THE SIZE EFFECT AT THE NAIROBI STOCK EXCHANGE (NSE)

AN EMPIRICAL INVESTIGATION

By

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DECLARATION

This research project is my original work and has not been submitted for a degree in any other University.

SIGNED  : DATE 24/12/2004

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The project has been submitted for examination with my approval as University supervisor.

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DEDICATION

To my dear wife Wairimu, daughter Wanjiru and son Kabui.

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ABSTRACT

The size effect is one of the best known academic market anomalies. There have been a considerable number of empirical studies that have found a relationship between equity returns and the size of a firm. Collaborating results of Fama and French (1992) indicates that there is regression indicating a positive linear relationship between stock returns and size.

This study aims at examining the role of firm size in explaining the cross-section of average stock returns in Kenya over the period 1991 – 2002. For purposes of this study secondary data is obtained predominantly from 53 quoted companies on the Nairobi Stock Exchange (NSE).

The objective of the study was to determine whether firm size influences returns on investment portfolio in Nairobi Stock Exchange. The daily stock return data is not well documented in the Nairobi stock exchange records for the years prior to 1996. In our analysis therefore, we used the weekly returns for the period between 1996 and 2002, to compute the excess returns and also the outstanding number of shares at the end of each year under consideration to compute the market values.

The finding of this study was that the size effect is weakly exhibited in the Nairobi stock exchange and more studies should be done in this area.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

What determines expected stock returns? Assets pricing theories, chief among them the Capital asset pricing model (CAPM), developed by Sharpe (1964), Mossin (1966) and Lintner (1965), postulates a linear relation between a stock's expected return and it's risk. In addition, the twin concept of efficient market hypothesis (EMH) championed by Fama and French (1992) requires that risk and its proxies be the only factors determining stock returns.

However, recent evidence has shown that other factors have a consistent and significant effect on common stock returns. For example, Basu(1977) documented a negative relationship between P/E ratios and stock returns. Fama and French (1992) find that two factors, market equity (ME) and the ratio of book equity to market equity (BE/ME) capture much of the cross-section of average equity returns. Other empirical research has discovered strong seasonality in stock returns. Banz(1981) and Reinganum (1983) report that January returns are higher than in any other Months in the (USA). Litzenberger and Ramaswamy (1979) show a significant positive relationship between dividend yield and returns on common stock. De Bondt and Thaler (1985) found that past stock market losers in the US outperformed past winners, a phenomenon, which they christened the "stock market overreaction effect"

But even more controversial has been the documented evidence of the predictability of stock returns on the issue of whether size is of importance to stock returns and other metrics of the company performance. The studies on the relationship fall into two broad categories: Research on the small firm effect and the others on the size effect. This paper aims to contribute this debate.

Size was first shown to be related to excess returns by Banz (1981) and confirmed in a subsequent study by Reinganum (1983). Keim (1983) , also documented a strong relation between January returns and firm size concluding that a significant portion of the abnormal returns reported by Banz (1981) occurs in trading days in January.

Zarowin(1990) examines the subsequent stock returns performance of a firm that have experienced extreme earnings years and finds that while the poorest earners outperform the best earners by a statistically significant amount over the subsequent 36 months, the poorest earner also are significantly smaller than the best earners at the time of portfolio formation. When the poorest earners are matched with the best earners of equal size, there is virtually no evidence of differential stock return

performance, indicating that the market does not overreact to extreme earning news, and suggesting that size discrepancies between winners and losers may be responsible for the apparent overreaction phenomenon.

Dissanaike G. (2002) investigated as to whether there was a similar winner-loser anomaly among FT500 companies in the UK and found evidence consistent with stock price reversals, even after bid-ask biases, metric related issues, look-ahead and survivorship biases. He dismissed the possibility that the winner-loser effect could be 'subsumed' by size effect (as argued by Zarowin, 1990, p. 124) on the grounds that his study was restricted to large FT500 companies, companies with which one would not usually associate the small firm anomaly.

However, efficient markets have been investigated widely in recent years. Researchers have focused on whether these markets are informational efficient or whether anomalies exist. Dibartolomeo (1999) indicates that the Kuala Lumpur stock markets are inefficient. Coleman (1995) examines 20 emerging markets in Latin America, Asia, Middle East, Europe and Africa. He finds that returns in these emerging markets are more predictive than returns in developed markets and returns are influenced by local rather than global information.

The existence of the above anomalies has serious implications for the efficient market hypothesis. A capital market is said to be efficient if it fully and correctly reflects all relevant information in determining security prices. Thus it is impossible to acquire economic profits by trading on the basis of such information. This is implied because people are assumed to be rational. An indication of abnormally high profits attracts investors and increases the demand for that security. In turn, the price for that stock will increase eliminating excess profits. Since the size of a company in public information, buying stocks on the basis of firm size should not lead to higher returns. Yet, the Studies done by Banz (1981), Reinganum (1983), Zarowin (1990) and Fama and French (1992) indicates that one can design profitable trading strategies based on size.

This paper seeks and aims to study the small firm effect that has been documented in many stock exchanges in the developed market, but has not been studied in a thin and emerging market like Kenya.

Subsumed.

1.2 STATEMENT OF THE PROBLEM

The central question posed in this paper is,"Do the anomaly of size effects influence the behavior of stock returns on NSE?"

The study of the small size anomaly has been one of the areas that have attracted a lot of research for more than twenty years. Nevertheless, there has been no study conducted on the anomaly in Kenya, which is an emerging and thin market.

Therefore, the aim of this study is to find out whether Kenyan stock returns exhibit the " the size effect" that have been studied in the developed markets.

1.3 OBJECTIVE OF THE STUDY

The objective of the study is to determine whether firm size influences returns on investment portfolios in Nairobi Stock Exchange.

1.4 IMPORTANCE OF THE STUDY

Little is known about the relationship between the company size and the stock return, especially by Kenyan investors, scholars and public in general. It is therefore important to carry out the study to promote awareness and knowledge of the effect of size of company on the Stock returns in an emerging and thin economy like Kenya. The study would be of interest to the following groups of people,

1. **Investors**
   A rational investor generally considers various parameters before making any investment decision. After the study, the investor would be interested in performance of company returns in relation to its size.
2. **Brokers and agents**
   The study is useful within Brokers and agents organizations for fundamental research and analysis. This analysis will assist them in making informal decisions and in giving advise to their clients about investments.
3. **Corporations**
   In Kenya, some corporations invest excess funds in various ways. One of the prominent ways to invest available funds in Kenya is through the purchase of stocks. Therefore it would be of noble value if the corporations utilize the information from this study to gauge avenues for investments.
4. **The Government**
   Understanding of the relationship between Company's size and the stock return will influence government decisions regarding making economic policies like monetary and fiscal policies.
5. **Security Analysts**
   The study will help security analysts to realize the importance of the information that can be released to the user or investor.
6. **Scholars**
   The study will act as an important catalyst to explore and study the area further. This is particularly so because the study is suitable for further research. It would also facilitate the conduct of other studies that requires the results of their study on their information.

7. **Management**

   Management is responsible for the day to day running of the company. The action of management may be affected either positively or negatively by the company size on the company's returns. Hence the need for the management to get and understand the findings of the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 SIZE AS A MEASURE OF SUCCESS

Generally, existing and potential investors regard size as a measure of success, but when it comes to managed funds, the larger the amount, the harder it is for a manager to out perform his/her benchmark.

Over the past few decades financial economists have identified investment styles that can be associated with high and low stock returns. One style is company size. It turns out that the returns of small company stocks are larger than those of large company stocks. Most investors guess that the glamour stocks have higher returns than those of the doggy companies. But the empirical literature shows otherwise "Good companies have quite often lousy stocks and lousy companies are most often good stocks." The widely accepted capital asset pricing model (henceforth CAPM) developed by Sharpe(1964), Mossin(1966) and, Linter(1965) postulates a simple linear relationship between a stock's expected return and its risk.

However, recent evidence has shown that other factors have a consistent and significant effect on common stock return. Basu (1977) finds that price-earnings ratios and risk adjusted returns are related. A study performed by Litzenberger and Ramaswamy (1979) shows a significant positive relationship between yield and returns on common stock. One of the most discussed relationships, and the main focus of this study, is the one between a company's size and the return on its stock. This anomaly, now known, as the size effect has been the focus of recent studies conducted. However, Fama and French (1992) as well as Kalra and chan (1996) performed the seminal work performed by Banz in 1981. His findings show that the size of a firm and the return on its common stock are inversely related. While Banz's findings were shown to be accurate and his models appear to address the possible econometric problems involved, he cannot offer a theoretical foundation for this relationship. Therefore, Banz suggests that size may be a proxy for other factors that were not tested but are correlated to size.

Fama and French (1992) were not the first to adduce evidence of the book to market effect. Banz (1981) was amongst the first to document the size effect when he found that smaller firms had higher risk adjusted returns on the NYSE, providing evidence inconsistent with the CAPM. Keim (1983) showed the size effect was largely attributable to the month of January. Basu (1983) found that as well as the size effect, shares with

high earnings to price (E/P) ratios, on average, gave higher risk adjusted returns than those with low E/P 4 ratios.

DeBondt and Thaler (1985) used empirical studies to show the size effect as a market overreaction whereby past losers outperform past winners. The pricing anomaly that is shown by the size effect and E/P ratios did not go unchallenged. Annaert and Combez (2002) showed that by altering the way in which beta was calculated, firm size became a proxy for the true beta, eliminating the anomaly. Boudreaux (1995) used estimates of risk to show that the size effect was a result of the high risk associated with small firms. Inspite of this earlier evidence, it was Fama and French (1992) who provided the evidence that seriously undermined the CAPM within academic circles. Until their study was published the evidence was sufficiently contradictory that the arguments on size and earning per share were largely unresolved. They found that size and book to market captured all the cross sectional variation in return associated with beta, size, leverage, book to market equity and earning per share ratios, and that after allowing for the variation of beta associated with firm size it had no explanatory power. That is not to say that the book to market effect is totally accepted, but the controversy still exists although the evidence is now far more complete.

2.2 EXPLAINING STOCK RETURNS

Theoretical Backgrounds

Our objective in summarizing this survey is to provide an overview of the work that has been done in an important area of financial markets research which explaining the behavior of common stock returns. We have tried to make this survey as complete as possible, without getting bogged down in a lot of technical details. Since this area of research has been very active for the past several years, describing all of the work that has been done is not feasible. However, it is worthwhile to mention about the following:

1. Markowitz Portfolio Selection

Any discussion of the theory of stock price behavior has to start with Markowitz (1952). The Markowitz model is a single-period model, where an investor forms a portfolio at the beginning of the period. The investor's objective is to maximize the portfolio's expected return, subject to an acceptable level of risk or minimize risk and also subject to an acceptable level of expected return. The assumption of a single time period, coupled with assumptions about the investor's attitude toward risk, allows risk to be measured by the variance or standard deviation of the portfolio's return.

As securities are added to a portfolio, the expected return and standard deviation change in very specific ways, based on the way in which the added securities co-vary with the other securities in the portfolio.

2. Capital Asset Pricing Model

Building on the Markowitz framework, Sharpe (1964), Lintner (1965) and Mossin (1966) independently developed what has come to be known as the Capital Asset Pricing Model (CAPM). This model assumes that investors use the logic of Markowitz in forming portfolios. It further assumes that there is an asset, which is the risk-free asset that has a certain return. So, all investors combine the market portfolio and the risk-free asset, and the only risk that investors are paid for bearing is the risk associated with the market portfolio.

