	0.5	19.43	0.9997	-0.2643	0.0001	0.0001	0.0093	0.0014	-0.0003	-0.0156	0.0001	0.0001	0	14	-7.43	-11.9997
					12				11.4564	0.8858	-4.2432	0.0115	0.0291	0.0371	1.385	-0.1142	-2.7509	0.0115	0.0291	-0.0191	14	-9.4564	-3.385
					22				6.8107	0.6697	-7.1019	0.0215	0.0546	0.0373	6.0964	-0.3303	-4.3661	0.0215	0.0546	-0.0657	14	-14.8107	1.9036
					17				8.786	0.7777	-6.0579	0.0177	0.0449	0.0389	3.3931	-0.2223	-3.9438	0.0177	0.0449	-0.0406	14	-11.786	-0.3931
					18				8.342	0.7557	-6.3256	0.0186	0.0473	0.0388	3.8847	-0.2443	-4.0872	0.0186	0.0473	-0.0454	14	-12.342	0.1153
TPS Serena	14.5				12	13.29	16	0.5	3.2774	0.9897	-1.5164	0.0166	0.0028	0.0554	0.0059	-0.0103	-0.0242	0.0166	0.0028	-0.0008	16.1	0.8226	-4.1059
					13				2.3748	0.9462	-1.6871	0.0666	0.0112	0.0567	0.039	-0.0538	-0.0705	0.0666	0.0112	-0.0041	16.1	0.7252	-3.139
					14				1.5572	0.83	-1.8076	0.1543	0.0259	0.0524	0.1572	-0.17	-0.0666	0.1543	0.0259	-0.0131	16.1	0.5428	-2.2572
					15				0.9022	0.6347	-1.7199	0.2292	0.0386	0.0415	0.4379	-0.3653	0.1454	0.2292	0.0386	-0.0287	16.1	0.1978	-1.5379
					16				0.4554	0.4105	-1.3685	0.237	0.0399	0.0275	0.9268	-0.5895	0.6212	0.237	0.0399	-0.0474	16.1	-0.3554	-1.0268
					17				0.1997	0.223	-0.8928	0.1819	0.0306	0.0152	1.6067	-0.777	1.2213	0.1819	0.0306	-0.0644	16.1	-1.0997	-0.7067
					18				0.0764	0.1025	-0.4806	0.1089	0.0183	0.0071	2.4192	-0.8975	1.7578	0.1089	0.0183	-0.0772	16.1	-1.9764	-0.5192
					19				0.0258	0.0405	-0.2173	0.053	0.0089	0.0028	3.3043	-0.9595	2.1454	0.053	0.0089	-0.0861	16.1	-2.9258	-0.4043
Uchumi Supermark	44				30	13.29	27	0.5	15.9496	0.9928	-3.8529	0.0024	0.0062	0.1387	0.0209	-0.0072	-0.1222	0.0024	0.0062	-0.0017	48.2	2.2504	-18.2209
					40				7.4255	0.8271	-5.9986	0.0305	0.0796	0.1448	0.8539	-0.1729	-1.0244	0.0305	0.0796	-0.0423	48.2	0.7745	-9.0539
					50				2.2357	0.4106	-5.3705	0.0463	0.121	0.0791	5.0212	-0.5894	0.8473	0.0463	0.121	-0.1548	48.2	-4.0357	-3.2212
					60				0.4527	0.1188	-2.303	0.0236	0.0618	0.0239	12.5952	-0.8812	5.1583	0.0236	0.0618	-0.2568	48.2	-12.2527	-0.7952
					41				6.7202	0.792	-6.1456	0.0341	0.0892	0.1406	1.0843	-0.208	-1.047	0.0341	0.0892	-0.0512	48.2	0.4798	-8.2843
					42				6.0541	0.754	-6.2511	0.0375	0.098	0.1356	1.3539	-0.246	-1.0281	0.0375	0.098	-0.0609	48.2	0.1459	-7.5539
					43				5.4292	0.7136	-6.3099	0.0405	0.1059	0.1298	1.6647	-0.2864	-0.9626	0.0405	0.1059	-0.0713	48.2	-0.2292	-6.8647
					61				0.3792	0.1025	-2.0495	0.0213	0.0556	0.0206	13.4574	-0.8975	5.5362	0.0213	0.0556	-0.2647	48.2	-13.1792	-0.6574
					62				0.3167	0.0881	-1.8151	0.019	0.0497	0.0178	14.3307	-0.9119	5.8949	0.019	0.0497	-0.2723	48.2	-14.1167	-0.5307

SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JANUARY-JUNE 1999

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.99	Value of European call option	Value of European put option						
Barclays Bank	126.3	89	13.3	20	0.5	43.0285	0.9987	-11.1208	0.0002	0.0038	0.4155	0.0067	-0.0013	-0.0531	0.0002	0.0038	-0.0008	109.6	-22.4285	-20.6067						
						33.7411	0.9882	-12.6535	0.0017	0.0275	0.4553	0.0763	-0.0118	-0.3423	0.0017	0.0275	-0.0079	109.6	-23.1411	-10.6763						
						24.765	0.9432	-14.5786	0.0064	0.1019	0.4718	0.4574	-0.0568	-1.0239	0.0064	0.1019	-0.0382	109.6	-24.165	-1.0574						
						16.6607	0.8319	-16.2369	0.0141	0.2244	0.442	1.7101	-0.1681	-1.4385	0.0141	0.2244	-0.1147	109.6	-26.0607	7.6899						
						23.9037	0.9355	-14.7775	0.0071	0.1126	0.4712	0.5318	-0.0645	-1.0984	0.0071	0.1126	-0.0434	109.6	-24.3037	-0.1318						
						23.0517	0.927	-14.9733	0.0078	0.1239	0.4701	0.6155	-0.073	-1.1698	0.0078	0.1239	-0.0492	109.6	-24.4517	<b>0.7845</b>						
						22.2098	0.9178	-15.1644	0.0085	0.1355	0.4685	0.7093	-0.0822	-1.2365	0.0085	0.1355	-0.0555	109.6	-24.6098	1.6907						
						21.3787	0.9078	-15.3493	0.0093	0.1476	0.4664	0.8139	-0.0922	-1.2971	0.0093	0.1476	-0.0623	109.6	-24.7787	2.5861						
						20.5591	0.8971	-15.5265	0.01	0.1601	0.4637	0.93	-0.1029	-1.3499	0.01	0.1601	-0.0696	109.6	-24.9591	3.47						
						City Trust Ltd	26.1	20	13.3	14	0.5	7.386	0.9997	-2.489	0.0005	0.0002	0.0935	0.0002	-0.0003	-0.0019	0.0005	0.0002	0	22.5	-4.886	-2.5002
												0.3601	0.2464	-1.6213	0.122	0.0582	0.0303	2.3314	-0.7536	2.1094	0.122	0.0582	-0.11	22.5	-7.8601	5.1686
												5.5207	0.9928	-2.7616	0.0077	0.0037	0.102	0.0063	-0.0072	-0.0258	0.0077	0.0037	-0.001	22.5	-5.0207	-0.5063
												4.6015	0.9771	-2.9179	0.021	0.01	0.1045	0.0228	-0.0229	-0.0577	0.021	0.01	-0.0031	22.5	-5.1015	<b>0.4772</b>
												3.7102	0.9416	-3.0744	0.0452	0.0215	0.1043	0.0673	-0.0584	-0.0898	0.0452	0.0215	-0.008	22.5	-5.2102	1.4327
2.8729	0.8761	-3.1857	0.0792	0.0378	0.1							0.1657	-0.1239	-0.0768	0.0792	0.0378	-0.017	22.5	-5.3729	2.3343						
CFC Bank	15.6	8	13.3	43	0.5							8.1228	0.9949	-1.0533	0.0031	0.0016	0.037	0.0085	-0.0051	-0.0584	0.0031	0.0016	-0.0004	15.1	-1.0228	-7.1085
						1.4002	0.4601	-2.6508	0.0837	0.0438	0.0289	2.6429	-0.5399	-0.4123	0.0837	0.0438	-0.0553	15.1	-4.3002	<b>0.2571</b>						
						1.7539	0.535	-2.7611	0.0838	0.0438	0.033	2.061	-0.465	-0.6471	0.0838	0.0438	-0.0466	15.1	-3.6539	-0.161						
Diamond Trust Bank	22	17	13.3	25	0.5	6.1361	0.9727	-2.2729	0.0162	0.0098	0.0763	0.0431	-0.0273	-0.1589	0.0162	0.0098	-0.0032	23.9	0.7639	-6.9431						
						0.5153	0.2438	-1.8636	0.0806	0.0488	0.0242	3.7795	-0.7562	1.494	0.0806	0.0488	-0.1021	23.9	-3.6153	-0.6795						
						3.6354	0.8422	-2.917	0.062	0.0375	0.0745	0.3496	-0.1578	-0.4299	0.062	0.0375	-0.0191	23.9	<b>0.2646</b>	-4.2496						
						2.9304	0.7665	-3.0425	0.0787	0.0476	0.0697	0.5803	-0.2335	-0.4311	0.0787	0.0476	-0.0286	23.9	-0.0304	-3.4803						
						2.3113	0.6788	-3.0704	0.0921	0.0557	0.0631	0.8969	-0.3212	-0.3346	0.0921	0.0557	-0.0398	23.9	-0.4113	-2.7969						
						0.1126	0.07	-0.712	0.0345	0.0209	0.0071	7.1196	-0.93	3.143	0.0345	0.0209	-0.1379	23.9	-7.2126	-0.0196						
						0.0743	0.0489	-0.5274	0.0261	0.0158	0.005	8.017	-0.9511	3.4519	0.0261	0.0158	-0.1447	23.9	-8.1743	<b>0.083</b>						
Housing Finance Co of Kenya	16.1	9	13.3	28	0.5	7.6789	0.9996	-1.1227	0.0004	0.0002	0.0421	0.0003	-0.0004	-0.0035	0.0004	0.0002	0	13.1	-3.5789	-4.1003						
						0.66	0.3439	-1.8211	0.1154	0.0419	0.0244	2.3385	-0.6561	0.5416	0.1154	0.0419	-0.0645	13.1	-6.56	3.5615						
						4.0335	0.9351	-1.8685	0.0397	0.0144	0.0551	0.0978	-0.0649	-0.2519	0.0397	0.0144	-0.0057	13.1	-3.9335	-0.1978						
ICDC Investments Co Ltd	42	43	13.3	8	0.5	2.0649	0.7844	-4.7991	0.1232	0.0869	0.1544	0.3004	-0.2156	0.5482	0.1232	0.0869	-0.0468	48.3	3.2351	-5.6004						
						0.0012	0.0018	-0.0237	0.0024	0.0017	0.0004	7.5938	-0.9982	6.5671	0.0024	0.0017	-0.2476	48.3	-4.7012	-2.8938						
						0.2852	0.2161	-1.8647	0.1234	0.087	0.044	2.2636	-0.7839	3.98	0.1234	0.087	-0.1759	48.3	1.0148	-3.5636						
						0.1419	0.1235	-1.1557	0.0859	0.0606	0.0252	3.0559	-0.8765	4.8134	0.0859	0.0606	-0.1993	48.3	<b>0.1581</b>	-3.3559						
						0.0648	0.064	-0.6462	0.0527	0.0372	0.0131	3.9146	-0.936	5.4472	0.0527	0.0372	-0.2161	48.3	-0.7648	-3.2146						
Jubilee Insurance	30.3	20	13.3	23	0.5	11.5875	0.9988	-2.5013	0.0008	0.0008	0.0934	0.0017	-0.0012	-0.0142	0.0008	0.0008	-0.0002	28.4	-3.1875	-8.4017						

Co Ltd	30				3.2103	0.7092	-4.1182	0.0696	0.0734	0.0914	0.9816	-0.2908	-0.3875	0.0696	0.0734	-0.049	28.4	-4.8103	<b>0.6184</b>	
	25				7.0098	0.9528	-3.3907	0.02	0.0211	0.1093	0.1026	-0.0472	-0.2819	0.02	0.0211	-0.0077	28.4	-3.6098	-3.5026	
	26				6.1519	0.9238	-3.6085	0.0291	0.0307	0.1092	0.1803	-0.0762	-0.3753	0.0291	0.0307	-0.0124	28.4	-3.7519	-2.5803	
	27				5.3334	0.8847	-3.812	0.0395	0.0417	0.1074	0.2975	-0.1153	-0.4544	0.0395	0.0417	-0.019	28.4	-3.9334	-1.6975	
	28				4.5645	0.8353	-3.9788	0.0503	0.0531	0.1037	0.4644	-0.1647	-0.4969	0.0503	0.0531	-0.0273	28.4	-4.1645	-0.8644	
	29				3.8544	0.7762	-4.0869	0.0607	0.0641	0.0983	0.69	-0.2238	-0.4805	0.0607	0.0641	-0.0374	28.4	-4.4544	-0.09	
KCB Ltd	61.6	35	13.3	23	0.5	28.8502	1	-4.3537	0	0.0093	0.0093	0.0001	0	-0.0012	0	0.0001	0	43.9	-19.9502	-8.9001
		45				19.52	0.9923	-5.7425	0.0021	0.0093	0.208	0.0269	-0.0077	-0.1465	0.0021	0.0093	-0.0025	43.9	-20.62	0.892
		43				21.3756	0.9965	-5.4218	0.001	0.0045	0.2001	0.0111	-0.0035	-0.0745	0.001	0.0045	-0.0011	43.9	-20.4756	-0.9111
		44				20.4463	0.9947	-5.5777	0.0015	0.0066	0.2042	0.0175	-0.0053	-0.106	0.0015	0.0066	-0.0017	43.9	-20.5463	<b>0.0825</b>
National Bank Ltd	8.6	5	13.3	29	0.5	3.922	0.9989	-0.6268	0.002	0.0002	0.0233	0.0006	-0.0011	-0.005	0.002	0.0002	0	6.3	-2.622	-1.3006
		6				2.9954	0.9855	-0.7933	0.0209	0.0022	0.0274	0.0097	-0.0145	-0.0471	0.0209	0.0022	-0.0007	6.3	-2.6954	-0.3097
		7				2.1158	0.9237	-1.0275	0.0813	0.0087	0.0291	0.0658	-0.0763	-0.157	0.0813	0.0087	-0.0036	6.3	-2.8158	<b>0.6342</b>
NIC Bank Ltd	30	24	13.3	14	0.5	7.5442	0.9985	-2.9927	0.0016	0.001	0.1121	0.0013	-0.0015	-0.0082	0.0016	0.001	-0.0002	28.7	-2.8442	-4.7013
		34				0.5213	0.2934	-2.1224	0.1159	0.073	0.0414	2.3355	-0.7066	2.1057	0.1159	0.073	-0.1177	28.7	-5.8213	2.9645
		28				3.9091	0.9219	-3.5897	0.0492	0.031	0.1187	0.109	-0.0781	-0.1077	0.0492	0.031	-0.0123	28.7	-3.2091	-0.809
		29				3.0935	0.8562	-3.6756	0.0763	0.0481	0.113	0.2291	-0.1438	-0.0693	0.0763	0.0481	-0.0227	28.7	-3.3935	<b>0.0709</b>
Pan Africa Ins Co	16.7	4	13.3	109	0.5	13.0144	0.99	-0.8111	0.0021	0.0032	0.0176	0.0572	-0.01	-0.3137	0.0021	0.0032	-0.0011	24	6.9856	-20.0572
		14				6.4787	0.7582	-4.8397	0.0243	0.0369	0.0309	2.8786	-0.2418	-3.0987	0.0243	0.0369	-0.0346	24	3.5213	-12.8786
		24				3.3998	0.5004	-5.7938	0.031	0.0471	0.0248	9.1569	-0.4996	-2.8093	0.031	0.0471	-0.0875	24	-3.3998	-9.1569
		34				1.9159	0.3261	-5.1078	0.028	0.0426	0.0176	17.03	-0.6739	-0.8797	0.028	0.0426	-0.1414	24	-11.9159	-7.03
		44				1.1455	0.2161	-4.0997	0.0228	0.0346	0.0123	25.6167	-0.7839	1.3719	0.0228	0.0346	-0.1935	24	-21.1455	-5.6167
		54				0.7183	0.1466	-3.1856	0.0178	0.0271	0.0087	34.5466	-0.8534	3.5296	0.0178	0.0271	-0.244	24	-30.7183	-4.5466
		64				0.4682	0.1018	-2.4518	0.0138	0.021	0.0062	43.6536	-0.8982	5.507	0.0138	0.021	-0.2933	24	-40.4682	-3.6536
		74				0.3151	0.0722	-1.8874	0.0107	0.0162	0.0045	52.8577	-0.9278	7.3149	0.0107	0.0162	-0.3418	24	-50.3151	-2.8577
		19				4.6494	0.6195	-5.6599	0.0296	0.045	0.0285	5.7279	-0.3805	-3.2971	0.0296	0.045	-0.0604	24	<b>0.3506</b>	-10.7279
		20				4.3607	0.5939	-5.7306	0.0301	0.0458	0.0278	6.3749	-0.4061	-3.2435	0.0301	0.0458	-0.0658	24	-0.3607	-10.3749
Standard Chartered Bank Ltd	51.6	44	13.3	15	0.5	10.4579	0.9854	-5.57	0.0067	0.0135	0.202	0.0292	-0.0146	-0.0983	0.0067	0.0135	-0.0039	48.9	-5.5579	-4.9292
		54				2.7377	0.5991	-5.86	0.0706	0.1411	0.1409	1.666	-0.4009	0.8552	0.0706	0.1411	-0.1118	48.9	-7.8377	3.434
		49				6.0943	0.8784	-6.3189	0.0369	0.0737	0.1962	0.344	-0.1216	-0.2255	0.0369	0.0737	-0.0331	48.9	-6.1943	-0.244
		50				5.3153	0.8356	-6.3792	0.0453	0.0904	0.189	0.5008	-0.1644	-0.1614	0.0453	0.0904	-0.0449	48.9	-6.4153	<b>0.5992</b>

SIMULATION OF OPTION VALUES USING SOPSOL INDUSTRIAL AND ALLIED SECTOR-JANUARY-JUNE 1999																	Stock price at expiration	Value of European call option	Value of European put option							
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	30.6.99								
Athl River Mining Ltd	6.2	3	13.29	42	0.5	3.3943	0.9976	-0.3848	0.0041	0.0003	0.014	0.0014	-0.0024	-0.0117	0.0041	0.0003	-0.0001	5.7	-0.6943	-2.7014						
						2.4831	0.9677	-0.6006	0.0393	0.0032	0.0176	0.026	-0.0323	-0.1031	0.0393	0.0032	-0.0011	5.7	-0.7831	-1.726						
						1.6674	0.8636	-0.8926	0.1188	0.0096	0.0184	0.146	-0.1364	-0.2708	0.1188	0.0096	-0.005	5.7	-0.9674	-0.846						
						1.0284	0.6853	-1.0818	0.1928	0.0156	0.0161	0.4427	-0.3147	-0.3357	0.1928	0.0156	-0.012	5.7	-1.3284	-0.1427						
						0.5903	0.4855	-1.0557	0.2165	0.0175	0.0121	0.9403	-0.5145	-0.1852	0.2165	0.0175	-0.0207	5.7	-1.8903	<b>0.3597</b>						
Bamburi Cement Ltd	36	20	13.29	31	0.5	17.2881	0.999	-2.5083	0.0004	0.0008	0.0934	0.0023	-0.001	-0.0212	0.0004	0.0008	-0.0002	26	-11.2881	-6.0023						
						8.373	0.8933	-4.6126	0.0233	0.0468	0.1189	0.4443	-0.1067	-0.8819	0.0233	0.0468	-0.0214	26	-12.373	3.5557						
						12.666	0.9811	-3.3752	0.0059	0.0118	0.1133	0.0588	-0.0189	-0.2663	0.0059	0.0118	-0.0037	26	-11.666	-1.0588						
						11.7666	0.9711	-3.6028	0.0084	0.0168	0.116	0.0951	-0.0289	-0.3696	0.0084	0.0168	-0.0057	26	-11.7666	-0.0951						
						10.8833	0.9577	-3.8468	0.0114	0.0229	0.118	0.1475	-0.0423	-0.4891	0.0114	0.0229	-0.0083	26	-11.8833	<b>0.8525</b>						
BAT Ltd	71.2	48	13.29	27	0.5	26.314	0.9939	-6.1411	0.0013	0.0086	0.2223	0.0281	-0.0061	-0.172	0.0013	0.0086	-0.0023	71.5	-2.814	-23.5281						
						17.3419	0.9354	-8.2614	0.0093	0.0635	0.2463	0.4131	-0.0646	-1.0488	0.0093	0.0635	-0.0251	71.5	-3.8419	-13.9131						
						9.7732	0.7531	-10.1184	0.0232	0.1589	0.2192	2.2015	-0.2469	-1.6622	0.0232	0.1589	-0.0989	71.5	-6.2732	-5.7015						
						4.6359	0.4863	-9.4056	0.0293	0.2007	0.15	6.4212	-0.5137	0.2941	0.0293	0.2007	-0.215	71.5	-11.1359	<b>0.0788</b>						
						5.0327	0.5133	-9.6081	0.0293	0.2007	0.1576	5.8824	-0.4867	-0.0328	0.0293	0.2007	-0.2027	71.5	-10.5327	-0.3824						
BOC Gases Ltd	36	20	13.29	31	0.5	17.2881	0.999	-2.5083	0.0004	0.0008	0.0934	0.0023	-0.001	-0.0212	0.0004	0.0008	-0.0002	26	-11.2881	-6.0023						
						8.373	0.8933	-4.6126	0.0233	0.0468	0.1189	0.4443	-0.1067	-0.8819	0.0233	0.0468	-0.0214	26	-12.373	3.5557						
						12.666	0.9811	-3.3752	0.0059	0.0118	0.1133	0.0588	-0.0189	-0.2663	0.0059	0.0118	-0.0037	26	-11.666	-1.0588						
						11.7666	0.9711	-3.6028	0.0084	0.0168	0.116	0.0951	-0.0289	-0.3696	0.0084	0.0168	-0.0057	26	-11.7666	-0.0951						
						10.8833	0.9577	-3.8468	0.0114	0.0229	0.118	0.1475	-0.0423	-0.4891	0.0114	0.0229	-0.0083	26	-11.8833	<b>0.8525</b>						
Carbacid Investment	76.5	51	13.29	29	0.5	28.8238	0.9919	-6.6018	0.0014	0.012	0.2353	0.045	-0.0081	-0.2596	0.0014	0.012	-0.0033	95.6	15.7762	-44.645						
						19.8868	0.9371	-8.8235	0.0079	0.0669	0.259	0.4651	-0.0629	-1.2378	0.0079	0.0669	-0.0264	95.6	14.7132	-35.0651						
						12.1902	0.7854	-10.9437	0.0186	0.1579	0.2394	2.1256	-0.2146	-2.1145	0.0186	0.1579	-0.0927	95.6	12.4098	-26.7256						
						6.5786	0.5588	-10.9969	0.0252	0.2135	0.1808	5.871	-0.4412	-0.924	0.0252	0.2135	-0.1981	95.6	8.0214	-20.471						
						3.1522	0.3373	-8.7407	0.0233	0.1976	0.1133	11.8018	-0.6627	2.5757	0.0233	0.1976	-0.3125	95.6	1.4478	-16.4018						
						1.3648	0.1766	-5.682	0.0165	0.1403	0.0607	19.3715	-0.8234	6.878	0.0165	0.1403	-0.4118	95.6	-6.7648	-13.9715						
						2.9114	0.3181	-8.4423	0.0227	0.193	0.1071	12.4967	-0.6819	2.9985	0.0227	0.193	-0.3233	95.6	<b>0.6886</b>	-16.0967						
						2.6863	0.2995	-8.138	0.0221	0.1879	0.1011	13.2073	-0.7005	3.4271	0.0221	0.1879	-0.334	95.6	-0.0863	-15.8073						
						Crown Berger Ltd	8.1	3	13.29	69	0.5	5.3049	0.9922	-0.4482	0.0055	0.0012	0.0137	0.012	-0.0078	-0.0751	0.0055	0.0012	-0.0004	8.5	0.1951	-5.512
												0.539	0.2778	-1.5526	0.0848	0.0192	0.0086	4.6032	-0.7222	0.0641	0.0848	0.0192	-0.0523	8.5	-5.039	-0.1032
0.053	0.0393	-0.371	0.0215	0.0049	0.0013							13.4744	-0.9607	2.4892	0.0215	0.0049	-0.1063	8.5	-14.553	1.0256						
4.4208	0.9661	-0.75	0.019	0.0043	0.017							0.0637	-0.0339	-0.2525	0.019	0.0043	-0.0017	8.5	<b>0.0792</b>	<b>-4.5637</b>						
3.6138	0.9145	-1.1219	0.0396	0.009	0.019							0.1923	-0.0855	-0.5001	0.0396	0.009	-0.0044	8.5	-0.1138	-3.6923						
Dunlop Kenya Ltd	20	6	13.29	57	0.5	14.3867	0.9996	-0.7566	0.0002	0.0002	0.028	0.0009	-0.0004	-0.0104	0.0002	0.0002	0	15	-5.3867	-9.0009						
						5.9832	0.8212	-3.4938	0.0324	0.037	0.0522	0.9545	-0.1788	-1.5041	0.0324	0.037	-0.0227	15	-6.9832	<b>0.0455</b>						
						6.6609	0.86	-3.1951	0.0276	0.0315	0.0527	0.6965	-0.14	-1.3297	0.0276	0.0315	-0.0175	15	-6.6609	-0.6965						

