

AN ANALYSIS OF PRICE MOVEMENT FOR SELECTED STOCKS IN
NAIROBI STOCK EXCHANGE

By
Moses N. Mwangi

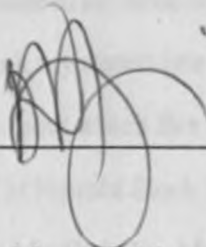
A Management Research Project
Submitted to the Department of Management Science
in Partial Fulfillment of the Requirements
for the Degree of Masters of Business and Administration
in the Faculty of Commerce, University of Nairobi

University of Nairobi

July 1997

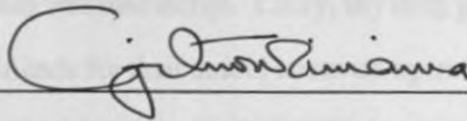
DECLARATION

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



Moses N. Mwangi

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



Dr. G. Wainaina

Department of Management Science

Faculty of Commerce,

University of Nairobi

ACKNOWLEDGMENTS

I wish to express my gratitude to all those who in one way or another enabled me to complete this study. I wish to thank my supervisor Dr. G. Wainaina for his invaluable guidance and close supervision without which this study would not have been a success. I am indeed indebted to all the staff at Nairobi Stock Exchange (NSE) who offered their assistance to me in various ways. Mr. Githuku, Mr. Wambugu, Sarah and Beth of the information department were also helpful.

I would likewise to thank the administration of Dima college Mr. Wambugu and the Principal and the proprietor of the same college Mr. Mundia for allowing me to use their computer facilities. I am grateful indeed to the academic staff of the Faculty of Commerce for their suggestions and challenging comments, and the University of Nairobi for granting me a post-graduate scholarship. Special thanks go to Catherine and Joyce of Twaweza Communications for typing this manuscript. Lastly, my deep gratitude goes to family members, relatives and friends for their untold warm co-operation in various forms. My very special thanks to my best friend and wife F.E.W. for taking interest in my project and for being a motivator.

DEDICATION

This work is dedicated to my two sons Amos and Robert.

PROLOGUE

| | Page |
|----------------|------|
| CONTENTS | 2 |
| ABBREVIATIONS | 11 |
| LIST OF TABLES | 15 |
| LIST OF WORDS | 2 |
| ABSTRACT | 2 |
| ABBREVIATIONS | 11 |

CHAPTER

We can either run away from our past or learn from it...

| | |
|-----------------------------------|----|
| i. INTRODUCTION | 1 |
| Background of the Study | 1 |
| Need for the Study | 3 |
| Objectives of the Study | 3 |
| Methods of Inquiry and Procedure | 4 |
| Data Collection and Delimitation | 5 |
| Research Design | 7 |
| Significance of the Study | 8 |
| Limit of the Study | 9 |
| ii. LITERATURE REVIEW | 9 |
| A Review of Market Stock Exchange | 9 |
| Stock Stock Exchange Operations | 10 |
| Trading System | 10 |
| Order | 11 |
| Announcement | 12 |
| Availability of Information | 15 |
| Clearance and Settlement | 14 |
| Remarks on Market Stock Exchange | 14 |
| Emerging Markets | 18 |
| Other Stock Exchanges | 21 |

TABLE OF CONTENTS

| | Page |
|--|------|
| DECLARATIONS | ii |
| ACKNOWLEDGEMENTS | iii |
| DEDICATION | iv |
| PROLOGUE | v |
| CHAPTER | vi |
| LIST OF TABLES | ix |
| LIST OF FIGURES | x |
| ABSTRACT | xi |
| ABBREVIATIONS | xii |
| CHAPTER | |
| I: INTRODUCTION | 1 |
| Background of the Study | 1 |
| Need for the Study | 3 |
| Objective of the Study | 5 |
| Methods of Analysis and Procedure | 6 |
| Data Collection and Description | 6 |
| Research Design | 7 |
| Importance of the Study | 8 |
| Scope of the Study..... | 8 |
| II: LITERATURE RIVIEW | 9 |
| A Review of Nairobi Stock Exchange | 9 |
| Nairobi Stock Exchange Operations | 10 |
| Trading System | 10 |
| Orders | 11 |
| Auctions | 12 |
| Availability of Information | 13 |
| Clearance and Settlement | 14 |
| Research on Nairobi Stock Exchange | 14 |
| Emerging Markets | 18 |
| Other Stock Exchanges | 23 |

| | |
|---|----|
| III: DATA ANALYSIS AND INTERPRETATIONS | 26 |
| Characteristics of the sample | 26 |
| Agricultural Sector | 27 |
| Rea Vipingo Plantations Limited | 27 |
| Kapchorua Tea Company Limited | 29 |
| Sasini Tea and Coffee Limited | 31 |
| Ol Pejeta Ranching Limited | 33 |
| Kakuzi Limited | 35 |
| Commercial and Services Sector | 38 |
| Uchumi Supermarkets Limited..... | 38 |
| Pearl Dry Cleaners Limited | 40 |
| Standard Newspapers Group | 43 |
| Nation Printers and Publishers | 45 |
| Car and General (Kenya) Limited | 47 |
| Marshalls (East Africa) Limited seven percent preference shares..... | 49 |
| Finance and Investment Sector | 51 |
| National Industrial Credit Limited | 51 |
| City Trust Limited | 53 |
| Kenstock Limited Deferred 12.5 percent..... | 55 |
| Industrial Commercial Development Corporation Limited. | 56 |
| Housing Finance Company of Kenya Limited | 58 |
| National Bank of Kenya Limited | 60 |
| Pan Africa Insurance Company Limited | 62 |
| Industrial And Allied Sector | 64 |
| East African Portland Limited Rights | 64 |
| Dunlop Kenya Limited | 65 |
| Kenya Power and Lighting Company Limited..... | 67 |
| Kenya Breweries Limited | 69 |
| Unga Group Limited | 71 |
| IV SUMMARY AND CONCLUSION..... | 75 |
| Summary of Findings and Implications | 75 |
| Conclusion | 78 |
| Limitations of the Study | 79 |
| Recommendations for Further Studies | 80 |

| | |
|------------------|------|
| CHAPTER | Page |
| REFERENCES | 81 |

APPENDICES

LIST OF TABLES

| | |
|---|----|
| Appendix I - Population of the Study | 86 |
| Appendix II - Sample of the Study | 88 |
| Typical Transport of Firms in the Sample (March 1997) | 29 |

LIST OF TABLES

| TABLE | Page | Page |
|-------|---|------|
| 1. | Types and Numbers of Firms in the Sample Frame: 1997 | 26 |
| 2. | Average Monthly Prices for the Vipac Limited: 1997 | 27 |
| 3. | Average Monthly Prices for Kaskasa: 1997 | 28 |
| 4. | Average Monthly Prices for Of Peasle: 1997 | 29 |
| 5. | Average Monthly Prices for Kakasa: 1997 | 30 |
| 6. | Average Monthly Prices for Uduwa: 1997 | 31 |
| 7. | Average Monthly Prices for Pearl City Cement: 1997 | 32 |
| 8. | Average Monthly Prices for Pearl City Cement, 5 percent Preference Shares: 1997 | 33 |
| 9. | Average Monthly Prices for Standard Newspapers Group: 1997 | 34 |
| 10. | Average Monthly Prices for Motor Tractors and Trailblowers: 1997 | 35 |
| 11. | Average Monthly Prices for Car and Tractor: 1997 | 36 |
| 12. | Average Monthly Prices for Marston 7 percent Preference Shares: 1997 | 37 |
| 13. | Average Monthly Prices for National Industrial Credit Limited: 1997 | 38 |
| 14. | Average Monthly Prices for City Trust Limited: 1997 | 39 |
| 15. | Average Monthly Prices for Kasesa & Limited Debenture (2.5 percent Fixed Rate): 1997 | 40 |
| 16. | Average Monthly Prices for Federal Organizational Development Company Ltd: 1997 | 41 |
| 17. | Average Monthly Prices for Industrial Finance Company Limited: 1997 | 42 |
| 18. | Average Monthly Prices for Regional Bank of Kenya Limited: 1997 | 43 |
| 19. | Average Monthly Prices for Pan Africa Insurance Company Limited: 1997 | 44 |
| 20. | Average Monthly Prices for Orinda Electric Limited: 1997 | 45 |
| 21. | Average Monthly Prices for Kenya Power Lighting Company Limited: 1997 | 46 |
| 22. | Average Monthly Prices for Kenya Breweries Limited: 1997 | 47 |
| 23. | Average Monthly Prices for Unga Group Limited: 1997 | 48 |

LIST OF FIGURES

| Figure | Page |
|--|------|
| 1. Average Monthly Prices for Rea Vipingo Limited: 1997..... | 28 |
| 2. Average Monthly Prices for Kapchorua: 1997..... | 30 |
| 3. Average Monthly Prices for Sasini: 1997..... | 33 |
| 4. Average Monthly Prices for Ol Pejeta: 1997..... | 34 |
| 5. Average Monthly Prices for Kakuzi: 1997 | 36 |
| 6. Average Monthly Prices for Uchumi: 1997 | 49 |
| 7. Average Monthly Prices for Pearl Dry Cleaners: 1997 | 41 |
| 8. Average Monthly Prices for Pearl Dry Cleaners, 5 percent Preference Shares: 1997 | 42 |
| 9. Average Monthly Prices for Standard Newspapers Group: 1997..... | 44 |
| 10. Average Monthly Prices for Nation Printers and Publishers: 1997 | 46 |
| 11. Average Monthly Prices for Car and General: 1997 | 48 |
| 12. Average Monthly Prices for Marshalls 7 percent Preference Shares: 1997..... | 50 |
| 13. Average Monthly Prices for National Industrial Credit Limited: 1997.... | 51 |
| 14. Average Monthly Prices for City Trust Limited: 1997 | 54 |
| 15. Average Monthly Prices for Kenstock Limited Deferred 12.5 percent Loan Stock: 1997..... | 55 |
| 16. Average Monthly Prices for Industrial Commercial Development Corporation: 1997 | 57 |
| 17. Average Monthly Prices for Housing Finance Company Limited: 1997 . | 58 |
| 18. Average Monthly Prices for National Bank of Kenya Limited: 1997 | 61 |
| 19. Average Monthly Prices for Pan Africa Insurance Company Limited: 1997 | 62 |
| 20. Average Monthly Prices for Dunlop Kenya Limited: 1997 | 65 |
| 21. Average Monthly Prices for Kenya Power Lighting Company Limited: 1997 | 67 |
| 22. Average Monthly Prices for Kenya Breweries Limited: 1997 | 70 |
| 23. Average Monthly Prices for Unga Group Limited: 1997 | 72 |

ABSTRACT

The aim of this study was to analyze the price movement of selected securities in the NSE. The objectives were to identify a pattern for stock movement, determine the factors that affect share prices and to determine a predictive model for stock movement in NSE. The model was developed using a PC-give (version 6) software package. Using the model, the prices from the month of May 1996 to April 1997 were computed and compared with the actual ones. T-test were carried out to determine whether the two prices were significantly different from each other. Forecast Chi-square and chow test were also computed to test for parameter consistency. All data was obtained from the data bank of the Secretariat of NSE in form of raw published stock price lists. Data covering the period 1st January 1992 to 30th April 1997 was collected.

Since the study was aimed at predicting price movement, data from the equity shares, preference shares and the loan stock that were traded in the exchange was used. The sample selected met the following criteria, had a traded volume of shares above 5 percent per annum, this being the average traded volume of shares in 1996, and/or the top five shares in each strata. using both criteria, 26 securities were studied. Of the securities studied, only 8 models could predict the prices accurately. This can be attributed to the fact that different securities react differently to the same events in the market. Therefore, it is not always possible to develop models that would give accurate ex-ante forecasts. Further, parameters of the forecasting models vary over time to reflect changes in the underlying earning generating process. However, these findings are similar to other studies that have been undertaken in other stock exchanges.

ABBREVIATIONS

| | | |
|-------------|---|---|
| B | - | The bonus shares issued to the existing shareholders |
| Div. cash | - | Dividends. These are dividends per share and refer to the actual payment in shilling paid by the company per share for that financial year. |
| EPS | - | Earning per share, based on attributable profit, profit after tax, minority interest and preference dividends, but before taking into account extraordinary items dividend by the number of ordinary shares in issues at the balance sheet date, adjusted for any bonus issues. |
| F/E (Us/Dm) | - | Foreign exchange rate between US dollars and German deutschemark |
| F/E | - | Foreign exchange rate between Kenya shillings and the US dollars |
| Int | - | This is the prevailing 90-day treasury bill interest rates. |
| OLS | - | Ordinary Least Square |
| P | - | The price of a security |
| $P_{(t-1)}$ | - | This is the monthly price of a security with a lag of one |
| P/E | - | Price to earning ratio, based on the share price for that month dividend by EPS at the same date. |
| PLC | - | Public Limited Company |
| SD | - | Standard deviation |
| WCP | - | World Coffee Prices |
| WSP | - | World Sisal Price |
| WTP | - | World Tea Prices |

CHAPTER I

INTRODUCTION

Background of the Study

In Kenya, dealing in shares and stocks started in the 1920's when the country was still a British colony. There was, however, no formal market, no rules and no regulations to govern stockbroking activities. Trading took place on gentlemen's agreement in which standard commissions were charged, with clients being obligated to honour their commitments of making good delivery and setting relevant costs.

The Nairobi Stock Exchange was constituted in 1954 as a voluntary association of stockbrokers registered under the Societies Act. The business of dealing in shares was then confined to the resident European community since Africans and Asians were not permitted to trade in securities until after the attainment of independence in 1963. At the dawn of independence, stock market activity slumped due to uncertainty about the future of independent Kenya. However, after three years of calm and economic growth, confidence in the market was once again rekindled and the exchange handled a number of highly over-subscribed public issues. The growth was, however, halted when the oil crisis of 1972 introduced inflationary pressures in the economy which depressed share prices. A 35 percent capital gains tax introduced in 1975 (suspended since 1985) inflicted further losses to the exchange which at the same time lost its regional character following the nationalisations, exchange controls, and other inter-territorial restrictions introduced in neighbouring Tanzania and Uganda. For instance, in 1976 Uganda compulsorily acquired a number of companies which were either quoted or subsidiaries of companies quoted on the NSE.

A 1984 study on "Development of Money and Capital Markets in Kenya" by the

International Finance Corporation (a subsidiary of World Bank) and Central Bank of Kenya (IFC/CBK) study, became a blue-print for structural reforms in the financial markets which culminated in the formation of a regulatory body, the Capital Markets Authority (CMA) in 1989, to assist towards the creation of a conducive environment for growth and development of the country's capital markets.

In 1991, the NSE was registered under the Companies Act and phased out the "call over" trading system in favour of the floor based open outcry system. As at 31 December 1996, market capitalization stood at Shs. 99,945 million up from Shs. 10,902 million at the end of 1990, making it the third largest stock exchange in Africa after Johannesburg stock exchange and Morocco stock exchange. For the year ended December 1996, some 2,530 million shares valued at Shs. 3,962 million were traded, giving a turnover of 4.49 percent.

There were 58 listed companies on the stock exchange and with 58 ordinary shares, 13 preference shares, and 2 loan stocks that were available by 30th April 1997, giving a total of 73 equity securities. This is the same total number of equity securities that existed in 1994 comprising of 45 ordinary shares, 28 preference shares and no loan stock.

In 1990, the NSE 20 share index, at the end of the year, stood at 915.34 increasing by 387 percent to 3503 percent in 1994 and reducing by 23.9 per cent to 2523 percent in 1995. It can be seen that there was a sharp increase in the percentage points between the years of 1993 and 1994. Thereafter, there was a gradual decrease which is still expected to continue, since 1997 is an election year, it is expected that the index will rise in the following years.

Nairobi Stock Exchange has attracted both non-academic work and academic work. Non-academic work includes: Hartland (1993), on the characteristics of the NSE; CMA (1992), on the ability of the Kenya market to absorb new equity issues; and Bishop (1988), on recommendations of rules and regulations of NSE. Further, an IFC/CBK (1984), study that was the blue print for the current trading system.

The academic works include Muthamia (1990), who studied the factors that were

considered by publicly quoted companies in NSE in selecting external auditors. Muturi, (1990), forecasted the asset requirements in publicly quoted companies. Abdul (1993), did an empirical study to identify parameters which are important in the determination of dividends by publicly quoted companies. Omollo (1993), studied the distribution of financial ratio of companies quoted at the NSE, while Gitare (1990), did an empirical investigation into the risk return relationship among the companies quoted in the NSE. Simiyu (1992), measured the market performance of the NSE while Omosa (1989), predicted the ability of selected pricing models on the NSE. Kinandu (1990), studied the NSE for the doctoral studies.

The Need for the Study

According to economic theory, market achieves optimal capital allocations through the classical risk return trade off that is the keystone of modern finance. But this theory takes the market as a "black box" (Glen, 1995) where information goes in and an efficiently determined price comes out. But for the investors, this is not usually the case. There are other factors which determine the prices such as market institutional mechanisms, which are important determinants of market behaviour. In addition, prices in stock exchange are expected to reflect, in the present, what most people expect to happen in future. This will depend on the information that is available and which is released to the public. However, this does not happen simultaneously with the same degree of speed as argued by the random walk theory. Bernstein and Bostain (1974) say that investors are able to overcome uncertainty and inertia only when it is apparent that other investors have begun to take action.

To the extent that the investor is a rational human being, he must engage in opportunity cost calculations. This extends beyond the decision of whether stock X is of superior value to stock Y. The wider question is whether, given the investor's assessment of risk and the scarce resources, he can earn a higher return on other type of investment. The investor must, therefore, compare the stock return with debt instruments of other

kinds, for example, treasury bills, consideration of interest rates fluctuation and general monetary considerations.

Glen (1995) further says that stock markets provide four basic functions. First, they provide information on value of financial instruments,. Second, they provide savings investments. Third, the stock acts as storage of wealth and fourth, they provide risk sharing through diversification. However, the last three are not unique to stock markets alone, but any other assets can provide these basic functions. For this reason—and for the opportunity cost computation—the stock prices will seldom correlate uniquely or consistently with earnings (or even with lagged earnings to reflect expectations). For example, after the bonus issue of Barclays Bank, one would expect, using the Modigliani - Miller model, the price of Barclays Bank shares to fall. However, they increased against all expectations. This would be explained by the fact that there are some basic factors that drive stock returns. The fact that models are unable to capture those factors may indicate model failure as opposed to the inefficiency of the market (Claessens, Dasgupta and, Glen, 1995).

The fundamentalist school forecast stock prices on the basis of what they see in economics, and monetary and company statistics. They make judgment as to whether stocks are overvalued or undervalued, relative to earning power and the economic environment. Furthermore, they believe that other investors will drive prices upward or downward until prices reach what they (other investors) consider to be the proper level of valuation (Brigham and Gapesenki, 1985). The investors know nothing of the value in terms in which the fundamentalist use it. They believe the actions of other investors are reflected in the price fluctuations of stock. This is further explained by the fact that while investors are expected to carry out rational calculation in making an equity investment in quoted companies, the decision making process is occasionally irrational and departs from what normally appears to be the fundamental consideration in deciding to invest and disinvest. This is more so because, as Bernstein and Bostain (1974) argue, prices register

expectations of future values rather than an estimate of current values. Therefore, the job of predicting the state of expectation in the near or far future is more difficult than projecting earnings, dividends or interest rates. It is this aspect of the problem that promoted John Maynard Keynes, to compare investing in the stock market to a beauty contest in which:

"each competitor has to pick, not those faces which he himself finds the prettiest, but those which he thinks likeliest to catch the fancy of other competitors. (Bernstein and Bostain 1974: pp 543).

The supply and demand of shares and therefore the prices are governed at any moment by many hundreds of factors, some rational and some irrational. Such include information, opinions, moods, guesses (shrewd or otherwise) as to the future (Pinches, 1970). No ordinary man can hope to grasp and weigh them all up, but the market does this automatically. Therefore, a typical stock market investor is faced with the problem of predicting the future behaviour either of the market or a particular stock which requires some evaluation of the above mentioned factors. This evaluation process may not be easy. Some stock exchange markets in the world have developed models that can help to predict prices (for example, Fama 1990, Corhay 1987, Guetckin and Buttent 1983). For NSE, there is the global model that has been developed for emerging markets by World Bank researchers (Claessens et al, 1995). Since this is a global model, there is the need for a specific model for NSE like any other stock exchange model (for example, Balvers, Casimano and McDonald, 1990), since a globalized model cannot be expected to perform as efficiently as a model specifically designed for the NSE would perform. Therefore, this study undertakes to develop and test models that can be used to predict price movements in NSE.

Objectives of the Study

The purpose of the study was to analyse price movement for selected stocks in NSE. The main objective was to develop and test a model that could be used to predict price movement in NSE. The specific objectives were to:

1. Identify and describe a pattern for stock movement in NSE.
2. Determine the factors which affect the share price movements.

Methods of Analysis and Procedure

The study involved descriptive, graphical, dynamic time series and regression analysis. The two specific objectives were achieved by the use of various statistical tools. To achieve the first objective, historical information of NSE stock movement figures, tables and graphs were utilized. Excel software package was utilized.

To achieve the second objective, PC-give version 6 (student) was utilized to provide a dynamic time series. The ordinary least square method was employed to develop the models, and where applicable the last 12 observations were retained for forecast purpose. Statistics such as R^2 were used to show how all the variables in the model jointly predicted the changes in prices. The F statistics were used to show how the variables in the model are jointly significant at 1 per cent level in explaining prices of the security and giving the probability of making a type 1 error.

In cross validation of the model, the forecast Chi-square was used to examine whether the contribution of the parameters have changed between the actual and post sample era (in this case the 12 months in which data was retained for cross validation). Chow test was also used to test the null hypothesis that the parameters were constant over the actual period of developing the model. Rejection of null hypothesis implied that the parameters contribution (due, to say, a change in policy of any of the parameters) has changed. If the probability is high it implies the acceptance of the null hypothesis that the contribution for the parameters for the actual date had not changed.

Data Collection and Description

This study was exploratory in nature. All the data was obtained from the data bank of the secretariat of the NSE in form of raw published stock prices lists. Data for a period of five years and four months covering the period from 1st January 1992 to 30th April

1997 was collected. Data covering the period 1st April 1992 to 30th April 1996 was used to develop the predictive model while the data from 1st May 1996 to 30th April 1997 was used for cross validation. The above period was selected on the basis that it was a period in which only one type of trading system, that is 'open outcry' system, was in operation, hence consistence of trading pattern was obtained.

Since the study was aimed at predicting price movement, data from the equity shares, preference shares and the loan stock that were traded in the exchange was used. For each type of security traded in NSE, the following information was collected, number of shares outstanding as per 31st December 1996, the volume of shares traded per day and the transaction prices for the whole period. The prices that were used were the arithmetic means of the month. In the months that no trading took place, the last traded month's average price was used because, in making a decision, the investors use the available set of data in order to arrive at a decision.

Research Design

Since the study sought to explore the predictability of the securities traded at the NSE, the population of the study was all those securities which were quoted on the NSE as at 31st March, 1997. The population was divided into four strata, that is, agriculture, finance and investment, commercial and services, and industrial and allied. The main purpose of stratifying was to minimize the difference among the sampling units within the strata and to maximize the difference among the strata. The same specification that is used by NSE was used because it was appropriate for the purpose of this study.

Although the population of interest was rather small, a census could not be carried out because the trading activities of the different securities are not homogeneous and therefore a sample was taken. The sample selected met the following criteria; had a traded volume of shares above 5 percent per annum, this being the average traded volume of shares in 1996, and/or the top five traded shares in each strata. Using both criteria, 26 securities were studied.

Importance of the Study

The study will benefit the following groups of people:

1. The investors, since the price movement is a significant input in investment decision. Therefore, the investors will be interested in how well they can predict the movement of the share prices in the NSE. This will enable the investors to optimize their returns.
2. The academicians, since the study will enhance the overall understanding of the NSE. It will enable further studies in areas where the knowledge of the market is an essential input.

Scope of the Study

The study was limited to NSE, and all other references to other stock exchanges was made to clarify the status of NSE. Chapter one covers the background of the study, the statement of the problem, the objectives of the study, the methods of analysis and procedures, data collection and description, research designs, and importance of the study and scope of the study. Chapter two covers literature review on the working of NSE, the studies that have been done about the NSE, emerging stock markets and other stock markets of the world. Chapter three cover the analysis and results while Chapter four include a summary, conclusions and recommendations.

