

**THE EFFECT OF GOVERNMENT OWNERSHIP  
ON SHARE PRICE VOLATILITY OF COMPANIES QUOTED  
AT NAIROBI STOCK EXCHANGE**

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# DECLARATION

**THIS PROJECT IS MY ORIGINAL WORK AND HAS NOT BEEN  
SUBMITTED FOR A DEGREE IN ANY OTHER UNIVERSITY**

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## **DEDICATION**

My gratitude goes to my wife, Esther, daughters, Brenda and Lucy for their unconditional encouragement, patience, perseverance and comfort when uncertainty surrounded my studies over the one and a half years.

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Usually, such an effort as this is fraught with errors of commission or omission. Although I have made an effort against these arising, it may turn out that some will actually arise. For these, I bear the full responsibility

Finally "May All The Glory, Praise and Honor go back to God". He watched my joining and leaving.

# ABSTRACT

The study contained in this report investigated the effect of ownership on share price volatility of companies quoted at the Nairobi stock exchange (NSE) for the period 1997 to 1998. The specific objective of the study was to establish whether ownership influences the share price volatility of companies quoted at NSE. Share price volatility is regarded as risk surrogate and hence was used to measure the risk perceived by investors.

The population of interest was the eight companies, which the government had shareholding and are quoted at the NSE. Data of share prices and NSE index was collected for the two years and first analyzed by selecting the weekly high, low and closing for each company and the NSE index. Statistical test was carried out using chi-square test for independence to find out whether ownership and share price volatility are independent.

From the research findings it was concluded that what has been assumed all along by this study is actually true. That is, companies which the government has shareholding are perceived to be more risky by investors. This conclusion supports the need for privatization of such companies.

# 1. INTRODUCTION

## 1.1. BACKGROUND

### 1.1.1. BACKGROUND OF THE STUDY

A Company may have a combination of different types of investors. The main classifications are institution, government, individual and foreign. The combination of the investors ranges from one to all the four. The ownership of a company has a lot of influence on the direction it will take in terms of its investment and management policies. This implies that the performance and prosperity of a business can be good or bad depending on the direction the investors steers the company.

Some investors have substantial influence on the financial and operating decisions of a company. Power to appoint directors of a company by investors has at times contributed to such influence. Consequently, the performance of a company will be as per the financial and operating decisions of the influencing shareholders/investors.

In most of the developing countries, Kenya included, we can reclassify the investors into two. These are the government on one hand and other investors on the other hand. The reason for separating the government from other investors is due to its unique financial and operating policy decisions. Where the government has been having a significant influence, it is likely to affect the performance of such companies and hence the share price volatility.

Management of the Public Companies (PCs) has been noted in various commission (Oyugi & Okelo 1997) to be the major bottleneck of performance. Some of these commissions are; Duncan Ndegwa commission(1971), The Waruhiu Commission (1980) and the Philip Ndegwa Commission (1981) which were all concerned that the PCs were poorly managed and therefore



recommended changes in various areas of management. Waruhiu Commission concluded by saying;

*"the assertion that the staffing of the parastatals was mainly by ex-civil servants and that a large number of these organisations do not make any profits is at best sad comment on the civil services itself indeed, the poor selection of civil servants who have been appointed to head parastatal organisations has been the root cause of poor management in most of these organisations"(PAGE 103).*

To evaluate the performance of a company both the potential and current investors use ratio analysis on data from Stock exchanges (SE);in Kenya we have the Nairobi Stock Exchange (NSE). The data obtained includes the stock prices from SE or the financial statements issued by companies.

### **1.1.2. FINANCIAL ANALYSIS**

To be successful in the long run, an investor should have access to pertinent and timely information on which to base investment decisions. All financial decisions that an individual make should be based on fundamental data from reliable sources that, if properly understood and applied, can greatly increase an investor's chances for success. Such data is usually obtained from the financial statements issued by companies or the Stock Exchange for the quoted companies.

The volatility of share prices can be used to analyse the risk of a company. The characteristic of a frequency distribution is commonly referred to as volatility. That is, the way the data is spread around on either side of the central point. Small volatility indicates high uniformity of the items, while large volatility indicates less uniformity. ***The volatility is regarded as risk surrogate (Pinches, 1971) and hence can be used to measure the risk perceived by investors.***

There are many different measures of volatility that have been suggested by various authors such as, Altman & Schwartz (1970) and Pinches & Kenney (1971). Three basic classifications of measures were considered in this study: high-low measures; measures of dispersion around an arithmetic mean; and measures of dispersion around a quadratic mean.

### **1.1.3. THE NAIROBI STOCK EXCHANGE (NSE)**

The NSE was constituted in 1954 as a voluntary association of stockbrokers registered under the Societies Act. However, dealing with shares and stocks started in the 1920's. No formal market, no rules and no regulations to govern stockbroking activities were in place then (NSE Annual Report, 1997). 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. Now it is in the process of shifting to Electronic Transfer, with a central depository system of share certificates.

The NSE has played an essential role in the Kenyan economy especially in the privatisation of the state-owned enterprises. The basic function of the NSE is the raising of funds for investment in long-term assets. While this basic function is extremely important and is the engine through which stock exchanges are driven, there are also other quite important functions :-

- The mobilisation of saving for investment in productive enterprises as alternative to putting saving in bank deposits, purchases of real estate and outright consumption.
- The growth of related financial services sector e.g. insurance, pension and provident fund schemes which nature the spirit of savings.

- The check against flight of capital which takes place because of local inflation and currency depreciation.
- Encouragement of the divorcement of the owners of capital from the managers of capital; a very important process because owners of capital may not necessarily have the expertise to manage capital investment efficiently.
- Encouragement of higher standards of accounting, resource management and public disclosure which in turn affords greater efficiency in the process of capital growth.
- Facilitation of equity financing as opposed to debt financing. Debt financing has been the undoing of many enterprises in both developed and developing countries especially in recessionary periods.
- Improvement of access to finance for new and smaller companies. This is futuristic in most developing countries because venture capital is mostly unavailable, an unfortunate situation.
- Encouragement of public floatation of private companies which in turn allows greater growth and increase of the supply of assets available for long-term investment.

There are many other less general benefits which stock exchanges afford individuals, corporate organisations and even the government. The government for example could raise long term financing locally by issuing various types of bonds through the stock exchange and thus be less inclined to foreign borrowing. However, Stock exchanges, especially in developing countries have not always played their full role in economic development.

#### **1.1.4. DEFINITION OF TERMS**

##### **i. Public Companies (PCs)**

This is where the government has share holding in a company. The ownership may be directly or indirectly. Direct ownership occur when the government has shares in a company and indirect is when the government has shares through its statutory boards. The major statutory boards that the government has invested though are Industrial and Commercial Development Corporation (ICDC), Kenya Tourist Development Corporation (KTDC), Kenya Tea Development Authority (KTDA) and Agricultural Development Corporation (ADC).

##### **ii. Private Owned Companies**

Private owned companies are those where the government does not have any shareholding directly or otherwise. The government cannot therefore influence the management of such companies

##### **iii. Privatisation**

This is the transfer of government owned shareholding in designated enterprises to private shareholding, comprising individuals and corporate bodies.

## 1.2. STATEMENT OF THE PROBLEM

Over the years, the performance of PCs has been a big debate. In many developing countries, the performance has been poor and continue to deteriorate over time. Ogeto (1994) noted that they have not been making much profit as compared to private companies. Also, in most of the developing countries, PCs have grown beyond their original purpose, size and objectives without any effort to re-defining or clarifying those objectives; others have been saddled with objectives, which are not clear. In Kenya, for example, there are a number of PCs that have been declared bankrupt due to non performance, included being; Kenya National Assurance Corporation, Kenya Meat Commission and Africa Tours & Hotel. A number of attempts have been made by the government to improve Public sector performance. Included are: -

- The formation of the Parastatal Advisory Committee in 1979 and the enlargement of the Inspectorate of State Corporations to serve as a troubleshooting, management audit and consulting services for parastatals
  
- The formation of the Anti-corruption unit to investigate all corruption cases.

Not much has been achieved from the above two changes, hence, necessitating the government to embark on privatisation from 1992. This is on the general belief that private companies perform better than PCs since they are more focused, have a profit motive and are efficiently and effectively managed.

The performance of shares of PCs at the NSE has also been a big debate. Management of some of these companies has been alleging that share prices are manipulated by the NSE and hence being under-priced. For example, former Kenya Commercial Bank Ltd (KCB) chairman Dr. Benjamin Kipkorir (Daily Nation (D/N) Tuesday June 18, 1991) alleged that KCB shares were being under-priced. Likewise, Kenya Airways (KA) shares have been trading below the

expectation of the investor. In 1996 Dec. the KA shares dropped from Kshs. 9.35 to Kshs 8.85. This was alleged to have been due to the Government proposal of a director which the shareholders rejected (Economic Review, Dec 2-8, 1996). The price for KA share dropped further to Kshs. 8/50 in September, 1999. This may be due to the government management policies of KA.

Despite the allegation that the shares of PCs are under priced at NSE, there are times when the share prices have been trading at a relatively high price. For example, as at August,1999, National Bank of Kenya Company's highest price has been 18/60 and lowest 3/70, variance of 400%, likewise, for Kenya Power & Lighting the highest price has been 225/= and lowest 100/=, variance of 120%. CFC bank ltd, a company which the government does not own shares, the highest price has been 20/50 and lowest 13/50 a relatively low variance of 51%. This show that the share prices of PCs have been relatively volatile. The price volatility of shares may be as a result of the risk or uncertainty perceived by the investors in the government owned companies. It is from this basis that there is need to evaluate the effect of government ownership on share prices volatility of companies quoted at NSE.

### **1.3. OBJECTIVE OF THE STUDY**

The study was expected to establish whether the share prices volatility of companies quoted at the NSE is influenced by ownership.

The following hypothesis were tested: -

*H<sub>0</sub> : ownership of companies and share price volatility are independent.*

*H<sub>1</sub> : ownership of companies and share price volatility are not independent.*

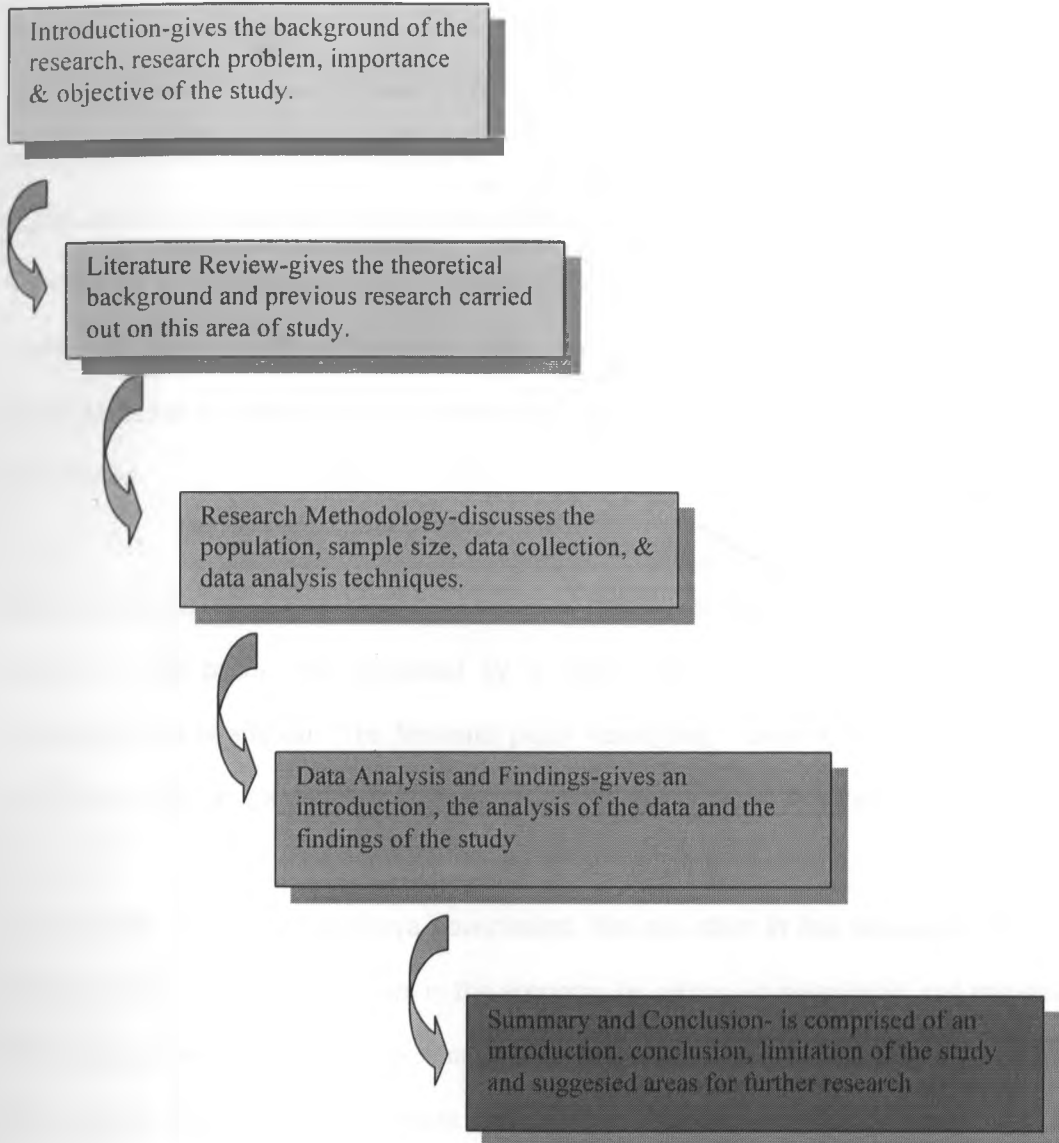
### **1.4. IMPORTANCE OF THE STUDY**

This study will be important in the following ways:-

- The government, investors and scholars will be able to use the results of the study in establishing the risk associated with companies that the government is having shareholding.
- Academicians can use the study to further research on privatisation of PCs.
- Together with other studies done on privatisation, it will enlighten on the way forward for the government. That is, whether or not to privatise.

## 1.5. OVERVIEW OF THE PROJECT

A pictorial depiction of the flow of the project is as follows: -





## 2. LITERATURE REVIEW

### 2.1. BACKGROUND

#### 2.1.1. HISTORICAL BACKGROUND

In the post-independence decade of the 1970's, the private sector development was relatively neglected by the Kenya government in favour of the public sector. This relative neglect was attributed to the fact that indigenous entrepreneurs were presumed to be few and local subsidiaries of multinational firms, representing a large part of local private sector activities, were distrusted. The notion was also widespread within the donor community that entrepreneurial functions could be better served by the state than by private enterprise or individuals.

Sessional paper No 10 of 1965 established a broad mandate for public participation in the economy. The policy was tempered by a clear view on the importance of performance monitoring and regulation. The Sessional paper noted that, "*ownership can be abused whether public or private, and ways must be found to control resource use in either case*"(page 10).

To meet this challenge, the Kenya government, like any other in less developed country (LDC) involved itself in almost all sectors in the economy by setting up parastatals and ministries of all kinds and nature. However, over time the performance of the parastatals has not been that encouraging. The government of most developing countries have generally not lived up to public expectations as effective instruments of development and modernisation. Following an incisive analysis of the performance of African public enterprises, the World Bank in 1991 stated as follows<sup>1</sup>:

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<sup>1</sup> Report of ECA/OAU Regional Conference on the role of Public Sector in National & Regional Development, Addis. Ababa, Ethiopia 22-27 Nov 1982-P.6.

*"In many African countries the Parastatals present the most urgent problems of public sector performance. African governments should not only examine ways in which public sector organisation can be operated more efficiently, but should also examine the possibility of placing greater reliance on the private sector"(page 56).*

Consequently, the World Bank, IMF and other donors have advocated for the government to carry out the following reforms: -

- i. Divestitures from the Parastatals
- ii. Civil service reforms
- iii. Cutting down on government expenditure

To implement the above reforms among others, the World Bank, IMF and other donors designed a programme referred to as structural adjustment programme (SAP). The privatisation methods that have been recommended by the World Bank are: competitive bidding; public offering of share; sale of shares by private placement; employee/management buy-out among others.

So far, we have ten companies that have been privatised through the NSE. The table below shows the government shareholding before and after the privatisation.

**TABLE 2.1**

**SOME OF THE SUCCESSFUL PRIVATISATION SO FAR EFFECTED**

<i>Company</i>	<i>Year</i>	<i>Government Share Before (%)</i>	<i>Government Share After (%)</i>	<i>Sector</i>	<i>Buyer</i>
<i>Bamburi Portland Cement Co. Ltd</i>	1991	26	0	Industrial & Allied	NSSF
<i>E.A Oxygen Ltd</i>	1993	15	0	Industrial & Allied	Individuals & other Investors
<i>CMC Holdings</i>	1993	20	0	Commercial & Services	Individuals & other Investors
<i>National Bank of Kenya</i>	1994	100	42.5	Finance & Investment	Individuals & other Investors
<i>Kenya Airways</i>	1996	100	23	Commercial & Services	Individuals & other Investors
<i>Safari Lodges &amp; Properties (K) Ltd</i>	1997	33	0	Commercial & Services	Individuals & other Investors
<i>Tourism Promotion Services Ltd</i>	1997	11	0	Commercial & Services	Individuals & other Investors
<i>Kenya Commercial Bank Ltd</i>	1988, 1990 & 1997	100	35	Finance & Investment	Individuals & other Investors
<i>Uchumi Supermarkets Ltd</i>	1992	90	44	Commercial & Services	Individuals & other Investors
<i>Housing Finance Company of Kenya</i>	1992	50	30	Finance & Investment	Individuals & other Investors

Source: Business Week July 27, 1999

Currently the government holds share in the following companies. It is the interest of the study to find out the risk perceived by investors for these companies.

**TABLE 2.2**

**COMPANIES THAT ARE QUOTED AT NSE WHICH THE GOVERNMENT STILL HOLDS SHARES AS AT DECEMBER 1998.**

	<i>Company</i>	<i>Government shareholding (%)</i>
<b>1</b>	National Bank of Kenya	42.5
<b>2</b>	Kenya Airways	23
<b>3</b>	Kenya Commercial Bank Ltd	35
<b>4</b>	Uchumi Supermarkets Ltd	44
<b>5</b>	Housing Finance Company of Kenya	30
<b>6</b>	ICDC Investments	23
<b>7</b>	Kenya Power & Lighting Company	51
<b>8</b>	East African Portland Cement Company	26

**Source : NSE, 1998**

The process of privatisation in Kenya has experienced a number of problems. This has resulted to the slow pace of privatisation. Some of the problems experienced are; Shortage of technical expertise to undertake the privatisation exercise, Unwillingness of the government to abandon the public sector to private ownership and management, Job losses for workers in privatised enterprises and Political opposition.

### **2.1.2. CAUSES OF POOR PERFORMANCE OF PCs**

Some of the causes of poor performance of PCs as suggested by Oyugi & Okelo (1997) are: -

#### **i. Political factors**

These factors arise because of the need for public control and public accountability, which are inherent in the very system of PCs. While control over public enterprises is recognised and accepted as essential, the degree of such control and the manner of its exercise constitute a fundamental problem. This is because it involves a delicate balancing of, on the one hand, managerial autonomy so very essential for the success of a commercial PCs. On the other hand, social control demanded by the public and purpose of such PCs. This is a formidable problem, for too much control would lead to apathy, demoralisation and hence jeopardising the very functioning of the enterprise. Public control therefore, should operate effectively but in full recognition of the need for managerial freedom and should confine itself to major matters of policy leaving everything else to the PCs accounting within this legal competence.

Such public control operates through several channels, included being: ministerial or government control, parliament or legislative control, judicial control and general social control. Of these, government or ministerial control is by far the most prominent and the most potent for the success or failure of the PCs.

## ii. Structural and managerial factors

The basic structure for the administration of a PC is practically the same in most countries. That is, an independent governing board responsible to government and accountable to its efficient management. However, the practice followed differ when it comes to the matter of composition or membership of the governing board, its duties and responsibilities, its powers and limitations and its role in management. The differences are not only from country to country but also from one PC to another within the same country.