Simulation of option values: Industrial and Allied sector, January-June-1999

E A Cables Ltd	20	6	13.29	68	0.5	14.3921	0.998	-0.8003	0.0007	0.0009	0.0278	0.0064	-0.002	-0.0541	0.0007	0.0009	-0.0002	19.6	-0.7921	-13.6064					
						6.4053	0.8003	-3.9658	0.0291	0.0396	0.048	1.3766	-0.1997	-1.9761	0.0291	0.0396	-0.0269	19.6	-2.8053	-4.9766					
						2.3837	0.4337	-4.6193	0.0409	0.0556	0.0314	6.7121	-0.5663	-1.386	0.0409	0.0556	-0.0902	19.6	-8.7837	-0.3121					
						0.867	0.1994	-3.1021	0.0291	0.0395	0.0156	14.5525	-0.8006	1.3748	0.0291	0.0395	-0.1528	19.6	-17.267	1.8475					
						27	2.1535	0.403	-4.5076	0.0403	0.0547	0.0295	7.4177	-0.597	-1.15	0.0403	0.0547	-0.0968	19.6	-9.5535	-0.0177				
						28	1.9454	0.374	-4.3793	0.0394	0.0536	0.0277	8.1453	-0.626	-0.8974	0.0394	0.0536	-0.1033	19.6	-10.3454	<b>0.2547</b>				
						15.5	5	13.29	51	0.5	10.8218	0.9998	-0.6261	0.0002	0.0001	0.0234	0.0004	-0.0002	-0.0043	0.0002	0.0001	0	14	-1.8218	-9.0004
						15					2.9239	0.6756	-3.0134	0.0643	0.0394	0.0377	1.4596	-0.3244	-1.148	0.0643	0.0394	-0.0324	14	-3.9239	-0.4596
						22					0.785	0.2721	-2.3115	0.0594	0.0364	0.0172	5.8706	-0.7279	0.4244	0.0594	0.0364	-0.0858	14	-8.785	2.1294
						16					2.4544	0.6089	-3.0745	0.0687	0.0421	0.0349	1.9258	-0.3911	-1.0848	0.0687	0.0421	-0.0399	14	-4.4544	<b>0.0742</b>
EA Portland Cement	17.6	2	13.29	107	0.5	15.7304	0.9996	-0.2675	0.0001	0.0002	0.0093	0.0018	-0.0004	-0.0188	0.0001	0.0002	0	14.5	-3.2304	-12.5018					
						12	8.115	0.8346	-4.1849	0.0187	0.0309	0.0329	1.7436	-0.1654	-2.6926	0.0187	0.0309	-0.0233	14.5	-5.615	-4.2436				
						22	4.25	0.568	-5.9988	0.0295	0.0489	0.0287	7.2356	-0.432	-3.263	0.0295	0.0489	-0.0742	14.5	-11.75	<b>0.2644</b>				
						21	4.5209	0.592	-5.9544	0.0292	0.0483	0.0295	6.5708	-0.408	-3.3429	0.0292	0.0483	-0.0688	14.5	-11.0209	-0.0708				
Firestone EA Ltd	16.1	12	13.29	24	0.5	4.8853	0.9864	-1.5565	0.0127	0.004	0.055	0.0138	-0.0136	-0.0642	0.0127	0.004	-0.0012	16.5	-0.3853	-4.5138					
						22	0.1015	0.0864	-0.6017	0.0576	0.0179	0.0064	4.5871	-0.9136	2.1342	0.0576	0.0179	-0.0965	16.5	-5.6015	0.9129				
						17	1.1814	0.5619	-2.1222	0.1442	0.0449	0.0393	0.9884	-0.4381	-0.0082	0.1442	0.0449	-0.0402	16.5	-1.6814	-0.4884				
						18	0.7814	0.4282	-1.8847	0.1436	0.0447	0.0306	1.5242	-0.5718	0.3537	0.1436	0.0447	-0.0536	16.5	-2.2814	-0.0242				
						19	0.4958	0.3087	-1.5568	0.1289	0.0401	0.0224	2.1742	-0.6913	0.8059	0.1289	0.0401	-0.0665	16.5	-2.9958	<b>0.3258</b>				
EABL	68.8	54	13.29	20	0.5	18.3144	0.9879	-6.9052	0.0032	0.0153	0.2483	0.0427	-0.0121	-0.19	0.0032	0.0153	-0.0044	77.1	4.7856	-23.1427					
						64	9.697	0.8536	-8.7482	0.0236	0.1116	0.2452	0.7825	-0.1464	-0.7894	0.0236	0.1116	-0.0543	77.1	3.403	-13.8825				
						74	3.6736	0.5101	-8.0565	0.041	0.194	0.1571	4.1161	-0.4899	1.1459	0.041	0.194	-0.1891	77.1	-0.5736	-7.2161				
						84	0.9657	0.1919	-4.2829	0.0281	0.1328	0.0612	10.7653	-0.8081	6.163	0.0281	0.1328	-0.3318	77.1	-7.8657	-3.8653				
						94	0.1834	0.0478	-1.3816	0.0102	0.0484	0.0155	19.3401	-0.9522	10.3079	0.0102	0.0484	-0.4242	77.1	-17.0834	-2.4401				
						72	4.5947	0.5867	-8.5436	0.04	0.1895	0.1789	3.1658	-0.4133	0.41	0.04	0.1895	-0.158	77.1	<b>0.5053</b>	-8.2658				
						73	4.1161	0.5484	-8.3202	0.0407	0.1927	0.1681	3.6229	-0.4516	0.7578	0.0407	0.1927	-0.1735	77.1	-0.0161	-7.7229				
Kenya National Mills	17	4	13.29	77	0.5	13.2606	0.9989	-0.5295	0.0004	0.0005	0.0186	0.0034	-0.0011	-0.032	0.0004	0.0005	-0.0001	14	-3.2606	-10.0034					
						14	5.5308	0.7736	-3.7983	0.0325	0.0362	0.0381	1.6307	-0.2264	-2.0574	0.0325	0.0362	-0.0274	14	-5.5308	-1.6307				
						24	2.0285	0.4055	-4.2352	0.0419	0.0466	0.0243	7.4856	-0.5945	-1.2507	0.0419	0.0466	-0.088	14	-12.0285	2.5144				
						17	4.1023	0.6533	-4.3473	0.0399	0.0444	0.035	3.0094	-0.3467	-2.2333	0.0399	0.0444	-0.0445	14	-7.1023	-0.0094				
						18	3.7098	0.6138	-4.4351	0.0413	0.046	0.0336	3.5525	-0.3862	-2.1967	0.0413	0.046	-0.0506	14	-7.7098	<b>0.4475</b>				
19	3.3541	0.5753	-4.4807	0.0423	0.0471	0.0321	4.1326	-0.4247	-2.1179	0.0423	0.0471	-0.0568	14	-8.3541	0.8674										
Kenya Oil Co Ltd	55	33	13.29	42	0.5	24.2412	0.9818	-4.6849	0.0027	0.0174	0.1488	0.1196	-0.0182	-0.5812	0.0027	0.0174	-0.0056	76	18.7588	-43.1196					
						43	15.8092	0.8851	-7.5368	0.0119	0.0754	0.1644	1.0447	-0.1149	-2.1895	0.0119	0.0754	-0.0368	76	17.1908	-34.0447				
						53	9.245	0.6904	-9.5772	0.0216	0.1371	0.1436	3.8376	-0.3096	-2.9863	0.0216	0.1371	-0.1043	76	13.755	-26.8376				
						63	4.9319	0.4661	-9.2445	0.0243	0.1546	0.1035	8.8816	-0.5339	-1.4101	0.0243	0.1546	-0.1912	76	8.0681	-21.8816				
						73	2.4575	0.2806	-7.2284	0.0206	0.131	0.0649	15.7643	-0.7194	1.8496	0.0206	0.131	-0.2767	76	<b>0.5425</b>	-18.7643				
						83	1.1683	0.1554	-4.8805	0.0146	0.0928	0.0369	23.8322	-0.8446	5.4411	0.0146	0.0928	-0.3514	76	-8.1683	-16.8322				
						74	2.2855	0.2654	-6.9898	0.0201	0.1275	0.0615	16.528	-0.7346	2.2126	0.0201	0.1275	-0.2847	76	-0.2855	-18.528				
						KPLC	124.9	78	13.29	25	0.5	51.9202	0.9991	-9.7506	0.0001	0.0026	0.3643	0.0056	-0.0009	-0.0508	0.0001	0.0026	-0.0006	111.3	-18.6202

Simulation of option values: Industrial and Allied sector, January-June-1999

					88	42.6129	0.9928	-11.259	0.0009	0.0177	0.4089	0.0553	-0.0072	-0.3157	0.0099	0.0177	-0.0048	111.3	-19.3129	-23.3553
					98	33.5071	0.9668	-13.2275	0.0033	0.0653	0.4363	0.3066	-0.0332	-1.0407	0.0033	0.0653	-0.0222	111.3	-20.2071	-13.8066
					108	24.9585	0.9009	-15.4866	0.0079	0.154	0.4378	1.1152	-0.0991	-2.0562	0.0079	0.154	-0.0675	111.3	-21.6585	-4.4152
					118	17.459	0.784	-17.1623	0.0133	0.2588	0.4023	2.9728	-0.216	-2.4883	0.0133	0.2588	-0.1498	111.3	-24.159	3.7272
					113	21.0471	0.8487	-16.4685	0.0106	0.2071	0.4247	1.8823	-0.1513	-2.4163	0.0106	0.2071	-0.1039	111.3	-22.7471	-0.1823
					114	20.3019	0.8367	-16.6348	0.0112	0.2178	0.421	2.0728	-0.1633	-2.4582	0.0112	0.2178	-0.1124	111.3	-23.0019	0.6272
Total Kenya Ltd	49	35	13.29	25	0.5	16.2776	0.991	-4.5	0.0028	0.0084	0.1614	0.0275	-0.009	-0.1476	0.0028	0.0084	-0.0023	47	-4.2776	-12.0275
		45				7.762	0.8279	-6.569	0.0294	0.0884	0.164	0.869	-0.1721	-0.973	0.0294	0.0884	-0.0465	47	-5.762	-2.869
		55				2.4409	0.425	-5.8375	0.0452	0.1358	0.0919	4.905	-0.575	1.002	0.0452	0.1358	-0.1654	47	-10.4409	3.095
		48				5.7422	0.7194	-6.8405	0.0389	0.1168	0.1475	1.6562	-0.2806	-0.8714	0.0389	0.1168	-0.077	47	-6.7422	-0.6562
		49				5.1479	0.6788	-6.8387	0.0414	0.1241	0.1406	1.9977	-0.3212	-0.7453	0.0414	0.1241	-0.0887	47	-7.1479	0.0023
		50				4.5949	0.6368	-6.7868	0.0433	0.13	0.133	2.3804	-0.3632	-0.569	0.0433	0.13	-0.1009	47	-7.5949	0.6196
Unga Group Ltd	47	7	13.29	103	0.5	40.4626	0.9989	-0.9848	0.0001	0.0012	0.0324	0.0126	-0.0011	-0.1143	0.0001	0.0012	-0.0003	31.1	-16.3626	-24.1126
		17				31.6654	0.968	-4.2971	0.0021	0.0239	0.0691	0.5725	-0.032	-2.183	0.0021	0.0239	-0.0104	31.1	-17.5654	-14.6725
		27				24.377	0.8881	-8.8238	0.0056	0.0633	0.0868	2.6412	-0.1119	-5.4662	0.0056	0.0633	-0.0395	31.1	-20.277	-6.7412
		37				18.7443	0.7834	-12.4465	0.0086	0.0975	0.0904	6.3655	-0.2166	-7.8453	0.0086	0.0975	-0.0827	31.1	-24.6443	-0.4655
		47				14.4931	0.6756	-14.6049	0.0105	0.1195	0.0863	11.4714	-0.3244	-8.7602	0.0105	0.1195	-0.1336	31.1	-30.3931	4.4286
		38				18.2626	0.7725	-12.7279	0.0088	0.1003	0.0902	6.8195	-0.2275	-8.0024	0.0088	0.1003	-0.0875	31.1	-25.1626	0.0805

## SIMULATION OF OPTION VALUES USING BICOL

## AGRICULTURAL SECTOR-JULY-DECEMBER 1999

Company	Stock price	Exercise price	RF	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31/12/99	Value of European call option	Value of European put option		
Brooke Bond	146.9	72	13.29	39	0.5	79.5478	0.9985	-9.121	0.0001	0.0051	0.3356	0.0189	-0.0015	-0.1674	0.0001	0.0051	-0.0012	104	-47.5478	-32.0189		
		82				70.2622	0.9937	-10.7841	0.0004	0.0185	0.3785	0.0904	-0.0063	-0.5869	0.0004	0.0185	-0.0051	104	-48.2622	-22.0904		
		92				61.1229	0.981	-12.9039	0.0011	0.0481	0.415	0.3082	-0.019	-1.4632	0.0011	0.0481	-0.0155	104	-49.1229	-12.3082		
		102				52.2782	0.9556	-15.5078	0.0023	0.0974	0.4405	0.8206	-0.0444	-2.8235	0.0023	0.0974	-0.0367	104	-50.2782	-2.8206		
		112				43.9137	0.9135	-18.386	0.0039	0.1638	0.4514	1.8131	-0.0865	-4.4582	0.0039	0.1638	-0.0726	104	-51.9137	6.1869		
		105				49.7096	0.9448	-16.3579	0.0028	0.1159	0.4454	1.0591	-0.0552	-3.3006	0.0028	0.1159	-0.0458	104	-50.7096	-0.0591		
		106				48.8639	0.9409	-16.6455	0.0029	0.1223	0.4467	1.1491	-0.0591	-3.4637	0.0029	0.1223	-0.0492	104	-50.8639	<b>0.8509</b>		
		107				48.0238	0.9368	-16.9344	0.0031	0.1289	0.4479	1.2447	-0.0632	-3.6284	0.0031	0.1289	-0.0527	104	-51.0238	1.7553		
		Eaagads Ltd	42.1	14	13.29	60	0.5	29.0088	0.9985	-1.8195	0.0003	0.0015	0.0651	0.0087	-0.0015	-0.0785	0.0003	0.0015	-0.0004	26	-17.0088	-12.0087
				24				20.0355	0.9548	-4.3783	0.0053	0.0283	0.1008	0.3925	-0.0452	-1.3938	0.0053	0.0283	-0.0115	26	-18.0355	-2.3925
34						12.628	0.8085	-7.7157	0.0153	0.0812	0.1071	2.3422	-0.1915	-3.4876	0.0153	0.0812	-0.052	26	-19.0628	5.6578		
26						18.3899	0.9338	-5.0777	0.0072	0.0383	0.1046	0.6183	-0.0662	-1.8445	0.0072	0.0383	-0.017	26	-18.3899	-0.6183		
27						17.5947	0.9216	-5.4336	0.0082	0.0436	0.106	0.7589	-0.0784	-2.076	0.0082	0.0436	-0.0203	26	-18.5947	<b>0.2411</b>		
28						16.8195	0.9082	-5.7887	0.0092	0.049	0.1071	0.9194	-0.0918	-2.3068	0.0092	0.049	-0.0239	26	-18.8195	1.0806		
29						16.0652	0.8939	-6.1394	0.0103	0.0546	0.1078	1.1008	-0.1061	-2.5331	0.0103	0.0546	-0.0278	26	-19.0652	1.8992		
George Williamson	143			87	13.29	22	0.5	61.5938	0.9999	-10.8263	0	0.0004	0.407	0.0006	-0.0001	-0.0073	0	0.0004	-0.0001	92	-56.5938	-5.0006
				97				52.245	0.9986	-12.1343	0.0002	0.0045	0.4528	0.0089	-0.0014	-0.0718	0.0002	0.0045	-0.001	92	-57.245	4.9911
				92				56.9172	0.9996	-11.466	0.0001	0.0015	0.4301	0.0025	-0.0004	-0.0252	0.0001	0.0015	-0.0003	92	-56.9172	-0.0025
		93				55.9823	0.9995	-11.5967	0.0001	0.0019	0.4347	0.0033	-0.0005	-0.0316	0.0001	0.0019	-0.0004	92	-56.9823	<b>0.9967</b>		
		87				39.133	0.984	-11.4632	0.0017	0.034	0.3967	0.1398	-0.016	-0.6443	0.0017	0.034	-0.0103	87	-39.133	-0.1398		
Kakuzi Ltd	120.4	68	13.29	27	0.5	56.7736	0.9997	-8.4763	0	0.0009	0.318	0.0018	-0.0003	-0.0201	0	0.0009	-0.0002	87	-37.7736	-19.0018		
		78				47.439	0.9967	-9.8724	0.0004	0.0085	0.3628	0.0243	-0.0033	-0.1727	0.0004	0.0085	-0.0021	87	-38.439	-9.0243		
		88				38.2227	0.9815	-11.6674	0.002	0.0386	0.3997	0.1652	-0.0185	-0.724	0.002	0.0386	-0.012	87	-39.2227	<b>0.8348</b>		
		87				39.133	0.984	-11.4632	0.0017	0.034	0.3967	0.1398	-0.016	-0.6443	0.0017	0.034	-0.0103	87	-39.133	-0.1398		
		Kapchorua Tea Co	150	137	13.29	24	0.5	24.0567	0.8439	-19.7202	0.0094	0.2539	0.5126	2.2489	-0.1561	-2.6835	0.0094	0.2539	-0.1283	150	-11.0567	-15.2489
147						17.1842	0.7242	-20.6593	0.0131	0.3544	0.4573	4.7336	-0.2758	-2.379	0.0131	0.3544	-0.2305	150	-14.1842	-7.7336		
157						11.6608	0.5822	-19.9962	0.0153	0.4141	0.3784	8.5673	-0.4178	-0.4724	0.0153	0.4141	-0.3561	150	-18.6608	-1.5673		
167						7.5219	0.4379	-17.7629	0.0155	0.418	0.2908	13.7854	-0.5621	3.0045	0.0155	0.418	-0.4905	150	-24.5219	3.2146		
159						10.7247	0.5529	-19.6632	0.0155	0.4194	0.3611	9.5025	-0.4471	0.1094	0.0155	0.4194	-0.3828	150	-19.7247	-0.5025		
160						10.2774	0.5383	-19.4735	0.0156	0.4212	0.3523	9.991	-0.4617	0.4235	0.0156	0.4212	-0.3962	150	-20.2774	<b>0.009</b>		
161						9.8439	0.5237	-19.2689	0.0156	0.4224	0.3435	10.4931	-0.4763	0.7524	0.0156	0.4224	-0.4097	150	-20.8439	0.5069		
162						9.4238	0.5091	-19.0501	0.0157	0.423	0.3347	11.0088	-0.4909	1.0956	0.0157	0.423	-0.4232	150	-21.4238	0.9912		
Limuru Tea Co	650			503	13.29	16	0.5	179.3777	0.9982	-62.8148	0.0001	0.0266	2.3472	0.0397	-0.0018	-0.2638	0.0001	0.0266	-0.0061	650	-32.3777	-147.0397
				513				170.0524	0.9969	-64.2113	0.0001	0.0434	2.3896	0.0715	-0.0031	-0.4168	0.0001	0.0434	-0.0105	650	-33.0524	-137.0715
		523				160.7481	0.9948	-65.6687	0.0002	0.0683	2.4295	0.1242	-0.0052	-0.6306	0.0002	0.0683	-0.0174	650	-33.7481	-127.1242		
		533				151.4752	0.9918	-67.1967	0.0003	0.1034	2.4658	0.2085	-0.0082	-0.9151	0.0003	0.1034	-0.0278	650	-34.4752	-117.2085		
		543				142.2482	0.9872	-68.7997	0.0004	0.1513	2.4973	0.3386	-0.0128	-1.2745	0.0004	0.1513	-0.0431	650	-35.2482	-107.3386		
		553				133.0858	0.9809	-70.473	0.0006	0.2141	2.5224	0.5333	-0.0191	-1.7042	0.0006	0.2141	-0.0648	650	-36.0858	-97.5333		
		563				124.0113	0.9722	-72.1998	0.0009	0.2936	2.5396	0.8159	-0.0278	-2.1875	0.0009	0.2936	-0.0945	650	-37.0113	-87.8159		
		573				115.053	0.9607	-73.9482	0.0012	0.3908	2.5469	1.2147	-0.0393	-2.6923	0.0012	0.3908	-0.1339	650	-38.053	-78.2147		
		583				106.2438	0.9458	-75.6695	0.0015	0.5054	2.5426	1.7625	-0.0542	-3.17	0.0015	0.5054	-0.185	650	-39.2438	-68.7625		
		593				97.6207	0.9272	-77.2984	0.0019	0.6361	2.5252	2.4966	-0.0728	-3.5554	0.0019	0.6361	-0.2491	650	-40.6207	-59.4966		
		603				89.2239	0.9044	-78.7555	0.0023	0.7802	2.4933	3.4568	-0.0956	-3.7689	0.0023	0.7802	-0.3278	650	-42.2239	-50.4568		
		613				81.0954	0.8774	-79.9508	0.0028	0.9336	2.446	4.6854	-0.1226	-3.7207	0.0028	0.9336	-0.422	650	-44.0954	-41.6854		

623	73.2772	0.6459	-80.7904	0.0032	1.0911	2.3827	6.2243	-0.1641	-3.3167	0.0032	1.0911	-0.532	650	-46.2772	-33.2243					
633	65.8102	0.8101	-81.1832	0.0037	1.247	2.3037	8.1144	-0.1699	-2.4659	0.0037	1.247	-0.6578	650	-48.8102	-25.1144					
643	58.7318	0.7702	-81.0485	0.0041	1.3948	2.2096	10.3931	-0.2298	-1.0877	0.0041	1.3948	-0.7987	650	-51.7318	-17.3931					
653	52.0746	0.7268	-80.323	0.0045	1.5286	2.1018	13.093	-0.2732	0.8814	0.0045	1.5286	-0.9533	650	-55.0746	-10.093					
663	45.8649	0.6804	-78.9666	0.0049	1.6427	1.982	16.2404	-0.3196	3.4813	0.0049	1.6427	-1.1198	650	-58.8649	-3.2404					
673	40.1215	0.6318	-76.9662	0.0051	1.7327	1.8527	19.8541	-0.3682	6.7253	0.0051	1.7327	-1.296	650	-63.1215	3.1459					
667	43.5107	0.6612	-78.2435	0.005	1.6818	1.9313	17.6291	-0.3388	4.7018	0.005	1.6818	-1.1893	650	-60.5107	-0.6291					
668	42.934	0.6563	-78.0466	0.005	1.691	1.9184	17.988	-0.3437	5.0231	0.005	1.691	-1.2069	650	-60.934	0.012					
Rea Vipingo Ltd	6	4	13.29	20	0.5	2.2572	0.9997	-0.4982	0.0014	0.0001	0.0187	0.0001	-0.0003	-0.0007	0.0014	0.0001	0	4.8	-1.4572	-0.8001
		5				1.3333	0.9664	-0.6568	0.0881	0.0032	0.0223	0.0118	-0.0336	-0.0351	0.0881	0.0032	-0.0011	4.8	-1.5333	0.1882
Sasini Tea & Coffet	54	31	13.29	27	0.5	24.9941	0.9996	-3.867	0.0001	0.0006	0.1449	0.0011	-0.0004	-0.012	0.0001	0.0006	-0.0001	44.9	-11.0941	-13.9011
		41				15.7625	0.9704	-5.5636	0.0065	0.0257	0.1832	0.1266	-0.0296	-0.465	0.0065	0.0257	-0.0086	44.9	-11.8625	-4.0266
		51				7.7872	0.7712	-7.621	0.0294	0.1156	0.1693	1.5084	-0.2288	-1.2788	0.0294	0.1156	-0.0693	44.9	-13.8872	4.5916
		45				12.3036	0.919	-6.5072	0.0146	0.0573	0.1866	0.4105	-0.081	-0.9112	0.0146	0.0573	-0.0239	44.9	-12.4036	-0.3105
		46				11.4851	0.9003	-6.74	0.017	0.0669	0.1857	0.5277	-0.0997	-1.0196	0.017	0.0669	-0.0296	44.9	-12.5851	0.5723



SIMULATION OF OPTION VALUES USING BOPSCOL  
COMMERCIAL AND SERVICES SECTOR-JULY-DECEMBER 1999

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.99	Value of European call option	Value of European put option
A Baumann & Co	16.9	14	13.29	12	0.5	3.8005	0.9988	-1.7439	0.0027	0.0005	0.0654	0.0005	-0.0012	-0.0029	0.0027	0.0005	-0.0001	14.9	-2.9005	-0.9005
		15				2.8709	0.9872	-1.8831	0.0231	0.004	0.0691	0.0066	-0.0128	-0.0178	0.0231	0.004	-0.0011	14.9	-2.9709	0.0934
CMC Holdings Ltd	28	22	13.29	16	0.5	7.4171	0.9972	-2.7521	0.0027	0.0017	0.1025	0.0027	-0.0028	-0.0162	0.0027	0.0017	-0.0004	30	0.5829	-8.0027
		32				0.5585	0.2959	-2.1212	0.1091	0.0684	0.0386	2.5012	-0.7041	1.8582	0.1091	0.0684	-0.1111	30	-2.5585	-0.5012
		26				3.8232	0.903	-3.3958	0.0542	0.034	0.1073	0.1516	-0.097	-0.1626	0.0542	0.034	-0.0143	30	0.1768	-4.1516
		27				3.0329	0.8328	-3.4891	0.079	0.0496	0.1014	0.2971	-0.1672	-0.1315	0.079	0.0496	-0.0249	30	-0.0329	-3.2971
Car & General	10	2	13.29	105	0.5	8.1412	0.9957	-0.335	0.0017	0.0009	0.0091	0.0126	-0.0043	-0.0862	0.0017	0.0009	-0.0003	9	-1.1412	-7.0126
		12				2.4946	0.5852	-3.3404	0.0525	0.0276	0.0168	3.7231	-0.4148	-1.8481	0.0525	0.0276	-0.0394	9	-5.4946	-0.7231
		22				0.8955	0.2738	-2.7172	0.0448	0.0235	0.0092	11.4811	-0.7262	0.0186	0.0448	0.0235	-0.0937	9	-13.8955	1.5189
		14				2.0015	0.503	-3.3644	0.0537	0.0282	0.0151	5.1014	-0.497	-1.6234	0.0537	0.0282	-0.0504	9	-7.0015	-0.1014
		15				1.7982	0.466	-3.3315	0.0535	0.0281	0.0143	5.8339	-0.534	-1.4662	0.0535	0.0281	-0.0559	9	-7.7982	0.1661
		16				1.6188	0.4316	-3.2768	0.0529	0.0278	0.0135	6.5901	-0.5684	-1.2871	0.0529	0.0278	-0.0614	9	-8.6188	0.4099
		17				1.4601	0.3998	-3.2052	0.052	0.0273	0.0127	7.3672	-0.6002	-1.0912	0.052	0.0273	-0.0668	9	-9.4601	0.6328
		20				7.5488	0.8568	-3.8971	0.0256	0.0407	0.0715	0.763	-0.1432	-1.41	0.0256	0.0407	-0.0221	18.9	-8.6488	0.337
Express Kenya Ltd	25.5	9	13.29	49	0.5	17.0795	0.9996	-1.1298	0.0002	0.0002	0.0421	0.0009	-0.0004	-0.0106	0.0002	0.0002	-0.0001	18.9	-7.1795	-9.9009
		19				8.2842	0.8877	-3.5938	0.0216	0.0344	0.0718	0.5627	-0.1123	-1.231	0.0216	0.0344	-0.0171	18.9	-8.3842	-0.4627
		29				2.8594	0.4975	-4.8308	0.0452	0.0719	0.0491	4.495	-0.5025	-1.2245	0.0452	0.0719	-0.0865	18.9	-12.9594	5.605
		20				7.5488	0.8568	-3.8971	0.0256	0.0407	0.0715	0.763	-0.1432	-1.41	0.0256	0.0407	-0.0221	18.9	-8.6488	0.337
		4				4.2585	0.9981	-0.5086	0.0028	0.0003	0.0186	0.0013	-0.0019	-0.0112	0.0028	0.0003	-0.0001	7.8	-0.4585	-3.8013
		5				3.3379	0.9814	-0.7003	0.0207	0.0026	0.0226	0.0164	-0.0186	-0.0785	0.0207	0.0026	-0.0008	7.8	-0.5379	-2.8164
Kenya Airways	8	6	2.4722	0.9225	-0.9725	0.0658	0.0082	0.0245	0.0865	-0.0775	-0.2263	0.0658	0.0082	-0.0035	7.8	-0.6722	-1.8865			
		7	1.7218	0.8059	-1.2345	0.1246	0.0156	0.0236	0.2718	-0.1941	-0.364	0.1246	0.0156	-0.0091	7.8	-0.9218	-1.0718			
		8	1.1307	0.6476	-1.3574	0.1683	0.021	0.0203	0.6164	-0.3524	-0.3626	0.1683	0.021	-0.0172	7.8	-1.3307	-0.4164			
		9	0.7052	0.4808	-1.2965	0.1806	0.0225	0.0157	1.1266	-0.5192	-0.1773	0.1806	0.0225	-0.0264	7.8	-1.9052	0.0734			
		8	9.5153	0.9993	-1.0045	0.0005	0.0003	0.0374	0.001	-0.0007	-0.0096	0.0005	0.0003	-0.0001	13.3	-4.2153	-5.301			
		18	1.8881	0.5671	-2.8268	0.0861	0.0473	0.0388	1.7309	-0.4329	-0.5884	0.0861	0.0473	-0.0455	13.3	-6.5881	2.9691			
Lonhro Motors	17	13	5.0318	0.9162	-2.1045	0.0337	0.0185	0.0527	0.196	-0.0838	-0.4878	0.0337	0.0185	-0.0081	13.3	-4.7318	-0.496			
		14	4.2518	0.8653	-2.3803	0.0475	0.0261	0.0523	0.3517	-0.1347	-0.6393	0.0475	0.0261	-0.0132	13.3	-4.9518	0.3483			
		16	7.0301	0.9983	-2.0006	0.0018	0.0008	0.0747	0.0015	-0.0017	-0.0109	0.0018	0.0008	-0.0002	23.6	0.5699	-7.6015			
Marshalls EA Ltd	22	26	0.408	0.2477	-1.6048	0.107	0.0492	0.0252	2.7364	-0.7523	1.6284	0.107	0.0492	-0.0964	23.6	-2.808	-0.3364			
		20	3.4373	0.8982	-2.6949	0.0602	0.0277	0.0816	0.1515	-0.1018	-0.2078	0.0602	0.0277	-0.012	23.6	0.1627	-3.7515			
		21	2.6619	0.8181	-2.8189	0.0894	0.0411	0.0767	0.3118	-0.1819	-0.2074	0.0894	0.0411	-0.0216	23.6	-0.0619	-2.9118			
Nation Media Group	130	83	13.29	22	0.5	52.338	0.9996	-10.3411	0.0001	0.0012	0.3881	0.0019	-0.0004	-0.0195	0.0001	0.0012	-0.0002	100.4	-34.938	-17.4019
		93				43.0047	0.9961	-11.7296	0.0006	0.0107	0.4324	0.0257	-0.0039	-0.1645	0.0006	0.0107	-0.0027	100.4	-35.6047	-7.4257
		103				33.8024	0.9773	-13.4816	0.0027	0.0495	0.4663	0.1805	-0.0227	-0.673	0.0027	0.0495	-0.0156	100.4	-36.4024	2.4195