This leads to the CAPM equation:

$$E(Rj) = Rf + \beta j[E(Rm) - Rf]\ E(Rj)$$

Where,

E(Rm) : the expected returns to asset j and the market portfolio,

Rf : the risk free rate,

Bj : beta coefficient for asset j.

The beta coefficient measures the tendency of asset j to co-vary with the market portfolio. It represents the part of the asset's risk that cannot be diversified away, and this is the risk that investors are compensated for bearing. The CAPM equation says that the expected return of any risky asset is a linear function of its tendency to co-vary with the market portfolio. So, if the CAPM is an accurate description of the way assets are priced, this positive linear relation should be observed when average portfolio returns are compared to portfolio betas. Further, when beta is included as an explanatory variable, no other variable should be able to explain cross-sectional differences in average returns. While the CAPM is a simple model that is based on sound reasoning, some of the assumptions that underlie the model are unrealistic.

3. Arbitrage Pricing Theory (APT).

Unlike the CAPM, which is a model of financial market equilibrium, the APT starts with the premise that arbitrage opportunities should not be present in efficient financial markets. This assumption is much less restrictive than those required to derive the CAPM. The APT starts by

assuming that there are "n" factors, which cause asset returns to systematically deviate from their expected values. The theory does not specify how large the number "n" is, nor does it identify the factors. It simply assumes that these n factors cause returns to vary together. There may be other, firm-specific reasons for returns to differ from their expected values, but these firm-specific deviations are not related across stocks. Since the firm-specific deviations are not related to one another, all return variation not related to the "n" common factors can be diversified away. Based on these assumptions, Roll (1976) shows that, in order to prevent arbitrage, an asset's expected return must be a linear function of its sensitivity to the "n" common factors:

$$E(Rj) = Rf + \beta jk\lambda k + \beta j2\lambda 2 + \ldots + \beta jn\lambda n$$

E(Rj) and **Rf** are defined as before.

Bjk : coefficient represents the sensitivity of asset j to risk factor k,

λk : represents the risk premium for factor k.

As with the CAPM, we have an expression for expected return that is a linear function of the asset's sensitivity to systematic risk. Under the assumptions of APT, there are "n" sources of systematic risk, where there is only one in a CAPM world.

4. Earnings / Price ratios (E/P)

One of the early studies that contradicted the predictions of the CAPM was Basu (1977). Using a sample period that stretched from April 1957 to March 1971, Basu showed those stocks with high earnings/price ratios (or low P/E ratios) earned significantly higher returns than stocks with low earnings/price ratios. His results indicated that differences in beta could not explain these return differences. In a follow-up study, Basu (1983) showed that this "E/P effect" is not just observed among small cap stocks. A later study Keim (1983) confirmed this finding and also showed that the E/P effect does not just appear in the month of January, as had been claimed by some researchers. The E/P effect is a direct contradiction of the CAPM; beta should be all that matters.

5. Firm Size

Banz (1981) uncovered another apparent contradiction of the CAPM by showing that the stocks of firms with low market capitalization have higher average returns than large cap stocks. Other researchers, Basu (1983)

showed that the size effect is distinct from the E/P effect discussed above. Small firms tend to have higher returns, even after controlling for E/P. Proponents of the CAPM are quick to point out that small firms tend to have higher betas than large firms, so we would expect to see higher average returns for small firms. However, the beta differences are not large enough to explain the observed return differences. Once again, the CAPM predictions are violated.

6. Long-term Return Reversals

DeBondt and Thaler (1985) identify "losers" as stocks that have had poor returns over the past three to five years. "Winners" are those stocks that had high returns over a similar period. The main result of DeBondt and Thaler is that losers have much higher average returns than winners over the next three to five years. Chopra, Lakonishok and Ritter (1992) show that beta cannot account for this difference in average returns. This tendency of returns to reverse over long horizons (i.e., losers become winners) is yet another contradiction of the CAPM. Losers would have to have much higher betas than winners in order to justify the return difference. Chopra, Lakonishok and Ritter(1992) show that the beta difference required to save the CAPM is not there.

7. Book-to-Market Equity

Rosenberg, Reid and Lanstein (1985) provide yet another piece of evidence against the CAPM by showing that stocks with high ratios of book value of common equity to market value of common equity, also known as book-to-market equity, or BtM have significantly higher returns than stocks with low BtM. Since the sample period for this study is fairly short (1973-1984), the empirical results did not receive as much attention as some of the other studies discussed above. However, when Chan, Hamao and Lakonishok (1991) found similar results in the Japanese market, BtM began to receive serious attention as a variable that could produce dispersion in average returns. Studies on Leverage by Bhandari (1988) finds that firms with high leverage (high debt/equity ratios) have higher average returns than firms with low leverage for the 1948-1979 period. This result persists after size and beta are included as explanatory variables. High leverage increases the riskiness of a firm's equity, but this increased risk should be reflected in a higher beta coefficient. Consequently, Bhandari's results are yet another deviation from the CAPM predictions.

8. Stocks return and short-term momentum

Jegadeesh (1990) found that stock returns tend to exhibit short-term momentum; stocks that have done well over the previous few months continue to have high returns over the next month. In contrast, stocks that have had low returns in recent months tend to continue the poor performance for another month. A study by Jegadeesh and Titman (1993) would later confirm these results, showing that the momentum lasts for more than just one month. Their study also indicates that the momentum is stronger for firms that have had poor recent performance. The tendency of recent good performance to continue is weaker. Note that the pattern here is the opposite of that found in the long-term overreaction papers. In those studies, long-term losers outperform long-term winners. In the momentum studies, short-term winners outperform short-term losers. The studies discussed in this section cast doubt on the ability of the CAPM to explain equilibrium relationships in the financial markets. These other variables should not be able to explain average returns better than beta. Stocks with high E/P, high Book to Market, high leverage, etc. should not outperform other stocks to the extent that they have. To make matters worse, Reinganum (1983) shows that the positive relation between beta and return that was observed in earlier studies has weakened in more recent years. In spite of all this negative evidence, the CAPM was still the default view for most financial economists and practitioners going into the 1990s.

2.3 THE WORKS OF FAMA AND FRENCH IN EXPLAINING STOCK RETURNS

In 1992, an influential paper was published that pulled together much of the earlier empirical work. Fama and French (1992) brought together size, leverage, Earning price, Book to market, and beta in a single cross-sectional study. Their results were controversial. First, they showed that the previously documented positive relation between beta and average return was an artifact of the negative correlation between firm size and beta. When this correlation is accounted for, the relation between beta and return disappears. The positive relation between return and beta is highly linear, as predicted by the CAPM. Based on this evidence, it appears that the CAPM nicely explains the higher returns that small firms have earned.. This result contradicts the central prediction of the single-period CAPM. Given that beta does a poor job of explaining average returns, what variables can do a better job? This is the second main point of the Fama and French study. They compared the explanatory power of size, leverage, Earning/Price, Book to market, and beta in cross-sectional

regressions that spanned the 1963-1990 period. Their results indicate that Book to Market and sizes are the variables that have the strongest relation to returns. The explanatory power of the other variables vanishes when these two variables are included in the regressions. The cross-section of average stock returns can be nicely described by two variables. The Fama and French (1992) results dealt a severe blow to the view that the single-period CAPM is the way securities are actually priced. The model that has been taught more than any other in business school doesn't seem to work. Whenever a well-established paradigm is questioned, the reaction will be swift and often aggressive. It is no different in the world of academic finance. This is a good thing, as long as the reaction is honest and straightforward. Well established prior beliefs should not be abandoned unless the contrary evidence is rigorously analyzed and found to be valid.

The give and take that followed Fama and French (1992) represents one of the more interesting strands of the academic finance literature. Many a graduate student found a dissertation topic buried in this debate. One of the nice aspects of this area of inquiry was the fact that most of the important questions could be answered, if the researcher could find the necessary data. The papers that were written in response to the criticisms of Fama and French (1992) have impacted both the practice of finance and the theoretical study of financial economics. Seldom has an area of academic inquiry had so much real-world application. One of the early responses to the criticisms of Fama and French (1992) was Davis (1994), who constructed a database of book values for large US industrial firms for the 1940-1963 period, a period for which the Compustat coverage is either poor or nonexistent. This database was constructed to be free of survivorship bias, and it covers a period that precedes the period studied by Fama and French. If the Fama and French results are a result of data mining, this independent time period should produce different results. A spurious relation in one period is not likely to carry over to a different period. Also, the beta coefficients in this study were estimated using annual returns to address one of Kothari, Shanken and Sloan's (1995) main criticisms. The results of Davis (1994) generally confirmed those of Fama and French (1992).

The explanatory power of BtM was observed in the 1940-1963 period, although the magnitude of the return dispersion was somewhat smaller. This is probably caused by the fact that the database for the pre-Compustat period contains only large firms. In addition, the relation between beta and average return was flat. Betas based on annual returns could not improve the CAPM's performance during the 1940-1963 period. Chan, Hamo and Lakonishok (1995) provided further evidence that the Fama and French (1992) results were not due to survivorship bias. Examining the 1968-1991 period, they found that, when firms on CRSP

and Compustat were properly matched, there were not enough firms missing from Compustat to have a significant effect on the Fama/French results. They also formed a dataset of large firms for this period that is free of survivorship bias. Using this dataset, they found a reliable BtM effect. Barber and Lyon (1997) presented a clever way to address the issue of data mining. Noting that empirical results that are caused by data mining should not carry over to other independent samples, they formed a sample of financial firms for the 1973-1994 period and found a reliable BtM effect among these firms. Since financial firms were purposely excluded from the Fama and French sample, the results of Barber and Lyon provide independent evidence of the explanatory power of BtM. Because of their controversial nature, the results of Fama and French (1992) were subjected to a high degree of scrutiny. Based on the papers that supported the Fama and French results, most researchers reached the conclusion that the size and book-to-market effects are real, since they have been observed over several decades in the US, and in other countries as well. The next topic to be debated is why do we have why do we have the size effect? The issue is no longer whether size and BtM are able to produce cross-sectional dispersion in average returns, but why. The two primary explanations are risk and inefficiency. The risk-based story starts with Fama and French (1998), who show that factors related to size and BtM are able to explain a significant amount of the common variation in stock returns. For the 1963-1991 period, they run three-factor regressions.

Fama and French (1998) provide support for the risk hypothesis by showing that there are size and value factors in earnings as well as returns. This suggests that systematic variation in firms' cash flow streams may be associated with systematic variation in stock returns. Also, Fama and French (1998) show that the three-factor model can explain most of the departures from the CAPM predictions discussed in the recent financial literature. However, the three-factor model could not explain the short-term momentum in stock prices. The ability of the three-factor model to explain most of the observed cross-sectional empirical results support a multi-factor risk model of expected returns. Still, it is not clear why the three-factor model cannot explain momentum. Daniel and Titman (1997) doubt the risk-based explanation. They contend that it is characteristics and not covariance that produces return dispersion. For example, the risk-based story says that high BtM stocks have high average returns because they are sensitive to common variation in stock returns. In contrast, Daniel and Titman argue that high BtM stocks have high returns due to some other reason (possibly overreaction), so that the high returns have nothing to do with systematic risk. In their opinion, it is the characteristic of high BtM rather than the covariance that is associated with high returns. The cross-sectional correlation between BtM and size sensitivity is quite high,

so it is difficult to see which of these variables has more explanatory power for returns. Nevertheless, Daniel and Titman provide results suggesting that the characteristics-based story is more plausible for the 1973-1993 period. However, Davis, Fama and French (2000) show that the Daniel and Titman results are confined to their relatively short sample period. When the longer 1929-1997 period is examined, covariance shows more explanatory power than characteristics. It is not clear why the shorter period produces different results, but the longer period should produce more reliable results, and these results favor the risk-based story.

