AN EMPIRICAL ANALYSIS OF THE NSE RESPONSE TO CATACLYSMIC EVENTS: A CASE STUDY OF UCHUMI INSOLVENCY.

BY

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2008

DECLARATION

THIS MANAGEMENT RESEARCH PROJECT IS MY ORIGINAL WORK, AND HAS NOT BEEN PRESENTED FOR THE AWARD OF A DEGREE IN ANY OTHER UNIVERSITY.

SIGNED DATE

.....
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30/07/2008

THIS MANAGEMENT RESEARCH PROJECT HAS BEEN SUBMITTED FOR EXAMINATION WITH MY APPROVAL AS THE UNIVERSITY SUPERVISOR.

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30th July 2008

JULY, 2008

DEDICATION

To my precious son, for giving me a new purpose for living and a renewed zeal to complete my MBA study.

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LIST OF ABBREVIATIONS

MIMS:	Main Investment Market Segment
AIMS:	Alternative Investment Market Segment
FISMS:	Fixed Investment Securities Market Segment
CAPM:	Capital Asset Pricing Model
NSE:	Nairobi Stock Exchange
OTC:	Over the Counter Market
NYSE:	New York Stock Exchange
NASDAQ:	National Association of Securities Dealers Automated Quotation System

DEFINITION OF TERMS

Liquidity: The ability to trade large quantities quickly, at low cost, and without moving the price.

Capital Market: A market where financial assets in form of shares, bonds and debentures are traded.

Equity: This is the financial claim of owners of the firm. It reflects the amount of funds invested by the owners of the firm.

Returns: The gains that accrue to investors from their investments inform of dividends, interest and capital gains.

ABSTRACT

Without warning, the country's widely networked supermarket (Uchumi Supermarket) declared insolvency and closed shop on 1st June 2006. On 31st May 2006, a day before uchumi threw in the towel, the company conducted a normal trading on the Nairobi Stock Exchange (NSE), selling over 1.6 million shares at a price of Kshs 14.50 per share. The objective of the study is to assess the impact of decline in fortunes in Uchumi Supermarket on performance of ordinary shares at the Nairobi Stock Exchange.

The study is carried out by analyzing data which comprises daily prices and the derived daily returns for the period 1996 to 29th July 2006.The findings of the study indicate that liquidity and share prices of the listed firms were not negatively affected after Uchumi suspension. The mean return during the event window is lowest with a negative value while the estimation window and the post estimation window both show positive returns. The results have important implications because cataclysmic events have significant influence on liquidity and share prices and thence returns.

The study recommends that a similar study with a bigger sample, time horizon and taking into account more cataclysmic events be conducted by using advanced time series models to enhance our understanding of the association between the cataclysmic events and share returns and liquidity of the NSE.

CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND TO THE STUDY

Prices of individual stocks reflect investors' hopes and fears about the future, and taken in aggregate, stock price movements can generate a tidal wave of activity (Chen and Siems, 2002). Cataclysmic events-that is, unforeseen disastrous occurrences-can have negative implications for stocks and bonds because of their impact on liquidity (Barrett et.al., 1987). Decisions to buy and sell can quickly, easily, and inexpensively be reversed in liquid markets. When information becomes available about a cataclysmic event, investors often flee the market in search of safer financial instruments. This initial panic has the potential to turn into chaos and a long-term bear market, or it can be reversed if investors' hopes return; with adverse effects on the economy.

Studies on financial market behaviour (Thaler, and De Bondt, 1985; Shapiro, et.al., 1985; Shiller, 1981) suggest that overreaction to certain kind of information occurs. This contradicts the wealth of historical evidence in support of market efficiency. Market efficiency requires that information is accurately reflected in share prices in a timely manner, the effect of cataclysmic events on stock markets thus tells as of the inefficiency of the market. The investors fleeing the market could lead to a drop in the share prices and negatively affect the liquidity of the market. Chen and Siems (2002) conclude that a cataclysmic event in one part of the world has great potential to affect capital markets in other parts of the world in a short period of time. In today's information-oriented world, news travels very fast and contagion can spread quickly. Similarly a cataclysmic event in

one listed stock could have an effect on other listed stocks. This study thus seeks to determine whether Uchumi's insolvency had an effect on other listed stocks.

Without warning, the country's widely networked supermarket (Uchumi Supermarket) declared insolvency and closed shop on 1st June 2006. On 31st May 2006, a day before uchumi threw in the towel, the company conducted a normal trading on the Nairobi Stock Exchange (NSE), selling over 1.6 million shares at a price of Kshs 14.50 per share. Furthermore the collapse of Uchumi came as a shock, just months after it concluded what was celebrated as a successful sale of rights in the NSE.

Uchumi was also one of the four companies from Commercial and Services Sector included in the NSE 20 share index which the main NSE index is showing the geometric mean in price movements of 20 main firms across all sectors. Chan and Howard (2002); Woolridge and Gosh (1986); Pruitt and Wei (1989); Wansley and Robinson (1995) report that changes in the composition of the S&P 500 index are associated with significant changes in both share prices and trading volume. This study assumes that the deletion of Uchumi from the NSE 20 share index around the actual date of insolvency would have aggrevated the effect on the market.

What drives investor behaviour? We would all like to think we always behave rationally while at the same time assuming that others often do not. One would also tend to think that an insolvency of one firm should not affect the share prices of other firms. However, behavioral finance, a study of the markets that draws on psychology, an attempt is made

to explain why investors buy or sell the stocks, and even why they do not transact in stocks at all (Shiller, 1999).

Kahneman, and Tversky, (1979), suggest that people respond differently to equivalent situations depending on whether it is presented in the context of a loss or gain. Shiller, (1999) asserts that typically people become considerably more distressed at the prospect of losses than they are made happy by equivalent gains. This 'loss aversion' means that people are willing to take more risks to avoid losses than to realize gains: even faced with sure gain, most investors are risk-averse; but faced with sure loss, they become risk-takers. This therefore could mean that investors at NSE when they were faced by the news that Uchumi had been suspended they responded by trying to avoid losses in other stocks hence affecting liquidity and share prices of the market.

Shiller, 1999 asserts that the consequence of investors putting too much weight on recent news at the expense of other data is market over- or under-reaction. The study seeks to determine whether the response to cataclysmic events results from this. Kahneman, and Riepe, (1998) observe that people show overconfidence. They tend to become more optimistic when the market goes up or more pessimistic when the market goes down. Hence, prices fall too much on bad news and rise too much on good news and in certain circumstances they may lead to extreme events.

The researcher proposed to use event study methodology to assess the capital market response to cataclysmic event. If investors react favorably to an event, we would expect

positive abnormal returns around the event date. Alternatively, if investors react unfavorably to an event, we would expect negative abnormal stock returns (Chen and Siems, 2002).

In a segmented capital market like NSE, illiquidity in the market in which the shares of a country fund are traded affects only the share price of the fund (S), while illiquidity in the market in which the underlying assets are traded affects only the fund net asset value (NAV), (Chan et.al., 2005). In an integrated market, illiquidity in one market can easily spill over to another and affect both the fund share price and its underlying asset value. Chan concludes that the closed–end country fund premium, P = ln (S)–ln (NAV), is negatively (positively) affected by the share (asset) market illiquidity in segmented capital markets, but has only an ambiguous association with either share or asset market illiquidity in an integrated market.

Theoretical studies of the effect of illiquidity on asset prices have yielded mixed results. While Kyle (1985) and Allen and Gale (1994) show an important effect of illiquidity on asset prices, Constantinides (1986) and Vayanos (1998) show that illiquidity in the form of transaction costs has a large effect on asset turnover but only a very small effect on asset prices. Empirical studies consistently show, however, that illiquidity depresses asset prices and leads to higher asset returns. Amihud (2002) shows that the aggregate stock returns are higher when the market is less liquid. Amihud and Mendelson (1986), Brennan and Subrahmanyan (1996), and Brennan, Chordia, and Subrahmanyam (1998) show that less liquid stocks tend to have higher returns. Finally, Pastor and Stambaugh

(2003) find that stock returns are related, not only to levels of liquidity, but also to the covariance of returns with measures of market liquidity.

A new dawn is emerging in the Kenyan capital market. It is a period of re-awakening for the people of Kenya, who are now keen, more than ever before, to rise up to the challenge and manage their own destiny by making investments through the NSE. As a result, the NSE has in the recent past witnessed publicity that never was. This is more so due to the government's bid to relinquish control of some of its firms through the exchange. The failure of Uchumi and its subsequent suspension from NSE came just after the much-publicized Kengen IPO which led to new interest in the capital market by investors who were less informed and thus Uchumi failure may have led to a panic among investors. If this holds these investors must have all been trying to exit the market and thus affecting liquidity and thence the share prices of all the other stocks.

The researcher was also drawn to this area by Breed (2005) who asserts that while he does not dispute Mr. Chertoff's assessment with respect to human suffering and infrastructure damage due to cataclysmic events, he feels compelled to suggest the investment implications are not nearly as negative as one might surmise. Of course, forecasting stock prices is difficult under even normal circumstances and that difficulty is certainly compounded by the waves of emotion unleashed in the aftermath of the two storms (Breed, 2005).

Yet history offers relatively clear guidance regarding how stock prices normally react to a catastrophe. During the past 65 years or so, stocks have generally proven very resilient

following cataclysmic events including natural disasters, assassinations, the outbreak of wars and terrorism (Breed, 2005). Breed (2005) bases this conclusion on data mined by Smith Barney, Ned Davis Research and the Leuthold Group. In varying degrees all examined the impact on U.S. stock prices of numerous crises, including the fall of France in 1940, the bombing of Pearl Harbor in 1941, the Kennedy assassination in 1963, the Gulf wars of 1991 and 2003, and the terrorist attacks of 9/11, among others.