					98	38.3736	0.9899	-12.5474	0.0013	0.0248	0.4515	0.0731	-0.0101	-0.3605	0.0013	0.0248	-0.007	100.4	-35.9735	-2.4731
					99	37.4532	0.988	-12.7247	0.0015	0.0288	0.4549	0.0885	-0.012	-0.4135	0.0015	0.0288	-0.0083	100.4	-36.0532	-1.4885
					100	36.5356	0.9858	-12.9069	0.0018	0.0332	0.4581	0.1086	-0.0142	-0.4713	0.0018	0.0332	-0.0098	100.4	-36.1356	-0.5066
					101	35.621	0.9833	-13.0939	0.0021	0.0381	0.461	0.1277	-0.0167	-0.5339	0.0021	0.0381	-0.0115	100.4	-36.221	0.4723
Pearl Drycleaners	10	1	13.29	120	0.5	9.0662	0.9994	-0.1424	0.0003	0.0002	0.0046	0.0019	-0.0006	-0.0181	0.0003	0.0002	0	3	-7.0662	-2.0019
		11				3.1898	0.6518	-3.5793	0.0436	0.0261	0.0166	3.4826	-0.3482	-2.2114	0.0436	0.0261	-0.0348	3	-11.1898	4.5174
		3				7.3171	0.9727	-0.8546	0.0074	0.0045	0.012	0.1243	-0.0273	-0.4815	0.0074	0.0045	-0.002	3	-7.3171	-0.1243
		4				6.5559	0.9432	-1.3501	0.0134	0.0081	0.0144	0.2987	-0.0568	-0.8527	0.0134	0.0081	-0.0043	3	-7.5559	0.7013
		5				5.8781	0.9065	-1.841	0.0197	0.0118	0.0159	0.5567	-0.0935	-1.2193	0.0197	0.0118	-0.0075	3	-7.8781	1.4433
		6				5.2789	0.8653	-2.2877	0.0255	0.0153	0.0169	0.8931	-0.1347	-1.5415	0.0255	0.0153	-0.0112	3	-8.2789	2.1069
Standard Newspaper	14	2	13.29	112	0.5	12.1353	0.9983	-0.304	0.0005	0.0005	0.0092	0.0067	-0.0017	-0.0553	0.0005	0.0005	-0.0001	9.9	-4.2353	-7.8983
		12				5.4107	0.75	-4.1996	0.0287	0.0315	0.0254	2.6393	-0.25	-2.7073	0.0287	0.0315	-0.0307	9.9	-7.5107	-0.5393
		22				2.6094	0.4638	-4.9212	0.0358	0.0393	0.0194	9.195	-0.5362	-2.1854	0.0358	0.0393	-0.0835	9.9	-14.7094	2.905
		13				5.0055	0.7168	-4.4211	0.0305	0.0335	0.0252	3.1697	-0.2832	-2.8045	0.0305	0.0335	-0.0357	9.9	-8.1055	-0.0697
		14				4.6357	0.6843	-4.5994	0.0321	0.0352	0.0247	3.7357	-0.3157	-2.8584	0.0321	0.0352	-0.0408	9.9	-8.7357	0.3643
TPS Serena	16.1	12	13.29	16	0.5	4.8718	0.9994	-1.4948	0.0011	0.0002	0.0561	0.0003	-0.0006	-0.0025	0.0011	0.0002	0	16.1	-0.7718	-4.1003
		13				3.9392	0.9944	-1.6334	0.0088	0.0018	0.0604	0.0034	-0.0056	-0.0168	0.0088	0.0018	-0.0005	16.1	-0.8392	-3.1034
		14				3.0222	0.9699	-1.7979	0.0375	0.0078	0.063	0.0221	-0.0301	-0.0569	0.0375	0.0078	-0.0025	16.1	-0.9222	-2.1221
		15				2.1572	0.8979	-1.9591	0.0978	0.0203	0.0615	0.0928	-0.1021	-0.0938	0.0978	0.0203	-0.0087	16.1	-1.0572	-1.1928
		16				1.4048	0.7577	-2.0038	0.1715	0.0356	0.054	0.2761	-0.2423	-0.0141	0.1715	0.0356	-0.0209	16.1	-1.3048	-0.3761
		17				0.8225	0.5648	-1.8162	0.2161	0.0448	0.0414	0.6296	-0.4352	0.2978	0.2161	0.0448	-0.0382	16.1	-1.7225	0.2704
Uchumi Supermark	48.2	33	13.29	27	0.5	17.346	0.9924	-4.2445	0.0023	0.0071	0.1524	0.0244	-0.0076	-0.1408	0.0023	0.0071	-0.002	39.3	-11.046	-6.3244
		43				8.7378	0.8512	-6.4256	0.0252	0.0791	0.1614	0.7733	-0.1488	-1.0783	0.0252	0.0791	-0.0397	39.3	-12.4378	2.9267
		38				12.829	0.9544	-5.2905	0.0104	0.0327	0.1659	0.1859	-0.0456	-0.5649	0.0104	0.0327	-0.0119	39.3	-11.529	-1.4859
		39				11.9649	0.9398	-5.5293	0.013	0.0407	0.1667	0.2576	-0.0602	-0.6794	0.013	0.0407	-0.0158	39.3	-11.6649	-0.5576
		40				11.1207	0.9222	-5.7687	0.0158	0.0496	0.1667	0.349	-0.0778	-0.7945	0.0158	0.0496	-0.0205	39.3	-11.8207	0.351

SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JULY-DECEMBER 1999

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31/12/99	Value of European call option	Value of European put option
Barclays Bank	109.6	79	13.3	20	0.5	35.6891	0.9979	-9.8963	0.0004	0.0052	0.3684	0.0102	-0.0021	-0.0722	0.0004	0.0052	-0.0012	103.1	-11.5891	-24.1102
		89				26.4554	0.9779	-11.5441	0.0034	0.0408	0.4036	0.1335	-0.0221	-0.4765	0.0034	0.0408	-0.0128	103.1	-12.3554	-14.2335
		99				17.7808	0.8961	-13.4862	0.0116	0.1398	0.4022	0.8161	-0.1039	-1.175	0.0116	0.1398	-0.061	103.1	-13.6808	-4.9161
		109				10.5215	0.7188	-14.3002	0.0218	0.2614	0.3413	2.9139	-0.2812	-0.7455	0.0218	0.2614	-0.1686	103.1	-16.4215	2.9861
		104				13.9168	0.819	-14.1612	0.017	0.2041	0.3792	1.6307	-0.181	-1.2282	0.017	0.2041	-0.1074	103.1	-14.8168	-0.7307
		105			13.1972	0.8006	-14.239	0.018	0.2166	0.3727	1.8467	-0.1994	-1.1817	0.018	0.2166	-0.1185	103.1	-15.0972	0.0533	
City Trust Ltd	22.5	16	13.3	14	0.5	7.5287	1	-1.9898	0	0	0.0749	0	0	-0.0001	0	0	0	22.1	-1.4287	-6.1
		25				0.5285	0.3656	-1.8606	0.1688	0.0598	0.0385	1.4212	-0.6344	1.2483	0.1688	0.0598	-0.0785	22.1	-3.4285	1.4788
		21				2.9319	0.9219	-2.6922	0.0656	0.0232	0.089	0.0818	-0.0781	-0.0808	0.0656	0.0232	-0.0092	22.1	-1.8319	-1.1818
		22				2.1289	0.8284	-2.7612	0.1143	0.0405	0.0825	0.2145	-0.1716	-0.0254	0.1143	0.0405	-0.0204	22.1	-2.0289	-0.3145
		23				1.4444	0.691	-2.659	0.1582	0.056	0.0705	0.4657	-0.309	0.2012	0.1582	0.056	-0.0371	22.1	-2.3444	0.4343
CFC Bank	15.1	7	13.3	43	0.5	8.5528	0.9981	-0.8938	0.0013	0.0006	0.0326	0.0027	-0.0019	-0.0233	0.0013	0.0006	-0.0002	14.3	-1.2528	-7.3027
		17				1.497	0.4923	-2.6204	0.0869	0.0426	0.0297	2.3041	-0.5077	-0.5063	0.0869	0.0426	-0.0498	14.3	-4.197	0.3959
		16				1.8819	0.5715	-2.6989	0.0855	0.0419	0.0337	1.7532	-0.4285	-0.7092	0.0855	0.0419	-0.0411	14.3	-3.5819	-0.0532
Diamond Trust Bank	23.9	17	13.3	25	0.5	8.0054	0.9916	-2.1823	0.0054	0.0039	0.0785	0.0125	-0.0084	-0.0683	0.0054	0.0039	-0.0011	26	0.9946	-9.0125
		27				1.1337	0.4108	-2.7972	0.0921	0.0657	0.0434	2.4979	-0.5892	0.5604	0.0921	0.0657	-0.0829	26	-2.1337	-1.4979
		34				0.1083	0.0631	-0.7091	0.0293	0.0209	0.007	8.0224	-0.9369	3.519	0.0293	0.0209	-0.1521	26	-8.1083	-0.0224
		22				3.7489	0.8246	-3.2117	0.0611	0.0436	0.0798	0.4345	-0.1754	-0.4758	0.0611	0.0436	-0.0231	26	0.2511	-4.4345
		23				3.0612	0.7522	-3.3187	0.0749	0.0535	0.0746	0.6825	-0.2478	-0.4585	0.0749	0.0535	-0.033	26	-0.0612	-3.6825
Housing Finance Co of Kenya	13.1	7	13.3	28	0.5	6.5501	0.9998	-0.8718	0.0002	0.0001	0.0327	0.0001	-0.0002	-0.0013	0.0002	0.0001	0	10.3	-3.2501	-3.3001
		17				0.2463	0.189	-0.9978	0.1043	0.0251	0.0111	3.0533	-0.811	1.1162	0.1043	0.0251	-0.0684	10.3	-6.9463	3.6467
		10				3.7829	0.9639	-1.3808	0.0305	0.0073	0.0442	0.04	-0.0361	-0.1373	0.0305	0.0073	-0.0026	10.3	-3.4829	-0.34
		11				2.9311	0.9061	-1.6226	0.0646	0.0155	0.0447	0.1239	-0.0939	-0.2547	0.0646	0.0155	-0.0068	10.3	-3.6311	0.5761
		12			2.1703	0.8099	-1.8256	0.1047	0.0251	0.0422	0.2988	-0.1901	-0.3334	0.1047	0.0251	-0.0139	10.3	-3.8703	1.4012	
ICDC Investments Co Ltd	48.3	49	13.3	8	0.5	2.7077	0.8286	-5.654	0.0931	0.0869	0.1866	0.2575	-0.1714	0.4394	0.0931	0.0869	-0.0427	51	-0.7077	-2.2575
		59				0.0089	0.0098	-0.1331	0.0096	0.0089	0.0023	6.9158	-0.9902	7.2039	0.0096	0.0089	-0.2737	51	-8.0089	1.0842
		52				0.9247	0.4594	-3.9106	0.1453	0.1355	0.1063	1.2816	-0.5406	2.5559	0.1453	0.1355	-0.137	51	-1.9247	-0.2816
		53				0.5763	0.3305	-3.0348	0.1326	0.1238	0.0769	1.8689	-0.6695	3.556	0.1326	0.1238	-0.171	51	-2.5763	0.1311
		54				0.3374	0.2209	-2.1844	0.1086	0.1014	0.0517	2.5658	-0.7791	4.5308	0.1086	0.1014	-0.201	51	-3.3374	0.4342
Jubilee Insurance Co Ltd	28.4	18	13.3	23	0.5	11.5579	0.9995	-2.2446	0.0004	0.0004	0.0841	0.0006	-0.0005	-0.0062	0.0004	0.0004	-0.0001	23	-6.5579	-5.0006
		28				3.0819	0.7181	-3.8606	0.0731	0.0678	0.0866	0.8818	-0.2819	-0.3787	0.0731	0.0678	-0.0444	23	-8.0819	4.1182
		23				6.9511	0.963	-3.0844	0.0175	0.0162	0.102	0.0724	-0.037	-0.2242	0.0175	0.0162	-0.0056	23	-6.9511	-0.0724
		24			6.0794	0.9364	-3.3023	0.027	0.025	0.1026	0.1364	-0.0636	-0.3178	0.027	0.025	-0.0097	23	-7.0794	0.8636	
KCB Ltd	43.9	24	13.3	23	0.5	21.443	1	-2.9849	0	0	0.1123	0	0	-0.0003	0	0	0	31.4	-14.043	-7.4
		34				12.1402	0.9804	-4.4467	0.0067	0.0148	0.1545	0.0543	-0.0196	-0.2186	0.0067	0.0148	-0.0046	31.4	-14.7402	2.4455

					31	14.903	0.9957	-3.9186	0.0018	0.0039	0.144	0.01	-0.0043	-0.0636	0.0018	0.0039	-0.001	31.4	-14.503	-0.41
					32	13.9757	0.9925	-4.0806	0.0029	0.0064	0.148	0.0184	-0.0075	-0.1013	0.0029	0.0064	-0.0017	31.4	-14.5757	<b>0.5816</b>
					33	13.0539	0.9876	-4.2564	0.0045	0.01	0.1515	0.0324	-0.0124	-0.1527	0.0045	0.01	-0.0029	31.4	-14.6539	1.5676
National Bank Ltd	6.3	4	13.3	29	0.5	2.5589	0.9959	-0.5095	0.0094	0.0005	0.0186	0.0018	-0.0041	-0.012	0.0094	0.0005	-0.0001	5	-1.5589	-1.0018
		5				1.6578	0.9399	-0.7208	0.0924	0.0053	0.0213	0.0363	-0.0601	-0.099	0.0924	0.0053	-0.0021	5	-1.6578	-0.0363
		6				0.9039	0.7468	-0.9184	0.2476	0.0143	0.019	0.2181	-0.2532	-0.1723	0.2476	0.0143	-0.0091	5	-1.9039	<b>0.7819</b>
NIC Bank Ltd	28.7	24	13.3	14	0.5	6.2484	0.9943	-3.0084	0.0058	0.0033	0.1114	0.0054	-0.0057	-0.0239	0.0058	0.0033	-0.0009	26.9	-3.3484	-2.9054
		34				0.2304	0.1608	-1.2764	0.0859	0.0495	0.0219	3.3445	-0.8392	2.9517	0.0859	0.0495	-0.1371	26.9	-7.3304	3.7555
		27				3.5602	0.9095	-3.4592	0.0574	0.0331	0.1127	0.1244	-0.0905	-0.1016	0.0574	0.0331	-0.0136	26.9	-3.6602	-0.0244
		28				2.7624	0.834	-3.522	0.0877	0.0506	0.1059	0.2622	-0.166	-0.04	0.0877	0.0506	-0.0251	26.9	-3.8624	<b>0.8378</b>
		29				2.0562	0.731	-3.4525	0.1162	0.067	0.0946	0.4918	-0.269	0.1538	0.1162	0.067	-0.0411	26.9	-4.1562	1.6082
Pan Africa Ins Co	24	6	13.3	109	0.5	18.4829	0.9884	-1.2571	0.0016	0.0051	0.0262	0.0971	-0.0116	-0.511	0.0016	0.0051	-0.0019	26.9	2.4171	-20.9971
		16				11.3492	0.8408	-5.6599	0.0131	0.0412	0.0441	2.3206	-0.1592	-3.6702	0.0131	0.0412	-0.0307	26.9	-0.4492	-13.2206
		26				7.0871	0.6435	-8.0076	0.0202	0.0633	0.0418	7.4155	-0.3565	-4.7744	0.0202	0.0633	-0.0799	26.9	-6.1871	-8.3155
		36				4.5858	0.4783	-8.2847	0.0215	0.0676	0.0345	14.2714	-0.5217	-3.8079	0.0215	0.0676	-0.134	26.9	-13.6858	-5.1714
		46				3.0707	0.3548	-7.6084	0.0201	0.0632	0.0272	22.1134	-0.6452	-1.888	0.0201	0.0632	-0.188	26.9	-22.1707	-3.0134
		56				2.1186	0.2651	-6.6239	0.0177	0.0556	0.0212	30.5183	-0.7349	0.34	0.0177	0.0556	-0.2408	26.9	-31.2186	-1.4183
		66				1.4997	0.2002	-5.6211	0.0151	0.0475	0.0165	39.2565	-0.7998	2.5864	0.0151	0.0475	-0.2923	26.9	-40.5997	-0.1565
		76				1.0852	0.1529	-4.7123	0.0128	0.0401	0.0129	48.1992	-0.8471	4.7387	0.0128	0.0401	-0.3426	26.9	-50.1852	0.9008
		67				1.4506	0.1948	-5.525	0.0149	0.0468	0.0161	40.1431	-0.8052	2.8068	0.0149	0.0468	-0.2973	26.9	-41.5506	-0.0431
		68				1.4034	0.1895	-5.43	0.0146	0.046	0.0157	41.0316	-0.8105	3.0262	0.0146	0.046	-0.3024	26.9	-42.5034	<b>0.0684</b>
		69				1.358	0.1844	-5.3361	0.0144	0.0452	0.0153	41.922	-0.8156	3.2444	0.0144	0.0452	-0.3075	26.9	-43.458	0.178
		70				1.3144	0.1795	-5.2433	0.0142	0.0445	0.015	42.8141	-0.8205	3.4616	0.0142	0.0445	-0.3125	26.9	-44.4144	0.2859
		71				1.2725	0.1747	-5.1518	0.0139	0.0437	0.0146	43.7079	-0.8253	3.6775	0.0139	0.0437	-0.3176	26.9	-45.3725	0.3921
Standard Chartered Bank Ltd	48.9	45	13.3	15	0.5	6.9655	0.9283	-5.8165	0.0264	0.0473	0.1921	0.1724	-0.0717	-0.2205	0.0264	0.0473	-0.0184	55.8	3.8345	-10.9724
		55				1.0818	0.334	-3.9145	0.0702	0.1258	0.0763	3.6459	-0.666	2.9251	0.0702	0.1258	-0.1811	55.8	-0.2818	-4.4459
		65				0.0421	0.0225	-0.4188	0.0103	0.0185	0.0053	11.9632	-0.9775	7.6643	0.0103	0.0185	-0.2988	55.8	-9.2421	-2.7632
		54				1.3878	0.3991	-4.4115	0.0744	0.1335	0.0906	3.0162	-0.6009	2.3037	0.0744	0.1335	-0.162	55.8	<b>0.4122</b>	-4.8162

## SIMULATION OF OPTION VALUES USING BOPSCOL

## INDUSTRIAL AND ALLIED SECTOR-JULY TO DECEMBER 1999

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.99	Value of European call option	Value of European put option						
Athi River Mining Ltd	5.7	3	13.29	42	0.5	2.8962	0.9944	-0.3956	0.0095	0.0006	0.0139	0.0034	-0.0056	-0.0226	0.0095	0.0006	-0.0002	5.9	0.0038	-2.9034						
						4	2.0053	0.9412	-0.645	0.0693	0.0047	0.0168	0.0481	-0.0588	-0.1476	0.0693	0.0047	-0.0019	5.9	-0.1053	-1.9481					
						5	1.2525	0.792	-0.9186	0.1693	0.0116	0.0163	0.231	-0.208	-0.2969	0.1693	0.0116	-0.0071	5.9	-0.3525	-1.131					
						6	0.7115	0.5791	-1.0061	0.231	0.0158	0.0129	0.6258	-0.4209	-0.26	0.231	0.0158	-0.0151	5.9	-0.8115	-0.5258					
						7	0.3751	0.3747	-0.8757	0.2239	0.0153	0.0088	1.2251	-0.6253	-0.0052	0.2239	0.0153	-0.0239	5.9	-1.4751	-0.1251					
						8	0.1873	0.2209	-0.6449	0.1753	0.012	0.0054	1.973	-0.7791	0.35	0.1753	0.012	-0.0321	5.9	-2.2873	0.127					
						Bamburi Cement Ltd	26	14	13.29	31	0.5	12.901	0.9994	-1.7508	0.0004	0.0004	0.0654	0.001	-0.0006	-0.0099	0.0004	0.0004	-0.0001	26.3	-0.601	-12.301
						24						4.3386	0.7817	-3.8045	0.0517	0.0542	0.0799	0.7956	-0.2183	-0.82	0.0517	0.0542	-0.0324	26.3	-2.0386	-3.0956
34	0.6073	0.2087	-2.2767	0.0504	0.0528	0.0241						6.4214	-0.7913	1.9514	0.0504	0.0528	-0.135	26.3	-8.3073	1.2786						
29	1.7947	0.466	-3.637	0.0697	0.0731	0.0516						2.9303	-0.534	-0.0307	0.0697	0.0731	-0.0841	26.3	-4.4947	-0.2303						
30	1.466	0.4051	-3.4142	0.068	0.0713	0.0453						3.5373	-0.5949	0.3165	0.068	0.0713	-0.095	26.3	-5.166	0.1627						
BAT Ltd	71.5	47	13.29	27	0.5	27.5402						0.9959	-5.9695	0.0009	0.0062	0.2183	0.0185	-0.0041	-0.1248	0.0009	0.0062	-0.0016	64.5	-10.402	-17.5185	
57						18.4822						0.9485	-7.9979	0.0077	0.0534	0.2467	0.3177	-0.0515	-0.9096	0.0077	0.0534	-0.02	64.5	-10.9822	-7.8177	
67						10.6647						0.7835	-10.0325	0.0215	0.1483	0.2268	1.8573	-0.2165	-1.7006	0.0215	0.1483	-0.0867	64.5	-13.1647	0.6427	
66						11.3538	0.8059	-9.9021	0.0201	0.139	0.2313	1.6106	-0.1941	-1.6947	0.0201	0.139	-0.0775	64.5	-12.8538	-0.1106						
BOC Gases Ltd						26	15	13.29	31	0.5	11.9674	0.9983	-1.8907	0.001	0.001	0.0699	0.003	-0.0017	-0.0254	0.001	0.001	-0.0002	26.3	-0.6674	-11.303	
25											3.7034	0.723	-3.9145	0.0588	0.0616	0.0755	1.0962	-0.277	-0.8056	0.0588	0.0616	-0.0415	26.3	-2.4034	-2.3962	
35											0.4795	0.1728	-1.9904	0.0449	0.047	0.0201	7.2293	-0.8272	2.3621	0.0449	0.047	-0.1437	26.3	-9.1795	1.4707	
29											1.7947	0.466	-3.637	0.0697	0.0731	0.0516	2.9303	-0.534	-0.0307	0.0697	0.0731	-0.0841	26.3	-4.4947	-0.2303	
30	1.466	0.4051	-3.4142	0.068	0.0713						0.0453	3.5373	-0.5949	0.3165	0.068	0.0713	-0.095	26.3	-5.166	0.1627						
Carbacid Investment	95.6	66	13.29	29	0.5						33.9363	0.9872	-8.6787	0.0017	0.0223	0.3022	0.0931	-0.0128	-0.4712	0.0017	0.0223	-0.0066	76	-23.9363	-10.0931	
76											25.0476	0.9389	-10.9691	0.0062	0.0817	0.3235	0.5615	-0.0611	-1.5181	0.0062	0.0817	-0.032	76	-25.0476	-0.5615	
86											17.1359	0.8271	-13.2461	0.0131	0.1729	0.3097	2.007	-0.1729	-2.5515	0.0131	0.1729	-0.0929	76	-27.1359	7.993	
76						25.0476	0.9389	-10.9691	0.0062	0.0817	0.3235	0.5615	-0.0611	-1.5181	0.0062	0.0817	-0.032	76	-25.0476	-0.5615						
77						24.2011	0.9308	-11.2188	0.0068	0.09	0.3239	0.6508	-0.0692	-1.6434	0.0068	0.09	-0.0363	76	-25.2011	0.3492						
Crown Berger Ltd						8.5	3	13.29	69	0.5	5.7021	0.994	-0.4352	0.0041	0.001	0.0137	0.0093	-0.006	-0.0621	0.0041	0.001	-0.0003	10	1.2979	-7.0093	
13											0.6569	0.3118	-1.7318	0.0853	0.0213	0.01	4.3211	-0.6882	-1.1152	0.0853	0.0213	-0.0509	10	-3.6569	-1.3211	
21											0.108	0.0703	-0.6237	0.0325	0.0081	0.0024	11.2579	-0.9297	1.9878	0.0325	0.0081	-0.0958	10	-11.108	-0.2579	
7	2.6221	0.7817	-1.757	0.0711	0.0177						0.0201	0.672	-0.2183	-0.8865	0.0711	0.0177	-0.0126	10	0.3779	-3.672						
8	2.0985	0.693	-1.9608	0.0847	0.0211						0.019	1.0842	-0.307	-0.966	0.0847	0.0211	-0.0185	10	-0.0985	-3.0842						
9	1.6702	0.6037	-2.0583	0.0929	0.0232						0.0173	1.5916	-0.3963	-0.9391	0.0929	0.0232	-0.0248	10	-0.6702	-2.5916						
10	1.3248	0.5188	-2.0626	0.0961	0.024						0.0154	2.1819	-0.4812	-0.819	0.0961	0.024	-0.0314	10	-1.3248	-2.1819						
Dunlop Kenya Ltd	15	4	13.29	57	0.5						11.2574	0.9999	-0.5003	0.0001	0.0001	0.0187	0.0002	-0.0001	-0.0028	0.0001	0.0001	0	9.8	-5.4574	-5.8002	
14						3.3176	0.7046	-3.0511	0.0571	0.0366	0.0363	1.4175	-0.2954	-1.3101	0.0571	0.0366	-0.0292	9.8	-7.5176	2.7825						
9						6.731	0.9488	-1.6319	0.0174	0.0111	0.0375	0.1524	-0.0512	-0.5127	0.0174	0.0111	-0.0046	9.8	-5.931	-0.9524						
10						5.9234	0.915	-1.9774	0.0257	0.0165	0.039	0.2805	-0.085	-0.7339	0.0257	0.0165	-0.0078	9.8	-6.1234	-0.0805						
11						5.1733	0.872	-2.3161	0.0346	0.0222	0.0395	0.4661	-0.128	-0.9481	0.0346	0.0222	-0.0119	9.8	-6.3733	0.7339						

E A Cables Ltd	19.6	8	13.29	68	0.5	13.9929	0.9977	-0.8059	0.0007	0.001	0.0278	0.0072	-0.0023	-0.0597	0.0007	0.001	-0.0003	16	-3.9929	-10.0072	
						6.0875	0.7883	-3.9731	0.0307	0.0401	0.0468	1.4589	-0.2117	-1.9834	0.0307	0.0401	-0.028	16	-6.0875	-1.4589	
						2.2135	0.4172	-4.4711	0.0414	0.0541	0.0298	6.9419	-0.5828	-1.2378	0.0414	0.0541	-0.0918	16	-12.2135	3.0581	
						17	5.5252	0.75	-4.214	0.0337	0.044	0.0459	1.8322	-0.25	-2.1	0.0337	0.044	-0.0337	16	-6.5252	-0.8322
E A Packaging Ltd	14	5	13.29	51	0.5	9.3224	0.9994	-0.6318	0.0004	0.0002	0.0233	0.001	-0.0006	-0.01	0.0004	0.0002	0	7	-7.3224	-2.001	
						15	1.9881	0.5688	-2.7782	0.0778	0.0389	0.0299	2.0237	-0.4312	-0.9129	0.0778	0.0389	-0.0403	7	-9.9881	5.9763
						7	7.4717	0.9889	-0.9944	0.0058	0.0029	0.0319	0.0217	-0.0111	-0.1239	0.0058	0.0029	-0.0009	7	-7.4717	-0.0217
						8	6.5754	0.9723	-1.2564	0.0126	0.0063	0.0352	0.061	-0.0277	-0.2615	0.0126	0.0063	-0.0022	7	-7.5754	0.939
EA Portland Cement	14.5	2	13.29	107	0.5	12.6324	0.999	-0.2838	0.0003	0.0004	0.0093	0.0039	-0.001	-0.0351	0.0003	0.0004	-0.0001	11.2	-3.4324	-9.2039	
						12	5.6311	0.7631	-4.1086	0.0281	0.0316	0.0272	2.3597	-0.2369	-2.6163	0.0281	0.0316	-0.029	11.2	-6.4311	-1.5597
						22	2.6417	0.4662	-4.9082	0.0362	0.0408	0.0206	8.7273	-0.5338	-2.1724	0.0362	0.0408	-0.0823	11.2	-13.4417	2.0727
						15	4.4419	0.6632	-4.6927	0.0333	0.0374	0.0259	3.9776	-0.3368	-2.8274	0.0333	0.0374	-0.0443	11.2	-8.2419	-0.1776
Firestone EA Ltd	16.5	11	13.29	24	0.5	6.209	0.9979	-1.3815	0.0023	0.0008	0.0513	0.0018	-0.0021	-0.0136	0.0023	0.0008	-0.0002	16	-1.209	-5.0018	
						21	0.2401	0.1724	-1.0612	0.0912	0.0298	0.013	3.39	-0.8276	1.5503	0.0912	0.0298	-0.0852	16	-5.2401	1.61
						16	1.9978	0.7446	-2.2672	0.1148	0.0375	0.0514	0.4692	-0.2554	-0.2775	0.1148	0.0375	-0.0234	16	-1.9978	-0.4692
						17	1.4175	0.6181	-2.2348	0.1362	0.0445	0.0439	0.8246	-0.3819	-0.1208	0.1362	0.0445	-0.0356	16	-2.4175	0.1754
EABL	77.1	69	13.29	20	0.5	13.035	0.9075	-9.3735	0.0152	0.0904	0.2847	0.4989	-0.0925	-0.7929	0.0152	0.0904	-0.0382	69.9	-12.135	-1.3989	
						79	6.0331	0.6437	-9.8587	0.0342	0.2032	0.218	2.8541	-0.3563	-0.0346	0.0342	0.2032	-0.1516	69.9	-15.1331	6.2459
						70	12.2197	0.8895	-9.5474	0.0173	0.1029	0.2818	0.6193	-0.1105	-0.8425	0.0173	0.1029	-0.0457	69.9	-12.3197	-0.5193
						71	11.4254	0.8694	-9.704	0.0195	0.1157	0.278	0.7608	-0.1306	-0.8747	0.0195	0.1157	-0.0542	69.9	-12.5254	0.3392
Kenya National Mills	14	3	13.29	77	0.5	11.1944	0.9994	-0.3885	0.0003	0.0002	0.014	0.0015	-0.0006	-0.0155	0.0003	0.0002	-0.0001	9.5	-4.6944	-6.5015	
						13	3.8153	0.7021	-3.4412	0.0455	0.0343	0.0301	1.9796	-0.2979	-1.8246	0.0455	0.0343	-0.0308	9.5	-7.3153	1.5204
						23	6.8522	0.9225	-1.912	0.019	0.0144	0.0303	0.3378	-0.0775	-0.9172	0.019	0.0144	-0.0071	9.5	-5.3522	-1.8378
						8	6.1241	0.886	-2.3047	0.0253	0.0191	0.0314	0.5455	-0.114	-1.1855	0.0253	0.0191	-0.0107	9.5	-5.6241	-1.0455
						9	5.457	0.8443	-2.6675	0.0314	0.0237	0.0318	0.8141	-0.1557	-1.4239	0.0314	0.0237	-0.015	9.5	-5.957	-0.3141
						10	4.8512	0.7988	-2.9834	0.0369	0.0278	0.0317	1.144	-0.2012	-1.6155	0.0369	0.0278	-0.0198	9.5	-6.3512	0.356
Kenya Oil Co Ltd	76	43	13.29	42	0.5	35.8583	0.989	-5.8779	0.0013	0.0156	0.1965	0.0938	-0.011	-0.5306	0.0013	0.0156	-0.0047	67.8	-11.0583	-24.8938	
						53	27.0179	0.9436	-8.5007	0.005	0.061	0.2235	0.6105	-0.0564	-1.9098	0.005	0.061	-0.0245	67.8	-12.2179	-15.4105
						63	19.2008	0.8423	-11.3958	0.0107	0.1295	0.2241	2.1505	-0.1577	-3.5614	0.0107	0.1295	-0.0707	67.8	-14.4008	-6.9505
						73	12.9035	0.6942	-13.2121	0.0155	0.1885	0.1993	5.2103	-0.3058	-4.1341	0.0155	0.1885	-0.1422	67.8	-18.1035	-0.0103
						83	8.2617	0.5301	-13.2352	0.0176	0.2138	0.1601	9.9256	-0.4699	-2.9137	0.0176	0.2138	-0.2282	67.8	-23.4617	5.2744
						74	12.3659	0.678	-13.2972	0.0159	0.1927	0.1958	5.6084	-0.322	-4.0949	0.0159	0.1927	-0.1504	67.8	-18.5659	0.5916
KPLC	111.3	69	13.29	25	0.5	46.7403	0.9992	-8.6204	0.0001	0.0021	0.3224	0.0043	-0.0008	-0.0399	0.0001	0.0021	-0.0004	92.5	-23.2403	-23.5043	
						79	37.4349	0.9919	-10.1336	0.0011	0.0175	0.3648	0.056	-0.0081	-0.3095	0.0011	0.0175	-0.0048	92.5	-23.9349	-13.556