CHAPTER II

LITERATURE REVIEW

A Review of Nairobi Stock Exchange

As was mentioned, the NSE was established in 1954 to serve the needs of the business community in East Africa. The NSE has through the years, developed to become a crucial institution that continues to fulfill its stated mandate.

The 1984 study on "Development of money and capital markets in Kenya" by IFC/CBK became the blue print for structural reforms on the financial markets which culminated in the formation of the CMA in 1989. Capital Market Authority's main aim was to assist in the creation of a conducive environment for development of the country's capital markets. In 1991, the NSE phased out the "call over" trading system in favour of the floor based "open outcry auction" system. This was in line with the recommendation by Bishop (1988) who undertook a United States Agency of International Development (USAID) sponsored study on the rules and regulations of NSE. The NSE has also embarked on an extensive modernization programme that has seen the exchange computerize its operations and enhance staff training, to improve service delivery. For example, on 20th March, 1997 the NSE got connected to the Internet. This opened another window of information in which investors—both domestic and international—can have more information on NSE.

In the period beginning 1995, there was a significant turning point for the NSE in many ways. For example, the government opened the NSE to foreign investors who were also allowed to buy government securities; all exchange controls were removed, consequently easing capital inflows and repatriation of earnings. The securities market enjoys a favourable tax regime. Withholding tax on dividends and incomes payable to residents investors have been reduced to five percent, and it is a final tax while all listed

securities are exempted from stamp duty. The membership of stockbroking firms have risen to 20 while transactions costs have been scaled downwards with brokerage commission rates standing at a maximum of two percent and a minimum of one percent.

The recent privatization of Kenya Airways and National Bank of Kenya Limited attest to the vast potential of Kenya's capital market and, with more privatization coming, the NSE will grow more rapidly. The renewal of the East African Cooperation may also present an opportunity for growth at the NSE as the listed companies may seek to raise more capital through NSE in order to take up the larger East African market.

Nairobi Stock Exchange Operations

Nairobi Stock Exchange is a quasi-public organization with a membership of 20 stockbrokers. These brokerage firms are the only entities allowed to trade on the floor of NSE. They all must be Kenyan owned. Currently, there are no foreign brokers or traders allowed to operate in Kenya. The management of NSE is in the hands of the Board of directors made up of five members from the stock brokers, two members from the listed companies, two other who are co-opted members, and two members form the NSE secretariat. This ensures that the interest of all the key players in the stock exchange are catered for.

Trading Systems

Trading is conducted by open outcry system. Traders with orders from clients or who trade on their own account meet on the floor and attempt to buy and sell by voicing their desired position. When a match occurs, the staff of NSE fill out a trading slip in triplicate that is fully authenticated with signatures for both buyers and sellers and the stock exchange approved stamps. Trading occurs on Monday to Friday as continuous auction during one session from 10.00 am to 12.00 noon.

Orders

Brokers can place orders at market price, where the transacted price will be determined by the market, or limit order where the security will be transacted if the recommended price is met. The NSE accepts orders of 100 shares which is referred to as a board lot. Special lot are lots other than board lots. There are three types of special lot, three days offer, one hour hold and odd lots.

Orders of more than 100,000 shares or more, and which represent less than 15 percent of voting power at a general meeting, must be transacted through a special three days lot board. These lots must be offered on the board for a minimum of three days before they can be transacted. The order placed in the special lot must contain the name of the security offered, the reserve prices and the code number of the brokers offering. Once it has been placed on the board, it cannot be withdrawn or substituted. If, after the end of the third day no buyer has been identified, then it is transferred to the normal board and split into smaller lot sizes to facilitate transactions. In this case, the intent of NSE is to ensure that significant transaction that trade in large volume of shares is conducted in a fair and open manner.

If a single lot is less than 100,000 shares and the transaction value is Shs. 3 million or more, it will be offered in the one hour hold board at a reserve price and held for one hour before it can be transacted. This offer cannot be withdrawn until the end of the trading season, unless there is some material news that affect the company. Further, the reserve price cannot be changed until the expiry of the first one hour should one hour be over and there are no offers that are forthcoming, the lot may be split and transferred to the normal boards and the shares will be traded in accordance with the normal trading rules and regulations.

Odd lots are lots of less than 100 shares. Odd lots are traded in their own section of the boards and the rules of spreads do not apply when any auction is conducted. Otherwise, all other rules regarding transaction in the ordinary boards are applied.

Orders are matched according to well defined criteria. Prices receive top priority on all orders followed by time of placing an order. When an order is entered, it is matched with the best outstanding orders. The NSE does not have an all or nothing (AON) orders and, therefore, all orders are divisible in the sense that one can buy a fraction in the order.

Different colours indicate different types of orders. A green colour indicates that orders placed will be traded cum-dividend, while a black colour indicates that the orders placed will be ex-dividend. A yellow colour indicates trade with bonus issue while a white colour signifies that the shares are traded ex-bonus. A blue colour tag next to the name of a company indicates that a company has released certain information which may be material to the market. Unlike other exchanges such as Bosla Electronica of Chile (BCE), NSE does not accept orders for companies that may be having legal problems or under-liquidation or non-listed companies. If a company has been suspended from trading, a red colour tag will be placed next to its name on the board.

Auctions

The auction is concurrent, that is, all shares are auctioned simultaneously. There are several boards in NSE. These include, ordinary shares board; fixed Interest board, foreign Investors board, 1 hour hold board, 3 day hold board and odd lots board. Traders with orders to bid or offer voice out their orders and staff members of NSE write them out on board. Each order must include a trader members code number, the number of shares being offered or being bid for and the offer or bid price.

The bidding advance for ordinary shares has been recommended by NSE as follows:

| | |
|--------------------------|------------|
| Below Shs. 20 | 0.05 cents |
| Shs. 20 - Shs. 50 | 0.25 cents |
| Shs. 50 - Shs. 100 | 0.50 cents |
| Over Shs. 100..... | Shs. 1 |

All transactions must occur on the trading floor. Transactions will take place at the bid price when that price bid and the one offered for a security are two spread apart. When the bid and offer prices are one spread apart the transaction will take place at the offer price. A transaction can also take place at par when both the bid price and offer price are the same. When the same trader bids and offers within a transactable spread, the transaction will hold for 30 seconds before it is recorded. This is to enable other dealers to offer or bid during that period. If no response is forthcoming, the orders are closed and the transaction is completed.

A reference price is established at the start of trading each day. This is the previous day's closing price. The reference price determines a range in which subsequent trade may occur. Trades outside the range of 15 percent of the reference price can result in a suspension of trade but that depends on the behaviour of the price movement of up to that point. However, the supervisor on the trading floor can allow trading to go on if, in the supervisor's opinion, there is information which has been received, and it is material to warrant a more than 15 per cent share price movement. For example, on March 7th 1997 Lonhro Motors announced a bonus issue of two shares for every one held. Price subsequently moved upwards more than 15 percent and this rule was suspended. Also, if the floor supervisor is satisfied that there is sufficient supply and demand positions among the stock brokers in the floor to justify trading outside the 15 percent limit, the rule can be suspended.

Availability of Information

Members of the public have access to information on the boards in the public gallery of the trading floor. These boards provide the information on the previous day's trading, displaying current information on each share, including the highest and lowest price transacted and the number of shares traded in and number of deals.

Clearance and Settlement

A person wishing to buy securities pays the brokers the amount of money required to purchase the shares. However, the complete settlement of a transaction can take up to 14 days as per the rules of NSE. There are plans to introduce a Central Depository System (CDS) as a private company which would guarantee the clearance and settlement of any transaction. The process of clearing and settlement will then take place immediately a transaction is completed. It is hoped that this will increase the turnover from the current level of five percent.

Research on Nairobi Stock Exchange

The NSE and other stock exchanges in Africa have attracted a number of both non-academic and academic research work. The key non-academic research that was undertaken at NSE was by the CMA (1992). Among its findings were the facts that holding of shares is less popular than having a savings account, investing in land or having an account with a cooperative society but, on the other hand, it was more popular than a life insurance or a pension scheme. Also, the group surveyed held strong views about any new shares issued through the NSE. These views were that dividend yield should be 20-30 percent while capital appreciation should be 10-20 percent per year.

There was also a clear difference between small investors and professional investors, on the investment criteria and information required to enable them to make investment decision. The small investors were mainly concerned with dividend yield, profit track record and reputation of the company. Major investors, underwriters and stock brokers on the other hand looked first at the company management (not board of directors), the market in which the company operates in and the strength of the companies product. The research further stated that the privatisation of fundamental sound companies through selling of the government equity in the NSE would be successive. This was similar to the findings of Munge (1974) who stated that NSE was successive as a share distribution facility.

The report (CMA 1992) further states that half the potential investors regard shares as a good chance to make a quick profit. This partly explains why newly floated shares at NSE are undervalued. The main reason being that it provides room for capital appreciation in the short run in order to attract small investors in the primary market. This will lead to shares being traded at a premium in the secondary market immediately after issue. The size of the premium will be dictated by the anticipated supply and demand. McDonald and Fisher (1972) argue that the appreciation of the prices of the shares is in line with efficient market hypothesis which suggests that the prices of newly issued stock will quickly adjust to reflect the set of available information. For, if the issues are judiciously underpriced, there is a tendency for the exchange to attract investors and increase activity. This increase in activity further encourages increase in prices. Therefore, underpricing of newly issued shares can result in share appreciation at a later date.

In 1988 USAID sponsored report (Bishop, 1988) was released which became the blue print for the current micro structure of NSE. In his research, Bishop found that an average Kenyan citizen has a propensity to save rather than buy shares. This was the same conclusion arrived at by the CMA report (1992) which placed savings top on the list for all preference of Kenya investors. Bishop (1988) further stated that the NSE is a sellers market and the transacted price was usually or near to the best offer price.

In a paper presented to the African Stock Market Conference in Nairobi, Hartland (1993) stated that in Africa most stock exchange are characterized by having the main companies that are listed on the stock exchange being managed and partly owned by foreigners and often being subsidiaries of multinational companies. Examples of such companies are British American Tobacco (BAT), Uniliver, Lonhro, Barclays Bank and Standard Chartered Bank. These companies have been in the country for a long period of time. They have good management and also sound financial resources. Besides, these companies have low indebtedness, coupled with a well established financial infrastructure (auditing, corporate finance disclosure, minority protection, prospectus preparation), and

this means that financial information is readily available and is comparable in quality with the developed countries. Similar findings have been reported by Mathu (1996) and Aboagye (1993).

One of the earliest academic research done at NSE was by Munge (1974). He established that the NSE provides an active market for only a very small portion of company shares. The situation has not changed very much and this explains partly why the NSE turnover is still less than five percent annum. He further points out that the markets were highly illiquid and it could take upto 3 months before an offer was accepted. The most important function by then of NSE was the transfer of ownership of companies from the expatriates to the citizens of the country. Therefore, it was not an important source of capital for the listed companies.

Academicians have been using data from the NSE quoted companies to predict future events. Among them were Kiege (1991) who developed a model that could predict failure of companies 2 years before the event by using the current ratios, average collection period and return on equity for a period covering five years. Omosa (1989) also tested the predictive ability of the NSE by using three selected models. She concluded that the models selected were generally not good predictors of the prices. She attributed the failure of the model to capture some of the attributes of the NSE to the inefficiency of the model itself or to the imperfection of the market. The failure of the model is in line with the argument of Claessens (1995) who said that the inability of capital asset pricing model (CAPM) to predict prices was as a result of the model failure. Munge (1974) explained that the reason as to the differences in findings in NSE and the developed markets was that the former operated in a different environment from those in the developed countries on which the classical business finance theories are based. One of Omosa (1989) significant findings was that autogressive integrated moving average (ARIMA) models were better predictors than the earning per share (EPS) and CAPM models and that 3 companies in which the ARIMA model predicted the share prices accurately were all in the actively traded stratum

of the sample. Similar findings were established by Deschamps and Mehta (1980). This would imply that for the actively traded companies it would be possible to predict the prices. This is supported by the findings of Blavers, Cosimano and McDonald (1990). Omosa (1989) also attributed the failure of the models to predict the prices due to the different rates at which the investors receive information and how they react to this information. This may lead to the differences between actual prices and the expected prices. Therefore, the differences between the actual and / or predicted prices could have been "Noises" which could have been a significant variations between the two prices.

Kinandu (1990) did a case study of NSE and concluded that the market may provide empirical results consistent with weak form efficiency. He notes that the results do not categorically state that the market is weak from efficient, but the result do not contradict the weak-form of the efficient market hypothesis (EMH). As has been the case with developed markets, many more studies would have to be carried out for this market, covering longer time intervals, for any strong conclusion to be arrived at. However, since the rules and regulations, and the mirco-structure have changed in NSE since Kinandu (1990) did his study, there is need for further study.

Kerandi (1990) also studied the predictive ability of the dividend valuation model on the ordinary shares. The study indicated that only three percent of the 13 companies studied indicated that the dividend valuation model is good predictor of ordinary shares prices at the NSE. This may partly be explained by the use of bid prices only which are prices that originate from the demand side only and not the supply side. The result may have been different if he used the transaction price because this could have been the price which would have equated the future expectation of both the buyers and sellers of the securities.

Muturi (1990) also forecasted asset requirements in publicly quoted companies. He used multiple linear regression analysis to predict the asset requirement of the companies. The major findings of the study was that there was a strong relationship between the level

of the sales and the level of asset although the relationship was not that of cause and effect, and therefore the study could not predict the asset level accurately.

There has been a growing body of research on the level of corporate disclosure on the publicly quoted companies in the NSE. Among them has been Mathu (1996), who states that the level of disclosure in the publicly quoted companies is enforced by the compliance with the Companies Act with regard to disclosure in the corporate annual reports. This is done indirectly through the auditing Certified Public Accountants (CPA) firms and by the CMA through NSE. The CMA regulation requires that the NSE has rules in place regarding corporate disclosure by the listed companies. This would enable any investor who wants to make any decision based on published information to do so. To avoid the asymmetry of information on NSE, the Companies Act require that information be disclosed through the corporate annual reports.

Emerging Markets

Nairobi Stock Exchange belongs to a category of stock markets that are known as emerging markets by the World Bank. The World Bank defines emerging markets as any stock exchange in a developing country, with the implication that they all have a potential to develop (IFC, 1994). These types of markets have attracted a lot of interest from the researchers of the World Bank, and other researchers in the developed world. Glen (1994) says that the micro structure of the stock markets has an effect on how securities are traded in the market and, therefore, the market structure plays a significant role in both market success and individual security pricing. The micro structure effect can be felt in the, liquidity, trading cost, information availability and volatility.

Liquidity has an effect both on attracting market participant and on the market. The attractiveness of the market is enhanced by the ability to transact quickly and without moving prices. The speed with which transaction are completed depends on two factors; the number of market traders, and the micro structure of the market. For any given micro structure the more traders there are, the more likely order to buy or sell can be matched

against other potential traders. By limiting the number of hours in which trading can occur, for example, between 10.00 a.m. and 12.00 noon in NSE, rather than continuously throughout the day, the market micro structure has a direct impact on liquidity of the market. The poor regulatory procedures and slow clearance of upto 14 days in the NSE between the purchase, delivery and sales of shares makes the investor vulnerable to high inflation. The delay affects the investor in the sense that he cannot sell the securities and, therefore, he is exposed to further risk by weak brokerage system. Glen (1994) adds further that liquidity goes beyond the physical ability to trade and also includes market depth, which refers the ability to transact at the current market price. In a deep market, even large orders can be transacted at current prices. In contrast, when market depth is lacking, the larger an order, the more prices will have to be adjusted to fill that order. He explains that markets with continuous trade in all the hours of the day may be thinner than markets with batch orders in a periodic auction. Therefore, even if the periodic auction forces trader to wait, auction markets can be deeper and more attractive as a result. The trade-off between the depth and speed at which transaction can be made is among the many dilemmas that must be dealt with when designing trading system.

Trading cost includes the cost associated with a trade, such as taxes and commission. Most markets determine the commission to be charged by the broker while the sales taxes are determined by the central government. The micro structure of the stock exchange will have a role in determining the commission for the brokers as well as the major cost that the market imposes. This is the bid/ask spread, which is the difference between the price one pays to buy and the price one receives for a sale. The spread that investors pay for accessing the market reflects a combination of factors, including the differences of opinion held by buyers and sellers, but also it includes micro structure features. In some markets, for example, a single individual is responsible for quoting prices. In such a situation, he is referred to as a market maker. He can influence liquidity in determining the depth of the market. Market makers supply liquidity by influencing the

supply and demand of the securities but the risk associated with that activity is reflected in the bid/ask spread, which is the source of returns on the market maker's inventory and for bearing the risk. Alternatively, multiple market makers are possible and the competition this provides reduces spreads. In other markets, no designated market maker exists perhaps reducing spreads even further. With no individual responsible for making the market, investors are exposed to possible reduced levels of liquidity. By adopting a micro structure that allows for competition among traders, or by assigning an individual market maker whose duty it is to ensure that trading is possible, micro structure can have a direct effect on trading costs and liquidity.

Markets are said to be efficient if they quickly and correctly incorporate information into prices. This is important because many traders are unable to devote time and resources to gathering information, preferring, instead, to depend in the market itself to properly reflect all available information in prices. For these uninformed traders, a market that is inefficient is also unattractive because it means that trades may be made at unfavourable prices. For those reasons, markets that are more efficient will attract investors, which translates into increased liquidity. Micro structure has an important role to play in encouraging market efficiency both through the information services that are provided to participants as well as the nature of the trading system. Without information on recent market activity, traders will have to rely solely on the current market prices as a signal of value. In addition, the current price being a sufficient statistic of true value in an efficient market, traders might also benefit from information on recent trading behaviour.

Information on volume, market depth and recent price movement can all provide important signals about market activity that the investors employ to determine what traders make. The availability of information reduces uncertainty and increases market interest, which leads to liquidity. The micro-structure of a stock exchange can, to a large extent, influence the efficiency of the market by determining the trading system. For example, some markets have introduced automated trading. However, Glen (1994) says that by

moving information from the trading floor to the anonymity of a computer terminal, the system could be exploited by unscrupulous traders. On the floor, traders have to develop a reputation of honesty in their dealing that may make them less likely to attempt to conduct trades at the expense of uninformed colleagues. But such is not the case with automated systems, where reputation can be lost as a control factor and an informed trader can take advantage of the uninformed. However, in automating transactions, the transparency and objectivity of the system is appealing, as is the market information they make available. Because all traders are processed by a computer, market participant can observe volume and prices on a transaction-by-transaction basis, something nearly impossible without computer intervention.

Glen (1994) refers to volatility as the frequency and magnitude of price movements. This can also be influenced by micro-structure. Prices are expected to vary over time to reflect changes in relative and absolute value. The concern over volatility is that short-term price movements do not correctly reflect changes in equilibrium value. Liquid markets have lower transaction costs, especially bid/ask spreads, and the observed movement of prices will be less volatile as the natural bouncing of transaction between bid and offer occurs over time. In the industrialized countries, the stock markets are efficient and new information will be correctly and quickly incorporated into price and, even though that may result into price jumps, price overshooting and deviations from equilibrium prices are reduced.

Volatility may arise from the economic fundamentals that drive prices. For this reason, volatility will always remain. However, to isolate fundamental volatility from trading noises owing to asymmetric information or temporary order imbalances, market micro structure may introduce price limits which stop trading whenever price changes exceed a given level. In the NSE, case it is 15 percent of the previous days closing price. The main aim in this case is to provide a cooling-off period for the information to be disseminated and processed by investors in order that economic fundamentals may prevail

when trading is resumed. While the price swings may achieve their effect, their impact on liquidity is not desirable. Once again, micro structure of the market affects volatility. Moss and Kenny (1996) provide examples of volatility in gains of Zimbabwe market of 133 percent in 1990 and 110 percent in 1993, but losses of 55 percent in 1991 and 59 percent in 1992, and, this shows, that emerging markets are highly volatile.

Other World Bank researchers have been interested in the emerging markets.

Claessens et al (1995a) says that the returns are very high in these markets but they have very high volatilities. Harvey (1995) finds that the rates of return in the emerging markets are more predictable than in industrial countries, mostly because of a higher auto-correlation of return. He also finds that these markets have several constraints. These constraints involve limitation of short selling (prohibited by the rules and regulations of NSE), maximum position limits for each market or groups of markets (the 40 percent limit of foreign ownership in NSE), and limits on the security exposure to certain risks (15 percent price swings limit for the NSE).

Buckberg (1995) characterizes the emerging markets on two bases, price and return patterns, and price volatility. He states that price and returns reveal some of the most crucial differences between emerging markets and mature markets. The emerging markets have also a low to negative correlation with the world markets. Buckberg (1995) also concurs with Harvey (1995) in predictability; he argues that the high auto-correlation in returns is characterized by speculative inefficiency, and this indicated lagged prices which may contain information about future returns. He also concurs with Glen (1994) on volatility and inefficiency of these markets and attributes this to information asymmetry and with few trades occurring, information about stock value and hence prices tend to be noisy. Further, market micro-structure allows for limited reporting requirements and this implies that many investors have less information about firms and receive less frequent up dates than do investors in industrial markets.

Claessens, et al (1995b) say that certain institutional features may induce return behaviour that deviates from expected behaviour such as random walk. They also introduce the concept of seasonality and predictability. By seasonality they argue that there are certain periods of the year where returns are high, and predictability they try to ascertain the level of returns in a certain time in future. They argue that just because the stock market is predictable does not mean that it is inefficient but, rather, it maybe that the models being used may not be capturing the factors that drive stock returns. This may imply a model failure rather than market inefficiency. Their conclusion is that, returns can be predicted in emerging markets and they do not appear to be related to size of the company listed or the stock exchange itself.

Other Stock Exchanges

There is a growing body of researchers who have attempted to predict the prices movement at the stock exchanges. Fama (1965) stated that prices moved in a random manner, because the market does not have a memory and that prices react to the information that is randomly released in the market. However, Pinches (1970) say that disregarding minor fluctuations, prices move in trends which persist for an appreciable length of time. Therefore, changes in trend, which represents an important shift in the balance between supply and demand, however caused, are detectable sooner or later in the action of the market itself. Further, when statisticians predict that course of stock prices describe a random walk, they do not imply that prices changes cannot be forecast, rather the implication is that one cannot predict the price movement on the basis of historical figures alone.

Umstead (1974) explains that stock prices are determined by expectations, which if they are rational, must be derived from existing measures of the economy. These expectations are formed in a systematic relationship to the leading elements of economic activity. For example, he argues that business cycle information does not become available in discrete bits which the market place instantaneously absorb with perfect efficiency, but

rather this information unfolds gradually in a cyclical pattern over time. Therefore, stock prices appear to respond in a predictive manner to the cyclical flow of information. Jones (1974) also observes that in share price modelling, not nearly enough is known to justify building system of equation with confidence in their completeness. When one is primarily concerned with forecasting, it is appropriate to regress the dependent variable drawn from previous periods. Schwarts (1973) further examines that price movements take place due to information that is either market related or firm unique. He concluded that even though the cardinal measure of volatility behaves randomly over time, the ordinal measure will remain stable for a reasonable long period of time for the firms in the stock market. Therefore, there is a relationship between present or past movement in volume and present or future movement in prices.

Researchers have established a seasonal price movements in stock exchanges. Corhay et al (1987) attributed seasonality in the stock exchange to the tax-loss selling hypothesis, which predicts that stock returns will be higher in the first month of the fiscal year. As the end of the fiscal year approaches, investors can reduce their taxes by selling the stocks on which they lose money during the year. In doing so, they realize capital losses that are deductible from their taxable income. The sale of securities at the end of the year depress prices which recover at the beginning of the next fiscal year as stock move back toward their equilibrium value. Empirical evidence revealed a common characteristics across the three stock exchanges they studied. In New York Stock Exchange (NYSE) and Belgium Stock Exchange the returns are high in January. This can be attributed to the fiscal year ending in December, while in London Stock Exchange (LSE) the return is significantly high in April because the fiscal year ends in March.

Jegadeesh (1990) used data from Centre for Research in Security Prices (CRSP) of USA. He also obtained high returns for the month of January. Lakonishuk and McBerly (1990) established that Monday is the day with the lowest trade volume, because there are more sellers than buyers and therefore there is a price drop on Monday (NYSE). Afel

(1990) used data from CRSP and established that there are high returns on the trading day prior to holiday which average nine to 14 times the mean return for the remaining days of the year.

Baldwin (1984) noted that a security analyst can predict earning per share, using segment or line of business reporting, and therefore for a multi segmented firm it was possible to predict earning per share, hence one can predict prices. Vanhome and William (1972) observes that by carefully analyzing the sensitivity of prices, wages and other costs of unanticipated changes in inflation, one is able to predict the likely effect on share volume traded. Hence, one is able to predict the effect of inflationary periods, which have an influence on the behaviour of stock prices.