Among the contributory causes for the PCs failure to achieve their objectives and to run profitably is the poor performance by the production sector. There are several reasons for the poor performance of the governing board, included being:-

- Appointment of members of the governing board of persons who have no knowledge or experience in commercial enterprises, not to mention the particular line of business in which the PC is engaged.
- Lack of clear specification of the policies and objectives of the powers, duties and responsibilities of the governing board.
- Absence of clear demarcation of responsibilities and accountability on the one side, as between the ministry and the board, and on the other, as between the board and the chief executives.
- Appointment of more than one top executive in the same organisation. For example, executive director on the board and managing director leading to conflicts.
- Lack of incentives to the members of the board for better performance.
- Erosion of managerial autonomy by excessive control over the financial operations of the enterprises.
- Many members of the governing board have also other occupations, such as being members of other boards, leading to inadequate attention being paid to the problems of the PC.

### **iii. Financial factors**

Government or ministerial control of PCs is nowhere in greater evidence or more frequent than in financial matters. Such control operates at several stages and in a variety of ways, such as; in the provision of funds and resources to the PC, by regulating its budget and expenditure by requiring approval for capital outlay and for borrowing, by regulating prices of goods and services and by formulating a wage policy for the PC.

Excessive or too rigid controls in these matters result in large erosion of managerial autonomy and it would be difficult to execute the PC to function "profitably" in such circumstances.

#### **2.1.3. DETERMINANTS OF SHARE PRICES**

Some of the determinants of share price are, dividend policy, capital structure and company's performance. Paradigms have been developed on each of these determinants which at times contradict each other. It would therefore be important to discuss the major paradigm for each determinant.

##### **i. DIVIDEND POLICY**

This is one of the major decisions that companies normally make. Dividend pay-out may be constant, decreasing, increasing or non-existence over time. The debate as to whether dividend policy matters has waged intensely for some time; that is, does a high dividend pay-out ratio produce a high stock value?

Fisher (1985) in his article on Dividend Puzzle mentioned two unresolved questions on dividend. These are; why do corporations pay dividends? and why do investors perhaps pay

attention to dividends? The answer to these questions is not obvious. Some of the reasons for paying dividend are:-

- dividend represent the return to the investors who put his money at risk in the corporation.
- to reward existing shareholders and/or to encourage others to buy new common stock at high prices
- investors pay attention to dividends because only through dividends or the prospect of dividends they receive a return on their investment or a chance to sell their shares at a higher price in the future.

On the other hand, a firm may not pay dividend if it has attractive investment opportunities that might be missed if it paid dividends. If it carries the investment the shareholders will end up with capital appreciation that is greater than the dividends they missed out. The shareholders may gain further if they are taxed at lower effective rate on capital appreciation than on dividends.

Basically the Fisher puzzle tried to bring out the issue that despite the considerable debate and research, there is little agreement among economists, managers and investors about the stock price consequences of, and thus the corporate motives for, applying cash dividend.

Modigliani and Miller (MM)(1961) made a comprehensive argument for irrelevancy of dividend. They asserted that, given the investment decision of a company, the dividend pay-out ratio is a mere detail. MM argued that the value of the firm is determined by the earning powers of the company's assets or its investment policy and the manner in which the earnings stream is split between dividend and retained earnings does not affect the value. However, they assumed a perfect capital market situation among other assumptions.

Gordon (1963) came up with the version of the "bird in the hand" argument. He argued that investors would discount the expected stream of future dividend at a lower rate than expected capital gain and hence place premium prices on stocks offering higher dividend growth. The issue



Gordon was addressing was uncertainty. That is, investor would prefer a shilling today than tomorrow.

In summary, there is no single theory to explain a firm's dividend policy or determine an optimal level for a firm's dividend. Empirical studies gives contradictory evidence but from a practical point, managers seems to attempt to maintain a particular pay-out ratio, tempered by great reluctance to reduce the dividend from last years minimum level. Dividend as a whole may be paradoxically high. For example, why do many firms incur unnecessary issue and transaction cost for paying dividends and at the same time seeks new equity capital.

## **ii. CAPITAL STRUCTURE**

Capital structure is the combination of debt and equity in the financing of a company. MM (1958) argued that capital structure is irrelevant in determining the value of a company. The value of a company's share should not be affected by the debt/equity ratio but the ability to generate earnings. MM thus concluded that a company cannot reduce the cost of capital or increase its valuation, because a benefit from cheaper debt is offset by increased cost of equity financing. However, MM assumed a perfect capital market but when we introduce imperfection, there are likely to be changes on share price due to change of capital structure.

The imperfections are:-

### **➤ Corporate Income Taxes**

With the introduction of taxes, where interest payments are tax deductible, MM(1963) recognised that the use of debt can increase the value of the firm. This is because the use of

debt by a firm will lead to it paying less corporate taxes than the one that is not using debt since the dividend payments are not tax deductible. MM therefore said that the optimal capital structure is one with maximum amount of leverage.

### ➤ **Personal Taxes**

The above argument may not hold when personal tax is introduced. Miller(1977) argued that where the income tax rate applicable to debt income is equal to personal tax rate applicable to common stockholders income, the levered firm has higher value than the unlevered firm. However, the overall tax advantages associated with corporate debt is reduced by the fact that overall stock income is taxed at a lower personal rate than is debt income. This is so because stock income is divided into capital gain and dividend. In Kenya, capital gain tax is suspended.

Another argument by Myers (1984) on capital structure is that a firm can increase its value or lower the overall cost of capital by increasing the proportion of debt in the capital structure. The crucial assumption of this approach is that the use of debt does not change the risk perception of the investors. Thus a company can raise all the funds it desires at a constant cost of equity and debt. However, when debt is increased beyond a certain level, the issue of financial distress needs to be considered. That is, the more debt a company uses the more investors' view such a company as risky and hence they will ask for higher return for any increase in debt. This implies that there is an optimum capital structure, which maximises the investors' returns.

### iii. THE COMPANY'S PERFORMANCE

A Company's performance can be measured by the ability of generating revenue at a given cost. That is, it's earning powers of its assets and investment policy. The ability of a company to pay continuously high dividend is influenced by its earning powers. A company that pays high dividend to signal higher future cash flows and hence prosperity, may only deceive the market in the short run if it is not performing as it wants to depict. It will run out of reserves in the long run and this may increase the probability of bankruptcy. It can therefore be argued that a company has to be performing well if it has to pay continuously high dividend.

The ownership of a company influences the direction it takes in terms of investment and management policies. The investment and management policies in-turn influences the earning powers of a company. A Company that is able to carry out the appropriate investment and implement the desired management policies will be able to generate higher revenue for its investors than expected (Fadahunsi, 1996). Such companies will be more attractive to investors and this may command higher non-volatile share prices. Consequently, ownership may have some bearing with the share prices volatility of a company.

Due to the unique investment and management policies of the government, the performance of those companies that it has significant influence in is likely to be different from the other companies where the government does not have significant influence.

#### 2.1.4. MEASURES OF VOLATILITY

In order to have a better understanding of a company, ratio analysis is crucial. This is because they evaluate figures in relative terms and not absolute terms. The following measures of individual common stock price volatility were used by Pinches & Kinney (1971).

##### i. Range divided by Mid-range (R)

This is the simplest possible measure of volatility and is defined as the difference between the highest and lowest price divided by their mid-range, hence very useful in finding the extent of extreme variations.

It is computed as follows: -

$$R = \frac{P_h - P_L}{(P_h + P_L)/2}$$

where:  $P_h$  is the high stock price for the period

$P_L$  is the low stock price for the same period

##### ii. Variance (V)

The variance is defined as the average of the square of the deviations. It takes care of the negative deviations by squaring the difference between the highest and lowest price.

It is computed as follows: -

$$V = \sum_{1}^{n} (P_i - P)^2 / N$$

Where :  $P_i$  is the price for a sub-period of time

$P$  is the arithmetic mean of price over the period  
 $N$  is the number of sub-periods

### iii. Standard deviation (SD)

Is one of the most popular measure of volatility. It helps in determining where the values of the frequency distribution are located with respect to the mean. It is the square root of the variance.

It is computed as follows: -

$$SD = \left( \sum_{1}^{n} (P_i - P)^2 / N \right)^{1/2}$$

Where  $P_i$ ,  $P$  &  $N$  are as defined in (ii) above.

### iv. Mean Absolute Deviation (MAD)

Unlike the range, which takes into account only two values, the MAD takes into account all the values.

It is computed as follows: -

$$V = \sum_{1}^{n} \left| \frac{P_i - P}{N} \right|$$

Where  $P_i$ ,  $P$  &  $N$  are as defined in (ii) above.

## v. Coefficient of variation

Coefficient of variation is a measure, which shows the magnitude of the variation relative to the size of the quantity that is being measured.

For the study two measures of coefficient of variation were computed:

### v .1 Coefficient of Variation of Prices (CVP)

It is computed as follows :-

$$CVP = \left[ \sum_{1}^{n} \frac{(P_i - P)^2}{N} \right]^{1/2} / P$$

where:  $P_i$ ,  $P$  &  $N$  are as defined in ( ii ) above.

## v . 2 Coefficient of Variation of Price Changes (CVPC)

It is computed as follows :-

$$CVPC = \left( \sum_{1}^{n} (D_i - D)^2 / N \right)^{1/2} / D$$

where:  $D_i$  is  $P_i - P_{i-1}$  for sub-period  $i$  from 1 to  $n$   
 $D$  is the arithmetic mean of the  $D_i$  s  
 $N$  is the number of sub-periods

## vi. Modified Quadratic Mean considering only Adverse Returns (MQMAR)

It is computed as follows :-

$$MDMAR = \left( \sum_{1}^{n} (R_i)^2 / N \right)^{1/2}$$

where:  $R_i$  is  $(P_i - P_{i-1}) / P_{i-1}$  for  $P_i - P_{i-1} < 0$ ;  
 $R_i$  is 0 for  $P_i - P_{i-1} > 0$   
 $P_i$  and  $N$  are as defined (ii) above

## vii. Modified Quadratic Mean of the logarithms of Sub-Period " Value Relatives"(MQMAL)

It is computed as follows :-

$$MDMAL = \left( \sum_{1}^{n} (\ln(1+R_i))^2 / N \right)^{1/2}$$

Where  $R_i$  and  $N$  is as defined (vii) above

Three financial ratios were not used after establishing that they resulted to a zero value for some weeks for the NSE index. Since when computing the chi-square test, we divide the square of the difference of the observed and expected with the expected, (in this study the expected was the NSE index) it implies that the results will be infinite when we divide by zero. Those ratios that were not used are the Coefficient of variation of prices, Modified Quadratic Mean considering only Adverse Returns, and Modified Quadratic Mean of the Logarithms of Sub-Period " Value relatives".



## 2.2. PREVIOUS RESEARCH

### 2.2.1. STUDIES ON PERFORMANCE OF PCs

A debate is currently raging in Kenya about the relative efficiency of performance between the private and public sector enterprises in the economy (Fadahunsi,1996). Research findings by Grosh (1988) indicted that the public sector has contributed immensely to Kenyan economic development, particularly at the time when the economic power was being transferred from the hands of foreigners to that of the Africans. The views differ sharply from those expressed by the World Bank (1991) which state that; *"the public sector has been the core of the stagnation and decline in growth in Africa"*(Page 16).

These differing views indicate that the debate on the superiority of private over public enterprise performance is not yet settled. Fadahunsi (1996) further noted that PCs are faulted for their inefficiency, unprofitability and for wasting resources.

Grosh (1988) carried out a research on the performance of PCs. He did a systematic analysis of the financial performance of 70 parastatal quasi-public manufacturing firms during the 1984 period. When examined sector by sector, parastatal firms were found to be operating in monopoly, more profitable and efficient than private firms. His results were slightly different, when aggregated across sectors. Parastatals were just as efficient as private companies though operating in monopoly. His results suggested that the case for privatisation is far from proven.

Makoba (1993) looked on public control and public enterprise performance in sub-Saharan Africa. The case of Tanzania and Zambia. He used financial profitability and capacity utilisation as useful indicators of PCs performance. His findings were that in the absence of political interference combined with managerial competence and operational autonomy, foreign management facilitate the high levels of financial profitability observed among foreign managed enterprises in both Tanzania and Zambia. This finding suggested that the state policy and practice are the most important constraints to PC performance in Tanzania and Zambia and probably Africa in general.

Ogeto (1994) carried out a research on the financial performance of public enterprises and privately owned firms. He analysed data of 28 companies from each sector. His findings were that PCs are not making as much profits as compared to private companies. This confirms the claims that many PCs in Kenya are performing poorly. He further noted that PCs do not strive to maximise profits in a competitive market and their managers have no autonomy, capacity and motivation to respond to competition. Manager's autonomy is compromised by undue government intervention; they are not held accountable for results and are not given incentives to improve performance and the way they are selected and rewarded encourages qualities more appropriate to a central bureaucracy than a competitive enterprise.

To extend Ogeto's research, Otieno (1998), did an analysis of financial and operating performance of the newly privatised enterprises in Kenya. He analysed data for 26 companies that were newly privatised by computing; return on equity, return on assets, return on sales, sales per employee, net income per employee, capital expenditure to sale and to number of employees ratios. His findings

were that there is improved performance of the firms after privatisation. That is; they became more profitable and efficient. He called for the government to commit itself in faster privatisation. His sentiments were also shared by The World Bank and IMF (1991) which have raised concern about the slackened pace.

Fadahunsi (1996) had the following on the debate of privatisation;

*"the process of privatisation should not be viewed as an end in itself but as an integral and visible element of the government's overall PCs reform programme and a progressive effort to promote productive efficiency, to strengthen competitive forces in the economy and to support entrepreneurial development"(page 102)*

### **2.2.2. STUDIES ON VOLATILITY**

Studies of volatility in a financial market constitutes a main component in the modern finance theory, Mike et al (1997). For example, volatility is an important ingredient in the Asset Pricing Model of Sharpe (1964), the Option Pricing Model of Black and Scholes (1973) and in the research carried by DeGennaro (1990) who analysed the relationship between stock return and volatility in the United States of America.

Officer (1973) carried out a research on the variability of the market factor of the New York Stock Exchange (NYSE). In his study, he defined market factors as the index of returns to all stocks on the NYSE; which reflects common movements in all stocks. The period of research was 1897 to 1967. The hypothesis tested was that since the market factors reflects general economic conditions, any decline in its variability might be related to a decline in business fluctuations. His findings were that market factor variability could be related to business fluctuations as reflected by the variability of industrial production. In his study, he defined business fluctuations as those fluctuations that relate to specific sector. In this study, specific sector is those companies where the government has ownership and the market factors are the factors that affect the whole market of quoted companies at NSE.

Flood and Hodrick (1986) carried out a research on Asset price volatility, bubbles and process switching. They defined bubbles as what is left over after market fundamentals have been removed from the price, such as speculative bubbles. They noted that speculative bubbles results to excess volatilities of asset prices compared with those of the market fundamental. They demonstrated that the existence of bubbles could lead to excess volatility of market fundamentals.

An empirical study of volatility in seven Southeast Asian stock markets using Autoregressive Random Variance (ARV) model was carried out by Mike et al (1997). The markets focused by the study were HongKong, Malaysia, Philippines, Singapore, South Korea, Thailand and Taiwan. The main objectives of their study were on the persistence of volatility, the fluctuation of volatility and the transmission of volatilities between countries. The data used for the study was the daily price indices in the seven stock markets from January 1980 to December 1991. The findings were that for some markets changes from 1985 to 1986 were enormous, that is, there was a clear distinction of the markets fluctuations before and after 1986 whereby it was much less after 1986. These

results were consistent with some critical events in those countries. For instance: the 1986 "People's Revolution" in the Philippines gave Philippine stock market and the economy a new lease of life; in March 1986, the Malaysian government announced a corporatisation policy whereby approved financial institutions including foreign brokers, were permitted to acquire upto 30% of local broking houses. Tight government regulations in Singapore resulted to the least volatile index throughout the period of study. Taiwan had the greatest overall volatility. They noted that the clear discrepancy in the volatility structure of the six Asian markets before and after 1986 could be explained by certain intervening events brought by some new regulations or rules in the market. In Kenya, we have not had such interventions and hence a period of two years will be sufficient on this study of share price volatility.

Mankiw et al (1985) re-examined the stock market volatility. They argued that previous work demonstrated serious statistical problems with standard volatility tests. To carry out the study they collected data of dividend and prices of large portfolio of commonly traded stocks. The finding was that volatility in stock prices could not be explained by the expected present discounted value of dividend. The results could be explained by the market not being efficient or the stock price volatility does not accurately reflect underlying fundamentals.

Board and Sutcliffe (1995) research was to establish whether future market is too volatile compared to spot market and whether there is a causal link from future to spot volatility. This research on relative volatility helped to improve the understanding of the actual relationship between spot and future markets and hence can eliminate some theories of how index futures destabilise the stock markets and how to devise a hedging strategy.

The findings were that while both the spot and future markets respond simultaneously to new information, their relative price responsiveness to information changes over time in a systematic way. For example, changes in macroeconomic variables may alter interest rate and dividend volatility, the size of the bid-ask spread, the number of noise traders, transaction costs and the stale price effect. Such changes may lead to movements in relative volatility.

### **3. RESEARCH METHODOLOGY**

#### **3.1. POPULATION**

The population was the eight companies that the government has shareholding and are quoted at the NSE as at December 1998. The selection of NSE is due to the availability of share price data.

#### **3.2. SAMPLING PLAN**

A census survey was conducted as from January 1997 to December 1998. That is, all the eight companies of the population were selected.

#### **3.3. DATA COLLECTION**

Secondary data of weekly share price and NSE index for the two years (high, low and closing) was collected. The NSE index was selected since it represents the market performance. The weekly data for two years from January 1997 to December 1998 translates into 104 data points. The weekly period was selected because it provides an adequate number of observations and the problem of accounting for trend in price over a relatively long sub-period is avoided.

#### **3.4. DATA ANALYSIS METHODOLOGY**

Chi-square test (  $\chi^2$  ) for independence was selected for this study. Chi-square test provides a simple test based on the difference between observed and expected frequencies. The test has proved to be popular for hypothesis testing since it makes few assumptions about the underlying population, it is fairly easy to understand and calculate.

Chi-square test is categorised as a non-parametric test since it makes few assumptions about the populations. Other non-parametric test include; Sign Test, Run Test, Mann-Whitney Test, Spearman Rank Correlation and Kruskal-Wallis Test.

Chi-square test can be classified into two major types, these are, test of goodness-of-fit and test for independence. By performing a goodness-of-fit test, it can be established whether it is reasonable to assume that a population has a particular distribution, such as normal, uniform or poisson distribution.

Some of the characteristics of the Chi-square distribution are:-

- The computed value of Chi-square is always positive because the difference between the observed and expected is squared, that is  $(O-E)^2$
- The number of degree of freedom is determined by the number of categories less one  $(N-1)$ , where N is the number of categories. Therefore, the shape of the Chi-square distribution does not depend on the size of the sample but on the number of categories. In this study, the categories are the weeks.
- The chi-square distribution is positively skewed. However, as the number of degree of freedom increases, the distribution begins to approximate the normal distribution.

The interest of this study is to use the chi-square test for independence. This test allows the comparison of two attributes to determine if there is any relationship between them. In this study, the two attributes are share price volatility, which is assumed to be risk surrogate and government ownership.

The difference between observed and expected frequencies was analysed. Range, Variance, Standard Deviation, Mean Absolute Deviation and Coefficient of Variation of Price Changes were



computed for all the companies selected and the NSE index for the 104 sub-periods. For each ratio, chi-square test for independence was carried out.

## 4. DATA ANALYSIS AND PRESENTATION OF FINDINGS

### 4.1. INTRODUCTION

The objective of this study was to find the effect of government ownership on share price volatility of companies quoted at the NSE. It was expected that the share prices for companies which the government has shareholding are more volatile than the market. Since volatility of share prices is regarded as risk surrogate, these companies are perceived by investors to be more risky.

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### 4.2. DATA ANALYSIS

To establish whether the two attributes mentioned above, daily share prices and NSE index are independent, data was collected for the sampled companies for the period January, 1997 to December, 1998. Excel spreadsheet was used to analyse the data. The data was sorted by selecting the weekly high, low and closing for both the share prices and NSE index. Formulas were then applied to calculate the five financial ratios for each company and the NSE index.

To test the hypothesis, Chi-square test was performed for each week taking the Sample Company as the Observed value and the NSE index as Expected value.