					89	28.3799	0.9581	-12.1607	0.0045	0.0704	0.3913	0.3581	-0.0419	-1.0931	0.0045	0.0704	-0.0251	92.5	-24.8799	-3.8581
					99	20.0506	0.8701	-14.3657	0.0107	0.1664	0.3839	1.3859	-0.1299	-2.0545	0.0107	0.1664	-0.0792	92.5	-26.5506	5.1141
					93	24.9264	0.9306	-13.0765	0.0068	0.1049	0.3933	0.6474	-0.0694	-1.5114	0.0068	0.1049	-0.0418	92.5	-25.4264	-0.1474
					94	24.0857	0.9222	-13.3041	0.0074	0.1146	0.3928	0.7424	-0.0778	-1.6146	0.0074	0.1146	-0.047	92.5	-25.5857	<b>0.7576</b>
<b>Total Kenya Ltd</b>	<b>47</b>	<b>33</b>	<b>13.29</b>	<b>25</b>	<b>0.5</b>	<b>16.1412</b>	<b>0.9931</b>	<b>-4.2173</b>	<b>0.0023</b>	<b>0.0064</b>	<b>0.1527</b>	<b>0.0196</b>	<b>-0.0069</b>	<b>-0.1135</b>	<b>0.0023</b>	<b>0.0064</b>	<b>-0.0017</b>	<b>48</b>	<b>-1.1412</b>	<b>-15.0196</b>
		<b>43</b>				<b>7.5647</b>	<b>0.8333</b>	<b>-6.2758</b>	<b>0.0301</b>	<b>0.083</b>	<b>0.158</b>	<b>0.8002</b>	<b>-0.1667</b>	<b>-0.9285</b>	<b>0.0301</b>	<b>0.083</b>	<b>-0.0432</b>	<b>48</b>	<b>-2.5647</b>	<b>-5.8002</b>
		<b>53</b>				<b>2.2606</b>	<b>0.4147</b>	<b>-5.5288</b>	<b>0.0469</b>	<b>0.1295</b>	<b>0.0862</b>	<b>4.8532</b>	<b>-0.5853</b>	<b>1.062</b>	<b>0.0469</b>	<b>0.1295</b>	<b>-0.1618</b>	<b>48</b>	<b>-7.2606</b>	<b>0.1468</b>
		<b>52</b>				<b>2.6045</b>	<b>0.4572</b>	<b>-5.8049</b>	<b>0.0477</b>	<b>0.1318</b>	<b>0.0944</b>	<b>4.2614</b>	<b>-0.5428</b>	<b>0.6616</b>	<b>0.0477</b>	<b>0.1318</b>	<b>-0.1489</b>	<b>48</b>	<b>-6.6045</b>	<b>-0.2614</b>
<b>Unga Group Ltd</b>	<b>31.1</b>	<b>5</b>	<b>13.29</b>	<b>103</b>	<b>0.5</b>	<b>26.4336</b>	<b>0.9985</b>	<b>-0.7254</b>	<b>0.0002</b>	<b>0.0011</b>	<b>0.0231</b>	<b>0.0121</b>	<b>-0.0015</b>	<b>-0.1036</b>	<b>0.0002</b>	<b>0.0011</b>	<b>-0.0003</b>	<b>26</b>	<b>-5.4336</b>	<b>-21.0121</b>
		<b>15</b>				<b>18.0795</b>	<b>0.9274</b>	<b>-4.5586</b>	<b>0.0061</b>	<b>0.0304</b>	<b>0.0538</b>	<b>1.0151</b>	<b>-0.0726</b>	<b>-2.6932</b>	<b>0.0061</b>	<b>0.0304</b>	<b>-0.0164</b>	<b>26</b>	<b>-7.0795</b>	<b>-12.0151</b>
		<b>25</b>				<b>12.1533</b>	<b>0.7749</b>	<b>-8.3822</b>	<b>0.0132</b>	<b>0.066</b>	<b>0.0597</b>	<b>4.446</b>	<b>-0.2251</b>	<b>-5.2733</b>	<b>0.0132</b>	<b>0.066</b>	<b>-0.0572</b>	<b>26</b>	<b>-11.1533</b>	<b>-5.446</b>
		<b>35</b>				<b>8.2719</b>	<b>0.6153</b>	<b>-10.1</b>	<b>0.0169</b>	<b>0.084</b>	<b>0.0543</b>	<b>9.9218</b>	<b>-0.3847</b>	<b>-5.7476</b>	<b>0.0169</b>	<b>0.084</b>	<b>-0.1094</b>	<b>26</b>	<b>-17.2719</b>	<b>-0.9218</b>
		<b>45</b>				<b>5.7426</b>	<b>0.4793</b>	<b>-10.2421</b>	<b>0.0176</b>	<b>0.0876</b>	<b>0.0458</b>	<b>16.7495</b>	<b>-0.5207</b>	<b>-4.6461</b>	<b>0.0176</b>	<b>0.0876</b>	<b>-0.1647</b>	<b>26</b>	<b>-24.7426</b>	<b>2.2505</b>
		<b>37</b>				<b>7.677</b>	<b>0.5859</b>	<b>-10.2275</b>	<b>0.0172</b>	<b>0.0857</b>	<b>0.0527</b>	<b>11.1982</b>	<b>-0.4141</b>	<b>-5.6263</b>	<b>0.0172</b>	<b>0.0857</b>	<b>-0.1204</b>	<b>26</b>	<b>-18.677</b>	<b>-0.1982</b>
		<b>38</b>				<b>7.398</b>	<b>0.5715</b>	<b>-10.2697</b>	<b>0.0173</b>	<b>0.0863</b>	<b>0.0519</b>	<b>11.855</b>	<b>-0.4285</b>	<b>-5.5442</b>	<b>0.0173</b>	<b>0.0863</b>	<b>-0.1259</b>	<b>26</b>	<b>-19.398</b>	<b>0.145</b>
		<b>39</b>				<b>7.1307</b>	<b>0.5575</b>	<b>-10.2989</b>	<b>0.0174</b>	<b>0.0868</b>	<b>0.051</b>	<b>12.5234</b>	<b>-0.4425</b>	<b>-5.449</b>	<b>0.0174</b>	<b>0.0868</b>	<b>-0.1314</b>	<b>26</b>	<b>-20.1307</b>	<b>0.4766</b>
		<b>40</b>				<b>6.8744</b>	<b>0.5437</b>	<b>-10.3157</b>	<b>0.0175</b>	<b>0.0872</b>	<b>0.0502</b>	<b>13.2028</b>	<b>-0.4563</b>	<b>-5.3415</b>	<b>0.0175</b>	<b>0.0872</b>	<b>-0.137</b>	<b>26</b>	<b>-20.8744</b>	<b>0.7972</b>

SIMULATION OF OPTION VALUES USING BOPSCOL																		Stock price	Value of	Value of
AGRICULTURAL SECTOR-JANUARY-JUNE 2000																		at expiration	European	European
Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	30.6.00	call option	put option
Brooke Bond	104.7	68	12.07	28	0.5	40.7163	0.9951	-7.9548	0.0007	0.0105	0.3174	0.0339	-0.0049	-0.2279	0.0007	0.0105	-0.0027	74	-34.7163	-6.0339
		78				31.5202	0.9707	-9.8465	0.0032	0.0494	0.3505	0.2521	-0.0293	-0.9833	0.0032	0.0494	-0.0166	74	-35.5202	3.7479
		73				36.0758	0.987	-8.8136	0.0016	0.0248	0.3363	0.1006	-0.013	-0.5185	0.0016	0.0248	-0.0073	74	-35.0758	-1.1006
		74				35.1562	0.9845	-9.0061	0.0019	0.0289	0.3396	0.1224	-0.0155	-0.5974	0.0019	0.0289	-0.0087	74	-35.1562	-0.1224
		75				34.2403	0.9816	-9.2058	0.0022	0.0333	0.3427	0.148	-0.0184	-0.6835	0.0022	0.0333	-0.0104	74	-35.2403	0.852
Eaagads Ltd	25	17	12.07	21	0.5	8.9967	0.999	-1.9414	0.0009	0.0006	0.0799	0.0011	-0.001	-0.0097	0.0009	0.0006	-0.0001	25	-0.9967	-8.0011
		27				1.292	0.485	-2.7875	0.1074	0.0705	0.0542	1.7107	-0.515	0.2806	0.1074	0.0705	-0.0729	25	-3.292	0.2893
		26				1.7403	0.5857	-3.004	0.105	0.0689	0.0645	1.2176	-0.4143	-0.0496	0.105	0.0689	-0.0579	25	-2.7403	-0.2176
George Williamson	92	50	12.07	43	0.5	45.0241	0.9908	-6.263	0.0009	0.0162	0.2306	0.0958	-0.0092	-0.5815	0.0009	0.0162	-0.0047	75	-20.0241	-25.0958
		60				36.0139	0.9605	-8.7056	0.0031	0.0555	0.2618	0.5	-0.0395	-1.8877	0.0031	0.0555	-0.0207	75	-21.0139	-15.5
		70				27.7205	0.8942	-11.6975	0.0065	0.1189	0.2727	1.6209	-0.1058	-3.7433	0.0065	0.1189	-0.0568	75	-22.7205	-6.6209
		80				20.54	0.7911	-14.3428	0.0103	0.1869	0.2612	3.8548	-0.2089	-5.2523	0.0103	0.1869	-0.1154	75	-25.54	1.1452
		78				21.873	0.8142	-13.8882	0.0096	0.1741	0.2652	3.3049	-0.1858	-5.0249	0.0096	0.1741	-0.102	75	-24.873	-0.3049
		79				21.1998	0.8028	-14.1213	0.0099	0.1806	0.2633	3.5731	-0.1972	-5.1445	0.0099	0.1806	-0.1086	75	-25.1998	0.4269
Kakuzi Ltd	91.5	50	12.07	29	0.5	44.4304	0.9996	-5.7047	0.0001	0.001	0.2352	0.0021	-0.0004	-0.0231	0.0001	0.001	-0.0002	66.5	-27.9304	-16.5021
		60				35.06	0.993	-7.1024	0.001	0.0127	0.279	0.0461	-0.007	-0.2845	0.001	0.0127	-0.0035	66.5	-28.56	-6.5461
		70				25.9678	0.9557	-9.1763	0.005	0.0605	0.3074	0.3683	-0.0443	-1.2221	0.005	0.0605	-0.0221	66.5	-29.4678	3.1317
		65				30.4504	0.9805	-8.0422	0.0025	0.0306	0.2963	0.1436	-0.0195	-0.6562	0.0025	0.0306	-0.0096	66.5	-28.9504	-1.6436
		66				29.5412	0.9767	-8.2547	0.0029	0.0356	0.2991	0.1759	-0.0233	-0.755	0.0029	0.0356	-0.0115	66.5	-29.0412	-0.6759
		67				28.6376	0.9724	-8.4749	0.0034	0.0411	0.3017	0.2138	-0.0276	-0.8616	0.0034	0.0411	-0.0137	66.5	-29.1376	0.2862
Kapchorua Tea Co	150	151	12.07	0	0.5	7.8433	1	-17.1583	0	0	0.7108	0	0	0	0	0	0	150	-8.8433	1
Limuru Tea Co	650	678	12.07	0	0.5	11.7071	1	-77.042	0	0	3.1915	0	0	0	0	0	0	650	-39.7071	28
Rea Vipingo Ltd	4.95	3	12.07	22	0.5	2.1257	0.9999	-0.3412	0.0006	0	0.0141	0	-0.0001	-0.0003	0.0006	0	0	3.85	-1.2757	-0.85
		4				1.1949	0.9668	-0.4904	0.0961	0.0026	0.018	0.0106	-0.0332	-0.0359	0.0961	0.0026	-0.0009	3.85	-1.3449	0.1394
Sasini Tea & Coffee	44.9	30	12.07	30	0.5	16.6953	0.989	-3.62	0.003	0.0092	0.1386	0.0383	-0.011	-0.2111	0.003	0.0092	-0.0027	35	-11.6953	-5.0383
		40				8.2348	0.8252	-5.9317	0.027	0.0818	0.1441	0.9922	-0.1748	-1.3864	0.027	0.0818	-0.0442	35	-13.2348	4.0078
		35				12.2113	0.9412	-4.7438	0.0123	0.0372	0.1502	0.2615	-0.0588	-0.7667	0.0123	0.0372	-0.0145	35	-12.2113	-0.2615
		36				11.3634	0.9239	-4.9986	0.015	0.0454	0.1506	0.3551	-0.0761	-0.9078	0.015	0.0454	-0.0189	35	-12.3634	0.6449



**SIMULATION OF OPTION VALUES USING BOPSCOL  
COMMERCIAL AND SERVICES SECTOR-JANUARY-JUNE 2000**

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.00	Value of European call option	Value of European put option
A Baumann & Co	15	12.07	22	0.5	9	6.5271	0.9999	-1.0233	0.0002	0	0.0424	0.0001	-0.0001	-0.0007	0.0002	0	0	13.8	-1.7271	-4.8001
					17	0.5409	0.3674	-1.4788	0.1614	0.04	0.0248	1.5453	-0.6326	0.4529	0.1614	0.04	-0.0552	13.8	-3.7409	1.6547
					12	3.73	0.9713	-1.4614	0.0281	0.007	0.0542	0.0273	-0.0287	-0.0978	0.0281	0.007	-0.0023	13.8	-1.93	-1.8273
					13	2.8555	0.9171	-1.6721	0.0655	0.0162	0.0545	0.0942	-0.0829	-0.1949	0.0655	0.0162	-0.0067	13.8	-2.0555	-0.8942
					14	2.0681	0.8184	-1.8478	0.1131	0.028	0.051	0.2482	-0.1816	-0.257	0.1131	0.028	-0.0149	13.8	-2.2681	-0.0482
					15	1.4089	0.6793	-1.895	0.1534	0.038	0.0439	0.5304	-0.3207	-0.1906	0.1534	0.038	-0.0267	13.8	-2.6089	0.6696
CMC Holdings Ltd	30	12.07	27	0.5	15	24.8785	1	-1.7045	0	0	0.0706	0	0	0	0	0	0	16.8	-23.0785	-1.8
					25	15.4714	0.9969	-2.8949	0.0013	0.0026	0.117	0.0073	-0.0031	-0.0541	0.0013	0.0026	-0.0006	16.8	-23.6714	8.1927
					16	23.937	1	-1.8181	0	0	0.0753	0	0	0	0	0	0	16.8	-23.137	-0.8
					17	22.9956	1	-1.9318	0	0	0.08	0	0	0	0	0	0	16.8	-23.1956	0.2
Car & General	9	12.07	94	0.5	2	7.1253	0.9964	-0.2871	0.0018	0.0007	0.0092	0.0082	-0.0036	-0.0598	0.0018	0.0007	-0.0002	10.05	0.9247	-8.0582
					12	1.6405	0.4961	-2.7274	0.0667	0.0254	0.0141	3.9377	-0.5039	-1.3638	0.0667	0.0254	-0.0424	10.05	-3.5905	-1.9877
					22	0.4385	0.1784	-1.7016	0.0436	0.0166	0.0058	12.15	-0.8216	0.7983	0.0436	0.0166	-0.0977	10.05	-12.3885	-0.2
					28	0.2196	0.0995	-1.1276	0.0292	0.0111	0.0034	17.5797	-0.9005	2.0541	0.0292	0.0111	-0.1284	10.05	-18.1696	0.3703
					7	3.4436	0.7885	-2.1722	0.0484	0.0184	0.0183	1.0336	-0.2115	-1.3767	0.0484	0.0184	-0.0147	10.05	-0.3936	-4.0836
					6	4.0069	0.8492	-1.8384	0.0391	0.0149	0.0182	0.6555	-0.1508	-1.1566	0.0391	0.0149	-0.0101	10.05	0.0431	-4.7055
					23	0.3889	0.1615	-1.5926	0.0409	0.0156	0.0053	13.0419	-0.8385	1.0209	0.0409	0.0156	-0.1029	10.05	-13.3389	-0.0919
					24	0.3456	0.1463	-1.4888	0.0383	0.0146	0.0049	13.9401	-0.8537	1.2384	0.0383	0.0146	-0.1081	10.05	-14.2956	0.0099
Express Kenya Ltd	18.9	12.07	13	0.5	15	4.7788	0.9994	-1.7069	0.0013	0.0003	0.0705	0.0003	-0.0006	-0.0024	0.0013	0.0003	-0.0001	19.05	-0.7288	-4.0503
					21	0.357	0.3286	-1.3347	0.2081	0.0483	0.0293	1.2271	-0.6714	1.0515	0.2081	0.0483	-0.0696	19.05	-2.307	0.7229
					19	1.2981	0.7406	-2.0956	0.1865	0.0433	0.0635	0.2853	-0.2594	0.0634	0.1865	0.0433	-0.0259	19.05	-1.2481	-0.3353
					20	0.7278	0.5347	-1.8224	0.2288	0.0531	0.0469	0.6565	-0.4653	0.4502	0.2288	0.0531	-0.0473	19.05	-1.6778	0.2935
Kenya Airways	7.85	12.07	25	0.5	6	2.2157	0.9744	-0.7385	0.0429	0.0033	0.0272	0.0143	-0.0256	-0.0567	0.0429	0.0033	-0.0011	8	-0.2157	-2.0143
					7	1.3677	0.8595	-0.9589	0.1608	0.0124	0.0269	0.1078	-0.1405	-0.1635	0.1608	0.0124	-0.0061	8	-0.3677	-1.1078
					8	0.7157	0.6265	-1.0328	0.2729	0.021	0.021	0.3972	-0.3735	-0.1237	0.2729	0.021	-0.0166	8	-0.7157	-0.3972
					9	0.316	0.3656	-0.8301	0.271	0.0209	0.0128	0.9389	-0.6344	0.1926	0.271	0.0209	-0.0296	8	-1.316	0.0611
Marshalls EA Ltd	23.6	12.07	20	0.5	16	8.5376	0.9994	-1.8232	0.0006	0.0003	0.0752	0.0005	-0.0006	-0.0051	0.0006	0.0003	-0.0001	19.3	-5.2376	-3.3005
					26	0.9613	0.4257	-2.4049	0.1175	0.0654	0.0454	1.8386	-0.5743	0.5496	0.1175	0.0654	-0.077	19.3	-7.6613	4.8614
					19	5.7401	0.9788	-2.2649	0.0152	0.0085	0.0868	0.0274	-0.0212	-0.1059	0.0152	0.0085	-0.0026	19.3	-5.4401	-0.3274
					20	4.8409	0.9523	-2.4598	0.0297	0.0166	0.0882	0.0696	-0.0477	-0.1872	0.0297	0.0166	-0.006	19.3	-5.5409	0.6304
					21	3.9835	0.9071	-2.658	0.0498	0.0278	0.0871	0.1536	-0.0929	-0.2718	0.0498	0.0278	-0.0117	19.3	-5.6835	1.5464
Nation Media Group	101	12.07	17	0.5	68	36.9826	0.9999	-7.7291	0	0.0002	0.3201	0.0002	-0.0001	-0.0022	0	0.0002	0	75	-29.9826	-7.0002
					78	27.5809	0.9967	-8.9434	0.0008	0.0072	0.3654	0.0128	-0.0033	-0.0802	0.0008	0.0072	-0.0018	75	-30.5809	2.9872
					73	32.2771	0.9994	-8.3118	0.0002	0.0014	0.3433	0.0018	-0.0006	-0.0167	0.0002	0.0014	-0.0003	75	-30.2771	-2.0018
					74	31.3366	0.9992	-8.4324	0.0002	0.002	0.3479	0.0028	-0.0008	-0.0237	0.0002	0.002	-0.0004	75	-30.3366	-1.0028

					75 76	30.3966 29.4571	0.9988 0.9983	-8.5553 -8.681	0.0003 0.0005	0.0028 0.0039	0.3524 0.3569	0.0042 0.0062	-0.0012 -0.0017	-0.0329 -0.0451	0.0003 0.0005	0.0028 0.0039	-0.0006 -0.0009	75 76	-30.3966 -30.4571	-0.0042 -0.9938
Pearl Drycleaners	3	2	12.07	26	0.5	1.1179	0.9957	-0.2326	0.023	0.0003	0.0093	0.0008	-0.0043	-0.0053	0.023	0.0003	-0.0001	2.4	-0.7179	-0.4008
		3				0.3125	0.6628	-0.4037	0.6622	0.0077	0.0084	0.1368	-0.3372	-0.0628	0.6622	0.0077	-0.0057	2.4	-0.9125	0.4632
Standard Newspaper	11	2	12.07	110	0.5	9.1305	0.9961	-0.3202	0.0014	0.0009	0.0091	0.0133	-0.0039	-0.0929	0.0014	0.0009	-0.0003	6.1	-5.0305	-4.0961
		12				3.2275	0.6386	-3.6636	0.0438	0.0291	0.019	3.5247	-0.3614	-2.3	0.0438	0.0291	-0.0375	6.1	-9.1275	2.3753
		7				5.3827	0.8526	-2.4541	0.0269	0.0179	0.02	0.9727	-0.1474	-1.6587	0.0269	0.0179	-0.013	6.1	-6.2827	-0.0727
		8				4.8441	0.8095	-2.8159	0.0318	0.0211	0.0203	1.3755	-0.1905	-1.9068	0.0318	0.0211	-0.0174	6.1	-6.7441	0.5245
TPS Serena	16.2	3	12.07	97	0.5	13.3833	0.9981	-0.4044	0.0006	0.0007	0.0139	0.0077	-0.0019	-0.0635	0.0006	0.0007	-0.0002	15.95	-0.4333	-12.9577
		13				6.0965	0.7739	-4.119	0.0271	0.0344	0.0322	2.1352	-0.2261	-2.6418	0.0271	0.0344	-0.029	15.95	-3.1465	-5.0852
		23				2.7794	0.4681	-4.9985	0.0358	0.0456	0.024	8.2324	-0.5319	-2.385	0.0358	0.0456	-0.0842	15.95	-9.8294	-1.1824
		33				1.3598	0.2721	-4.0563	0.0299	0.038	0.0152	16.2272	-0.7279	-0.3065	0.0299	0.038	-0.1401	15.95	-18.4098	0.8228
		28				1.9266	0.3569	-4.6096	0.0336	0.0427	0.0193	12.0868	-0.6431	-1.428	0.0336	0.0427	-0.1125	15.95	-13.9766	-0.0368
		29				1.7944	0.338	-4.5063	0.0329	0.0419	0.0184	12.896	-0.662	-1.211	0.0329	0.0419	-0.1181	15.95	-14.8444	0.154
Uchumi Supermark	40.2	36	12.07	17	0.5	6.4638	0.9306	-4.3798	0.0276	0.0379	0.1547	0.1555	-0.0694	-0.2891	0.0276	0.0379	-0.0147	42.75	0.2862	-6.9055
		46				0.8192	0.2881	-2.9478	0.0706	0.097	0.0538	3.9252	-0.7119	2.2792	0.0706	0.097	-0.1627	42.75	-4.0692	-0.6752
		56				0.023	0.0141	-0.2386	0.0074	0.0102	0.0027	12.5434	-0.9859	6.1247	0.0074	0.0102	-0.2609	42.75	-13.273	0.7066
		37				5.6231	0.8948	-4.543	0.0377	0.0518	0.1517	0.2562	-0.1052	-0.3386	0.0377	0.0518	-0.0224	42.75	0.1269	-6.0062
		38				4.8268	0.8486	-4.6686	0.0486	0.0667	0.1464	0.4014	-0.1514	-0.3506	0.0486	0.0667	-0.0324	42.75	-0.0768	-5.1514
		49				0.3245	0.139	-1.7061	0.0458	0.063	0.0263	6.2548	-0.861	3.8618	0.0458	0.063	-0.2043	42.75	-6.5745	-0.0048
		50				0.2314	0.1052	-1.362	0.0377	0.0517	0.02	7.1031	-0.8948	4.3195	0.0377	0.0517	-0.2154	42.75	-7.4814	0.1469
		51				0.1627	0.0782	-1.0657	0.0302	0.0415	0.0149	7.9759	-0.9218	4.7295	0.0302	0.0415	-0.2252	42.75	-8.4127	0.2741

SIMULATION OF OPTION VALUES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JANUARY-JUNE 2000