Balvers, Casimano and McDonald (1990) used a model which related financial assets returns with serial correlation in aggregate output. Aggregate output is serially correlated hence predictable. Empirical results confirmed that stock returns are predictable function of aggregate output in NYSE. Fama (1990) using data from NYSE established that 58 percent of variance in prices could be explained by one year leads of quarterly production growth.

Lamoubex and Lastrapes (1990) say that auto regressive conditioned heteroskedasticity in daily stock return data reflects time dependence in the process of gathering information flow to the market. Daily trading volume, used as a proxy for information arrival time, is shown to have significant explanatory power regarding the variance of daily returns. Most researchers therefore established that it is possible to predicate the price movement in the stock exchange by using the actual past price and observing their movements or using surrogate figures such as production or inflation.

CHAPTER III

DATA ANALYSIS AND INTERPRETATIONS

Characteristics of the Sample

Appendix I shows the population of the study while appendix II shows the sample selected on the basis of the top five securities in each category and/or the security which had a traded/issued share ratio of five percent and above. In absolute terms both the financial and commercial sector provided the bulk of the securities analyzed.

Table 1: Types and Numbers of the Firms in the Sample Frame: 1997

| Type of company | Number of companies | Sample selected | Percentage |
|-----------------|---------------------|-----------------|------------|
| Agricultural | 10 | 5 | 50.00 |
| Commercial | 23 | 7 | 34.43 |
| Finance | 17 | 7 | 41.18 |
| Industrial | 21 | 6 | 28.51 |

Sample size 25

Source: Primary data

The above table shows the number of companies in each sector, the sample selected and the percentage of the sample in relation to the total number of companies in each sector.

Agricultural Sector

Rea-Vipingo Plantations Limited

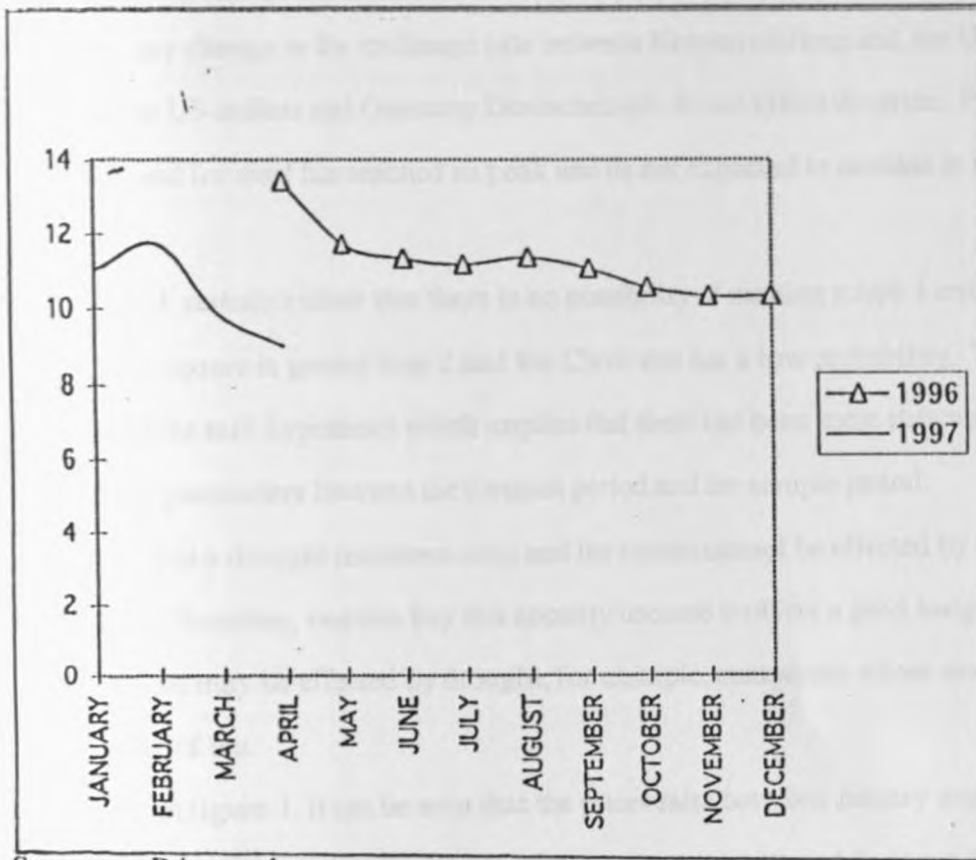
This company was incorporated in 1995 and has foreign control. The shares have a per value of Shs. 5.00. The company was incorporated for the purpose of acquiring the principal East Africa Sisal interest of two overseas groups, Alberts and Rea. These interests consisted of established sisal estates in Kenya and Tanzania, a herd of cattle and sisal spinning mill in Tanzania. The acquisition resulted in the creation of the East African plantation group, which has over 10,000 hectares of existing sisal plantations, divided between three separate estates units in Kenya and Tanzania and with substantial reserve land available for further expansion. The group has a capacity of converting a proportion of its raw fibre production into twine and industrial rope yarns. In March 1996, it floated 8 million ordinary shares, 14.3 percent of its authorized shares of Shs. 5.00 to the public, at Shs. 10.50 each.

The security started trading in the secondary market in April 1996 with a price of Shs. 15.00. The prices started to decrease and stabilized to levels between Shs. 10 and Shs. 11. This can be attributed to the fact that six months before the shares had been sold to the public, there had been a private placement of 8 million shares which were sold at Shs. 8.50, these shares were also eligible to be sold at NSE and the supply outstripped the demand. This resulted in a decrease in price of the security. In January 1997, when the end year results were announced and a dividend was declared, the price increased to Shs. 11.70 and later when they started to trade ex-dividend, the price decreased to Shs. 9.85. The prices have continued to decrease since then.

The dividends levels of Shs. 1.70 was paid out to minority shareholders as the principal share holders had waived the right to dividends for the financial year ending 30th September 1996. However, this waiver expired with the 1995/96 dividend, and although the chairman of the company promised the same amount of total dividend (Shs. 43 million), the dividend per share may be lower unless the company pays out of the general

reserves to retain the same level dividend paid out to the share holders in 1996.

Figure 1: Average Monthly Prices for Rea Vipingo Limited: 1997



Source: Primary data

The following is the OLS model for this security:

$$P = 0.341 P_{(t-1)} + 0.009 WSP - 0.421 Div + 0.959 EPS - 0.0423 P/E - 0.064 F/E$$

$$(1.272) \quad (0.842) \quad (0.835) \quad (-1.442) \quad (0.203) \quad (-0.227)$$

$$+ 1.874 F/E (Us/Dm) + 0.459 Y + 137.948$$

$$(0.504) \quad (0.889) \quad (4.307)$$

$$R^2 = 0.999$$

$$F(6,5) = 1081.01, p\text{-value} = 0.000$$

$$SD = 1.279$$

$$\text{Forecast chi-square} = 4.27$$

$$\text{Chow test} = 2.04, p\text{-value} = 0.0003$$

Where figures in parentheses represent t-values and also in all subsequent equations.

Rea Vipingo prices its products in US dollars while its major market is in Germany. However, any change in the exchange rate between Kenyan shilling and, the US dollar, and between US dollars and Germany Deutschemark do not affect the price. Further, the world demand for sisal has reached its peak and its not expected to increase in the near future .

The F statistics show that there is no possibility of making a type 1 error, but the forecast chi-square is greater than 2 and the Chow test has a low probability. This is a rejection of the null hypothesis which implies that there has been some structural changes in some of the parameters between the forecast period and the sample period.

Sisal is a drought resistance crop and the results cannot be effected by the vagaries of weather. Therefore, one can buy this security because it offers a good hedge against securities that may be effected by drought, for example, companies whose main business is the growing of tea.

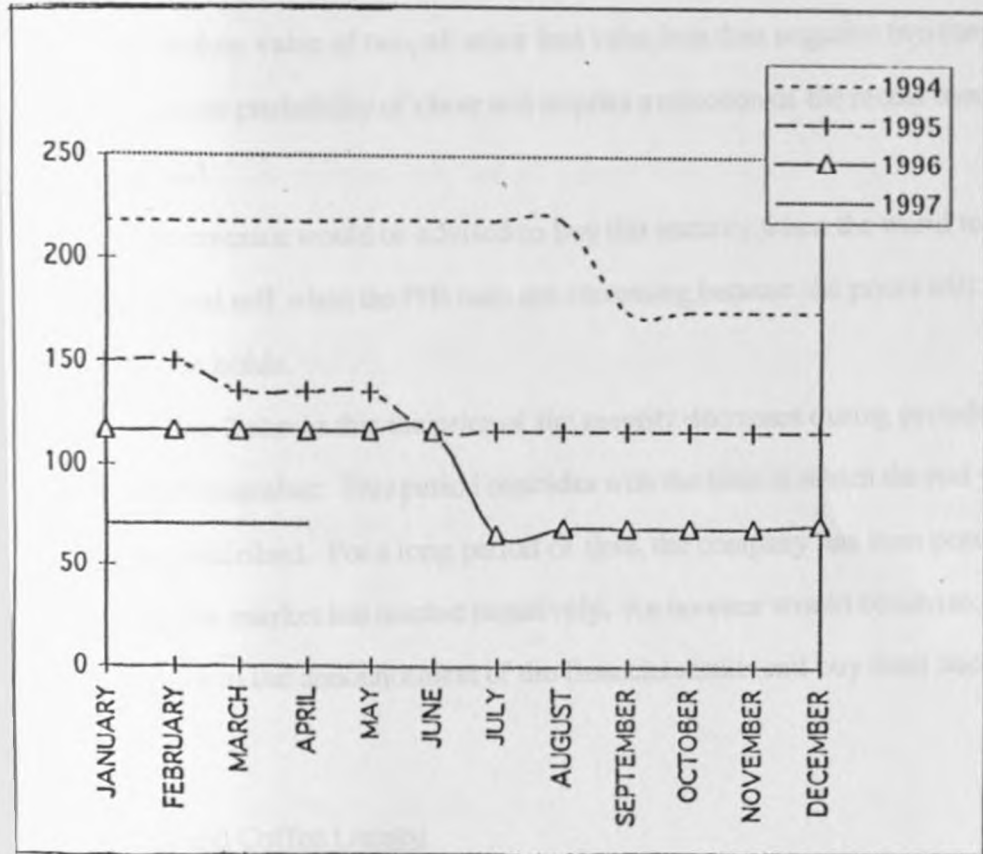
From figure 1, it can be seen that the prices raise between January and February. This is the period that the company release the end year results and declare a dividend. Therefore an investor is advised to buy the security in December and sell it immediately the dividends are declared.

Kapchorua Tea Company Limited

The principle activities of this company are the cultivation and manufacturing of tea, mainly in Nandi Hill areas. This security is an ordinary share with a par value of Shs. 5.00. This security is very illiquid because the shares are largely in the hands of foreigners, and in family trust. The first time it was traded in the sample period was in March 1994 at a price of Shs. 189.50. This was the period where the foreign exchange rate was Shs. 64.88 to the US dollar. The price also improved after a bonus of 1 for 1 was declared, (to the level of Shs. 218.00). Since then, the price for the security has been on a

decline. By the time of this study, it had declined to an average of Shs. 70. This was because the investors viewed that there were better opportunities for investment in and outside the market.

Figure 2: Average Monthly Prices for Kapchorua: 1997



Source: Primary data

The following is the generated OLS model:

$$P = 0.572_{(t-1)} + 0.280 \text{ WTP} - 0.680 \text{ F/E} - 4.466 \text{ Div} - 5.223 \text{ EPS} + 54.747 \text{ B}$$

$$(3.795) \quad (1.043) \quad (-1.026) \quad (-0.403) \quad (-3.424) \quad (0.952)$$

$$- 0.416 \text{ P/E} + 3.496 \text{ Y} + 158.680$$

$$(-3.484) \quad (1.320) \quad (2.302)$$

$$R^2 = 0.952042$$

$$F(7,17) = 48.21 \text{ p-value} = 0.0000$$

SD = 10.245

Forecast chi-square = 61.63

Chow test (12,17) = 2.6, p-value = 0.0321

Although the forecast chi-square does not measure the absolute forecast accuracy, the large value for the statistic in this model imply that the equation does not provide very accurate ex-ante predictions, (only the months of May 1995 and June 1995 had a t-value less than absolute value of two, all other had value less than negative two (negative). Further, the low probability of chow test implies a rejection of the model used in the entire sample period.

The investor would be advised to buy this security when the world tea prices are increasing, and sell when the P/E ratio are increasing because the prices will be decreasing. The converse holds.

Figure 2 shows that the price of the security decreases during periods between March and September. This period coincides with the time in which the end year financial results are published. For a long period of time, the company has been posting poor results and the market has reacted negatively. An investor would be advised to sell this security prior to the announcement of the financial results and buy them back at a lower price.

Sasini Tea and Coffee Limited

This is a locally controlled company with an ordinary security which has a par value of Shs. 5.00. The company main activity include, growing and processing of tea and coffee, investment in equity and property, forestry and breeding of cattle for milk and beef.

From January 1992 to July 1993, the prices were depressed to a figure below Shs. 50.00. The later half of the 1993 year saw the government liberalize the foreign exchange and allowed foreign current account where farmers could retain their hard currencies. A combination of this favourable factor, a weakening of the shilling and a declaration of the bonus of 2 for 1 moved the prices to an all time high of Shs. 320.00. But when the shares

started to trade ex-bonus, the price slumped down to Shs. 112.15. After an interim dividend was announced in July 1994, the prices improved but started to decline when they were quoted ex-dividend. In July 1995 when the security was traded cum-dividend for an interim dividend, the prices improved and the average for that month was Shs. 69.00. After that, the prices started to decline and they reached their lowest levels of Shs. 49.80 in March 1996. The decline in the market price was generally for every security in the market. This decline could be attributed to an earlier on announcement by the government that it would allow foreign buyers to participate in the market. The Kenyan investor, anticipating a boom in the market, bought shares. When the anticipated boom never materialized, they started to offload their shares and this depressed the prices. However, when the foreigners started to actively participate, the prices improved and towards the end of the sample period the prices had started to pick up.

The following is the OLS model:

$$P = 0.770 P_{(t-1)} + 13.641 \text{ Div} + 14.240B - 0.001 \text{ WCP} + 0.001 \text{ WTP}$$

$$(8.531) \quad (1.490) \quad (1.632) \quad (0.38335) \quad (0.067)$$

$$+ -733.216 Y + 8.974 \text{ EPS} + 6.497 \text{ P/E} - 15.458$$

$$(-1.506) \quad (1.321) \quad (2.472) \quad (-0.507)$$

$$R^2 = 0.7936179$$

$$F(3,43) = 23.62, p\text{-value} = 0.000$$

$$SD = 9.0342$$

$$\text{The forecast chi-square} = 0.4$$

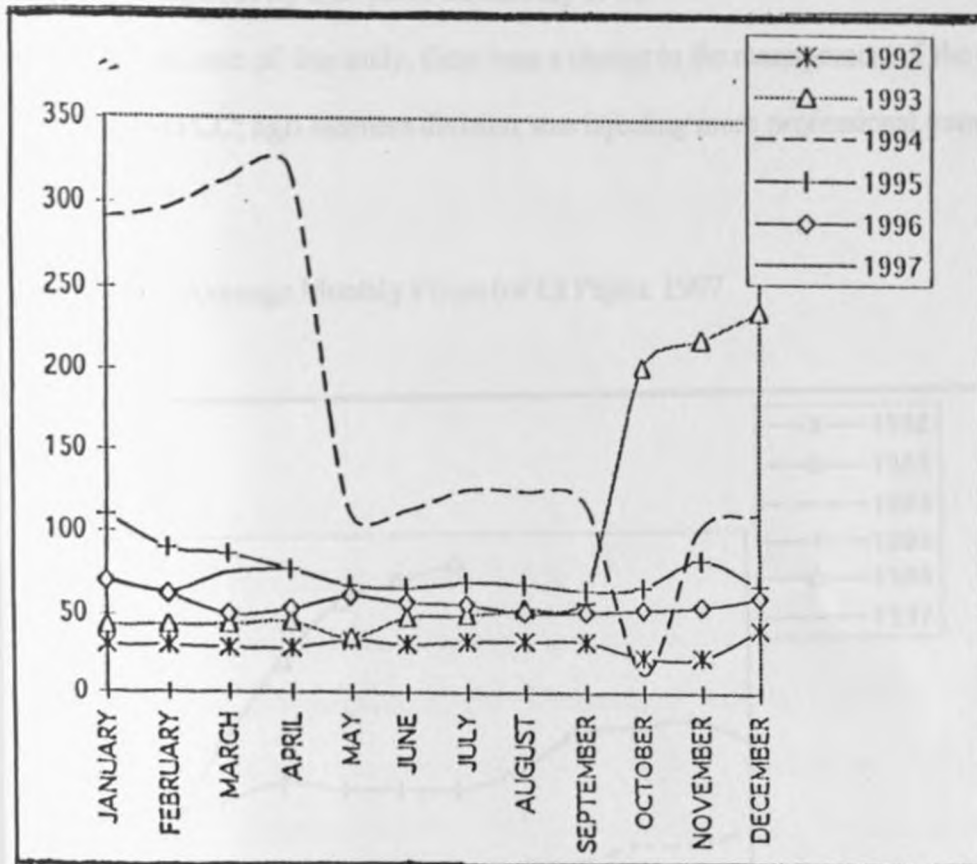
$$\text{Chow test } (12,43) = 0.04, p\text{-value} = 1.000$$

The F statistics indicate that there is no probability of making a type 1 error. The Chow test rejects the null hypothesis and it has a probability of 1, of not making a type 1 error. All the ex-ante forecast figures were significantly accurate.

The foreign exchange rate is the only variable which directly influenced the earnings of the company, through foreign exchange loss or gains. An investor should buy (sell)

when the shilling is weak (strong) for a long period. The investor should also hold buying or selling when the direction of the F/E is not clear.

Figure 3: Average Monthly Prices for Sasini: 1997



Source: Primary data

There is no pattern in the price movements and therefore an investor cannot predict price movement (see figure 3). It should be noted that the company's two main commodities (coffee and tea) are seldom in step with each other. The company balances the fortune of one commodity against the losses of the other commodity.

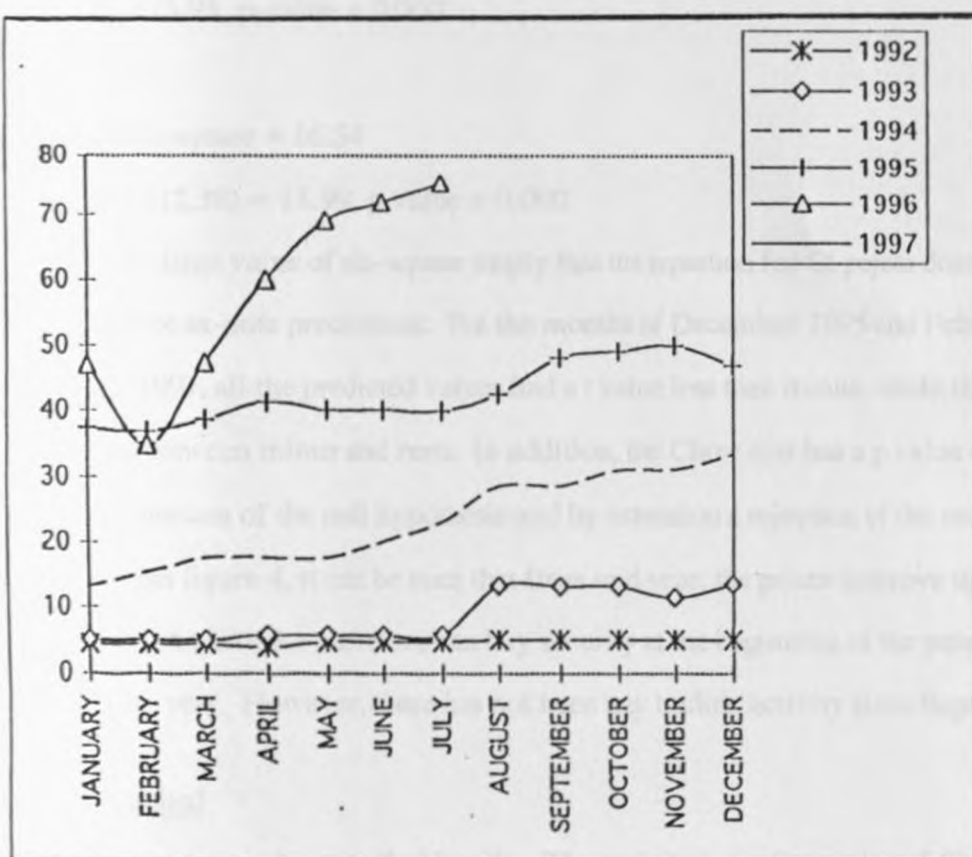
OI Pejeta Ranching Limited

This company was incorporated in 1953 and it is locally controlled with ultimate holding being in Louhro Public Limited Company. The company has two main activities,

the breeding and trading in livestock and the operation of tourist lodges and a game reserve. The price of this security has been on an upward trend. This can be explained by the fact that Lonhro PLC is buying every security of this company that comes into the market at whatever price. The free float for this security keeps on reducing. It is for this reason that the last trading activity took place on 1st July 1996.

At the time of this study, there was a change in the management of the Ol pejeta with Lonhro PLC; agri business division was injecting more professional management in the company.

Figure 4: Average Monthly Prices for Ol Pejeta: 1997



Source: Primary data

The factors that can affect the results of this company and in extension the prices of this security are the vagaries of weather in the livestock division and drought in the

neighbouring countries which will increase the supply of beef in the country they export their beef products at a cheap price to avoid any loss that may result from the drought. This appreciation (depreciation) of the Kenyan shilling may decrease (increase) the number of tourists who will visit the country and therefore affect the performance of the lodges.

The OLS model has the following parameters.

$$P = 0.973 P(t-1) + 0.735 \text{ Div} - 0.477 \text{ EPS} + 0.024 \text{ F/E} - 5.779 \text{ Y} - 0.014 \text{ P/E}$$

$$(13.789) \quad (0.284) \quad -1.044 \quad (1.487) \quad -2.292 \quad (-0.014)$$

$$+ 17.025$$

$$(5.098)$$

$$R^2 = 0.992962$$

$$F(6,33) = 775.93, \text{ p-value} = 0.000$$

$$SD = 1.702$$

$$\text{Forecast chi-square} = 16.54$$

$$\text{Chow test}(12,38) = 13.99, \text{ p-value} = 0.000$$

The large value of chi-square imply that the equation for Ol pejeta does not provide very accurate ex-ante predictions. For the months of December 1995 and February, March and April 1997, all the predicted values had a t value less than minus, while the rest of the values are between minus and zero. In addition, the Chow test has a p value of 0.000.

This is a rejection of the null hypothesis and by extension a rejection of the model.

From figure 4, it can be seen that from mid year, the prices improve up to December. An investor therefore can buy security at the beginning of the year and sell towards the year. However, there has not been any trading activity since September 1996.