The equation used for the test was:-

$$\chi^2 = \sum_{i=1}^n \frac{(O - E)^2}{E}$$

where: O is the observed value

E is the expected value

n is the number of observations

$\chi^2$  is the computed Chi-square value

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The above test was done for 5% level of significance and at 103 degree of freedom. The degree of freedom (d.f) was obtained by taking the number of observation less one(124-1). From the tables at 5% level of significance and 103 d.f, the critical value was 124.

Hypotheses tested were: -

$H_0$  : *ownership of companies and share price volatility are independent.*

$H_1$  : *ownership of companies and share price volatility are not independent.*

Rejection rule

The null hypothesis was rejected when:-

$$\chi^2_{0.05, 103} < \chi^2$$

and failed to reject the null hypothesis when:-

$$\chi^2_{0.05, 103} > \chi^2$$

where:-

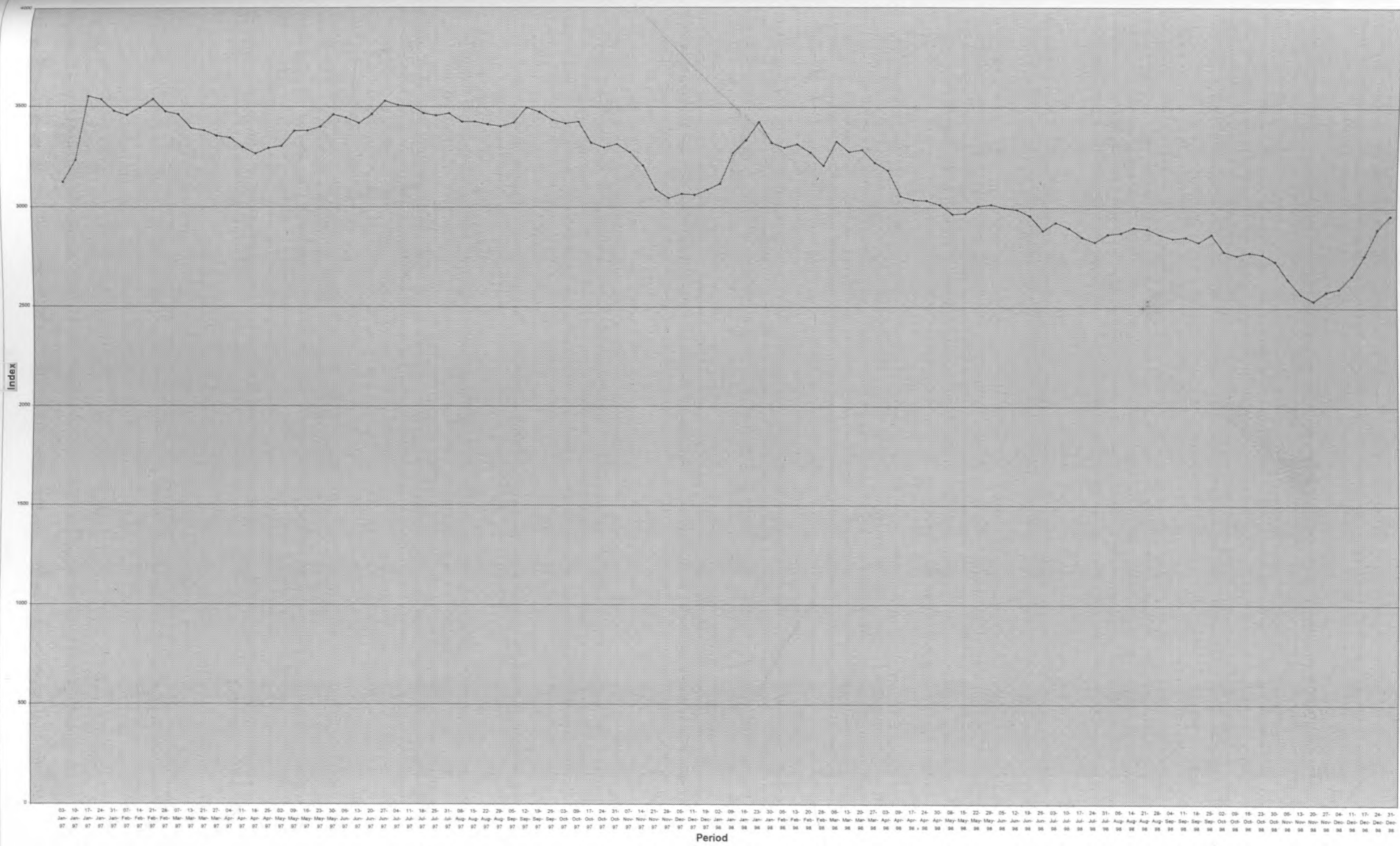
$\chi^2_{0.05, 103}$  is the critical value and  $\chi^2$  is the computed value.

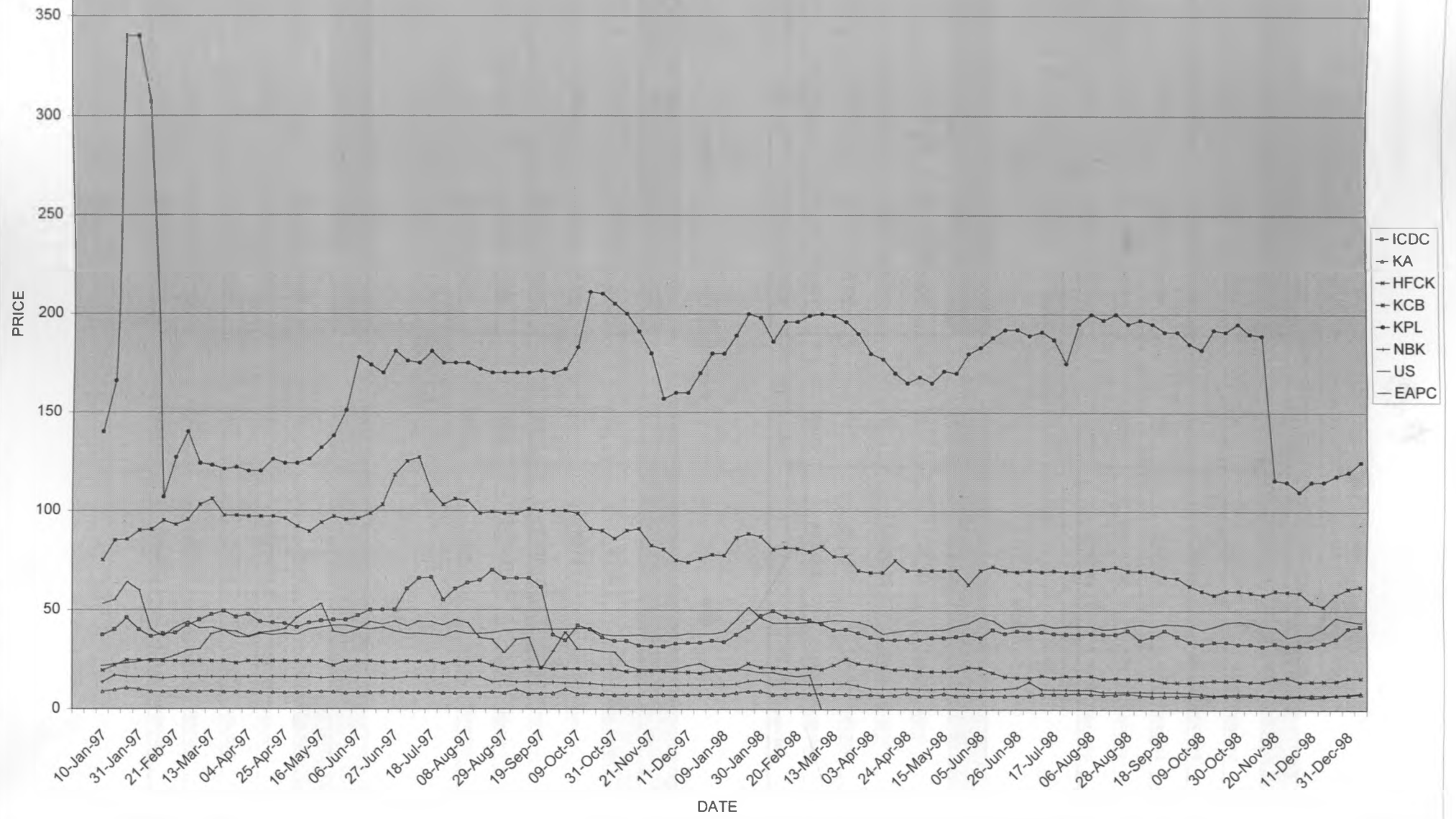
Management decision for this study was that share price volatility and ownership are not independent when we reject the null hypothesis otherwise they are independent. When share prices and ownership are not independent, it implies that investor perceive those companies where the government has shareholding to be more risky.

### **4.3.FINDINGS**

This study was set out to compare the share price volatility and ownership of companies quoted at NSE. Basically, the study was trying to establish whether investors perceive companies which government has share holding to be more risky. Should it turn out that they are more risky, privatisation is then advocated.

In order to visualise the share price and NSE movement, graphs were drawn using excel spreadsheet. These are on the next two consecutive pages. The statistical results are as summarised thereafter.





The findings were as shown below:-

**CHI-SQUARE STATISTICAL TEST RESULTS**

**ICDC**

	Computed value	Critical Value	Decision
R	390.21	124.00	Rejected
V	75,416.37	124.00	Rejected
SD	2,347.99	124.00	Rejected
MAD	23,944.89	124.00	Rejected
CVPC	640.14	124.00	Rejected

**KA**

	Computed value	Critical Value	Decision
R	133.57	124.00	Rejected
V	75,590.22	124.00	Rejected
SD	2,475.73	124.00	Rejected
MAD	25,247.56	124.00	Rejected
CVPC	486.44	124.00	Rejected

**HFCK**

	Computed value	Critical Value	Decision
R	173.99	124.00	Rejected
V	75,567.82	124.00	Rejected
SD	2,429.05	124.00	Rejected
MAD	24,771.60	124.00	Rejected
CVPC	387.99	124.00	Rejected

**KCB**

	Computed value	Critical Value	Decision
R	217.45	124.00	Rejected
V	75,058.35	124.00	Rejected
SD	2,210.61	124.00	Rejected
MAD	22,543.85	124.00	Rejected
CVPC	702.86	124.00	Rejected

**KPL**

	Computed value	Critical Value	Decision
R	199.46	124.00	Rejected
V	72,756.90	124.00	Rejected
SD	2,017.31	124.00	Rejected
MAD	20,572.57	124.00	Rejected
CVPC	2,267.81	124.00	Rejected

**NBK**

	Computed value	Critical Value	Decision
R	53.30	124.00	<b>Accepted</b>
V	75,573.17	124.00	Rejected
SD	2,435.77	124.00	Rejected
MAD	24,840.06	124.00	Rejected
CVPC	894.71	124.00	Rejected

**US**

	Computed value	Critical Value	Decision
R	126.11	124.00	Rejected
V	75,546.60	124.00	Rejected
SD	2,428.24	124.00	Rejected
MAD	24,763.29	124.00	Rejected
CVPC	894.71	124.00	Rejected

**EAPC**

	Computed value	Critical Value	Decision
R	58.26	124.00	<b>Accepted</b>
V	31,205.75	124.00	Rejected
SD	1,113.46	124.00	Rejected
MAD	11,665.18	124.00	Rejected
CVPC	4,840.91	124.00	Rejected

As shown in the previous page, for all the ratios computed, the null hypothesis was rejected except for Range values outcome for EAPC and NBK. This could be due to the length of the sub-period taken of one week being long as Range is greatly affected by the length of time. This means that we have failed to reject the alternate hypothesis. That is, the share price volatility is influenced by the ownership of a company. These findings concur with those of earlier research by Ogeto (1994) who did a study on the financial performance of public enterprises and privately owned firms which established that public enterprises perform worse than privately owned firms and by Otieno (1998), who did an analysis of financial and operating performance of the newly privatised enterprises in Kenya. His findings were that there is improved performance of the firms since privatisation.



## **5. SUMMARY AND CONCLUSION**

### **5.1. INTRODUCTION**

The study used chi-square test for independence to find out whether share price volatility and ownership are independent. The research problem was developed in chapter one and supported with a literature review in chapter two. The research methodology was outlined in chapter three and the finding presented in the previous chapter. This chapter will be composed of conclusions made from the results of data analysis, the limitation of the study and suggestions for further study.

### **5.2. CONCLUSION**

In this study, we have tried to determine whether the measures of stock price volatility suggested in the literature review yield substantially the same characteristics for companies, which the government has ownership with the market.

It has been demonstrated that there is a significance difference in the share stock volatility between the companies in which the government has share holding and the market index. The researcher therefore calls for the government to carry out privatisation of these companies.

### **5.3.LIMITATION OF THE STUDY**

The following are the underlying limitations, which should be taken into account by users of this study's findings: -

- i. Share price volatility is likely to be different and hence is the results of the finding, if we were to take daily prices for the shares for each company and then select the high, low and closing for each day rather the weekly prices.
- ii. There were instances when some calendar weeks had less than four working days due to holidays. In addition, some shares were not very active or not active in some sub-periods. This resulted to analysis of data for less than the intended total 104 weeks for those companies.

### **5.4.SUGGESTIONS FOR FURTHER RESEARCH**

This study may be viewed as a starting point for several other studies related to it. Further research can be carried out in the following areas: -

- i. It can be replicated in future with changes of measure from weekly to daily share prices. The length of period over which the measures are computed may be important. The range divided by the mid-range particularly is likely to be quite satisfactory for short periods and unsatisfactory for longer periods.

- ii. It could be profitably extended by an experiment to determine whether any of the suggested volatility measures approximate investment decision-makers subjective weighting of stock as to risk, since volatility has been used as a risk surrogate.

**POPULATION OF THE STUDY**

	Abbreviation
1. National Bank of Kenya	NBK
2. Kenya Airways	KA
3. Kenya Commercial Bank Ltd	KCB
4. Uchumi Supermarkets Ltd	US
5. Housing Finance Company of Kenya	HFCK
6. ICDC Investments	ICDC
7. Kenya Power & Lighting Company	KPL
8. East African Portland Cement Company	EAPC

## NSE INDEX

## Index

## Measures of Volatility

Week	Date	High	Low	Closing	R	V	SE	MAES	CVPC
1	03-Jan-97	3,124.14	3,115.82	3,124.14	0.00	15.13	4.02	40.95	10.25
2	10-Jan-97	3,233.75	3,193.24	3,233.75	0.03	45.37	6.73	66.95	0.78
3	17-Jan-97	3,550.97	3,363.05	3,550.97	0.06	147.61	37.37	280.15	0.84
4	24-Jan-97	3,615.00	3,515.00	3,615.00	0.04	151.64	38.56	353.97	0.75
5	31-Jan-97	3,475.97	3,475.97	3,475.97	0.00	33.45	35.35	311.97	0.53
6	07-Feb-97	3,444.44	3,444.44	3,444.44	0.00	33.62	33.62	251.83	0.17
7	14-Feb-97	3,466.33	3,466.33	3,466.33	0.00	126.90	37.06	327.15	0.07
8	21-Feb-97	3,516.07	3,516.07	3,516.11	0.01	174.41	35.36	271.05	0.16
9	28-Feb-97	3,514.48	3,459.84	3,473.99	0.01	617.19	35.31	500.30	0.11
10	07-Mar-97	3,475.45	3,461.31	3,461.31	0.00	343.37	35.04	366.32	0.14
11	13-Mar-97	3,447.97	3,393.25	3,393.25	0.00	495.15	27.17	277.15	0.37
12	21-Mar-97	3,392.10	3,373.72	3,380.42	0.01	445.43	23.11	215.43	0.14
13	27-Mar-97	3,377.97	3,354.72	3,354.72	0.01	345.75	18.56	168.63	0.13
14	04-Apr-97	3,345.14	3,310.32	3,345.14	0.03	315.95	17.86	186.09	0.13
15	11-Apr-97	3,350.36	3,298.95	3,298.95	0.07	377.45	13.71	133.26	0.09
16	18-Apr-97	3,295.85	3,265.32	3,265.32	0.01	355.36	13.51	160.23	0.21
17	25-Apr-97	3,259.57	3,259.56	3,259.56	0.00	151.30	12.70	149.52	0.03
18	02-May-97	3,311.73	3,298.84	3,303.89	0.01	135.41	13.61	138.55	0.07
19	09-May-97	3,378.54	3,350.51	3,378.54	0.04	442.18	23.51	214.45	0.16
20	16-May-97	3,380.67	3,352.39	3,380.67	0.01	448.45	23.11	215.48	0.16
21	23-May-97	3,421.92	3,421.92	3,421.92	0.01	355.45	23.14	216.03	0.13
22	30-May-97	3,439.35	3,413.90	3,439.35	0.04	339.36	21.57	239.46	0.10
23	06-Jun-97	3,474.92	3,459.15	3,474.92	0.01	316.04	21.33	205.41	0.13
24	13-Jun-97	3,491.97	3,471.24	3,471.11	0.02	315.43	23.11	252.03	0.19
25	20-Jun-97	3,474.35	3,427.83	3,427.42	0.01	850.57	25.19	237.43	0.06
26	27-Jun-97	3,527.33	3,461.99	3,527.33	0.02	1,304.48	15.56	307.64	0.13
27	04-Jul-97	3,503.80	3,503.80	3,503.80	0.01	1,330.12	31.89	243.59	0.11
28	11-Jul-97	3,527.92	3,501.76	3,527.92	0.01	1,026.94	31.89	311.59	0.11
29	18-Jul-97	3,495.74	3,448.22	3,495.74	0.01	873.75	28.35	301.81	0.17
30	25-Jul-97	3,453.58	3,445.58	3,445.58	0.00	813.37	27.48	280.49	0.14
31	01-Aug-97	3,466.97	3,443.51	3,466.97	0.01	643.30	25.35	258.75	0.14
32	08-Aug-97	3,493.22	3,493.22	3,493.22	0.01	643.30	25.35	258.75	0.14
33	15-Aug-97	3,434.55	3,395.34	3,435.22	0.01	650.84	26.01	260.11	0.14
34	22-Aug-97	3,420.97	3,403.92	3,411.95	0.00	825.11	24.26	248.51	0.09
35	29-Aug-97	3,425.03	3,394.93	3,403.22	0.00	645.74	23.95	235.13	0.12
36	05-Sep-97	3,420.48	3,388.11	3,420.46	0.01	647.94	23.94	253.37	0.04
37	12-Sep-97	3,495.35	3,412.35	3,495.35	0.02	1,051.95	27.43	332.75	0.18
38	19-Sep-97	3,503.53	3,473.53	3,473.56	0.01	819.85	30.33	306.27	0.17
39	26-Sep-97	3,463.40	3,435.12	3,435.12	0.01	701.11	26.45	270.03	0.23
40	03-Oct-97	3,447.41	3,411.31	3,416.81	0.01	618.33	24.85	251.59	0.18
41	09-Oct-97	3,425.80	3,403.84	3,425.80	0.01	652.74	25.65	260.71	0.07
42	17-Oct-97	3,466.15	3,434.74	3,434.49	0.00	315.15	15.34	156.43	0.45
43	24-Oct-97	3,235.63	3,235.63	3,235.63	0.01	173.46	13.09	133.53	0.17
44	31-Oct-97	3,317.83	3,284.18	3,314.85	0.01	215.55	14.59	149.78	0.04
45	07-Nov-97	3,308.34	3,275.19	3,275.19	0.01	115.45	12.80	142.10	0.24
46	14-Nov-97	3,256.00	3,205.19	3,205.19	0.01	18.36	4.70	18.10	0.32
47	21-Nov-97	3,189.33	3,088.53	3,088.53	0.00	15.75	7.47	16.16	0.61
48	28-Nov-97	3,093.87	3,029.00	3,048.80	0.00	119.42	11.82	118.48	0.24
49	05-Dec-97	3,043.46	3,043.46	3,043.46	0.01	49.40	9.45	49.47	0.02
50	11-Dec-97	3,078.57	3,063.05	3,063.05	0.01	400.27	10.01	107.94	0.13
51	19-Dec-97	3,083.89	3,060.67	3,083.89	0.01	36.13	7.49	76.40	0.01
52	02-Jan-98	3,118.18	3,110.85	3,118.18	0.00	40.51	4.84	46.11	0.10
53	09-Jan-98	3,213.15	3,128.01	3,213.15	0.02	172.10	10.90	108.01	0.43
54	16-Jan-98	3,253.78	3,203.87	3,253.78	0.02	278.17	10.65	176.05	0.11
55	23-Jan-98	3,425.30	3,403.84	3,425.30	0.01	653.94	25.66	260.71	0.21
56	30-Jan-98	3,395.15	3,214.74	3,214.48	0.02	475.46	15.34	155.40	0.46
57	06-Feb-98	3,326.10	3,295.53	3,295.53	0.01	373.49	13.09	143.54	0.16
58	13-Feb-98	3,313.93	3,264.15	3,314.95	0.01	315.55	14.96	142.78	0.04
59	20-Feb-98	3,205.34	3,205.15	3,205.15	0.03	138.35	10.90	118.10	0.22
60	28-Feb-98	3,256.50	3,206.19	3,206.19	0.01	16.49	4.46	13.70	0.22
61	06-Mar-98	3,253.25	3,228.74	3,228.74	0.01	468.67	18.15	164.65	0.31
62	13-Mar-98	3,420.27	3,284.27	3,277.59	0.01	123.89	11.03	114.30	0.20
63	20-Mar-98	3,311.48	3,271.35	3,289.38	0.01	448.50	17.19	144.23	0.09
64	27-Mar-98	3,252.00	3,222.27	3,224.84	0.01	340.00	16.84	166.56	0.16
65	03-Apr-98	3,131.30	3,145.54	3,145.54	0.01	416.00	15.81	153.56	0.23
66	09-Apr-98	3,133.35	3,091.19	3,091.19	0.02	113.84	10.56	103.90	0.34
67	17-Apr-98	3,096.73	3,093.35	3,093.35	0.01	154.39	12.43	175.91	0.14
68	24-Apr-98	3,046.97	3,032.85	3,034.55	0.00	153.51	11.79	140.44	0.11
69	30-Apr-98	3,022.95	3,012.25	3,015.01	0.00	478.56	14.72	150.08	0.17
70	08-May-98	3,056.93	2,967.23	2,967.23	0.01	376.44	14.40	137.46	0.36
71	15-May-98	2,984.45	2,967.03	2,971.45	0.01	361.92	14.26	142.95	0.39
72	22-May-98	2,908.99	2,913.32	2,909.99	0.01	230.72	12.70	122.74	0.03
73	29-May-98	3,010.47	2,959.18	2,959.18	0.02	243.45	14.53	146.55	0.08
74	05-Jun-98	3,025.11	2,936.83	2,929.21	0.03	364.99	16.27	155.08	0.16
75	12-Jun-98	3,002.63	2,990.02	2,990.02	0.00	493.11	17.13	175.01	0.12
76	19-Jun-98	2,994.81	2,960.34	2,960.34	0.01	451.11	16.16	204.14	0.20
77	26-Jun-98	2,954.19	2,895.81	2,895.81	0.02	751.36	13.41	270.49	0.32
78	03-Jul-98	2,925.07	2,890.22	2,890.22	0.01	546.34	13.44	235.05	0.04
79	10-Jul-98	2,916.98	2,895.52	2,900.06	0.01	675.11	15.25	235.05	0.19
80	17-Jul-98	2,872.95	2,848.57	2,854.34	0.01	928.30	30.43	310.75	0.25
81	24-Jul-98	2,847.78	2,829.50	2,829.50	0.01	1,048.99	31.46	335.40	0.18
82	31-Jul-98	2,808.27	2,835.79	2,808.27	0.01	343.44	28.11	346.07	0.04
83	06-Aug-98	2,778.37	2,852.03	2,879.31	0.01	612.11	33.43	385.72	0.04
84	14-Aug-98	2,725.10	2,868.76	2,802.46	0.01	647.11	33.16	352.72	0.17
85	21-Aug-98	2,851.35	2,851.95	2,851.95	0.00	608.35	28.42	409.48	0.13
86	28-Aug-98	2,873.27	2,868.95	2,868.95	0.00	639.59	28.42	409.48	0.20
87	04-Sep-98	2,862.56	2,834.17	2,834.34	0.01	961.39	31.01	316.40	0.19
88	11-Sep-98	2,872.85	2,848.57	2,854.34	0.01	961.39	31.01	316.40	0.19
89	18-Sep-98	2,847.78	2,839.50	2,839.50	0.01	1,048.99	31.46	335.40	0.16
90	25-Sep-98	2,868.27	2,835.79	2,808.27	0.01	343.44	28.11	346.07	0.03
91	02-Oct-98	2,783.41	2,783.18	2,783.41	0.02	1,001.11	33.43	385.72	0.17
92	09-Oct-98	2,774.34	2,765.59	2,765.59	0.01	1,048.99	31.46	335.40	0.17
93	16-Oct-98	2,751.47	2,764.23	2,764.23	0.01	1,468.45	38.07	468.26	0.05
94	23-Oct-98	2,783.33	2,783.55	2,783.55	0.01	1,536.99	36.50	531.50	0.05
95	30-Oct-98	2,771.80	2,733.56	2,733.56	0.01	1,183.95	40.33	431.81	0.21
96	06-Nov-98	2,735.75	2,642.89	2,642.89	0.04	675.11	33.16	352.72	0.17
97	13-Nov-98	2,634.37	2,630.11	2,630.11	0.01	431.43	30.43	369.27	0.25
98	20-Nov-98	2,584.97	2,601.11	2,601.11	0.01	331.43	31.46	311.26	0.23
99	27-Nov-98	2,595.36	2,587.50	2,587.50	0.01	331.43	31.46	311.26	0.23
100	04-Dec-98	2,587.27	2,587.27	2,587.27	0.01	331.43	31.46	311.26	0.23
101	11-Dec-98	2,669.34	2,610.24	2,609.34	0.02	2,442.71	48.56	504.75	0.14
102	17-Dec-98	2,552.52	2,644.84	2,752.52	0.04	1,551.14	48.56	451.27	0.15
103	24-Dec-98	2,564.19	2,759.34	2,804.19	0.04	202.34	48.56	270.65	0.23
104	31-Dec-98	2,562.36	2,922.54	2,922.36	0.03	246.35	48.56	403.04	0.13