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.00	Value of European call option	Value of European put option		
Barclays Bank	82.95	49	12.1	36	0.5	36.8761	0.9925	-5.9234	0.001	0.0121	0.2273	0.0564	-0.0075	-0.3554	0.001	0.0121	-0.0034	86	0.1239	-37.0564		
		59				27.8282	0.9557	-8.1862	0.0044	0.0549	0.2572	0.4229	-0.0443	-1.482	0.0044	0.0549	-0.0205	86	-0.8282	-27.4229		
		69				19.6603	0.8616	-10.9162	0.0105	0.1295	0.2591	1.6693	-0.1384	-3.0756	0.0105	0.1295	-0.0657	86	-2.6603	-18.6693		
		79				12.9717	0.7109	-12.7693	0.0162	0.2005	0.23	4.395	-0.2891	-3.7924	0.0162	0.2005	-0.1419	86	-5.9717	-11.395		
		89				8.0313	0.535	-12.7784	0.0188	0.2331	0.1817	8.869	-0.465	-2.6652	0.0188	0.2331	-0.2372	86	-11.0313	-5.869		
		99				4.7068	0.3705	-11.1176	0.0179	0.2216	0.1301	14.9589	-0.6295	0.1318	0.0179	0.2216	-0.3359	86	-17.7068	-1.9589		
		109				2.6365	0.2393	-8.6318	0.0147	0.1821	0.0861	22.303	-0.7607	3.754	0.0147	0.1821	-0.427	86	-25.6365	0.697		
		54				32.2834	0.9798	-6.9427	0.0023	0.0286	0.245	0.1709	-0.0202	-0.8066	0.0023	0.0286	-0.0092	86	-0.2834	-32.1709		
		53				33.1933	0.9832	-6.7198	0.002	0.0245	0.2418	0.1394	-0.0168	-0.6974	0.002	0.0245	-0.0077	86	-0.1933	-33.1394		
		52				34.1081	0.9861	-6.5065	0.0017	0.0209	0.2384	0.1127	-0.0139	-0.5977	0.0017	0.0209	-0.0063	86	-0.1081	-34.1127		
		51				35.0272	0.9886	-6.3028	0.0014	0.0176	0.2349	0.0904	-0.0114	-0.5076	0.0014	0.0176	-0.0052	86	-0.0272	-35.0904		
		50				35.95	0.9907	-6.1085	0.0012	0.0147	0.2311	0.0718	-0.0093	-0.4269	0.0012	0.0147	-0.0042	86	0.05	-36.0718		
		104				3.5406	0.3001	-9.9205	0.0165	0.204	0.1068	18.4998	-0.6999	1.8971	0.0165	0.204	-0.3828	86	-21.5406	-0.4998		
		105				3.3404	0.2872	-9.6668	0.0161	0.1999	0.1024	19.2411	-0.7128	2.2645	0.0161	0.1999	-0.3918	86	-22.3404	-0.2411		
		106				3.1503	0.2746	-9.4103	0.0158	0.1956	0.0981	19.9925	-0.7254	2.6346	0.0158	0.1956	-0.4008	86	-23.1503	0.0075		
		City Trust Ltd	22	18	12.1	19	0.5	5.0798	0.9778	-2.1397	0.0179	0.0082	0.0822	0.0256	-0.0222	-0.0943	0.0179	0.0082	-0.0026	20	-3.0798	-2.0256
				28				0.1333	0.1005	-0.7715	0.0596	0.0274	0.0104	4.4935	-0.8995	2.4102	0.0596	0.0274	-0.1214	20	-8.1333	3.5065
				20				3.3379	0.8899	-2.5163	0.0637	0.0293	0.0812	0.1666	-0.1101	-0.2437	0.0637	0.0293	-0.0129	20	-3.3379	-0.1666
				21				2.5689	0.8058	-2.6425	0.093	0.0428	0.0758	0.3391	-0.1942	-0.2563	0.093	0.0428	-0.0231	20	-3.5689	0.6609
22						1.9013	0.6972	-2.6539	0.1181	0.0543	0.0672	0.6128	-0.3028	-0.154	0.1181	0.0543	-0.0364	20	-3.9013	1.3872		
23						1.3506	0.5736	-2.5191	0.1327	0.061	0.0563	1.0036	-0.4264	0.0944	0.1327	0.061	-0.0519	20	-4.3506	1.9964		
CFC Bank	11	6	12.1	40	0.5	5.3582	0.9938	-0.7275	0.0057	0.0014	0.0279	0.0069	-0.0062	-0.0457	0.0057	0.0014	-0.0004	9.8	-1.5582	-3.8069		
		16				0.2427	0.166	-0.9666	0.0801	0.0194	0.0079	4.3056	-0.834	0.8515	0.0801	0.0194	-0.0674	9.8	-6.4427	1.8944		
		10				2.1088	0.7555	-1.7256	0.1009	0.0244	0.031	0.5231	-0.2445	-0.5893	0.1009	0.0244	-0.0161	9.8	-2.3088	-0.3231		
		11				1.55	0.6386	-1.8263	0.1204	0.0291	0.0274	0.9058	-0.3614	-0.5764	0.1204	0.0291	-0.0244	9.8	-2.75	0.2942		
Diamond Trust Bank	26	13	12.1	29	0.5	13.7614	0.9999	-1.4786	0.0001	0.0001	0.0612	0.0001	-0.0001	0.0001	0.0001	0.0001	0	20	-6.7614	-7.0001		
		23				4.8411	0.8401	-3.3489	0.0456	0.0447	0.085	0.4941	-0.1599	-0.7354	0.0456	0.0447	-0.0233	20	-7.8411	2.5059		
		18				9.0829	0.9857	-2.1904	0.0068	0.0068	0.0827	0.0287	-0.0143	-0.1451	0.0068	0.0068	-0.002	20	-7.0829	-2.0287		
		19				8.1719	0.973	-2.3996	0.0117	0.0115	0.0856	0.0592	-0.027	-0.2406	0.0117	0.0115	-0.0038	20	-7.1719	-0.973		
		20				7.283	0.9532	-2.6341	0.0184	0.018	0.0875	0.1117	-0.0468	-0.3614	0.0184	0.018	-0.0066	20	-7.283	-0.1117		
		21				6.4252	0.9248	-2.8828	0.0266	0.0261	0.0881	0.1953	-0.0752	-0.4965	0.0266	0.0261	-0.0107	20	-7.4252	0.8047		
Housing Finance Co of Kenya	10.6	1	12.1	111	0.5	9.6592	0.9997	-0.1211	0.0001	0.0001	0.0047	0.0007	-0.0003	-0.0075	0.0001	0.0001	0	7.05	-3.6092	-6.0507		
		11				3.322	0.6635	-3.4842	0.0439	0.0274	0.0186	3.0778	-0.3365	-2.2342	0.0439	0.0274	-0.0332	7.05	-7.272	0.8722		
		9				4.086	0.7511	-3.1057	0.0381	0.0238	0.0194	1.9589	-0.2489	-2.083	0.0381	0.0238	-0.023	7.05	-6.036	-0.0089		
		10				3.6807	0.7066	-3.3231	0.0414	0.0258	0.019	2.4951	-0.2934	-2.1868	0.0414	0.0258	-0.028	7.05	-6.6307	0.4549		
ICDC Investments Co Ltd	50	33	12.1	27	0.5	18.948	0.9952	-3.8526	0.0015	0.005	0.1541	0.0154	-0.0048	-0.1028	0.0015	0.005	-0.0013	49.5	-2.448	-16.5154		
		43				10.0989	0.8852	-5.9737	0.0203	0.0685	0.1708	0.5806	-0.1148	-1.0875	0.0203	0.0685	-0.0316	49.5	-3.5989	-7.0806		
		53				3.8508	0.5424	-6.5951	0.0416	0.1403	0.1163	3.7468	-0.4576	-0.5727	0.0416	0.1403	-0.1331	49.5	-7.3508	-0.2468		
		63				1.0519	0.2122	-3.9211	0.0304	0.1025	0.0478	10.3623	-0.7878	3.2377	0.0304	0.1025	-0.2488	49.5	-14.5519	3.1377		

					<b>54</b>	3.4301	0.5034	-6.432	0.0418	0.141	0.1087	4.2675	-0.4966	-0.2959	0.0418	0.141	-0.1455	49.5	-7.9301	<b>0.2325</b>
Jubilee Insurance Co Ltd	25.1	18	12.1	24	0.5	8.1664	0.9918	-2.1145	0.0053	0.004	0.0836	0.0122	-0.0082	-0.0691	0.0053	0.004	-0.0011	22	-4.1664	-4.0122
		28				1.1816	0.4193	2.7919	0.0917	0.0694	0.0467	2.4418	0.5807	0.3897	0.0917	0.0694	0.0851	22	-7.1816	3.5582
		21				5.4662	0.9321	-2.7229	0.0308	0.0233	0.0896	0.1363	-0.0679	-0.3366	0.0308	0.0233	-0.0092	22	-4.4662	-1.1363
		22				4.6368	0.8882	-2.9414	0.0446	0.0338	0.0883	0.2483	-0.1118	-0.4415	0.0446	0.0338	-0.0153	22	-4.6368	-0.2483
		23				3.8654	0.8303	-3.1256	0.0593	0.0449	0.0849	0.4184	-0.1697	-0.5121	0.0593	0.0449	-0.0234	22	-4.8654	<b>0.5816</b>
KCB Ltd	21.8	14	12.1	34	0.5	8.6466	0.9866	-1.7328	0.0066	0.0053	0.0643	0.0267	-0.0134	-0.142	0.0066	0.0053	-0.0016	28	<b>5.3534</b>	-14.0267
		24				1.75	0.4886	-3.1643	0.0761	0.0615	0.0445	2.5445	-0.5114	-0.4372	0.0761	0.0615	-0.0685	28	2.25	-6.5445
		34				0.1476	0.0698	-0.8678	0.0256	0.0206	0.0069	10.3564	-0.9302	2.9957	0.0256	0.0206	-0.1532	28	-6.1476	-4.3564
		27				0.8922	0.302	-2.5148	0.0665	0.0538	0.0285	4.511	-0.698	0.5532	0.0665	0.0538	-0.0986	28	<b>0.1078</b>	-5.511
		28				0.702	0.2515	-2.2476	0.0608	0.0491	0.0239	5.2622	-0.7485	0.934	0.0608	0.0491	-0.1079	28	-0.702	-5.2622
		29				0.5487	0.2073	-1.9783	0.0546	0.0441	0.0199	6.0503	-0.7927	1.3171	0.0546	0.0441	-0.1167	28	-1.5487	-5.0503
National Bank Ltd	5	2	12.1	51	0.5	3.1183	0.9981	-0.2371	0.0034	0.0002	0.0094	0.0011	-0.0019	-0.0098	0.0034	0.0002	-0.0001	3.6	-1.5183	-1.6011
		3				2.208	0.9611	-0.4653	0.0467	0.003	0.013	0.0323	-0.0389	-0.1244	0.0467	0.003	-0.0011	3.6	-1.608	-0.6323
		4				1.4252	0.8331	-0.7817	0.1387	0.0088	0.0137	0.1909	-0.1669	-0.3272	0.1387	0.0088	-0.0051	3.6	-1.8252	<b>0.2091</b>
																		3.6		
NIC Bank Ltd	27	13	12.1	39	0.5	14.7643	0.9987	-1.5049	0.0006	0.0008	0.061	0.003	-0.0013	-0.0276	0.0006	0.0008	-0.0002	21	-6.7643	-8.003
		23				6.1437	0.8259	-3.863	0.0345	0.049	0.0808	0.7967	-0.1741	-1.2495	0.0345	0.049	-0.0275	21	-8.1437	1.2033
		18				10.1642	0.9662	-2.4815	0.0101	0.0144	0.0796	0.11	-0.0338	-0.4362	0.0101	0.0144	-0.0051	21	-7.1642	-3.11
		19				9.2919	0.9486	-2.7553	0.0142	0.0201	0.0816	0.1792	-0.0514	-0.5963	0.0142	0.0201	-0.0078	21	-7.2919	-2.1792
		20				8.4483	0.9258	-3.043	0.0189	0.0268	0.0827	0.277	-0.0742	-0.7704	0.0189	0.0268	-0.0114	21	-7.4483	-1.277
		21				7.639	0.8976	-3.3326	0.024	0.0341	0.083	0.4092	-0.1024	-0.9464	0.024	0.0341	-0.0159	21	-7.639	-0.4092
		22				6.8693	0.8642	-3.6104	0.0293	0.0416	0.0823	0.5809	-0.1358	-1.1106	0.0293	0.0416	-0.0212	21	-7.8693	<b>0.4191</b>
Pan Africa Ins Co	26.5	11	12.1	39	0.5	16.1446	0.9998	-1.2547	0.0001	0.0001	0.0518	0.0004	-0.0002	-0.0048	0.0001	0.0001	0	20	-7.1446	-9.0004
		21				7.1933	0.885	-3.3811	0.0266	0.0364	0.0813	0.4635	-0.115	-0.9948	0.0266	0.0364	-0.0176	20	-8.1933	<b>0.5365</b>
		20				7.9879	0.9158	-3.0944	0.0211	0.029	0.0814	0.3166	-0.0842	-0.8218	0.0211	0.029	-0.0127	20	-7.9879	-0.3166
Standard Chartered Bank Ltd	37.5	21	12.1	51	0.5	17.8772	0.9747	-3.0515	0.0044	0.0156	0.0934	0.1474	-0.0253	-0.6652	0.0044	0.0156	-0.0055	48	<b>9.1228</b>	-27.1474
		31				10.0183	0.8094	-6.1316	0.0201	0.0721	0.1017	1.7028	-0.1906	-2.609	0.0201	0.0721	-0.0443	48	6.9817	-18.7028
		41				4.9124	0.5399	-7.2189	0.0294	0.1053	0.0767	6.0113	-0.4601	-2.56	0.0294	0.1053	-0.1163	48	2.0876	-13.0113
		51				2.221	0.3068	-5.8697	0.026	0.0931	0.0464	12.7342	-0.6932	-0.0745	0.026	0.0931	-0.1936	48	-5.221	-9.7342
		61				0.9639	0.1583	-3.8676	0.0179	0.0641	0.0249	20.8915	-0.8417	3.0639	0.0179	0.0641	-0.2623	48	-13.9639	-7.8915
		71				0.412	0.0775	-2.2626	0.0107	0.0385	0.0125	29.7538	-0.9225	5.8052	0.0107	0.0385	-0.3212	48	-23.412	-6.7538
		81				0.176	0.0369	-1.237	0.006	0.0214	0.006	38.9322	-0.9631	7.9671	0.006	0.0214	-0.3752	48	-33.176	-5.9322
		44				3.8961	0.4619	-6.991	0.0294	0.1053	0.0671	7.8193	-0.5381	-1.9912	0.0294	0.1053	-0.14	48	<b>0.1039</b>	-11.8193
		45				3.6015	0.4373	-6.8727	0.0291	0.1045	0.064	8.4661	-0.5627	-1.7593	0.0291	0.1045	-0.1478	48	-0.6015	-11.4661
		46				3.3271	0.4134	-6.7369	0.0288	0.1033	0.0609	9.1331	-0.5866	-1.5098	0.0288	0.1033	-0.1557	48	-1.3271	-11.1331

SIMULATION OF OPTION VALUES USING BOPSCOL  
INDUSTRIAL AND ALLIED SECTOR-JANUARY-JUNE 2000

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 30.6.00	Value of European option	Value of European put option	
Athi River Mining Ltd	5.6	2	12.07	42	0.5	3.7172	0.9999	-0.2277	0.0002	0	0.0094	0	-0.0001	-0.0004	0.0002	0	0	4.55	-1.1672	-2.55	
		3				2.7799	0.9929	-0.3683	0.0118	0.0008	0.0139	0.0042	-0.0071	-0.0274	0.0118	0.0008	-0.0002		4.55	-1.2299	-1.5542
		4				1.8913	0.9312	-0.6215	0.0797	0.0052	0.0166	0.057	-0.0688	-0.167	0.0797	0.0052	-0.0022		4.55	-1.3413	-0.607
		5				1.1549	0.7683	-0.887	0.1833	0.0121	0.0157	0.2621	-0.2317	-0.3188	0.1833	0.0121	-0.0078		4.55	-1.6049	<b>0.1879</b>
Bamburi Cement Ltd	26	25	12.07	14	0.5	2.6657	0.8544	-2.9478	0.0888	0.042	0.0977	0.2016	-0.1456	-0.107	0.0888	0.042	-0.0199	29.25	<b>1.5843</b>	-4.4516	
		35				0.008	0.0096	-0.0949	0.0099	0.0047	0.0012	6.9583	-0.9904	3.8822	0.0099	0.0047	-0.1635		29.25	-5.758	-1.2083
		28				0.8634	0.4644	-2.3757	0.1544	0.0731	0.056	1.2236	-0.5356	0.8059	0.1544	0.0731	-0.0758		29.25	<b>0.3866</b>	-2.4736
		29				0.5267	0.3285	-1.8979	0.1405	0.0665	0.0401	1.8283	-0.6715	1.3974	0.1405	0.0665	-0.0964		29.25	-0.2767	-2.0783
		30				0.3023	0.2158	-1.3945	0.1138	0.0538	0.0265	2.5454	-0.7842	2.0145	0.1138	0.0538	-0.1147		29.25	-1.0523	-1.7954
BAT Ltd	57	26	12.07	52	0.5	32.5724	0.9935	-3.287	0.0009	0.0074	0.1203	0.0498	-0.0065	-0.3326	0.0009	0.0074	-0.0021	57	-1.5724	-31.0498	
		36				23.6762	0.9449	-5.9766	0.0053	0.0449	0.1509	0.5679	-0.0551	-1.8859	0.0053	0.0449	-0.0185		57	-2.6762	-21.5679
		46				16.0783	0.8241	-9.1493	0.0123	0.1042	0.1545	2.3843	-0.1759	-3.9223	0.0123	0.1042	-0.0621		57	-5.0783	-13.3843
		56				10.3196	0.654	-10.9842	0.0176	0.1487	0.1348	6.04	-0.346	-4.6209	0.0176	0.1487	-0.1288		57	-9.3196	-7.04
		66				6.3567	0.4798	-10.8841	0.019	0.1606	0.105	11.4914	-0.5202	-3.3844	0.019	0.1606	-0.2057		57	-15.3567	-2.4914
		76				3.8093	0.332	-9.4327	0.0173	0.1463	0.0756	18.3583	-0.668	-0.7967	0.0173	0.1463	-0.2822		57	-22.8093	0.6417
		71				4.9342	0.4016	-10.2725	0.0185	0.1559	0.0898	14.7761	-0.5984	-2.2047	0.0185	0.1559	-0.2444		57	-18.9342	-0.7761
		72				4.6872	0.3869	-10.1193	0.0183	0.1543	0.0868	15.4705	-0.6131	-1.9378	0.0183	0.1543	-0.2521		57	-19.6872	-0.4705
		73				4.4516	0.3726	-9.9578	0.0181	0.1525	0.0839	16.1764	-0.6274	-1.6628	0.0181	0.1525	-0.2597		57	-20.4516	-0.1764
		74				4.2271	0.3587	-9.7891	0.0178	0.1506	0.0811	16.8933	-0.6413	-1.3804	0.0178	0.1506	-0.2672		57	-21.2271	<b>0.1067</b>
BOC Gases Ltd	64	37	12.07	30	0.5	29.1729	0.9985	-4.2573	0.0004	0.0022	0.1737	0.006	-0.0015	-0.053	0.0004	0.0022	-0.0005	47.25	-18.9229	-10.256	
		47				19.939	0.9676	-6.0532	0.0053	0.0329	0.2099	0.1864	-0.0324	-0.7126	0.0053	0.0329	-0.0113		47.25	-19.689	-0.4364
		57				11.7491	0.8255	-8.4519	0.019	0.1164	0.2054	1.4109	-0.1745	-1.975	0.019	0.1164	-0.0629		47.25	-21.4991	8.3391
		48				19.0509	0.9597	-6.2918	0.0064	0.0393	0.2118	0.2398	-0.0403	-0.8375	0.0064	0.0393	-0.0141		47.25	-19.8009	<b>0.5102</b>
Carbacid Investment	56	27	12.07	40	0.5	30.5895	0.9983	-3.1411	0.0003	0.0021	0.1266	0.0083	-0.0017	-0.0731	0.0003	0.0021	-0.0005	50	-7.5895	-23.0083	
		37				21.4057	0.9656	-5.1491	0.0048	0.0301	0.1633	0.2388	-0.0344	-0.9448	0.0048	0.0301	-0.0108		50	-8.4057	-13.2388
		47				13.3398	0.835	-7.9654	0.0157	0.0983	0.1671	1.5872	-0.165	-2.6247	0.0157	0.0983	-0.0541		50	-10.3398	-4.5872
		57				7.405	0.6149	-9.3175	0.0241	0.1514	0.1352	5.0668	-0.3851	-2.8405	0.0241	0.1514	-0.1332		50	-14.405	1.9332
		52				10.0735	0.7313	-8.9516	0.0208	0.1306	0.1544	3.0281	-0.2687	-3.0428	0.0208	0.1306	-0.0904		50	-12.0735	-1.0281
		53				9.4917	0.7087	-9.0779	0.0217	0.1358	0.151	3.3877	-0.2913	-3.0554	0.0217	0.1358	-0.0985		50	-12.4917	-0.3877
54				8.9341	0.6856	-9.1779	0.0224	0.1406	0.1473	3.7716	-0.3144	-3.0418	0.0224	0.1406	-0.1069		50	-12.9341	<b>0.2284</b>		
Crown Berger Ltd	11.05	6	12.07	34	0.5	5.4029	0.9982	-0.6945	0.0022	0.0005	0.0281	0.0015	-0.0018	-0.0127	0.0022	0.0005	-0.0001	12.5	<b>1.0971</b>	-6.5015	
		16				0.1439	0.1213	-0.68	0.0759	0.0158	0.006	4.1569	-0.8787	1.1381	0.0759	0.0158	-0.0693		12.5	-3.6439	-0.6569
		11				1.4081	0.6518	-1.6815	0.1392	0.0289	0.029	0.7138	-0.3482	-0.4316	0.1392	0.0289	-0.0228		12.5	<b>0.0919</b>	-2.2138
12				0.95	0.5112	-1.6266	0.1501	0.0312	0.0235	1.1972	-0.4888	-0.263	0.1501	0.0312	-0.033		12.5	-0.45	-1.6972		
Dunlop Kenya Ltd	9.8	6	12.07	22	0.5	4.1514	0.9999	-0.6825	0.0004	0	0.0282	0.0001	-0.0001	-0.0007	0.0004	0	0	7.5	-2.6514	-1.5001	
		7				3.2121	0.9957	-0.8093	0.0083	0.0009	0.0327	0.0021	-0.0043	-0.0139	0.0083	0.0009	-0.0002		7.5	-2.7121	-0.5021
		8				2.2934	0.9617	-0.9876	0.0546	0.0058	0.0357	0.0248	-0.0383	-0.0786	0.0546	0.0058	-0.002		7.5	-2.7934	<b>0.4752</b>
E A Cables Ltd	12.95	5	12.07	62	0.5	8.2548	0.9943	-0.6506	0.0029	0.0015	0.0231	0.012	-0.0057	-0.0824	0.0029	0.0015	-0.0004	8	-5.2548	-3.012	

Simulation of option values:Industrial and Allied sector,January-June 2000

					15	1.8077	0.5086	-2.8413	0.0703	0.0365	0.0239	2.9792	-0.4914	-1.1368	0.0703	0.0365	-0.0467	8	-8.8077	4.0208
					10	1.8077	0.5086	-2.8413	0.0703	0.0365	0.0239	2.9792	-0.4914	-1.1368	0.0703	0.0365	-0.0467	8	-3.8077	-0.9792
					11	3.5709	0.767	-2.5042	0.0539	0.028	0.0318	0.9767	-0.233	-1.2542	0.0539	0.028	-0.02	8	-6.5709	2.0233
E A Packaging Ltd	12.5	2	12.07	86	0.5	10.6179	0.9997	-0.2355	0.0002	0.0001	0.0094	0.0007	-0.0003	-0.0083	0.0002	0.0001	0	13.2	0.5821	-11.2007
		12				3.4822	0.681	-3.322	0.047	0.0316	0.0252	2.2794	-0.319	-1.9584	0.047	0.0316	-0.0313	13.2	-2.2822	-3.4794
		22				1.0842	0.2993	-2.961	0.0457	0.0307	0.0133	9.2958	-0.7007	-0.4611	0.0457	0.0307	-0.0903	13.2	-9.8842	-0.4958
		28				0.5678	0.178	-2.1809	0.0343	0.023	0.0083	14.4279	-0.822	1.0008	0.0343	0.023	-0.1235	13.2	-15.3678	0.3721
		6				7.0738	0.9463	-1.4034	0.0144	0.0096	0.0238	0.2224	-0.0537	-0.7216	0.0144	0.0096	-0.0045	13.2	0.1262	-7.4224
		7				6.3133	0.9126	-1.8229	0.0209	0.014	0.0255	0.4033	-0.0874	-1.0274	0.0209	0.014	-0.0075	13.2	-0.1133	-6.8033
EA Portland Cement	11.2	8	12.07	24	0.5	3.6736	0.9923	-0.9383	0.0111	0.0017	0.0372	0.0051	-0.0077	-0.0292	0.0111	0.0017	-0.0005	12.4	0.7264	-4.4051
		15				0.0841	0.1001	-0.459	0.0924	0.0139	0.0052	3.0057	-0.8999	1.2455	0.0924	0.0139	-0.0654	12.4	-2.6841	-0.4057
		11				1.2271	0.7077	-1.4616	0.1808	0.0272	0.0335	0.3828	-0.2923	-0.2117	0.1808	0.0272	-0.0183	12.4	0.1729	-1.7828
		12				0.713	0.5135	-1.366	0.2098	0.0316	0.0252	0.8102	-0.4865	-0.0024	0.2098	0.0316	-0.0313	12.4	-0.313	-1.2102
Firestone EA Ltd	15.6	9	12.07	30	0.5	7.1285	0.9986	-1.0352	0.0014	0.0005	0.0422	0.0014	-0.0014	-0.0126	0.0014	0.0005	-0.0001	12.95	-3.1785	-3.9514
		20				0.3728	0.2175	-1.3379	0.0889	0.0324	0.0151	3.6015	-0.7825	0.9347	0.0889	0.0324	-0.079	12.95	-7.4228	3.4485
		13				3.5449	0.8944	-1.8605	0.0552	0.0201	0.052	0.1836	-0.1056	-0.3833	0.0552	0.0201	-0.0092	12.95	-3.5949	-0.1336
		14				2.7878	0.8161	-2.0802	0.0804	0.0293	0.0497	0.3679	-0.1839	-0.4894	0.0804	0.0293	-0.0162	12.95	-3.8378	0.6821
EABL	65.95	58	12.07	17	0.5	11.5261	0.9485	-6.996	0.0133	0.0492	0.2551	0.1794	-0.0515	-0.4054	0.0133	0.0492	-0.0179	65.5	-4.0261	-7.6794
		68				4.1754	0.6208	-7.4541	0.048	0.1775	0.1838	2.243	-0.3792	0.2728	0.048	0.1775	-0.1363	65.5	-6.6754	0.257
		67				4.7385	0.6667	-7.6174	0.0459	0.1696	0.1961	1.8647	-0.3333	-0.0041	0.0459	0.1696	-0.1192	65.5	-6.2385	-0.3647
Kenya National Mills	9.5	2	12.07	80	0.5	7.6186	0.9992	-0.2414	0.0005	0.0002	0.0094	0.0014	-0.0008	-0.0142	0.0005	0.0002	0	10.5	0.8814	-8.5014
		12				1.5218	0.4906	-2.5222	0.0742	0.0268	0.0157	3.319	-0.5094	-1.1587	0.0742	0.0268	-0.0408	10.5	-3.0218	-1.819
		21				0.3466	0.1556	-1.4204	0.0445	0.016	0.0057	10.6167	-0.8444	0.9659	0.0445	0.016	-0.0932	10.5	-10.8466	-0.1167
		7				3.5942	0.8237	-1.9027	0.0482	0.0174	0.0212	0.6842	-0.1763	-1.1072	0.0482	0.0174	-0.0118	10.5	-0.0942	-4.1842
		6				4.2435	0.8853	-1.5441	0.0361	0.013	0.0208	0.3921	-0.1147	-0.8624	0.0361	0.013	-0.0074	10.5	0.2565	-4.8921
Kenya Oil Co Ltd	67.75	54	12.07	23	0.5	17.0606	0.9676	-6.6518	0.0066	0.0347	0.2425	0.148	-0.0324	-0.5157	0.0066	0.0347	-0.0117	82	10.9394	-28.148
		64				8.9275	0.7889	-8.5589	0.0262	0.1385	0.2226	1.4294	-0.2111	-1.2865	0.0262	0.1385	-0.0787	82	9.0725	-19.4294
		74				3.5601	0.4641	-7.7431	0.0361	0.1903	0.1394	5.4763	-0.5359	0.6656	0.0361	0.1903	-0.2089	82	4.4399	-13.4763
		84				1.0859	0.1923	-4.4532	0.0248	0.131	0.0597	12.4164	-0.8077	5.0918	0.0248	0.131	-0.3357	82	-3.0859	-10.4164
		79				2.0289	0.3113	-6.1949	0.0321	0.1693	0.0953	8.6523	-0.6887	2.7819	0.0321	0.1693	-0.2766	82	0.9711	-11.6523
		80				1.7992	0.2845	-5.8469	0.0308	0.1625	0.0874	9.364	-0.7155	3.2436	0.0308	0.1625	-0.2892	82	0.2008	-11.364
		81				1.5915	0.2592	-5.4953	0.0294	0.1551	0.0798	10.0977	-0.7408	3.7088	0.0294	0.1551	-0.3014	82	-0.5915	-11.0977
KPLC	92.2	35	12.07	46	0.5	59.2535	0.9996	-4.0191	0.0001	0.001	0.1645	0.0038	-0.0004	-0.042	0.0001	0.001	-0.0002	51.5	-42.7535	-16.5038
		45				49.8917	0.9947	-5.5066	0.0005	0.01	0.2091	0.0562	-0.0053	-0.3932	0.0005	0.01	-0.0027	51.5	-43.3917	-6.5562
		55				40.7602	0.9736	-7.7498	0.002	0.0399	0.245	0.3392	-0.0264	-1.5	0.002	0.0399	-0.0139	51.5	-44.2602	3.1608
		50				45.2785	0.9871	-6.5166	0.0011	0.0217	0.2287	0.1502	-0.0129	-0.835	0.0011	0.0217	-0.0067	51.5	-43.7785	-1.6502
		51				44.3658	0.9849	-6.7454	0.0013	0.0248	0.2322	0.179	-0.0151	-0.9502	0.0013	0.0248	-0.0078	51.5	-43.8658	-0.679
		52				43.4572	0.9825	-6.9833	0.0014	0.0281	0.2357	0.2118	-0.0175	-1.0745	0.0014	0.0281	-0.0091	51.5	-43.9572	0.2882