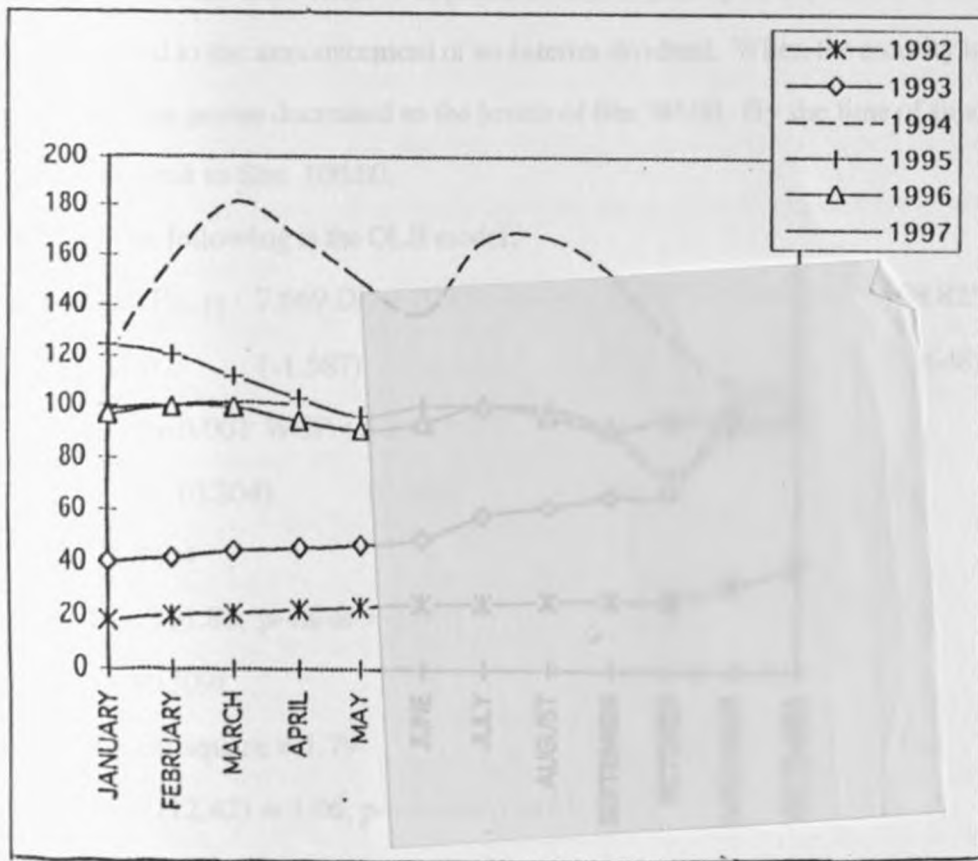
Kakuji Limited

This company is controlled locally. The security has a face value of Shs. 5.00. The nature of business is the cultivation and manufacturing of tea, coffee and livestock farming. It also has jointly controlled operations dealing with the growing of pineapple with Del Monte Kenya Limited. It has a growing interest of other horticultural crops, and

afforestation. The company is also an agent for sale of coffee. The security of this company is cross listed at LSE.

The prices have had an upward trend since January 1992 and attained a level of Shs. 180.00 per share during the NSE 1993/1994 boom. The prices started to decline in April 1994 when the shilling started to gain against the US dollar. The prices declined to levels of Shs. 135.00 towards the end of June 1994, when the prices shot up again to Shs. 190.00. This was in response to an increase in world prices of coffee. Thereafter, the prices stabilized, but started to decline in November 1994.

Figure 5: Average Monthly Prices for Kakuzi: 1997



Source: Primary data

This was in response to a reduction in world coffee prices. The prices stabilized and later started picking up again to a level of Shs. 125.00 when the interim dividends were

declared. When the shares started to trade ex-dividend the prices declined again but they stabilized in March 1995 when a bonus of 1 for 2 share was declared. Immediately the prices were quoted ex-bonus, the prices decreased slightly but again picked up when a final dividend was declared in May 1995 and then stabilized upto mid September the same year when they started to fall. This coincides with the period in which interim dividends of Shs. 0.75 was declared. In March 1996 when the results were announced and a final dividend of Shs. 1.25 was declared, the prices dropped due to the low yield and in May when the prices of coffee declined by approximately 13 percent, the prices for this security dropped to levels slightly over Shs. 80.00. In June 1996, the prices of this security stabilized but at the end of the year they started to decline again. This could be attributed to the drop in prices of both tea and coffee. The prices started to pick up in September 1996. This could be attributed to the announcement of an interim dividend. When the security traded ex-dividend, the prices decreased to the levels of Shs. 80.00. By the time of this study, they had recovered to Shs. 100.00.

The following is the OLS model:

$$P = 0.556 P(t-1) - 7.669 \text{ Div} - 10.961 B + 4.216 \text{ EPS} + 2.044 \text{ P/E} + 158.825 Y + \\ (8.375) \quad (-1.587) \quad (-1.151) \quad (4.136) \quad (6.922) \quad (0.648) \\ 0.005 \text{ F/E} + 0.001 \text{ WCP} + 0.290 \text{ WTP} - 18.087 \\ (0.232) \quad (0.204) \quad (0.083) \quad (-3.087)$$

$$R^2 = 0.97464$$

$$F(8,42) = 201.80, p\text{-value} = 0.000$$

$$SD = 8.0413091$$

$$\text{Forecast chi-square} = 1.79$$

$$\text{Chow test } (12,42) = 1.06, p\text{-value} = 0.4167$$

From the model, the most significant variables were EPS, the Price (t-1) and P/E. The model produced an accurate ex-ante value since all the forecast prices had t-value of between zero and minus 2.

An investor would be advised to buy (sell) the shares when the prices of tea and coffee are increasing (decreasing); also when the shilling is depreciating (appreciating). The investor should hold to buy when the economic conditions are stable. Figure 5 does not provide a clear pattern for the price movement, and therefore an investor cannot be able to predict the when the price would increase or decrease.

Commercial and Services Sector

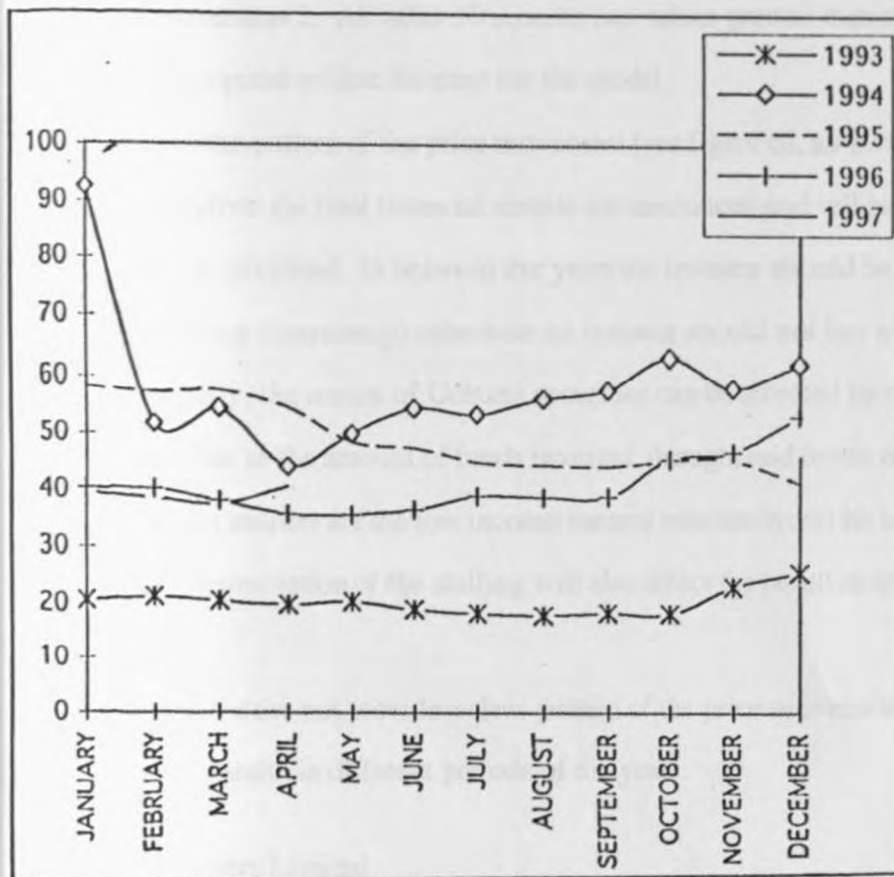
Uchumi Supermarkets Limited

This is a locally controlled company whose ordinary share has a par value of Shs. 5.00. It is an enterprise for the retail sale of essential commodities at competitive prices and creates outlets of locally manufactures goods. It also earns a substantial amount of interest from deposited funds.

In 1993, major economic changes occurred as interest rates were deregulated, foreign exchange liberalized, and import controls were removed. The prices of consumer products fell rapidly and competition became fierce. This affected the end year financial result of the company.

In 1992 and 1995, the government sold part of its stake in the company to the public through a public offering. The securities started trading at the NSE on 4th January, 1993. The prices opened at slightly over Shs. 20.00 and improved up to Shs. 25.00 but later started to decrease to prices under Shs. 20.00. There were "noises" in trading upto the end of 1993 and in the beginning of 1994. Uchumi security, just like any other security benefited from the 1993/1994 NSE boom. In 1994, on both occasions when an interim dividend (April 1994) and a final dividend (November 1994) were declared the prices improved. But towards the end of the year prices started to slide down when no more announcements were forthcoming. In May 1995, an interim dividend was declared and the prices went slightly up again. Both the announcement of a bonus and final dividend (October 1996) caused the prices to shoot up and when the shares started to trade at ex-dividends, the prices decreased to levels below Shs. 40.00.

Figure 6: Average Monthly Prices for Uchumi: 1997



Source: Primary data

The OLS model has the following characteristics:

$$P = 0.041 P(t-1) + 0.228 \text{ Div} + 7.783 \text{ EPS} + 4.783 \text{ P/E} - 0.001 \text{ F/E} - 2.015 Y$$

$$(0.866) \quad (0.272) \quad (18.345) \quad (20.339) \quad (0.549) \quad (-0.051)$$

$$-39.291$$

$$(-17.786)$$

$$R^2 = 0.993303$$

$$F(5,33) = 978.95 \text{ p-value} = 0.000$$

$$SD = 1.32245$$

$$\text{Forecast chi-square} = 1.54$$

Chow test (12,33) = 1.14, p-value = 0.364

As the above results indicate only the EPS and P/E are significant. The possibility of making a type 1 error is zero. In the forecast, only January 1997 and March 1997 had t-value less than minus 2. All other 10 months had values greater than minus 2 and less than zero implying a good ex-ante forecast for the model.

As per the pattern of the price movement (see figure 6), an investor should buy this security just before the final financial results are announced and sell just before the shares start to trade ex-dividend. In between the years the investor should buy (sell) when the P/E ratio is decreasing (increasing) otherwise an investor should not buy nor sell this security.

Generally, the results of Uchumi securities can be effected by changes in the interest rates due to the amount of funds invested, drought and levels of inflation because the major target market are the low income earners who are worst hit by the last two factors. The depreciation of the shilling will also affect the result as most of the goods sold are imported.

Figure 6 does not provide a clear pattern of the price movement as the company announces its results in different periods of the year.

Pearl Dry Cleaners Limited

This company was incorporated in 1945 and is locally controlled. Its main business activities include dry cleaning, laundering and dyeing, and owning some properties. The company has two types of securities traded at NSE; ordinary share with a par value of Shs. 5.00 and 5.5 percent preference shares with a par value of Shs. 20.00.

The prices of this security traded between Shs. 4.00 and Shs. 6.00, but benefited from the 1993/1994 NSE boom, reaching an all time high level of Shs. 14.00. The prices then started to decline. Between 1994 and 1996 (both years inclusive) the prices have been decreasing, but the rate of decline increased in later half of the years. This can be attributed to poor end of year financial reports that disappoints the market, and the investor off-load their securities in the market.

The OLS model for this security has the following variables:

$$P = 0.065 P_{(t-1)} + 0.0529 \text{ Div} + 7.098 \text{ EPS} + 1.133 \text{ P/E} + 0.0789 Y + 8.445$$

(1.563) (0.300) (16.351) (23.082) (0.353) (0.865)

$$R^2 = 0.995181$$

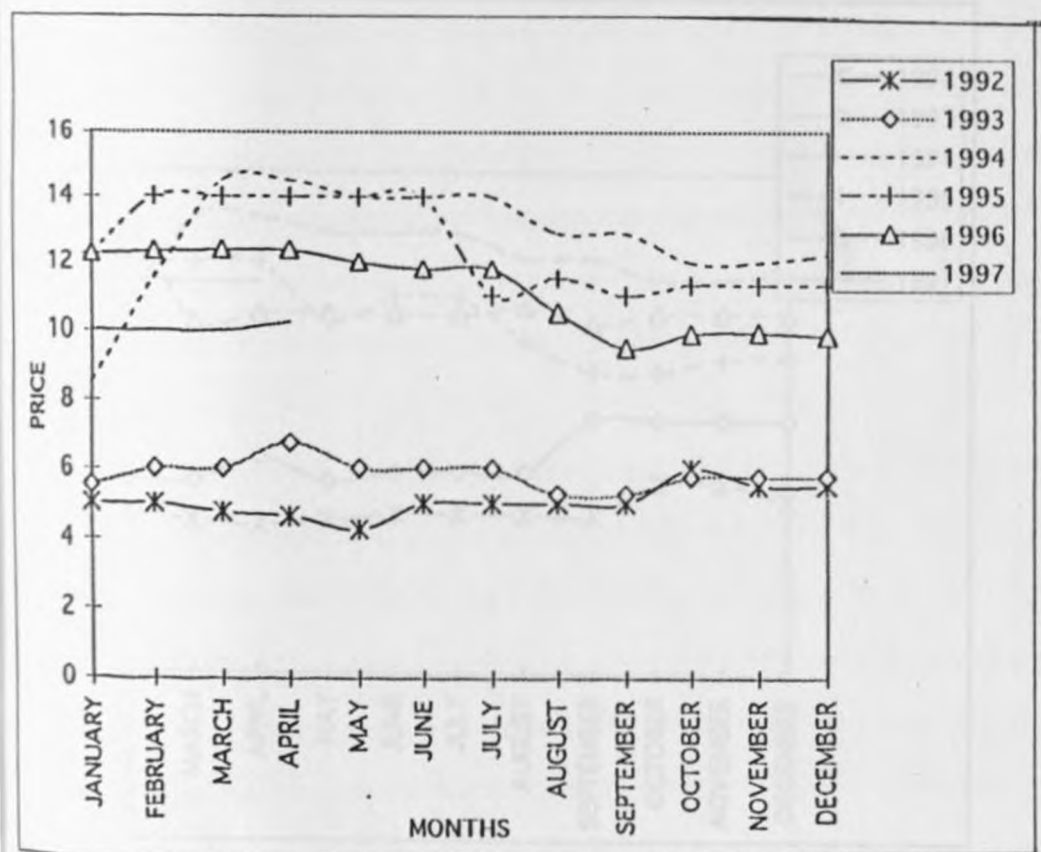
$$F(5,54) = 1858.43, p\text{-value} = 0.000$$

$$SD = 3.043$$

$$\text{Forecast Chi-square} = 17.43$$

$$\text{Chow test } (12,45) = 4.77, p\text{-value} = 0.001$$

Figure 7: Average Monthly Prices for Pearl Dry Cleaners: 1997



Source: Primary data

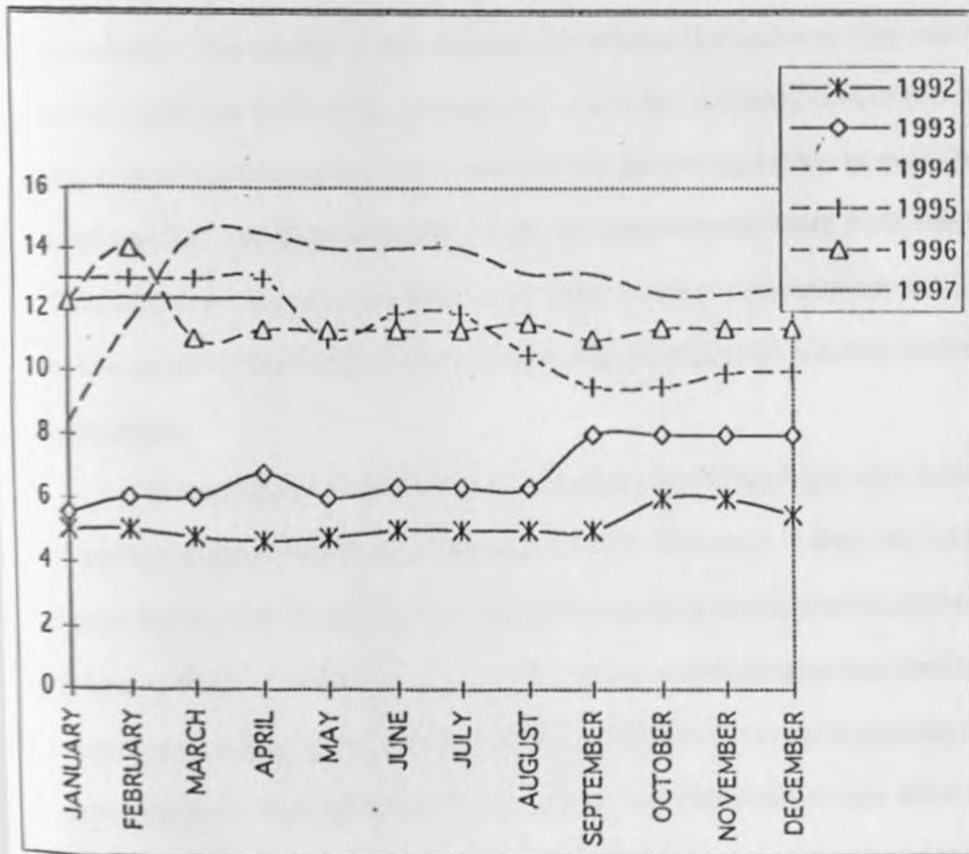
The value of forecasts chi-square reject the null hypothesis that there has been no structural changes in any parameter between the sample and the forecast periods. The

Chow test also rejects the null hypothesis of constancy and the implication is that the model can not provide very accurate ex-ante predictions. It is only the month of May 1996 which has a t-value of -1.19, all other predictions had an absolute t value of less than two.

implying a poor ex-ante forecast. It can be concluded that the share prices are not influenced by the wisdom of the market.

From the figures, it can be seen that the prices have been on a decline for the last four years. An investor would be advised to hold buying this security until the trend reverses.

Figure 8: Average Monthly Prices for Pearl Dry Cleaners 5 percent Preference Shares: 1997



Source: Primary data

The pattern of movement of prices of this security closely resemble the movement of the ordinary share. This being a fixed income security the dividend do not play a crucial role

in determining the price. One of the purposes of buying this security is to satisfy the income requirements of portfolio; therefore the security is not guided by wisdom of the market. However, the security can be bought or sold depending on the prevailing interest rates, compared to the yield of this security.

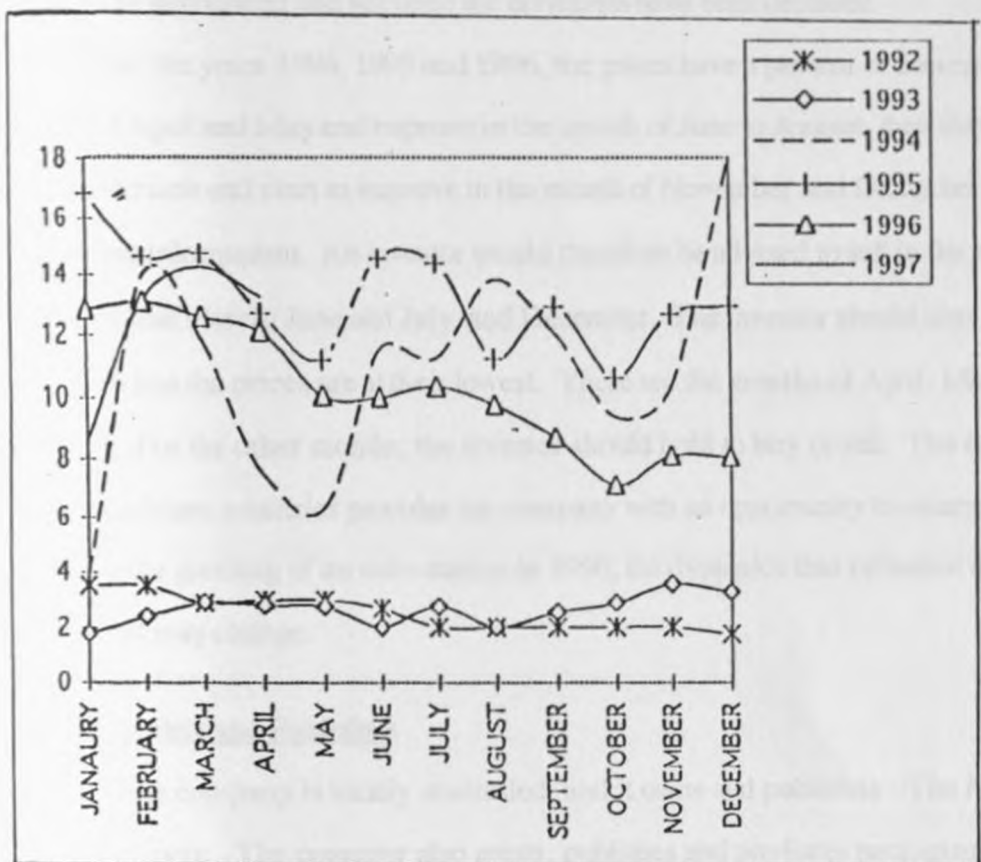
From figure 8, of both the security it can be seen that for the years 1994, 1995 and 1996 the prices decreased from the month of February and March and only improved slightly towards the end of December.

Standard Newspaper Group

The main nature of business for this company is that it publishes "The Standard Newspaper" and distributes selected local and overseas newspapers, magazines and periodicals. The results of the company are affected by tourist as they constitute a big market share for the foreign newspapers. Also, the escalating cost of the newspaper print may also affect the results. The fluctuation of the foreign exchange may also affect the results as the cost of the imports of both raw materials and spare parts will be affected. Generally, low economic conditions and high levels of competitiveness will also affect the results more so since any increase in cost cannot be passed on to the readers nor the advertisers.

This security is one of the few securities which has been very volatile with swings in prices ranging from Shs. 2.00 to Shs. 21.00. However, it does not seem to be affected by the declaration of dividends, since 1990, the first dividend to be declared was on 18th February 1997. At that time, the prices started an upward trend but stabilized at prices slightly above Shs. 15.00 but later stated to slid down. At the beginning of the sample period the price was quoted at Shs. 3.75 until the 1993/1994 boom when they improved to Shs. 14.00. However, the prices have continued to have swings that cannot be explained by any market factors; apart from the time that a declaration of dividend was made.

Figure 9: Average Monthly Prices for Standard Newspapers Group: 1997



Source: Primary data

The OLS model for this security has the following characteristics:

$$P = 0.407 P(t-1) - 4.355 \text{ Div} + 2.204 \text{ EPS} + 7.557 \text{ P/E} + 0.001 \text{ F/E} - 25.216$$

$$(6.380) \quad (-1.917) \quad (7.843) \quad (10.664) \quad (0.327) \quad (-8.761)$$

$$R^2 = 0.986$$

$$F(7,43) = 422.83, p\text{-value} = 0.000$$

$$SD = 4.031$$

$$\text{Forecast Chi-square} = 2.15$$

$$\text{Chow test } (12,43) = 0.94, p\text{-value} = 0.577$$

From the above model, price with a lag of one, EPS, and P/E are significant in the cross validation and the only month in which the ex-ante forecast a t-value of 2.01 was in

February 1997, all others had absolute values less than two. Since the company has started to declare dividends, an investor would be advised to buy the security when results are about to be announced and sell once the dividends have been declared.

For the years 1994, 1995 and 1996, the prices have a pattern of decreasing in the month of April and May and improve in the month of June to August, then the prices would decrease and start to improve in the month of November and December. Figure 9 shares this information. An investor would therefore be advised to sell in the month of February and March, June and July, and December. The investor should also buy in the months when the prices are at their lowest. These are the months of April, May and October. For the other months, the investor should hold to buy or sell. The opening up of the East African countries provides the company with an opportunity to enlarge its market, and with the granting of a radio station in 1996, the dynamics that influence the price movement may change.