ICDC

Week	Date	Share Prices			Measures of Volatility					Chi-square test				
		High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC
1	03-Jan-97	37.25	33.50	37.25	0.11	0.20	0.45	1.56	8.86	4.00	15.73	3.17	32.31	0.27
2	10-Jan-97	46.25	33.00	40.00	0.20	0.23	0.18	1.83	0.56	1.18	45.26	6.38	65.05	0.30
3	17-Jan-97	46.50	39.00	46.00	0.18	0.17	0.41	4.17	1.34	0.10	1,426.23	36.96	376.88	0.13
4	24-Jan-97	45.00	30.00	40.00	0.00	0.03	0.18	1.83	1.54	3.35	1,315.62	35.91	366.26	12.88
5	31-Jan-97	40.25	30.00	38.50	0.11	0.27	0.52	5.33	0.84	3.61	832.91	29.52	301.01	1.38
6	07-Feb-97	38.00	34.00	38.00	0.11	0.14	0.38	3.83	0.26	1.46	818.61	27.87	284.22	0.06
7	14-Feb-97	38.25	20.00	38.25	0.63	0.12	0.35	3.68	0.04	40.15	1,028.84	31.38	320.03	0.01
8	21-Feb-97	45.00	38.00	42.00	0.17	0.00	0.02	0.17	0.80	3.51	1,324.01	36.35	370.73	10.93
9	28-Feb-97	45.00	38.00	45.00	0.17	0.10	0.31	3.17	0.62	1.24	917.30	29.67	302.59	0.32
10	07-Mar-97	47.75	44.75	47.50	0.06	0.31	0.56	5.67	0.50	0.83	842.50	27.94	284.88	0.92
11	13-Mar-97	51.00	40.00	49.25	0.24	0.53	0.73	7.42	0.32	3.16	495.10	20.84	212.56	0.00
12	21-Mar-97	47.00	42.00	46.25	0.11	0.19	0.43	4.42	0.82	2.10	445.45	20.26	206.58	3.35
13	27-Mar-97	49.50	44.75	47.50	0.10	0.31	0.58	5.87	0.20	1.28	345.14	17.50	178.46	0.00
14	04-Apr-97	48.00	43.75	44.00	0.09	0.05	0.21	2.17	0.94	0.66	311.61	17.23	175.73	5.01
15	11-Apr-97	43.75	42.25	43.50	0.03	0.03	0.16	1.67	0.22	0.02	172.23	12.80	130.54	0.01
16	18-Apr-97	43.50	42.50	43.00	0.02	0.11	0.11	1.17	0.22	0.02	96.57	9.60	97.90	0.00
17	25-Apr-97	44.75	33.00	41.00	0.30	0.01	0.08	0.83	0.58	5.99	161.28	12.54	127.86	183.60
18	02-May-97	43.50	37.00	43.50	0.16	0.03	0.16	1.67	0.10	1.70	185.18	13.28	135.48	2.87
19	09-May-97	44.50	36.00	44.50	0.21	0.07	0.26	2.67	0.14	1.60	442.05	20.51	209.14	0.00
20	16-May-97	45.00	38.85	45.00	0.12	0.10	0.31	3.17	0.08	2.54	446.25	20.51	209.18	0.06
21	23-May-97	46.75	44.25	45.00	0.06	0.10	0.31	3.17	0.10	0.27	535.47	22.53	229.73	0.18
22	30-May-97	49.75	40.00	47.00	0.22	0.28	0.51	5.17	0.38	2.28	838.86	27.87	285.21	0.74
23	06-Jun-97	55.00	40.00	50.00	0.32	0.84	0.80	8.17	0.82	9.01	754.76	25.92	264.30	1.50
24	13-Jun-97	51.50	46.00	50.00	0.11	0.64	0.80	8.17	0.10	0.43	609.42	23.14	235.94	0.05
25	20-Jun-97	52.00	42.00	50.00	0.21	0.64	0.80	8.17	0.10	2.94	848.75	27.57	281.21	0.03
26	27-Jun-97	63.50	48.00	60.50	0.28	3.35	1.83	18.67	2.43	3.55	1,257.78	31.99	326.26	42.53
27	04-Jul-97	67.50	57.50	66.00	0.18	5.82	2.37	24.17	1.22	2.24	1,123.91	29.12	296.95	6.91
28	11-Jul-97	70.00	50.50	66.50	0.32	5.85	2.42	24.67	0.02	14.00	1,084.67	28.45	290.13	0.08
29	18-Jul-97	61.00	44.00	55.00	0.32	1.67	1.28	13.17	2.86	6.98	870.42	27.03	275.68	31.50
30	25-Jul-97	62.00	55.00	60.50	0.12	3.35	1.83	18.67	1.22	2.94	804.68	24.94	254.35	8.76
31	31-Jul-97	65.00	58.00	63.50	0.17	5.52	2.12	21.67	0.82	3.79	866.95	25.50	260.04	5.36
32	08-Aug-97	70.00	61.00	65.00	0.14	5.18	2.27	23.17	0.26	3.05	633.62	21.03	214.51	0.00
33	15-Aug-97	70.00	61.00	70.00	0.31	7.63	2.78	28.17	1.10	7.97	635.47	20.28	206.84	10.93
34	22-Aug-97	66.50	60.00	68.00	0.10	5.62	2.37	24.17	1.06	2.04	574.53	19.69	200.83	5.85
35	29-Aug-97	72.50	63.00	66.00	0.14	5.82	2.37	24.17	0.10	1.88	534.06	18.85	192.24	0.01
36	05-Sep-97	90.50	50.05	66.00	0.58	5.62	2.37	24.17	0.10	33.72	615.86	20.52	208.31	0.09
37	12-Sep-97	65.00	61.00	61.50	0.06	3.72	1.93	19.67	1.18	0.06	1,044.50	28.89	292.59	6.56
38	19-Sep-97	64.00	36.25	37.25	0.55	0.20	0.45	4.58	5.93	34.55	919.27	29.43	300.18	193.53
39	26-Sep-97	38.00	30.00	34.50	0.18	0.52	0.72	7.33	0.78	3.68	700.07	25.06	255.57	1.20
40	03-Oct-97	42.00	31.00	42.00	0.30	0.00	0.02	0.17	1.71	8.04	608.28	24.63	251.18	14.80
41	09-Oct-97	40.50	35.25	40.25	0.14	0.02	0.15	1.58	0.82	2.72	653.49	25.26	257.56	3.06
42	17-Oct-97	40.00	34.50	38.00	0.15	0.33	0.57	5.83	1.12	0.63	234.54	14.21	144.96	0.98
43	24-Oct-97	34.50	32.25	34.25	0.07	0.55	0.74	7.58	0.57	0.50	170.36	11.65	118.81	0.67
44	31-Oct-97	34.50	34.25	34.25	0.01	0.55	0.74	7.58	0.10	0.00	214.54	13.24	134.98	0.07
45	07-Nov-97	34.00	20.00	32.00	0.52	0.93	0.98	9.83	0.84	25.67	114.70	8.95	91.32	0.71
46	14-Nov-97	32.25	30.25	31.50	0.06	1.03	1.01	10.33	0.22	0.17	16.37	2.50	25.48	0.03
47	21-Nov-97	32.25	30.00	31.50	0.07	1.03	1.01	10.33	0.10	0.05	53.74	5.58	56.90	0.33
48	28-Nov-97	33.25	27.00	33.00	0.21	0.78	0.87	8.83	0.88	1.71	133.51	9.85	101.49	0.00
49	05-Dec-97	33.25	30.00	33.25	0.10	0.71	0.64	8.58	0.04	0.99	87.89	7.84	79.98	0.01
50	11-Dec-97	34.00	30.25	33.50	0.12	0.67	0.82	8.33	0.04	2.40	98.79	8.44	86.06	0.05
51	19-Dec-97	34.50	32.00	34.50	0.08	5.52	0.71	7.33	1.11	0.65	55.10	6.12	62.45	1.63
52	02-Jan-98	33.75	33.00	33.75	0.02	0.83	0.78	8.08	0.28	0.16	19.39	3.10	31.57	16.56
53	09-Jan-98	38.50	33.00	37.50	0.16	0.18	0.42	4.33	0.80	0.26	111.94	9.77	99.59	0.33
54	16-Jan-98	47.00	35.00	41.50	0.28	0.00	0.03	0.33	0.86	4.95	278.17	16.61	169.43	4.97
55	23-Jan-98	48.50	41.00	47.00	0.17	0.28	0.51	5.17	1.22	4.04	653.03	24.56	250.47	4.87
56	30-Jan-98	48.75	40.50	49.50	0.80	5.57	0.75	7.57	0.88	1.35	234.06	13.87	141.43	0.01
57	06-Feb-98	49.50	40.00	48.75	0.21	0.23	0.48	4.92	0.78	5.78	171.00	12.15	123.88	1.93
58	13-Feb-98	51.50	41.00	46.00	0.23	0.17	0.41	4.17	0.28	4.66	215.31	13.88	141.53	1.30
59	20-Feb-98	51.00	40.00	45.00	0.24	0.10	0.31	3.17	0.34	5.33	116.36	10.18	103.85	0.05
60	28-Feb-98	45.00	40.00	43.00	0.11	0.01	0.11	1.17	0.58	0.73	18.33	4.06	41.39	0.20
61	06-Mar-98	42.50	35.00	40.00	0.19	0.03	0.18	1.83	0.82	4.94	260.60	15.79	161.01	0.81
62	13-Mar-98	41.00	35.00	40.25	0.16	0.02	0.15	1.58	0.04	0.67	121.65	10.72	109.36	0.21
63	20-Mar-98	40.50	35.00	38.50	0.15	0.11	0.33	3.33	0.52	1.46	148.31	11.54	117.72	3.67
64	27-Mar-98	40.00	35.00	38.25	0.13	0.30	0.55	5.58	1.64	1.40	33.50	4.80	48.91	0.32
65	03-Apr-98	35.75	34.75	35.25	0.03	0.42	0.65	6.58	0.34	0.04	3.26	0.93	9.47	0.05
66	09-Apr-98	35.50	35.00	35.00	0.01	0.45	0.67	6.83	0.16	0.00	111.05	9.28	94.67	0.27
67	17-Apr-98	38.00	30.00	35.25	0.18	0.42	0.66	6.68	0.04	5.12	153.56	11.17	113.90	0.10
68	24-Apr-98	35.75	31.00	35.00	0.14	0.45	0.67	6.83	0.16	4.41	162.72	11.49	117.14	0.02
69	30-Apr-98	36.00	32.00	36.00	0.12	0.33	0.57	5.83	0.14	3.79	215.93	13.60	138.65	0.00
70	08-May-98	37.75	35.00	38.00	0.08	0.33	0.57	5.83	0.10	0.31	375.79	18.28	186.38	0.10
71	15-May-98	37.00	34.50	36.75	0.07	0.25	0.41	4.17	0.88	0.40	359.69	18.00	183.52	0.00
72	22-May-98	38.00	30.00	37.50	0.24	0.18	0.42	4.33	0.06	4.08	231.86	14.40	146.87	0.08
73	29-May-98	45.00	36.00	38.00	0.22	0.33	0.57	5.83	0.46	2.63	211.83	13.46	137.22	1.96
74	05-Jun-98	40.25	37.00	40.25	0.08	0.02	0.15	1.58	0.92	0.09	264.54	15.96	162.74	3.75
75	12-Jun-98	38.75	35.00	38.25	0.10	0.12	0.35	3.58	0.58	2.26	294.46	16.47	167.98	1.56
76	19-Jun-98	39.80	35.00	39.50	0.12	0.05	0.23	2.33	0.20	1.03	403.00	19.62	200.12	0.00
77	26-Jun-98	40.00	38.00	39.00	0.05	0.08	0.28	2.83	0.22	0.03	750.92	26.85	273.86	0.05
78	03-Jul-98	40.00	39.00	39.00	0.03	0.08	0.28	2.83	0.18	0.01	548.18	22.89	233.40	0.08
79	10-Jul-98	39.25	38.00	38.25	0.03	0.12	0.35	3.66	0.28	0.07	675.07	25.29	257.90	0.05
80	17-Jul-98	39.00	34.00	38.00	0.14	0.14	0.38	3.83	0.16	2.06	928.22	29.72	303.14	0.04
81	24-Jul-98	39.00	30.00	38.00	0.26	0.14	0.38	3.83	0.10	10.23	1,080.71	32.13	327.68	0.04
82	31-Jul-98	39.00	33.00	38.25	0.17	0.12	0.35	3.58	0.04	2.12	847.19			