2.4 RECENT DEVELOPMENTS IN EXPLAINING STOCK RETURNS BEHAVIOUR

The research into stock price behavior and asset pricing continues, and a number of interesting results have surfaced recently. Perez-Quiros and Timmermann (2000) provide evidence that small firms have high average returns because they are more affected by tight credit market conditions. Small firms do not have the same access to both domestic and international bond markets that are enjoyed by large firms. Since the availability of credit is tied to economic conditions, so that a credit contraction typically occurs near a recession, small firms would be very sensitive to systematic variation in credit market conditions. Thus, the high returns to small firms might be compensation for the high sensitivity to a credit-related risk factor. A study by Elton, Gruber, Agrawal and Mann (2001) reports a potentially important link between the equity and fixed income markets. If certain risk factors are pervasive enough to explain common variation in stock returns, it is reasonable to expect that these same risk factors would be at work in the bond market as well. Their research isolates the portion of a bond's return that is due to changing risk premiums, and they show that this part of the bond's return is strongly related to capitalization of small cap stocks. Not only does this result support the risk-based story, but it also suggests some interesting avenues for future research in fixed income portfolio management. In an interesting recent study, Lettau and Ludvigson (2001) show that a consumption-oriented capital asset pricing model (CCAPM) that allows expected returns to vary over time provides a nice cross-sectional explanation of equity returns. They use the ratio of aggregate consumption to wealth as a "conditioning variable" to model the evolution of expected returns over time. The relation between the consumption/wealth ratio and expected returns is straightforward. If investors expect returns to be high in the future, they would be more likely to raise their consumption level relative to their level of wealth. So, an increase in the consumption/wealth ratio would signal high expected returns. Lettau and Ludvigson also find that

the variation in returns that is picked up by the Fama and French three-factor model appears to be related to the changing risk premium from the consumption-oriented capital asset pricing model (CCAPM).

2.5 BOOK-TO-MARKET RATIO WITH RETURN OF SHARES

The high return of shares with a high book to market ratio, or the value premium as it has come to be called, has been explained in various ways. The first of these is that the value premium is due to data mining and that the results are unlikely to be consistently found when tested outside the original sample.

Basu (1997), Bloom and Milkov (1998) and Tauchen (1985) favour this explanation. This explanation is now largely rejected as a large number out of sample tests have reproduced the earlier results in a variety of markets, and time periods, for example Schuhz,(1985) and Marroney (1999) and Fama and French (1998). In addition to accusations of data mining, it has been suggested that survival bias is the cause of the book to market effect.

2.6 RELATIONSHIP BETWEEN RETURN AND MARKET VALUE OF COMMON STOCK

Gordon's dividend-capitalization model showed that, the market value of a share is equal to the present value of an infinite stream of dividends to be received by shareholders. This theory asserts that a firm's size has no effect on its market value or its cost of capital.

A study by Banz (1981) and Reinganum (1983) showed that, despite a large and growing literature review directed at providing explanations for the apparently negative relationship between stock returns and firm size, a general theory which endogenises the small firm effect into a model of asset pricing has remained elusive. Yet, a consequence of not being able to precisely define a required rate of return for small firms is that it creates uncertainties in relation to the interpretation of results of event studies where the sample includes significant proportions of small firms. Conversely, event studies with small firms and large firms as part of their sample can provide an opportunity to further articulate the circumstances under which the size anomaly operates and how it relates to stock returns. While empirical research has proceeded to independently investigate the separate effects of small firms and large firms on shareholders returns, no research to date has been done to investigate these issues concurrently.
The liquidity should impact upon the returns to the target firm. Shareholders following evidence to suggest that the size of company and the returns to shareholders are positively related.

2.7 THE CROSS-SECTION OF STOCK RETURNS: EVIDENCE FROM EMERGING MARKETS

Several factors besides market risk including firm size, earnings-price ratio, and turnover are significant in explaining a cross-section of stock returns in emerging markets. The signs for some factors are contrary to those documented in U.S. and Japanese markets.

Cross-sectional tests of asset returns have a long tradition in finance. The often-used capital asset pricing model (CAPM) and the arbitrage pricing theory both imply cross-sectional relationships between individual asset returns and other factors, and tests of those models have done much to increase understanding of how markets price risk. But much about the way assets are priced remains unclear. After much testing, numerous empirical anomalies about the CAPM cast doubt on the central hypothesis of that theory, that on a cross-sectional basis a positive relationship exists between asset returns and assets' relative riskiness as measured by their beta being the ratio of the covariance of an asset's return with the market return to the variance of the market return.

As tenuous as the relationship between beta and returns may be, other risk factors apparently influence developed market's equity market returns and more significantly market capitalization (or size), earnings-price ratios, and book-to-market value of equity ratios. Once these factors are included as explanatory variables in the cross-sectional model, the relationship between beta and returns disappears. A lot of international empirical work on this area of study has focused on more developed markets, especially Japan, USA and the United Kingdom, with some evidence from other European markets as well. The international evidence largely confirms the hypothesis that other factors besides beta are important in explaining asset returns.

Some scholars have conducted studies in emerging markets and which have shown empirical evidence on the nature of asset returns. They have found that, in addition to beta, size and trading volume having significant explanatory power in a number of these markets. Dividend yield and earnings-price ratio are also important, but in slightly fewer markets. For several of the markets studied, the relationships between all four of these variables and returns is contrary to the relationships documented for USA and Japanese markets. In several countries, exchange-rate risk is a significant factor. With independent new empirical evidence introduced into the asset-pricing debate, future research must now cope with the idea that any theory hoping to explain asset pricing in all markets must explain how factors can be priced differently simply, by crossing an international border. The big question is that, is it market microstructure that causes these substantial differences Or perhaps, are the regulatory and tax

regimes force investors to behave differently in various countries? As a final hypothesis, can any of these results be attributed to the segmentation or increasing integration of financial markets?

2.8 RISK AND SIZE

The value premium is actually a premium for risk. Certainly, there seems to be a general agreement that at least part of the premium is due to risk, especially that associated with size. This is the explanation favoured by Fama and French (1992) who argued that the value premium is a compensation for risk in a multifactor model such as proposed in the arbitrage pricing theory.

Zarowin .P. (1990), in his empirical studies concluded that losers superior performance over winners during the 3- years test period is due not to investor's overreaction but to size discrepancies between winners and losers since losers tend to be smaller than winners without controlling for size, losers significantly outperform winners and neither differences in risk (beta) nor in January returns can account for this result. When losers and winners of comparable size are matched, there is evidence of differential performance only in January when 3-year losers are smaller than winners, losers out perform winners, when 3-year winners are smaller than losers, winners outperform losers.

Basu (1983) attempts to explain the size effect from the perspective of a discounted cash-flow model. If the investor value stocks as the discounted present value of future earnings, the size effect could be the result of investors having different expectations of future earnings of small companies, or they could be using higher discount rates in computing the present value. He studied several metrics of firm size, in addition to capitalizing, such as measures of sales, assets and number of employees. Only the results for the market capitalization show some differences in returns between large and small firms.

Basu (1983) concluded that investors apply a different discount rate when valuing small stocks. While the other measures would tend to impact on the expectations of future earnings and a discount rate difference would be evidenced by a direct relationship with the firm value.

2.9 STOCK RETURNS

The amount of return that an investor expects from a share or security influences his investment decisions. A rational investor aims at maximizing returns from his investment. Such returns appear in the form of capital gains and dividends during the period the investor plans to hold the investment.

Company returns are influenced by several factors such as the level of economic activity, governments fiscal and taxation policies, management policies, stock market conditions and company size. Internally, firms can also influence the stock return through their policies on production methods, mode of long term financing and the dividend policy. The conventional calculation of a stock's returns considers the stock prices and dividends. Hence, the higher the dividends, the higher will be stock returns, *ceteris paribus*. Management can increase the stock return by raising the dividend payout ratio.

Company returns are also influenced by the size of the company. It is common knowledge that stock market prices fluctuate from time to time as evidenced in the stock reports in the media. This study focuses on one of the important effect of company size on the company return. The financial base in particular total assets determine the company size.

2.10 COMMON VALUATION MEASURES OF STOCK RETURNS

1. Earning Per Share (EPS)

EPS is probably one of the most known indicator.
EPS is defined as:
EPS = Net Income divided by the Number of common shares outstanding.
EPS is directly constructed out of the balance sheet figures published by the company.

2. P/E = Stock Price/ Earning per share

Basically, the P/E gives an idea of the numbers of years the company needs to work to generate the price paid for the company (under the assumption that the incomes don't fluctuate). Because the incomes are not always the same from one year to the other, expected PE for the X coming years are computed and published by the analysts.
Companies with high P/E are considered as recognized by the market for their future profitable growth (and of course a low P/E indicates the opposite).

But what is a high or a low P/E ratio? This question can be answered in many ways. One of the frequently used methods is to compare the P/E ratio of the stock with the one of the entire market or the industry. But, if the overall market's PE is overvalued, it will be misleading to compare the stock P/E and the Market's P/E.

3. Return on Equity ROE(ROE)

Return on equity encompasses the three main "lever" by which management can poke and prod the corporation profitability, asset management and financial leverage. By perceiving return on as a composite that represents the executive teams' ability to balance these pillars of corporate management, investors cannot only get an excellent sense of whether they will receive a decent return on equity but also assess management's ability to get the job done.

ROE is basically calculated by taking a year's worth earnings and then divide by the average shareholder's equity for that year.

4. Stock price appreciation as a measure of return

Alternatively, **Total return** is defined as stock price appreciation (capital gains) plus dividend yield (dividend income), both adjusted for number of shares outstanding, where t indexes time and there is no index for firms: Total return is measured before tax, information costs , and transactions costs.

$$R_t = (P_t N_t + D_t N_t - P_{t-1} N_{t-1}) / P_{t-1} N_{t-1}$$

Where,

D_t : Dividends per share at time '*t*'

N_t : Number of shares outstanding at time '*t*'

P_t : Share price at time '*t*'

R_t : Total return at time '*t*'

P_{t-1} : Closing price per share of security I at the end of the week

N_{t-1} : Number of shares outstanding at time '***t-1***'

2.11 COMPANY SIZE

Size is determined as the Market value of a firms ordinary Equity calculated at the of end of the financial year .The number of shares and market price of each share are obtained from Nairobi Stock Exchange files. If a price is not available at the end of the financial year when it is needed for calculating size in forming portfolios, the most recent price will be used in this study.

Basu (1977 p. 667) cited volume of activity as one of the determinants of returns. Consequently it is reasonable to expect that the bigger the company the larger will be the returns. On the other hand, however, there are several grounds to expect an inverse relationship between size and returns.

For the purposes of this study the market value valuation method will be determined by using the company's size. Jordan (1991) observes that though the share prices form a trend over a given period of time, it may not be possible to precisely determine the time a change will occur in the trend.

The published History of the "size effect" as it appears in academic journals can be seen as the most researched area in the last twenty years. Instead of raising concern in the direction of protecting the investing public and their own retirement accounts, academicians are primarily responsible for the origination and maintenance of this research.
The size of a firm as measured by the market value of its common stock equity has been observed to have a significant inverse relationship with stock returns in capital asset pricing models that are specified to explain total return. The market value of equity, sometimes referred to as firm "size", is defined as "share price times number of common stock shares outstanding ".