The stock market's reaction has been fairly similar in response to each of the major "events" studied. Stock prices typically decline immediately after the initial shock. However, in almost all cases this initial decline is erased just three months later and materially exceeded six months afterward. It is with this in mind that the researcher proposes to determine if the effect of Uchumi suspension from the market if any would be sustained three months after.

Simply put, the studies above suggest that regardless of the event, the shock to the system is typically short-lived and the economic fundamentals in place prior to the event remain relevant. Time after time headline-grabbing national and international shocks have had far less impact than initially feared. While history doesn't ever repeat itself exactly, it is the best teacher we have and still provides many useful guideposts and lessons. Why? Because investor psychology hasn't changed–fear and greed always carry the day (Breed, 2005).

1.2 STATEMENT OF THE PROBLEM

Prices of individual stocks reflect investors' hopes and fear about the future, and taken in aggregate, stock price movements can generate a tidal wave of activity (Chen and Siems, 2002). In the recent past, NSE has seen many unlikely investors tryout their luck in the Exchange. Like in many developed stock markets, this is set to see improved performance of the NSE that had less than 150,000 investors out of a potential investing population of 5,000,000 people. Economic analysts have said that the state of investments usually reels over the effects of firms' closure (Vahid, 2006) and thus Uchumi's suspension is likely to negatively affect NSE improved performance.

Cataclysmic events can have serious implications for stocks and bonds because of their impact on liquidity (Barrett et.al., 1987). Decisions to buy and sell can quickly, easily, and inexpensively be reversed. When information becomes available about a cataclysmic event, investors often flee the market in search of safer financial instruments and panic ensues. This initial panic has the potential to turn into chaos and a long-term bear market, or it can be reversed if investors' hopes return.

Investors are concerned about liquidity risk. It affects their ability to trade the quantity of shares they want to buy or sell within their desired time-framework (Vassalou et. al., 2005). Most importantly, investors fear that in the event of a financial crisis, they may not be able to exit the market fast enough to contain their losses. These considerations may lead them to shy away from illiquid securities, or require a liquidity-related premium to

hold them and thus the researcher was motivated to determine whether the failure of Uchumi had any of these adverse effects.

Evidence produced by Foerster and Karolyi (1996) found that important inferences pertaining to the issue of capital market cataclysmic events can be drawn from the reaction of stock prices. The basis of this research hinges on these, with a view to first understanding the effect firms suspension has on the share prices of the other listed firms. Further, it will investigate the effect on liquidity.

Firm suspension is an event that occurred at NSE whose effects on share returns, liquidity and investor recognition has not been subjected to any empirical study despite of the far reaching consequences it is likely to have on the diverse stakeholder groups. The event study methodology is a forward looking approach that focuses on identifying abnormal returns to firms from a specific event (Chen and Siems, 2002). This study therefore seeks to determine if the suspension of a firm affects the share prices and liquidity because of their great importance in the stock market.

1.3 OBJECTIVE OF THE STUDY

This study seeked to determine the effect Uchumi's failure and subsequent suspension from the stock market had on the trading activity at the NSE. It was an attempt to determine whether suspension was harmful to any of the firms listed at NSE. Specifically the study aimed at determining the following;

1) To determine the extent to which a firm's suspension affects the stock market.

1.4 RESEARCH HYPOTHESIS

1) The failure of Uchumi Supermarket had a negative impact on the returns from shares.
2) The failure of Uchumi Supermarket had a negative impact on the liquidity of the market.

1.5 IMPORTANCE OF THE STUDY

The study will be beneficial to NSE and the Capital Markets Authority due to the fact that the failure of Uchumi Supermarket and its subsequent suspension from trading had negative implications on the trading at NSE. Investors may shy away from investing and firms from listing thus NSE needs to take precautionary measures. More so, the NSE has played an important role in the privatization of state-owned corporations Uchumi being one of them (privatized in 1992).

The study was also aimed at giving an indication of the effects of the Uchumi closure on the future of public interest in buying shares in locally run enterprises. In addition, the study was to give an indication of the consequences on the government's intended privatization of some of the country's leading parastatals including Telcom Kenya and Kenya Ports Authority. The study will thus be informative both to the government and the investing public in general.

Given the importance that liquidity risk has in trading assets, it is no surprise that it has received a large amount of attention in academic research. One of the main concerns in this study was to determine what effects Uchumi suspension had on liquidity and thus of great importance to investors. The study aimed to improve our understanding of the sources of liquidity risk and the effects that it has on equities.

CHAPTER TWO
LITERATURE REVIEW

2.1 INTRODUCTION

Prices of individual stocks reflect investor's hopes and fears about the future. Decisions to buy or sell can be quickly, easily, and inexpensively reversed when information becomes available about an event. This study looks at the response of the NSE to the failure of Uchumi and its subsequent suspension of trading. The reaction to Uchumi failure can be derived from studies on investor Psychology.

2.2 INVESTOR PSYCHOLOGY

What drives investor behaviour? We would all like to think we always behave rationally while at the same time assuming that others often do not. One would also tend to think that an insolvency of one firm should not affect the share prices of other firms. However, behavioral finance, a study of the markets that draws on psychology, is throwing more light on why people buy or sell the stocks they do – and even why they do not buy stocks at all (Shiller, 1999).

Subrahmanyam et.al. (1998) in their study on investor psychology proposes a theory of securities market under- and overreactions based on two well known psychological biases: investor overconfidence about the precision of private information; and the biased self-attribution, which causes asymmetric shifts in investors' confidence as a function of their investment outcomes. They show that overconfidence implies negative long-lag autocorrelations, excess volatility, and, when managerial actions are correlated with stock mispricing, public-event-based return predictability. Biased self-attribution adds positive short-lag autocorrelations ('momentum'), short-run earnings 'drift,' but negative

correlation between future returns and long-term past stock market and accounting performance.

Although it is not obvious how the empirical securities market phenomena can be captured plausibly in a model based on perfect investor rationality, Subrahmanyam et.al. (1998), point out that no psychological ("behavioral") theory for these phenomena has won general acceptance. Some aspects of the patterns seem contradictory, such as apparent market underreaction in some contexts and overreaction in others (Subrahmanyam et.al., 1998).

A general criticism often raised by economists against psychological theories is that, in a given economic setting, the universe of conceivable irrational behavior patterns is essentially unrestricted (Subrahmanyam et.al., 1998). Thus, it is sometimes claimed that allowing for irrationality opens a Pandora's Box of ad hoc stories which will have little out-of-sample predictive power. However, DeBondt and Thaler (1995) argue that a good psychological finance theory will be grounded on psychological evidence about how people actually behave. Subrahmanyam et.al. (1998), concurs, and also believe that such a theory should allow for the rational side of investor decisions. The goal of this paper is to determine whether the reaction to Uchumi's failure was driven by such behavior.

Kahneman, and Tversky, (1979), Prospect theory suggests that people respond differently to equivalent situations depending on whether it is presented in the context of a loss or gain. Shiller, 1999 asserts that typically people become considerably more distressed at

the prospect of losses than they are made happy by equivalent gains. This 'loss aversion' means that people are willing to take more risks to avoid losses than to realize gains: even faced with sure gain, most investors are risk-averse; but faced with sure loss, they become risk-takers. This therefore could mean that investors at NSE when they were faced by the news that Uchumi had been suspended they responded by trying to avoid losses in other stocks hence affecting liquidity and share prices of the market.

Regret theory is about people's emotional reaction to having made an error of judgement, whether buying a stock that has gone down or not buying one they considered and which has subsequently gone up (Shiller, 1999). According to Shiller, (1999) investors may avoid selling stocks that have gone down in order to avoid the regret of having made a bad investment and the embarrassment of reporting the loss. They may also find it easier to follow the crowd and buy a popular stock: if it subsequently goes down, it can be rationalized, as everyone else owned it. Going against conventional wisdom is harder since it raises the possibility of feeling regret if decisions prove incorrect.

Anchoring is a phenomenon in which, in the absence of better information, investors assume current prices are about right (Shiller, 1999). In a bull market, for example, each new high is "anchored" by its closeness to the last record, and more distant history increasingly becomes an irrelevance. People tend to give too much weight to recent experience, extrapolating recent trends that are often at odds with long-run averages and probabilities.

Shiller, 1999 asserts that the consequence of investors putting too much weight on recent news at the expense of other data is market over- or under-reaction. The study seeks to determine whether the response to cataclysmic events results from this. Kahneman, and Riepe, (1998) observe that people show overconfidence. They tend to become more optimistic when the market goes up or more pessimistic when the market goes down. Hence, prices fall too much on bad news and rise too much on good news and in certain circumstances they may lead to extreme events.

Two psychological theories underpin these views of investor behavior. The first is what Kahneman, and Tversky, (1979), co-authors of prospect theory of investors psychology call the 'representativeness heuristic'- where people tend to see patterns in random sequences, for example in financial data. The second, 'conservatism', is where people chase what they see as a trend but remain slow to change their opinions in the face of new evidence that runs counter to their current view of the world.

2.3 ADDITIONS TO AND DELETIONS OF SECURITIES FROM THE MARKET INDEX

Sensational price increases for stocks added to the S&P 500 index are now regarded as a fact of life (Messod & Whaley, 2002). They study the S&P 500 index and find out that newly added stocks are subject to enormous buying pressure both immediately after the

addition is announced and throughout the days following before the change becomes effective. For stocks deleted in the aftermath of their exclusion from the S&P 500, Messod & Whaley, (2000) show that, they appear to generate significant risk-adjusted returns.

More generally, Messod & Whaley, (2000) purpose is to examine the price and trading volume effects of stocks that have been added to and deleted from the S&P 500 index. They document that there are abnormal price increases in additions and deletions emanating from two separate components-the overnight price change from the close on the announcement day until the open on the day after the announcement, and the price change from the open on the day after the announcement until the close of the day the change becomes effective.