		Share Prices			Measures of Volatility					Chi-square test					
Week	Date	High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC	
1	03-Jan-97	8.70	8.36	8.65	0.04	0.00	0.07	0.69	10.50		0.55	16.12	3.88	39.58	0.00
2	10-Jan-97	9.55	8.50	9.50	0.12	0.03	0.16	1.64	1.08		0.33	45.27	6.41	65.41	2.34
3	17-Jan-97	10.60	8.60	10.55	0.21	0.07	0.28	2.68	1.20		0.18	1,426.43	37.24	379.81	0.05
4	24-Jan-97	10.50	9.70	10.00	0.08	0.04	0.21	2.14	0.78		0.04	1,315.59	35.85	365.63	2.64
5	31-Jan-97	10.00	8.40	8.75	0.17	0.01	0.09	0.89	1.63		1.16	933.44	30.38	309.79	6.14
6	07-Feb-97	8.65	8.50	8.60	0.04	0.01	0.07	0.74	0.28		0.15	818.88	28.47	290.34	0.09
7	14-Feb-97	9.05	8.00	8.80	0.12	0.01	0.09	0.94	0.18		1.36	1,028.07	31.89	325.26	0.73
8	21-Feb-97	9.05	8.50	8.80	0.06	0.01	0.09	0.94	0.10		0.41	1,324.00	36.20	369.19	0.04
9	28-Feb-97	8.85	8.30	8.55	0.06	0.00	0.07	0.69	0.41		0.12	917.48	30.15	307.51	0.03
10	07-Mar-97	9.00	8.50	9.00		0.01	0.11	1.14	0.46		0.63	843.09	28.81	293.83	0.71
11	14-Mar-97	10.00	8.50	8.50	0.16	0.00	0.06	0.64	0.72		1.33	496.15	22.15	225.87	0.44
12	21-Mar-97	9.00	8.35	8.50	0.07	0.00	0.06	0.64	0.10		0.89	445.82	20.99	214.04	0.01
13	27-Mar-97	8.60	8.05	8.50	0.07	0.00	0.06	0.64	0.10		0.51	345.75	18.47	188.34	0.04
14	04-Apr-97	8.50	8.00	8.20	0.06	0.00	0.03	0.34	0.47		0.25	311.70	17.59	179.36	0.88
15	11-Apr-97	8.75	8.00	8.25	0.09	0.00	0.04	0.38	0.04		0.35	172.28	13.05	133.07	0.19
16	18-Apr-97	8.20	8.00	8.15	0.02	0.00	0.03	0.29	0.22		0.02	96.59	9.77	99.64	0.00
17	25-Apr-97	8.90	8.00	8.10	0.11	0.00	0.02	0.24	0.18		0.62	161.29	12.65	129.03	13.79
18	02-May-97	8.55	8.05	8.50	0.06	0.00	0.06	0.64	0.40		0.17	185.23	13.48	137.51	1.65
19	09-May-97	9.00	8.45	8.60	0.06	0.01	0.07	0.74	0.03		0.07	442.18	20.88	212.96	0.11
20	16-May-97	8.75	8.50	8.50	0.03	0.00	0.06	0.64	0.22		0.11	446.44	21.00	214.19	0.17
21	23-May-97	9.00	8.00	8.06	0.12	0.00	0.01	0.14	0.72		1.47	535.66	23.12	235.74	17.00
22	30-May-97	8.35	8.00	8.10	0.04	0.00	0.02	0.24	0.03		0.04	839.37	28.92	294.97	0.06
23	06-Jun-97	8.30	8.00	8.20	0.04	0.00	0.03	0.34	0.03		0.07	756.04	27.43	279.72	0.10
24	13-Jun-97	9.50	8.60	8.50	0.06	0.00	0.06	0.64	0.27		5.82	610.69	24.59	250.73	0.03
25	20-Jun-97	8.88	8.00	8.88	0.06	0.00	0.04	0.38	0.41		0.16	850.03	28.08	296.54	2.19
26	27-Jun-97	9.50	8.00	8.20	0.17	0.00	0.03	0.34	0.16		1.23	1,264.48	35.49	361.95	0.01
27	04-Jul-97	9.60	8.00	8.88	0.17	0.00	0.04	0.38	0.04		2.59	1,135.11	33.61	342.80	0.10
28	11-Jul-97	8.35	8.00	8.20	0.04	0.00	0.03	0.34	0.18		0.18	1,096.34	33.04	336.98	0.01
29	18-Jul-97	8.20	7.25	8.00	0.12	0.00	0.01	0.14	0.35		0.87	873.75	29.53	301.16	0.07
30	25-Jul-97	8.45	7.80	8.00	0.23	0.00	0.01	0.14	0.10		11.28	811.37	28.46	290.20	0.01
31	01-Aug-97	9.45	7.50	8.00	0.23	0.00	0.01	0.14	0.10		7.39	875.96	29.57	301.54	0.03
32	08-Aug-97	8.20	7.80	8.00	0.05	0.00	0.01	0.14	0.10		0.34	643.90	25.35	258.49	0.09
33	15-Aug-97	8.50	7.60	8.50	0.11	0.00	0.06	0.64	0.52		0.88	650.63	25.38	258.84	1.96
34	22-Aug-97	8.10	7.80	8.00	0.08	0.00	0.01	0.14	0.72		0.23	585.71	24.17	246.52	2.30
35	29-Aug-97	9.80	7.00	9.80	0.33	0.01	0.19	1.94	2.13		11.49	545.16	22.97	234.25	31.49
36	05-Sep-97	9.65	7.55	7.60	0.24	0.00	0.03	0.28	2.82		5.80	627.04	24.99	254.86	187.52
37	12-Sep-97	8.00	7.50	7.80	0.06	0.00	0.01	0.06	0.15		0.07	1,051.83	32.42	330.65	0.00
38	19-Sep-97	8.00	7.55	7.80	0.06	0.00	0.01	0.06	0.10		0.28	919.68	30.32	309.16	0.03
39	26-Sep-97	9.90	7.10	9.90	0.33	0.04	0.20	2.88	2.60		12.58	701.02	26.08	265.95	22.27
40	03-Oct-97	7.70	7.50	7.60	0.03	0.00	0.03	0.26	2.95		0.02	808.28	24.61	251.01	48.20
41	09-Oct-97	9.08	7.50	7.60	0.18	0.00	0.03	0.38	0.22		4.78	653.54	25.49	260.00	0.36
42	17-Oct-97	8.00	7.30	7.40	0.09	0.00	0.04	0.48	0.22		0.19	235.19	15.25	155.49	0.12
43	24-Oct-97	7.55	7.00	7.10	0.08	0.01	0.07	0.78	0.47		0.64	171.45	12.95	132.03	0.49
44	31-Oct-97	7.30	7.00	7.20	0.04	0.00	0.06	0.66	0.03		0.10	215.64	14.56	148.45	0.01
45	07-Nov-97	7.35	6.95	7.10	0.08	0.01	0.07	0.78	0.22		0.21	116.54	10.65	108.59	0.00
46	14-Nov-97	7.45	6.00	7.00	0.22	0.01	0.08	0.88	0.22		2.77	18.35	4.12	42.00	0.03
47	21-Nov-97	7.40	7.00	7.20	0.06	0.00	0.06	0.68	0.18		0.02	55.77	7.34	74.86	0.25
48	28-Nov-97	7.40	7.00	7.18	0.06	0.01	0.07	0.78	0.11		0.06	134.99	11.47	116.99	0.00
49	05-Dec-97	7.50	7.00	7.28	0.07	0.00	0.06	0.66	0.03		0.40	89.30	8.32	85.07	0.00
50	11-Dec-97	7.35	7.05	7.35	0.04	0.00	0.03	0.51	0.09		0.26	100.12	8.91	101.03	0.01
51	19-Dec-97	7.50	7.10	7.45	0.05	0.00	0.04	0.41	0.03		0.32	56.13	7.41	75.59	0.02
52	02-Jan-98	7.50	7.28	7.30	0.03	0.00	0.05	0.58	0.28		0.38	20.62	4.43	45.21	17.24
53	09-Jan-98	8.55	7.30	8.20	0.16	0.00	0.03	0.34	1.02		0.28	112.30	10.53	107.38	0.81
54	16-Jan-98	9.20	8.35	9.00	0.10	0.01	0.11	1.14	0.89		0.43	278.15	16.45	167.81	5.36
55	23-Jan-98	9.10	9.00	9.10	0.11	0.01	0.12	1.24	0.03		0.00	653.51	25.32	258.22	0.16
56	29-Jan-98	9.15	7.30	7.30		0.00	0.05	0.56	2.33		1.68	235.19	15.23	155.29	7.75
57	06-Feb-98	8.05	7.20	7.60	0.11	0.00	0.03	0.28	0.27		1.49	171.46	13.04	133.03	0.05
58	13-Feb-98	8.05	7.50	8.00	0.07	0.00	0.01	0.14	0.40		0.36	215.65	14.66	149.47	2.95
59	20-Feb-98	8.60	7.30	7.75	0.16	0.00	0.01	0.11	0.41		2.34	116.55	10.78	109.89	0.13
60	27-Feb-98	8.80	7.50	8.00	0.09	0.00	0.01	0.14	0.21		0.38	18.36	4.26	43.41	0.04
61	06-Mar-98	7.80	7.50	7.50	0.04	0.00	0.01	0.36	0.72		0.15	260.66	16.08	163.94	0.52
62	13-Mar-98	7.80	7.20	7.50	0.06	0.00	0.03	0.38	0.10		0.11	121.69	10.96	111.79	0.11
63	20-Mar-98	7.65	7.00	7.10	0.09	0.01	0.07	0.78	0.69		0.48	148.52	12.04	122.78	4.96
64	27-Mar-98	8.00	7.00	7.00	0.13	0.00	0.03	0.38	0.40		1.40	34.10	5.77	58.84	0.02
65	03-Apr-98	8.08	7.00	7.00	0.13	0.01	0.08	0.86	0.72		1.80	4.03	1.85	18.84	1.02
66	09-Apr-98	8.00	7.00	7.25	0.13	0.00	0.06	0.61	0.11		0.70	111.93	10.46	106.69	0.20
67	17-Apr-98	8.05	7.00	8.05	0.14	0.00	0.02	0.18	0.89		2.95	154.39	12.38	126.32	3.30
68	24-Apr-98	8.05	7.00	7.00		0.01	0.08	0.88	0.40		4.24	163.60	12.62	128.74	14.99
69	30-Apr-98	7.40	7.00	7.00	0.06	0.01	0.08	0.88	0.18		0.79	216.56	14.55	148.37	0.03
70	08-May-98	8.00	6.00	8.00	0.29	0.00	0.01	0.14	1.14		5.78	376.44	19.37	197.57	2.97
71	15-May-98	7.30	7.00	7.00	0.04	0.01	0.08	0.88	1.34		0.12	360.17	18.81	181.84	18.87
72	22-May-98	7.28	6.80	7.08	0.06	0.01	0.06	0.66	0.10		0.22	232.20	15.07	153.70	0.14
73	29-May-98	7.25	7.00	7.00	0.04	0.01	0.08	0.88	0.18		0.02	212.47	14.41	146.95	0.01
74	05-Jun-98	7.05	7.00	7.00	0.06	0.01	0.08	0.86	0.10		0.01	264.57	16.10	164.18	0.02
75	12-Jun-98	7.00	6.75	7.00	0.04	0.01	0.08	0.86	0.10		0.25	294.69	17.00	173.36	0.01
76	19-Jun-98	7.10	6.80	7.10	0.04	0.01	0.07	0.78	0.03		0.09	403.10	19.93	203.24	0.15
77	26-Jun-98	7.10	7.00	7.05	0.01	0.01	0.08	0.61	0.16		0.00	751.06	27.25	277.88	0.11
78	03-Jul-98	8.10	7.00	8.00	0.15	0.00	0.01	0.14	1.08		1.44	549.34	23.41	238.73	27.06
79	10-Jul-98	8.25	8.00	8.00	0.03	0.00	0.01	0.14	0.10		0.06	675.31	25.96	264.72	0.04
80	17-Jul-98	8.88	8.00	8.00	0.05	0.00	0.01	0.14	0.10		0.21	928.50	30.44	310.46	0.10
81	24-Jul-98	8.25	8.00	8.25	0.03	0.00	0.01	0.39	0.21		0.09	1,080.99	32.80	334.51	0.00
82	31-Jul-98	8.50	7.90	8.00	0.07	0.00	0.01	0.14	0.4						

Week	Date	Share Prices			Measures of Volatility						Chi-square test				
		High	Low	Clp/High	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC	
1	03-Jan-97	19.25	19.00	19.25	0.01	0.00	0.06	0.84	12.02	0.04	16.12	3.89	39.68	0.20	
2	10-Jan-97	22.00	19.25	22.00	0.13	0.04	0.21	2.11	1.63	0.46	45.24	6.32	64.50	6.68	
3	17-Jan-97	24.50	21.88	24.50	0.15	0.20	0.46	4.61	1.48	0.06	1,426.16	36.87	378.02	0.25	
4	24-Jan-97	25.00	24.00	24.50	0.04	0.20	0.45	4.61	0.10	0.00	1,315.27	35.37	360.75	0.02	
5	31-Jan-97	24.75	23.00	24.00	0.07	0.16	0.40	4.11	0.41	0.14	933.13	29.75	303.41	0.05	
6	07-Feb-97	24.50	22.00	24.00	0.11	0.18	0.40	4.11	0.18	1.36	818.57	27.82	283.67	0.03	
7	14-Feb-97	24.25	20.00	24.00	0.19	0.18	0.40	4.11	0.10	3.52	1,028.76	31.28	318.98	0.26	
8	21-Feb-97	24.25	18.00	24.00	0.41	0.16	0.40	4.11	0.10	21.88	1,323.69	35.59	362.90	0.04	
9	28-Feb-97	24.25	24.00	24.00	0.01	0.16	0.40	4.11	0.10	0.00	917.16	29.49	300.74	0.14	
10	07-Mar-97	25.25	19.00	24.00	0.28	0.18	0.40	4.11	0.10	17.60	842.79	28.24	287.95	0.01	
11	14-Mar-97	24.25	24.00	24.00	0.01	0.18	0.40	4.11	0.10	0.00	495.83	21.48	219.01	0.17	
12	21-Mar-97	24.25	20.00	23.00	0.19	0.09	0.30	3.11	0.73	6.41	445.64	20.51	209.15	2.51	
13	27-Mar-97	24.00	23.00	24.00	0.04	0.16	0.40	4.11	0.53	0.19	345.43	17.80	181.50	0.64	
14	04-Apr-97	24.00	20.00	24.00	0.18	0.16	0.40	4.11	0.10	2.86	311.38	16.86	171.92	0.01	
15	11-Apr-97	24.00	15.00	24.00	0.46	0.18	0.40	4.11	0.10	12.74	171.96	12.33	125.77	0.10	
16	18-Apr-97	24.00	23.50	24.00	0.02	0.16	0.40	4.11	0.10	0.01	96.27	9.04	92.18	0.06	
17	25-Apr-97	24.00	23.75	24.00	0.01	0.16	0.40	4.11	0.10	0.00	160.97	11.91	121.43	5.10	
18	02-May-97	24.00	23.25	24.00	0.03	0.16	0.40	4.11	0.10	0.03	184.91	12.82	130.70	0.02	
19	09-May-97	24.00	20.00	24.00	0.18	0.18	0.40	4.11	0.10	1.14	441.86	20.23	206.31	0.02	
20	16-May-97	24.00	19.00	22.00	0.19	0.04	0.21	2.11	1.36	6.48	446.36	20.72	211.28	16.85	
21	23-May-97	24.00	21.50	24.00	0.11	0.16	0.40	4.11	1.16	1.27	535.34	22.35	227.88	45.83	
22	30-May-97	24.00	18.00	24.00	0.40	0.16	0.40	4.11	0.10	8.36	838.05	28.17	287.30	0.00	
23	06-Jun-97	24.00	23.00	24.00	0.04	0.18	0.40	4.11	0.10	0.10	755.72	26.70	272.25	0.02	
24	13-Jun-97	24.00	22.75	23.50	0.06	0.13	0.35	3.61	0.41	0.06	610.45	24.01	244.85	0.24	
25	20-Jun-97	24.00	23.00	23.50	0.04	0.13	0.35	3.61	0.10	0.06	849.78	28.45	290.15	0.03	
26	27-Jun-97	24.00	23.00	24.00	0.04	0.18	0.40	4.11	0.22	0.03	1,264.15	34.76	354.47	0.07	
27	04-Jul-97	24.00	21.50	23.75	0.11	0.14	0.38	3.86	0.28	0.99	1,134.83	32.84	335.91	0.05	
28	11-Jul-97	24.00	21.00	24.00	0.13	0.16	0.40	4.11	0.06	2.22	1,096.01	32.31	329.50	0.03	
29	18-Jul-97	24.00	22.50	23.00	0.06	0.08	0.30	3.11	0.73	0.18	873.57	28.95	295.26	1.15	
30	25-Jul-97	24.00	23.00	24.00	0.04	0.16	0.40	4.11	0.53	0.32	811.05	27.68	282.33	1.16	
31	31-Jul-97	24.00	23.00	23.50	0.13	0.13	0.36	3.61	0.41	2.38	875.71	28.89	294.65	2.10	
32	08-Aug-97	24.00	21.00	24.00	0.13	0.16	0.40	4.11	0.22	2.86	643.58	24.58	250.62	0.00	
33	15-Aug-97	24.00	22.00	22.00	0.08	0.04	0.21	2.11	1.36	0.50	650.55	25.10	255.93	17.07	
34	22-Aug-97	22.00	18.70	20.25	0.11	0.00	0.04	0.36	1.20	2.36	585.71	24.13	246.09	7.77	
35	29-Aug-97	21.25	20.00	20.00	0.06	0.00	0.05	0.61	0.09	0.28	545.23	23.23	236.91	0.04	
36	05-Sep-97	21.25	20.50	21.25	0.04	0.02	0.13	1.36	0.37	0.07	627.01	24.77	252.66	2.85	
37	12-Sep-97	21.75	19.00	21.00	0.13	0.01	0.11	1.11	0.26	0.51	1,051.90	32.22	328.54	0.06	
38	19-Sep-97	22.00	20.00	20.00	0.10	0.00	0.01	0.11	0.73	0.87	918.68	30.30	309.05	1.80	
39	26-Sep-97	22.00	20.00	20.25	0.10	0.00	0.04	0.36	0.06	0.92	701.10	26.41	269.31	0.13	
40	03-Oct-97	21.00	18.00	20.25	0.16	0.00	0.04	0.36	0.18	1.95	608.28	24.59	250.80	0.02	
41	09-Oct-97	20.60	20.00	20.00	0.02	0.00	0.01	0.11	0.26	0.05	653.54	25.54	260.49	0.53	
42	17-Oct-97	21.00	14.00	20.00	0.40	0.00	0.01	0.11	0.10	5.82	235.19	15.31	156.18	0.28	
43	24-Oct-97	20.00	18.88	20.00	0.03	0.00	0.01	0.11	0.10	0.04	171.46	13.07	133.32	0.03	
44	31-Oct-97	19.65	18.45	18.80	0.06	0.01	0.11	1.09	0.88	0.28	215.62	14.47	147.58	15.36	
45	07-Nov-97	19.10	18.00	19.00	0.06	0.01	0.09	0.88	0.03	0.24	116.54	10.62	108.32	0.18	
46	14-Nov-97	18.15	18.00	19.15	0.01	0.01	0.07	0.74	0.00	0.00	18.35	4.14	42.23	0.32	
47	21-Nov-97	19.85	18.70	19.10	0.06	0.01	0.08	0.79	0.13	0.02	55.76	7.31	74.59	0.28	
48	28-Nov-97	19.10	18.50	18.75	0.03	0.01	0.11	1.14	0.32	0.01	134.98	11.40	116.22	0.02	
49	05-Dec-97	19.00	18.10	18.80	0.08	0.02	0.13	1.28	0.18	0.18	89.27	9.20	93.81	1.27	
50	11-Dec-97	19.10	18.00	18.00	0.06	0.03	0.18	1.79	0.41	0.56	100.06	9.66	98.49	0.74	
51	18-Dec-97	19.35	18.05	19.00	0.07	0.01	0.09	0.89	0.47	0.54	56.11	7.32	74.63	19.70	
52	31-Dec-97	18.20	19.00	19.15	0.01	0.01	0.07	0.74	0.00	0.02	20.62	4.40	44.85	0.00	
53	09-Jan-98	20.00	19.00	19.70	0.06	0.00	0.02	0.18	0.26	0.00	112.30	10.56	107.69	0.08	
54	16-Jan-98	24.25	20.00	23.00	0.19	0.06	0.30	3.11	1.98	2.01	277.99	16.07	163.93	30.68	
55	23-Jan-98	23.25	19.55	21.00	0.17	0.01	0.11	1.11	1.38	4.31	653.52	25.35	258.49	6.22	
56	28-Jan-98	22.25	18.00	20.75	0.21	0.01	0.08	0.88	0.26	1.44	235.18	15.17	154.68	0.09	
57	06-Feb-98	21.25	20.25	20.50	0.06	0.00	0.06	0.61	0.26	0.23	171.46	12.98	132.32	0.04	
58	13-Feb-98	21.25	20.00	20.25	0.06	0.00	0.04	0.36	0.26	0.25	215.64	14.61	149.04	1.06	
59	20-Feb-98	21.08	20.00	20.75	0.05	0.01	0.08	0.86	0.22	0.15	116.54	10.63	108.39	0.00	
60	27-Feb-98	21.25	20.00	20.00	0.06	0.00	0.01	0.11	0.57	0.14	18.36	4.26	43.48	0.19	
61	06-Mar-98	22.25	19.55	22.25	0.13	0.00	0.23	2.38	1.11	2.12	260.56	15.69	159.96	3.20	
62	13-Mar-98	27.00	20.50	25.25	0.27	0.28	0.53	5.36	1.78	2.35	121.14	10.01	102.04	8.31	
63	20-Mar-98	24.00	19.85	23.00	0.18	0.09	0.30	3.11	1.51	2.43	148.34	11.59	118.15	36.64	
64	27-Mar-98	23.75	21.88	22.25	0.10	0.05	0.23	2.38	0.88	0.73	33.99	5.39	54.92	0.20	
65	03-Apr-98	23.25	21.00	21.00	0.11	0.01	0.11	1.11	0.88	1.00	4.02	1.80	18.36	1.85	
66	09-Apr-98	21.00	20.00	20.00	0.05	0.00	0.01	0.11	0.73	0.05	111.94	10.56	107.68	0.07	
67	17-Apr-98	20.00	19.70	20.00	0.02	0.00	0.01	0.11	0.10	0.01	154.39	12.40	126.50	0.03	
68	24-Apr-98	19.70	19.20	19.20	0.03	0.00	0.07	0.69	0.60	0.11	163.60	12.66	129.07	2.17	
69	30-Apr-98	19.30	15.00	19.00	0.26	0.01	0.08	0.84	0.11	17.77	216.56	14.55	148.40	0.00	
70	08-May-98	19.25	19.00	19.05	0.01	0.01	0.08	0.84	0.10	0.00	378.43	19.24	196.19	0.10	
71	14-May-98	19.20	15.00	19.20	0.25	0.00	0.07	0.69	0.00	6.05	360.18	18.84	192.17	0.08	
72	22-May-98	21.80	18.00	21.25	0.12	0.02	0.13	1.36	1.19	1.01	232.18	14.97	152.70	42.06	
73	29-May-98	21.00	20.00	20.75	0.06	0.01	0.08	0.86	0.41	0.07	212.47	14.41	146.94	1.52	
74	05-Jun-98	23.25	18.55	18.55	0.22	0.02	0.13	1.34	1.48	1.20	264.55	16.00	163.21	11.21	
75	12-Jun-98	18.00	18.50	19.00	0.14	0.11	0.33	3.39	1.39	4.44	294.49	16.51	168.35	12.25	
76	19-Jun-98	16.70	16.00	16.00	0.04	0.15	0.38	3.88	0.41	0.08	402.82	19.32	197.04	0.23	
77	26-Jun-98	16.25	16.00	16.00	0.02	0.15	0.38	3.88	0.10	0.00	750.78	26.65	271.76	0.18	
78	03-Jul-98	17.18	16.00	17.05	0.07	0.08	0.28	2.84	0.59	0.24	546.18	22.88	233.37	6.85	
79	10-Jul-98	17.00	16.00	16.00	0.06	0.16	0.38	3.89	0.78	0.34	675.02	25.23	257.29	1.75	
80	17-Jul-98	17.10	16.05	17.00	0.06	0.06	0.28	2.89	0.53	0.38	928.34	29.91	304.99	0.30	
81	24-Jul-98	17.60	17.00	17.00	0.03	0.08	0.28	2.88	0.10	0.08	1,080.83	32.31	329.54	0.04	
82	31-Jul-98	17.28	17.00	17.00	0.01	0.08	0.28	2.89	0.10	0.00	847.28	28.55	291.12	0.13	
83	07-Aug-98	17.10	15.80	15.50	0										