Nation Printers and Publishers

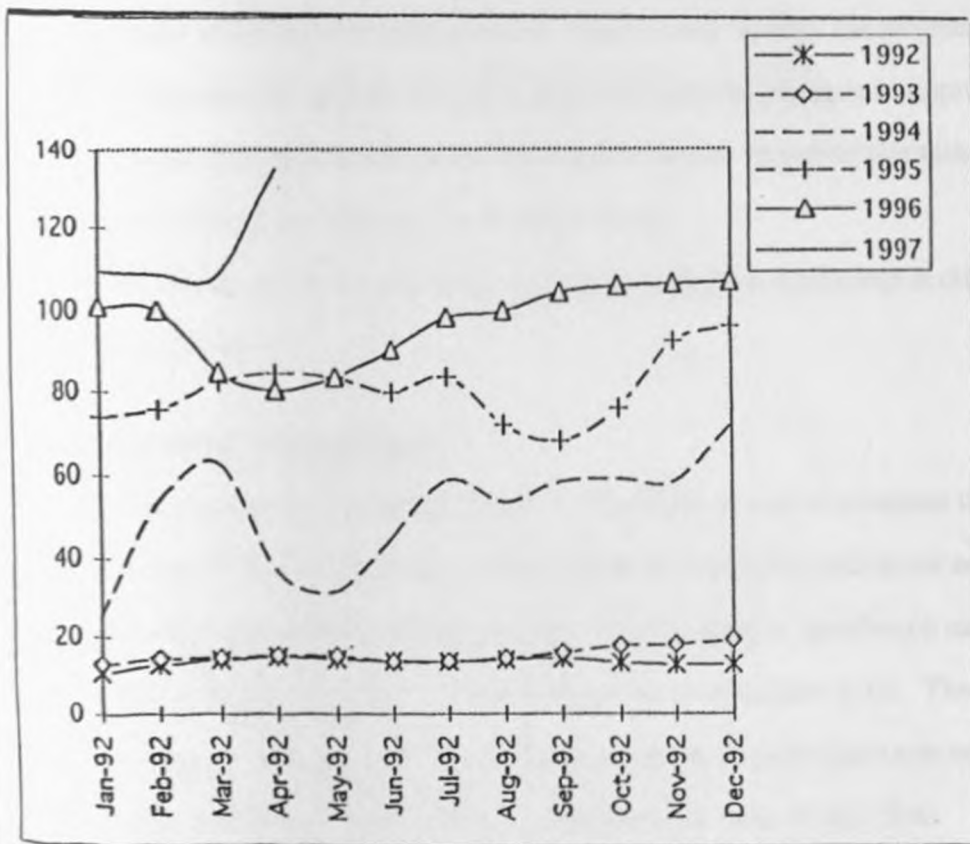
This company is locally controlled, and it owns and publishes The Nation Group of Newspapers. The company also prints, publishes and produces packaging materials through Kenya Litho Limited. There are some quality brochures and journals that are published by Nation marketing and publishing Limited. The security traded at NSE has a par value of Shs. 5.00. Most of the factors affecting this company are the same that affect Standard Newspaper Group as they are competitors in the same market. The company has a greater potential due to the widening market of East African countries and the possibility of the group being granted television and radio licenses. This makes it an attractive company in which one can invest in.

The prices of shares have gradually increased from Shs. 10.00 per share to Shs. 155.00 by the time of this study. In both occasions when the company declared bonus issue, the prices shot up to reflect this announcement. During the first time that an announcement of the bonus was made (March 1995), the prices shot up to over Shs.

100.00 but later started to slide down and by the time the prices were quoted ex-dividend, they had fallen to levels of Shs. 70.00. At the time of this study, the company had also announced a bonus issue (10th April, 1997) and predictably the prices went up by Shs. 25.00.

The company, benefited from the NSE boom at the beginning of 1993/1994, but when the boom came to an end, and the Kenyan currency started to gain, the prices settled to levels below Shs. 30.00. Apart from the period which the securities have started to trade ex-dividend or bonus, the price have been on an upward trend. Immediately after the prices are quoted ex-dividend or bonus, they would recover and continue on their upward trend.

Figure 10: Average Monthly Prices for Nation Printers and Publishers: 1997



Source: Primary data

The following is the OLS model:

$$P = 0.753 P_{(t-1)} - 2.765 \text{ Div} + 32.256 B + 0.672 \text{ EPS} + 2.212 \text{ P/E} - 64.867 Y$$

$$(9.581) \quad (0.740) \quad (1.352) \quad (1.849) \quad (3.713) \quad (-8.854)$$

$$- 0.011 \text{ F/E} - 23.494$$

$$(-653) \quad (-7.784)$$

$$R^2 = 0.987$$

$$F(7,44) = 478.65, p\text{-value} = 0.000$$

$$SD = 6.6512$$

$$\text{Forecast chi-square} = 1.28$$

$$\text{Chow test } (12,44) = 0.60, p\text{-value} = 0.834$$

The model has a forecast chi-square of 1.28 implying a very accurate ex-ante forecast, while Chow test show constantly in the variables used for this model. An investor would be advised to buy this security when the general reserves are high because the company would have to issue a bonus. The investor can buy the securities prior to the results being announced and later sell this security after the prices have improved. The improvement will be due to the results being announced. However this security has been on an upward trend, so one can be advised to hold.

From figure 10 no clear pattern emerges as the price fluctuates in different patterns in different years.

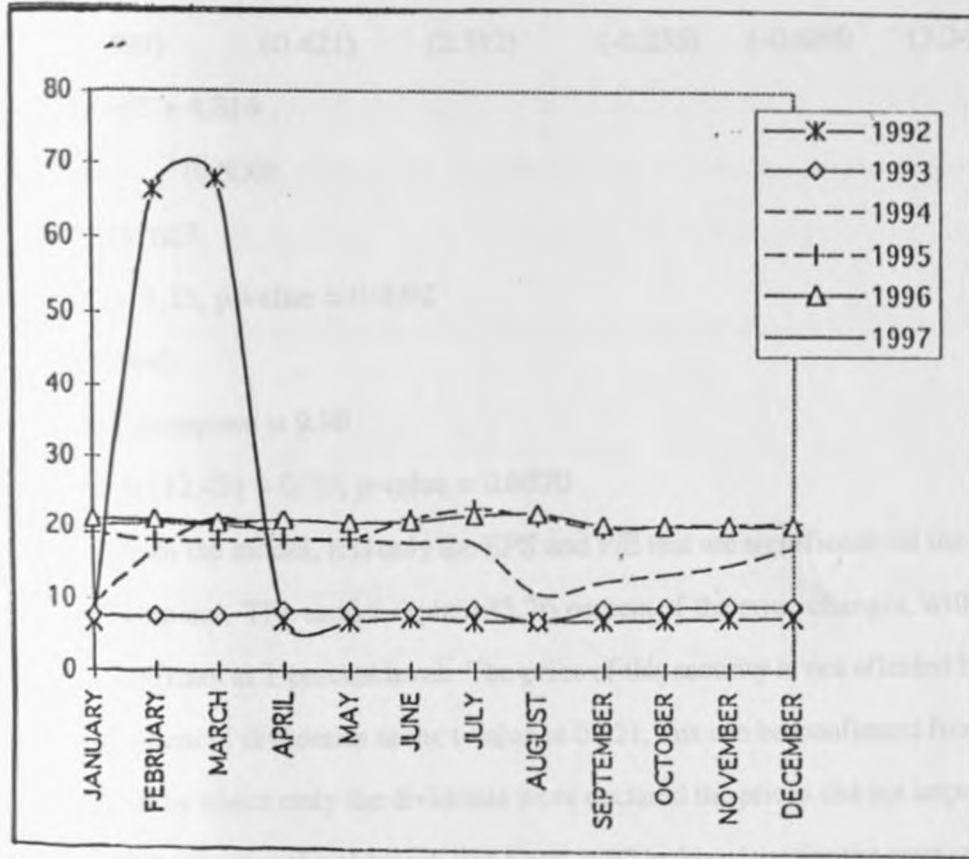
Car and General (Kenya) Limited

This company is controlled locally. The business activities include the selling of domestic appliances, kitchen equipment, Yamaha motorcycles, and motor accessories. It is also actively engaged in the manufacturing of a wide range of goods such as rubber products, welding rods, brake lining, refrigerators, cookers and so on. The company was originally operating in the three East African countries, but they have now reduced the market only to Kenya. Their ordinary share has a par value of Shs. 5.00.

This is a company that has been worst hit by the liberalization of the economy, as

cheap imports of low quality products have offered stiff competition in their traditional market.

Figure 11: Average Monthly Prices for Car and General: 1997



Source: Primary data

From January to April 1994, the security benefited from a delayed NSE boom as small companies with low prices were targeted later by the investors. The prices also improved during the same period due to a declaration of a bonus of 1 for 5. In December 1994, the major shareholders wanted to consolidate their holdings and they bought shares through the NSE. This increase in demand improved the price to the levels of Shs. 19.00 and when they stopped buying the shares dropped to Shs. 17.00. The same thing happened in June 1995 and the prices improved again to levels of Shs. 23.00. When again, the major shareholders stopped buying, the shares dropped in price to Shs. 18.00.

The second time that the company issued a bonus was in August 1996. Together with a declaration of two percent dividend the prices improved slightly to Shs. 23.00, but when they started to trade ex-bonus the prices reduced to levels of Shs. 18.00.

The following is the OLS model:

$$P = -0.079 P_{(t-1)} + 7.432 \text{ Div} + 17.273 \text{ EPS} - 13.273 \text{ B} - 160.806 \text{ Y} + 0.077 \text{ P/E}$$

$$(-0.587) \quad (0.421) \quad (2.332) \quad (-0.235) \quad (-0.688) \quad (3.345)$$

$$- 0.014 \text{ F/E} + 4.814$$

$$(-0.550) \quad (0.800)$$

$$R^2 = 0.337627$$

$$F(7,43) = 3.13, \text{ p-value} = 0.0092$$

$$SD = 10.445$$

$$\text{Forecast chi-square} = 9.98$$

$$\text{Chow test} (12,43) = 0.79, \text{ p-value} = 0.6870$$

From the model, it is only the EPS and P/E that are significant; all the other variables are not. The model explain 33.76 percent of the price changes, with the values being significant at 1 percent level. The price of this security is not affected by the announcement of dividends as the t-value is 0.421, this can be confirmed from figure 11 as the periods in which only the dividends were declared the prices did not improve.

Only the months of March and April 1997 had t-values for the predicted prices being -2.05 and -2.06 respectively. All the others had values between zero and -1.59. The implication is that the ex-ante value are accurate.

From figure 11, it can be seen for the month of August every year the prices reduce and an investor can sell their shares at a higher price in July and buy them back in August at a lower price. An investor can also buy the shares in August and sell them in the month of June and July.

Marshall's (East Africa) Limited seven percent Preference Shares

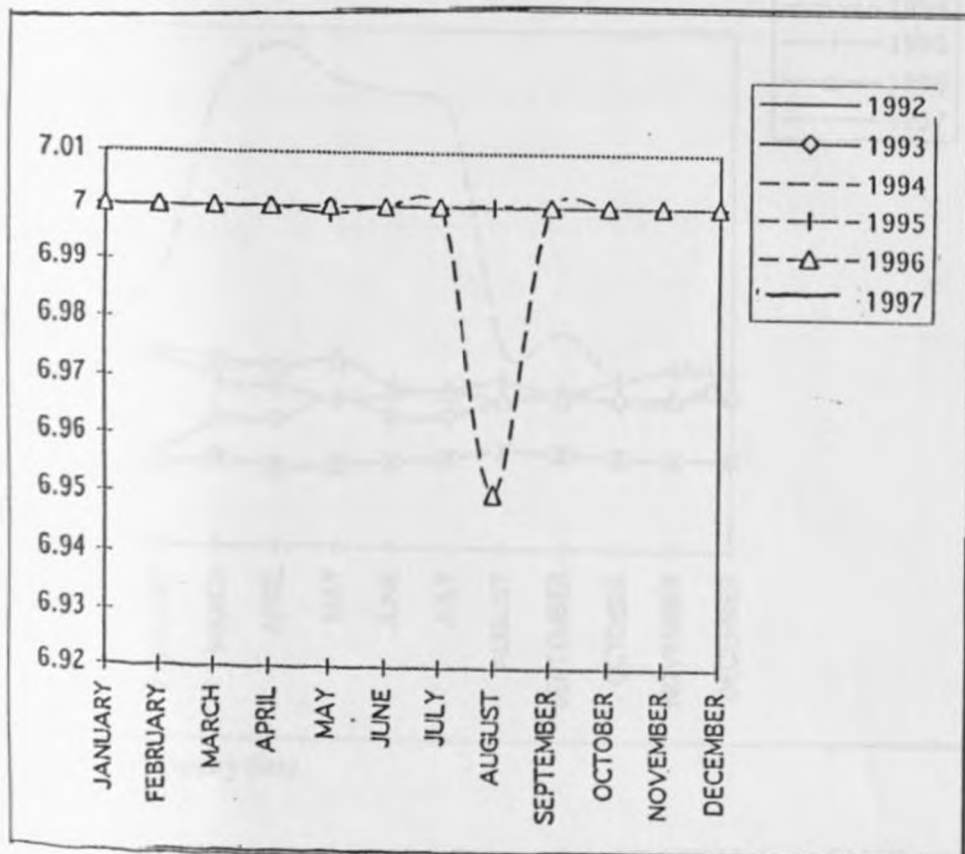
The company is locally controlled. It deals with the assembly and marketing of

Peugeot, Tata and Volvo vehicles and related services. The company also holds the franchise for Volvo earth moving equipment.

It has an authorized 50,000 7 percent preference shares of Shs. 20.00 each but it has a fully issued 25,000 7 percent preferences shares. However, in the period of the study there were only three transactions, and the prices have ranged between Shs. 6.95 and Shs. 7.00.

Since this security is very illiquid, the wisdom of the market cannot be applied (see figure 12). However, an investor can buy this security to meet the income requirements of his/her portfolio or when the yield rates are higher than the prevailing market interest rates.

Figure 12: Average Monthly Prices for Marshalls 7 percent Preference Shares: 1997



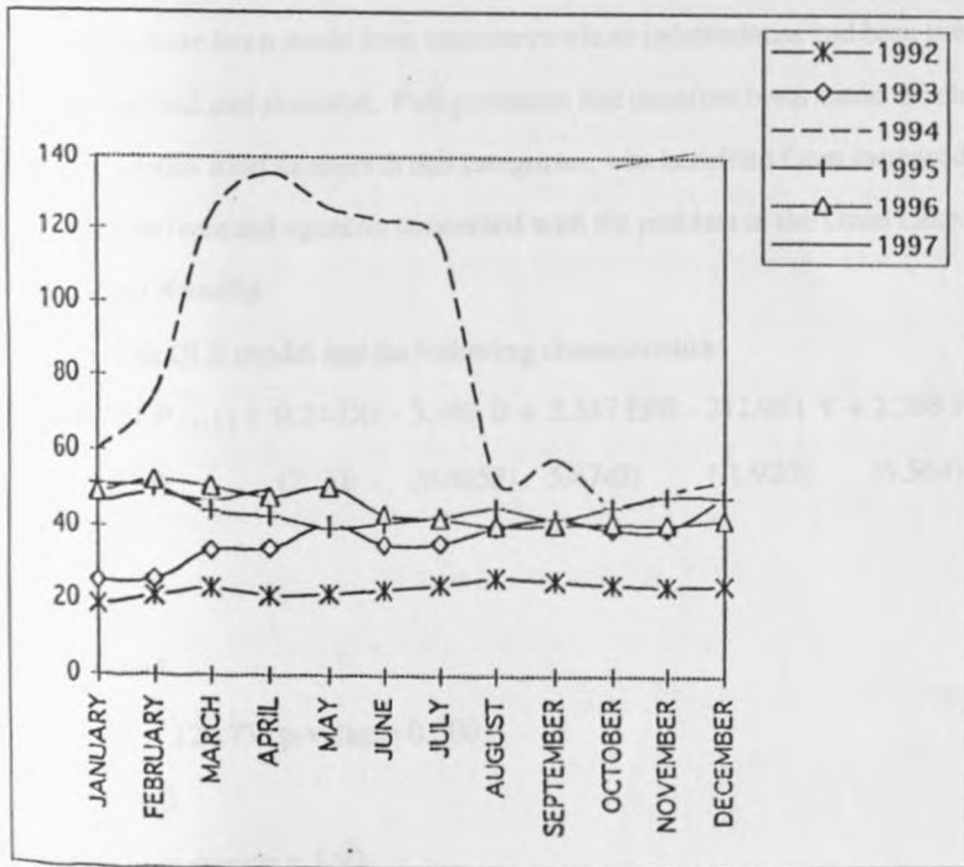
Source: Primary data

Financial Sector and Investment Sector

National Industrial Credit Limited

This is a locally controlled bank whose main activities include the provision of asset financing (hire purchase) and other forms of industrial credit. At the time of this study, plans were at an advanced stage to acquire African Merchantile Bank in line with the 1995 directive of the Central Bank of Kenya (CBK). The security traded at the exchange are ordinary shares which have a Shs. 5.00 par value.

Figure 13: Average Monthly Prices for National Industrial Credit Limited: 1997



Source: Primary data

The security seemed to benefit from the 1993/1994 boom of NSE, when the prices rose to an all time high of Shs. 157.00. At the same time, a bonus of 1 for 1 was issued and the price remained at high levels until July 1994 when they started to trade at an ex-

bonus level of Shs. 60.00. The prices have stabilized between Shs. 60.00 and Shs. 37.00. However, there is a periodic raise in prices at around the month of February and March when the financial results have been released, final dividends declared and a bonus issued.

Factors that have affected the results include high interest rates in real terms caused by the bench mark treasury bills yields. Increase in ratio by CBK (18 percent), which is interest free adds 4-5 percent to the overall cost of funds. This results into high lending rates which make cost of fund and repayment difficult to the customers. The liberalization of trade made cheaper imports available hence making the client have stiff competition from some competitors in the transport sector who did not have any loans to repay. Some large recoveries have been made from customers whose indebtedness had been previously considered bad and doubtful. Full provision had therefore been made. Such debtors include several road hauliers in this categories, who benefited from increased demand for the services from aid agencies concerned with the problem in the Great Lake Region, Sudan and Somalia.

The OLS model had the following characteristics;

$$P = 0.494 P_{(t-1)} + 9.24 \text{ Div} - 3.483 B + 5.537 \text{ EPS} - 212.951 Y + 2.268 \text{ P/E}$$

$$(7.974) \quad (2.50) \quad (0.4053) \quad 5.4742 \quad (-1.926) \quad (6.564)$$

$$- 29.750$$

$$(-4.638)$$

$$R^2 = 0.945$$

$$F_{(96,44)} = 126.73, p\text{-value} = 0.000$$

$$SD = 7.010$$

$$\text{Forecast chi-square} = 1.92$$

$$\text{Chow test } (12,44) = 0.67, p\text{-value} = 0.771$$

All the forecast value had an absolute value of less than two, hence the model is a good estimate. From figure 13, there appears to be no pattern in price movement over the

5 year period. Therefore, it is difficult to advise an investor on when to buy, sell or hold.

City Trust Limited

This is a locally controlled company whose ordinary shares have par value of Shs. 5.00. This is an investment company which holds all ordinary shares of Kenstock Limited.

At the beginning of the sample period (January 1992), the prices were quoted at Shs. 30.00, but later the price improved.. This can be attributed to capital gains made in the market when the company sold some of its shares to the market. Later, after the market excitement faded off, the price reduced to Shs. 15.00 in a period of two months. During the month of October 1992, a combination of dividends of Shs. 0.60 and a bonus of 1 for 5 were declared. This had the effect of boosting the prices. In June 1993, the company posted low investment returns due to the post-election uncertainty and the prices were depressed. Later the NSE boom of 1993/94 shot up the prices to over Shs. 35.00. When the boom was over, the prices stabilized at around Shs. 25.00. In July 1996, the prices started picking up because the company sold its holding in Barclays Bank and Standard Chartered at a significant gain. The market was impressed and it reacted in a favourable manner pushing up the prices. They reached a mini peak in September and started to slide down until the year ended. Early in 1997, the prices started to recover and by the time of writing this report they had stabilized at around Shs. 33.00.

The following is the OLS model for this security.

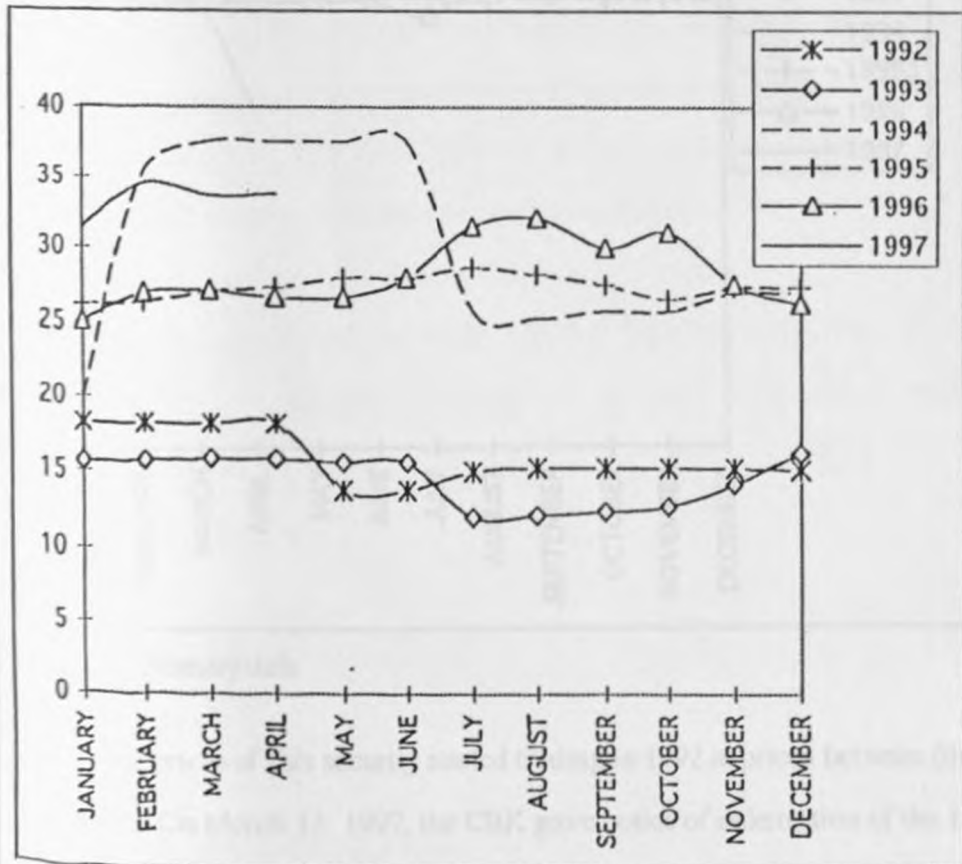
$$\begin{aligned}
 P = & 0.183 P_{(t-1)} - 7.769 \text{ Div} + 14.979 B + 3.129 \text{ EPS} + 1.309 \text{ P/E} - 0.153 \text{ Int} \\
 & (2.155) \quad (-0.568) \quad (1.926) \quad (6.57) \quad (7.939) \quad (-4.072) \\
 & + 52.930 Y + 2.375 \\
 & (0.848) \quad (0.701) \\
 R^2 = & 0.53605 \\
 F(7,43) = & 126.26, p\text{-value} = 0.000 \\
 SD = & 1.753
 \end{aligned}$$

Forecast Chi-square = 149.82

Chow test (12,343 = 13.99, p-value = 0.001

The low value of the Chow test indicate that there has been a structural change in some parameters between the sample and the forecast period. Also, the large value for the forecast Chi-square indicates that the model does not provide accurate ex-ante values. This was the case because all t-value for the forecast values were less than minus 2. An investor should buy this security when the market (NSE) raises and sell when the market goes down. The investor should hold to buy or sell when there are large fluctuations in the market as this implies uncertainty. Figure 14 did not reveal any clear pattern and it would be difficult to advise the investor based on the price patterns over the five year period.

Figure 14: Average Monthly Prices for City Trust Limited: 1997



Source: Primary data

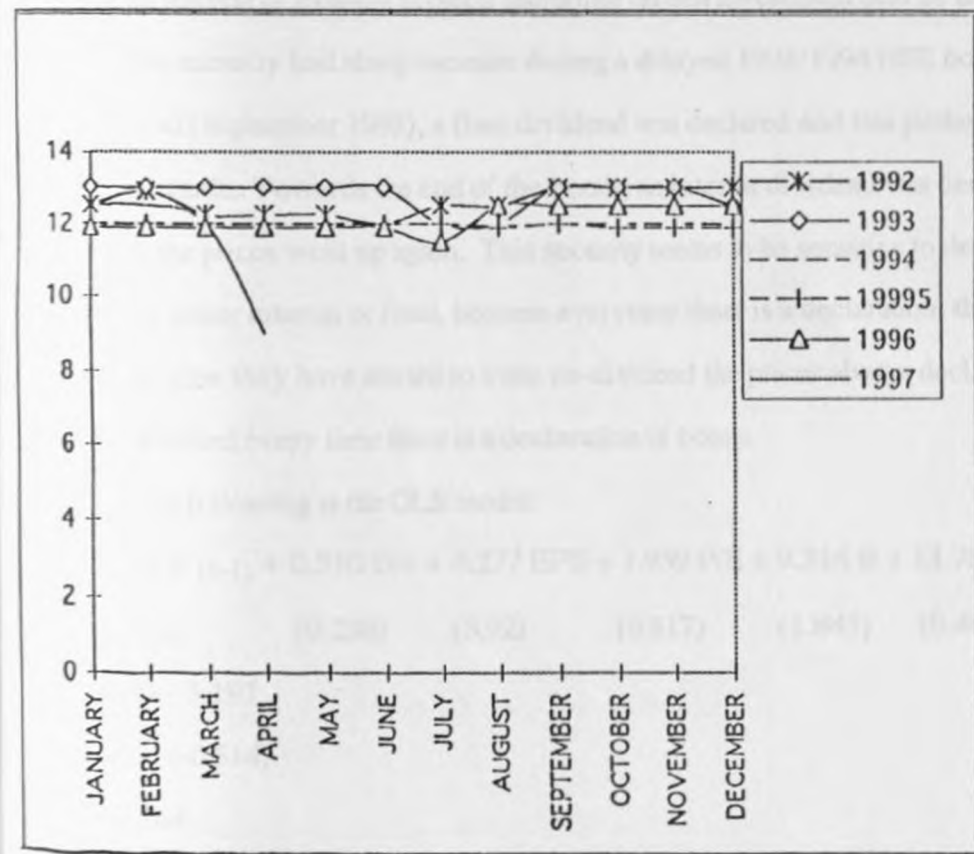
Kenstock Limited Deferred 12.5 percent

This company is locally controlled. It has two securities being dealt in at NSE.