2.12 COMPANY SIZE VALUATION METHODS

Common measures of size includes:

1. Capitalization of income valuation

This method places no value on fixed assets such as equipment, and takes into account a greater number of intangibles. This valuation method is best used for non-asset intensive businesses like service companies.

2. Book to Market (B/M) Ratio

Market ratios have long been used as indirect measures of value. Among them are **Book/market** (B/M), **Earnings/price**, **Cash flow/price** and **Sales/price**. These ratios have been shown to be significant predictors of future returns in the empirical literature.

3. Book Value.

Total assets minus total liabilities. This method however, ignores the future return the assets can produce and is calculated using accounting practice that does not reflect how much the business is worth to someone who may buy it as a going concern.

4. Market Value.

For quoted companies only, the Market value is derived by multiplying the quoted share price of the company by the number of issued shares. This valuation reflects the price that the market at a point in time is prepared to pay for the shares. It is therefore influenced by the condition of the stock market, the concerns and opportunities that are seen for the company in the sector or market in which it operates. Also the investor's view of the ability of management to deliver a return on the capital he or she is using. It may be anticipated that some synergies can be obtained through acquisition, but is likely to have less of a grasp to the potential buyer from the same industry. For companies not listed on stock markets there is

obviously no group of investors setting a value on the business on a day to day basis.

2.13 MODERN FINANCE THEORY ON STOCK RETURNS

Modern finance theory started from portfolio theory, which predict how individual investors allocate their assets by balancing the risk and return trade based on this theory, Sharpe (1964), Mossin (1966) and Lintner (1965) developed the so called capitalization Asset Prizing Model (CAPM). For the first time their theory clearly prescribes that it is the individual stocks movements with the overall markets that determine stocks' expected returns (thus the stock prices). In other words, it is the systematic risk that matters in asset pricing. The (CAPM) has been under intensive scrutiny since its birth.

Early empirical studies generally failed to reject the model. In the recent years, one of the most influential papers by Fama and French (1992) questioned the cross-sectional predictability of the (CAPM). Despite the heated debate, the (CAPM) still receives wide attention especially from the practitioners at the same time, for good or bad, we have at least learned that there might be multiple factors in determining the asset returns.

2.14 THE SMALL FIRM EFFECT PHENOMENON

The small firm effect is a phenomenon where small firms have higher returns on average than large firms. Such an anomaly would affect the pricing of capital assets. Researchers gave different explanations to answer size anomaly. The literature can be divided broadly into three categories:

1.Seasonality in Stock Returns
2.Information content of the stocks traded
3.Firm characteristic

1. Seasonality in Stock Returns:

Kiem (1983) has shown that half of the small firms' effect occurs in January. The reasoning given by Kiem (1983) is that the investors sell securities at the end of the year to establish short-term tax losses for tax purposes. In January, stocks go back to their equilibrium and these results in creating larger returns. Roll (1987) and Reinganum (1983) tested this hypothesis and found that the January effect can't be fully explained by tax-loss selling. Zirney and Thompson (1987) were able to fully explain the January portion of the small firm effect with the stocks relative price ratio defined as the ratio of the current stock price to the average of the highest and lowest prices over some holding period. However, they were unable to explain the small firm effect for the remaining eleven months of the year.

2. Information Content of the Stock Traded:

Banz (1981) argued that the lack of information about small firms could cause certain investors to exclude them from their portfolio. This would then lead to higher risk adjusted returns for the undesirable small firms. Reinganum (1983) argued that the risk due to lack of information could only be firm-specific (unsystematic) risk. If a sufficiently large number of securities are held, this risk can be diversified away and thus the unsystematic risk need not be included while pricing the assets.

3. Firm Characteristic:

After identifying the importance of size as a factor for pricing an asset in Fama and French (1995) extended their work to find relationship between size and firm earnings. They found that small firm effect is prevalent and small firms have stronger earnings than larger firms.

2.15 ECONOMIC EXPLANATION FOR THE SIZE EFFECT

1. Tax Effects

Keim (1983) found that a large part of the differential risk-adjusted returns to small firms stocks occurs in the first week of January. A natural hypothesis to consider is that some investors sell securities at the end of the calendar year to establish short-term capital losses for income tax purposes. If this "selling pressure" depresses stock prices prior to the end of the year, the increase in prices during the first week of the subsequent year superficially seems reasonable.

4. Transaction Costs

Schuhz (1985) examine the magnitude of transaction costs for stocks of firms in different size categories. He noted that small firms' stocks tend to have lower prices and higher bid– ask spreads, so transaction costs are relatively high for these stocks. Adding together estimates of the bid-ask spread and the commission rate, round-trip transaction costs average 6 to 8 percent for the smallest deciles of firms and 2 to 7 percent for the largest deciles of firms.

2.16 COMMONALITY IN THE DETERMINANTS OF EXPECTED STOCK RETURNS

Evidence is presented that the determinants of the cross-section of expected stock returns are stable in their identity and influence from period to period and from country to country. The determinants are related to risk, liquidity, price-level, growth potential, and stock price history. Evidence is mounting that relative stock returns can be predictable

with factors that are inconsistent with the accepted paradigms of Modern Finance. DeBondt and Thaler (1985), Chopra, Lakonishok and Ritter (1992), and Jegadeesh (1990) show that the return history of a stock contains useful information in predicting relative returns. In addition, Fama and French (1992) and Davis (1994) show that future returns can be predicted by the relative sizes of:

- the current market price of a stock and
- the current values of accounting numbers such as book value or earnings-per-share.

The reaction to this evidence has been strong; three interpretations have been offered to explain the results.

- Some believe that the evidence is flawed and results, at least in part, from bias. Kothari, Shanken, and Sloan (1995), and Ross (1976) cite survival bias as a problem that can exaggerate predictive power. Black (1993), suggest that the results can be the result of snooping the data in some fashion prior to testing.

- Others take the view that, while success in prediction may be exaggerated to some degree by the influence of various biases, the fundamental nature of the results still stands, and it deserves the close attention of the field. We can divide those who take this position into two groups. One group believes that the differences are related to relative risk, while the other attributes them to bias in pricing by the market. Those in the first group believe that the differentials in expected stock returns are expected and required by investors. (See Fama and French, 1992, Kothari and Shanken 1995.) They believe that the differentials are risk premiums. While they argue that the nature of the risk premiums seem inconsistent with the predictions of the Capital Asset Pricing Model, they claim that they may be consistent with other, multi-factor models. Thus, while this group believes that the new results can lead to a rejection of the CAPM, in their view the efficient markets theory remains intact.

  The second group, on the other hand, believes that the differentials in predicted returns come as a surprise to investors. (See Chopra, Lakonishok and Ritter (1992) .The differential returns are said to derive from market over or under reactions to various events. Distortions in the patterns of realized returns, caused by bias in the pricing of stocks, can mask the true nature of the relation between expected return and risk, whatever its nature. This group sees the results as a major setback for the efficient markets hypothesis.

2.17 JANUARY EFFECT AND SIZE EFFECT

Financial market anomalies have been extensively studied and publicized. Yet, there still exist many seemingly predictable patterns in the markets. The January effect refers to the phenomenon that small stocks tend to yield unusually high returns in the first few days of January. Researchers have long noticed the January effect on stock returns. The study by Banz (1981), Fama and French (1992) show that the previous findings on the size effect are not robust across sub-periods. The findings are that the size effect is largely driven by the January effect on all markets and the size effect on the various stock exchanges.

Why do we observe the January effect? Many possible explanations have been proposed. One of the more plausible explanations of the January effect is the capital gains taxes hypothesis. Capital gains taxes create incentives to realize capital losses and defer capital gains and thus generate trading at year-end as investors try to sell "losers" (stocks whose prices have decreased). This implies a negative correlation between sales volume and past returns at year-end.

2.18 BACKGROUND OVERVIEW OF NAIROBI STOCK EXCHANGE

The Nairobi Stock Exchange (NSE) in Kenya is small and somewhat speculative. The exchange was established in 1954. The exchange is sub-Saharan Africa's fourth largest. Twenty brokers (1995) are licensed to operate, and there are over 53 companies listed, with a total capitalization of approximately $ 1.9 billion. The NSE's market capitalization jumped from $ 1.7 billion at the end of 1996 to $ 2.24 billion at end May 1997. The NSE turnover in 1996 was $ 75 billion through trade of 114 million shares.

In Kenya, dealing in shares and stock started in 1920s when the country was still a British colony. There was, however, no formal market, nor rules or regulations to govern stock broking activities. Trading took place on gentleman's agreement, in which standard commissions were charged with clients being obligated to honour their contractual commitments of making good delivery and settling relevant costs.

The Nairobi Stock Exchange has experienced lacklustre performance over its entire existence since it was founded in 1954. Over the years the number of stocks traded have stagnated around 53 qouted companies. There are several impediments to the growth of the Nairobi Stock Exchange. Ordinarily one would expect to find a significant degree of correlation between economic growth and the growth of the stock exchange. A recent study on the operation of NSE (1999) reviewed that economic growth averages 3.8 percent in the period 1985-1996, while the growth of stock exchange averaged 0.6% percent as measured by the number of quoted companies. The study indicated that, general lack of

awareness and information on the role functions and operations of the stock exchange are some of the impediments to growth. If the stock exchange is to be enhanced as a vehicle for mobilizing capital for development, then all players in the scene must change their approaches. The Stock Exchange must play an increasingly educational role and the Capital Market Authority as the regulatory agency must alter its approach from the heavy-handed type of control to a more pro-active, creative and supportive role in order to assist in the creation of a more vibrant and forward looking capital market environment.

As a capital market institution, the Stock Exchange plays an important role in the process of economic development. It helps to mobilize domestic savings thereby bringing about the reallocation of financial resources from dormant to active agents. Long-term investments are made liquid, as the transfer of securities between shareholders is facilitated. The Exchange has also enabled companies to engage local participation in their equity, thereby giving Kenyans a chance to own shares. Companies can also raise extra finance, which is essential for expansion and development. To raise funds, a new issuer publishes a prospectus, which gives all pertinent particulars about the operations and future prospects and states the price of the issue. A stock market also enhances the inflow of international capital. They can also be useful tools for privatization programmes. The Nairobi Stock Exchange is at present made up of eighteen stock broking firms all based in Nairobi. These members of the Nairobi Stock Exchange transact business mainly on the Nairobi market, with a limited proportion of business conducted in foreign securities through overseas agents. The stockbrokers act as financial advisers to their clients and also carry out their orders. The Nairobi Stock Exchange deals in both variable income securities and fixed income securities. Variable income securities are the ordinary shares, which have no fixed rate of dividend payable, as the dividend is dependent upon both the profitability of the company and what the board of directors decides. The fixed income securities include Treasury and Corporate Bonds, preference shares, debenture stocks these have a fixed rate of interest and dividend which is not dependent on profitability.

CHAPTER THREE
3.0 RESEARCH METHODOLOGY

3.1 POPULATION

Included in our sample will be all equity stocks listed and traded on the NSE for the period from January 1 1991 to December 31 2002 and for whom data is available on NSE files and tapes. Effort will be made to fill any gaps in data at the NSE secretariat by resorting to press reports of activity at the stock exchange. Where it is not possible to fill any gaps firms with missing data will be excluded without causing any survivorship bias resulting.