## KCB

Week	Date	Share Prices			Measures of Volatility					Chi-square test				
		High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC
1	03-Jan-97	75.00	72.00	75.00	0.04	0.48	0.89	7.04	12.12	0.55	15.19	2.75	28.09	0.23
2	10-Jan-97	85.00	76.00	85.00	0.11	0.08	0.29	2.98	1.53	0.30	45.15	6.16	62.86	5.72
3	17-Jan-97	85.50	77.00	85.50	0.10	0.12	0.34	3.46	0.02	0.00	1,426.34	37.09	378.29	0.95
4	24-Jan-97	90.00	76.00	90.00	0.17	0.61	0.78	7.98	0.64	0.43	1,314.46	34.73	354.15	1.57
5	31-Jan-97	90.50	71.00	90.50	0.24	0.69	0.83	8.46	0.02	2.40	932.07	28.92	294.88	0.26
6	07-Feb-97	95.00	80.00	95.00	0.17	1.82	1.27	12.98	0.64	3.65	815.67	26.13	266.48	1.33
7	14-Feb-97	93.00	80.00	93.00	0.15	1.16	1.07	10.66	0.42	2.09	1,026.77	29.97	305.59	7.21
8	21-Feb-97	95.50	85.00	95.50	0.12	1.74	1.32	13.48	0.31	1.60	1,320.53	33.79	344.64	1.28
9	28-Feb-97	103.00	78.00	103.00	0.28	4.22	2.06	20.98	1.12	3.64	909.06	26.32	268.40	2.14
10	07-Mar-97	106.00	80.00	106.00	0.28	5.52	2.35	23.98	0.39	17.24	832.11	24.53	250.13	0.44
11	14-Mar-97	97.50	80.00	97.50	0.20	2.30	1.52	15.46	1.48	2.04	491.57	19.35	197.29	3.97
12	21-Mar-97	97.50	87.50	97.50	0.11	2.30	1.52	15.48	0.10	1.94	441.24	18.19	185.51	0.01
13	27-Mar-97	97.00	90.00	97.00	0.07	2.15	1.47	14.98	0.18	0.67	341.46	15.78	160.88	0.00
14	04-Apr-97	97.00	89.00	97.00	0.09	2.15	1.47	14.98	0.10	0.56	307.41	14.84	151.37	0.01
15	11-Apr-97	97.00	88.00	97.00	0.10	2.15	1.47	14.98	0.10	0.43	168.01	10.36	105.61	0.10
16	18-Apr-97	96.00	82.50	96.00	0.16	1.87	1.37	13.98	0.26	2.10	92.88	7.28	74.25	0.01
17	25-Apr-97	92.00	74.00	92.00	0.22	0.95	0.98	9.98	0.75	2.97	159.39	10.82	110.38	308.22
18	02-May-97	89.50	80.00	89.50	0.39	0.54	0.73	7.48	0.51	11.24	184.17	12.19	124.28	2.90
19	09-May-97	94.00	80.00	94.00	0.16	1.38	1.17	11.98	0.84	0.86	439.44	18.75	191.19	1.41
20	16-May-97	97.00	85.00	97.00	0.13	2.15	1.47	14.98	0.39	3.15	442.15	18.30	186.59	0.93
21	23-May-97	95.50	88.00	95.50	0.08	1.74	1.32	13.46	0.34	0.66	532.18	20.58	209.87	3.53
22	30-May-97	96.00	90.00	96.00	0.08	1.87	1.37	13.98	0.02	0.13	835.63	26.30	268.19	0.07
23	06-Jun-97	96.50	90.00	96.50	0.06	2.61	1.81	16.46	0.31	0.62	750.84	24.36	248.45	0.17
24	13-Jun-97	103.00	90.00	103.00	0.13	4.22	2.06	20.98	0.64	0.66	602.28	20.77	211.84	0.99
25	20-Jun-97	118.00	95.00	118.00	0.22	12.43	3.53	35.98	2.35	3.04	825.35	22.53	229.75	92.84
26	27-Jun-97	125.00	101.00	125.00	0.21	17.75	4.21	42.98	1.04	1.98	1,229.23	27.63	281.80	6.76
27	04-Jul-97	127.00	100.00	127.00	0.24	18.44	4.41	44.98	0.23	5.17	1,096.57	25.45	259.55	0.03
28	11-Jul-97	110.00	100.00	110.00	0.10	7.62	2.74	27.98	2.87	1.08	1,081.35	27.85	284.06	63.92
29	18-Jul-97	103.00	95.00	103.00	0.08	4.22	2.06	20.98	1.24	0.33	865.33	25.59	260.98	4.67
30	25-Jul-97	106.00	90.00	106.00	0.18	5.52	2.35	23.98	0.39	5.58	800.37	23.98	244.54	0.48
31	01-Aug-97	105.00	94.50	105.00	0.11	5.07	2.25	22.98	0.26	1.44	865.85	25.26	257.65	0.68
32	08-Aug-97	98.50	85.00	98.50	0.16	2.61	1.81	16.46	1.18	3.51	638.70	22.25	226.90	3.40
33	15-Aug-97	99.50	85.00	99.50	0.15	2.93	1.71	17.46	0.06	1.70	644.79	22.20	226.38	0.01
34	22-Aug-97	98.50	90.00	98.50	0.09	2.81	1.81	16.46	0.28	1.55	580.51	21.08	214.98	0.10
35	29-Aug-97	98.50	90.00	98.50	0.09	2.81	1.81	16.46	0.10	0.72	540.04	20.23	206.34	0.01
36	05-Sep-97	101.00	90.00	101.00	0.12	3.46	1.88	18.98	0.31	1.18	620.15	21.46	218.85	1.86
37	12-Sep-97	100.00	88.00	100.00	0.13	3.10	1.78	17.98	0.26	0.44	1,045.73	29.01	295.81	0.07
38	19-Sep-97	100.00	90.00	100.00	0.11	3.10	1.78	17.98	0.10	1.09	913.48	26.91	274.39	0.03
39	26-Sep-97	100.00	90.00	100.00	0.11	3.10	1.78	17.98	0.10	1.15	694.91	23.07	235.30	0.08
40	03-Oct-97	88.50	82.00	88.50	0.18	2.61	1.81	16.46	0.34	2.82	603.08	21.54	219.67	0.20
41	09-Oct-97	91.00	85.00	91.00	0.07	0.77	0.88	8.98	1.32	0.59	652.00	23.84	243.09	233.53
42	17-Oct-97	90.00	80.00	90.00	0.40	0.81	0.78	7.98	0.28	5.82	233.98	13.81	140.88	0.08
43	24-Oct-97	88.00	75.00	88.00	0.14	0.15	0.39	3.98	0.75	2.30	171.16	12.33	125.73	1.87
44	31-Oct-97	90.00	79.00	90.00	0.13	0.61	0.78	7.98	0.66	1.43	214.43	13.17	134.26	6.10
45	07-Nov-97	91.00	77.00	91.00	0.17	0.77	0.88	8.98	0.08	2.44	115.01	9.11	92.90	0.12
46	14-Nov-97	82.50	75.00	82.50	0.10	0.00	0.06	0.46	1.48	0.45	18.36	4.19	42.78	4.13
47	21-Nov-97	80.50	70.00	80.50	0.14	0.02	0.18	1.54	0.42	0.36	55.73	7.17	73.12	0.01
48	28-Nov-97	75.00	70.00	75.00	0.07	0.48	0.69	7.04	0.89	0.11	134.05	10.28	104.83	2.33
49	05-Dec-97	74.00	69.50	74.00	0.06	0.62	0.78	8.04	0.26	0.32	88.07	7.94	80.87	2.51
50	11-Dec-97	78.00	70.00	78.00	0.08	0.38	0.59	6.04	0.23	1.14	99.42	8.86	90.32	0.10
51	18-Dec-97	78.00	70.00	78.00	0.11	0.18	0.40	4.04	0.23	1.42	55.82	6.72	68.54	4.43
52	02-Jan-98	77.50	77.00	77.50	0.01	0.20	0.45	4.54	0.18	0.01	20.23	3.70	37.68	6.76
53	09-Jan-98	87.50	74.00	87.50	0.17	0.19	0.44	4.46	1.37	0.33	111.92	9.74	99.33	2.06
54	16-Jan-98	96.00	76.00	96.00	0.23	0.40	0.63	6.46	0.23	3.04	277.37	15.44	157.41	0.12
55	23-Jan-98	91.50	78.50	91.50	0.15	0.24	0.49	4.96	0.34	3.34	653.07	24.60	250.88	0.08
56	29-Jan-98	87.00	75.00	87.00	0.16	0.02	0.15	1.54	1.16	0.63	235.15	15.04	153.34	1.09
57	06-Feb-98	84.00	77.00	84.00	0.00	0.00	0.05	0.54	0.06	0.87	171.46	12.99	132.46	0.07
58	13-Feb-98	83.00	77.00	83.00	0.08	0.01	0.10	1.04	0.18	0.42	215.63	14.48	147.69	0.44
59	20-Feb-98	84.00	88.00	79.50	0.21	0.08	0.25	2.54	0.34	3.99	116.43	10.30	105.08	0.05
60	27-Feb-98	82.50	72.00	82.00	0.14	0.00	0.00	0.04	0.31	1.01	18.36	4.28	43.62	0.00
61	06-Mar-98	83.00	66.00	77.00	0.23	0.24	0.49	5.04	0.91	6.95	260.18	15.17	154.73	1.14
62	13-Mar-98	80.00	70.00	77.00	0.13	0.24	0.49	5.04	0.10	0.44	121.21	10.07	102.65	0.11
63	20-Mar-98	79.00	55.00	70.00	0.36	1.39	1.18	12.04	1.24	9.82	145.75	9.94	101.37	24.08
64	27-Mar-98	73.00	58.00	69.00	0.23	1.63	1.28	13.04	0.26	4.44	30.91	3.56	36.33	0.01
65	03-Apr-98	70.00	58.00	69.00	0.19	1.63	1.28	13.04	0.10	3.70	1.44	0.27	2.73	0.08
66	09-Apr-98	75.50	65.00	75.00	0.15	0.48	0.69	7.04	0.88	0.91	110.99	9.24	94.28	0.22
67	17-Apr-98	74.00	65.00	70.00	0.13	1.39	1.18	12.04	0.91	2.52	151.61	10.18	103.78	3.47
68	24-Apr-98	72.50	60.00	70.00	0.19	1.39	1.18	12.04	0.10	7.87	160.84	10.54	107.48	0.00
69	30-Apr-98	70.50	61.00	70.00	0.14	1.39	1.18	12.04	0.10	5.78	213.80	12.45	126.97	0.03
70	08-May-98	71.00	60.00	70.00	0.17	1.39	1.18	12.04	0.10	1.87	373.66	17.11	174.52	0.10
71	15-May-98	70.50	60.00	70.00	0.18	1.39	1.18	12.04	0.10	2.49	357.41	16.69	170.22	0.00
72	22-May-98	66.00	60.00	63.00	0.10	3.49	1.87	19.04	1.24	0.56	225.30	11.73	119.66	45.49
73	29-May-98	70.50	65.50	70.00	0.07	1.39	1.18	12.04	1.04	0.20	208.70	12.31	125.55	12.47
74	05-Jun-98	74.00	65.50	72.00	0.12	0.97	0.98	10.04	0.23	0.26	262.85	14.36	146.41	0.03
75	12-Jun-98	73.50	66.00	70.00	0.11	1.39	1.18	12.04	0.42	2.54	291.93	14.89	151.82	0.67
76	19-Jun-98	70.00	50.00	69.50	0.33	1.61	1.23	12.54	0.18	8.94	400.09	17.69	180.44	0.00
77	26-Jun-98	71.00	60.00	70.00	0.17	1.39	1.18	12.04	0.02	0.89	748.29	25.10	255.93	0.32
78	03-Jul-98	71.00	66.00	69.50	0.07	1.51	1.23	12.54	0.18	0.30	546.32	21.04	214.60	0.49
79	10-Jul-98	71.00	64.00	70.00	0.10	1.39	1.18	12.04	0.02	1.12	672.53	23.68	241.48	0.15
80	17-Jul-98	70.00	64.00	69.50	0.09	1.61	1.23	12.54	0.18	0.82	925.48	28.06	286.18	0.02
81	24-Jul-98	71.00	61.00	69.50	0.15	1.51	1.23	12.54	0.10	3.33	1,077.97	30.47	310.69	0.04
82	31-Jul-98	71.00	64.00	70.50	0.10	1.2								