Uchumi was one of the firms in the NSE 20 share index and thus the investors' reaction and subsequent changes in share prices and liquidity if any, may have been due to the reconstitution of the 20 share index and not the suspension of Uchumi and thus the study proposes to examine these two phenomenons concurrently.

2.4 EVENT STUDIES

The event-study methodology is a forward-looking approach that focuses on identifying abnormal returns to firms from a specific event (Chandra et. al., 1990). If investors react favorably to an event, we would expect positive abnormal stock returns around the event date. Alternatively, if investors react unfavorably to an event, we would expect negative

abnormal stock returns. Hence, when analyzed using composite stock indices and major sector indices, abnormal returns provide a means of assessing the capital market's response to specific events (Chandra et. al., 1990). Chen and Siems, 2002 examine global capital market's response to cataclysmic events- the 1987 stock market crash, Iraq's invasion of Kuwait in 1990, and the September 11th terrorist attacks in the US. They conclude that global capital markets today appear to be inter-linked; news spreads rapidly, with quick spillover, or contagion, effects. They also find evidence that suggests that U.S. capital markets are more resilient than in the past and that they recover sooner from cataclysmic events than other global markets.

The event-study methodology is based on the efficient markets hypothesis (Fama, et al. 1969). This hypothesis generally states that as new information becomes available (perhaps as the result of some significant unexpected event), it is fully taken into consideration by investors assessing its current and future impact. Investors immediately reassess individual firms and their ability to withstand potential economic, environmental, political, societal, and demographic changes resulting from the event.

The new assessment results in stock price changes that reflect the discounted value of current and future firm performance. Significant positive or negative stock price changes can then be attributed to specific events. The strength of the event-study method lies in its ability to identify such abnormal changes because it is based on the overall assessment of many investors who quickly process all available information in assessing each individual firm's market value (McWilliams and Siegel, 1997).

There is an extensive literature concerning various aspects of event methodology, including: the choice of measurement interval (Brown and Warner 1980 and 1985, and Morse, 1984); infrequent trading (Scholes and Williams, 1977); event clustering (Patel, 1976, Collins and Dent, 1984, and Chandra and Balachandran, 1990); and, specifically in relation to the market model, the most frequently used model of expected returns (Strong, 1992).

Despite this extensive literature, a continuing feature of many event studies is the use of a number of alternative techniques to estimate expected returns (Limmack, 1991; Frank and Harris, 1993 and Parkinson and Dobbins, 1993). Whilst such an approach may be prudent, it does suggest the absence of a framework within which the competing models can be assessed. Using simulated data Brown and Warner (1985) concluded that "methodologies based on the OLS market model and using standard parametric tests are well specified under a variety of conditions." However, Chandra, Moriarity and Willinger (1990) state that Brown and Warner's "conclusions are a result of comparing inconsistent test procedures". Chandra et. al., (1990) conclude that with event clustering there is an advantage in using test statistics which correct for cross sectional dependence.

Dwyer, (2001) lists the steps in event study as follows:

i. Identification of the events of interest and definition of the event window-a period over which the event occurs and then definition of an estimation window-a period over which parameters are estimated.

ii. Selection of the sample set of firms to include in the analysis. Once the event dates are known, returns are collected around these dates for each of the firms in the sample. The analyst decides whether to collect weekly, daily, or shorter interval returns around the event and how many periods of returns before and after the announcement date will be considered as part of the event window.

iii. Prediction of a 'normal' return during the event window in the absence of the event.

iv. Estimation of the abnormal return within the event window, where the abnormal return is defined as the difference between the actual and predicted (normal) returns. The excess returns, by day, are averaged across all firms in the sample and a standard error is computed.

v. Testing whether the abnormal return is statistically different from zero. This is answered by estimating the t statistic for each day, by dividing the average excess return by the standard error. If the t statistics are statistically significant, the event affects returns; the sign of the excess return determines whether the effect is positive or negative.

The study follows the excess return approach as described in Brown and Warner (1985) to measure the NSE's abnormal performance. The daily excess returns are to be measured by the mean-adjusted-returns approach; that is, for each day at, and following, the event, I measured;

$$AR_{jt} = R_{jt} - \bar{R}_j .$$

Where AR_{jt} is the abnormal (or excess) return for stock index j at time t, R_{jt} is the actual observed arithmetic return for stock index j at time t, and R_j is the mean of stock index j's daily returns in the (-30, -11) estimation period. R_j is computed as follows:

$$\overline{R_j} = \frac{1}{20} \sum_{j=-30}^{-11} R_{jt},$$

According to Brown and Warner (1985), the date of the event is t = 0, the mean adjusted returns model is estimated over 20 days, from t = -30 to t = -11 relative to the event date. The primary event windows under study are the event date itself (t = 0), and the two windows called Estimation and Post event windows from the event date to five days following the event (t = +5) and from the event date to ten days following the event (t = +10).

Event study methodology relies on capturing any abnormal return to a particular security in a given period (U_{jt}), which is simply the difference between actual return (R_{jt}), and that which would be expected in the absence of the event, the 'normal' return (R_{Jt}). Correct specification of the counterfactual, 'normal' return is critical for the successful application of the method (Strong, 1992). Several methods may be used to obtain or estimate normal and abnormal returns: the single-index model (constant mean return model), the market model and the capital asset pricing model (CAPM) are the most widely used.

The market model assumes a linear relationship between the return of any security to the return of the market portfolio Chandra et. al., (1990):

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}$$

With $E(e_{it}) = 0$ and $Var(e_{it}) = \delta^2_{ei}$ (2.4.1)

Where t is the time index, i= 1,2,..., N stands for security, R_{it} and R_{mt} are returns on security i and the market portfolio respectively during the period t, and e_{it} is the error term for security i.

Equation (1) is generally estimated over a period which runs between 120 and 210 days prior to the event up to 10 days prior to the event. The event window is defined as the period from 10 days prior to the event to 10 days after the event. With the estimates of α_i and β_i from equation (1), one can predict normal return during the days covered by the event window. The prediction error (the difference between the actual return and the

predicted normal return), commonly referred to as the abnormal return (AR), is then calculated as:

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \qquad (2.4.2)$$

Under the null hypothesis, the abnormal returns will be jointly normally determined with zero conditional mean and conditional variance $\delta^2 (AR_{it})$:

$$\sigma^2 (AR_{it}) = \sigma^2_{ei} + \frac{1}{L}\left[1 + \frac{(R_{mt} - \overline{R}_m)^2}{\sigma^2_M}\right] \qquad (2.4.3)$$

Where L is the estimation period length (i.e number of days used for estimation) and R_m — is the mean of the market portfolio. With L large, $\sigma^2 (AR_{it}) \rightarrow \sigma^2_{ei}$.

For each individual event, one can estimate the abnormal return and relevant test statistics at each instant in time within the event window. However, in order to draw overall inference on the abnormal return observation for the event(s) of interest, one can also aggregate the abnormal returns. For any given subset of N events (or securities), the sampled aggregated abnormal returns (AAR_t) at each instant t within the event window is computed as

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \qquad (2.4.4)$$

For large L, the variance is

$$VAR (AAR_t) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma^2_{ei} \qquad (2.4.5)$$

To test for the persistence of the impact of the event during a period ($T_2 - T_1$), the abnormal return can be added to obtain the cumulated abnormal returns ($CAR_i (T_1, T_2)$) for security i over the period ($T_2 - T_1$).

$$CAR_i (T_1, T_2) = \sum_{t=T_1}^{T1} AR_{it} \qquad (2.4.6)$$

Where $T_a \leq T_1 < t < T_2 \leq T_b \in$ event window, and T_a and T_b are the lower and upper limits of the event window, respectively. Asymptotically (as L increases) the variance of the cumulative abnormal return for security i is:

$$\sigma^2_i (T_1, T_2) = (T_2 - T_1 + 1)\, \sigma^2_{ei} \qquad (2.4.7)$$

To test the null hypothesis of zero cumulative abnormal return, one can formulate a Z test as

$$CAR_i (T_i, T_2) \sim N(0, \sigma^2_i (T_i, T_2)):$$

$$Z = \frac{CAR}{(\sigma^2_i (T_1, T_2))^{1/2}} \sim N(0,1) \qquad (2.4.8)$$

An aggregation of interest can also be performed across both time and events. In that scenario, the average cumulative abnormal return is defined as:

$$CAAR (T_1, T_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i (T_1, T_2) \qquad (2.4.9)$$

Where N is the number of events. The variance of CAAR is:

$$Var (CAAR (T_1, T_2)) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma^2_i (T_1, T_2) \qquad (2.4.10)$$

Under the null hypotheses that the abnormal returns are zero,

$$Z = \frac{CAAR (T_1, T_2)}{(var(CAAR(T_1, T_2)))^{1/2}} \sim N(0,1) \qquad (2.4.11)$$

As pointed by MacKinlay (1997), this distributional result is asymptotic with respect to the number of securities N and the length of estimation window L.

2.5 LIQUIDITY

Liquidity is an elusive concept that cannot be observed directly and generally denotes the ability to trade large quantities quickly, at low cost, and without moving the price Mandala (2006). Since liquidity has many dimensions, it is hard to proxy it with a single measure. Many different measures of illiquidity have been used in empirical studies. For example, Amihund and Mendelson (1986) used the quoted bid-ask spread on stock returns and Chalmers and Kadlec (1998) used the amortized effective spread as a measure of liquidity. Brennan and Subrahmanyam (1996) measured illiquidity with the price response to signed order flow and within the fixed cost of trading based on continuous data on transaction and quotes, and Pastor and Stambaugh (2003) estimated liquidity cost from signed volume related return reversals. Most of these liquidity measures require data that is not readily available.