Total Kenya Ltd	48.25	28	12.07	43	0.5	21.984	0.9838	-3.6686	0.0028	0.0138	0.1274	0.0942	-0.0162	-0.4869	0.0028	0.0138	-0.0044	51	<b>1.016</b>	-23.0942		
		38				13.5527	0.872	-6.5128	0.0143	0.0714	0.1426	1.0773	-0.128	-2.1948	0.0143	0.0714	-0.0363	51	-0.5527	-14.0773		
		48				7.3055	0.6434	-8.3357	0.0254	0.1272	0.1187	4.2444	-0.3566	-2.8814	0.0254	0.1272	-0.1072	51	-4.3055	-7.2444		
		58				3.5401	0.3994	-7.5648	0.0263	0.1318	0.0787	9.8933	-0.6006	-0.9742	0.0263	0.1318	-0.1944	51	-10.5401	-2.8933		
		68				1.5945	0.2183	-5.4035	0.0201	0.1006	0.0447	17.3621	-0.7817	2.3234	0.0201	0.1006	-0.2754	51	-18.5945	-0.3621		
		78				0.686	0.1095	-3.3046	0.0128	0.0639	0.023	25.8679	-0.8905	5.5586	0.0128	0.0639	-0.3442	51	-27.686	1.1321		
		33				17.5676	0.9452	-5.0117	0.0076	0.0378	0.1402	0.3849	-0.0548	-1.2619	0.0076	0.0378	-0.0151	51	0.4324	-18.3849		
		34				16.7263	0.9334	-5.3123	0.0088	0.0441	0.1416	0.4851	-0.0666	-1.4489	0.0088	0.0441	-0.0185	51	0.2737	-17.4851		
		35				15.9027	0.9202	-5.6165	0.0101	0.0506	0.1425	0.6029	-0.0798	-1.6395	0.0101	0.0506	-0.0223	51	<b>0.0973</b>	-16.6029		
		36				15.0984	0.9055	-5.9206	0.0115	0.0574	0.143	0.74	-0.0945	-1.8299	0.0115	0.0574	-0.0265	51	-0.0984	-15.74		
		70				1.3509	0.1913	-4.948	0.0186	0.093	0.0394	19.0014	-0.8087	3.0061	0.0186	0.093	-0.2901	51	-20.3509	-0.0014		
		71				1.2427	0.1788	-4.7248	0.0178	0.0892	0.0369	19.8346	-0.8212	3.343	0.0178	0.0892	-0.2973	51	-21.2427	<b>0.1654</b>		
		72				1.1427	0.167	-4.5057	0.0171	0.0854	0.0346	20.676	-0.833	3.6758	0.0171	0.0854	-0.3043	51	-22.1427	0.324		
		73				1.0504	0.1559	-4.2912	0.0163	0.0816	0.0324	21.5251	-0.8441	4.0039	0.0163	0.0816	-0.3113	51	-23.0504	0.4749		
		Unga Group Ltd	22.85	6	12.07	73	0.5	17.2073	0.9985	-0.7348	0.0004	0.0008	0.028	0.0059	-0.0015	-0.0531	0.0004	0.0008	-0.0002	15.4	-7.8073	-9.4059
				16				8.9013	0.8566	-3.9559	0.0192	0.0365	0.0534	1.1143	-0.1434	-2.1378	0.0192	0.0365	-0.0219	15.4	-9.5013	-0.5143
				26				4.0476	0.5497	-5.6964	0.0336	0.064	0.0426	5.6749	-0.4503	-2.742	0.0336	0.064	-0.0798	15.4	-14.6476	4.9251
17						8.2538	0.8284	-4.291	0.0216	0.0411	0.0534	1.4082	-0.1716	-2.3593	0.0216	0.0411	-0.0266	15.4	-9.8538	<b>0.1918</b>		

## SIMULATION OF OPTION VALUES USING BOPSCOL

## AGRICULTURAL SECTOR-JULY-DECEMBER 2000

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price	Value of	Value of				
																		at expiration	European call option	European put option				
Brooke Bond	74	12.07	28	0.5	28.8346	0.9952	-5.6128	0.001	0.0073	0.2241	0.0235	-0.0048	-0.1585	0.001	0.0073	-0.0019	97	20.1654	-49.0235					
					19.7357	0.9489	-7.6308	0.0072	0.0549	0.2524	0.339	-0.0511	-1.0402	0.0072	0.0549	-0.0206	97	19.2643	-39.339					
					11.8213	0.797	-9.8304	0.0193	0.1478	0.2358	1.8389	-0.203	-2.1035	0.0193	0.1478	-0.0843	97	17.1787	-30.8389					
					6.1015	0.5548	-10.009	0.027	0.2068	0.1748	5.5334	-0.4452	-1.1458	0.027	0.2068	-0.1924	97	12.8985	-24.5334					
					2.7361	0.3187	-7.7468	0.0244	0.1868	0.1042	11.5824	-0.6813	2.2528	0.0244	0.1868	-0.31	97	6.2639	-20.5824					
					1.0884	0.1551	-4.7457	0.0163	0.1247	0.0519	19.349	-0.8449	6.3901	0.0163	0.1247	-0.4094	97	-2.0884	-18.349					
					1.7491	0.2265	-6.2223	0.0205	0.1575	0.0751	15.3026	-0.7735	4.3454	0.0205	0.1575	-0.3627	97	2.2509	-19.3026					
					1.5941	0.2106	-5.9174	0.0197	0.151	0.0699	16.089	-0.7894	4.764	0.0197	0.151	-0.3725	97	1.4059	-19.089					
					1.4512	0.1955	-5.616	0.0188	0.1445	0.0651	16.8876	-0.8045	5.1789	0.0188	0.1445	-0.3821	97	<b>0.5488</b>	-18.8876					
					1.3199	0.1812	-5.3196	0.018	0.1379	0.0604	17.6976	-0.8188	5.589	0.018	0.1379	-0.3914	97	-0.3199	-18.6976					
					Eaagads Ltd	25	12.07	21	0.5	8.9967	0.999	-1.9414	0.0009	0.0006	0.0799	0.0011	-0.001	-0.0097	0.0009	0.0006	-0.0001	20.5	-5.4967	-3.5011
										1.292	0.485	-2.7875	0.1074	0.0705	0.0542	1.7107	-0.515	0.2806	0.1074	0.0705	-0.0729	20.5	-7.792	4.7893
4.453	0.9101	-2.811	0.0437	0.0287						0.0915	0.1645	-0.0899	-0.3112	0.0437	0.0287	-0.0121	20.5	-5.953	1.3355					
5.31	0.951	-2.6054	0.0273	0.0179						0.0923	0.0801	-0.049	-0.2192	0.0273	0.0179	-0.0065	20.5	-5.81	<b>0.4199</b>					
6.206	0.9763	-2.4042	0.015	0.0099						0.091	0.0347	-0.0237	-0.1316	0.015	0.0099	-0.0031	20.5	-5.706	-0.5347					
George Williamson	75	41	12.07	43						0.5	36.4839	0.9903	-5.1541	0.0011	0.0138	0.1889	0.0827	-0.0097	-0.4952	0.0011	0.0138	-0.0041	97	19.5161
27.5585	0.9473	-7.7025	0.0047	0.0571	0.2174	0.5717	-0.0527	-1.9073	0.0047	0.0571	-0.0226	97	18.4415	-46.5717										
19.644	0.8485	-10.6623	0.0103	0.1245	0.22	2.0715	-0.1515	-3.7308	0.0103	0.1245	-0.0672	97	16.356	-38.0715										
13.2507	0.7022	-12.6597	0.0152	0.1838	0.1971	5.0926	-0.2978	-4.5918	0.0152	0.1838	-0.1371	97	12.7493	-31.0926										
8.5239	0.5388	-12.9031	0.0174	0.2106	0.1594	9.7802	-0.4612	-3.699	0.0174	0.2106	-0.2219	97	7.4761	-25.7802										
5.2778	0.3876	-11.6065	0.0168	0.2031	0.119	15.9484	-0.6124	-1.266	0.0168	0.2031	-0.3094	97	<b>0.7222</b>	-21.9484										
3.1731	0.2649	-9.4826	0.0144	0.1737	0.0835	23.258	-0.7351	1.9942	0.0144	0.1737	-0.392	97	-7.1731	-19.258										
92	5.0219	0.374	-11.4186	0.0166	0.2009	0.1151	16.634	-0.626	-0.9646	0.0166	0.2009	-0.3179	97	-0.0219	-21.634									
Kakuzi Ltd	66.5	12.07	29	0.5	33.5505	0.9998	-3.9861	0.0001	0.0004	0.1647	0.0008	-0.0002	-0.009	0.0001	0.0004	-0.0001	55	-13.5505	-20.0008					
					24.1886	0.9893	-5.4063	0.0021	0.0133	0.208	0.0531	-0.0107	-0.2929	0.0021	0.0133	-0.0038	55	-14.1886	-10.0531					
					15.3663	0.907	-7.6939	0.0122	0.0782	0.2248	0.6453	-0.093	-1.4442	0.0122	0.0782	-0.0341	55	-15.3663	-0.6453					
					8.2886	0.6943	-9.3539	0.0257	0.1649	0.1894	2.9819	-0.3057	-1.9678	0.0257	0.1649	-0.1166	55	-18.2886	7.0181					
					14.5582	0.8916	-7.9369	0.0136	0.0875	0.2237	0.7785	-0.1084	-1.5736	0.0136	0.0875	-0.0399	55	-15.5582	<b>0.2215</b>					
Kapchorua Tea Co	150	151	12.07	0	0.5	7.8433	1	-17.1583	0	0	0.7108	0	0	0	0	0	0	150	-8.8433	1				
Limuru Tea Co	650	678	12.07	0	0.5	11.7071	1	-77.042	0	0	3.1915	0	0	0	0	0	0	650	-39.7071	28				
Rea Vipingo Ltd	3.85	12.07	22	0.5	1.9671	1	-0.2273	0	0	0.0094	0	0	0	0	0	0	0	3.1	-0.8671	-1.1				
					1.0301	0.9807	-0.3595	0.0783	0.0013	0.0137	0.0044	-0.0193	-0.0186	0.0783	0.0013	-0.0004	3.1	-0.9301	-0.1044					
					0.2806	0.5871	-0.4722	0.6502	0.0106	0.0099	0.1963	-0.4129	-0.0176	0.6502	0.0106	-0.0089	3.1	-1.1806	<b>0.7037</b>					
Sasini Tea & Coffee	35	12.07	30	0.5	13.3707	0.9911	-2.7518	0.0032	0.006	0.1066	0.0237	-0.0089	-0.1382	0.0032	0.006	-0.0017	34	-2.3707	-11.0237					
					5.1837	0.7479	-4.9037	0.043	0.079	0.105	1.251	-0.2521	-1.1538	0.043	0.079	-0.0504	34	-4.1837	-2.251					
					1.1647	0.281	-3.5502	0.0454	0.0835	0.0434	6.6464	-0.719	1.3359	0.0454	0.0835	-0.1591	34	-10.1647	2.3536					
					2.6177	0.5012	-4.7631	0.0537	0.0987	0.0746	3.3923	-0.4988	-0.4451	0.0537	0.0987	-0.1043	34	-6.6177	0.6077					
					3.0336	0.5512	-4.8998	0.0533	0.0979	0.0813	2.8667	-0.4488	-0.6955	0.0533	0.0979	-0.0929	34	-6.0336	<b>0.1333</b>					
					3.4971	0.6017	-4.985	0.052	0.0955	0.0878	2.3887	-0.3983	-0.8943	0.052	0.0955	-0.0816	34	-5.4971	-0.3887					



SIMULATION OF OPTION VALUES USING BOPSCOL  
COMMERCIAL AND SERVICES SECTOR-JULY-DECEMBER 2000

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price	Value of	Value of
																		at expiration	European call option	European put option
A Baumann & Co	13.8	9	12.07	22	0.5	5.3275	0.9993	-1.0264	0.0011	0.0002	0.0423	0.0004	-0.0007	-0.0038	0.0011	0.0002	0	9.5	-4.8275	-0.5004
						0.401	0.3138	-1.2356	0.1652	0.0346	0.0196	1.664	-0.8862	0.5825	0.1652	0.0346	-0.0557	9.5	-6.901	4.836
						4.3897	0.9944	-1.1608	0.0075	0.0016	0.0467	0.004	-0.0056	-0.0245	0.0075	0.0016	-0.0004	9.5	-4.8897	0.496
CMC Holdings Ltd	16.8	9	12.07	27	0.5	8.3272	0.9999	-1.0239	0.0001	0.0001	0.0424	0.0001	-0.0001	-0.0012	0.0001	0.0001	0	15.25	-2.0772	-6.2501
						0.8456	0.4079	-1.9703	0.121	0.0461	0.03	1.9329	-0.5921	0.1887	0.121	0.0461	-0.0594	15.25	-4.5956	1.8171
		1.2116	0.52	-2.1862	0.1242	0.0473	0.0376	1.3574	-0.48	-0.1408	0.1242	0.0473	-0.0471	15.25	-3.9616	1.3926				
		1.6851	0.6367	-2.2914	0.117	0.0446	0.0451	0.8895	-0.3633	-0.3596	0.117	0.0446	-0.035	15.25	-3.4351	0.8605				
		2.272	0.7477	-2.2661	0.0996	0.0379	0.0514	0.535	-0.2523	-0.448	0.0996	0.0379	-0.0239	15.25	-3.022	0.215				
		2.9678	0.8426	-2.1225	0.0751	0.0286	0.0559	0.2893	-0.1574	-0.418	0.0751	0.0286	-0.0147	15.25	-2.7178	-0.5393				
Car & General	10.05	2	12.07	94	0.5	8.1723	0.9978	-0.2696	0.001	0.0005	0.0093	0.0052	-0.0022	-0.0424	0.001	0.0005	-0.0001	10	-0.1723	-8.0052
						2.1968	0.5621	-3.0493	0.059	0.028	0.0173	3.444	-0.4379	-1.6857	0.059	0.028	-0.0392	10	-4.1968	-1.444
						0.6501	0.225	-2.1976	0.0449	0.0213	0.0081	11.3117	-0.775	0.3023	0.0449	0.0213	-0.0955	10	-12.6501	0.6883
		1.1675	0.3566	-2.7824	0.0558	0.0265	0.0121	7.1219	-0.6434	-0.8506	0.0558	0.0265	-0.0679	10	-8.1675	-0.1219				
		1.0347	0.325	-2.6737	0.0539	0.0256	0.0112	7.9305	-0.675	-0.6284	0.0539	0.0256	-0.0736	10	-9.0347	0.0695				
		1.1675	0.3566	-2.7824	0.0558	0.0265	0.0121	7.1219	-0.6434	-0.8506	0.0558	0.0265	-0.0679	10	-8.1675	-0.1219				
Express Kenya Ltd	19.05	15	12.07	13	0.5	4.9287	0.9995	-1.7063	0.001	0.0002	0.0706	0.0002	-0.0005	-0.0019	0.001	0.0002	0	17.9	-2.0287	-2.9002
						0.4086	0.3603	-1.4344	0.2137	0.0504	0.0323	1.1288	-0.6397	0.9518	0.2137	0.0504	-0.0666	17.9	-3.5086	1.9712
		0.8106	0.5687	-1.898	0.2244	0.0529	0.0501	0.5893	-0.4313	0.3746	0.2244	0.0529	-0.044	17.9	-2.9106	1.5107				
		1.4112	0.7676	-2.1295	0.1744	0.0411	0.0661	0.2485	-0.2324	0.0295	0.1744	0.0411	-0.0234	17.9	-2.5112	0.8515				
		2.1837	0.9065	-2.1133	0.0954	0.0225	0.0754	0.0795	-0.0935	-0.0679	0.0954	0.0225	-0.0093	17.9	-2.2837	0.0205				
		3.0636	0.9739	-1.9757	0.0346	0.0082	0.0774	0.018	-0.0261	-0.044	0.0346	0.0082	-0.0026	17.9	-2.1636	-0.918				
Kenya Airways	8	7	12.07	25	0.5	1.4984	0.882	-0.9504	0.1398	0.0112	0.0278	0.0884	-0.118	-0.1549	0.1398	0.0112	-0.0052	9	0.5016	-2.0884
						0.8127	0.6663	-1.0597	0.2572	0.0206	0.0226	0.3442	-0.3337	-0.1507	0.2572	0.0206	-0.0151	9	0.1873	-1.3442
		0.3739	0.4065	-0.896	0.2743	0.0219	0.0144	0.8468	-0.5935	0.1266	0.2743	0.0219	-0.028	9	-0.3739	-0.8468				
		0.1479	0.2026	-0.5767	0.1995	0.016	0.0074	1.5623	-0.7974	0.5596	0.1995	0.016	-0.0397	9	-1.1479	-0.5623				
		0.3739	0.4065	-0.896	0.2743	0.0219	0.0144	0.8468	-0.5935	0.1266	0.2743	0.0219	-0.028	9	-0.3739	-0.8468				
Marshalls EA Ltd	19.3	13	12.07	20	0.5	7.0617	0.9995	-1.4808	0.0006	0.0002	0.0611	0.0004	-0.0005	-0.0036	0.0006	0.0002	0	18.6	-1.4617	-5.6004
						0.3389	0.2288	-1.3185	0.1109	0.0413	0.0204	2.6919	-0.7712	1.295	0.1109	0.0413	-0.0879	18.6	-4.7389	1.7081
		0.5593	0.3342	-1.7044	0.1333	0.0497	0.0295	1.9709	-0.6658	0.7955	0.1333	0.0497	-0.0741	18.6	-3.9593	1.4291				
		0.882	0.4604	-2.0495	0.1454	0.0542	0.04	1.3522	-0.5396	0.3367	0.1454	0.0542	-0.0588	18.6	-3.282	1.0478				
		1.3267	0.597	-2.2871	0.1418	0.0528	0.051	0.8554	-0.403	-0.0145	0.1418	0.0528	-0.0432	18.6	-2.7267	0.5446				
		1.9021	0.7285	-2.3724	0.1215	0.0453	0.0608	0.4893	-0.2715	-0.2134	0.1215	0.0453	-0.0286	18.6	-2.3021	-0.0893				
Nation Media Group	75	52	12.07	17	0.5	26.0457	0.9998	-5.9127	0.0001	0.0003	0.2447	0.0003	-0.0002	-0.0039	0.0001	0.0003	-0.0001	69	-9.0457	-17.0003
						16.6845	0.9841	-7.2542	0.0044	0.0212	0.2856	0.0535	-0.0159	-0.2091	0.0044	0.0212	-0.0062	69	-9.6845	-7.0535
						8.1724	0.8164	-8.7992	0.0295	0.1409	0.2653	0.9558	-0.1836	-0.6178	0.0295	0.1409	-0.0736	69	-11.1724	2.0442
		12.2007	0.9333	-8.1425	0.0144	0.0686	0.289	0.2768	-0.0667	-0.5292	0.0144	0.0686	-0.0264	69	-10.2007	-2.2768				
		11.3476	0.9158	-8.3137	0.0171	0.082	0.2867	0.3652	-0.0842	-0.5868	0.0171	0.082	-0.0334	69	-10.3476	-1.3652				
		10.5153	0.8954	-8.4712	0.0201	0.0962	0.2832	0.4743	-0.1046	-0.6307	0.0201	0.0962	-0.0416	69	-10.5153	-0.4743				
		9.7068	0.872	-8.6089	0.0232	0.111	0.2785	0.6072	-0.128	-0.6547	0.0232	0.111	-0.051	69	-10.7068	0.3928				
		9.7068	0.872	-8.6089	0.0232	0.111	0.2785	0.6072	-0.128	-0.6547	0.0232	0.111	-0.051	69	-10.7068	0.3928				

Pearl Drycleaners	2.4	1	12.07	26	0.5	1.4586	1	-0.1136	0	0	0.0047	0	0	0	0	0	0	0	2.05	-0.4086	-1.05	
		2				0.5341	0.921	-0.2673	0.3337	0.0025	0.0084	0.017	-0.079	-0.04	0.3337	0.0025	-0.001			2.05	-0.4841	-0.067
		3				0.0492	0.2137	-0.1844	0.6599	0.0049	0.0023	0.4735	-0.7863	0.1564	0.6599	0.0049	-0.0118			2.05	-0.9992	0.4765
Standard Newspaper	6.1	11	12.07	110	0.5	5.1633	0.9974	-0.1496	0.0017	0.0003	0.0046	0.0047	-0.0026	-0.036	0.0017	0.0003	-0.0001			15.8	9.6367	-14.7974
						0.8752	0.3853	-1.9922	0.0806	0.0165	0.0074	5.131	-0.6147	-0.7422	0.0806	0.0165	-0.0444			15.8	3.9248	-4.1853
		21				0.2307	0.1307	-1.0761	0.0448	0.0092	0.0028	13.9009	-0.8693	1.3101	0.0448	0.0092	-0.096			15.8	-5.4307	6.0693
		16				0.4296	0.2197	-1.5136	0.0624	0.0128	0.0046	9.3926	-0.7803	0.3045	0.0624	0.0128	-0.0708			15.8	-0.6296	0.9803
		15				0.4914	0.245	-1.6127	0.0663	0.0136	0.005	8.5129	-0.755	0.0918	0.0663	0.0136	-0.0656			15.8	0.3086	-0.045
TPS Serena	15.95	3	12.07	97	0.5	13.1338	0.9979	-0.4076	0.0006	0.0007	0.0139	0.0082	-0.0021	-0.0667	0.0006	0.0007	-0.0002			7.15	-8.9838	-4.1582
		13				5.9039	0.767	-4.1098	0.028	0.0345	0.0317	2.1926	-0.233	-2.6326	0.028	0.0345	-0.0295			7.15	-11.7539	3.6574
		8				8.9209	0.9246	-2.2577	0.013	0.016	0.0291	0.5024	-0.0754	-1.3487	0.013	0.016	-0.0085			7.15	-9.7709	0.3476
		7				9.6749	0.9486	-1.8115	0.0096	0.0119	0.0273	0.3149	-0.0514	-1.0161	0.0096	0.0119	-0.0057			7.15	-9.5249	-0.4649
Uchumi Supermark	42.75	39	12.07	17	0.5	6.2668	0.9076	-4.7778	0.0322	0.0501	0.1627	0.2328	-0.0924	-0.3461	0.0322	0.0501	-0.0209			49	3.7332	-10.2328
		49				0.8521	0.2833	-3.0989	0.0659	0.1023	0.0563	4.2324	-0.7167	2.469	0.0659	0.1023	-0.1744			49	-0.8521	-4.2324
		48				1.1081	0.344	-3.5329	0.0716	0.1113	0.068	3.547	-0.656	1.9214	0.0716	0.1113	-0.1579			49	-0.1081	-4.547
		47				1.4209	0.4105	-3.9449	0.0757	0.1175	0.0806	2.9183	-0.5895	1.3958	0.0757	0.1175	-0.1406			49	0.5791	-4.9183

SIMULATION OF OPTION PRICES USING BOPSCOL  
FINANCE AND INVESTMENT SECTOR-JULY-DECEMBER 2000

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price	Value of	Value of					
																		at expiration	European	European					
																		31.12.00	call option	put option					
Barclays Bank	86	48	12.1	36	0.5	40.8401	0.996	-5.6669	0.0005	0.0071	0.2241	0.029	-0.004	-0.2126	0.0005	0.0071	-0.0018	75.5	-13.3401	-27.529					
						31.6541	0.972	-7.674	0.0029	0.039	0.2597	0.2573	-0.028	-1.0834	0.0029	0.039	-0.0133	75.5	-14.1541	-17.7573					
						23.1267	0.9009	-10.3762	0.008	0.106	0.2718	1.1443	-0.0991	-2.6493	0.008	0.106	-0.0483	75.5	-15.6267	-8.6443					
						15.8526	0.7727	-12.7106	0.0138	0.1834	0.253	3.2846	-0.2273	-3.8474	0.0138	0.1834	-0.1141	75.5	-18.3526	-0.7846					
						10.2187	0.608	-13.4893	0.0176	0.2337	0.2103	7.065	-0.392	-3.4897	0.0176	0.2337	-0.2039	75.5	-22.7187	5.435					
							15.2123	0.7574	-12.8716	0.0143	0.1902	0.2496	3.5856	-0.2426	-3.8947	0.0143	0.1902	-0.1223	75.5	-18.7123	-0.0856				
							14.5888	0.7417	-13.0153	0.0148	0.1966	0.246	3.9036	-0.2583	-3.9248	0.0148	0.1966	-0.1306	75.5	-19.0888	<b>0.5964</b>				
City Trust Ltd	20	17	12.1	19	0.5	4.0441	0.9578	-2.0658	0.0335	0.0127	0.0756	0.0485	-0.0422	-0.134	0.0335	0.0127	-0.0045	23.25	2.2059	-6.2985					
						0.0225	0.0234	-0.2023	0.0206	0.0078	0.0022	6.3827	-0.9766	2.9793	0.0206	0.0078	-0.1296	23.25	-4.7725	-1.6327					
						0.7711	0.4235	-1.9813	0.1457	0.0554	0.0385	1.4826	-0.5765	0.5185	0.1457	0.0554	-0.0651	23.25	<b>0.4789</b>	-2.7326					
						0.4779	0.3002	-1.6014	0.1294	0.0492	0.0276	2.1309	-0.6998	1.0121	0.1294	0.0492	-0.0806	23.25	-0.2279	-2.3809					
CFC Bank	9.8	5	12.1	40	0.5	5.0957	0.9969	-0.5904	0.0034	0.0007	0.0234	0.0029	-0.0031	-0.0223	0.0034	0.0007	-0.0002	10.05	-0.0457	-5.0529					
						0.2428	0.1824	-0.9199	0.0955	0.0183	0.0077	3.6229	-0.8176	0.671	0.0955	0.0183	-0.0582	10.05	-4.1928	0.3271					
						0.3796	0.2597	-1.16	0.117	0.0225	0.0108	2.8183	-0.7403	0.3172	0.117	0.0225	-0.0504	10.05	-3.3296	<b>0.1317</b>					
						0.5832	0.359	-1.3902	0.1348	0.0259	0.0147	2.0805	-0.641	-0.0266	0.1348	0.0259	-0.0418	10.05	-2.5332	-0.1305					
Diamond Trust Bank	20	10	12.1	29	0.5	10.5857	0.9999	-1.1374	0.0001	0	0.0471	0.0001	-0.0001	-0.0011	0.0001	0	0	14	-6.5857	-4.0001					
						0.7394	0.3113	-2.1116	0.0862	0.05	0.0274	3.3338	-0.6887	0.6156	0.0862	0.05	-0.0855	14	-10.7394	6.6662					
						5.9417	0.964	-1.934	0.0193	0.0112	0.0667	0.0632	-0.036	-0.2295	0.0193	0.0112	-0.0039	14	-6.9417	<b>0.9368</b>					
						6.8456	0.9837	-1.7154	0.0099	0.0058	0.0641	0.0257	-0.0163	-0.1245	0.0099	0.0058	-0.0018	14	-6.8456	-0.0257					
Housing Finance Co of Kenya	7.05	1	12.1	111	0.5	6.1117	0.9984	-0.1398	0.0009	0.0003	0.0046	0.0031	-0.0016	-0.0261	0.0009	0.0003	-0.0001	5.5	-1.6117	-4.5031					
						0.6832	0.2827	-2.0294	0.0611	0.0169	0.0065	8.6961	-0.7173	-0.2113	0.0611	0.0169	-0.0688	5.5	-11.1832	1.8039					
						2.7115	0.7501	-2.069	0.0574	0.0158	0.0129	1.3101	-0.2499	-1.3873	0.0574	0.0158	-0.0154	5.5	-3.2115	-0.8101					
						2.3192	0.6838	-2.2708	0.0643	0.0177	0.0125	1.8593	-0.3162	-1.4754	0.0643	0.0177	-0.0204	5.5	-3.8192	-0.3593					
						1.9924	0.6211	-2.3931	0.0688	0.019	0.0119	2.4739	-0.3789	-1.484	0.0688	0.019	-0.0257	5.5	-4.4924	<b>0.0261</b>					
ICDC Investments Co Ltd	49.5	33	12.1	27	0.5	18.4506	0.9944	-3.8657	0.0017	0.0056	0.1539	0.018	-0.0056	-0.1158	0.0017	0.0056	-0.0015	46.5	-4.9506	-13.518					
						9.6589	0.8747	-6.0089	0.0218	0.0722	0.1682	0.6406	-0.1253	-1.1227	0.0218	0.0722	-0.0342	46.5	-6.1589	-4.1406					
						3.5848	0.5214	-6.4474	0.0422	0.1394	0.1111	3.9808	-0.4786	-0.4249	0.0422	0.1394	-0.1384	46.5	-10.0848	2.5192					
						6.157	0.7166	-6.7381	0.0358	0.1185	0.1466	1.8459	-0.2834	-1.2838	0.0358	0.1185	-0.0794	46.5	-7.657	-0.3459					
						5.5655	0.6789	-6.7689	0.0379	0.1253	0.1402	2.1958	-0.3211	-1.201	0.0379	0.1253	-0.0904	46.5	-8.0655	<b>0.3042</b>					
Jubilee Insurance Co Ltd	22	20	12.1	24	0.5	3.5066	0.8418	-2.7137	0.0647	0.0376	0.0751	0.3353	-0.1582	-0.4411	0.0647	0.0376	-0.0191	18.5	-5.0066	1.1647					
						0.1318	0.0827	-0.7728	0.0408	0.0237	0.0084	6.3748	-0.9173	2.6361	0.0408	0.0237	-0.1328	18.5	-11.6318	5.1252					
KCB Ltd	28	15	12.1	34	0.5	13.8816	0.9985	-1.7319	0.0007	0.001	0.0704	0.0031	-0.0015	-0.0274	0.0007	0.001	-0.0002	25.5	-3.3816	-10.5031					
						5.3095	0.8003	-3.9468	0.0416	0.0554	0.0855	0.8453	-0.1997	-1.106	0.0416	0.0554	-0.0322	25.5	-4.8095	-1.3453					
						1.08	0.2888	-3.1454	0.0508	0.0676	0.035	6.0302	-0.7112	0.8317	0.0508	0.0676	-0.1297	25.5	-10.58	3.4698					
						4.6521	0.7516	-4.1105	0.047	0.0627	0.082	1.1294	-0.2484	-1.1561	0.047	0.0627	-0.0404	25.5	-5.1521	-0.6294					