The security that was included in the sample is deferred 12.5 percent unsecured loan stock.

The company is a wholly owned subsidiary of City Trust Limited. Dividends are declared in the deferred stock at every end of the accounting period.

Figure 15: Average Monthly Prices for Kenstock Deferred 12.5 percent Loan Stock: 1997



Source: Primary data

The prices of this security started trading in 1992 at prices between Shs. 12.00 and Shs. 14.00. On March 13, 1997, the CBK gave notice of redemption of the 10 1/2 percent of Kenya loan stock which was redeemed at par on the outstanding as at April 14, 1997.

This had the effect of depressing the prices which slid down to price slightly above Shs.

8.00.

The wisdom of the market cannot be applied on this security since it is very illiquid. An investor should, however, buy the security to meet the income requirement of his portfolio, or when the yield rates are higher than the prevailing returns from other investment opportunity (see figure 15).

Industrial Commercial Development Corporation Limited

This is a locally controlled company whose equity share has a par value of Shs. 5.00. The company is a parastatal which specializes in investment. It enables Kenyans to acquire an interest in existing projects including certain investment held by the corporation.

The security had sharp increase during a delayed 1993/1994 NSE boom. At the same period (September 1993), a final dividend was declared and this pushed the prices further upwards. Towards the end of the boom, an interim dividend was declared in April 1994 and the prices went up again. This security seems to be sensitive to declaration of dividends, either interim or final, because everytime there is a declaration, the prices raise and by the time they have started to trade ex-dividend the prices always decline. The prices are also affected every time there is a declaration of bonus.

The following is the OLS model:

$$P = 0.142 P_{(t-1)} + 0.310 \text{ Div} + 4.277 \text{ EPS} + 1.959 \text{ P/E} + 9.316 \text{ B} + 13.763 \text{ Y}$$

$$(1.755) \quad (0.238) \quad (5.92) \quad (9.817) \quad (1.841) \quad (0.463)$$

$$- 0.19 \text{ Int} - 3.193$$

$$(-2.106) \quad (-0.514)$$

$$R^2 = 0.964$$

$$F(7,33) = 125.28, p\text{-value} = 0.000$$

$$SD = 2.502$$

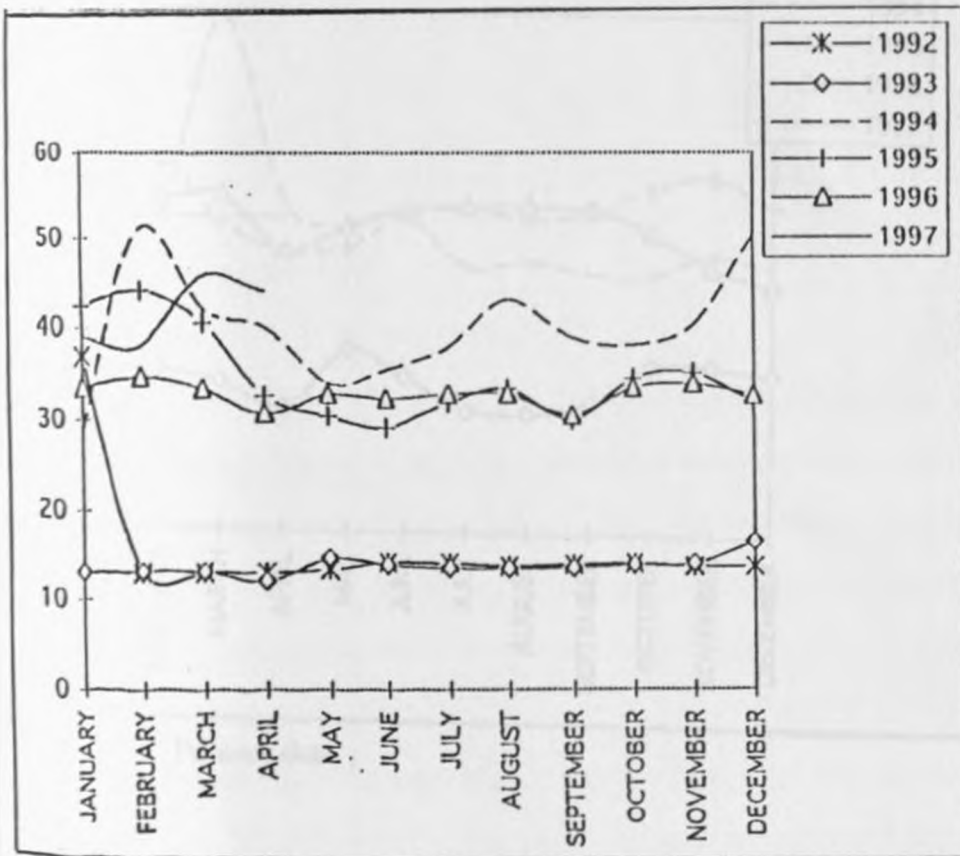
$$\text{Forecast chi-square} = 1.36$$

$$\text{Chow test } (12,33) = 1.07, p\text{-value} = 0.416$$

The low forecast chi-square and the Chow test show that there has been stability in

the parameters and it is only the month of March 1997 that the forecast value has a t-value smaller than minus 2. All other have t values are between one and -1.75. An investor should sell this security just after an announcement of a dividend or bonus has been made, and buy back the security after the prices are quoted ex-dividend (bonus). For the year 1994 to 1996, the price improved in January, August and in October and November. The prices also decline in the months of April and May, and also in October. Therefore an investor should buy during the months in which the prices are at their lowest and sell when they are at their highest. Figure 16 illustrates this.

Figure 16: Average Monthly Prices for Industrial Commercial Development Corporation Limited: 1997

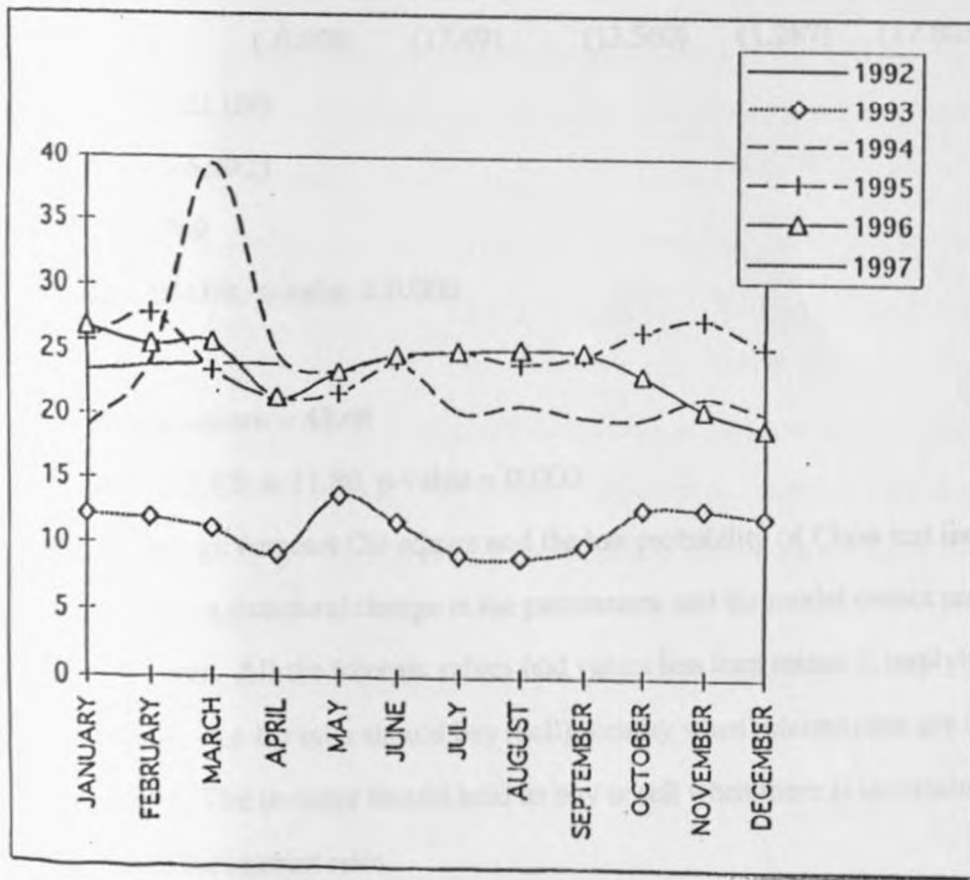


Source: Primary data

Housing Finance Company of Kenya Limited

This is a locally controlled company whose equity is divided into shares with a par value of Shs. 5.00. This is a mortgage institution which seeks to encourage and promote the flow of savings, both private and public, into financing home ownership through the provision of savings and deposit facilities as well as such other services as the acceptance and administration of provident funds.

Figure 17: Average Monthly Prices for Housing Finance Company of Kenya: 1997



Source: Primary data

On 7th October 1992, there was a public offering of 18 million authorized but not issued shares at Shs. 7.00 payable in full at application, (the par value was Shs. 5.00).

The reason for the issue was to fulfill the objective of increasing the shareholders' base of

the company. The proceeds of the issue was to be used to strengthen further the capital base of the country.

Although the prices increase every time there is a declaration of interim and final dividends, and for bonus issue, the rate of increase is very small compared to other factors that cause the security to have any price fluctuations. This security benefited from a delayed 1993/1994 NSE boom. After the boom was over the prices stabilized at levels of Shs. 20.00. Thereafter the prices have fluctuated between Shs. 17.00 and Shs. 28.00.

The following is the OLS model:

$$P = 0.056 P(t-1) - 0.680 \text{ Div} + 3.231 \text{ EPS} + 1.529 \text{ P/E} + 2.923 \text{ B} + 4.365 \text{ Y}$$

$$(1.056) \quad (-0.993) \quad (17.491) \quad (13.560) \quad (1.287) \quad (17.803)$$

$$+ 0.114 \text{ Int} - 21.093$$

$$(3.217) \quad 9-6.992)$$

$$R^2 = 0.975769$$

$$F(7,32) = 184.09, p\text{-value} = 0.000$$

$$SD = 1.161$$

$$\text{Forecast chi-square} = 43.68$$

$$\text{Chow test } (12,32) = 11.80, p\text{-value} = 0.000$$

The high forecast Chi-square and the low probability of Chow test indicate that there has been a structural change in the parameters, and the model cannot produce accurate ex-ante figures. All the forecast values had values less than minus 2, implying poor ex-ante forecast. An investor should buy (sell) security when interest rates are decreasing (increasing). The investor should hold to buy or sell when there is uncertainty in the direction of the interest rates.

As figure 17 shows, the prices are comparatively high in the months of January and February, and also in November. The prices were also at their lowest in the month of April, and during the period between June to September. An investor would be advised to buy during the months in which prices are at low levels and sell during the months in

which prices are at high levels.

National Bank of Kenya Limited

The company was incorporated in 1968 and is locally controlled. Its main nature of business is to provide a full range in banking services. Towards the end of 1994, the government sold 20 percent of its share holding (40 million shares) to the public. This was in line with the aim of the government to privatize and also to diversity the base of the shareholders. The same process was also repeated in June 1996, where again 20 percent of the government holding was sold to the public. Though the government holding has reduced substantially, the control of the activities of the bank is still on the hands of the government through the appointment of the board of directors and also through the combined holding of the National Social Security Fund (NSSF) and the government which amount to over 51 percent.

The security started to trade in the NSE in November 1994. The opening price then was Shs. 23.00. In 1996, the price started to decline and by the end of the year, the price had reduced to Shs. 15.50. In 1997, the prices had stabilized at this level. The dividend yield for this security is low and the announcement of any dividends either final or interim do improve prices. For example, in January 1995 when the half year results were announced, the price dropped from Shs. 24.00 to Shs. 20.00 despite the announcement of an interim dividend.

The generated OLS model for this security is as follows:

$$P = 1.022 P_{(t-1)} + 184.894 \text{ Div} - 1.113 \text{ EPS} + 0.0367 \text{ P/E} - 0.005 \text{ Int}$$

$$(7.829) \quad (0.046) \quad (-0.524) \quad (0.457) \quad (0.045)$$

$$- 3970.864 Y + 153.473$$

$$(-0.0451) \quad (1.874)$$

$$R^2 = 0.998$$

$$F(6,11) = 846.36, p\text{-value} = 0.000$$

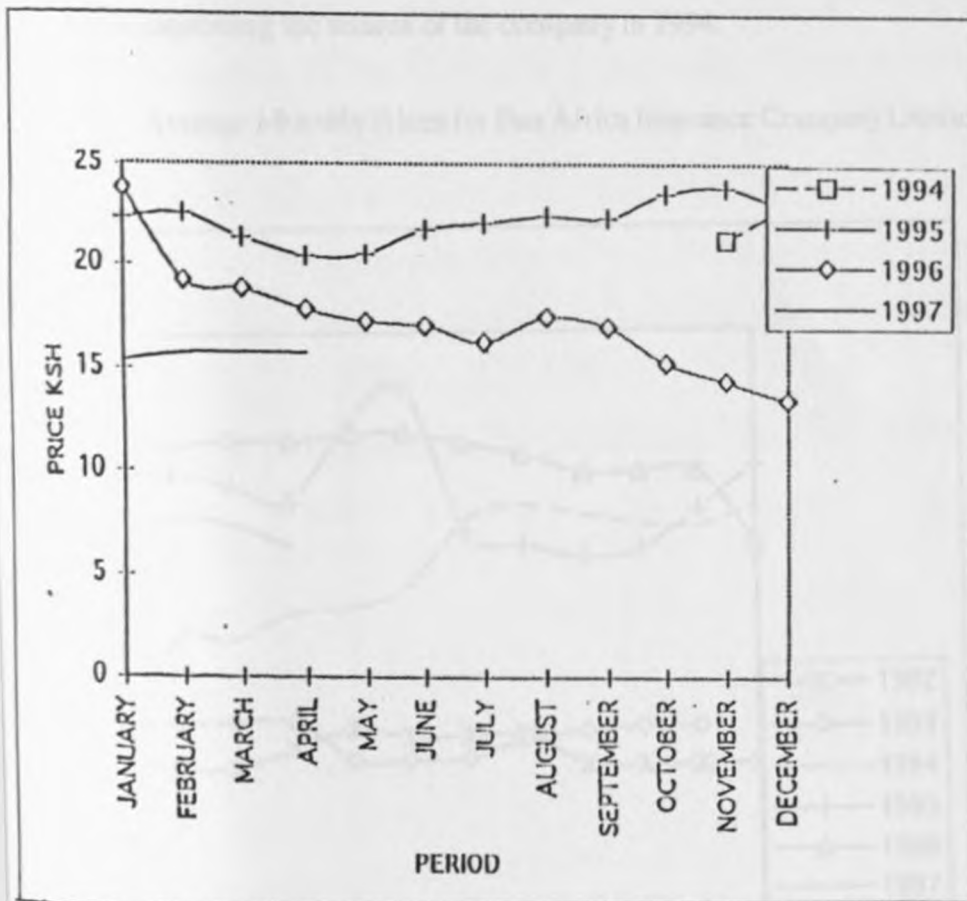
$$SD = 1.248$$

Forecast Chi-square = 362.06

Chow test (12,11) = 0.63, p-value = 0.78

From the above model, the Chow test is large indicating that there has been no structural changes in any parameter, implying a good ex-ante forecast. The fundamental ratios do not influence the price in any way. This can be attributed to the government controlling the bank.

Figure 18: Average Monthly Prices for National Bank of Kenya Limited: 1997



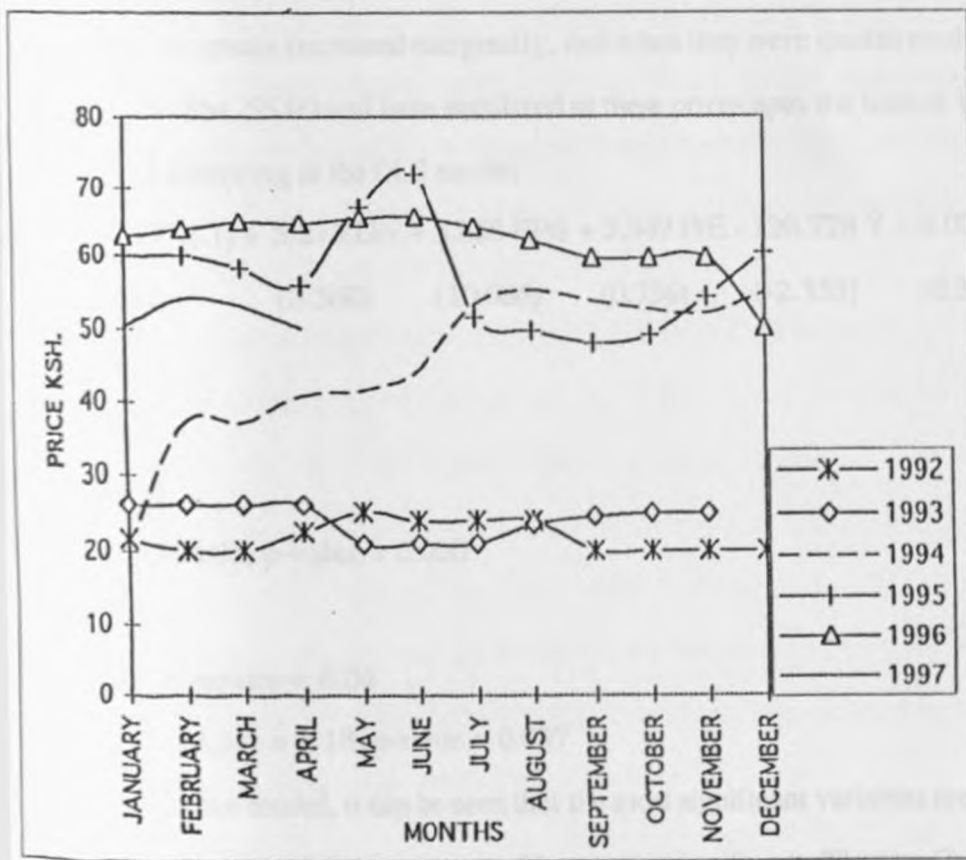
Source: Primary data

From figure 18, no pattern can be identified and therefore it would be difficult to advise an investor based on the past price movements.

Pan Africa Insurance Company Limited

This company is locally controlled and it has ordinary shares that have a par value of Shs. 5.00. Its main business is to offer life insurance but it also offers fire and general insurance. The company is mostly affected by the state of economy and any factors that may adversely affect the growth of the economy will effect the results of the company in a negative manner. Hence, high rate of inflation, low growth rates of economy and the general crime wave will adversely affect the returns of the company. The management, towards the end of 1993, started a policy of employing qualified staff and this started to bear fruits in improving the returns of the company in 1994.

Figure 19: Average Monthly Prices for Pan Africa Insurance Company Limited: 1997



Source: Primary data

At the beginning of the sample period, the security traded at Shs. 21.00 in May

1992, the end year financial report was released and the prices improved to Shs. 27.00. When the security started to trade ex-dividend, the price reduced to Shs. 20.00. They remained at those levels until May the following year when the end year results were released again and the prices improved to levels of Shs. 25.00. The prices did not improve to the levels of 1991 because the results were not as good as those of 1991. The prices of the security started to increase during the NSE boom and unlike other securities, they did not decline after the boom. In May 1995, the company declared a 1 for 4 bonus issue and the price improved to Shs. 75.00, (the bonus does not appear in the model because it was the only bonus issued during that period and it resulted into a singular matrix. It had to be deleted from the equation). When the shares started trading ex-bonus, the price fell to below Shs. 50.00. But they started to recover slowly and by April 1996, they had reached Shs. 60.00 in anticipation of the final results. When a final dividend was announced in May 1996, the prices increased marginally, and when they were quoted ex-dividend, the prices slid to Shs. 55.00 and have stabilized at these prices up to the time of this study.

The following is the OLS model:

$$P = 0.054 P_{(t-1)} + 5.215 \text{ Div} + 5.858 \text{ EPS} + 3.349 \text{ P/E} - 120.728 \text{ Y} + 0.022 \text{ Int}$$

$$(0.681) \quad (3.560) \quad (10.086) \quad (0.736) \quad (-2.353) \quad (0.355)$$

$$- 22.214$$

$$(-4.277)$$

$$R^2 = 0.982$$

$$F(6,34) = 304.85, p\text{-value} = 0.000$$

$$SD = 2.374$$

$$\text{Forecast Chi-square} = 6.04$$

$$\text{Chow test } (12,34) = 2.18, p\text{-value} = 0.037$$

From the model, it can be seen that the most significant variables are dividends, EPS, P/E and yield. All the other variables are not significant. The low Chow test probability indicate that the model does not offer accurate ex-ante predictions and therefore

it should be rejected.

An investor should buy this security when he wants to hedge against other financial based securities. The investor also buys to diversify his portfolio or when the interest rates are increasing. When they are decreasing, he should sell this security. When the direction of the interest rates is uncertain the investor should hold to buy or sell as the security prices could move in any direction.

The figure is not predictable pattern for the price movement (see figure 19). Therefore, it not possible to advise an investor when to buy or sell this security.

Industrial and Allied Sector

East African Portland Limited Rights

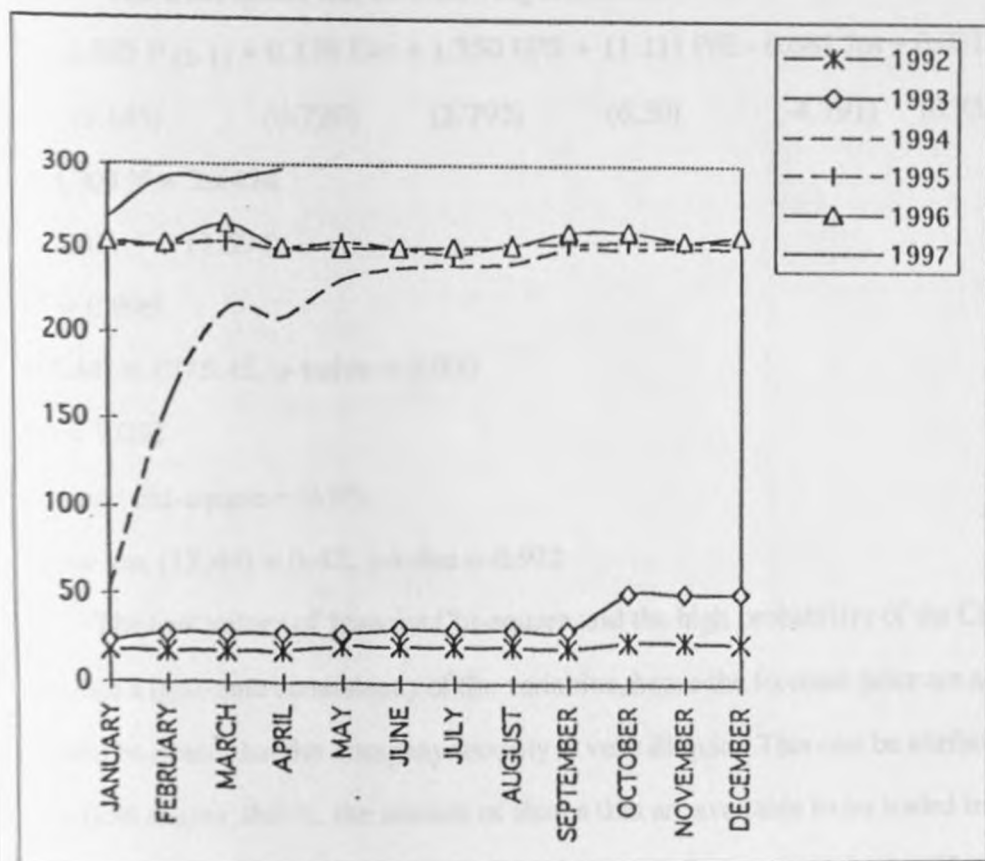
This was a 4 for 1 right issue to the shareholders of the East African Portland Limited Security. They were being bought from the company at Shs. 14.00. The NSE decided to sell them as a separate security for one month, but the company applied to CMA for an extension and this period was extended to two months. This was the first time that this type of security was sold in the stock exchange. Initially, the speculators bought the right issue at prices of Shs. 17.00 increasing to Shs. 17.30.