Week	Date	Share Prices			Measures of Volatility						Chi-square test				
		High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC	
1	03-Jan-97	140	114	140	0.20	10.77	3.28	33.47	11.21	15.31	1.78	0.13	1.37	0.04	
2	10-Jan-97	166	160	166	0.10	0.54	0.73	7.47	7.00	0.23	44.26	5.35	54.53	10.82	
3	17-Jan-97	340	166	340	0.69	163.65	16.33	166.63	13.98	4.28	943.10	12.17	124.12	171.70	
4	24-Jan-97	340	284	340	0.25	266.65	16.33	166.53	0.10	1.16	836.42	10.96	111.82	0.02	
5	31-Jan-97	307	90	307	1.09	171.44	13.09	133.53	2.76	56.43	622.06	9.98	101.74	20.50	
6	07-Feb-97	107	85	107	0.73	42.48	8.52	66.47	16.28	6.67	736.13	17.06	174.03	1,565.91	
7	14-Feb-97	127	98	127	0.26	20.77	4.66	46.87	1.52	6.50	987.97	23.61	240.81	100.03	
8	21-Feb-97	140	115	140	0.20	10.77	3.28	33.47	0.95	4.81	1,302.56	30.12	307.15	15.68	
9	28-Feb-97	124	114	124	0.00	23.63	4.85	49.47	1.99	0.24	871.03	21.36	217.88	3.77	
10	07-Mar-97	123	120	123	0.02	24.49	4.95	50.47	0.18	0.09	794.84	19.98	203.78	0.01	
11	14-Mar-97	121	115	121	0.05	28.47	5.16	52.47	0.26	0.08	444.62	13.17	134.34	0.02	
12	21-Mar-97	122	110	122	0.10	25.47	5.05	51.87	0.02	1.77	396.33	12.23	124.69	0.11	
13	27-Mar-97	120	100	120	0.18	27.49	5.24	53.47	0.26	4.45	292.96	9.59	97.76	0.03	
14	04-Apr-97	120	115	120	0.04	27.49	5.24	53.47	0.16	0.10	259.14	8.73	88.99	0.01	
15	11-Apr-97	126	112	126	0.12	21.87	4.85	47.47	0.39	0.67	131.67	5.47	55.75	0.07	
16	18-Apr-97	124	115	124	0.08	23.53	4.85	49.47	0.26	0.45	55.26	2.52	25.70	0.01	
17	25-Apr-97	124	121	124	0.02	23.53	4.85	49.47	0.10	0.01	117.66	4.85	49.47	5.10	
18	02-May-97	128	124	128	0.02	21.87	4.85	47.47	0.08	0.00	144.44	5.89	60.09	0.00	
19	09-May-97	132	110	132	0.18	18.54	4.07	41.47	0.39	1.14	409.73	13.68	139.52	0.32	
20	16-May-97	138	120	138	0.14	12.10	3.48	35.47	0.36	3.55	422.58	14.75	150.37	0.90	
21	23-May-97	151	137	151	0.10	4.86	2.20	22.47	0.96	0.97	526.00	18.95	193.22	30.53	
22	30-May-97	178	156	178	0.13	0.20	0.44	4.53	2.08	0.75	838.98	28.09	286.47	37.45	
23	06-Jun-97	174	151	174	0.14	0.00	0.06	0.53	0.42	1.66	756.04	27.39	279.35	0.49	
24	13-Jun-97	170	148	170	0.14	0.12	0.34	3.47	0.42	0.71	610.47	24.04	245.12	0.26	
25	20-Jun-97	181	185	181	0.09	0.65	0.74	7.53	0.79	0.46	848.94	27.70	282.46	9.55	
26	27-Jun-97	176	169	176	0.04	0.06	0.25	2.53	0.50	0.02	1,264.36	35.07	357.60	1.14	
27	04-Jul-97	175	168	175	0.04	0.02	0.16	1.83	0.18	0.09	1,135.07	33.39	340.54	0.00	
28	11-Jul-97	181	187	181	0.08	0.55	0.74	7.53	0.38	0.75	1,095.25	31.65	322.78	0.61	
29	18-Jul-97	175	180	175	0.09	0.02	0.15	1.53	0.88	0.42	873.71	29.26	298.40	0.59	
30	25-Jul-97	175	150	175	0.15	0.02	0.15	1.53	0.10	4.94	811.33	28.19	287.44	0.01	
31	01-Aug-97	175	172	175	0.02	0.00	0.16	1.63	0.10	0.02	875.91	29.30	298.78	0.03	
32	08-Aug-97	172	160	172	0.07	0.02	0.14	1.47	0.34	0.78	643.86	25.05	255.84	0.04	
33	15-Aug-97	170	160	170	0.06	0.12	0.34	3.47	0.26	0.21	650.41	24.83	253.23	0.30	
34	22-Aug-97	170	159	170	0.07	0.12	0.34	3.47	0.10	0.82	585.48	23.53	239.91	0.01	
35	29-Aug-97	170	160	170	0.08	0.12	0.34	3.47	0.18	0.29	545.01	22.67	231.24	0.01	
36	05-Sep-97	170	160	170	0.06	0.12	0.34	3.47	0.10	0.27	626.81	24.36	248.47	0.09	
37	12-Sep-97	171	185	171	0.04	0.06	0.24	2.47	0.02	0.01	1,051.81	31.95	325.83	0.13	
38	19-Sep-97	170	165	170	0.03	0.12	0.34	3.47	0.18	0.05	919.44	29.65	302.36	0.00	
39	26-Sep-97	172	165	172	0.04	0.02	0.14	1.47	0.06	0.14	701.06	26.19	267.09	0.12	
40	02-Oct-97	183	180	183	0.13	0.87	0.93	9.53	0.79	1.45	606.53	22.83	232.82	2.46	
41	09-Oct-97	211	170	211	0.22	13.64	3.68	37.53	2.16	6.78	626.74	18.73	191.05	65.94	
42	17-Oct-97	210	205	210	0.02	18.33	3.58	36.53	0.18	0.00	210.23	9.01	91.87	0.17	
43	24-Oct-97	208	195	208	0.05	9.58	3.08	31.53	0.50	0.25	152.88	7.64	77.92	0.60	
44	31-Oct-97	200	187	200	0.07	6.77	2.60	26.53	0.50	0.32	202.32	9.94	101.40	4.93	
45	07-Nov-97	191	180	191	0.06	2.95	1.88	17.53	0.88	0.24	110.72	7.63	77.83	1.50	
46	14-Nov-97	180	150	180	0.18	0.41	0.64	6.63	0.99	1.91	17.55	3.10	31.62	1.35	
47	21-Nov-97	157	122	157	0.25	2.81	1.82	16.47	1.96	1.50	50.68	4.59	46.78	4.15	
48	28-Nov-97	160	144	160	0.11	1.74	1.32	13.47	0.18	0.35	131.54	9.13	93.08	0.04	
49	05-Dec-97	160	140	160	0.13	1.74	1.32	13.47	0.10	0.73	85.85	6.99	71.31	0.25	
50	11-Dec-97	170	120	170	0.18	0.18	0.34	3.47	0.71	22.25	99.89	9.34	95.22	2.99	
51	19-Dec-97	180	158	180	0.13	0.41	0.64	6.63	0.71	2.12	55.31	6.27	63.90	46.00	
52	23-Dec-97	195	180	195	0.08	0.41	0.64	6.63	0.10	2.36	19.82	3.35	34.16	1.93	
53	09-Jan-98	189	178	189	0.08	2.32	1.52	15.53	0.83	0.02	107.71	7.77	79.24	0.09	
54	16-Jan-98	202	189	202	0.07	6.77	2.60	26.53	0.79	0.17	264.80	11.88	121.17	4.05	
55	23-Jan-98	198	185	198	0.07	5.77	2.40	24.53	0.79	0.59	642.02	20.98	213.96	0.01	
56	29-Jan-98	192	173	192	0.10	1.51	1.23	12.53	1.07	0.26	232.18	12.98	132.34	0.83	
57	06-Feb-98	196	185	196	0.06	4.88	1.81	22.58	0.71	0.35	161.84	9.05	92.28	1.62	
58	13-Feb-98	196	190	196	0.03	4.88	2.21	22.53	0.16	0.04	206.00	10.60	108.09	0.07	
59	20-Feb-98	200	181	200	0.10	8.27	2.88	26.63	0.18	0.80	104.36	6.37	64.96	0.03	
60	27-Feb-98	200	197	200	0.02	6.77	2.60	26.53	0.02	0.00	7.32	0.66	6.75	0.29	
61	06-Mar-98	200	190	200	0.05	6.27	2.50	25.53	0.18	0.28	248.28	11.53	117.55	0.06	
62	13-Mar-98	188	193	188	0.03	4.88	2.21	22.53	0.34	0.00	112.13	7.06	71.95	0.02	
63	20-Mar-98	195	189	190	0.03	2.83	1.82	16.63	0.58	0.03	143.32	9.16	93.43	4.76	
64	27-Mar-98	192	180	192	0.06	0.41	0.64	6.63	0.91	0.27	33.28	4.63	47.21	1.08	
65	02-Apr-98	182	177	177	0.03	0.12	0.35	3.53	0.88	0.04	3.81	1.38	14.07	0.05	
66	09-Apr-98	175	170	175	0.03	0.12	0.34	3.47	0.68	0.01	111.71	9.91	101.07	0.03	
67	17-Apr-98	170	162	165	0.05	0.69	0.83	8.47	0.50	0.29	153.01	10.82	110.34	0.71	
68	24-Apr-98	170	165	168	0.03	0.29	0.88	5.47	0.14	0.15	163.04	11.74	119.73	0.01	
69	30-Apr-98	170	140	165	0.19	0.69	0.83	8.47	0.88	10.50	215.20	13.10	133.62	0.19	
70	08-May-98	171	165	171	0.04	0.06	0.24	2.47	0.39	0.04	376.33	18.82	192.95	0.06	
71	15-May-98	173	167	170	0.04	0.12	0.34	3.47	0.18	0.07	359.96	18.30	186.66	0.11	
72	22-May-98	180	155	180	0.16	0.41	0.64	6.63	0.71	1.54	231.40	13.99	142.62	14.37	
73	29-May-98	183	177	183	0.03	0.87	0.93	9.53	0.18	0.02	210.74	12.77	130.21	0.06	
74	05-Jun-98	189	184	188	0.03	2.03	1.42	14.53	0.31	0.00	260.54	13.54	138.10	0.14	
75	12-Jun-98	193	186	192	0.04	3.30	1.82	18.63	0.23	0.25	288.14	13.73	139.97	0.07	
76	19-Jun-98	194	182	192	0.01	3.30	1.88	18.53	0.10	0.00	396.53	16.81	169.37	0.05	
77	26-Jun-98	193	150	189	0.28	3.32	1.52	15.53	0.34	2.20	746.45	24.44	249.29	0.00	
78	03-Jul-98	195	189	191	0.03	2.95	1.72	17.53	0.06	0.03	543.44	20.13	205.25	0.01	
79	07-Jul-98	190	187	187	0.02	1.78	1.33	13.63	0.42	0.01	671.80	23.40	238.65	0.29	
80	17-Jul-98	180	184	175	0.09	0.02	0.15	1.53	1.07	0.89	928.46	30.17	307.70	2.61	
81	24-Jul-98	195	190	195	0.03	4.48	2.11	21.53	1.82	0.06	1,072.10	28.79	293.62	9.82	
82	31-Jul-98	200	193	200	0.04	8.88	2.90	26.53	0.31	0.05	833.96	24.14	246.19	2.28	
83	07-Aug-98	198	190	197	0.04	5.32	2.31	23.63	0.34	0.13	796.50	23.98	244.58	0.97	
84	14-Aug-98	200	198	200	0.01	6.77	2.60	26.53	0.14	0.01	650.25	20.82	212.35	3.19	
85	21-Aug-98	200	195	195	0.03	4.48	2.11	21.53	0.80	0.14	689.37	22.37	228.14	1.20	

## NBK

## Share Prices

## Measures of Volatility

## Chi-square test

Week	Date	High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC
1	03-Jan-97	13.65	13.30	13.50	0.03	0.01	0.12	1.20	15.76	0.20	16.10	3.78	38.58	2.56
2	10-Jan-97	17.25	15.30	17.00	0.24	0.21	0.46	4.70	4.01	1.90	44.90	5.64	59.57	50.65
3	17-Jan-97	16.80	16.15	16.15	0.09	0.14	0.38	3.65	1.10	0.00	14.26	37.02	37.75	0.01
4	24-Jan-97	16.35	16.00	16.00	0.02	0.13	0.35	3.70	0.27	0.01	13.15	42.35	36.55	362.53
5	31-Jan-97	16.10	15.50	16.00	0.04	0.13	0.36	3.70	0.10	0.02	933.19	29.83	304.21	0.13
6	07-Feb-97	16.00	14.70	15.50	0.08	0.10	0.31	3.20	0.69	0.01	818.70	27.99	285.46	1.63
7	14-Feb-97	18.75	15.15	16.00	0.21	0.13	0.35	3.70	0.49	0.04	1028.82	31.36	319.78	9.74
8	21-Feb-97	16.00	15.50	16.00	0.03	0.13	0.36	3.70	0.10	0.08	1323.75	35.66	363.70	0.04
9	28-Feb-97	16.20	15.15	16.20	0.07	0.15	0.38	3.80	0.14	0.13	917.20	29.53	301.14	0.10
10	07-Mar-97	16.00	15.25	16.00	0.05	0.13	0.36	3.70	0.33	0.03	842.85	28.31	288.75	0.26
11	14-Mar-97	16.00	15.50	16.00	0.03	0.13	0.36	3.70	0.10	0.02	495.89	21.55	219.81	0.17
12	21-Mar-97	16.00	15.50	16.00	0.03	0.13	0.36	3.70	0.10	0.13	445.56	20.39	207.98	0.01
13	27-Mar-97	16.80	15.50	16.00	0.06	0.13	0.36	3.70	0.10	0.92	345.49	17.88	182.29	0.04
14	04-Apr-97	16.00	15.30	16.00	0.04	0.13	0.36	3.70	0.10	0.12	311.44	16.94	172.71	0.01
15	11-Apr-97	16.00	15.50	16.00	0.03	0.13	0.36	3.70	0.10	0.02	172.02	12.41	126.55	0.10
16	18-Apr-97	16.00	15.50	16.00	0.03	0.13	0.36	3.70	0.10	0.05	96.33	9.12	92.96	0.06
17	25-Apr-97	16.00	15.00	16.00	0.06	0.13	0.36	3.70	0.10	0.18	161.03	11.98	122.21	5.10
18	02-May-97	16.00	15.30	16.00	0.04	0.13	0.36	3.70	0.10	0.08	164.97	12.89	131.49	0.02
19	09-May-97	16.00	15.00	16.00	0.06	0.10	0.31	3.20	0.30	0.08	441.99	20.40	208.09	1.73
20	16-May-97	16.00	15.05	16.00	0.06	0.13	0.36	3.70	0.49	0.62	446.18	20.41	208.13	1.65
21	23-May-97	16.00	15.20	16.00	0.05	0.13	0.36	3.70	0.10	0.23	535.40	22.42	228.68	0.18
22	30-May-97	18.70	15.00	15.40	0.22	0.09	0.30	3.10	0.80	2.33	839.19	26.37	269.28	4.66
23	06-Jun-97	16.00	15.00	15.50	0.06	0.10	0.31	3.20	0.82	0.28	755.84	26.87	274.04	0.11
24	13-Jun-97	16.00	15.00	15.35	0.06	0.09	0.30	3.05	0.30	0.10	610.52	24.12	245.95	0.03
25	20-Jun-97	16.00	15.00	15.30	0.06	0.09	0.29	3.00	0.16	0.19	849.86	28.57	291.35	0.18
26	27-Jun-97	16.00	15.00	16.00	0.05	0.13	0.36	3.70	0.72	0.11	1,264.22	34.84	355.27	2.88
27	04-Jul-97	16.00	15.05	16.00	0.03	0.13	0.36	3.70	0.10	0.26	1,134.85	32.97	336.22	0.03
28	11-Jul-97	16.00	15.20	16.00	0.05	0.13	0.36	3.70	0.10	0.27	1,096.07	32.39	330.30	0.00
29	18-Jul-97	16.65	15.50	16.00	0.06	0.13	0.38	3.70	0.10	0.42	873.49	28.84	294.08	0.01
30	25-Jul-97	16.05	15.60	16.00	0.03	0.13	0.36	3.70	0.10	0.13	811.11	27.76	283.13	0.01
31	01-Aug-97	16.05	15.70	16.00	0.02	0.13	0.36	3.70	0.10	0.03	875.70	28.87	294.46	0.03
32	08-Aug-97	16.05	15.70	16.00	0.02	0.13	0.36	3.70	0.10	0.05	643.64	24.65	251.42	0.09
33	15-Aug-97	16.00	13.20	13.45	0.19	0.01	0.11	1.16	3.09	2.83	650.61	25.28	257.82	96.26
34	22-Aug-97	14.00	13.00	14.00	0.07	0.03	0.17	1.70	0.55	1.02	565.65	23.87	243.41	1.14
35	29-Aug-97	14.00	13.45	13.55	0.04	0.01	0.12	1.20	0.69	0.10	545.21	23.11	235.72	2.44
36	05-Sep-97	14.00	13.50	13.55	0.04	0.02	0.12	1.20	0.69	0.10	545.21	23.11	235.72	2.44
37	12-Sep-97	14.00	13.50	13.60	0.04	0.02	0.13	1.20	0.69	0.08	627.01	24.80	252.86	0.00
38	19-Sep-97	13.70	13.20	13.50	0.04	0.01	0.12	1.20	0.69	0.10	619.65	30.09	306.86	0.01
39	26-Sep-97	13.55	13.10	13.10	0.04	0.01	0.08	0.80	0.57	0.13	701.09	26.32	268.42	0.49
40	03-Oct-97	13.20	13.00	13.05	0.02	0.01	0.07	0.75	0.16	0.00	608.27	24.52	250.01	0.00
41	09-Oct-97	13.25	12.85	12.95	0.03	0.00	0.06	0.65	0.22	0.09	653.53	25.44	259.40	0.33
42	17-Oct-97	13.00	12.30	12.30	0.06	0.00	0.00	0.00	0.85	0.04	235.19	15.34	156.39	0.37
43	24-Oct-97	12.80	12.00	12.05	0.06	0.00	0.02	0.25	0.39	0.45	171.46	13.05	133.05	0.26
44	31-Oct-97	12.25	12.00	12.00	0.02	0.00	0.03	0.30	0.16	0.01	215.65	14.63	149.17	0.30
45	07-Nov-97	12.30	12.00	12.20	0.02	0.00	0.01	0.10	0.14	0.02	116.55	10.78	109.91	0.04
46	14-Nov-97	12.50	12.00	12.15	0.04	0.00	0.04	0.00	0.15	0.05	18.36	4.26	43.41	0.09
47	21-Nov-97	12.30	12.00	12.00	0.02	0.00	0.03	0.30	0.27	0.00	55.77	7.41	75.57	0.11
48	28-Nov-97	12.30	12.00	12.00	0.02	0.00	0.02	0.20	0.02	0.00	135.00	11.58	118.10	0.21
49	05-Dec-97	12.40	12.00	12.15	0.03	0.00	0.03	0.60	0.04	0.06	89.30	9.42	96.08	0.01
50	11-Dec-97	12.40	12.05	12.20	0.03	0.00	0.01	0.10	0.04	0.11	100.12	9.99	101.85	0.05
51	19-Dec-97	12.60	12.05	12.45	0.04	0.00	0.02	0.15	0.20	0.20	56.13	7.46	76.09	3.22
52	02-Jan-98	12.60	12.50	12.50	0.04	0.00	0.04	0.40	0.04	0.00	20.63	2.68	26.82	0.00
53	09-Jan-98	12.80	12.50	12.70	0.03	0.00	0.04	0.40	0.04	0.00	112.30	10.52	107.26	0.20
54	16-Jan-98	14.10	12.50	14.00	0.12	0.03	0.17	1.70	1.43	0.71	278.12	16.35	166.70	15.25
55	23-Jan-98	15.35	14.00	14.50	0.69	0.05	0.22	2.20	0.49	1.14	653.45	25.13	256.32	0.37
56	29-Jan-98	14.75	12.50	12.50	0.17	0.00	0.02	0.20	2.45	0.82	235.19	15.30	155.99	8.76
57	05-Feb-98	13.00	12.10	12.00	0.07	0.00	0.02	0.70	0.48	0.57	171.45	12.96	132.13	0.56
58	13-Feb-98	13.10	12.00	12.80	0.09	0.00	0.05	0.50	0.33	0.60	215.64	14.59	148.75	1.97
59	20-Feb-98	13.00	12.50	12.65	0.04	0.00	0.02	0.25	0.39	0.08	116.55	10.75	109.59	0.11
60	27-Feb-98	12.75	12.50	12.55	0.02	0.00	0.03	0.35	0.02	0.00	18.36	4.22	42.69	0.29
61	06-Mar-98	13.15	12.50	12.95	0.05	0.00	0.08	0.85	0.25	0.27	260.66	16.02	163.34	0.01
62	13-Mar-98	13.05	12.50	13.00	0.04	0.00	0.07	0.70	0.04	0.00	121.68	10.89	111.10	0.20
63	20-Mar-98	13.05	11.35	11.85	0.14	0.00	0.04	0.45	1.45	1.33	148.52	12.10	123.40	33.42
64	27-Mar-98	11.35	10.00	10.30	0.13	0.04	0.20	2.00	1.92	1.25	34.02	5.45	55.63	8.03
65	03-Apr-98	10.70	10.05	10.25	0.06	0.04	0.20	2.05	0.16	0.34	3.97	1.63	16.63	0.02
66	09-Apr-98	10.40	10.10	10.30	0.03	0.04	0.20	2.00	0.94	0.01	111.87	10.19	103.94	0.46
67	17-Apr-98	10.55	10.10	10.50	0.04	0.03	0.18	1.80	0.14	0.23	154.33	12.08	123.15	0.00
68	24-Apr-98	10.55	10.05	10.10	0.05	0.05	0.22	2.50	0.57	0.45	163.52	12.36	126.09	1.89
69	30-Apr-98	10.40	10.00	10.10	0.04	0.05	0.22	2.20	0.10	0.37	216.49	14.29	145.72	0.03
70	08-May-98	10.95	9.80	10.30	0.11	0.04	0.20	2.00	0.14	0.75	376.37	19.01	193.89	0.06
71	15-May-98	10.75	10.20	10.50	0.05	0.03	0.18	1.80	0.14	0.20	360.13	18.63	188.97	0.03
72	22-May-98	12.00	10.10	10.10	0.17	0.05	0.22	2.20	0.57	2.09	232.12	14.81	151.04	8.97
73	29-May-98	10.45	9.90	10.00	0.05	0.05	0.23	2.30	0.22	0.09	212.38	14.13	144.10	0.26
74	05-Jun-98	10.50	10.00	10.15	0.05	0.04	0.21	2.15	0.89	0.01	264.50	15.85	161.62	0.04
75	12-Jun-98	10.40	10.00	10.30	0.04	0.04	0.20	2.00	0.08	0.29	294.63	16.78	171.10	0.02
76	19-Jun-98	11.20	10.00	11.00	0.11	0.02	0.13	1.30	0.72	0.89	403.08	19.82	202.17	1.38
77	26-Jun-98	14.00	10.00	14.00	0.33	0.03	0.17	1.70	3.43	4.09	751.02	27.07	276.09	26.75
78	03-Jul-98	12.75	10.10	10.20	0.23	0.04	0.21	2.10	4.56	3.91	549.25	23.03	234.85	512.05
79	10-Jul-98	10.25	10.00	10.05	0.02	0.05	0.22	2.25	0.27	0.03	675.22	25.55	260.54	0.04
80	17-Jul-98	10.25	10.00	10.05	0.02	0.05	0.22	2.25	0.10	0.03	928.41	30.03	306.27	0.10
81	24-Jul-98	9.75	9.75	10.00	0.05	0.05	0.23	2.30	0.16	0.30	1,080.69	32.43	330.72	0.00
82	31-Jul-98	10.05	9.95	10.00	0.01	0.05	0.23	2.30	0.10	0.00	84			