					27	4.0491	0.6993	-4.2176	0.0517	0.0689	0.0777	1.4678	-0.3007	-1.1496	0.0517	0.0689	-0.0494	25.5	-5.5491	0.0322
National Bank Ltd	3.6	1	12.1	51	0.5	2.6586	1	-0.1139	0.0002	0	0.0047	0	0	-0.0002	0.0002	0	0	3.15	-0.5086	-2.15
		2				1.7305	0.976	-0.2885	0.0435	0.0014	0.0089	0.0133	-0.024	-0.0613	0.0435	0.0014	-0.0005	3.15	-0.5805	-1.1633
		3				0.9461	0.8032	-0.5947	0.2135	0.0071	0.0097	0.1704	-0.1968	-0.2538	0.2135	0.0071	-0.0044	3.15	-0.7961	-0.3204
		4				0.4482	0.5221	-0.6899	0.3068	0.0101	0.0072	0.6139	-0.4779	-0.2354	0.3068	0.0101	-0.0117	3.15	-1.2982	0.2361
NIC Bank Ltd	21	10	12.1	39	0.5	11.5877	0.9988	-1.1554	0.0007	0.0006	0.0469	0.002	-0.0012	-0.0191	0.0007	0.0006	-0.0001	17.75	-3.8377	-7.752
		20				3.4372	0.7032	-3.3713	0.0597	0.0514	0.0567	1.2659	-0.2968	-1.0987	0.0597	0.0514	-0.0375	17.75	-5.6872	0.9841
		19				4.0366	0.7641	-3.2329	0.0532	0.0457	0.0601	0.9239	-0.2359	-1.0739	0.0532	0.0457	-0.0294	17.75	-5.2866	0.3261
		18				4.7007	0.8201	-3.0304	0.0453	0.039	0.0626	0.6466	-0.1799	-0.9851	0.0453	0.039	-0.0221	17.75	-4.9507	-0.3966
Pan Africa Ins Co	20	8	12.1	39	0.5	12.4687	0.9999	-0.9113	0.0001	0.0001	0.0376	0.0002	-0.0001	-0.0022	0.0001	0.0001	0	11	-9.4687	-3.0002
		18				3.9049	0.77	-3.0622	0.0551	0.0429	0.0575	0.8507	-0.23	-1.0169	0.0551	0.0429	-0.0273	11	-10.9049	6.1493
		13				7.8255	0.9725	-1.7522	0.0115	0.009	0.0581	0.0641	-0.0275	-0.275	0.0115	0.009	-0.0031	11	-9.8255	1.9359
		12				8.7316	0.9864	-1.5191	0.0063	0.0049	0.055	0.0288	-0.0136	-0.1555	0.0063	0.0049	-0.0015	11	-9.7316	0.9712
		11				9.6554	0.9942	-1.3255	0.003	0.0023	0.0511	0.0111	-0.0058	-0.0756	0.003	0.0023	-0.0006	11	-9.6554	-0.0111
Standard Chartered Bank Ltd	48	22	12.1	51	0.5	27.326	0.994	-2.7556	0.001	0.0058	0.1019	0.0375	-0.006	-0.2558	0.001	0.0058	-0.0016	49.5	0.174	-27.6019
		32				18.5025	0.9295	-5.489	0.0078	0.0458	0.1306	0.6284	-0.0705	-1.8528	0.0078	0.0458	-0.0201	49.5	-1.0025	-18.1284
		42				11.3641	0.7636	-8.3892	0.0178	0.1046	0.1264	2.9044	-0.2364	-3.6167	0.0178	0.1046	-0.0713	49.5	-3.8641	-10.4044
		52				6.4697	0.55	-9.257	0.0229	0.1343	0.0997	7.4243	-0.45	-3.3482	0.0229	0.1343	-0.1451	49.5	-8.9697	-4.9243
		62				3.5024	0.3587	-8.1228	0.0216	0.1268	0.0686	13.8713	-0.6413	-1.0777	0.0216	0.1268	-0.2233	49.5	-16.0024	-1.3713
		72				1.84	0.2187	-6.1524	0.017	0.1001	0.0433	21.6234	-0.7813	2.029	0.017	0.1001	-0.2956	49.5	-24.34	0.8766
		27				22.7762	0.974	-3.9394	0.0035	0.0205	0.1199	0.1949	-0.026	-0.8713	0.0035	0.0205	-0.0072	49.5	-0.2762	-22.6949
		26				23.6695	0.9797	-3.6676	0.0028	0.0166	0.1168	0.1468	-0.0203	-0.7132	0.0028	0.0166	-0.0056	49.5	-0.1695	-23.6468
		25				24.5724	0.9845	-3.4128	0.0023	0.0132	0.1134	0.1083	-0.0155	-0.5721	0.0023	0.0132	-0.0043	49.5	-0.0724	-24.6083
		24				25.4836	0.9884	-3.1759	0.0018	0.0103	0.1098	0.0781	-0.0116	-0.4487	0.0018	0.0103	-0.0032	49.5	0.0164	-25.5781
		67				2.5455	0.2819	-7.1726	0.0195	0.1146	0.0549	17.6216	-0.7181	0.4407	0.0195	0.1146	-0.2604	49.5	-20.0455	-0.1216
		68				2.3864	0.2682	-6.9705	0.019	0.1119	0.0524	18.404	-0.7318	0.7564	0.019	0.1119	-0.2676	49.5	-20.8864	0.096

**SIMULATION OF OPTION PRICES USING BOPSCOL  
INDUSTRIAL AND ALLIED SECTOR-JULY-DECEMBER 2000**

Company	Stock price	Exercise price	Rf	V	t	Call price	Call delta	Call theta	Call gamma	Call vega	Call rho	Put price	Put delta	Put theta	Put gamma	Put vega	Put rho	Stock price at expiration 31.12.00	Value of European call option	Value of European put option
Athi River Mining Ltd	4.55	2	12.07	42	0.5	2.6675	0.9991	-0.2309	0.0023	0.0001	0.0094	0.0004	-0.0009	-0.0036	0.0023	0.0001	0	4	-0.6675	-2.0004
		3				1.7499	0.9603	-0.4319	0.0634	0.0028	0.0131	0.0242	-0.0397	-0.091	0.0634	0.0028	-0.001	4	-0.7499	-1.0242
		4				0.9782	0.7839	-0.7084	0.2169	0.0094	0.0129	0.194	-0.2161	-0.2539	0.2169	0.0094	-0.0059	4	-0.9782	-0.194
		5				0.4713	0.5136	-0.7639	0.2951	0.0128	0.0093	0.6285	-0.4864	-0.1958	0.2951	0.0128	-0.0142	4	-1.4713	<b>0.3715</b>
Bamburi Cement Ltd	29.25	17	12.07	14	0.5	13.2456	1	-1.9317	0	0	0.08	0	0	0	0	0	0	33.75	3.5044	-16.75
		27				3.9263	0.9289	-3.199	0.0469	0.0281	0.1162	0.095	-0.0711	-0.131	0.0469	0.0281	-0.0109	33.75	2.8237	-6.845
		37				0.0492	0.0432	-0.4118	0.0317	0.019	0.0061	5.6323	-0.9568	3.7925	0.0317	0.019	-0.1681	33.75	-3.2992	-2.3823
		32				0.7857	0.4019	-2.4439	0.1336	0.08	0.0548	1.6616	-0.5981	1.1923	0.1336	0.08	-0.0958	33.75	0.9643	-3.4116
		33				0.4958	0.2879	-1.9446	0.1178	0.0706	0.0396	2.3131	-0.7121	1.8052	0.1178	0.0706	-0.1157	33.75	<b>0.2542</b>	-0.0631
		34				0.2982	0.1946	-1.4486	0.0951	0.057	0.027	3.057	-0.8054	2.4149	0.0951	0.057	-0.1331	33.75	-0.5482	-2.807
BAT Ltd	57	25	12.07	52	0.5	33.4996	0.9952	-3.096	0.0007	0.0056	0.1161	0.0355	-0.0048	-0.2552	0.0007	0.0056	-0.0015	60.5	<b>2.0004</b>	-35.5355
		35				24.5212	0.953	-5.6549	0.0047	0.0396	0.149	0.4714	-0.047	-1.6778	0.0047	0.0396	-0.0158	60.5	0.9788	-25.9714
		45				16.7593	0.8391	-8.8679	0.0117	0.0984	0.1554	2.1239	-0.1609	-3.7545	0.0117	0.0984	-0.0565	60.5	-1.2593	-17.6239
		55				10.8101	0.6719	-10.8904	0.0172	0.1456	0.1374	5.5891	-0.3281	-4.6407	0.0172	0.1456	-0.1215	60.5	-5.3101	-11.0891
		65				6.6819	0.4963	-10.9691	0.019	0.1608	0.108	10.8752	-0.5037	-3.5831	0.019	0.1608	-0.1979	60.5	-11.1819	-6.3752
		75				4.0131	0.3452	-9.6138	0.0176	0.1485	0.0783	17.6207	-0.6548	-1.0914	0.0176	0.1485	-0.2747	60.5	-18.5131	-3.1207
		85				2.3674	0.23	-7.6611	0.0145	0.1224	0.0537	25.3893	-0.77	1.9976	0.0145	0.1224	-0.3464	60.5	-26.8674	-0.8893
		95				1.3826	0.1489	-5.7195	0.0111	0.0935	0.0355	33.8189	-0.8511	5.0755	0.0111	0.0935	-0.4117	60.5	-35.8826	0.6811
		40				20.4374	0.9051	-7.2998	0.0081	0.0681	0.1558	1.0948	-0.0949	-2.7545	0.0081	0.0681	-0.0325	60.5	<b>0.0626</b>	-21.5948
		41				19.6669	0.8933	-7.6284	0.0088	0.0742	0.1562	1.2657	-0.1067	-2.9695	0.0088	0.0742	-0.0368	60.5	-0.1669	-20.7657
90				1.8107	0.1856	-6.664	0.0128	0.1078	0.0438	29.5399	-0.8144	3.5628	0.0128	0.1078	-0.3798	60.5	-31.3107	-0.0399		
91				1.7158	0.1777	-6.4698	0.0124	0.1049	0.0421	30.3864	-0.8223	3.8706	0.0124	0.1049	-0.3863	60.5	-32.2158	<b>0.1136</b>		
BOC Gases Ltd	47.25	28	12.07	30	0.5	20.8965	0.9979	-3.2362	0.0007	0.0022	0.1313	0.0067	-0.0021	-0.0545	0.0007	0.0022	-0.0005	47.25	-1.6465	-19.2567
		38				11.8614	0.9218	-5.2897	0.0146	0.0488	0.1585	0.3859	-0.0782	-0.9717	0.0146	0.0488	-0.0204	47.25	-2.6114	-9.6359
		48				5.0204	0.6241	-6.757	0.0379	0.1268	0.1223	2.9592	-0.3759	-1.3027	0.0379	0.1268	-0.1036	47.25	-5.7704	-2.2092
		58				1.5824	0.2824	-4.8074	0.0337	0.1129	0.0588	8.9357	-0.7176	1.7833	0.0337	0.1129	-0.2142	47.25	-12.3324	1.8143
		53				2.914	0.4401	-6.1115	0.0394	0.1318	0.0894	5.5601	-0.5599	-0.089	0.0394	0.1318	-0.1601	47.25	-8.664	<b>0.1899</b>
		52				3.2672	0.4757	-6.3097	0.0397	0.133	0.096	4.9719	-0.5243	-0.4009	0.0397	0.133	-0.1487	47.25	-8.0172	-0.2219
Carbacid Investment	56	23	12.07	40	0.5	34.348	0.9998	-2.6256	0.0001	0.0003	0.1082	0.001	-0.0002	-0.0121	0.0001	0.0003	-0.0001	40	-17.348	-17.001
		33				25.012	0.9869	-4.1842	0.0021	0.0133	0.1513	0.0793	-0.0131	-0.4344	0.0021	0.0133	-0.0041	40	-18.012	-7.0793
		43				16.3537	0.9013	-6.8721	0.011	0.0689	0.1706	0.8354	-0.0987	-1.986	0.011	0.0689	-0.0318	40	-19.3537	2.1646
		42				17.1562	0.915	-6.5793	0.0098	0.0616	0.1704	0.6965	-0.085	-1.8068	0.0098	0.0616	-0.0273	40	-19.1562	1.3035
		41				17.9762	0.9275	-6.2849	0.0087	0.0546	0.1698	0.575	-0.0725	-1.6261	0.0087	0.0546	-0.0232	40	-18.9762	<b>0.425</b>
		40				18.8124	0.9388	-5.992	0.0076	0.0479	0.1688	0.4698	-0.0612	-1.4467	0.0076	0.0479	-0.0195	40	-18.8124	-0.4698
Crown Berger Ltd	12.5	8	12.07	34	0.5	4.9832	0.987	-0.988	0.0111	0.003	0.0368	0.0147	-0.013	-0.079	0.0111	0.003	-0.0009	9	-3.9832	-1.0147
		19				0.1071	0.0853	-0.5846	0.0519	0.0138	0.0048	5.4943	-0.9147	1.5744	0.0519	0.0138	-0.0846	9	-10.1071	4.5057
		9				4.082	0.9589	-1.2189	0.0293	0.0078	0.0395	0.0549	-0.0411	-0.1962	0.0293	0.0078	-0.0028	9	-4.082	-0.0549
		10				3.2376	0.9031	-1.4872	0.0571	0.0152	0.0403	0.1519	-0.0969	-0.3509	0.0571	0.0152	-0.0068	9	-4.2376	<b>0.8481</b>
Dunlop Kenya Ltd	7.5	5	12.07	22	0.5	2.7932	0.9989	-0.5713	0.0031	0.0002	0.0235	0.0004	-0.0011	-0.0031	0.0031	0.0002	0	6.4	-1.3932	-1.4004

Simulation of option values:Industrial and Allied sector;July-December 2000

						6	1.865	0.9713	-0.7307	0.0562	0.0035	0.0271	0.0136	-0.0287	-0.0489	0.0562	0.0035	-0.0011	6.4	-1.465	-0.4136
						7	1.0341	0.8184	-0.9239	0.2262	0.014	0.0265	0.1241	-0.1816	-0.1285	0.2262	0.014	-0.0074	6.4	-1.6341	<b>0.4759</b>
E A Cables Ltd	8	3	12.07	62	0.5	5.1817	0.9953	-0.384	0.0039	0.0008	0.0139	0.006	-0.0047	-0.0431	0.0039	0.0008	-0.0002	9.25	1.0683	-6.256	
		18				0.089	0.0677	-0.5138	0.0373	0.0074	0.0023	9.0348	-0.9323	1.5316	0.0373	0.0074	-0.0825	9.25	-8.839	-0.2848	
		8				1.5942	0.6394	-1.7379	0.1067	0.0212	0.0176	1.1257	-0.3606	-0.8288	0.1067	0.0212	-0.0201	9.25	-0.3442	-2.3757	
		7				2.0901	0.7458	-1.5922	0.0914	0.0181	0.0194	0.6802	-0.2542	-0.7968	0.0914	0.0181	-0.0136	9.25	<b>0.1599</b>	-2.9302	
E A Packaging Ltd	13.2	3	12.07	86	0.5	10.3821	0.9977	-0.3933	0.0009	0.0007	0.0139	0.0064	-0.0023	-0.0524	0.0009	0.0007	-0.0002	7.5	-5.8821	-4.5064	
		13				3.5422	0.6658	-3.5548	0.0453	0.034	0.0262	2.5809	-0.3342	-2.0776	0.0453	0.034	-0.035	7.5	-9.0422	2.9191	
		8				6.2361	0.89	-2.1743	0.0234	0.0175	0.0276	0.5676	-0.11	-1.2652	0.0234	0.0175	-0.0101	7.5	-6.7361	-0.0676	
		9				5.5788	0.8492	-2.5577	0.0291	0.0218	0.0282	0.8517	-0.1508	-1.535	0.0291	0.0218	-0.0142	7.5	-7.0788	<b>0.6483</b>	
EA Portland Cement	12.4	9	12.07	24	0.5	3.9346	0.9901	-1.0627	0.0126	0.0023	0.0417	0.0075	-0.0099	-0.04	0.0126	0.0023	-0.0007	11.7	-1.2346	-2.7075	
		17				0.0693	0.078	-0.4152	0.0693	0.0128	0.0045	3.6737	-0.922	1.5165	0.0693	0.0128	-0.0755	11.7	-5.3693	1.6263	
		14				0.53	0.3918	-1.3309	0.1826	0.0337	0.0216	1.3101	-0.6082	0.26	0.1826	0.0337	-0.0443	11.7	-2.83	0.9899	
		13				0.9162	0.5644	-1.5626	0.1871	0.0345	0.0304	0.7549	-0.4356	-0.0854	0.1871	0.0345	-0.0308	11.7	-2.2162	<b>0.5451</b>	
		12				1.47	0.7369	-1.6122	0.1551	0.0286	0.0383	0.3672	-0.2631	-0.2486	0.1551	0.0286	-0.0182	11.7	-1.77	-0.0672	
Firestone EA Ltd	12.95	7	12.07	30	0.5	6.3603	0.9995	-0.7995	0.0006	0.0002	0.0329	0.0004	-0.0005	-0.0041	0.0006	0.0002	0	11.5	-1.8603	-4.5004	
		17				0.2544	0.1861	-0.9963	0.0975	0.0245	0.0108	3.3088	-0.8139	0.9354	0.0975	0.0245	-0.0692	11.5	-5.7544	2.1912	
		12				2.0544	0.7733	-1.7882	0.1096	0.0276	0.0398	0.4016	-0.2267	-0.4246	0.1096	0.0276	-0.0167	11.5	-2.5544	<b>0.0984</b>	
		11				2.7781	0.877	-1.5947	0.0741	0.0186	0.0429	0.1839	-0.123	-0.3448	0.0741	0.0186	-0.0089	11.5	-2.2781	-0.6839	
EABL	65.5	58	12.07	17	0.5	11.1007	0.9422	-7.0197	0.0147	0.0536	0.2531	0.2039	-0.0578	-0.4291	0.0147	0.0536	-0.0199	74.5	5.3993	-16.7039	
		68				3.901	0.5989	-7.3082	0.0491	0.1791	0.1766	2.4185	-0.4011	0.4188	0.0491	0.1791	-0.1434	74.5	2.599	-8.9185	
		78				0.7611	0.1865	-3.495	0.0341	0.1243	0.0573	8.693	-0.8135	5.3682	0.0341	0.1243	-0.3099	74.5	-4.2611	-5.193	
		73				1.8575	0.367	-5.6426	0.0478	0.1744	0.1109	5.0822	-0.633	2.6525	0.0478	0.1744	-0.2327	74.5	-0.3575	-6.5822	
		72				2.181	0.411	-6.0488	0.0494	0.1802	0.1237	4.4643	-0.589	2.1327	0.0494	0.1802	-0.2152	74.5	<b>0.319</b>	-6.9643	
Kenya National Mills	10.5	3	12.07	80	0.5	7.686	0.9954	-0.4136	0.0023	0.001	0.0138	0.0103	-0.0046	-0.0727	0.0023	0.001	-0.0003	7	-3.686	-4.0103	
		13				1.7523	0.5048	-2.7977	0.0672	0.0296	0.0177	3.491	-0.4952	-1.3204	0.0672	0.0296	-0.0435	7	-7.7523	2.509	
		8				3.8163	0.8079	-2.1859	0.046	0.0203	0.0233	0.8477	-0.1921	-1.2769	0.046	0.0203	-0.0143	7	-4.8163	<b>0.1523</b>	
		7				4.4398	0.8657	-1.8463	0.0364	0.0161	0.0233	0.5299	-0.1343	-1.0509	0.0364	0.0161	-0.0097	7	-4.4398	-0.5299	
Kenya Oil Co Ltd	82	64	12.07	23	0.5	21.8759	0.9759	-7.7736	0.0042	0.0328	0.2908	0.1277	-0.0241	-0.5012	0.0042	0.0328	-0.0105	73	-12.8759	-9.1277	
		74				13.3514	0.8607	-9.8652	0.0166	0.1286	0.2861	1.0176	-0.1393	-1.4565	0.0166	0.1286	-0.0622	73	-14.3514	-0.0176	
		84				6.8084	0.6195	-10.3896	0.0286	0.2209	0.22	3.8889	-0.3805	-0.8446	0.0286	0.2209	-0.1754	73	-17.8084	7.1111	
		75				12.5884	0.8416	-10.0338	0.0181	0.1402	0.2821	1.1961	-0.1584	-1.5114	0.0181	0.1402	-0.0709	73	-14.5884	<b>0.8039</b>	
KPLC	51.5	20	12.07	46	0.5	32.674	0.9994	-2.3021	0.0001	0.0007	0.094	0.0027	-0.0006	-0.0295	0.0001	0.0007	-0.0002	40	-12.674	-20.0027	
		30				23.4126	0.9778	-4.1392	0.0032	0.0193	0.1347	0.1557	-0.0222	-0.7303	0.0032	0.0193	-0.0065	40	-13.4126	-10.1557	
		40				15.1133	0.8697	-7.131	0.0126	0.0772	0.1484	1.2707	-0.1303	-2.5857	0.0126	0.0772	-0.0399	40	-15.1133	-1.2707	
		50				8.8209	0.6697	-9.1669	0.0216	0.1319	0.1283	4.3927	-0.3303	-3.4853	0.0216	0.1319	-0.107	40	-18.8209	5.6073	
		41				14.382	0.8529	-7.4203	0.0137	0.0838	0.1477	1.4808	-0.1471	-2.7614	0.0137	0.0838	-0.0453	40	-15.382	-0.4808	
		42				13.6723	0.8352	-7.696	0.0148	0.0903	0.1467	1.7126	-0.1648	-2.9235	0.0148	0.0903	-0.051	40	-15.6723	<b>0.2874</b>	

Simulation of option values: Industrial and Allied sector, July-December 2000

Total Kenya Ltd	51	29	12.07	43	0.5	23.7806	0.9863	-3.7428	0.0023	0.0126	0.1326	0.0822	-0.0137	-0.4475	0.0023	0.0126	-0.0039	55	<b>2.2194</b>	-26.0822					
		39				15.2147	0.8912	-6.5428	0.012	0.0673	0.1512	0.9307	-0.1088	-2.1112	0.012	0.0673	-0.0324	55	0.7853	-16.9307					
		49				8.6172	0.6851	-8.685	0.0229	0.1281	0.1316	3.7475	-0.3149	-3.1171	0.0229	0.1281	-0.099	55	-2.6172	-9.7475					
		44				11.6149	0.7984	-7.8746	0.0181	0.1014	0.1455	2.0381	-0.2016	-2.8749	0.0181	0.1014	-0.0616	55	-0.6149	-13.0381					
		43				12.2885	0.819	-7.6412	0.017	0.0949	0.1474	1.7702	-0.181	-2.7551	0.017	0.0949	-0.055	55	-0.2885	-13.7702					
		42				12.986	0.8387	-7.3885	0.0158	0.0882	0.1489	1.5263	-0.1613	-2.816	0.0158	0.0882	-0.0488	55	<b>0.014</b>	-14.5263					
		Unga Group Ltd				15.4	4	12.07	73	0.5	11.6379	0.9986	-0.4881	0.0006	0.0005	0.0187	0.0037	-0.0014	-0.0336	0.0006	0.0005	-0.0001	13.9	-1.7379	-9.9037
		14					4.1485				0.7121	-3.5346	0.0429	0.0371	0.0341	1.9286	-0.2879	-1.9438	0.0429	0.0371	-0.0318	13.9	-4.2485	-1.8286	
		24					1.2549				0.314	-3.2523	0.0446	0.0386	0.0179	8.4493	-0.686	-0.5251	0.0446	0.0386	-0.0951	13.9	-11.3549	1.6507	
		19					2.2843				0.4873	-3.7997	0.0502	0.0434	0.0261	4.7715	-0.5127	-1.6407	0.0502	0.0434	-0.0633	13.9	-7.3843	<b>0.3285</b>	
18	2.5761	0.529	-3.8353	0.0501	0.0433		0.0279				4.1219	-0.471	-1.7899	0.0501	0.0433	-0.0569	13.9	-6.6761	-0.0219						

## **APPENDIX 7 – SUMMARY OF FINDINGS**



SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option
Agricultural	Brooke Bond Kenya Limited	107 to 159	Nil	125 to 159
	Eaagads Limited	17 to 70	Nil	30 to 70
	George Williamson Kenya Ltd	28 to 185	Nil	87 to 185
	Kakuzi Ltd	45 to 185	Nil	125 to 185
	Kapchorua Tea Co Ltd	70 to 71	Nil	70 to 71
	Limuru Tea Co Ltd	677 to 1595	Nil	1005 to 1595
	Rea Vipingo Ltd	7 to 15	Nil	10 to 15
	Sasini Tea & Coffee Ltd	47 to 133	47 to 82	Nil
Finance & Investment	Barclays Bank Ltd	95 to 151	Nil	111 to 151
	City Trust Ltd	28 to 42	Nil	38 to 42
	CFC Bank Ltd	12 to 33	12 to 21	Nil
	Diamond Trust Bank Kenya Ltd	21 to 42	Nil	31 to 42
	Housing Finance Co (K) Ltd	18 to 26	Nil	24 to 26
	ICDC Investments Co Ltd	12 to 95	12 to 39	Nil
	Jubilee Insurance Co Ltd	25 to 55	25 to 27	47 to 55
	Kenya Commercial Bank Ltd	53 to 135	53 to 109	Nil
	National Bank of Kenya Ltd	9 to 22	Nil	16 to 22
	National Industrial Credit Ltd	36 to 70	36 to 57	Nil
	Pan Africa Insurance Ltd	29 to 74	29 to 58	Nil
	Standard Chartered Bank Ltd	43 to 62	Nil	48 to 62
Commercial & Services	Africa Lakes Corporation Plc	Not listed		
	A Baumann & Co Ltd	11 to 53	Nil	28 to 53
	CMC Holdings Ltd	43 to 123	43 to 72	
	Car & General (K) Ltd	13 to 24	Nil	18 to 24
	Express Kenya Ltd	53 to 89	Nil	72 to 89
	Kenya Airways Ltd	7 to 10	Nil	9 to 10
	Lonhro Motors (EA) Ltd	12 to 332	Nil	104 to 332
	Marshalls (EA) Ltd	6 to 167	6 to 64	Nil
	Nation Media Group Ltd	53 to 249	Nil	144 to 249
	Pearl Drycleaners Ltd	8 to 13	Nil	11 to 13
	Standard Newspapers Ltd	36 to 254	Nil	150 to 254
	Tourism Promotion Services (Serena)	Not listed for the full year		
	Uchumi Supermarkets Ltd	21 to 73	Nil	46 to 73
Industrial and Allied	Athi River Mining Ltd	Not listed for the full year		
	Bamburi Cement Ltd	20 to 69	Nil	41 to 69
	British American Tobacco Ltd	45 to 104	Nil	62 to 104
	B O C Gases Ltd	11 to 236	11 to 33	Nil
	Carbacid Investments Ltd	57 to 97	Nil	87 to 97
	Crown Berger Ltd	7 to 19	Nil	11 to 19
	Dunlop Kenya Ltd	11 to 973		
	EA Cables Ltd	23 to 49	Nil	34 to 49
	EA Packaging Ltd	29 to 112	Nil	76 to 112
	EA Portland Cement Ltd	9 to 46	9 to 43	Nil
	Firestone East Africa Ltd	17 to 44	Nil	30 to 44
	East Africa Breweries Ltd	37 to 75	37 to 53	Nil
	Kenya National Mills Ltd	23 to 59	23 to 45	Nil
	Kenya Oil Co Ltd	45 to 83	Nil	72 to 83
	Kenya Power & Lighting Ltd	76 to 283	76 to 170	Nil
	Total Kenya Ltd	32 to 155	Nil	95 to 155
Unga Group Ltd	70 to 206	70 10 138	Nil	