3.2 DATA SPECIFICATION

Stock prices of Data from 1991 January to December 2002 will be used for this study.

- **Size** is defined as the Market value of firms ordinary equity calculated as at December 31st of the previous year i.e. Year t-1 .The Outstanding number of shares for each company and their market price will be obtained from the Nairobi stock exchange (NSE). Therefore company size will be determined as:

= **Market value of quoted shares * Number of outstanding Shares.**
As at year ***t-1***

- **Stock Returns** can be defined as the returns on stock prices adjusted for dividends, stock splits and bonus issues.

3.3 METHOD OF STUDY AND DATA ANALYSIS

The data will be processed and analyzed as follows:

1. First weekly raw returns for the seven years period (Jan 1 1991 to 31 December 2002) are calculated for all the selected stocks in our sample.

The raw returns will be calculated using the following relationship;

$$R_{it} = (P_{it} + D_{it} - P_{it-1})/P_{it-1}$$

Where:

R_{it} = Rate of return of security *i* in week *t*

D_{it} = Cash dividends paid per share of security *i* in week *t*

P_{it-1} = Closing price per share of security *i* at end of week *t-1* adjusted for stock splits and stock dividends.

P_{it} = Closing price per share of security *i* at end of week *t*.

Where

R_{cit} = the week **t** return for the control portfolio to which firm **i** belongs

n = number of firms forming the Control portfolio (CP).

2. The **CAPM** developed by Sharpe (1964), Mossin (1966) and Lintner (1965) and the efficient markets hypothesis postulates a simple linear relationship between a security's expected return and its risk. Thus, the 'small firm effect' would be an anomaly only if one would find a relationship between a company's size and the return on its stock after controlling risk (see Banz 1981, Zarowin 1990 and Fama and French 1992). The risk is controlled in this study by forming control portfolios (CP) as follows:

Beginning December 31st 1996 and continuing for each successive non-overlapping three year periods through December 31 2000 control portfolio's are formed of the sampled security by regressing each security's weekly raw returns on the weekly NSE 20 index, for the three years prior to each control portfolio formulation dates. This enables us to estimate the market betas for each security. This is in line with the methodology used by Maroney and Aris (1999) and, Leong .K. and Zaima .J. (1991) who assumed the single index CAPM describes the security expected returns.

The securities are then ranked and divided into five groups according to the betas as estimated in order that equally weighted control portfolios weekly returns for each of the groups may be calculated for the three years subsequent to control portfolio formation i. e for :–

Jan1st 1994 to December 31st 1996
Jan1st 1997 to December 31st 1999
Jan1st 1998 to December 31st 2002

3. An excess return is next calculated for each week for all individual firms for nine years beginning Jan 1 1994 to Dec 31 2002 using:

$$ER_{it} = R_{it} - R_{cit}$$

Where:

$\mathbf{ER_{it}}$ = the excess return in week *t* for firm *i*
$\mathbf{R_{it}}$ = the week *t* raw return for firm *i*
$\mathbf{R_{cit}}$ = the week *t* return for the control portfolio to which firm **I** belongs
n = number of firms forming the Control portfolio (CP)

This procedure thus groups securities of similar beta risk and defines excess returns as returns above the average return of securities in the same risk class.

4. Next excess return portfolio is created based on market value. The market value (MV) of firms for each 3 year non-overlapping successive periods are arrived at by multiplying the year end (Formation date) price of the securities and the shares of each security outstanding. At each portfolio formation date the firms are divided into five equally weighted portfolios where the First portfolio **(**P1**)** contains firms with smallest MV and the Fifth portfolio P5 contains the firms with the largest MV. This process of portfolio formation based on the size of the firms will be carried out on December 31st 1993, December 31st 1997 and December 31st 1999.

5. For each of the three years subsequent to portfolio formations annual average excess returns (AER) and cumulative annual average excess returns (CAER) are calculated for each one of the five portfolios (based on size) to test for the small firm effect.

6. In order to empirically analyze the data, the annual average excess returns (AAER) for all portfolio at the end of each of the three post portfolio formation date years are calculated and displayed in a table. The largest MV portfolio returns will be compared with the smallest MV portfolio return, to test the hypothesis that there is no difference in returns based on size.

CHAPTER FOUR

4.0 DATA ANALYSIS AND FINDINGS

4.1 DATA ANALYSIS

The period of study had been suggested to cover the period between 1991 and 2002. However the data between 1991 and 1995 was not available. Therefore, we used the available data between 1996 and 2002 and the years prior to 1996 were excluded from this study.
The securities are then ranked and divided into five groups according to the betas as estimated in order that equally weighted control portfolios weekly returns for each of the groups may be calculated for the three years subsequent to control portfolio formation i. e for –

Jan 1st 1997 – December 31st 1999
Jan 1st 1998 – December 31st 2002

The data sample for the years between 1996 to 2002 are obtained from Nairobi Stock Exchange. The weekly share prices are obtained from the daily files in NSE and the year outstanding shares are from the financial statements of the companies included in this research.

This research depicts a richer data source because it includes all quoted companies in the NSE as at 1996, and also outstanding shares of each company that are not available in the NSE for some firms are dropped from the sample if more than one month of quotes could not be found in either the NSE files or the daily newspaper. This resulted in final samples of 40 companies in all the seven years under evaluation. The numbers of shares outstanding for the firms are found in NSE and financial statement of the companies firm under review.

A major concern in the Kenyan market is that dividend, announcement, stock splits and reverse split of information could not be obtained for all companies and therefore some companies were excluded without causing any survivorship bias.

To create the sample of the NSE stocks, initially all firms listed in NSE, as at 1996 were included. Firms that were missing in 1996 were either subsequently merged or delisted from NSE and subsequently were excluded. The sample selection provided only 40 firms.
Weekly raw returns were calculated for all the companies that qualified for this study.

Further so as to form the control portfolio at the two successive periods as described above the weekly raw returns of the year 1996 were regressed to arrive at the market beta used to form control portfolio

between 1997 and 1999. Also, the weekly raw returns of 1999 were regressed to determine the market beta for the formation of the control portfolio for the years between 2000 and 2002.

4.2 EMPIRICAL RESULTS

COMPARISON OF THE MARKET VALUE AND EXCESS RETURNS

First, to test the objective of this study, the data is constructed in the same way as described by Dissanaike .G (2002) p.140.

The study therefore begins on 1st January 1996, and is based on 40 companies, which are quoted on NSE. On each portfolio formation date, we considered only those stocks, which were members of the NSE and had complete information, which was necessary for this study. The weekly raw average excess returns and the market values were computed using the weekly prices of the stocks and the outstanding shares on each portfolio formation date.

A three-year interval was used to measure, rank and test for the small firm effect and this resulted in two test periods, i.e. 1997 to 1999 and 2000 to 2002.

Table 1:
Shows the average market excess returns for the portfolios formed on the basis of Market value of the firms.

Average excess returns evaluation after 12 , 24 and 36 months

Months after Portfolio Formation

Portfolio		12	24	36
Small	PI	0.071	0.015	0.072
P2		0.052	0.001	0.039
P3		0.001	0.028	0.062
P4		0.059	0.023	0.005
Large	P5	0.039	0.029	0.031

From this analysis, there was some size effect after twelve months. The smaller portfolios performed better than the larger portfolios.

Then after 24 months the larger portfolio performed better than smaller portfolios.

Then the trend reversed again after 36 months, where the smaller portfolios performed better than larger portfolios.

Although the results suggested that, the small firm effect is exhibited in the Nairobi stock exchange more research should be done in this area to find out whether size acts as a proxy of other parameters that can explain the cross-sectional difference in the stock returns.

NB

- Portfolios were formed annually beginning 1ST January in 1997.

- For purposes of comparison with the Second test period, we only included the 40 companies that qualified to have complete set of returns for all the periods under consideration.

The analysis also depicts that, the small firm's (**P1**) somehow, but not absolutely perform better than large firm **(P5**). This actually suggests that there exist the small firm effect in the Kenyan stocks. In the developed market like USA, the size effect is strongly depicted, unlike in an emerging market like Kenya where the results from this empirical studies shows that the size effect is weakly exhibited in the Nairobi Stock Exchange.

4.3 ALTERNATIVE WAY OF DATA ANAYSIS

Leong .K. and Zaima .J. (1991) adapted this method and we thought that, it could also be used in this analysis to examine whether the size effect is exhibited in Nairobi stock exchange.

Table 2

The table provides a profile of weekly raw return for each year. To create the sample data, weekly raw returns are calculated for the stocks included in this study. Deciles are calculated by ranking raw returns in ascending year. Decile **0** is the smallest raw return for the firms, decile **1** is the tenth percentile raw return, decile **2** is the twentieth percentile raw return and so on, for the other deciles up to **10^{th}** decile which is the top most.

The first column shows the years and the other columns represent the decile distribution. The rows represent the weekly averages of the raw returns (see Kenneth and Janis (1991).

TABLE 2

4.4 NAIROBI STOCKS WEEKLY RAW DISTRIBUTION (in percentage)

Decile	0	1	2	3	4	5	6	7	8	9	10
Year											
1996	2.003	0.194	0.153	0.015	0	0	0	0.004	0.146	0.189	2.117
1997	4.314	0.14	0.139	0.0010	0	0	0	0.023	0.142	0.79	2.003
1998	2.413	0.122	0.119	0.0222	0	0	0	0.005	0.114	0.899	1.923
1999	2.417	0.109	0.099	0.0223	0	0	0	0.002	0.135	0.934	1.008
2000	2.004	0.139	0.1023	0.0551	0	0	0	0.045	0.129	0.87	1.662
2001	2.126	0.118	0.1023	0.0879	0	0	0	0.002	0.118	0.968	1.114
2002	1.916	0.173	0.1043	0.0254	0	0	0	0.005	0.15	0.96	1.72

The table shows that weekly raw return seems to be symmetrically distributed around zero. The lower deciles show negative returns and the upper deciles shows positive returns.

The Returns range as follows from:

YEARS	HIGHEST (%)	LOWEST (%)
1996	2.0035	2.117
1997	4.4314	2.003
1998	2.413	1.923
1999	2.4177	1.008
2000	2.0044	1.662
2001	2.126	1.114
2002	1.916	1.719

The method of this study is similar to, the method used by Leong .K. and Zaima .J. in their journal entitled Further evidence of the small firm effect. They both generated weekly raw returns and the annual average excess returns from which they based their conclusion.

A notable observation is that Twenty percent (20%) to Forty (40%) of the weekly raw return is zero for each year.
This could actually imply that, there was trading which the financial analyst have attributed to be caused by the macro and micro- economic factors that could have discouraged investments in capital market hence causing the unpredictable results. Also, this could imply thin trading which researchers have attributed as the cause of model mis-specification thereby leading to the anomalous result of this study.

4.5 ANNUAL AVERAGE EXCESS RETURN

Next, the annual cummulative average excess return and annual average excess return are computed to examine and compare the excess returns and the average market values. This is still in agreement with the method used by Kenneth and Janis.
Apparently, our study is based on the Nairobi Stock Exchange operations, which is an environment where a thin and emerging market prevails. Only the firms quoted at NSE are considered.