The liquidity of a market is often measured as the size of its bid-ask spread, but this is an imperfect metric at best. More generally, Kyle (1985) identifies three components of market liquidity: tightness in the bid-ask spread; depth, that is the volume of transactions necessary to move prices; and resiliency, that is the speed with which prices return to equilibrium following a large trade. Persuad (2003) identifies a fourth component, which he calls diversity. This is simply the degree of diversity among market participants in their market views and desired trades. Persuad (2003) argues that lack of diversity can

lead to 'liquidity black holes.' These are conditions where liquidity dries up, and a decline (or increase) in prices brings out more sellers (or buyers), further exasperating the price move.

Chan et al. (2005) measure of illiquidity is related to Kyle's (1985) lambda, which measures the effect of order flow on prices. Amihund (2002) shows how to construct a Kyle-type measure of illiquidity using only daily returns and volume, which are readily available for almost every market.

For each fund, Chan et.al (2005) measures illiquidity each month for the fund itself, for the US market in which the fund shares are traded, and the corresponding foreign market in which the fund underlying assets are traded. Following Amihund (2002), Chan et.al (2005) illiquidity measure for stock i at month t in market c, $IL_{i,c,t,}$ is defined as the average ratio of the absolute daily price change to a measure of the trading volume:

$$IL_{i,c,t} = \frac{1}{Dt} \sum_{d=1}^{Dt} R_{i,d} \; / \; VOL_{i,d,} \qquad 2.5.1$$

Where D_t is the number of trading days in month t, R_{id} and VOL_{id} are, respectively, stock i's daily return and daily volume in day d of month t. Unlike Amihund (2002) who calculates illiquidity annually for stocks with at least 200 daily observations each year, Chan et.al (2005) uses only around 21 days to calculate IL for each month, so that they can relate illiquidity to fund premia at a monthly frequency.

Chan et.al (2005) calculates the illiquidity of the shares of fund f in month t, $IL_{f,t}$, using equation (2.5.1) from the fund's daily share price return and volume, and the illiquidity for the portfolio of all 41 funds is obtained by averaging over the 41 individual funds' illiquidity $IL_{f,t}$ at each month t:

$$FIL_t \equiv \frac{1}{41} \sum_{f=1}^{41} IL_{f,t} \qquad 2.5.2$$

The market wide illiquidity for the asset market c, CILc,t ($USIL_T$), is calculated as the equally weighted average of the illiquidity of all qualifying individual stocks in a representative market index for that market:

$$CIL_{c,t} = \frac{1}{N_{c,t}} \sum_{i=1}^{Nc,t} IL_{i,c,t} \qquad 2.5.3$$

Where $N_{c,t}$ is the number of stocks in the index of country c in month t.

2.6 TRADING SUSPENSION

Supporters of trading suspensions argue that they can serve to reinform market participants, allowing them to assess a new equilibrium price. Greenwald and Stein (1988) argue that when there is the risk of trading on the basis of uninformative prices, traders prefer to refrain from trading. This results in a reduction of market liquidity and, in turn, in a further reduction of prices informativeness. In such conditions, a trading halt can be beneficial in that it restores investors' confidence on the fairness of market prices. In a later study (Greenwald and Stein, 1991) the same authors develop a model where uncertainty on the importance of uninformed traders drives to excess volatility during the continuous market phase. In this case, trading halts may be beneficial in maintaining the

excess volatility at reasonable levels. Kodres and O'Brien (1994) claim that price limits help traders to share risks when some piece of material information is released and, therefore, dampen excess volatility.

Detractors of trading suspensions argue that any kind of market interference should be restricted to the minimum and that halts impose unnecessary liquidity costs on market participants (Anolli & Petrella, 2004). The discovery of a new equilibrium price is, in their view, far easier and more accurate when trading is permitted rather than when it is suspended. In the model developed by Grundy and McNichols (1989) the revelation of information takes place through trading ("learning-through-trading"). When trading is suspended, potential traders are inhibited from revealing their offer and demand schedules, and this harms the price discovery process.

Moving to empirical studies, in their seminal paper Hopewell and Schwartz (1978) observe price adjustments abnormally large (and proportional to the duration of the trading suspension) over the suspension period, and an anticipatory behavior of stock returns prior to the suspension. They consider such a behavior consistent with a very rapid adjustment to new equilibrium prices. Ma, Rao, and Sears (1989) find a positive contribution to market stabilization of price limits on futures contracts in that, after a price–limit hit, prices tend to stabilize (or even to reverse), return volatility declines and volumes have a tendency to remain stable. Lauterbach and Ben-Zion (1993), studying the performance of the Tel Aviv Stock Exchange during the October 1987 market crash, find that the implementation of trading halts in the form of circuit breakers had no net impact

on the overall (negative) return, but smoothed the fluctuations and contributed to reduce the supply imbalance. Thus, circuit breakers served to hedge against "execution price surprises."

Lee, Ready, and Seguin (1994) find that trading halts at the NYSE do not reduce either volume nor price volatility, but merely interfere with the normal trading activity (*trading interference hypothesis*): the period immediately following a trading halt shows higher levels of both volume and price volatility. They argue that the reason for the documented market behavior is that the batch reopening mechanism employed at the NYSE is less efficient than continuous trading. They find that the reopening price is noisy, and consequently that is counterproductive to stop trading. This leaves open the question if the halt is inefficient, or the reopening mechanism is not appropriate, or both.

Corwin and Lipson (2000) study the order flow pattern around NYSE trading halts. Their hypothesis is that, if traders have the opportunity to cancel orders in case of extreme market conditions (thanks to trading halts), they are more willing to submit limit orders during normal market conditions. Corwin and Lipson find that limit order cancellation and submission is exceptionally high during halts and remains high for many hours after the halt. A second important finding is that the order book depth is very thin near the best quotes before, during and after the halts. This implies a lower quality of the prices and liquidity of the market around trading halts.

A final noisy effect of price limits is the so called "magnet effect" that is observed when prices show a tendency to accelerate toward the bounds as these approach (Arak and Cook (1997); Cho, Russel, Tiao, and Tsay (2003)). This effect is originated by two, concurring factors: the fear of market illiquidity, and the behavior of market participants. The first effect induces traders to trade more actively than anticipated when there is a risk of being closed out of the market as a consequence of a trading suspension. This in turn increases price variability and, thus, the probability of hitting the limit (Subrahmanyam (1994)). The second reason is behavioral and states that investors who follow the patterns of prices may step in the market when prices break certain thresholds and will anticipate their trades if they are afraid of being closed out of a trend (Arak and Cook (1997)). Cho, Russel, Tiao, and Tsay (2003) study the Taiwan Stock Exchange price limit mechanism and find a clearly documented effect in the movement toward the upper limit, while the effect is less clear when the movement is toward the lower limit.

Anolli & Petrella (2004) examine the effects of firm-specific trading suspensions triggered by price limit hits on three dimensions of market quality: trading activity, return volatility, and price efficiency. They base the empirical analysis on a sample of trading halts on the Italian market (*Borsa Italiana*) and compare the results under two trading suspension regimes. Their preliminary results reveal mixed evidence. Consistently with previous studies, they find unusually higher levels of both volume and volatility after the halt. Differently from previous studies, they find abnormally higher levels of volume prior to the halt. No significant effect has been found on price efficiency.

Unanimous consensus is far from being reached, both in the academia and in the stock exchange industry, on the actual net benefits of halting the normal trading process in case of extreme market volatility conditions (Anolli & Petrella, 2004). This type of trading suspension is usually known as price limit hit trading halt. Several papers investigate this issue and provide useful insights, but (understandably) no definitive answer on this point. In the stock exchange industry as well there is no common view about the usefulness of imposing price boundaries, and securities markets with and without price limit hit triggered trading halts coexist (Anolli & Petrella, 2004).

Trading halts are non-planned interruptions to the normal trading process. Trading halts can be classified into two main categories: discretionary and non discretionary (or automatic) trading halts (Anolli & Petrella, 2004). A halt is discretionary when the suspension is called by an exchange official under specific circumstances, expressly defined by the market rulebook. For example, in case of rumors an exchange official may stop trading and simultaneously request the company to provide the market with complete information. A halt is non discretionary when it is inevitably triggered by a specific event, regulated by a market rulebook provision, such as the break of a maximum price variation limit (Anolli & Petrella, 2004).Price limit hit trading halts usually fall in the second type of suspensions (i.e, non discretionary trading halts).

Market authorities employ trading suspensions to limit "both potential and actual market disorder" (Iosco (2002)). It is believed that a suspension during abnormal market conditions (a "disordered market") may prevent the degeneration of the market or, if the

disordered conditions are already in place, may facilitate the restoration of orderly trading (*cooling off effect*).

The main reasons given for supporting the opportunity to suspend trading differ between discretionary and non-discretionary trading halts (Anolli & Petrella, 2004). For discretionary trading halts the reasons most frequently mentioned are related to market transparency, illegal trading practices, and exceptional market conditions (Iosco (2002)). First, in case of a firm-specific information event, a trading halt allows the issuer to release appropriate news, and market participants to assess the impact of such news on market price. Second, the market authority can stop trading if he suspects that some form of fraud or manipulation is being carried out, or the issuer fails to comply with some (material) listing rules. Third, a particular case of discretionary trading halt is when the market authority closes the whole market (i.e., trading is halted for all the securities listed). This may happen in very specific circumstances, as in the case of September 2001 U.S. markets four days closure (Anolli & Petrella, 2004).