Week	Date	High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC
1	03-Jan-97	54.00	53.00	53.00	0.02	27.01	5.20	3.00	12.07	0.10	7.34	0.35	3.54	0.22
2	10-Jan-97	55.50	50.00	55.00	0.10	1.78	1.33	13.52	0.36	0.25	41.87	4.34	44.27	0.03
3	17-Jan-97	64.50	49.00	64.00	0.27	4.88	2.21	22.88	1.97	0.42	1,416.83	33.48	341.45	0.99
4	23-Jan-97	64.00	58.00	60.00	0.10	3.30	1.82	18.52	1.02	0.09	1,309.09	32.73	333.79	5.00
5	31-Jan-97	41.00	37.50	40.00	0.09	0.02	1.14	1.48	4.89	0.23	933.41	30.26	308.63	64.96
6	07-Feb-97	55.00	35.50	36.75	0.43	0.21	0.46	4.73	0.84	24.34	818.47	27.70	282.46	2.79
7	14-Feb-97	43.25	38.00	41.00	0.18	0.00	0.05	0.48	0.68	3.17	1,029.08	31.99	326.19	32.70
8	21-Feb-97	44.25	36.00	44.00	0.21	0.05	0.25	2.52	0.58	5.30	1,323.89	35.89	366.05	5.61
9	28-Feb-97	53.00	39.00	40.50	0.30	0.01	0.10	0.98	0.90	4.48	917.47	30.10	306.95	1.13
10	07-Mar-97	43.00	35.00	41.00	0.21	0.90	0.05	0.48	0.02	8.17	843.11	28.94	295.16	0.11
11	14-Mar-97	42.80	33.25	39.50	0.24	0.04	0.19	1.68	0.44	3.23	496.08	21.89	223.22	0.04
12	21-Mar-97	40.00	35.00	38.25	0.13	0.26	0.51	5.23	0.84	3.01	445.30	20.10	205.00	3.60
13	27-Mar-97	37.00	35.00	38.00	0.05	0.29	0.54	5.48	0.16	0.34	345.18	17.54	178.83	0.00
14	04-Apr-97	38.50	35.50	38.00	0.08	0.12	0.34	3.48	0.38	0.49	311.47	16.98	173.16	0.41
15	11-Apr-97	45.00	33.00	37.25	0.31	0.17	0.41	4.23	0.27	5.46	171.94	12.31	125.54	0.00
16	18-Apr-97	38.25	32.00	38.00	0.18	0.12	0.34	3.48	0.07	2.97	96.36	9.16	93.40	0.09
17	25-Apr-97	38.00	36.00	37.50	0.05	0.15	0.39	3.98	0.11	0.12	160.99	11.93	121.69	24.54
18	02-May-97	41.00	38.00	40.25	0.08	0.01	0.12	1.23	0.53	0.31	185.21	13.37	136.36	3.28
19	09-May-97	42.00	37.50	41.00	0.11	0.00	0.05	0.88	0.07	0.37	442.18	20.94	213.50	0.05
20	16-May-97	47.00	41.00	42.00	0.14	0.00	0.05	0.52	0.13	3.38	446.44	21.03	214.43	0.01
21	23-May-97	43.75	36.00	42.00	0.19	0.00	0.05	0.52	0.10	4.25	535.66	23.04	234.98	0.18
22	30-May-97	42.00	40.00	40.75	0.05	0.01	0.07	0.73	0.38	0.06	839.37	28.83	294.01	0.75
23	06-Jun-97	41.00	39.00	40.25	0.05	0.01	0.12	1.83	0.21	0.15	756.01	27.26	277.96	0.03
24	13-Jun-97	41.00	40.00	41.00	0.02	0.00	0.05	0.48	0.07	0.00	610.70	24.62	251.07	0.07
25	20-Jun-97	40.25	39.00	39.25	0.03	0.05	0.22	2.88	0.18	0.02	849.94	28.72	292.89	3.48
26	27-Jun-97	40.25	37.00	38.00	0.08	0.12	0.34	3.48	0.38	0.22	1,264.25	34.88	355.72	0.54
27	04-Jul-97	40.00	37.50	38.00	0.06	0.12	0.38	3.48	0.10	0.30	1,134.89	33.01	336.67	0.03
28	11-Jul-97	39.00	37.50	37.50	0.04	0.15	0.38	3.98	0.21	0.14	1,096.03	32.34	328.76	0.08
29	18-Jul-97	38.00	37.00	37.00	0.03	0.19	0.44	4.48	0.21	0.01	873.37	28.69	292.56	0.00
30	25-Jul-97	40.00	35.00	39.25	0.13	0.05	0.22	2.23	0.42	3.68	811.28	28.05	286.05	0.59
31	01-Aug-97	39.00	37.50	38.00	0.10	0.13	0.34	3.48	0.38	0.16	875.73	28.92	294.92	1.78
32	08-Aug-97	38.75	37.00	38.00	0.05	0.12	0.34	3.48	0.10	0.29	643.67	24.70	251.87	0.09
33	15-Aug-97	38.00	38.00	38.50	0.03	0.09	0.29	2.98	0.02	0.02	650.47	24.93	254.21	0.06
34	22-Aug-97	40.00	38.00	39.50	0.05	0.04	0.19	1.98	0.13	0.46	585.64	23.82	242.87	0.00
35	29-Aug-97	40.25	36.00	40.00	0.11	0.02	0.15	1.48	0.02	1.14	545.19	23.06	235.18	0.10
36	05-Sep-97	40.25	37.00	40.00	0.08	0.02	0.14	1.48	0.10	0.59	627.00	24.75	252.42	0.09
37	12-Sep-97	40.75	40.00	40.25	0.11	0.01	0.12	1.88	0.08	0.00	1,051.90	32.19	328.31	0.09
38	19-Sep-97	41.50	40.00	40.25	0.04	0.01	0.12	1.23	0.10	0.09	919.65	30.09	306.82	0.03
39	26-Sep-97	40.25	40.00	40.25	0.01	0.01	0.12	1.23	0.10	0.00	701.07	26.24	267.58	0.08
40	02-Oct-97	40.50	39.50	40.50	0.03	0.01	0.10	0.98	0.04	0.02	608.26	24.47	249.57	0.09
41	09-Oct-97	40.50	38.00	40.50	0.05	0.01	0.10	0.98	0.10	0.51	653.52	25.37	258.76	0.01
42	17-Oct-97	40.00	37.50	37.80	0.05	0.15	0.39	3.98	0.79	0.07	234.89	14.57	148.55	0.24
43	24-Oct-97	38.00	36.75	37.00	0.03	0.19	0.44	4.48	0.21	0.09	171.08	12.23	124.74	0.01
44	31-Oct-97	39.00	35.00	37.00	0.11	0.19	0.44	4.48	0.10	0.95	215.26	13.82	140.94	0.07
45	07-Nov-97	39.00	36.00	37.25	0.08	0.17	0.41	4.23	0.06	0.49	116.21	9.98	101.81	0.16
46	14-Nov-97	37.50	32.00	36.75	0.18	0.21	0.46	4.73	0.21	1.41	17.93	3.41	34.76	0.04
47	21-Nov-97	37.25	36.25	37.00	0.03	0.19	0.44	4.48	0.04	0.00	55.39	6.62	67.47	0.43
48	28-Nov-97	38.00	36.00	37.00	0.05	0.19	0.44	4.48	0.10	0.06	134.62	10.76	109.71	0.09
49	05-Dec-97	38.00	36.50	38.00	0.04	0.12	0.34	3.48	0.13	0.11	89.07	8.78	89.55	0.52
50	11-Dec-97	38.00	37.00	38.00	0.03	0.12	0.34	3.48	0.10	0.09	99.89	9.34	95.21	0.00
51	18-Dec-97	39.00	36.00	38.00	0.08	0.12	0.34	3.48	0.10	0.74	55.90	6.83	69.61	0.72
52	31-Dec-97	39.25	38.00	39.00	0.03	0.06	0.24	2.48	0.13	0.35	20.51	4.07	41.50	3.56
53	09-Jan-98	45.50	39.00	45.00	0.16	0.12	0.35	3.52	1.18	0.26	112.06	9.92	101.14	1.69
54	16-Jan-98	51.50	45.50	51.50	0.18	0.97	0.96	10.02	1.39	0.76	276.24	14.77	150.63	14.46
55	23-Jan-98	50.00	41.00	46.00	0.20	0.20	0.88	4.82	1.38	5.69	653.15	24.68	251.74	6.27
56	29-Jan-98	45.50	41.00	43.50	0.10	0.04	0.20	2.88	0.67	0.26	235.11	14.94	152.38	0.10
57	06-Feb-98	45.00	40.00	43.50	0.11	0.04	0.20	2.88	0.10	1.68	171.38	12.70	129.52	0.03
58	13-Feb-98	45.25	43.00	43.50	0.05	0.04	0.20	2.02	0.10	0.17	215.57	14.29	145.74	0.07
59	20-Feb-98	45.25	43.25	43.75	0.05	0.08	0.30	3.02	0.04	0.12	116.45	10.35	105.60	0.16
60	27-Feb-98	45.00	43.50	44.00	0.03	0.06	0.25	2.52	0.04	0.03	18.24	3.80	38.80	0.25
61	06-Mar-98	47.50	44.00	45.00	0.12	0.35	3.52	3.52	0.13	0.69	260.43	15.46	157.68	0.11
62	13-Mar-98	45.00	44.00	44.75	0.02	0.10	0.32	3.27	0.16	0.00	121.49	10.40	106.05	0.05
63	20-Mar-98	47.00	43.00	44.00	0.09	0.06	0.25	2.52	0.22	0.48	148.41	11.70	119.29	0.78
64	27-Mar-98	45.00	38.00	42.00	0.17	0.88	0.05	0.88	0.56	2.33	34.09	5.74	58.51	0.18
65	03-Apr-98	40.00	38.00	38.00	0.05	0.12	0.34	3.48	1.02	0.21	3.82	1.39	14.16	2.67
66	09-Apr-98	40.00	37.00	39.00	0.08	0.08	0.24	2.48	0.13	0.19	111.82	10.10	103.00	0.31
67	17-Apr-98	40.25	39.00	40.00	0.01	0.02	0.14	1.48	0.13	0.11	154.35	12.14	123.78	0.01
68	24-Apr-98	40.00	38.50	40.00	0.09	0.53	1.14	1.48	0.10	1.76	163.57	12.50	127.51	0.00
69	30-Apr-98	41.25	39.00	40.00	0.05	0.02	0.14	1.48	0.10	0.81	216.54	14.43	147.14	0.03
70	08-May-98	41.00	39.50	40.25	0.11	0.01	0.12	1.23	0.04	0.05	376.41	19.16	195.42	0.19
71	14-May-98	42.00	40.00	42.00	0.05	0.00	0.06	0.73	0.30	0.17	360.18	18.88	192.50	0.58
72	22-May-98	45.00	40.00	43.50	0.12	0.04	0.20	2.88	0.88	0.91	232.14	14.84	151.38	1.44
73	29-May-98	47.00	41.00	48.75	0.14	0.27	0.50	5.27	0.88	0.86	211.95	13.56	138.29	4.37
74	05-Jun-98	47.00	44.50	45.00	0.05	0.12	0.36	3.68	0.50	0.02	264.35	15.58	158.91	0.75
75	12-Jun-98	44.00	40.00	41.00	0.10	0.00	0.05	0.48	1.02	1.97	294.70	17.07	174.12	6.08
76	19-Jun-98	43.50	40.00	42.00	0.06	0.00	0.05	0.52	0.13	0.45	403.10	19.97	203.70	0.02
77	26-Jun-98	44.75	42.00	42.00	0.05	0.00	0.05	0.52	0.10	0.07	751.07	27.30	278.44	0.18
78	03-Jul-98	48.00	40.80	43.00	0.14	0.02	0.18	1.82	0.13	1.31	549.29	23.14	235.98	0.21
79	10-Jul-98	43.00	40.50	41.50	0.08	0.00	0.00	0.02	0.44	0.33	675.31	25.98	264.97	0.35
80	17-Jul-98	42.00	40.00	42.00	0.05	0.00	0.05	0.52	0.02	0.21	928.50	30.37	309.70	0.22
81	24-Jul-98	43.50	37.00	42.00	0.16	0.00	0.05	0.88	0.10	3.80	1,080.99	32.78	334.25	0.04
82	31-Jul-98	42.50	36.00	42.00	0.17	0.00	0.05	0.52	0.10	2.09	847.43	29.01	295.83	0.13
83	07-Aug-98	42.25	40.50	40.50	0.08	0.01	0.10	0.98	0.44	0.14	807.10			

EAPC														
Share Prices					Measures of Volatility					Chi-square test				
Week	Date	High	Low	Closing	R	V	SD	MAD	CVPC	R	V	SD	MAD	CVPC
1	02-Jan-97	21.75	21.00	21.75	0.04	4.53	2.13	21.75	7.05	0.39	8.31	0.88	9.00	1.16
2	10-Jan-97	22.50	20.75	22.50	0.08	1.31	1.14	8.78	0.20	0.12	42.74	4.84	52.20	0.02
3	17-Jan-97	23.00	21.75	23.00	0.08	1.17	1.08	8.29	0.09	0.01	1,424.24	35.64	368.77	0.81
4	23-Jan-97	23.75	23.00	23.75	0.03	0.98	0.98	7.54	0.20	0.00	1,313.75	34.33	354.97	0.01
5	31-Jan-97	25.00	24.00	25.00	0.04	0.87	0.82	6.20	0.42	0.02	932.11	28.94	289.12	0.05
6	06-Feb-97	25.00	24.00	25.00	0.04	0.87	0.82	8.29	0.13	0.15	817.55	27.00	279.38	0.01
7	14-Feb-97	27.00	24.00	27.00	0.12	0.31	0.56	4.29	0.74	1.23	1,028.48	30.97	318.62	23.21
8	21-Feb-97	29.25	27.75	29.25	0.05	0.07	0.27	2.04	0.85	0.28	1,323.87	35.86	367.00	12.38
9	28-Feb-97	30.00	27.50	30.00	0.09	0.03	0.17	1.20	0.20	0.28	917.43	29.95	308.32	0.04
10	07-Mar-97	37.75	30.00	37.75	0.23	0.71	0.84	6.46	3.25	11.48	841.71	27.38	283.34	68.32
11	13-Mar-97	39.50	36.00	39.50	0.09	1.14	1.07	8.21	0.83	0.36	493.88	20.19	211.04	0.27
12	21-Mar-97	39.00	36.00	39.00	0.08	1.01	1.00	7.71	0.35	1.02	443.81	19.16	200.19	0.32
13	27-Mar-97	36.50	36.00	36.50	0.01	0.48	0.68	6.21	1.22	0.01	344.84	17.26	179.38	5.78
14	18-Apr-97	38.50	37.25	38.50	0.03	0.88	0.94	7.21	0.74	0.05	309.94	15.83	165.92	2.87
15	25-Apr-97	39.00	37.75	39.00	0.03	1.01	1.00	7.71	0.09	0.02	170.28	11.20	118.89	0.11
16	09-May-97	40.25	37.50	40.25	0.07	1.36	1.17	8.96	0.42	0.39	93.89	7.63	83.11	0.19
17	16-May-97	46.00	42.00	46.00	0.09	3.87	1.91	14.71	2.38	0.43	154.05	9.16	101.77	3,115.62
18	23-May-97	48.75	48.00	49.75	0.08	6.77	2.40	18.46	1.61	0.33	173.87	9.23	104.34	31.23
19	30-May-97	53.00	40.00	53.00	0.28	7.99	2.83	21.71	1.20	2.97	426.36	15.76	173.23	7.96
20	06-Jun-97	39.00	37.00	39.00	0.05	1.01	1.00	7.71	6.24	0.44	444.44	19.17	200.34	399.55
21	12-Jun-97	38.00	33.25	38.00	0.13	0.78	0.87	6.71	0.57	1.92	534.14	21.43	222.80	10.37
22	20-Jun-97	40.00	38.25	40.00	0.10	1.28	1.13	8.71	0.74	0.37	836.81	26.75	278.30	3.89
23	27-Jun-97	44.00	38.75	44.00	0.13	2.74	1.65	12.71	1.82	1.31	750.58	24.29	255.57	14.39
24	04-Jul-97	42.75	40.00	42.75	0.07	2.22	1.49	11.46	0.88	0.11	606.26	21.82	229.62	1.19
25	11-Jul-97	44.25	40.00	44.25	0.10	2.85	1.69	12.98	0.52	0.57	844.35	25.88	271.98	3.88
26	18-Jul-97	41.75	40.00	41.75	0.04	1.85	1.38	10.48	1.22	0.03	1,280.78	32.88	342.03	9.85
27	24-Jul-97	44.25	42.00	44.25	0.05	2.85	1.89	12.96	0.98	0.18	1,129.43	30.40	318.16	3.91
28	01-Aug-97	44.00	42.25	44.00	0.04	2.74	1.65	12.71	0.24	0.16	1,090.87	29.89	312.73	0.12
29	15-Aug-97	42.25	40.00	42.25	0.05	2.03	1.43	10.98	0.89	0.12	869.88	26.78	279.93	2.04
30	20-Aug-97	45.00	42.50	45.00	0.06	3.18	1.78	13.71	1.07	0.61	805.02	25.03	263.72	8.45
31	10-Sep-97	43.50	40.00	43.50	0.08	2.53	1.59	12.21	0.78	0.88	870.92	26.50	277.91	8.86
32	02-Oct-97	35.75	35.00	35.75	0.02	0.34	0.58	4.46	3.51	0.04	843.23	24.23	249.94	43.82
33	16-Oct-97	35.00	27.00	35.00	0.26	0.23	0.48	3.71	0.46	5.30	850.17	24.55	252.77	1.42
34	23-Oct-97	28.25	27.00	28.25	0.05	0.16	0.40	3.04	3.08	0.35	585.40	23.42	240.78	59.95
35	30-Oct-97	35.00	34.00	35.00	0.03	0.23	0.48	3.71	2.82	0.04	544.77	22.40	230.77	58.61
36	07-Nov-97	36.00	29.00	36.00	0.22	0.38	0.61	4.71	0.31	4.46	826.29	23.83	246.04	1.82
37	27-Nov-97	35.00	25.00	35.00	0.33	2.18	1.47	11.29	7.11	3.95	1,047.61	29.58	308.58	304.19
38	09-Jan-98	29.00	29.00	29.00	-	0.09	0.30	2.28	3.80	0.01	919.50	29.73	304.70	78.77
39	15-Jan-98	39.00	32.50	38.75	0.18	0.94	0.97	7.46	4.13	3.88	899.22	24.57	255.32	65.38
40	11-Feb-98	37.50	30.00	30.00	0.22	0.03	0.17	1.29	3.95	4.26	608.22	24.33	248.94	89.03
41	20-Feb-98	30.00	30.00	30.00	-	0.03	0.17	1.29	0.13	0.01	653.48	25.23	258.13	0.06
42	27-Feb-98	30.25	29.00	29.00	0.04	0.09	0.30	2.28	0.57	0.01	235.02	14.74	151.84	0.03
43	12-Mar-98	30.00	28.75	28.75	0.04	0.11	0.33	2.54	0.24	0.17	171.24	12.44	128.50	0.02
44	17-Apr-98	25.00	22.00	22.00	0.13	1.46	1.21	9.29	3.08	1.37	212.73	12.36	131.75	215.28
45	21-May-98	23.00	20.00	20.00	0.14	2.18	1.47	11.29	1.00	1.86	112.27	8.06	88.67	2.54
46	29-May-98	20.25	20.00	20.00	0.01	2.18	1.47	11.29	0.13	0.00	14.29	1.85	24.03	0.12
47	05-Jun-98	20.50	20.00	20.00	0.02	2.16	1.47	11.29	0.13	0.00	51.54	4.82	55.25	0.28
48	10-Jun-98	20.50	20.25	20.25	0.01	2.07	1.44	11.04	0.02	0.00	130.90	8.92	97.44	0.20
49	26-Jun-98	23.00	20.75	22.00	0.10	1.49	1.21	9.29	0.63	0.99	86.40	7.19	78.68	16.49
50	02-Jul-98	24.00	22.00	23.00	0.09	1.17	1.08	8.29	0.31	1.29	97.80	7.96	86.13	0.30
51	22-Jul-98	24.25	20.50	20.50	0.17	1.97	1.41	10.79	1.22	3.80	52.25	4.95	56.34	137.89
52	06-Aug-98	20.25	20.00	20.00	0.01	2.16	1.47	11.29	0.35	0.04	16.53	2.08	26.48	26.11
53	03-Sep-98	20.25	20.00	20.25	0.01	2.07	1.44	11.04	0.02	0.02	108.21	7.92	87.11	0.39
54	17-Sep-98	20.00	19.50	19.50	0.03	2.36	1.54	11.78	0.46	0.01	273.48	13.75	147.32	1.04
55	16-Oct-98	19.25	18.45	18.45	0.04	2.80	1.87	12.84	0.50	0.20	647.98	22.33	235.65	0.68
56	06-Nov-98	18.50	18.35	18.50	0.01	2.77	1.87	12.79	0.11	0.01	229.88	12.19	131.86	0.26
57	11-Dec-98	18.50	17.30	17.30	0.07	3.32	1.82	13.99	0.65	0.49	164.89	9.70	107.02	1.30
58	18-Dec-98	17.15	16.50	16.50	0.04	3.71	1.93	14.79	0.46	0.08	208.29	11.09	121.63	4.46
59	23-Dec-98	17.30	17.05	17.30	0.01	3.32	1.82	13.99	0.22	0.00	110.01	7.46	83.89	0.00

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