Further the results on **Table 3** and **Table 4**, displays the Annual average excess return (AER) and Average market value (MVA). The smallest Market Value (MV) portfolio is represented (P1) and the largest portfolio is represented by (P5)

The Table shows the Annual Average Excess return as follows:

1997: 3.212%
1998: 4.02%
1999: 2.58%
2000: 3.242%
2001: 3.44%
2002: 2.71%

The annual average ranges between **2.71%** in **2002** to **4.02%** in **1998.**

Table 3

Annual Average Excess Returns (ER) and Market Value Average (MV)

	1997		1998		1999		2000		2001		2002	
	AMV	AER	AMV	AER	AMV	AER	AMV	AER	AMV	AER	AMV	AER
P1	1.662	.113	2.88	.11	2.8	.019	2.87	.029	2.877	.189	2.87	.125
P2	8.317	.047	12.4	.043	13.2	.064	13.3	.056	13.24	.048	13.11	.0114
P3	23.044	.03	30.6	.03	31.6	.029	33.8	.041	33.63	.025	32.4	.095
P4	48.044	.114	79.2	.014	79.9	.012	80.1	.0012	79.3	.031	81.03	.062
P5	192.56	.045	196	.031	168	.029	160	.032	161	.026	159	.033
AER		**.032**		**.042**		**.025**		**.032**		**.034**		**.027**

NB

Where: **AMV** -- Average market value in millions of Ksh
AER – Average excess return in percentages

A comparison of the Excess Return and market value provides some unique results. When only excess results are considered the smallest portfolio (**PI**) does weakly outperform the largest portfolio (**P5**) in all the years under consideration. The existent of the small firm effect is shown slightly in 1997, 1998 and 2001. The basis of this study is that, the "small firm" effect would be an anomaly only if one would find a relationship between a company's size and the return on its stock control after controlling risk. The result are consistent with the small firm effect and it appears small firm effect does prevail on Nairobi stock exchange (**NSE**).

In our opinion, the result are consistent with the small firm effect and actually it appears that the size of the company has a negative relationship with the stock returns and this reflects a clear indication of the size effect in Nairobi stock exchange. This is in agreement with the

findings of the work of Banz (1981) and Fama & French (1992). In our view, in a thin and emerging market like Kenya size effect is not the only factor that can explain the cross-sectional differences in the stock returns. This shows that the pattern of the excess returns distribution can be explained by other factors other than size, bordering, the macro and micro economic factors and to some extent the political environment.

While using the quoted companies in our portfolios, the result can be explained that small firms (PI) perform better than large firms. It is also evident that the infrequent trading does not carry any information in explaining the small firm effect. However the descriptive statistics as shown in **Table 4** suggests that on average the mean, standard deviation and skewness of the small companies are higher than large companies. The result however supports the prevalence of size effect on Kenyan stocks but further research should be done in this area.

Table 4: shows the descriptive statistics of the annual average excess returns for the small and large firms for the years between 1997 and 2002.

The Table further explores the reasons behind superior performance of small firm. The table represents the statistical distribution of small and large companies. However, the descriptive statistic suggests that on average the mean, standard deviations of the small companies are higher than large companies.

Descriptive statistics showing the distribution of the average excess returns

Companies with small market value

	1997	1998	1999	2000	2001	2002
Mean	0.112	0.0465	0.0616	0.037	0.0136	0.161
S.E	1.14	1.82	1.24	0.93	0.67	0.78
Median	0.07	0	0.312	0	1.94	0
Mode	0	0	0	0	0	0
S.d	19.8	31.5	21.5	16	11.6	13.6

Companies with large market value

	1997	1998	1999	2000	2001	2002
Mean	0.0808	0.04	0.05	0.035	0.0211	0.37
S.E	1.03	1.07	.84	0.55	0.52	0.73
Median	0.344	0.7	0.269	0.118	2.16	0.3
Mode	0	0	0	0	0	0
S.d	17.9	29.5	14.5	9.48	8.93	12.7

CHAPTER FIVE

5.0 CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

5.1 CONCLUSION

The aim of this research was to evaluate the stock return on NSE investment strategies on size. This topic has been widely researched on, in the developed world.

In this study the risk is controlled by forming control portfolios (CP), beginning December 1996 and continuing for each non overlapping three year periods through December 1999, where control portfolios are formed by regressing each security's weekly raw returns on the NSE 20 index. The aim of this was to estimate the market beta. The security were then ranked and divided into five groups according to the betas as estimated in order that equally weighted control port folios for each group may be calculated. The results from table two are consistent with Banz (1981) findings. The company sizes somehow show some weak relationship with the excess returns. The fact that Banz (1981) research used a different measure of firm size seems to have made a little difference. On the contrary (P1), have positive and consistent excess returns in our control portfolio.

The reason could be that these small companies in Kenya are more concerned with building equity and gaining greater market share. As a result their earnings are distributed in all most even manner. A small company is more likely to reinvest its earning back into the company. This caused the retained earnings to grow faster and increase the value of common stock.

On the other hand large companies (P5) are more likely to use their earnings in ways that, generally do not increase the value of their common stocks. Since large companies retain their earning the small firms common stocks may return less excess returns. The Kenyan market has provided a unique environment where corporate accounting standards are evasive and the markets are speculative. Indeed, the cross-sectional evidence shows that size can be used in explaining the difference in Kenyan equity returns. Therefore, the size effect continues to be depicted weakly on the Kenyan stocks. This is actually one possibility supported by the concrete data and empirical analysis in this study.

5.2 LIMITATIONS

Data mining

The method we used in data mining shows that, a few variables are bound to show a statistical relation to returns, just by chance.

If an academic paper is judged by the amount of discussion that it generates, then Fama and French (1992) and our paper have unparalleled success. As Black and Fischer (1993), suggested that the Fama and French results were likely an artifact of data mining it is highly likely that our results are also an artifact of data mining. Hundreds of researchers, in an attempt to write publishable papers, spend a great deal of time looking for relationships between stock returns and other variables. Only the successful tests are submitted for publication; the unsuccessful ones never see the light of day. Since Fama and French chose their explanatory variables based on the results of earlier empirical studies, the observed explanatory power of the variables in our research could be due to massive data mining. We also suggested that, since the relations between returns and size, were likely an artifact of data mining, they would disappear if another time period or another data source were analyzed. MacKinlay (1995) also mentions data mining as a potential cause of the observed results.

Survivorship Bias

It is a well-known fact that the Nairobi stock database suffers from a survivorship bias, due to the way daily stock prices records of quoted firms are added to the database. Since the firms that are added to the database during a given year are firms that still exist, the back filling of historical data for the previous several years biases the database toward firms that survived through those years. The firms that died during those years, and that were not already in the database, are never included. This "ex post selection bias" can have a significant effect on cross-sectional studies of stock returns. Kothari, Shanken and Sloan claim that the observed explanatory power of Company size, Book to market and stock returns is likely due to survivorship bias. Since many of the firms that are excluded from our sample are firms that failed, it is likely that these firms had did not show any possible size effect.

Beta Estimation

The other main limitation in our study could be the same criticism that was directed to Fama and French (1992) by Kothari, Shanken and Sloan (1995) which is related to the estimation of beta. In our research beta coefficients were estimated with monthly returns and we found that they are not the same as betas estimated with annual returns. Since they are different, the

results of empirical studies will depend upon which beta estimation convention is used. Kothari, Shanken and Sloan argue that annual betas are more appropriate than monthly betas, since the investment horizon for a typical investor is probably closer to a year than a month. They show that the relation between beta and return is stronger when betas are estimated using annual returns.

However, the most likely justification to the findings in this study is that several other contributing factors can explain the behaviour of the excess return distribution. We have found that there is a negative relationship between the company size and the stock returns. The relationship is weaker and therefore it is consistent with the other findings from previous research work on similar study in the developed world, where the size effect strongly prevails.

Like many emerging markets, the Kenyan market also suffers from unsatisfactory corporate governance, dubious accounting practice, market manipulation and insider trading problems. Not only that there lacks strong institutional investors, but most investors have traded speculatively with very short holding periods. It shows that majority of the Kenyan investors are interested in short-term gains and ignored long-term objectives based on future profitability of a firm. Further, when the majority of the investors are playing for short-term gains, not only security price may be distorted but also the benefit of long-term investment is limited. However, from the average trading volume and the participation rate in the Nairobi Stock Exchange, there are other factors that determine the equity returns.

Several reasons can be advanced to support the findings in our research. These are:

- There has always been evidence to suggest that the size effect might not be that strong in Kenya. The reason behind this is that, majority of the Kenyan investors are not rational. They prefer shedding off excess liquidity to a popular and large investment portfolio.

- The sample used in this study has been subjected to survivorship bias as explained earlier. The sample selection is biased on the companies that have complete information necessary for the study.

- Kenyan market is a thin and emerging market implying that the market forces are yet to form and establish themselves. Besides, since 1963 there has been immense political interference on the local investment. Some of the best companies have been enjoying supreme political patronage.

Nevertheless, if the anomaly of size effect is an indication of stock market overreaction, then our findings are somehow consistent with the other

findings from previous research work on similar study in the developed world.

5.2 RECOMMENDATIONS

In summary, in this study there is no theoretical foundation to explain our findings. A possible explanation of the Table 1,2,3 and Table 4 findings could be based on a model by Leong K. and Zaima .J, (1991), where they found that if insufficient information is available about a portfolio of securities, investors will not hold these securities because of estimation of risk. If investors differ in the amount of information available, they will definitely limit their diversification to different subset of all securities in the market.

The existent of size effect in the Kenyan market is depicted weakly, unlike in the developed markets like USA and Japan. Until further research is done the findings of our research should be interpreted with caution. The preceding discussion suggest that the major questions on this study are left unanswered. Further, research should actually consider the relationship between size and other factors such as the dividend yield effect and earnings per share in order to explain the cross-sectional differences in the stock returns in Kenya. In particular it can be interesting to know whether there is absolute size effect and how it compares to those mature markets such as USA and Japan. Other studies on earning price and book-to-market ratios should be done to provide further understanding on the factors that can explain the behaviour of the stock returns in Kenya.

APPENDIX

LIST OF SAMPLE COMPANIES

Agricultural

1) Brook Bond
2) Eaagads
3) George Williamson
4) Kakuzi (Tea and Coffee)
5) Kapchorua Tea
6) Limuru Tea
7) Ol Pejeta
8) REA vipingo
9) Sasini Tea and Coffee
10) Theta Group

Commercial

11) A. Baumann
12) Car & General
13) CMC Holdings
14) Express Kenya
15) Hutchings Biemer
16) Kenya Airways
17) Lonrho Motors
18) Marshalls
19) Nation Media Group
20) Pearl Dry cleaners
21) Tourism P.S. (Serena)
22) Standard Newspaper
23) Uchumi Supermarkets

Financial

24) Barclays Bank
25) City Trust
26) CFC Bank
27) Diamond Trust Bank
28) I.C.D.C Investment
29) Housing Finance Co.
30) Jubilee Insurance
31) Kenya Comm. Bank
32) National Bank
33) NIC Bank
34) Pan Africa Insurance
35) Standard Chartered Bank

Industrial

36) Athi River Mining
37) B.A.T. Kenya
38) Bamburi Cement
39) BOC Kenya
40) Carbacid Investments
41) Crown Berger
42) Dunlop Kenya
43) E.A cables
44) E.A packaging
45) E.A Portland
46) Firestone E.A
47) E.A Breweries
48) Kenya National Mills
49) Kenya Oil
50) Kenya Orchards
51) Kenya Power and Lighting
52) Total Kenya
53) Unga Group

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SCHEDULE 1

NSE Weekly Average Market Return for the years between 1996 to 2002:

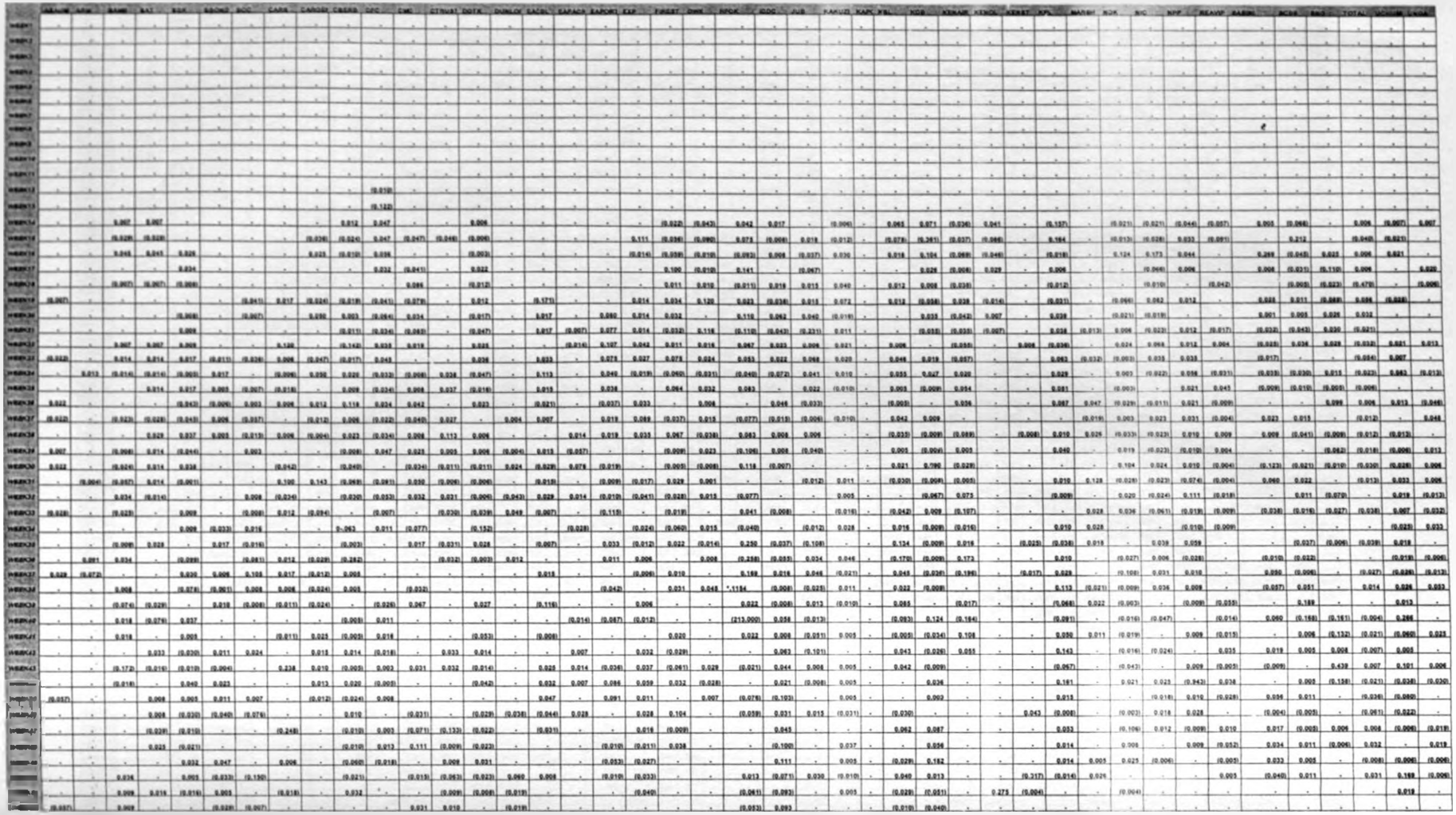
WEEK NUMBER	1996	1997	1998	1999	2000	2001	2002
1	1.2353	0.936	1.2576	1.279	0.113	0.699	0.236
2	1.5537	0.566	1.576	-0.926	-0.288	-0.003	0.414
3	1.1307	0.104	1.153	-0.533	-0.039	-0.0077	-0.499
4	-0.2505	-0.79	-0.2282	-0.151	0.009	-0.198	0.305
5	-0.2429	-0.123	-0.2206	-0.676	-0.456	0.091	-0.231
6	-0.582	0.545	-0.5597	-0.244	-0.007	-0.421	-0.528
7	0.2682	-1.671	0.2905	-1.582	0.041	0.069	-0.01
8	-.07463	1.118	-0.05233	1.5	0.586	0.676	-0.11
9	0.2499	0.196	0.2722	-0.371	-0.265	-0.155	-1.552
10	-0.4779	-2.93	-0.4556	-0.012	-0.626	-0.922	-0.894
11	0.2928	-0.247	0.3151	-0.422	-0.076	0.145	-0.292
12	-6676.022	0.019	-6676	-0.203	-0.093	-0.168	-0.123
13	-0.0638	-0.544	-0.0415	-0.296	0.561	-0.344	-0.882
14	-0.904	0.246	-0.8817	-0.206	-0.515	-0.176	-0.322
15	-0.5164	-0.127	-0.4941	-0.269	0.6655	-0.449	-0.83
16	0.2455	0.496	0.2678	-0.134	-1.712	-0.38	0.242
17	0.141	-1.545	0.1633	0.516	0.043	-0.522	0.799
18	-0.3537	0.639	-0.3314	-0.326	0.0537	0.001	-0.395
19	-0.5136	0.545	-0.4913	0.277	0.495	-721	-0.308
20	0.30705	-1.287	0.4982	-0.308	0.555	-0.588	-0.233
21	0.14965	0.176	0.2907	-0.105	-1.255	0.153	-0.111
22	-0.06665	1.22	0.7186	1.1	-0.5213	0.408	0.1
23	0.07975	-0.478	0.5612	-0.321	0.14539	0.211	0.246
24	-1.80795	-0.153	0.3449	0.202	0.12905	-0.511	0.0505
25	-0.16095	-0.185	0.4913	0.128	-0.3935	-0.005	0.0667
26	0.14545	0.523	-1.3964	0.308	-20143	0.089	0.439
27	-0.30465	1.436	0.2506	-0.81	-0.1744	0	1.34
28	-0.49435	-1.03	0.557	-0.308	-0.77467	0.612	-0.236
29	0.30655	-0.119	0.1069	-0.479	0.23876	0.261	0.779
30	0.42745	-1.03	-0.0828	-0.376	0.24751	0.261	0.158
31	0.05505	0.56	0.7181	-0.437	-0.00432	0.337	-0.287
32	-0.49925	0.793	0.839	-0.611	0.03842	0.565	-0.564
33	0.15355	0.42	0.4666	-0.323	-1.1738	1	-0.198
34	0.92045	0.077	-0.0877	-0.32	0.11986	0.334	0.166
35	-0.32155	-0.384	0.5651	-0.078	0.4721	0.118	0.382
36	-0.56855	0.314	1 332	-1.199	0.17451	-0.218	0.159
37	0.04445	0.246	0.09	0.349	-0.39856	-0.572	-0.101
38	-1.25155	-0.181	-0.157	-0.461	0.22471	-0.029	-0.119
39	-0.43755	-0.164	0.456	-0.184	0.8007	-0.352	-1.03
40	-2.85655	0.587	-0.84	0.779	-0.52608	-0 231	0.56
41	-2.28655	0.367	-0.026	0.158	-0.38629	-0.008	0.793
42	0.13345	0.314	-2.445	-0.287	-0.84782	0.016	0.42
43	-0.23955	0.246	-1.875	-0.564	-0.0593	-0.305	0.077
44	-0.12955	0.077	0.545	-0.198	0.27302	-0.221	-0.384
45	0.01345	-1.869	0.172	0.166	3.818	-1.148	0.314
46	0.379	0.164	0.282	0.382	1.9958	0.047	0.246
47	0.595	0.844	0.425	0.159	0.80914	0.71	-0.181
48	0.372	0.587	1.127	-0.101	-0.6921	0.722	-0.164
49	0.112	-0.485	1.23	-0.029	-0.47536	0.368	0.587
50	0.184	0.357	0.285	-0.28	1.58	0.124	0.367
51	-0.067	-0.292	0.128	0.019	-2.4624	0.066	0.314
52	0.232	-0.075	0.641	0.176	-0.3926	0.132	0.587

SCHEDULE 2

The schedule shows outstanding shares as at 31st December of the years under review