The existing literature does not provide conclusive results on the performance of trading halts and firm suspensions. The researcher believes the main reasons for, are two. First, there is a very widespread and heterogeneous array of institutional arrangements concerning trading halts and price limits, with reference to what happens when an abnormal change in contract prices is observed (the trigger event), how trading is resumed after a suspension, the duration of the suspension and so on. Moreover trading suspensions have different meanings and non-homogeneous consequences in order driven

and quote driven markets, and in physical or electronic markets. Second, a conclusive result on the desirability of trading suspension mechanisms could be obtained only if it were possible to contrast the performance of a market with *and* without suspension, which is clearly impossible.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Research Design

An empirical study of the NSE was conducted. The aim of the study was to explore the effect Uchumi suspension had on the stock market. Through the suspension an event happened and thus Event-study methodology was employed in this study.

3.2 Data Collection

3.2.1 Population and Sample of The Study

This study used all the 48 ordinary shares listed in the Nairobi Stock Exchange (NSE) Main Investment Market Segment (MIMS) as the population. There was a date of interest in this study, the date of suspension that is, 1st June 2006. The population incorporated all companies listed on that date from which the sample was selected. There were forty-eight listed and active companies in the Nairobi Stock Exchange, classified into the Main Investment Market Segment (MIMS) and the Alternative Investment Market Segment (AIMS) as per appendix I.

3.2.2 Sampling Technique

The study followed two sampling techniques in obtaining a viable set of stocks. For firms listed in MIMS, purposive sampling technique was employed and thus picked out the 20 share index firms due to the fact that these firms are representative of the entire market and thus allowed the researcher to control for firm specific risk.

All firms in AIMS were left out in the study sample. However the study followed a sequential sampling technique in obtaining a viable set of stocks. The reason for selecting this technique was because the data needed involved prices for which some shares did not have due to their inactive nature. The sample considered only the shares that had prices for every month of consideration. They were then sorted through pre-ranking by trading frequency for all listed stocks. The data was first filtered according to firms that either were suspended or did not trade during the period under consideration, that is, where a share price is not available for calculation of returns.

3.2.3 Data Type, Source and Collection.

In this study, secondary data sources from the NSE and the annual financial reports of the listed companies were employed. Daily data for prices and volumes on individual stocks were obtained from NSE. Share prices after being adjusted for dividends, seasonal equity offerings and stock splits, if any, were used in calculating security returns and risk. For each company, the closing share price for every day was taken for the period 1st April 1996 to 31st July 2006.

The event window was defined as follows;

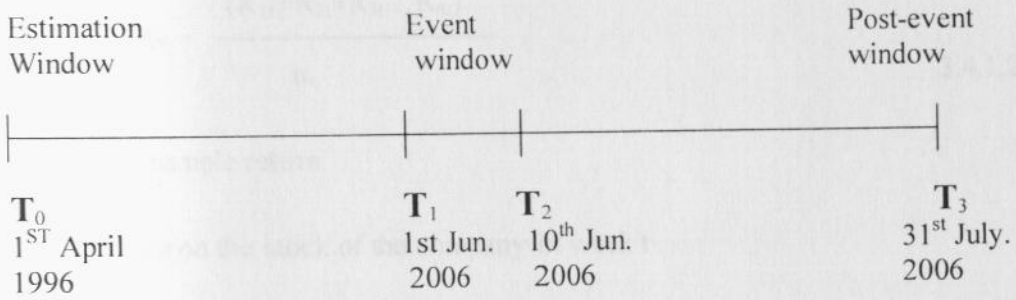


Fig 3.3: Formal Definition of Event Window Mandala, (2006).

3.3 Data Analysis

3.3.1 Variables Definition and Measurement

Changes in Share Prices

To document the return patterns surrounding the suspension announcement as well as obtain residuals for hypothesis testing, the event study methodology pioneered by Fama et al. (1969) was used to measure the stock price effects of Uchumi suspension.

The returns from the share prices and the capital gains were computed as follows.

$(P_{t-1}-P_t)$

$$R_{it} = \frac{}{P_{t-1}} \qquad 3.4.1.1$$

Where:

Rt – is the stocks return in the week't'

Pt – is the last traded price in week't'

Pt-1 – is the last traded price of stock (share) in the week 't-1'

The sample return R_m for the purpose of this study is a series of averages of weekly returns of each firm stock (share) constituting the sample.

$$Rs = \frac{(R_{1t}+R_{2t}+R_{3t}\ldots R_{nt})}{n.} \qquad 3.4.1.2$$

Where:

Rs - The sample return

R_{1t} - return on the stock of the company in week t

n - The number of firms in the sample.

The market return is computed and regressed with Uchumi's average return for the period under study with the average Uchumi's returns as the dependent variable and market return the independent variable.

Liquidity

The study's measure of liquidity was related to Chan et.al (2005) but unlike him who calculated it from daily prices and volume, the study used weekly data. Following Chan et.al (2005) liquidity measure for stock i at week t in market c, $IL_{i,c,t,}$ is defined as the average ratio of the absolute daily price change to a measure of the trading volume:

$$IL_{i,c,t} = \frac{1}{Dt} \sum_{d=1}^{D_t} R_{i,d} / VOL_{i,d,} \qquad 3.4.2.1$$

Where D_t is the number of trading days in week t, R_{id} and VOL_{id} are, respectively, stock i's weekly return and weekly volume in day d of week t. Unlike Amihund (2002) who calculated illiquidity annually for stocks with at least 200 daily observations each year, the study used only around 5 days to calculate IL for each week.

The market wide liquidity for each segment of the asset market c, CILc,t ($USIL_T$), was calculated as the equally weighted average of the liquidity of all qualifying individual stocks in a representative sample for that segment:

$$CIL_{c,t} = \frac{1}{N_{c,t}} \sum_{i=1}^{Nc,t} IL_{i,c,t,} \qquad 3.4.2.2$$

Where $N_{c,t}$ is the number of stocks in segment c in week t.

The data was analyzed using Ms. Excell and SPSS. The sample mean and standard deviation were calculated to describe and establish the variance in returns and liquidity of the sample. The returns and the liquidity of sample were determined both for the period before and after suspension. The normal return and the abnormal return within the event window were then determined.

The excess returns, were averaged across all firms in the sample and a standard error computed. The abnormal return was then tested if it's statistically different from zero by estimating the t statistic for each week, by dividing the average excess returns by the standard error. T-statistics were computed using standard error that account for non-

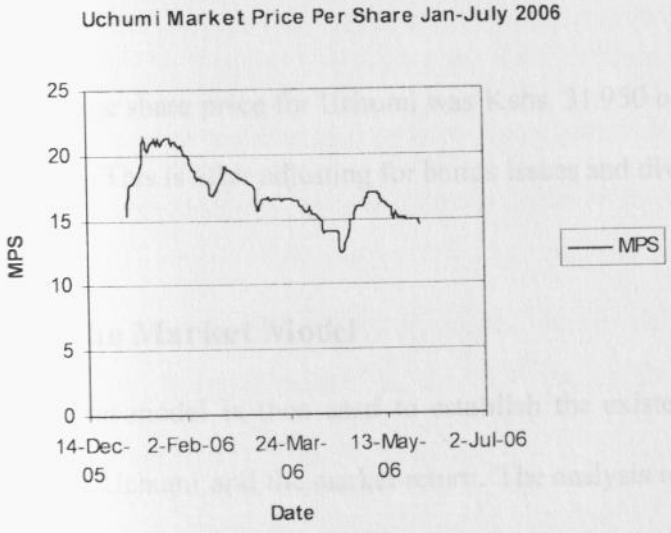
dependence of the data collected. (95% confidence level of estimate will be used). The t-statistic value was considered significant if the P value is less than 0.05.

CHAPTER FOUR
DATA ANALYIS AND FINDINGS

4.1 Introduction

The objective of the study is to assess the impact of decline in fortunes in Uchumi Supermarket on performance of ordinary shares at the Nairobi Stock Exchange. The data used for analysis are daily prices and the derived daily returns. The returns were for the period 1996 to 29th July 2006.

The study is based on the perceived existence of a relationship between the return earned on ordinary shares and the return on the stock market. The market return is computed by averaging for each day, daily returns for all shares included in the NSE 20-Share index. (See appendix III)



The graph above show that the decline in share price over the period 3rd. January to when the company was suspended from the stock exchange.

Table 4.1: Descriptive Statistics for Variables used in this study

Variable	N	Mean	StDev	Min	Max	Q1	Q3
UCHUMI(return)	2566	0.04	3.41	-65.29	57.69	-0.62	0.67
Market(return)	2564	0.12	1.57	-9.10	49.08	-0.35	0.47
UCHUMi(MPS)	2566	31.95	12.19	10.55	52.34	19.01	42.74

Return = Daily Returns; MPS = Market Price per Share; Min = Minimum; Max = Maximum & N = Number of observations.

The average daily return for Uchumi was 0.0438%, compared to 0.12% for the market (see table above). The total risk as measured by the standard deviation shows that Uchumi had higher risk of 3.4058% compared to 1.5731% of the market risk. This confirmed by looking at maximum and minimum values. In the period of the study, while the market showed a highest loss of 9.0950%, Uchumi reported a high negative return o 65.2903%. This is surprising given that this company's return is lower than that of the market.

The average share price for Uchumi was Kshs. 31.950 over the period April 1996 to 30th July 2006. This is after adjusting for bonus issues and dividends.

4.2 The Market Model

The market model is then used to establish the existence of relationship between the returns of Uchumi and the market return. The analysis result is a measure for market risk of Uchumi shares, i.e. Uchumi's common beta. A security's beta measures its sensitivity to market movements. This study cannot proceed in the absence of such sensitivity. The historical beta for a security could be estimated by examining the historical relationship between the return on the security and on market linear regression.