The intention was to make a capital gain should the price improve. Later, the price declined as investors studied the situations. After the investor realized the true value of the right issue, they started to buy it and the heavy demand pushed up the price to levels of Shs. 18.20. This was still at a bargain because on the open market, the East Portland Limited security was selling at Shs. 27.00 and to buy a right issue at Shs. 18.00 was buying the security at a discount of Shs. 8.80. Should such a right issue be sold in the market, the investor is advised to buy it so long as the right issue are lower than the prevailing market price of the underlying security.

Dunlop Kenya Limited

This company is foreign controlled and its main nature of business is the manufacturing of vinyl floor tiles and Dunlop adhesives. The company is also the importer and wholesaler of Dunlop consumer, sports and industrial products. The main clients are found in the building and construction industries. Therefore, any factor that would negatively (positively) affect this two industries would negatively (positively) affect the results of the company. These factors would include stagnation of the economy, high inflation and interest rates and a strong shilling.

Figure 20: Average Monthly Prices for Dunlop Kenya Limited: 1997



Source: Primary data

Like all other securities in NSE, Dunlop benefited from the 1993/94 boom. But unlike other securities, the prices never went down since the fundamentals such as EPS,

dividends per share, P/E and dividend yield were very attractive.

After the boom, the price remained on a steady level averaging Shs. 200.00 and slowly increasing towards Shs. 250.00. The dividend paid out by the company had been increasing both in absolute and percentage terms and the market anticipated that the 1996 dividend would be high since 1995 dividend was Shs. 20.95. This was three times the 1993 dividends (Shs. 6.50). Towards the end of the financial year of the company (31st December), the prices started to improve up and by the time the results were announced in March 1997, the price had reached, Shs. 270.00 but the results were disappointing and the dividend paid out was reduced to Shs. 17.95. This depressed the prices and they started to slide down. By the time of this b, the price had started to recover.

The OLS model has the following attributes.

$$P = 0.555 P_{(t-1)} + 0.378 \text{ Div} + 1.350 \text{ EPS} + 11.111 \text{ P/E} - 0.681 \text{ Int} + 0.001 \text{ F/E}$$

$$(9.145) \quad (0.720) \quad (3.792) \quad (6.50) \quad (-4.791) \quad (0.732)$$

$$- 54.703 Y + 29.474$$

$$(-.601) \quad (1.594)$$

$$R^2 = 0.996$$

$$F(7,44) = 1775.42, \text{ p-value} = 0.000$$

$$SD = 7.052$$

$$\text{Forecast chi-square} = 0.95$$

$$\text{Chow test } (12,44) = 0.47, \text{ p-value} = 0.922$$

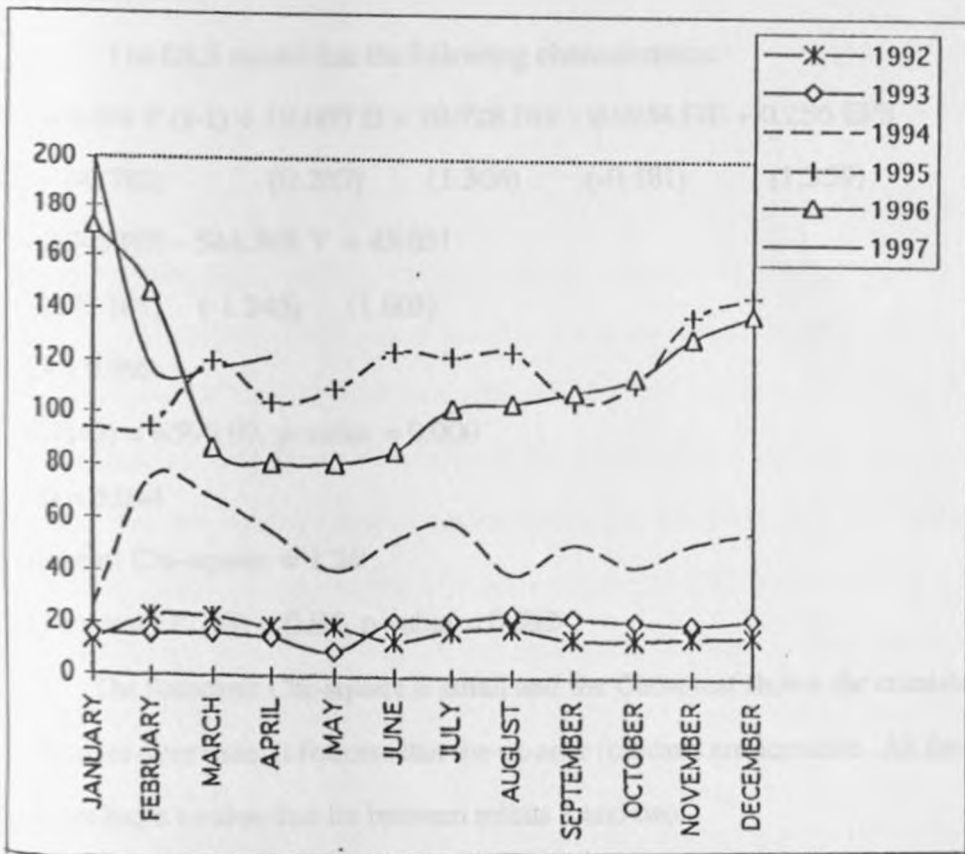
The low values of forecast Chi-square and the high probability of the Chow test indicate a post-ante consistency of the variables, hence the forecast price are accurate. It should be noted that the company security is very illiquid. This can be attributed to the few free float shares, that is, the amount of shares that are available to be traded in the market. The total amount of shares authorized and issued by the company were 400 thousand and they were held by big investors. For example, the 20th ranked investors in terms of shares held has 300 shares only. A demand for this security can fizzle out in the market before

any seller is found, and therefore the demand and supply of the share and by extension the price, are not guided by the wisdom of market. From the figure it is not possible to detect any pattern for the prices.

Kenya Power and Lighting Company Limited

The company was incorporated in 1922 and is locally controlled. The company generates and supplies electricity throughout Kenya.

Figure 21: Average Monthly Prices for Kenya Power and Lighting Company Limited: 1997



Source: Primary data

From January 1992 to December 1993, the price remained at levels of Shs. 25.00 but the company benefited from a delayed 1993/94 NSE boom. After the end of the boom, the prices declined. In 1994, before the rules of the trading were enforced, the prices would

fluctuate to any level hence the average price were low for the year 1994. By 1995, the prices had stopped fluctuating and stabilized and when a bonus of 1 for 1 was declared (December 1995), the prices increased to Shs. 130.00, and when the security started to trade ex-bonus the prices were depressed to levels below Shs. 100.00. When the half year results were announced in September 1996 the price improved to Shs. 100.00. The price continued on an upward trend because the market anticipated that the company could declare another bonus. This anticipation resulted from too much general reserves and they had to be capitalized. In January 1997, a 2 for 1 bonus was declared and the prices improved to Shs. 300.00, but when they started to trade ex-bonus, they finally settled at Shs. 120.00.

The OLS model has the following characteristics.

$$P = 0.004 P(t-1) + 19.687 B + 10.728 \text{ Div} - 0.0954 F/E + 0.256 \text{ EPS}$$

$$(-0.782) \quad (0.287) \quad (1.306) \quad (-0.181) \quad (1.359)$$

$$+ 8.945 P/E - 544.583 Y + 45.001$$

$$(170.101) \quad (-1.245) \quad (1.603)$$

$$R^2 = 0.999$$

$$F(7143) = 6596.09, p\text{-value} = 0.000$$

$$SD = 5.044$$

$$\text{Forecast Chi-square} = 1.26$$

$$\text{Chow test } (12,48) = 0.86, p\text{-value} = 0.592$$

The forecasts Chi-square is small and the Chow test shows the consistency of the variables over time, it follows that the ex-ante forecasts are accurate. All the forecasts prices had a t-value that lie between minus 2 and two.

Towards the end of the sample period there has been a lot of interest in this security that has been generated by the foreign buyers. The foreign buyers are driven by the belief that this company being a public utility, will always have a high demand for its services, and therefore the returns will always be good. An investor should sell securities when a

bonus has been declared because he can buy back the same number of securities at a lower price. For example, when a bonus of 2 for 1 was declared the price shot up to Shs. 300.00 up from Shs. 100.00. If one sold the security cum-bonus, he would buy back the same security at Shs. 100.00, making a profit of Shs. 200.00 per share. An investor should also invest in this company when the general economic conditions are improving or when the company has created a large reserve as the company will have to capitalize them by declaring bonus issues. An investor should hold to buy (sell), when the economic conditions are uncertain.

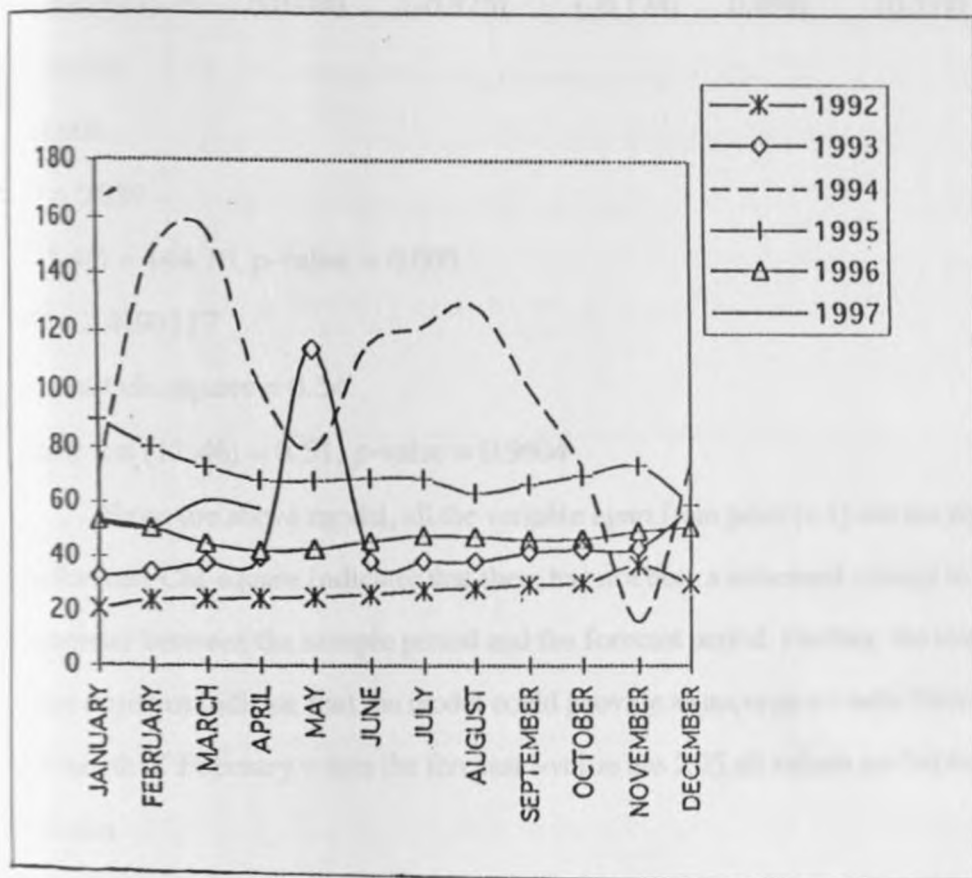
For the years of 1994, 1995 and 1996, figure 21 shows that the price have been declining from the month of March and reaching their lowest in April and May, when they start to improve. The price usually attain the highest point in December when they start to decrease. It would be advisable for an investor to buy in months of April and May and sell in December.

Kenya Breweries Limited

The company was incorporated in 1922 and is locally controlled. They are brewers and maltsters in Kenya. They also sell beer, manufacture and sell bottles. The shares traded at Shs. 19.00 at the beginning of the sample period and had an upward trend, with minor increase in prices due to announcements of dividends (whether final or interim). The 1993/94 NSE boom coincided with a bonus issue and the prices shot up from Shs. 50.00 level to Shs. 170.00 in a period of one month. By the time in which the NSE boom was over (April 1994), the Shares also started to trade ex bonus and the prices declined to Shs. 60.00.

The sharp increase in prices between May and September 1994 was the recovery period from the ex bonus prices. The price reached Shs. 120.00. From that period (August 1995) the prices started moving in a downward trend. In November 1995 there was a bonus and a final dividend of Shs. 3.50 and the prices improved.

Figure 22: Average Monthly Prices for Kenya Breweries Limited: 1997



Source: Primary data

In March 1996, a South African company indicated its interest in starting a brewing firm in Thika, thus ending the monopolistic hold of Kenya Breweries in the Kenyan market. This depressed the prices further to levels between Shs. 40.00 and Shs. 50.00. In July 1996, the prices started to recover from the March announcement, and have continued to raise steadily apart from February 1997 when the company announced an interim dividend and the price increased sharply. When the shares started to trade ex-dividend the prices declined and have stabilized since then. The market is not impressed by recent re-launching of the old products and also the launching of its new product since this amounts to cannibalization of its own market share as the drinkers of high quality beer shift and start drinking the low quality beer; hence affecting the company results.

The following is the OLS model:

$$P = 0.983 P_{(t-1)} + 0.192 \text{ Div} - 0.189 \text{ EPS} + 0.004 \text{ P/E} - 64.947 Y + 0.001 \text{ F/E}$$

$$(12.612) \quad (0.074) \quad (-0.825) \quad (-0.174) \quad 0.894 \quad (0.219)$$

$$+ 74.435$$

$$(1.909)$$

$$R^2 = 0.939$$

$$F(5,46) = 144.10, \text{ p-value} = 0.000$$

$$SD = 2.4193117$$

$$\text{Forecast chi-square} = 0.54$$

$$\text{Chow test } (12,46) = 0.51, \text{ p-value} = 0.9604$$

From the above model, all the variable apart from price (t-1) are not significant but the forecast Chi-square indicates that there has not been a structural change in any parameter between the sample period and the forecast period. Further, the low values of t-value statistics indicate that the model could provide an accurate ex-ante forecast. It is only the month of February when the forecast t-value has 2.05 all values are between minus two and two.

An investor should hold to sell when the general reserves are large since the pressure will be on the company to issue bonus shares. The investor should sell when a bonus announcement is made, and buy back the same number of shares at a lower price, thereby making a capital gain. Figure 22 does not provide any clear pattern in the price movement. Therefore, it would not be possible to advise the investor when to hold, buy or sell this security.

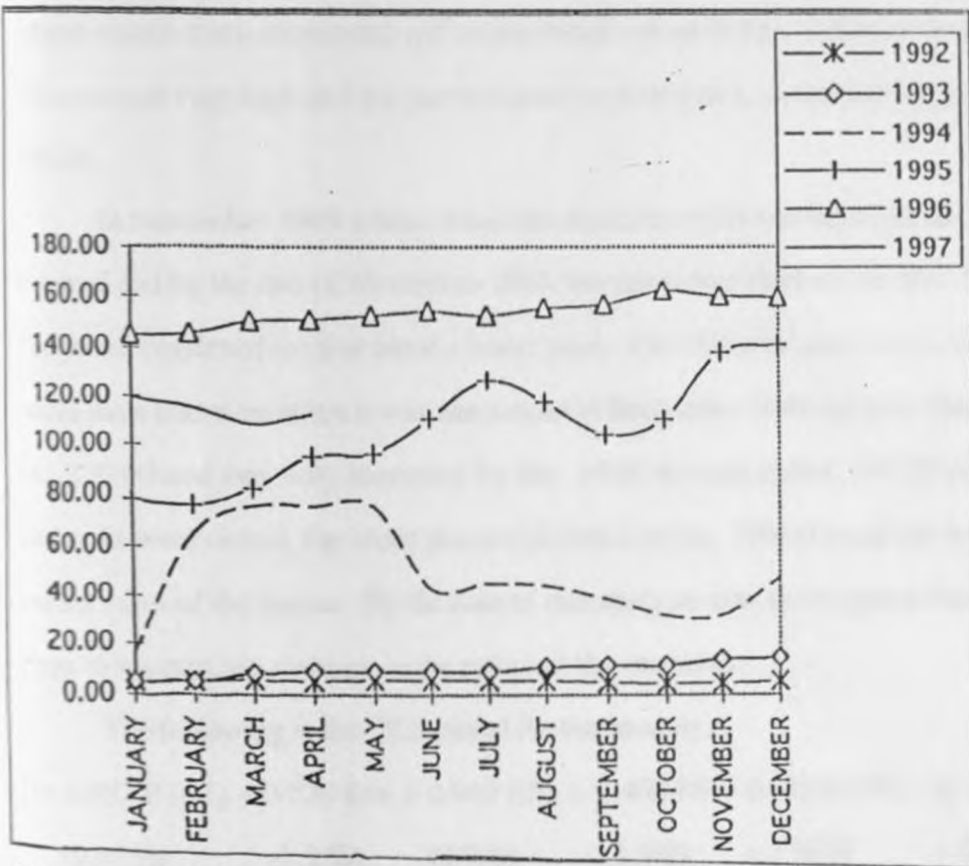
Unga Group Limited

This is a holding company mainly involved in the milling of wheat and maize. The company also manufactures cooking oils, breakfast cereals, animal feeds and related products. The company owns and develops properties for rental purposes.

Unga's core business derives raw materials from the agricultural sector and in turn

delivers to the sector a variety of processed goods. Any turmoil in this sector will affect the company adversely. For example, the working of transitional policies to a liberal economy were taking a heavy toll in rural activities. This has led to a decline in local production of maize and wheat. The option that Unga group limited had is to import basic cereals with consequence high prices. This, coupled with the prices of other imports, would adversely affect the operations and the results of the company.

Figure 23: Average Monthly Prices for Unga Group Limited: 1997



Source: Primary data

The prices for the shares were below Shs. 10.00 for the best part of 1992, but in November 1992 when a final dividend of Shs. 0.80 was declared, the prices moved up to slightly Shs. 10.00. In the later part of 1993, the securities benefited from the NSE boom and at the same time a dividend was declared. But in absolute terms the dividend was

minimal because the prices were being traded at over Shs. 80.00 per share.

After the 1993/94 boom the prices stabilized at Shs. 50.00 for some time but started to decline to below Shs. 40.00. Despite announcement of an interim dividend of Shs. 0.80 in July 1994, the price continued to slide down. This trend reversed and in the later part of 1994, the effects of a liberalized maize market were felt. This enabled the company to procure raw materials and supplies at low prices. Further, the liberalization of the company at that period enabled the company to introduce new products, re-launch old ones and enter into new business in Uganda. These news were favourably received by the market and the price continued on an upward trend reaching a peak of Shs. 140.00 in July 1995; when the interim results were announced and an interim dividend of Shs. 1.00 was declared. The P/E ratio was very high and the prices started to slide down, to an average price of Shs. 110.00.

In November 1995 when a final dividend Shs. 9.00 was declared, the trend was reversed and by the end of November 1995, the prices had reached the Shs. 130.00 level. The prices continued to raise but at a lower pace. This could be attributed to anticipating a bonus issue and even when it was announced in September 1996 the price had reached the Shs. 150.00 and they only increased by Shs. 10.00 to trade at Shs. 160.00 cum all. When the books were closed, the share prices slid down to Shs. 100.00 to reflect the pre-bonus market value of the shares. By the time of this study no new development had occurred at Unga to warrant any changes in the prices of the securities.

The following is the OLS model for the security.

$$P = 0.687 P(t-1) + 0.229 \text{ Div} + 0.949 \text{ EPS} + 0.400 \text{ P/E} - 0.03598 \text{ F/E} - 22.047 Y$$

$$(9.6755) \quad (0.259) \quad (4.738) \quad (2.645) \quad (-1.309) \quad (-0.370)$$

$$+ 12.166$$

$$(3.960)$$

$$R^2 = 0.969$$

$$F(6,44) = 230.05, p\text{-value} = 0.000$$

CHAPTER IV

SUMMARY AND CONCLUSION

The aim of this study was to analyze the price movement of selected securities in the NSE. The objectives were to identify a pattern for stock movement, determine the factors that affect share prices and to determine a predictive model for stock movement in NSE. The model was developed using PC-give software package. Using the model the prices from the month of May 1996 to April 1997 were computed and compared with the actual ones. T-test were carried out to determine whether the two prices were significantly different from each other. Forecast Chi-square and Chow test were also computed to test for parameter constancy.

Summary of Findings and Implications

Of the 25 securities selected the model could only be developed for 21 securities. Of the remaining four, three were of fixed income securities, and they were so illiquid such that the wisdom of the market could not be utilized. The remaining one company (Kenya Finance Bank) was under receivership and therefore was not been traded in the NSE.

Out of the 21 securities only eight computed models had predictions that were not significantly different from the actual ones. For the remaining securities that could not be predicted, the findings were consistent with existing studies, that past prices cannot be used to predict future ones in any meaningful way. Therefore, the models can be said to be poor predictors of share prices in the NSE. The findings are in line with existing studies.

The poor prediction was attributed to the choice of the sample during which the parameters of the forecasting models varies over time to reflect changes in the underlying earnings generating process. For example, at the beginning of the sample period, F/E

carried a lot of weight in influencing the price, but towards the end of the sample period, the Kenya shilling had stabilized, and therefore F/E did not influence the prices. A rejection of the null hypothesis by the Chow test implied a rejection of the model used in the entire sample period.

The EPS figures used had not been adjusted for retained and re-invested earnings. Since these earnings contribute to the generation of future EPS. This led to double counting. In some companies, the bonus had only been issued once in the sample period. In such cases, the statistical package would delete such a variable from the model since it would have a singular matrix. Further, the low bonus value implies the few times it was issued and at those times, the price would rise to high levels depending on the ratio of the bonus share given. Other factors considered possible explanations for the variations between the two prices are summarized below.

1. Lack of an efficient market in the exchange:

This implies that information differential and noise may be present in the market. The former indicates that an investor receives varying information or receiving information at different rates, meaning that the actual price may be very different from what was expected. For the latter, it is very difficult to test either practical or academic theories about the way the market works. Therefore, for some of the prices, the actual and/or predicted prices might have been noises. This implies that the existence of noises could have been the cause of these the significant variations between the two prices.

2. Transitory and permanent of variables:

The effect on the prices of these securities are multi variate and they can cancel each other such that there may be no effect at all. Further, there are some issues whose impact are transitory, and their impact are limited to contemporaneous earning values, for example, foreign exchange gains or losses. While others have a permanent effect, that is, all future earnings will be effected by the price shocks.

These are irrelevant for predictive purpose and the earning forecast would have to be adjusted for these drifts. It would be hard to obtain this permanent effects because this would have called for some field studies that would have taken longer than the time the present study was allocated.

3. The 1993/94 NSE boom.

In the later part of 1993 and early part of 1994, all securities at NSE had their prices increase dramatically. At that time, the NSE index rose from levels slightly below 2,000 to an all time high of 5,000. The reason for the increase in the general price increase was that during the first multi-party election of December 1992, there was financial indiscipline on the part of CBK, which resulted in injection of a lot of money into the economy. The resultant inflation reached levels of over 100 percent. In an effort to mop up excess cash liquidity introduced in the economy during the 1992 electioneering, the government, using various monetary instruments raised the rate of interest in treasury bills to levels of 80 percent per annum. This resulted in a high level of inflow of offshore funds which were brought in to cash in on the high interest rates.

The shilling also depreciated to levels of above Shs. 70.00. due to the liberalization of the economy, the removal of foreign currency restriction, and the removal in import controls. The resultant demand on hard currency resulted in the depreciation of the shilling. By the time the treasury bills matured and interest rates, had declined to unattractive levels, the shilling had depreciated and any gains made on the treasury bills could have been wiped out due to the loss in foreign exchange. This implied that funds were to remain in the country until the shilling appreciated, therefore the money had to be invested in the available options.

One of the options was to invest in the NSE and this resulted in the 1993/1994 boom. When the shilling had appreciated, the offshore funds had to be repatriated and this meant that the security had to be sold so that they could release the locked in

funds. There was a lot of money supply in the market, and the dynamics of the market resulted in there being a downward price movement. The index decreased and has stabilized at 3,000. Since then, however, due to the financial discipline on the part of the government on one hand, and on the other hand, CBK which has been a market maker in the foreign exchange market, it would be difficult for the economy to experience such a situation again.