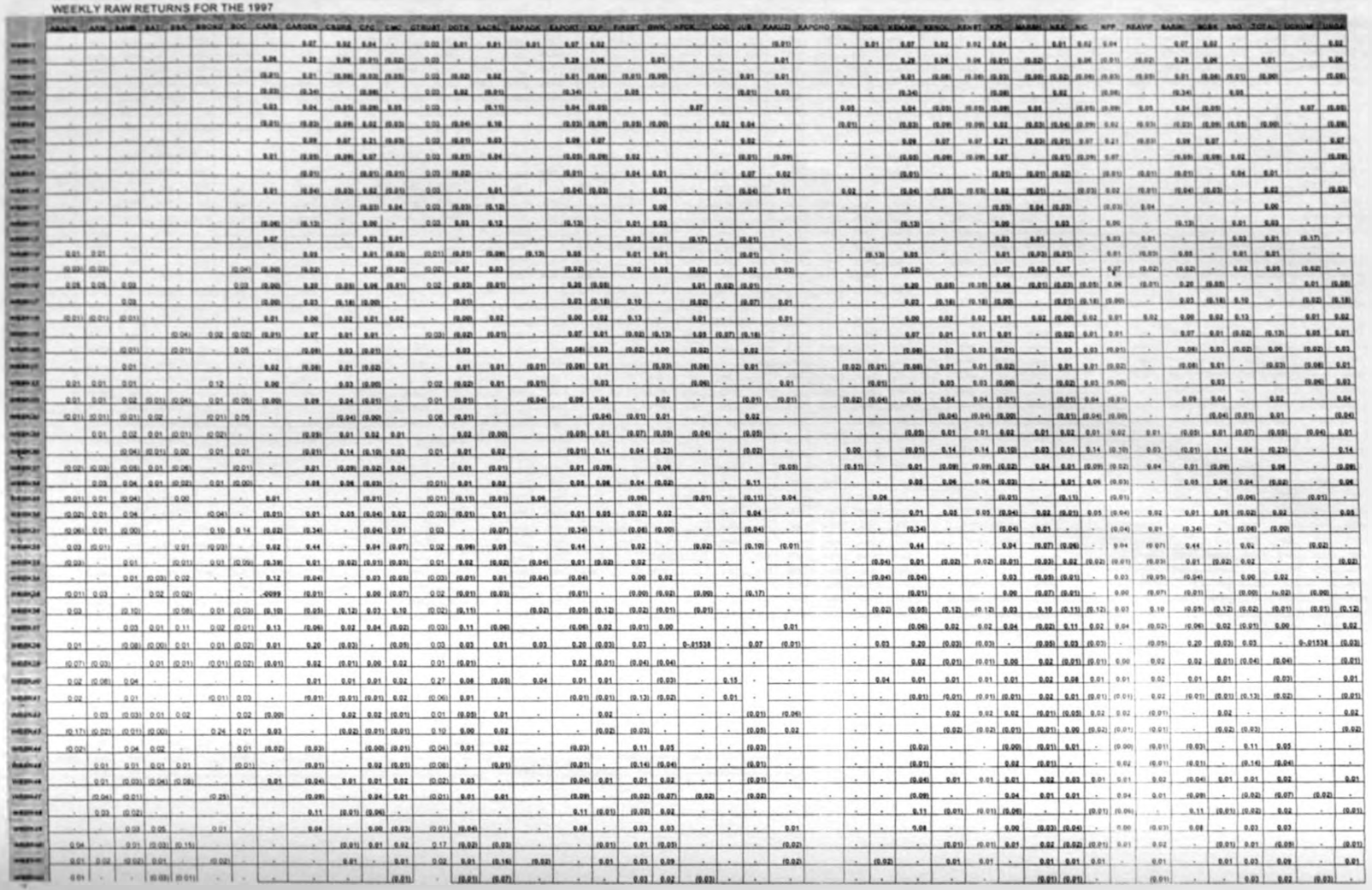
COMPANY NAME	1996	1997	1998	1999	2000	2001	2002
BROOK BOND	48,875,000	48,875,000	48,875,000	48,875,000	48,875,000	48,875,000	48,875,000
EAAGADS	6,431,400	6,431,400	6,431,400	6,431,400	6,431,400	6,431,400	6,431,400
GEORGE WILLIAMSON	8,756,320	8,756,320	8,756,320	8,756,320	8,756,320	8,756,320	8,756,320
KAKUZI	19,599,999	19,599,999	19,599,999	19,599,999	19,599,999	19,599,999	19,599,999
KAPCHORUA	3,912,000	3,912,000	3,912,000	3,912,000	3,912,000	3,912,000	3,912,000
LIMURU TEA	200,000	200,000	200,000	200,000	200,000	200,000	200,000
OL PEJETA	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
REA VIPINGO	55,772,688	55,772,688	60,000,000	60,000,000	60,000,000	55,772,688	55,772,688
SASINI TEA	25,339,500	25,339,500	38,009,250	38,009,250	38,009,250	38,009,250	38,009,250
THETA GROUP	1,927,900	1,927,900	1,927,900	1,927,900	1,927,900	1,927,900	1,927,900
A. BAUMAN	2,560,044	2,560,044	3,480,066	3,480,066	3,480,066	3,480,066	3,480,066
CAR & GENERAL	22,279,616	22,279,616	22,279,616	22,279,616	22,279,616	22,279,616	22,279,616
CMC HOLDINGS	20,254,196	20,254,196	24,279,616	20,254,196	20,254,196	20,254,196	20,254,196
EXPRESS KENYA	4,800,000	4,800,000	4,800,000	4,800,000	4,800,000	4,800,000	4,800,000
HUTCHINGS BIEMER	360,000	360,000	360,000	360,000	360,000	360,000	360,000
KENYA AIRWAYS	461,615,484	461,615,484	461,615,484	46,161,548	46,161,548	46,161,548	46,161,548
LONRHO MOTORS	21,253,692	21,253,692	21,253,692	21,253,692	21,253,692	21,253,692	21,253,692
MARSHALLS	9,595,404	9,595,404	14,393,106	14,393,106	14,393,106	14,393,106	14,393,106
NATION GROUP	35,652,630	35,652,630	35,652,630	35,652,630	35,652,630	35,652,630	35,652,630
PEARLCLEANERS	1,597,962	1,597,962	1,597,962	1,597,962	1,597,962	1,597,962	1,597,962
TOURISM P. S	38,679,000	38,679,000	38,679,000	38,679,000	38,679,000	38,679,000	38,679,000
STANDARD NEWSPAPER	12,811,859	12,811,859	12,811,859	12,811,859	12,811,859	12,811,859	12,811,859
UCHUMI SUPERMARKETS	40,000,000	40,000,000	60,000,000	60,000,000	60,000,000	60,000,000	60,000,000
BARCLAYS BANK	128,587,500	128,587,500	154,305,000	154,305,000	154,305,000	154,305,000	154,305,000
CITY TRUST	4,166,046	4,166,046	4,166,046	4,166,046	4,166,046	4,166,046	4,166,046
CFC BANK	100,000,000	100,000,000	120,000,000	120,000,000	120,000,000	120,000,000	120,000,000
DIAMOND TRUST BANK	79,500,000	79,500,000	79,500,000	79,500,000	79,500,000	79,500,000	79,500,000
ICDC INVESTMENTS	22,621,136	22,621,136	28,258,429	37,677,905	38,363,958	46,031,291	59,980,016
HOUSING FINANCE CO.	92,000,000	92,000,000	115,000,000	115,000,000	115,000,000	115,000,000	115,000,000
JUBILEE INSURANCE	25,000,000	25,000,000	36,000,000	36,000,000	36,000,000	36,000,000	36,000,000
KENYA COMMERCIAL BANK	112,200,000	112,200,000	112,200,000	112,200,000	112,200,000	112,200,000	112,200,000
NATIONAL BANK	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000
NIC BANK	43,945,313	43,945,313	65,931,725	82,414,551	82,414,551	82,414,551	82,414,551
PAN AFRICAN INSURANCE	10,000,000	10,000,000	13,000,000	24,000,000	48,000,000	48,000,000	48,000,000
STANDARD CHARTERED BANK	164,829,100	164,829,100	164,829,100	247,243,000	164,829,100	164,829,100	164,829,100
ARTI RIVER MINING	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000
B.AT KENYA	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000	75,000,000
BAMBURI CEMENT	161,292,700	161,292,700	362,931,725	362,940,725	362,959,025	362,959,025	362,959,025
BOC KENYA	16,161,000	16,161,000	19,525,446	19,525,446	19,525,446	19,525,446	19,525,446
CARBACID INVESTMENTS	5,899,352	5,899,352	9,438,963	9,438,963	9,438,963	11,326,755	11,326,755
CROWN BERGER	21,570,000	21,570,000	21,570,000	21,570,000	21,570,000	21,570,000	21,570,000
DUNLOP KENYA	400,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
EAST AFRICAN CABLES	16,200,000	16,200,000	20,250,000	20,250,000	20,250,000	20,250,000	20,250,000
EAST AFRICAN PACKAGING	7,680,000	7,680,000	7,680,000	7,680,000	7,680,000	7,680,000	7,680,000
EAST AFRICAN PORTLAND	90,000,000	90,000,000	90,000,000	90,000,000	90,000,000	90,000,000	90,000,000
FIRESTONE E A	185,561,600	185,561,600	278,342,400	278,342,400	278,342,400	278,342,400	278,342,400
E.A BREWERIES	65,521,577	65,521,577	81,901,971	93,602,252	95,574,902	105,733,981	109,030,506
KENYA NATIONAL MILLS	20,170,700	20,170,700	20,170,700	20,170,700	20,170,700	20,170,700	20,170,700
KENYA OIL	7,199,800	7,199,800	7,199,800	10,079,612	10,079,612	10,079,612	10,079,612
KENYA ORCHARDS	400,000	400,000	400,000	400,000	400,000	400,000	400,000
KENYA POWER	52,752,000	52,752,000 0	52,752,000	79,128,000	79,128,000	79,128,000	79,128,000
TOTAL KENYA	56,000,000	56,000,000	56,000,000	56,000,000	56,000,000	56,000,000	56,000,000
UNGA GROUP	46,858,758	46,858,758	46,858,758	46,858,758	46,858,758	52,954,468	52,954,468

SCHEDULE 3
WEEKLY RAIN RETURNS FOR THE 1996



SCHEDULE 4

WEEKLY RAW RETURNS FOR THE 1997

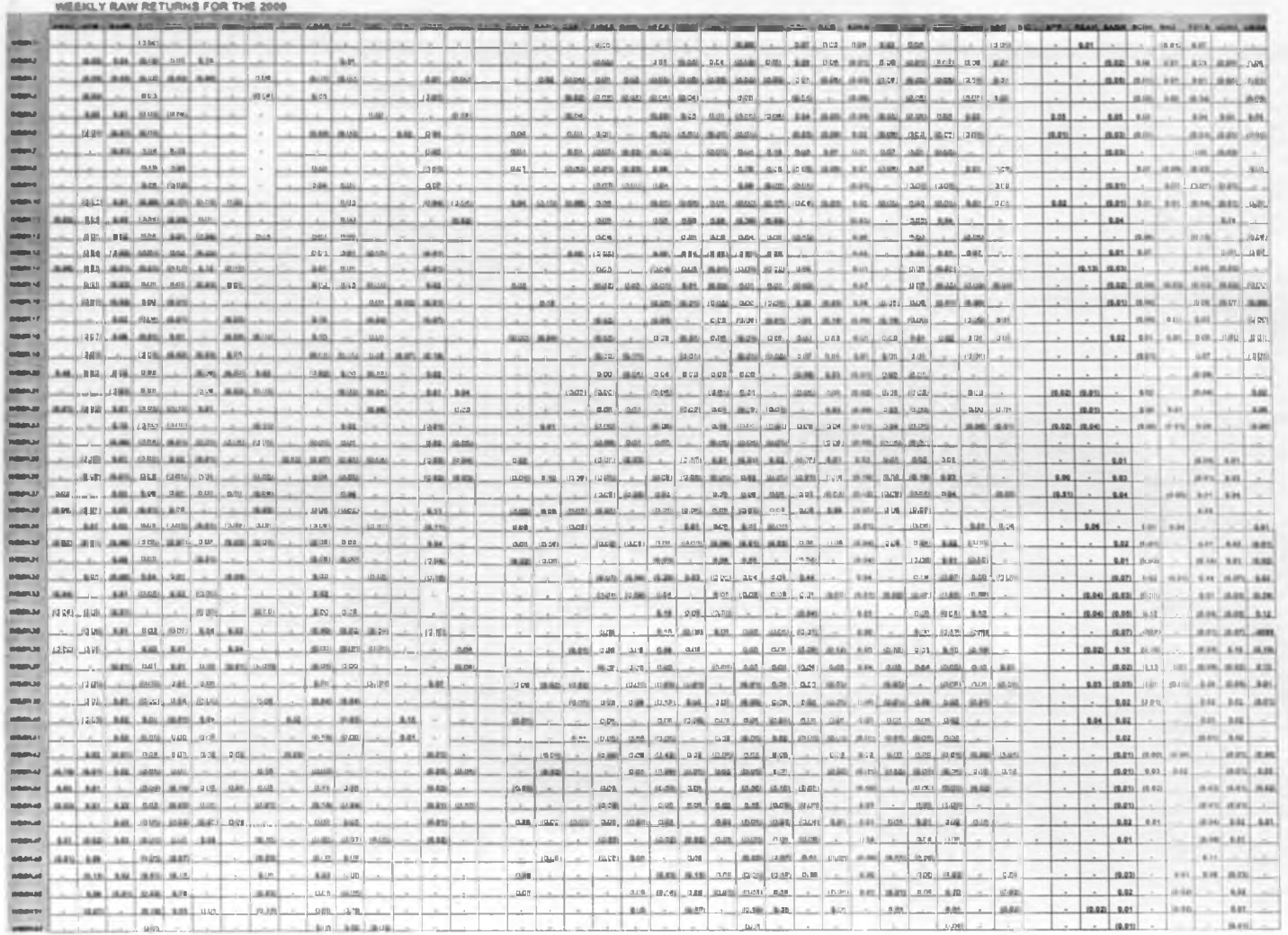


SCHEDULE 1

WEEKLY RAIN RETURNS FOR THE YEAR 1999

SHEDULE 7

WEEKLY RAW RETURNS FOR THE 2008



SCHEDULE 8

WEEKLY RAW RETURNS FOR THE 2001