Table 4.2 **: Regression Analysis: UCHUMI returns versus MKT returns**

```
The regression equation is
UCHUr = 0.0044 + 0.329 MKTr
2564 cases used 2 cases contain missing values
Predictor       Coef     SE Coef          T        P
Constant     0.00445     0.06671       0.07    0.947
MKTr         0.32872     0.04230       7.77    0.000

S = 3.368      R-Sq = 2.3%      R-Sq(adj) = 2.3%
```

The result of regression analysis, with return on Uchumi (UCHUr) as dependent variable and returns on the index (MKTr) are summarized in table 4.2 above. The alpha of 0.0044 (with a p-value of 0.947) is not different from zero, suggesting a tendency of no results where there is no change in the market as a whole. In which case the variations in returns from holding Uchumi share is related to the market as a whole.

The beta for Uchumi is 0.329, suggesting that when the market return changes by one percentage point, Uchumi's, change by 0.329. This betas p-value is 0.000 suggesting that is not zero (0) and therefore has information content. That a relationship exists enable us to proceed with the study and establish the effect of delisting Uchumi on stock market.

4.3 Comparing Return – Estimation Window

The estimation window period was from 2nd May to 31st May i.e. a period of 31 days. The results are summarized in table 4.3 below.

Table 4.3: Descriptive Statistics – Estimation Windows

Variable	N	Mean	St. Dev.	Min	Max
Uchumi – Return	31	0.167	3.364	-6.429	8.856
Market Return	31	0.517	3.296	-7.974	15.804

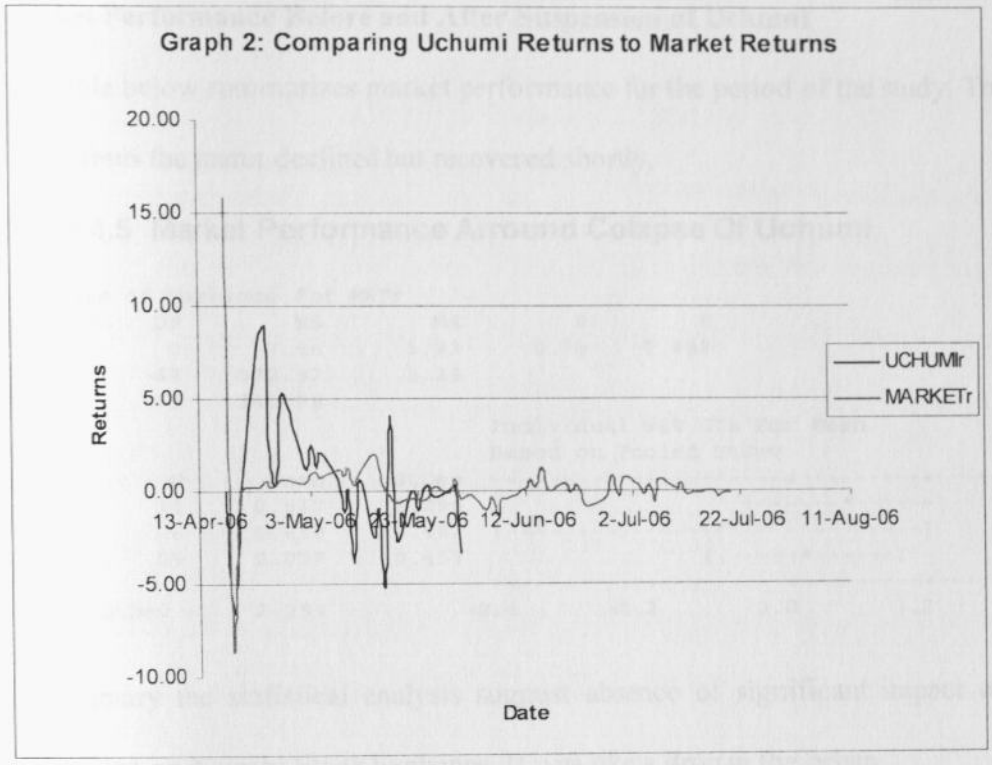
These were no big difference in the standard deviation between Uchumi and the market. However the average return of 0.167% was way below that of the market of 0.517%. However, given that the beta for Uchumi shares is below of 0.329 is below the market beta, we expect that on average the returns from Uchumi is below that of the market.

One-way ANOVA: UCHUr, MKTr (Estimation Window)

```
Analysis of Variance
Source     DF        SS        MS        F        P
Factor      1       1.9       1.9     0.17    0.681
Error      60     665.5      11.1
Total      61     667.4

                                        Individual 95% CIs For Mean
                                        Based on Pooled StDev
Level      N      Mean     StDev  ---+---------+---------+---------+---
UCHUr     31     0.167     3.364  (-----------*-----------)
MKTr      31     0.517     3.296        (-----------*-----------)
                                  ---+---------+---------+---------+---
Pooled StDev =    3.330           -0.80      0.00      0.80      1.60
```

However, inside the estimation window unusual observations are detected with Uchumi posting a low and high daily return on -6.43% and 8.86% respectively. These suggest unusual trading around the estimation window.



The graph capture a decline in Market returns immediately after Uchumi was suspended from the stock market. However the market recovers after a few days.

4.4 Market Performance around the Delisting of Uchumi.

The table (table 4.4) below shows that the market average return that was 0.517 in the estimation period, declined to -0.630 and regained to 0.077 after the event. The standard deviation of the market that was a high 3.296 over the estimation window shows high variability in returns, but damages to 0.482 during estimation windows and to 0.457% for post-events. The one way analysis of variance show no pronounced differences between Uchumi returns and market return.

Market Performance Before and After Suspension of Uchumi

The table below summarizes market performance for the period of the study. The average return from the maret declined but recovered shortly.

Table 4.5 Market Performance Arround Colapse Of Uchumi

```
Analysis of Variance for MKTr
Source     DF        SS        MS         F        P
Class       2      7.66      3.83      0.73    0.488
Error      63    332.92      5.28
Total      65    340.58

                                  Individual 95% CIs For Mean
                                  Based on Pooled StDev
Level      N      Mean     StDev  -+---------+---------+---------+-----
1         31     0.517     3.296                    (------*------)
2          6    -0.630     0.482  (---------------*---------------)
3         29     0.077     0.457                 (------*------)
                                  -+---------+---------+---------+-----
Pooled StDev =     2.299          -2.4      -1.2       0.0       1.2
```

In summary the statistical analysis suggest absence of significant impact of Uchumi suspension on Nairobi Stock Exchange. It was like a drop in the ocean.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION & RECOMMENDATIONS

The major contribution of this study has been the determination of whether Uchumi suspension had any effect on subsequent trading in shares on the NSE. It sought to answer the question as to whether suspension was beneficial or harmful to trading in other stocks. The results have important implications because cataclysmic events have significant influence on liquidity and share prices and thence returns.

The findings give an insight into the influence of Uchumi suspension on the share returns of companies listed at the Nairobi Stock Exchange. Consistent with Barrett et. al., (1987) the results show that Cataclysmic events-that is, unforeseen disastrous occurrences-particularly firm suspension from NSE does not have negative implications for stocks and bonds returns and or liquidity. Specifically, the study shows that the suspension had no adverse effects on the stock market.

Results indicate that liquidity and share prices of the listed firms were not negatively affected after Uchumi suspension. The mean return during the event window is lowest with a negative value while the estimation window and the post estimation window both show positive returns. Liquidity is shown not to be affected immediately after announcement contradicting Chen and Siems, (2002) assertion that prices of individual stocks reflect investors' hopes and fear about the future, and taken in aggregate, stock price movements can generate a tidal wave of activity which may be tragic for the entire market.

In support of evidence produced by Foerster and Karolyi (1996) that important inferences pertaining to the issue of capital market integration and regulation can be drawn from the reaction of stock prices to firm suspension, from the study Uchumi suspension did not significantly affect the share prices and liquidity of the other firms that were listed on NSE and thus Capital Markets Authority need not take into account these effects before the decision to suspend is made and just giving an explanation to investors prior to the suspension will suffice.

5.1 Policy Implications

The suspension of Uchumi was carried out by NSE so as to protect the general investing public; this was achieved at no cost as it did not result in losses to investors. However, the study should serve as a wake up call to NSE and the Capital Markets Authority that regulations are necessary but after a careful consideration of its effects on all stakeholders especially the investors as this is not always the case. Therefore there is the necessity of putting policies in place to guard against such regulations that are done without any studies being carried out.

5.2 Limitation of the Study

Some quoted companies at the Nairobi Stock Exchange were not included in the sample due to unavailability of data and other companies' data were outliers, while others did not trade during the period under study. This reduction in sample size would have affected the calculations of this study.

The study has made an implicit assumption that information on Uchumi suspension, only came to the market on the suspension date which has been taken to be the event date. The market has also been assumed to be efficient and thus this information was immediately reflected in the share prices. It has been assumed further that there were no other significant intervening variables that might have affected the share prices that went unrecorded. However to control for such intervening variables firms that issued dividends during the period under study were left out of the sample.

5.3 Recommendations for Further Research

It is important that a similar study with a bigger sample, time horizon and taking into account more cataclysmic events be conducted by using advanced time series models to enhance our understanding of the association between the cataclysmic events and share returns and liquidity of the NSE.