## SUMMARY OF FINDINGS-July-December 1997

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option
Agricultural	Brooke Bond Kenya Limited	89 to 132	Nil	124 to 132
	Eaagads Limited	16 to 67	16 to 40	Nil
	George Williamson Kenya Ltd	27 to 176	27 to 68	163 to 176
	Kakuzi Ltd	47 to 193	Nil	108 to 193
	Kapchorua Tea Co Ltd	70 to 71	Nil	70 to 71
	Limuru Tea Co Ltd	521 to 1227	Nil	751-1227
	Rea Vipingo Ltd	6 to 13	Nil	10 to 13
	Sasini Tea & Coffee Ltd	66 to 188	66 to 71	117 to 188
Finance & Investment	Barclays Bank Ltd	90 to 144	Nil	119 to 144
	City Trust Ltd	30 to 45	Nil	35 to 45
	CFC Bank Ltd	13 to 38	Nil	19 to 38
	Diamond Trust Bank Kenya Ltd	17 to 34	Nil	23 to 34
	Housing Finance Co (K) Ltd	17 to 26	Nil	20 to 25
	ICDC Investments Co Ltd	14 to 119	Nil	38 to 119
	Jubilee Insurance Co Ltd	27 to 59	Nil	36 to 59
	Kenya Commercial Bank Ltd	68 to 172	Nil	78 to 172
	National Bank of Kenya Ltd	9 to 21	Nil	14 to 21
	National Industrial Credit Ltd	43 to 84	Nil	51 to 84
	Pan Africa Insurance Ltd	35 to 92	Nil	43 to 92
	Standard Chartered Bank Ltd	38 to 54	Nil	47 to 54
Commercial & Services	Africa Lakes Corporation Plc	Not listed		
	A Baumann & Co Ltd	8 to 41	Nil	17 to 41
	CMC Holdings Ltd	51 to 145	Nil	86 to 145
	Car & General (K) Ltd	11 to 21	Nil	17 to 21
	Express Kenya Ltd	50 to 84	Nil	60 to 84
	Kenya Airways Ltd	7 to 10	Nil	9 to 10
	Lonhro Motors (EA) Ltd	8 to 214	Nil	44 to 214
	Marshalls (EA) Ltd	10 to 271	Nil	48 to 271
	Nation Media Group Ltd	55 to 255	Nil	189 to 255
	Pearl Drycleaners Ltd	8 to 14	Nil	12 to 14
	Standard Newspapers Ltd	100 to 701	Nil	264 to 701
	Tourism Promotion Services (Serena)	Not listed for the full year		
	Uchumi Supermarkets Ltd	21 to 73	Nil	44 to 73
Industrial and Allied	Athi River Mining Ltd	Not listed for the full year		
	Bamburi Cement Ltd	18 to 64	Nil	40 to 64
	British American Tobacco Ltd	33 to 77	Nil	51 to 77
	B O C Gases Ltd	12 to 256	Nil	96 to 256
	Carbacid Investments Ltd	58 to 100	Nil	67 to 100
	Crown Berger Ltd	6 to 16	Nil	11 to 16
	Dunlop Kenya Ltd	11 to 955	Nil	122 to 955
	EA Cables Ltd	20 to 44	Nil	30 to 44
	EA Packaging Ltd	27 to 107	Nil	51 to 107
	EA Portland Cement Ltd	17 to 84	Nil	21 to 84
	Firestone East Africa Ltd	15 to 41	Nil	25 to 41
	East Africa Breweries Ltd	42 to 86	Nil	50 to 86
	Kenya National Mills Ltd	31 to 79	Nil	38 to 79
	Kenya Oil Co Ltd	45 to 82	Nil	49 to 82
	Kenya Power & Lighting Ltd	144 to 538	Nil	218 to 538
	Total Kenya Ltd	29 to 139	Nil	54 to 139
Unga Group Ltd	88 to 257	Nil	123 to 257	

## SUMMARY OF FINDINGS-January -June 1998

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	91 to 172	91 to 125	Nil
	<i>Eaagads Limited</i>	29 to 66	Nil	38 to 66
	<i>George Williamson Kenya Ltd</i>	89 to 169	89 to 140	Nil
	<i>Kakuzi Ltd</i>	83 to 174	83 to 141	Nil
	<i>Kapchorua Tea Co Ltd</i>	64 to 119	Nil	82 to 119
	<i>Limuru Tea Co Ltd</i>	780 to 820	Nil	780-820
	<i>Rea Vipingo Ltd</i>	6 to 9	Nil	7 to 9
	<i>Sasini Tea &amp; Coffee Ltd</i>	34 to 118	34 to 66	Nil
Finance & Investment	<i>Barclays Bank Ltd</i>	69 to 209	Nil	105 to 209
	<i>City Trust Ltd</i>	9 to 78	Nil	40 to 78
	<i>CFC Bank Ltd</i>	12 to 23	Nil	18 to 23
	<i>Diamond Trust Bank Kenya Ltd</i>	17 to 29	Nil	23 to 29
	<i>Housing Finance Co (K) Ltd</i>	10 to 25	Nil	18 to 25
	<i>ICDC Investments Co Ltd</i>	23 to 65	23 to 30	49 to 65
	<i>Jubilee Insurance Co Ltd</i>	24 to 41	Nil	31 to 41
	<i>Kenya Commercial Bank Ltd</i>	53 to 102	Nil	71 to 102
	<i>National Bank of Kenya Ltd</i>	4 to 23	Nil	16 to 23
	<i>National Industrial Credit Ltd</i>	15 to 71	Nil	36 to 71
	<i>Regent Undervalued Assets Africa Fund</i>	580 to 580		
	<i>Pan Africa Insurance Ltd</i>	18 to 30	Nil	21 to 30
<i>Standard Chartered Bank Ltd</i>	31 to 78	Nil	44 to 78	
Commercial & Services	<i>Africa Lakes Corporation Plc</i>			
	<i>A Baumann &amp; Co Ltd</i>	14 to 19	Nil	16 to 19
	<i>CMC Holdings Ltd</i>	24 to 53	Nil	36 to 53
	<i>Car &amp; General (K) Ltd</i>	7 to 24	Nil	12 to 24
	<i>Express Kenya Ltd</i>	28 to 76	Nil	28 to 76
	<i>Kenya Airways Ltd</i>	6 to 11	Nil	8 to 11
	<i>Lonhro Motors (EA) Ltd</i>	22 to 44	Nil	27 to 44
	<i>Marshalls (EA) Ltd</i>	20 to 33	Nil	30 to 33
	<i>Nation Media Group Ltd</i>	37 to 348	Nil	138 to 348
	<i>Pearl Drycleaners Ltd</i>	9 to 11	Nil	
	<i>Standard Newspapers Ltd</i>	6 to 80	Nil	42 to 80
	<i>Tourism Promotion Services (Serena)</i>	9 to 21	Nil	14 to 21
	<i>Uchumi Supermarkets Ltd</i>	28 to 66	28 to 37	55 to 66
Industrial and Allied	<i>Athi River Mining Ltd</i>	4 to 15	Nil	11 to 15
	<i>Bamburi Cement Ltd</i>	18 to 66	Nil	39 to 66
	<i>British American Tobacco Ltd</i>	63 to 82	Nil	68 to 82
	<i>B O C Gases Ltd</i>	19 to 69	Nil	39 to 69
	<i>Carbacid Investments Ltd</i>	40 to 100	Nil	47 to 100
	<i>Crown Berger Ltd</i>	5 to 17	Nil	11 to 17
	<i>Dunlop Kenya Ltd</i>	6 to 48	6 to 28	Nil
	<i>EA Cables Ltd</i>	16 to 36	Nil	23 to 36
	<i>EA Packaging Ltd</i>	18 to 60	Nil	21 to 60
	<i>EA Portland Cement Ltd</i>	14 to 28	14 to 17	25 to 28
	<i>Firestone East Africa Ltd</i>	11 to 25	Nil	20 to 25
	<i>East Africa Breweries Ltd</i>	37 to 102	37 to 45	71 to 102
	<i>Kenya National Mills Ltd</i>	6 to 33	6 to 23	Nil
	<i>Kenya Oil Co Ltd</i>	39 to 73	39 to 50	66 to 73
	<i>Kenya Power &amp; Lighting Ltd</i>	83 to 176	Nil	142 to 176
	<i>Total Kenya Ltd</i>	28 to 83	Nil	43 to 83
	<i>Unga Group Ltd</i>	9 to 120	9 to 120	Nil

SUMMARY OF FINDINGS-July-December 1998

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option	
Agricultural	Brooke Bond Kenya Limited	109 to 206	Nil	149 to 206	
	Eaagads Limited	26 to 59	Nil	40 to 59	
	George Williamson Kenya Ltd	146 to 277	Nil	147 to 277	
	Kakuzi Ltd	123 to 256	Nil	145 to 256	
	Kapchorua Tea Co Ltd	69 to 128	69 to 92	Nil	
	Limuru Tea Co Ltd	785 to 826	Nil	785 to 826	
	Rea Vipingo Ltd	4 to 7	Nil		7
	Sasini Tea & Coffee Ltd	42 to 143	Nil	76 to 143	
	Theta Group Ltd				
	Oi Pejeta Ranching Ltd				
	Finance & Investment	Barclays Bank Ltd	63 to 179	61 to 109	Nil
City Trust Ltd		9 to 72	Nil	31 to 72	
CFC Bank Ltd		11 to 22	Nil	16 to 22	
Diamond Trust Bank Kenya Ltd		16 to 28	Nil	22 to 28	
Housing Finance Co (K) Ltd		10 to 26	Nil	18 to 26	
ICDC Investments Co Ltd		26 to 72	Nil	49 to 72	
Jubilee Insurance Co Ltd		23 to 40	Nil	31 to 40	
Kenya Commercial Bank Ltd		47 to 90	Nil	62 to 90	
National Bank of Kenya Ltd		4 to 23	Nil	9 to 23	
National Industrial Credit Ltd		13 to 58	Nil	32 to 58	
Regent Undervalued Assets Africa Fund					
Pan Africa Insurance Ltd		13 to 21	Nil	17 to 21	
Standard Chartered Bank Ltd		27 to 69	27 to 47	Nil	
Commercial & Services	Africa Lakes Corporation Plc	Not listed			
	A Baumann & Co Ltd	14 to 19	14 to 16	Nil	
	CMC Holdings Ltd	21 to 47	Nil	34 to 47	
	Car & General (K) Ltd	5 to 17	5 to 7	15 to 17	
	Express Kenya Ltd	14 to 38	Nil	31 to 38	
	Kenya Airways Ltd	5 to 11	5 to 7	10 to 11	
	Lonhro Motors (EA) Ltd	14 to 28	Nil	23 to 28	
	Marshalls (EA) Ltd	22 to 35	Nil	26 to 35	
	Nation Media Group Ltd	32 to 302	32 to 98	251 to 302	
	Pearl Drycleaners Ltd	9 to 11	Nil		11
	Standard Newspapers Ltd	5 to 75	Nil	25 to 75	
	Tourism Promotion Services (Serena)	8 to 20	Nil	15 to 20	
	Uchumi Supermarkets Ltd	31 to 74	Nil	47 to 74	
	Industrial and Allied	Athi River Mining Ltd	4 to 14	Nil	7 to 14
Bamburi Cement Ltd		17 to 63	Nil	42 to 63	
British American Tobacco Ltd		65 to 84	Nil	72 to 84	
B O C Gases Ltd		18 to 65	Nil	42 to 65	
Carbacid Investments Ltd		36 to 90	36 to 73	Nil	
Crown Berger Ltd		5 to 16	Nil	9 to 16	
Dunlop Kenya Ltd		10 to 74	Nil	20 to 74	
EA Cables Ltd		12 to 28	Nil	21 to 28	
EA Packaging Ltd		7 to 25	Nil	16 to 25	
EA Portland Cement Ltd		15 to 31	Nil	18 to 31	
Firestone East Africa Ltd		12 to 26	Nil	17 to 26	
East Africa Breweries Ltd		42 to 116	42 to 64	Nil	
Kenya National Mills Ltd		11 to 54	Nil	17 to 54	
Kenya Oil Co Ltd		39 to 73	Nil	57 to 73	
Kenya Power & Lighting Ltd		89 to 188	Nil	123 to 188	
Total Kenya Ltd		22 to 65	Nil	54 to 65	
Unga Group Ltd		26 to 354	Nil	59 to 354	

## SUMMARY OF FINDINGS-January -June 1999

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option
Agricultural	Brooke Bond Kenya Limited	70 to 206	70 to 87	184 to 206
	Eaagads Limited	14 to 76	Nil	55 to 76
	George Williamson Kenya Ltd	87 to 161	Nil	153 to 161
	Kakuzi Ltd	80 to 167	Nil	123 to 176
	Kapchorua Tea Co Ltd	91 to 176	91 to 149	Nil
	Limuru Tea Co Ltd	588 to 908	Nil	651 to 908
	Rea Vipingo Ltd	4 to 7	Nil	
	Sasini Tea & Coffee Ltd	40 to 83	Nil	55 to 83
				7
Finance & Investment	Barclays Bank Ltd	90 to 157	Nil	111 to 158
	City Trust Ltd	20 to 29	Nil	23 to 29
	CFC Bank Ltd	8 to 28	Nil	18 to 27
	Diamond Trust Bank Kenya Ltd	17 to 34	17 to 20	32 to 34
	Housing Finance Co (K) Ltd	9 to 20	Nil	14 to 20
	ICDC Investments Co Ltd	43 to 54	43 to 48	Nil
	Jubilee Insurance Co Ltd	20 to 37	Nil	30 to 37
	Kenya Commercial Bank Ltd	34 to 65	Nil	44 to 65
	National Bank of Kenya Ltd	4 to 10	Nil	7 to 10
	National Industrial Credit Ltd	24 to 35	Nil	29 to 35
	Regent Undervalued Assets Africa Fund	571 to 589		
	Pan Africa Insurance Ltd	4 to 78	4 to 19	
	Standard Chartered Bank Ltd	44 to 66	Nil	50 to 67
Commercial & Services	Africa Lakes Corporation Plc	Not listed		
	A Baumann & Co Ltd	14 to 19	Nil	18 to 19
	CMC Holdings Ltd	25 to 39	Nil	29 to 39
	Car & General (K) Ltd	2 to 34	Nil	15 to 34
	Express Kenya Ltd	11 to 45	Nil	29 to 45
	Kenya Airways Ltd	4 to 13	Nil	10 to 13
	Lonhro Motors (EA) Ltd	10 to 29	Nil	18 to 29
	Marshalls (EA) Ltd	18 to 31	Nil	23 to 31
	Nation Media Group Ltd	88 to 162	Nil	134 to 162
	Pearl Drycleaners Ltd	1 to 26	Nil	22 to 26
	Standard Newspapers Ltd	2 to 56	Nil	18 to 56
	Tourism Promotion Services (Serena)	12 to 19	12 to 15	Nil
	Uchumi Supermarkets Ltd	30 to 63	30 to 42	Nil
	Industrial and Allied	Athi River Mining Ltd	3 to 10	Nil
Bamburi Cement Ltd		20 to 48	Nil	27 to 48
British American Tobacco Ltd		48 to 102	Nil	78 to 102
B O C Gases Ltd		21 to 49	Nil	27 to 49
Carbacid Investments Ltd		52 to 115	51 to 92	Nil
Crown Berger Ltd		3 to 24	3 to 4	14 to 24
Dunlop Kenya Ltd		7 to 32	Nil	16 to 32
EA Cables Ltd		7 to 43	Nil	28 to 43
EA Packaging Ltd		5 to 22	Nil	16 to 22
EA Portland Cement Ltd		2 to 48	Nil	22 to 48
Firestone East Africa Ltd		12 to 23	Nil	19 to 23
East Africa Breweries Ltd		55 to 95	55 to 72	Nil
Kenya National Mills Ltd		4 to 34	Nil	18 to 34
Kenya Oil Co Ltd		33 to 106	33 to 73	Nil
Kenya Power & Lighting Ltd		79 to 158	Nil	114 to 158
Total Kenya Ltd		35 to 70	Nil	49 to 70
Unga Group Ltd		7 to 120	Nil	38 to 120

## SUMMARY OF FINDINGS-July-December 1999

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option
Agricultural	<i>Brooke Bond Kenya Limited</i>	73 to 214	Nil	106 to 214
	<i>Eaagads Limited</i>	14 to 74	Nil	27 to 74
	<i>George Williamson Kenya Ltd</i>	88 to 163	Nil	93 to 163
	<i>Kakuzi Ltd</i>	68 to 143	Nil	88 to 143
	<i>Kapchorua Tea Co Ltd</i>	145 to 278	Nil	160 to 278
	<i>Limuru Tea Co Ltd</i>	502 to 775	Nil	668 to 775
	<i>Rea Vipingo Ltd</i>	4 to 7	Nil	5 to 7
	<i>Sasini Tea &amp; Coffee Ltd</i>	31 to 65	Nil	46 to 64
Finance & Investment	<i>Barclays Bank Ltd</i>	78 to 136	Nil	105 to 136
	<i>City Trust Ltd</i>	17 to 25	Nil	23 to 25
	<i>CFC Bank Ltd</i>	8 to 27	Nil	17 to 27
	<i>Diamond Trust Bank Kenya Ltd</i>	18 to 37	17 to 22	Nil
	<i>Housing Finance Co (K) Ltd</i>	7 to 16	Nil	11 to 16
	<i>ICDC Investments Co Ltd</i>	49 to 62	Nil	53 to 62
	<i>Jubilee Insurance Co Ltd</i>	19 to 35	Nil	24 to 34
	<i>Kenya Commercial Bank Ltd</i>	25 to 47	Nil	32 to 47
	<i>National Bank of Kenya Ltd</i>	3 to 7	Nil	6 to 7
	<i>National Industrial Credit Ltd</i>	23 to 34	Nil	28 to 34
	<i>Pan Africa Insurance Ltd</i>	5 to 112	Nil	68 to 112
	<i>Standard Chartered Bank Ltd</i>	42 to 63	45 to 54	Nil
Commercial & Services	<i>Africa Lakes Corporation Plc</i>	Not listed		
	<i>A Baumann &amp; Co Ltd</i>	14 to 19	Nil	15 to 19
	<i>CMC Holdings Ltd</i>	21 to 33	22 to 26	Nil
	<i>Car &amp; General (K) Ltd</i>	1 to 29	Nil	15 to 29
	<i>Express Kenya Ltd</i>	10 to 40	Nil	20 to 40
	<i>Kenya Airways Ltd</i>	4 to 13	Nil	9 to 13
	<i>Lonhro Motors (EA) Ltd</i>	8 to 23	Nil	14 to 23
	<i>Marshalls (EA) Ltd</i>	16 to 27	16 to 20	Nil
	<i>Nation Media Group Ltd</i>	83 to 153	Nil	101 to 153
	<i>Pearl Drycleaners Ltd</i>	1 to 26	Nil	4 to 26
	<i>Standard Newspapers Ltd</i>	2 to 37	Nil	14 to 37
	<i>Tourism Promotion Services (Serena)</i>	10 to 15	Nil	Nil
	<i>Uchumi Supermarkets Ltd</i>	32 to 69	Nil	40 to 69
Industrial and Allied	<i>Athi River Mining Ltd</i>	3 to 9	Nil	8 to 9
	<i>Bamburi Cement Ltd</i>	15 to 35	Nil	30 to 35
	<i>British American Tobacco Ltd</i>	48 to 102	Nil	67 to 102
	<i>B O C Gases Ltd</i>	15 to 35	Nil	30 to 35
	<i>Carbacid Investments Ltd</i>	64 to 144	Nil	77 to 144
	<i>Crown Berger Ltd</i>	4 to 25	4 to 7	Nil
	<i>Dunlop Kenya Ltd</i>	5 to 24	Nil	11 to 24
	<i>EA Cables Ltd</i>	6 to 43	Nil	19 to 43
	<i>EA Packaging Ltd</i>	5 to 20	Nil	8 to 20
	<i>EA Portland Cement Ltd</i>	2 to 40	Nil	16 to 40
	<i>Firestone East Africa Ltd</i>	12 to 23	Nil	17 to 23
	<i>East Africa Breweries Ltd</i>	61 to 107	Nil	71 to 107
	<i>Kenya National Mills Ltd</i>	3 to 28	Nil	11 to 28
	<i>Kenya Oil Co Ltd</i>	45 to 146	Nil	74 to 146
	<i>Kenya Power &amp; Lighting Ltd</i>	70 to 140	Nil	94 to 140
	<i>Total Kenya Ltd</i>	33 to 67	Nil	53 to 67
<i>Unga Group Ltd</i>	4 to 79	Nil	38 to 80	

## SUMMARY OF FINDINGS-January -June 2000

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option	
Agricultural	Brooke Bond Kenya Limited	68 to 148	Nil	75 to 148	
	Eaagads Limited	17 to 30	Nil	27 to 30	
	George Williamson Kenya Ltd	50 to 166	Nil	79 to 166	
	Kakuzi Ltd	50 to 112	Nil	67 to 112	
	Kapchorua Tea Co Ltd		151 Nil		151
	Limuru Tea Co Ltd		678 Nil	650 to 678	
	Rea Vipingo Ltd	3 to 5	Nil	4 to 5	
	Sasini Tea & Coffee Ltd	26 to 60	Nil	36 to 60	
Finance & Investment	Barclays Bank Ltd	49 to 134	49 to 50	106 to 134	
	City Trust Ltd	18 to 30	Nil	21 to 30	
	CFC Bank Ltd	6 to 18	Nil	11 to 18	
	Diamond Trust Bank Kenya Ltd	14 to 30	Nil	21 to 30	
	Housing Finance Co (K) Ltd	1 to 28	Nil	10 to 28	
	ICDC Investments Co Ltd	34 to 71	Nil	54 to 71	
	Jubilee Insurance Co Ltd	18 to 36	Nil	23 to 36	
	Kenya Commercial Bank Ltd	14 to 37	14 to 27	Nil	
	National Bank of Kenya Ltd	2 to 7	Nil	4 to 7	
	National Industrial Credit Ltd	13 to 39	Nil	22 to 39	
	Pan Africa Insurance Ltd	11 to 33	Nil	21 to 33	
	Standard Chartered Bank Ltd	21 to 87	21 to 44	Nil	
Commercial & Services	Africa Lakes Corporation Plc	Not listed for the full year			
	A Baumann & Co Ltd	9 to 17	Nil	15 to 17	
	CMC Holdings Ltd	16 to 33	Nil	17 to 33	
	Car & General (K) Ltd	2 to 28	2 to 6	24 to 28	
	Express Kenya Ltd	15 to 22	Nil	20 to 22	
	Kenya Airways Ltd	6 to 13	Nil	9 to 13	
	Marshalls (EA) Ltd	16 to 28	Nil	19 to 28	
	Nation Media Group Ltd	68 to 109	Nil	76 to 109	
	Pearl Drycleaners Ltd	2 to 4	Nil	3 to 4	
	Standard Newspapers Ltd	2 to 46	Nil	8 to 46	
	Tourism Promotion Services (Serena)	3 to 38	Nil	29 to 38	
	Uchumi Supermarkets Ltd	36 to 58	36 to 37	50 to 58	
	Industrial and Allied	Athi River Mining Ltd	2 to 8	Nil	5 to 8
Bamburi Cement Ltd		25 to 37	25 to 28	Nil	
British American Tobacco Ltd		26 to 110	Nil	74 to 110	
B O C Gases Ltd		37 to 85	Nil	48 to 85	
Carbacid Investments Ltd		27 to 83	Nil	54 to 83	
Crown Berger Ltd		6 to 16	11 to 16	Nil	
Dunlop Kenya Ltd		6 to 11	Nil	8 to 11	
EA Cables Ltd		5 to 29	Nil	11 to 29	
EA Packaging Ltd		2 to 28	2 to 6	Nil	
EA Portland Cement Ltd		8 to 16	8 to 11	Nil	
Firestone East Africa Ltd		9 to 21	Nil	14 to 21	
East Africa Breweries Ltd		58 to 93	Nil	68 to 93	
Kenya National Mills Ltd		2 to 21	2 to 6	Nil	
Kenya Oil Co Ltd		53 to 101	53 to 80	Nil	
Kenya Power & Lighting Ltd		35 to 126	Nil	52 to 126	
Total Kenya Ltd		28 to 93	28 to 35	71 to 93	
Unga Group Ltd		6 to 45	Nil	17 to 45	

## SUMMARY OF FINDINGS-July-December 2000

SECTOR	COMPANY	Computed exercise price range	Range for in the money call option	Range for in the money put option	
Agricultural	Brooke Bond Kenya Limited	48 to 105	48 to 95	Nil	
	Eaagads Limited	17 to 30	Nil	21 to 30	
	George Williamson Kenya Ltd	41 to 135	41 to 91	Nil	
	Kakuzi Ltd	36 to 80	Nil	56 to 80	
	Kapchorua Tea Co Ltd		151 Nil	151	
	Limuru Tea Co Ltd		678 Nil	650 to 678	
	Rea Vipingo Ltd	2 to 4	Nil	4	
	Sasini Tea & Coffee Ltd	20 to 47	Nil	37 to 47	
	Finance & Investment	Barclays Bank Ltd	51 to 139	Nil	80 to 139
		City Trust Ltd	16 to 28	16 to 22	Nil
CFC Bank Ltd		5 to 16	Nil	13 to 16	
Diamond Trust Bank Kenya Ltd		10 to 23	Nil	15 to 23	
Housing Finance Co (K) Ltd		1 to 19	Nil	8 to 19	
ICDC Investments Co Ltd		33 to 70	Nil	49 to 70	
Jubilee Insurance Co Ltd		16 to 31	Nil	30 to 31	
Kenya Commercial Bank Ltd		18 to 47	Nil	27 to 47	
National Bank of Kenya Ltd		1 to 5	Nil	4 to 5	
National Industrial Credit Ltd		10 to 30	Nil	19 to 30	
Pan Africa Insurance Ltd		8 to 25	Nil	12 to 25	
Standard Chartered Bank Ltd		28 to 113	Nil	68 to 113	
Commercial & Services		Africa Lakes Corporation Plc	Not listed for the full year		
	A Baumann & Co Ltd	9 to 16	Nil	10 to 16	
	CMC Holdings Ltd	9 to 19	Nil	16 to 19	
	Car & General (K) Ltd	2 to 31	Nil	18 to 31	
	Express Kenya Ltd	15 to 22	Nil	18 to 22	
	Kenya Airways Ltd	6 to 13	6 to 8	Nil	
	Marshalls (EA) Ltd	13 to 23	Nil	20 to 23	
	Nation Media Group Ltd	51 to 81	Nil	70 to 81	
	Pearl Drycleaners Ltd	1 to 3	Nil	3	
	Standard Newspapers Ltd	1 to 25	Nil	16 to 25	
	Tourism Promotion Services (Serena)	2 to 38	Nil	8 to 38	
	Uchumi Supermarkets Ltd	39 to 62	39 to 47	Nil	
	Industrial and Allied	Athi River Mining Ltd	2 to 7	Nil	5 to 7
Bamburi Cement Ltd		28 to 42	28 to 33	Nil	
British American Tobacco Ltd		28 to 119	28 to 40	91 to 119	
B O C Gases Ltd		27 to 63	Nil	53 to 63	
Carbacid Investments Ltd		24 to 74	Nil	41 to 74	
Crown Berger Ltd		7 to 18	Nil	10 to 18	
Dunlop Kenya Ltd		4 to 9	Nil	7 to 9	
EA Cables Ltd		3 to 18	3 to 7	Nil	
EA Packaging Ltd		3 to 39	Nil	9 to 39	
EA Portland Cement Ltd		9 to 17	Nil	13 to 17	
Firestone East Africa Ltd		7 to 17	Nil	12 to 17	
East Africa Breweries Ltd		58 to 93	58 to 72	Nil	
Kenya National Mills Ltd		3 to 24	Nil	8 to 24	
Kenya Oil Co Ltd		29 to 270	Nil	75 to 264	
Kenya Power & Lighting Ltd		20 to 70	Nil	42 to 70	
Total Kenya Ltd		30 to 98	30 to 42	Nil	
Unga Group Ltd		4 to 30	Nil	19 to 30	