The significant difference between the actual and forecast prices were also attributed to the following possibilities:

1. Statistical / econometric problems.
2. Testing of joint hypothesis.
3. Illiquidity of some securities leading to delays in price adjustments.
4. The existence of anomalies that were not incorporated in the models.
5. The ability to identify proxy parameter for the investment decision making.

Conclusions

From the above finding and interpretations, it was concluded that it is not always possible to develop models that were accurate prediction of share prices in the NSE. This was mainly attributed to parameters of the forecasting models varying over time to reflect changes in the underlying earnings generating process.

However, it is important to note that variables used in the valuations models are only as good as being proxy for the investors decision making process. They are also limited by the inaccuracies in estimating future earnings of the company. At best, they are only a framework for analysis which is useful for structuring the way an investor can conceptualize share valuation.

Since the observation for each variable used were limited, the results obtained have been sensitive to the data used. For example, the prices used for each month were an arithmetic average for the whole month. This shows that the actual data used had some

element of bias.

Limitations of the Study

Some of the limitations were:

1. **Sampling:**

The sample studied was that of firms which are actively traded in the NSE and were quoted in January 1992 to April 1997. This sample bias meant that generalization of the finding to the rest of the population would be biased.

2. **Time:**

Lack of adequate time led to the use of parameters that may not have been good proxy for the investor decision making variables. To obtain such proxy one had to, for instance, create experiment markets, or observe decision making by a large sample of informed investors over a long period of time; or interview senior and informed investment people. This would mean carrying out another research altogether for a longer period than that of the present study. Since this was not possible, the available parameters had to be used. These parameters had some limitations implying that their output was also effected. 3. The quality of data available at NSE:

The data available from the NSE secretariat was not very accurate and some of it had to be inferred due to lack of proper record maintenance.

One of the major assumption of the study was that there were no structural changes in any parameter between the sample period and the forecast periods. One of the parameters, prices; had such a change. This was in 1994, when rules regarding trading procedures were introduced. These rules governed the limits on bids and offers and the completion of a transaction. For example, the maximum rise or drop in price within one dealing session would not exceed 15 percent of the previous days closing price.

Recommendations for Further Studies

The following areas have been suggested for further research.

1. A study on the impact of the introduction of the trading rules in 1994.
2. A study on the impact on NSE on allowing foreign participation in the market.
3. The effect of institutional investors in the NSE.
4. Whether the foreign buyers effectively utilize their Share holding to influence the management of the company that hold their shares.

REFERENCES

- Abdul, F. "An Empirical Study to Identify Parameters which are Important in the Determination of Dividends by Publicity Quoted Companies: Unpublished MBA Project, University of Nairobi, 1993.
- Aboagye, A.Q. "Financial Statement and Ratios - The Case of Ghanaian Public Companies." Unpublished Paper for African Capital Market Conference, Nairobi: August 18-26 1993.
- Altman, E. I. and S. A. Robert, "Common Stock Volatility Measures and Patterns" Journal of Financial and Quantitative Analysis Volume 4 Number 4 pp 603-627, 1970
- Affel, R. A. "High Stock Returns Before Holidays: Existence and Evidence on Possible Causes" Journal of Finance Volume 45 Number 5 pp 1611-1625, 1990
- Asienwa, J. T. K. "The Relationship Between Investment Ratios and Share Performance of Companies Quoted on the Nairobi Stock Exchange." Unpublished MBA Project University of Nairobi, 1992.
- Baldwin, B. A. "Segment Earnings Disclosure and Ability of Security Analyst to Forecast Earnings per Share" The Accounting Review Volume 54 Number 3 pp 376-389, July 1984.
- Ball, R and R. Watts. "Some Time Series Properties of Accounting Income" Journal of Finance Volume 42 Number 27 pp 663-682, June 1972
- Balvers, R. J., T. Casimano and B. McDonald "Predicted Stock Returns in an Efficient Market" Journal of Finance Volume 45 Number 4 pp 1109-1128, September 1990.
- Banz, W. "The Relationship Between Returns and Market Value of Common Stock" Journal of Financial Economics Volume 30 Number 2 pp. 287-292, March 1981.
- Barday, M. J. and B. Jerold "Stealth Trading and Volatility, which Trades More prices?" Journal of Financial Economics Volume 34 Number 3, December 1993.
- Bernstein, P. L. and D. Bostain. "How to Forecast the Stock Market in Methods and Techniques of Business Forecasting" editor William F., Robert, A. and Robert, B. New Jersey: Preence-Hall Inc. pp 543-561, 1974.
- Bishop, R. M. Recommendation to the Nairobi Stock Exchange: Kenya USAID publication Washington, DC: May 1988.
- Brigham, E. and Gapesenki. "Intermediate Financial Management" 4th ed. The Dryden Press Chicago, 1985.
- Brown, P, et al "New Evidence on the Nature of Size Related in Stock Prices," Journal on Financial Economics Volume 12 Number 1 pp 33-56, 1983.

- Buckberg, E. "Emerging Stock Markets and International Asset Pricing" The World Bank Economic Review: Volume 9 Number 1 pp 51-74, 1995
- Capital Market Authority: A Report on the Ability of the Kenyan Market to Absorb New Equity Issues Prepared by Cooper and Lybrand, Nairobi: 1992.
- Chepkairor, S. K. S. "An Assessment of the Impact of Foreign Exchange Fluctuations on Projects Partly Funded Through Foreign Currency Denominated Loans" Unpublished MBA Project, University of Nairobi, 1988.
- Claessens, S. and G. Sudarsham. "Portfolio Investments in Developing Countries" The World Bank Discussion Paper 228 Washington, DC. 1993.
- _____ et al The Cross-Section of Stock Returns - Evidence from Emerging Markets. Policy Research Working Paper 105. The World Bank Washington DC. 1995.
- _____ et al Return Behaviour in Emerging Stock Market in the World. World Economic Review: Volume 9 Number 1 pp 131-152, 1995b.
- Coperland, T. E. and J. F. Weston Financial Theory and Corporate Policy, 3rd ed., Addison-Wesley Company Inc., 1988.
- Corhay, A. et al "Seasonality in the Risk Returns Relationship. Some International Evidence". Journal on Finance Volume 42 Number 1 pp 49-68, 1984.
- Deschamps, B. and P. Mehta "Predictive Ability and Descriptive Validity of Earnings Forecasting Models" Journal of Finance. Volume 35 Number 4, September 1980.
- Deschamps, B and Dileep, R. M. "Predictive Ability and Descriptive Validity of Earnings Forecasting Models" Journal of Finance Volume 35 Number 4 pp 933-949, September 1980.
- Emhardt, D. "An Empirical Appraisal of the Efficiency of the Market for First Public Offerings of Common Stock" Unpublished Ph.D. Dissertation, Cornell University, 1971.
- Fama, E. F. "The Behaviour of Stock Market Pprices" Journal of Finance Volume 38 Number 1, January 1965.
- _____, "Efficient Capital Markets: A Review of Theory and Empirical Work" Journal of Finance Volume 25 Number 2, May 1970.
- _____, "Stock Returns, Expected Returns and Real Activity" The Journal of Finance Volume 45 Number 4 pp 1089-1108, September 1990.
- _____, Kenneth, C "The Cross Section of Expected Returns". Journal of Finance Volume 46 Number 2 (1992) pp 427-465.
- Giacotto, C. and M. A. Mukutar "Optimum Distribution Free Test and Further Evidence of Heteroscedasticity in the Market Model" Journal of Finance Volume 37 Number 5 pp 1247-1258, December 1982.
- Gichuki, P. "Using the Asset Market Approach to Estimate Future Exchange Rates in a Developing Country: The Case of Kenya" Unpublished MBA Project, University

of Nairobi, 1991.

- Gitare, A. "An Empirical Investigation into the Risk Return Relationship Among Kenyan Publicity Quoted Companies." Unpublished MBA Project, University of Nairobi, 1990.
- Glen, J. An Introduction to the Micro-Structure of Emerging Markets. The World Bank Discussion Paper Number 124. Washington, DC: 1995.
- Guctckin, M. N. and N. Bultent "Stock Market Seasonality: International Evidence Journal on Financial Economics Volume 12 Number 5 pp 469-481, December 1983.
- Hartland, C. W. "East African Stock Market" Unpublished Paper for African Capital Market Conference, Nairobi, August 1-26, 1993.
- Harvey, C. R. Risk Exposure of Emerging Equity Markets Characteristics of Emerging Market." World Economic Review: Volume 9 Number 1 pp 19-50, 1995.
- International Finance Corporation. IFC Index Methodology, Central Capital Markets Departments Washington, DC: The World Bank, 1994.
- _____, CBK Development of Money and Capital Markets in Kenya, 1984.
- Jegadeesh, N. S. "Evidence of Predictable Behaviours of Security Returns" Journal of Finance Volume 45 Number 3 pp 881-897, July 1990.
- Jones, A. "Financial Markets Overseas" Journal of Finance Volume 31 Number 1 pp 21-63, 1974.
- Kerandi, M. A. "Testing the Predictive Ability of the Dividend Valuation Model on Ordinary Shares." Unpublished MBA Project, University of Nairobi, 1990.
- Kiege, P.N. "Business Failure Prediction Using Discriminant Analysis" Unpublished MBA Project, University of Nairobi, 1991.
- Kinandu, M. "Stock Market Efficiency in Developing Countries: A Case Study of the Nairobi Stock Exchange." Unpublished Ph.D. Dissertation, University of Glasgow, 1990.
- Kraft, J. and K. Arthur. "Determinants of Common Stock Prices: A Time Series Analysis" Journal of Finance Volume 32 Number 2 pp 417-425, May 1977.
- Krainer, R. E. "Liquidity Preference and Stock Market Speculation" Journal of Financial and Quantitative Analysis Volume 4 Number 5 pp 89-97, 1970.
- Lakonishuk, J. and E. Mcberly "The Weekend Effect: Trading Patterns of Individual and Institutional Investors" Journal of Finance Volume 45 Number 1, March 1990.
- Lamoubex, C. G. and W.D. Lastrapes "Heteroskedasticity in Stock Return Data: Volume Versus GARCH Effects" Journal of Finance Volume 45 Number 1 pp 221-229, March 1990.
- Lenthold, R. M. "Random Walk and Price Trends: The Live Cattle Futures Market"

Journal of Finance Volume 26 Number 4 pp 879-890, September 1972.

- Levine, R. and Z. Sara "Capital Control Liberalization and Stock Market Development". Policy Research Working Paper 1622. The World Bank Washington, DC: 1996.
- Lishenga, L. "An Analysis of the Relationship Between Certain Corporate Attributes and Timeliness of Annual Report of Companies listed on the Nairobi Stock Exchange" Unpublished MBA Project University of Nairobi, 1989.
- Lo, A and A. C. Mackinlay "Stock Market Prices do not Follow Random Walks: Evidence from a Simple Specification Tests in" Review of Financial Studies Volume 1 Number 1 pp 41-66, 1986.
- Mathu, C. R. "An Empirical Analysis of the Level of Corporate in Annual Report" MBA Project, The University of Birminchain, 1996.
- McDonald, J. G. and A. K. Fisher "New Issue Stock Price Behaviour" Journal of Finance Volume 27 Number 1 pp 97-102, March 1972.
- Mensah, S. "Valuation of Equity Shares" Snpublished Paper for African Capital Market Conference, Nairobi, August 18-26 1993.
- Moss, T. J. and C. J. Kenny "Africas Emerging Market" Center for Strategic and International Studies (CSIS) Africa Notes Number 190 pp 1-8, November 1996.
- Muli, S. M. "Estimating the systematic return risk for the Nairobi Stock Exchange" Unpublished MBA Project, University of Nairobi, 1991.
- Munge, N. D. "The Nairobi Stock Exchange, its History, Organization and Role in the Kenyan Economy", Unpublished MBA Project, University of Nairobi, 1974.
- Muthamia, A. M. "Factors Considered by Publicity Quoted Companies in Kenya in Selecting External Auditors". Unpublished MBA Project, University of Nairobi, 1990.
- Muturi, J. M. "Forecasting Asset Requirements in Publicity Quoted Companies", Unpublished MBA Project, University of Nairobi, 1990.
- Njaramba, M. A. "Association Between Extraordinary Items of smooth Income in Publicly Quoted Companies in Kenya", Unpublished MBA Project, University of Nairobi, 1990.
- Omanwa, M. H. "An Empirical Investigation into the Behaviour of Annual Corporate Earnings Among Kenyan Publicity Quoted Companies", Unpublished MBA Project, University of Nairobi, 1991.

- Omollo, A. "The Distribution of Financial Ratios of Companies Quoted at the Nairobi Stock Exchange an Evidence", Unpublished MBA Project, University of Nairobi, 1993.
- Omosa, F.Y.B "Predicative Ability of Selected Assets Pricing Models on the Nairobi Stock Exchange", Unpublished MBA Project, University of Nairobi, 1989.
- Pinches, G. E. "The Random Walk Hypothesis and Technical Analysis" Financial Analyst Journal Volume 26 Number 2, March-April 1970.
- Schwartz, W. "An Introduction to Capital Markets" Journal of Financial Economics Volume 12 Number 5 pp 300.December 1993.
- Simiyu, W. M. "Measuring Market Performance of the Nairobi Stock Exchange," Unpublished MBA Project, University of Nairobi, 1992.
- Stevenson, R. A. and M. B. Robert "Commodity Futures; Trends or Random Walk?" Journal of Finance Volume 25 Number 1 , pp 65-82, March 1970.
- Ullmann, A. A. "Data in Search of Theory: A Critical Examination of the Relationships Among Social Performance, Social Disclosure, and Economic Performance of U.S. Firms" Academy of Management Review Volume 10 Number 3 pp 540-557, 1985.
- Umstead, M. E. "Stock Prices and their Effect on the Market" Journal of Finance Volume 30 Number 4 pp 103, September 1974.
- Vanhome, J. C. and F. G. William "The Impact of Unanticipated Change in Inflation on the Value of Common Stock" Journal of Finance Volume 27 Number 5 pp 1081-1092, December 1972.
- Wambugu, N. "The Effects of a Firm's Capital Structure on the Risk of Common Stocks: A Test on the NSE", Unpublished MBA Project, University of Nairobi, 1992.

APPENDICES

Appendix I: Population of the Study

| Security | Issued shares | Volume | Traded/ Issued share (Percent) |
|----------------------------------|---------------|------------|--------------------------------------|
| Agricultural | | | |
| 1. Rea Vipingo Plantations Ltd. | 55,772,688 | 6,006,415 | 10.77 |
| 2. Kapchorua Tea Co. Ltd | 3,912,000 | 247,300 | 6.32 |
| 3. Sasini Tea & Coffee Ltd. | 25,339,500 | 787,854 | 3.11 |
| 4. Ol Pejeta Ranching Ltd. | 1,500,000 | 28,650 | 1.91 |
| 5. Kakuzi Limited | 19,599,999 | 367,732 | 1.88 |
| 6. George Williamson Kenya Ltd. | 8,756,320 | 104,852 | 1.20 |
| 7. Theta Group Ltd. | 1,927,900 | 15,900 | 0.82 |
| 8. Limtea Limuru Tea Co. Ltd. | 200,000 | 1,000 | 0.50 |
| 9. Brooke Bond Ltd. | 48,875,000 | 167,437 | 0.34 |
| 10. Eaagads Ltd. | 6,431,400 | 7,920 | 0.12 |
| Commercial and Services | | | |
| 11. Uchumi Supermarkets Ltd. | 40,000,000 | 10,177,745 | 25.44 |
| 12. Pearl Drycleaners Ltd. 5% | 20,000 | 2,995 | 14.98 |
| 13. Standard Newspapers Group | 8,541,240 | 762,929 | 8.98 |
| 14. Nation Printers & Publishers | 11,884,210 | 941,615 | 7.92 |
| 15. Pearl Drycleaners Ltd. | 1,597,962 | 114,204 | 7.15 |
| 16. Car & General (K) Ltd. | 20,254,196 | 1,283,100 | 6.33 |
| 17. Marshalls (E.A.) Ltd. 7% | 25,000 | 1,517 | 6.07 |
| 18. KHL 6% | 58,473 | 2,688 | 4.60 |
| 19. C.M.C. Holdings Ltd. | 12,140,000 | 550,320 | 4.53 |
| 20. Standard Newspapers Group | 20,400 | 784 | 3.84 |
| 21. Kenya Airways Limited | 461,615,484 | 15,489,538 | 3.36 |
| 22. African Tours & Hotels | 500,000 | 13,786 | 2.76 |
| 23. Lonrho Motors 6% | 250,000 | 6,347 | 2.54 |
| 24. Philip International Ltd. | 350,000 | 7,339 | 2.10 |
| 25. Express Kenya Ltd. | 4,800,000 | 99,271 | 2.07 |
| 26. A. Baumann & Co. Ltd. | 2,560,044 | 45,207 | 1.77 |
| 27. Marshalls (E.A.)Ltd. | 9,595,404 | 96,067 | 1.00 |
| 28. Lonrho Motors | 21,253,692 | 110,808 | 0.52 |
| 29. Motor Mart Group Ltd. 6% | 250,000 | 2,225 | 0.89 |
| 30. Motor Mart Group Ltd. | 21,253,692 | 110,808 | 0.52 |
| 31. Hutchings Biemer Ltd. 5% | 60,000 | 300 | 0.50 |

| | Security | Issued shares | Volume | Traded/ Issued share (Percent) |
|-----|-----------------------|---------------|--------|--------------------------------------|
| 32. | Lonrho Motors 5% | 125,000 | 600 | 0.48 |
| 33. | Hutchings Biemer Ltd. | 360,000 | 1,200 | 0.33 |

Finance and Investment

| | | | | |
|-----|---------------------------------|-------------|------------|-------|
| 34. | National Industrial Credit Ltd. | 43,945,313 | 9,036,099 | 20.56 |
| 35. | City Trust Ltd. | 4,166,046 | 476,184 | 11.43 |
| 36. | Kenya Finance Bank | 19,557,590 | 1,966,308 | 10.05 |
| 37. | Kenstock Ltd. DFD 12.5% | 233,000 | 20,613 | 8.85 |
| 38. | I.C.D.C. Investment Co. Ltd. | 22,621,136 | 1,730,948 | 7.65 |
| 39. | Housing Finance Co. Ltd. | 92,000,000 | 6,191,954 | 6.73 |
| 40. | National Bank of Kenya Ltd. | 200,000,000 | 12,801,601 | 6.40 |
| 41. | Pan Africa Insurance Ltd. | 10,000,000 | 524,608 | 5.25 |
| 42. | Diamond Trust of Kenya Ltd. | 79,500,000 | 2,537,583 | 3.19 |
| 43. | Kenya Commercial Bank Ltd. | 112,200,000 | 3,378,467 | 3.01 |
| 44. | Barclays Bank Ltd. | 128,587,500 | 2,722,450 | 2.12 |
| 45. | Jubilee Insurance Co. Ltd. | 25,000,000 | 515,683 | 2.06 |
| 46. | Standard Chartered Bank Ltd. | 164,829,100 | 2,580,292 | 1.5 |
| 47. | CFC Bank Limited | 100,000,000 | 1,504,248 | 1.50 |
| 48. | Kenstock Ltd. PRF 12.5% | 361,671 | 5,000 | 1.38 |
| 49. | Chancery Investment Ltd 8% | 25,000 | 150 | 0.60 |
| 50. | Chancery Investment Ltd. 7% | 100,000 | 250 | 0.25 |

Industrial and Allied

| | | | | |
|-----|------------------------------------|-------------|------------|--------|
| 51. | East African Portland Ltd. Rights | 7,680,000 | 10,053,088 | 130.90 |
| 52. | Dunlop Kenya Ltd. | 400,000 | 65,950 | 16.49 |
| 53. | Kenya Power Lighting Co. Ltd. | 17,584,000 | 1,741,180 | 9.90 |
| 54. | Kenya Breweries Ltd. | 65,521,577 | 5,792,537 | 8.84 |
| 55. | Unga Group Ltd. | 5,206,529 | 262,429 | 5.04 |
| 56. | BOC Kenya Ltd. | 16,161,000 | 667,935 | 4.13 |
| 57. | Crown-Berger Ltd. | 21,570,000 | 673,905 | 3.12 |
| 58. | Kenya Orchards Ltd. 5.5% | 50,000 | 1,500 | 3.00 |
| 59. | Firestone East Africa Ltd. | 185,561,600 | 4,544,868 | 2.45 |
| 60. | Carbacid Investments Ltd. | 9,438,963 | 228,529 | 2.42 |
| 61. | Kenya National Mills Ltd. | 20,170,700 | 421,220 | 2.09 |
| 62. | Total Kenya Ltd. | 56,000,000 | 861,092 | 1.54 |
| 63. | Bamburi Portland Cement Co. Ltd. | 161,294,300 | 2,406,930 | 1.49 |
| 64. | East African Portland Cement Ltd. | 90,000,000 | 1,227,991 | 1.36 |
| 65. | Kenya Power & Lighting Co. Ltd. 4% | 1,800,000 | 24,125 | 1.34 |
| 66. | Kenyr Orchards Ltd. | 400,000 | 4,986 | 1.25 |
| 67. | East African Cables Ltd. | 16,200,000 | 192,130 | 1.19 |
| 68. | B.A.T. Kenya Ltd. | 75,000,000 | 659,056 | 0.88 |
| 69. | Kenya Oil Company Ltd. | 7,199,800 | 50,868 | 0.71 |
| 70. | East African Packaging Ltd. | 7,860,000 | 40,361 | 0.53 |
| 71. | Kenya Power & Lighting Co. Ltd. | 350,000 | 42 | 0.01 |

Appendix II: Sample of the Study

| Security | Issued shares | Volume | Traded/ Issued share (Percent) |
|--------------------------------------|---------------|------------|--------------------------------------|
| Agricultural | | | |
| 1. Rea Vipingo Plantations Ltd. | 55,772,688 | 6,006,415 | 10.77 |
| 2. Kapchorua Tea Co. Ltd | 3,912,000 | 247,300 | 6.32 |
| 3. Sasini Tea & Coffee Ltd. | 25,339,500 | 787,854 | 3.11 |
| 4. Ol Pejeta Ranching Ltd. | 1,500,000 | 28,650 | 1.91 |
| 5. Kakuzi Limited | 19,599,999 | 367,732 | 1.88 |
| Commercial and Services | | | |
| 1. Uchumi Supermarkets Ltd. | 40,000,000 | 10,177,745 | 25.44 |
| 2. Pearl Drycleaners Ltd. 5% | 20,000 | 2,995 | 14.98 |
| 3. Standard Newspapers Group | 8,541,240 | 762,929 | 8.98 |
| 4. Nation Printers & Publishers | 11,884,210 | 941,615 | 7.92 |
| 5. Pearl Drycleaners Ltd. | 1,597,962 | 114,204 | 7.15 |
| 6. Car & General (K) Ltd. | 20,254,196 | 1,283,100 | 6.33 |
| 7. Marshalls (E.A.) Ltd. 7% | 25,000 | 1,517 | 6.07 |
| Finance and Investment | | | |
| 1. National Industrial Credit Ltd. | 43,945,313 | 9,036,099 | 20.56 |
| 2. City Trust Ltd. | 4,166,046 | 476,184 | 11.43 |
| 3. Kenya Finance Bank | 19,557,590 | 1,966,308 | 10.05 |
| 4. Kenstock Ltd. DFD 12.5% | 233,000 | 20,613 | 8.8 |
| 5. I.C.D.C. Investment Co. Ltd. | 22,621,136 | 1,730,948 | 7.65 |
| 6. Housing Finance Co. Ltd. | 92,000,000 | 6,191,954 | 6.73 |
| 7. National Bank of Kenya Ltd. | 200,000,000 | 12,801,601 | 6.40 |
| 8. Pan Africa Insurance Ltd. | 10,000,000 | 524,608 | 5.25 |
| Industrial and Allied | | | |
| 1. East African Portland Ltd. Rights | 7,680,000 | 10,053,088 | 130.90 |
| 2. Dunlop Kenya Ltd. | 400,000 | 65,950 | 16.49 |
| 3. Kenya Power Lighting Co. Ltd. | 17,584,000 | 1,741,180 | 9.90 |
| 4. Kenya Breweries Ltd. | 65,521,577 | 5,792,537 | 8.84 |
| 5. Unga Group Ltd. | 5,206,529 | 262,429 | 5.04 |