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APPENDICES

APPENDIX I: LIST OF COMPANIES AND THEIR SEGMENTS

Main Investment Market Segment (MIMS)

Agricultural

Brooke Bond Ltd. Ord. 10.00
Kakuzi Ltd. Ord. 5.00
Rea Vipingo Plantations Ltd. Ord. 5.00
Sasini Tea and Coffee Ltd. Ord. 5.00

Commercial and Services

African Lakes Corporation PLC Ord. 5.00
Car and General (K) Ltd. Ord. 5.00
CMC Holdings Ltd. Ord. 5.00
Hutchings Biemer Ltd. Ord. 5.00
Kenya Airways Ltd. Ord. 5.00
Marshalls (E.A) Ltd. Ord. 5.00
Nation Media Group Ord. 5.00
Tourism Promotion Services Ltd. Ord.5.00 (Serena)
Uchumi Supermarket Ltd. Ord. 5.00

Finance and Investment

Barclays Bank Ltd. Ord. 10.00
C.F.C Bank Ltd. Ord. 5.00
Housing Finance Co. Ltd. Ord. 5.00
I.C.D.C Investments Co. Ltd. Ord. 5.00
Jubilee Insurance Co. Ltd. Ord. 5.00
Kenya Commercial Bank Ltd. Ord. 5.00
National Bank of Kenya Ltd. Ord. 5.00
NIC Bank Ltd. Ord.5.00
Pan African Insurance Ltd. Ord.5.00
Standard Chartered Bank Ltd. Ord. 5.00

Industrial and Allied

Athi River Mining Ord. 5.00
B.O.C Kenya Ltd. Ord. 5.00
Bamburi Cement Ltd. Ord. 5.00
British American Tobacco Kenya Ltd. Ord. 5.00
Carbacid Investments Ltd. Ord. 5.00
Crown Berger Ltd. Ord. 5.00
Dunlop Kenya Ord. 5.00
E.A Cables Ltd. Ord. 5.00
E.A Portland Cement Ltd. Ord. 5.00
East African Breweries Ltd. Ord. 10.00
Firestone East Africa Ltd. Ord. 5.00
Kenya Oil Company Ltd. Ord. 5.00

Mumias Sugar Company Ltd. Ord. 2.00
Kenya Power and Lighting Ltd. Ord. 5.00
Total Kenya Ltd. Ord. 5.00
Unga Group Lltd. Ord. 5.00

Alternative Investment Market Segment
A. Baumann and Company Ltd. Ord. 5.00
City Trust Ltd. Ord. 5.00
E.A Packaging Ltd. Ord. 5.00
Eaagads Ltd. Ord. 1.25
Express Ltd. Ord. 5.00
Williamson Tea Kenya Ltd. Ord. 5.00
Kapchorua Teaa Company Ltd. Ord. 5.00
Kenya Orchards Ltd. Ord. 5.00
Limuru Tea Company Ltd. Ord. 5.00
Standard Newspapers Group Ord. 5.00

APPENDIX II: NSE 20 SHARE INDEX FIRMS.

Unilever Tea Kenya Limited
Williamson Tea Kenya Limited.
Kakuzi
Sasini Tea and Coffee Limited.
Uchumi Supermarket.
Kenya Airways Limited
TPS-Serena
Nation Media Group
Barclays Bank (K) Limited.
Diamond Trust Bank Kenya Limited.
Kenya Commercial Bank Limited
Standard Chartered Bank Limited.
Bamburi Cement Limited
British Oxygen Company Kenya Limited
National Industrial Credit Bank Limited
East Africa Breweries Limited
Sameer East Africa Limited
Kenya Power and Lighting Company Limited
Total Kenya Limited.
BAT Kenya Limited

APPENDIX III: VOLUME TRADED/LIQUIDITY MEASURE

Results for: Data For Analysis- Estimation Window.xls

Regression Analysis: UCHUr versus MKTr

The regression equation is
UCHUr = 0.056 + 0.215 MKTr

Predictor	Coef	SE Coef	T	P
Constant	0.0562	0.6084	0.09	0.927
MKTr	0.2148	0.1853	1.16	0.256

S = 3.345 R-Sq = 4.4% R-Sq(adj) = 1.1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	15.03	15.03	1.34	0.256
Residual Error	29	324.53	11.19		
Total	30	339.57			

Unusual Observations

Obs	MKTr	UCHUr	Fit	SE Fit	Residual	St Resid
1	15.8	0.000	3.451	2.896	-3.451	-2.06RX
2	-8.0	-6.429	-1.656	1.684	-4.772	-1.65 X
5	0.2	8.400	0.105	0.603	8.295	2.52R
6	0.5	8.856	0.168	0.601	8.689	2.64R

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence.

One-way ANOVA: UCHUr, MKTr (Estimation Window)

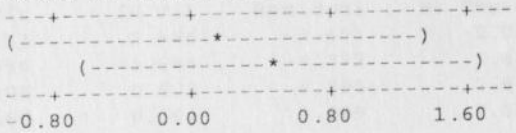
Analysis of Variance

Source	DF	SS	MS	F	P
Factor	1	1.9	1.9	0.17	0.681
Error	60	665.5	11.1		
Total	61	667.4			

Level	N	Mean	StDev
UCHUr	31	0.167	3.364
MKTr	31	0.517	3.296

Pooled StDev = 3.330

Individual 95% CIs For Mean Based on Pooled StDev



Results for: Data For Calculating Beta.xls

One-way ANOVA: UCHUr, MKTr (From 1996 to 31st July 2006)

Analysis of Variance

Source	DF	SS	MS	F	P
Factor	1	7.35	7.35	1.04	0.307
Error	5128	36095.28	7.04		
Total	5129	36102.64			

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
UCHUr	2566	0.044	3.406	(----------*----------)
MKTr	2564	0.120	1.573	(----------*----------)
Pooled StDev =		2.653		0.000 0.080 0.160

One-way ANOVA: UCHUr, MKTr (up to 30 days before event widow)

Analysis of Variance

Source	DF	SS	MS	F	P
Factor	1	6.63	6.63	0.95	0.330
Error	5066	35424.37	6.99		
Total	5067	35431.00			

Level	N	Mean	StDev	Individual 95% CIs For Mean Based on Pooled StDev
UCHUr	2535	0.042	3.407	(----------*----------)
MKTr	2533	0.115	1.541	(----------*----------)
Pooled StDev =		2.644		0.000 0.080 0.160

Results for: Data For Analysis- Estimation Window.xls

Regression Analysis: UCHUr versus MKTr

The regression equation is
UCHUr = 0.056 + 0.215 MKTr

Predictor	Coef	SE Coef	T	P
Constant	0.0562	0.6084	0.09	0.927
MKTr	0.2148	0.1853	1.16	0.256

S = 3.345 R-Sq = 4.4% R-Sq(adj) = 1.1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	15.03	15.03	1.34	0.256
Residual Error	29	324.53	11.19		
Total	30	339.57			

Unusual Observations

Obs	MKTr	UCHUr	Fit	SE Fit	Residual	St Resid
1	15.8	0.000	3.451	2.896	-3.451	-2.06RX
2	-8.0	-6.429	-1.656	1.684	-4.772	-1.65 X
5	0.2	8.400	0.105	0.603	8.295	2.52R
6	0.5	8.856	0.168	0.601	8.689	2.64R

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence.

One-way ANOVA: UCHUr, MKTr

Analysis of Variance

Source	DF	SS	MS	F	P
Factor	1	1.9	1.9	0.17	0.681
Error	60	665.5	11.1		

```
Total       61     667.4
                                  Individual 95% CIs For Mean
                                  Based on Pooled StDev
Level       N       Mean     StDev  ---+---------+---------+---------+---
UCHUr       31     0.167     3.364  (-------------*-------------)
MKTr        31     0.517     3.296        (-------------*-------------)
                                  ---+---------+---------+---------+---
Pooled StDev =     3.330            -0.80      0.00      0.80      1.60
```

Results for: Data For Calculating Beta.xls

Descriptive Statistics: UCHUr, MKTr, UCHU

Variable	N	N*	Mean	Median	TrMean	StDev
UCHUr	2566	0	0.0438	0.0000	0.0140	3.4058
MKTr	2564	2	0.1195	0.0138	0.0580	1.5731
UCHU	2566	0	31.950	32.120	31.978	12.186

Variable	SE Mean	Minimum	Maximum	Q1	Q3
UCHUr	0.0672	-65.2903	57.6923	-0.6197	0.6704
MKTr	0.0311	-9.0950	49.0765	-0.3460	0.4669
UCHU	0.241	10.550	52.340	19.009	42.740

Regression Analysis: UCHUr versus MKTr

The regression equation is
UCHUr = 0.0044 + 0.329 MKTr

2564 cases used 2 cases contain missing values

Predictor	Coef	SE Coef	T	P
Constant	0.00445	0.06671	0.07	0.947
MKTr	0.32872	0.04230	7.77	0.000

S = 3.368 R-Sq = 2.3% R-Sq(adj) = 2.3%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	685.33	685.33	60.40	0.000
Residual Error	2562	29067.67	11.35		
Total	2563	29753.00			

Unusual Observations

Obs	MKTr	UCHUr	Fit	SE Fit	Residual	St Resid
136	1.2	27.5083	0.4113	0.0816	27.0971	8.05R
157	-0.5	-7.4230	-0.1695	0.0720	-7.2535	-2.15R
164	0.4	11.3830	0.1507	0.0679	11.2323	3.34R
165	0.6	-11.7889	0.2098	0.0699	-11.9987	-3.56R
185	-0.0	8.4843	0.0027	0.0667	8.4817	2.52R
199	0.8	8.4102	0.2642	0.0723	8.1460	2.42R
201	8.1	5.5630	2.6797	0.3456	2.8833	0.86 X
219	1.0	10.4510	0.3262	0.0758	10.1248	3.01R
225	0.4	8.1587	0.1503	0.0679	8.0084	2.38R
226	0.8	-8.9790	0.2665	0.0724	-9.2455	-2.75R
242	-0.6	-9.7105	-0.1881	0.0729	-9.5224	-2.83R
275	1.3	8.3679	0.4262	0.0827	7.9417	2.36R
328	0.3	7.5095	0.1107	0.0671	7.3987	2.20R

396	-0.8	7.3603	-0.2605	0.0772	7.6208	2.26R
406	-0.2	-14.0940	-0.0556	0.0677	-14.0384	-4.17R
407	-0.2	8.0313	-0.0545	0.0677	8.0858	2.40R
414	-2.1	9.9034	-0.6938	0.1159	10.5972	3.15R
415	-0.3	-8.7851	-0.1093	0.0694	-8.6758	-2.58R
445	1.1	7.4106	0.3682	0.0785	7.0425	2.09R
491	3.8	-2.1348	1.2687	0.1711	-3.4035	-1.01 X
494	-0.1	-7.8706	-0.0322	0.0672	-7.8384	-2.33R
495	-0.1	11.9552	-0.0336	0.0673	11.9887	3.56R
533	0.8	7.9755	0.2702	0.0726	7.7053	2.29R
545	0.3	-7.4348	0.0875	0.0668	-7.5223	-2.23R
561	-0.2	-7.2565	-0.0743	0.0682	-7.1822	-2.13R
563	0.7	7.4351	0.2196	0.0703	7.2155	2.14R
660	-0.4	-7.8265	-0.1354	0.0704	-7.6912	-2.28R
667	0.1	8.2206	0.0223	0.0666	8.1983	2.43R
668	-0.5	-7.8657	-0.1545	0.0712	-7.7112	-2.29R
697	4.2	-0.7055	1.3857	0.1850	-2.0912	-0.62 X
751	-1.8	-12.5194	-0.6028	0.1065	-11.9167	-3.54R
752	1.4	9.1556	0.4670	0.0860	8.6886	2.58R
897	-0.9	-11.1111	-0.2962	0.0796	-10.8149	-3.21R
915	0.3	8.8139	0.1033	0.0670	8.7107	2.59R
916	0.2	-7.9250	0.0709	0.0666	-7.9959	-2.37R
917	1.3	11.9196	0.4314	0.0831	11.4882	3.41R
918	-1.1	-7.6662	-0.3544	0.0840	-7.3118	-2.17R
989	-1.3	-12.3803	-0.4148	0.0889	-11.9656	-3.55R
993	0.4	10.1616	0.1243	0.0673	10.0373	2.98R
994	-0.5	-7.9796	-0.1459	0.0709	-7.8336	-2.33R
1176	0.2	-13.8326	0.0803	0.0667	-13.9129	-4.13R
1297	-0.5	-8.0514	-0.1749	0.0722	-7.8765	-2.34R
1337	-4.7	-0.5525	-1.5373	0.2140	0.9849	0.29 X
1399	2.7	8.6661	0.8975	0.1284	7.7686	2.31R
1413	-2.6	-21.4607	-0.8522	0.1331	-20.6085	-6.12R
1503	-1.8	-25.9259	-0.6027	0.1065	-25.3232	-7.52R
1507	4.3	0.0000	1.4089	0.1878	-1.4089	-0.42 X
1632	-0.3	-7.1429	-0.0928	0.0688	-7.0501	-2.09R
1633	-0.8	-7.6923	-0.2450	0.0762	-7.4473	-2.21R
1637	0.9	8.3333	0.2899	0.0737	8.0434	2.39R
1638	0.4	7.6923	0.1341	0.0675	7.5583	2.24R
1639	0.3	7.1429	0.1146	0.0671	7.0283	2.09R
1673	2.3	11.7647	0.7685	0.1145	10.9962	3.27R
1677	0.2	-9.0909	0.0643	0.0666	-9.1552	-2.72R
1681	-1.1	-7.8947	-0.3548	0.0840	-7.5400	-2.24R
1682	-0.1	-8.5714	-0.0128	0.0669	-8.5587	-2.54R
1699	1.1	15.7895	0.3704	0.0787	15.4191	4.58R
1703	-4.9	0.0000	-1.6098	0.2229	1.6098	0.48 X
1707	5.2	0.0000	1.7223	0.2260	-1.7223	-0.51 X
1708	5.9	20.4710	1.9349	0.2523	18.5361	5.52RX
1709	5.0	11.8797	1.6536	0.2176	10.2261	3.04RX
1710	3.1	9.6774	1.0124	0.1413	8.6650	2.57R
1713	-0.6	-13.9618	-0.1962	0.0733	-13.7656	-4.09R
1714	-2.1	-8.6144	-0.6994	0.1165	-7.9150	-2.35R
1715	-1.6	-9.0143	-0.5272	0.0991	-8.4871	-2.52R
1717	0.1	13.2624	0.0527	0.0665	13.2097	3.92R
1740	-0.3	8.9749	-0.0879	0.0686	9.0627	2.69R
1756	-1.7	-65.2903	-0.5535	0.1016	-64.7369	-19.23R
1758	2.3	38.2435	0.7513	0.1128	37.4922	11.14R
1759	-1.2	-11.2605	-0.4026	0.0879	-10.8579	-3.22R
1761	-0.8	9.8485	-0.2736	0.0781	10.1221	3.01R
1762	3.6	57.6923	1.1898	0.1618	56.5026	16.79R
1763	-0.0	9.3356	-0.0016	0.0668	9.3372	2.77R
1764	0.4	7.0000	0.1340	0.0675	6.8660	2.04R
1768	0.9	8.8224	0.3025	0.0744	8.5199	2.53R
1790	3.9	0.0000	1.2712	0.1714	-1.2712	-0.38 X

1792	4.1	-0.9686	1.3598	0.1819	-2.3283	-0.69 X
1793	4.6	2.3230	1.5254	0.2019	0.7976	0.24 X
1873	-1.5	-19.0000	-0.5049	0.0970	-18.4951	-5.49R
1874	0.9	7.3673	0.3099	0.0748	7.0573	2.10R
1898	0.3	7.0000	0.1145	0.0671	6.8855	2.04R
1899	0.2	9.3458	0.0714	0.0666	9.2744	2.75R
1900	0.0	9.4017	0.0161	0.0666	9.3856	2.79R
1932	3.8	2.2998	1.2419	0.1679	1.0580	0.31 X
1970	0.9	8.5199	0.3006	0.0743	8.2194	2.44R
1973	4.3	0.0000	1.4198	0.1891	-1.4198	-0.42 X
1998	-1.8	7.3111	-0.6028	0.1065	7.9139	2.35R
2021	0.8	8.3159	0.2793	0.0731	8.0365	2.39R
2094	-0.3	-10.5671	-0.1002	0.0690	-10.4669	-3.11R
2096	-0.9	-10.2474	-0.2780	0.0783	-9.9694	-2.96R
2097	0.2	-9.0535	0.0838	0.0667	-9.1373	-2.71R
2099	-0.9	-7.9180	-0.2939	0.0794	-7.6242	-2.26R
2104	1.3	10.0000	0.4193	0.0822	9.5807	2.85R
2105	-0.2	9.9174	-0.0737	0.0682	9.9911	2.97R
2106	0.7	9.7744	0.2386	0.0711	9.5359	2.83R
2107	0.6	9.9315	0.1959	0.0693	9.7357	2.89R
2149	-0.7	-17.2189	-0.2324	0.0754	-16.9864	-5.04R
2156	0.8	7.4380	0.2801	0.0731	7.1580	2.13R
2161	1.4	9.9237	0.4499	0.0846	9.4738	2.81R
2190	0.9	8.2162	0.3164	0.0752	7.8998	2.35R
2256	-0.6	-9.5129	-0.1864	0.0728	-9.3264	-2.77R
2297	-0.3	-7.8200	-0.1106	0.0694	-7.7094	-2.29R
2339	1.2	-9.5477	0.3917	0.0802	-9.9395	-2.95R
2341	0.9	-6.8182	0.3087	0.0747	-7.1269	-2.12R
2342	0.3	-9.7561	0.1147	0.0671	-9.8708	-2.93R
2344	0.6	6.9767	0.2141	0.0700	6.7627	2.01R
2367	0.2	9.9688	0.0566	0.0665	9.9123	2.94R
2368	0.7	9.9150	0.2448	0.0714	9.6702	2.87R
2369	0.3	8.2474	0.1137	0.0671	8.1337	2.42R
2375	1.1	-9.1139	0.3681	0.0785	-9.4820	-2.82R
2377	-0.7	-9.1922	-0.2399	0.0759	-8.9523	-2.66R
2386	-0.0	-9.6552	-0.0006	0.0668	-9.6546	-2.87R
2403	1.1	8.3333	0.3645	0.0783	7.9688	2.37R
2412	0.6	9.3645	0.2094	0.0699	9.1551	2.72R
2417	-0.4	-8.5714	-0.1382	0.0705	-8.4332	-2.50R
2419	-0.1	-12.5000	-0.0249	0.0671	-12.4751	-3.70R
2420	-0.9	-10.0000	-0.3007	0.0799	-9.6993	-2.88R
2421	-0.9	-8.3333	-0.2817	0.0786	-8.0516	-2.39R
2426	0.4	8.1448	0.1458	0.0678	7.9990	2.38R
2427	0.0	10.0418	0.0135	0.0666	10.0283	2.98R
2428	-0.0	7.9848	-0.0094	0.0669	7.9942	2.37R
2433	-6.4	-0.6431	-2.0851	0.2819	1.4420	0.43 X
2434	49.1	-0.9709	16.1370	2.0717	-17.1079	-6.44RX
2461	-0.1	-7.6389	-0.0364	0.0673	-7.6025	-2.26R
2462	0.2	7.1429	0.0782	0.0667	7.0647	2.10R
2463	30.8	8.0702	10.1371	1.3004	-2.0669	-0.67 X
2464	0.6	9.7403	0.1881	0.0691	9.5522	2.84R
2469	0.9	7.5000	0.3098	0.0748	7.1902	2.14R
2517	-9.1	0.0000	-2.9853	0.3954	2.9853	0.89 X
2518	25.8	-0.3030	8.4790	1.0874	-8.7820	-2.75RX
2536	15.8	0.0000	5.1995	0.6667	-5.1995	-1.57 X
2537	-8.0	-6.4286	-2.6168	0.3487	-3.8118	-1.14 X
2540	0.2	8.4000	0.0794	0.0667	8.3206	2.47R
2541	0.5	8.8561	0.1749	0.0686	8.6812	2.58R

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence.