

**THE HOLIDAY EFFECT ON STOCK RETURNS AT THE
NAIROBI SECURITIES EXCHANGE**

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**A RESEARCH PROJECT PRESENTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
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DECLARATION

This research project is my original work and has not been presented to any other college or any other institution of higher learning for accreditation.

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DEDICATION

I dedicate this project to my husband Peter Wachira and our children Ann Muthoni, Serafin Wanjiku and Marta Wangeci.

TABLE OF CONTENTS

THE HOLIDAY EFFECT ON STOCK RETURNS AT THE	i
NAIROBI SECURITIES EXCHANGE	i
DECLARATION	ii
ACKNOWLEDGEMENT	iii
DEDICATION	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ABBREVIATIONS AND ACRONYMS	ix
ABSTRACT	x
CHAPTER ONE : INTRODUCTION	1
1.1 Background of the Study	1
1.1.1 Holiday Effect	2
1.1.2 Stock Return	3
1.1.3 Holiday Effect and Stock Returns	3
1.1.4 Nairobi Securities Exchange	4
1.2 Research Problem	5
1.3 Research Objective	6
1.4 Value of the Study	6
CHAPTER TWO : LITERATURE REVIEW	8
2.1 Introduction	8
2.2 Theoretical Literature Review	8
2.2.1 Efficient Market Hypothesis	8
2.2.2 Random Walk Theory	9
2.2.3 Behavioral Finance	10
2.3 Determinants of Stock Returns	10
2.3.1 Stock Market Anomalies	10
2.3.2 Profitability Level of the Firm	11
2.3.3 Size of the Firm	11

2.3.4 Trading Volume	12
2.4 Empirical Literature Review	12
2.5 Conceptual Framework	17
2.6 Summary of Literature Review	17
CHAPTER THREE: RESEARCH METHODOLOGY	19
3.1 Introduction	19
3.2 Research Design	19
3.3 Population of the Study	19
3.4 Data Collection Method	19
3.5 Data Analysis Techniques	20
3.5.1 Operationalization of Study Variables	21
3.5.2 Test of Significance	21
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION	22
4.1 Introduction	22
4.2 Data Analysis	22
4.3: Results and Discussion of Findings	23
4.4 Test of Significance of Abnormal Returns	35
CHAPTER FIVE : SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	37
5.1 Introduction	37
5.2 Summary of Findings	37
5.3 Conclusion.....	38
5.4 Recommendations	38
5.5 Limitations of the Study	38
5.6 Suggestions for Further Studies	38
REFERENCES.....	40
Appendix A: Companies Listed at the NSE	45
Appendix B: R Code for Data Analysis	46
Appendix C: NSE All Share Index	48

LIST OF TABLES

Table 4.1: Summary of Annual, Preholiday and Postholiday Returns for New Year Day.....	23
Table 4.2: Wilcoxon Statistic Values for New Year Day.....	24
Table 4.3: Summary of Annual, Preholiday and Postholiday returns for Labour Day.....	25
Table 4.4: Wilcoxon Statistic Values for Labour Day.....	26
Table 4.5: Summary of Annual, Preholiday and Postholiday returns for Madaraka Day	27
Table 4.6: Wilcoxon Statistic Values for for Madaraka Day.....	28
Table 4.7: Summary of Annual, Preholiday and Postholiday returns for Mashujaa Day.	29
Table 4.8: Summary of Annual, Preholiday and Postholiday returns for Mashujaa Day.	30
Table 4.9: Summary of Annual, Preholiday and Postholiday returns for Jamhuri Day ...	31
Table 4.10: Wilcoxon Statistic Values for Jamhuri Day	31
Table 4.11: Summary of Annual, Preholiday and Postholiday returns for Christmas Day.....	33
Table 4.12: Wilcoxon Statistic Values for Christmas Day	34
Table: 4.13 Summary of Mean Returns	34
Table 4.14: Cumulative Abnormal Holiday Returns	35
Table 4.15: Overall Wilcoxon Signed Rank Test for Abnormal Returns.....	35

LIST OF FIGURES

Figure: 1: New Year Day Return Differences	24
Figure: 2: Labour Day Return Differences	26
Figure 3: Madaraka Day Return Differences	28
Figure: 4 : Mashujaa Day Return Differences	30
Figure: 5: Jamhuri Day Return Differences	31
Figure: 6: Christmas Day Return Differences	33

ABBREVIATIONS AND ACRONYMS

AIG	-	American Investment Group
AMEX	-	American Exchange
ANOVA	-	Analysis of Variance
CAPM	-	Capital Asset Pricing Model
CMA	-	Capital Markets Authority
CPRA	-	Comparative period Return Approach
CRSP	-	Centre for Research for Security Prices
DJIA	-	Dow Jones Industrial Average
EMH	-	Efficient Markets Hypothesis
JSE	-	Johannesburg Stock Exchange
KSE	-	Karachi stock Exchange
NASDAQ	-	National Association of Securities Dealers Automated Quotations
NASI	-	Nairobi All Share Index
NSE	-	Nairobi Securities Exchange
NYSE	-	New York Securities Exchange
TAIEX	-	Taiwan Stock Exchange Capitalization Weighted Stock Index
U.S	-	United States of America

ABSTRACT

The objective of the study was to test for the existence of the holiday effect on stock returns at the Nairobi Securities Exchange. Daily stock market returns were computed for five days before the holidays and five days after the holidays. The results were further analyzed by computing the annual return, and cumulative annualized preholiday and post holiday returns and subsequently computing the abnormal returns. Secondary data used in this study constituted daily NASI indices obtained from the NSE for the period 1st March 2008 to 31st August 2016. This study adopted a descriptive research design and used the Wilcoxon signed rank test procedure to compute the annualized cumulative returns for holidays at the NSE. Data analysis was done using the statistical package R.

Stock return fluctuations occur in all the preholiday and post-holiday periods. Preholiday and post-holiday periods around Christmas and New Year holidays record the highest mean annualized returns. The results of the joint Wilcoxon signed rank test for all holidays show that preholiday abnormal returns have a P –value of 0.0126 while postholiday returns have a P-value of 0.0008 leading to the rejection of the null hypothesis. These results indicate that while trading at the NSE, trading in shares five days before and five days after a holiday consistently over a period of time can enable an investor to make higher profits. The study therefore implies that the NSE is an efficient market in the weak form and therefore CMA as a regulator should put in measures to ensure that there is increased market efficiency at the NSE.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The independence of successive changes in stock prices was put forward by Kendall (1953) and Cootner (1962) in their research in finance. Research findings have shown the existence of seasonal patterns that are followed by security prices and which when exploited can lead to higher returns. These patterns have been classified as stock market anomalies and have been a subject of research in finance literature. Holiday effect is a stock market anomaly whereby stock returns just before holidays are higher compared to other days' returns (Michayluk & Brockman, 1998).

Market analysts apply technical theories and fundamental theories to predict stock prices. Technical theories apply the history of stock price behavior to predict future prices whereas fundamental theories determine the intrinsic value of a stock derived from the earning potential of the stock which is determined by factors such as the economy, price earnings ratios, earnings per share and profitability which guide the stock price (Fama, 1965). There are also random walk theorists who believe that with security markets being efficient, competition among the rational traders who are well versed with relevant information about securities ensures that stock prices are an estimate of the intrinsic value of the various securities that are traded.

Nairobi Securities Exchange (NSE) is the Kenyan capital market where investors buy and sell their stocks. The NSE mobilizes domestic savings resulting in the reallocation of financial resources. Studies done on the efficiency of the NSE include: - Ndungu

(2003) on the size effect; Rasugu (2005) on the holiday effect; Osman (2007) on the holiday, Githiga (2008) on the Random walk theory and Ndonga (2014) on the Holiday effect.

1.1.1 Holiday Effect

Michayluk and Brockman (1998) describe the holiday effect as whereby equity stocks earn abnormally larger returns prior to holidays in comparison to other trading days. According to Dodd and Gakhovich (2011) holiday effect is realized where abnormal stock returns are earned around holidays. The occurrence whereby stock returns are higher on a day before a holiday is referred to as the holiday effect (Rowjee, 2014). Holiday effect increases the predictive power of investors and thus they are able to devise trading strategies that may earn them higher returns before holidays Zafar, Amjad, Chughtai, &Urooj; (2012) which is against the EMH and it will interesting to see the outcome which will help determine the level of market efficiency at the NSE.

Ariel (1990) used US stock market data for the period 1963 to 1982 to study the holiday effect while (Zafar et al; 2012) used stock market prices in the Karachi Stock Exchange for the years 1991 to 2007. Ndonga (2014) in the study of the holiday effect at the NSE adopted a descriptive research design and used secondary data of 62 companies listed at the NSE from 2011 to 2013. Osman (2007) used daily AIG index returns of 44 companies from 1st January 1998 to 31st December 2006. Rasugu (2005) used the daily stock prices (bids) as an approximation of the transaction prices for the period 1st January 1998 to 31st December 2002.

1.1.2 Stock Return

According to Frankel & Lee (1998), stock returns refer to the loss or gain on investment which is sensitive to both fundamental and technical expectations in the market. According to Hemed (2015), the gain or loss in a security that is made up of income and capital gains relative on an investment and is usually presented in form of a percentage is called a stock return. According to Reilly and Brown (2003), stock return compensates investors for inflation and uncertainty of earnings.

According to Pan (2012), stock returns are calculated as a relationship of the change in daily stock prices while incorporating dividend earned by the stock in the year and divided by the opening price of the stock.

1.1.3 Holiday Effect and Stock Returns

The random walk theory puts forward the proposition that stock prices are random, independent and are not predictable by use of past stock prices. Therefore stock returns are not expected to change because a there is a holiday approaching since the information about the holiday should have been already incorporated in the price of the stocks prices. Since days prior to holidays are shown to have lower liquidity which means less cash and therefore, people sell stocks hence they get more cash before a holiday. Investors typically lessen their shareholding prior to a holiday due to their perceived negative beliefs about new information. Investors tend to sell shares thereby increasing their supply before a holiday .A possible trading strategy is to buy shares before the holiday when everyone else is selling and sell after the holiday when everyone else is buying (Rasugu, 2005).

Research by Ariel (1990), documented that there were high returns on the trading day before the holidays. Chong et al (1998) reported a reduction of the preholiday returns in the USA, UK and Hong Kong stock markets. According to Bhana (1994) there were higher preholiday returns at the Johannesburg Stock Exchange (JSE).

1.1.4 Nairobi Securities Exchange

The Nairobi Stock Exchange started in 1954 rising from a voluntary association of stock brokers registered under the Societies Act. Before independence, only Europeans were allowed to trade at the NSE (Ng'ang'a 2013). The NSE opens from Monday to Friday with trading hours being from 9am to 3pm daily (www.nse.co.ke) and is closed on Saturday, on Sunday and public holidays. The trading of equities, bonds and preference shares of 65 firms listed at the NSE is done through the dealership market whereby, trading is carried out continuously and the clearing house which involves use of stock brokers (Kingori, 1995). The NSE is regulated by the Capital Markets Authority that was set up in January 1990 through the Capital Markets Authority Act (Cap 495A) (www.nse.co.ke).

Research has been done to test the efficiency of the NSE in regard to anomalies that have been observed in stock markets in other parts of the world. Lusinde (2012) reported that there is increased stock return volatility around general elections due to investors' increased sensitivity to developing political landscapes. Research by Mokuia (2003) concluded that there is no weekend effect. Ndungu (2003) found that the size effect is weakly exhibited. Mwangangi (2013) reported that economic growth, exchange rates and overall inflation affects stock returns at NSE. Long run returns on

stocks at the NSE is higher than long run real return on bonds at the NSE (Lukereto, 2008).

Studies done at the NSE include Rasugu (2005) and Osman (2007) who reported the absence of the holiday effect while Ndonga (2014) , Atala (2015) and Hemed (2015) show the presence of the holiday effect. Githiga (2008) found that share prices followed a random walk and that technical analysis of identifiable stock return trends cannot be used to earn investors a higher return at the NSE.

1.2 Research Problem

The EMH theory has been put into question by research findings that have shown the existence of stock market patterns which if exploited could earn investors abnormal returns. Ariel (1990) and Bhana (1994) have documented higher preholiday returns in US stock market and the Johannesburg Stock exchange respectively which are large stock markets in the developed world and which according to Fama (1965), are thought to be efficient. Research done on stock market anomalies at the NSE have documented variations in volatility of stock returns thus implying that the NSE is inefficient (Hemed, 2015) and it is therefore vital for a test of the existence of the holiday effect on the returns of stocks traded at the NSE.

Ndonga (2014) studied the holiday effect on share price volatility at the NSE and found that there is a holiday effect on returns of stocks traded at the NSE. This study covered a period of 3 years and according to Rasugu (2005) ,a period of 4 years is good enough to study stock price behavior hence the findings of this study may not be conclusive on the existence of the holiday effect. Research on holiday effect by

Atala (2015) and Hemed (2015) using event methodology concluded that the holiday effect exists at the NSE. Moreover, Atala (2015) studied the holiday effect on Muslim holidays which are faith based holidays and since there are other types of holidays that may affect the stock returns at the NSE, the research findings from this study may not be generalized to be representative of all other holidays.

Rasugu (2005) showed that there is no holiday effect at the NSE. This study was done 11 years ago and there have been changes in the economy and at the NSE hence the need for a retest of the holiday effect. From the review of empirical evidence on the holiday effect, it is still inconclusive if this stock market anomaly exists at the NSE. This study will investigate if the holiday effect can be associated with stock returns at the NSE and thereby answer the question; does the holiday effect exist at the NSE?.

1.3 Research Objective

The objective of this study is to investigate the existence of the holiday effect on stock returns at the Nairobi Securities Exchange.

1.4 Value of the Study

The study will add to the existing research findings on holiday effect stock anomaly at the NSE. Literature reviewed in the study will provide scholars with theoretical background on the holiday effect as well as identify gaps in research studies done that form a basis for further literature review.

The findings will be beneficial to the Capital Markets Authority in formulating and implementing policies geared towards developing a more efficient market. Knowledge of the holiday effect will benefit investors when making buy, sell or hold decisions and increased information to advice their portfolio managers or stock broker on the trading approach to adopt, whether passive or active trading.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter theories relevant to the research study and determinants of stock returns are discussed. Earlier studies on holiday effect are reviewed and gaps in the literature identified. The conceptual framework that guides the study is also discussed.

2.2 Theoretical Literature Review

This section discusses the theories that explain behavior and changes in stock returns namely; the Efficient Markets Hypothesis, Random Walk Theory and Behavioral Finance Theory.

2.2.1 Efficient Market Hypothesis

Fama (1970) is the finance scholar who came up with the efficient market hypothesis (EMH) theory that sought to classify the level of efficiency of a stock market in relation to the ability of assets traded to reflect available information. Three types of market efficiencies were identified namely; the weak form, the semi strong form and the strong form of market efficiency depending on the amount of information that has been incorporated into the stock prices. In a weak form current prices of stocks reflect historical prices. Stock markets where asset prices reflect all public information are referred to as being efficient in the semi strong form. On the other hand, stock markets whose asset prices incorporate all information whether public or private information are said to be in the strong form of market efficiency.

In an efficient market, activities of rational traders with relevant information will always cause the asset price to be an estimate of the intrinsic value of the asset. The absence of the holiday effect can contribute significantly to the proposition that a market is efficient and devoid of behavioral biases that would result in the holiday effect anomaly (Atala, 2015). For this study, EMH propositions will provide the basis for determining the efficiency of the NSE.

2.2.2 Random Walk Theory

According to Bachelier (1900), in an efficient market, asset prices follow a random walk trend and are therefore normally distributed leading to the random walk hypothesis which states that changes in asset prices are random and do not display any pattern.

In agreement with Bachelier (1900), Kendall (1953), put forward that the Random Walk Theory showing that stock prices follow a random walk making it difficult to make a profit from trading strategies that utilize observed stock market trends. Roberts (1959) found that patterns of price changes were random. For this study, the random walk theory implies that stock returns on a day preceding a holiday should not be higher than returns from any other trading day. Therefore, it will be important to see if there are identifiable trends of stock returns that can be exploited by investors to earn abnormal returns.

2.2.3 Behavioral Finance

There are usually market participants who are classified as irrational due to their inability to make use of new information to make better trading decisions (Barberis & Thaler 2003). According to Makiel (2003), these irrational investors are prone to suboptimal judgment that lead to mispricing of assets being traded and identifiable trends in stock returns. Behavioral finance theory is relevant to this study because it will help to see how decisions on when and how to buy or sell stocks are affected by individual investors' positive emotion around holidays.

2.3 Determinants of Stock Returns

According to Lee (1998), stock return is defined as the gain or loss resulting from an investment over time and is measured by the actual mean return or expected rate of return. Factors that affect stock returns include; stock market anomalies, profitability of a company, size of the firm and volume of shares traded as discussed below.

2.3.1 Stock Market Anomalies

According to Nawaz and Mirza (2012), an unusual pattern of stock returns is described as a stock market anomaly. Anomalies that have been identified through research studies include; Holiday effect, January effect and Weekend effect. Brockman and Michayluk (1985) describe the holiday effect being high preholiday stock returns. Pettengill (1989) found that significant pre-holiday returns are obtained by stocks of small capitalization companies. Ariel (1990) also found higher pre-holiday returns in the US capital markets.

According to Rasugu 2005, January effect occurs when stock returns are higher in January than in any other month of the year. From research done, the January effect is present at the NSE. Weekend effect refers to a stock market anomaly that manifests with low stock prices on Mondays which start rising on other days of the week French, (2008).

2.3.2 Profitability Level of the Firm

Shareholders expect a high return that gives the shortest possible investment payback on their investment. Managers are expected to make decisions that aim at increasing the shareholders' wealth which is measured by value of after tax cash flows available to a company. The profit realized by a firm is usually an indicator of the shareholders wealth.

Where a firm has increased profits and is able to pay high dividends, these dividends act as positive information signal in the stock market and the share prices could experience an upward shift holding other factors constant. When losses are reported, they serve as an indicator of adversity on the prospects of the company and in most instances leads to a downward shift of the share prices (Makokha, 2012).

2.3.3 Size of the Firm

Banz (1981) found that larger firms' stocks have lower returns than smaller firms' stocks. According to Schwert (1983), small firms' stocks in the United States and in Australia have higher average returns especially in the first few days of January. These stocks are not traded frequently and tend to have lower prices and higher bid ask spreads that leads to high transaction costs.

According to CAPM small firms have shown higher betas than large firms leading to higher returns even after adjusting for earnings effect (Ndung'u, 2003).

2.3.4 Trading Volume

Trading volume refers to number of shares traded each day and measures shifts in stock prices. The higher the trading volume the higher the stock returns. The relationship between trading volume and stock returns is therefore positive and highly significant (Ng'ang'a, 2013). Trading volume is relative and needs to be measured against the average daily volume of the stock in question.

According to Kamuti (2013), volume affects share price because price changes are an important input into trading strategies and since most investors tend to be risk averse , unfavourable price changes tend to discourage investments. There are instances where herd mentality can be identified among investors resulting in trading in the same direction leading to increase or decrease of stocks traded.

2.4 Empirical Literature Review

Teng and Liu (2013) studied the preholiday effect stock anomaly in the Taiwan Stock Market from 1971 to 2011 using the daily returns on the TAIEX (Taiwan Stock Exchange Capitalization Weighted Stock Index). Using regression analysis the study found higher mean preholiday return that is not attributable to risk, other calendar anomalies or macro economic factors. They suggested that holiday effect may not be explained by institutional factors since these factors vary across other countries.

Dodd and Gakhovich (2011) studied the holiday stock anomaly in Central and Eastern European (CEE) markets for the 20 year period from 1991 to 2010. The study used price data from national indices and applied regression to evaluate the holiday returns. From the study, it was found that around Christmas, New Year and Easter holidays there were higher preholiday and postholiday returns. Moreover, the observed pre-holiday returns tend to decrease over time for most markets signifying a possible increase in level of efficiency.

Marrett and Worthington (2007) studied the holiday stock anomaly in the Australian stock market for the 10 year period from 1996 to 2006. Using a trading time hypothesis they found higher pre holiday returns with the largest effect being in the retail industry stocks. The study could have used a calendar time hypothesis whereby returns are created on non trading days to test for the post holiday effect.

Bhana (1994) studied the holiday anomaly at the Johannesburg Stock Exchange (JSE) for the 15 year period between 1975 and 1990. The study set out two groups of days namely; days prior to the holidays and days after the holiday. The means and variances were calculated for the days and difference of the means was tested using T statistic while chi square statistic tested the null hypothesis. The study found the existence of holiday effect with a statistically significant mean return on pre holidays of five times the return accruing on non preholiday days. Measurement of the post holiday returns may have been affected since the study did not separate holidays accompanied by stock market closing from those that are not accompanied by market closing.

Kim and Park (1994) studied the holiday effect and stock returns in the U.S stock markets using firms listed in the AMEX, NYSE and NASDAQ. For the period 1963-1986, daily market returns were used while for the period 1973 to 1986 NASDAQ data was used. Trading days before and after regular holidays; the trading days before and after stock market holidays and all other trading days were set out as study groups. They compared the daily mean returns of the three groups of days and used the t-statistic to test the mean returns between the groups of days already set for the study. They found higher preholiday returns on in all three markets. The study did not include the New Year holiday hence the results are not affected by the January effect.

Yenn and Shyy (1993) studied the effect of the Chinese New year holiday in the period 1976 to 1990 on six stock markets namely; Hongkong, Japan, Malaysia, Singapore, South Korea and Taiwan. They used daily data from the stock market indices and applied a 5 day preholiday and 10 day post holiday period to calculate returns associated with the holiday. To identify the returns patterns, cumulative returns indexes were computed for each market using the daily returns and cumulative daily returns. Cumulative returns were evaluated using the Wilcoxon test. The study found significantly higher preholiday returns with high standard deviations as compared to actual returns. There were no significant postholiday returns as compared to actual annual returns.

Ariel (1990) studied the holiday effect using data from the CSRP for the 20 years period from 1963 to 1982 in the U.S. Using two bands of the trading days namely; the trading days prior to the holidays and the rest of the days, the means and variances of the two stock indexes were calculated along with a t-statistic. The study found higher

preholiday returns during each year. The effect of other stock anomalies on the study was not documented.

Hemed (2015) in the four year period study of the preholiday effect on stock returns at the NSE from 2010 to 2013 used an event methodology approach. A descriptive research design was applied with 5 pre-event days; the event day, and 5 post- event days. While using daily stock prices and market return model, normal return, expected return and abnormal returns were computed. The study found the existence of the holiday effect with statistically significant abnormal returns.

Atala (2015) sought to determine the Muslims holidays' effect on stock returns at the NSE and used a descriptive research design and event methodology for the two year period from 2011 to 2013. While having a 5 day event window specification, the study used 30 surrounding days before the holiday and 30 surrounding days after the holiday. For the event window and comparison period, normal return, expected return and abnormal returns were computed from daily prices using the Comparative Period Return Approach (CPRA) that produces firm-specific expected return estimates. Muslims' holiday effect was tested by the statistical difference between the mean daily returns in the event period and mean daily return during the comparison period. The study found a holiday effect associated with 60 percent of the Muslim holidays studied. This study was done on Muslim holidays which are faith based holidays and the conclusion may not be generalized to be that of all other holidays at the NSE. The study period was 2 years whose results may not be sufficient to draw a conclusion.

Ndonga (2014) in his study of the relationship between holiday effect and volatility of returns at the NSE used a descriptive research design and regression with daily stock returns data of 50 companies that were continuously listed from 1st January 2011 to 31st December 2013. Logarithmic daily stock returns were computed from daily stock prices, market. The study excluded the New Year holiday to eliminate the January effect. Using regression, tests of significance and magnitude of the daily return was carried out for the coefficient using P values and the F test were carried out. From the study, holiday effect was found to be present at the NSE and was accompanied by return volatility. The study could have used a longer period of time to test the anomaly in line with findings by Rasugu (2005) who suggested that at least a four year investment horizon is good enough to study stock investment behavior.

Osman (2007) in his 9 year study of the holiday effect at the NSE from January 1998 to December 2006 used AIG index returns data. The study considered holidays as those days which provoke stock market closings and are known in advance and gazetted as public holidays in Kenya. The Idd ul Fitr and Easter holidays which do not fall on a fixed date were eliminated from the regression model used. The study found no holiday effect at the NSE. The study did not isolate holidays that are followed by a non trading day for example; holidays falling on a Friday or a weekend or Christmas holidays since these holidays do not have a postholiday as defined in the study.

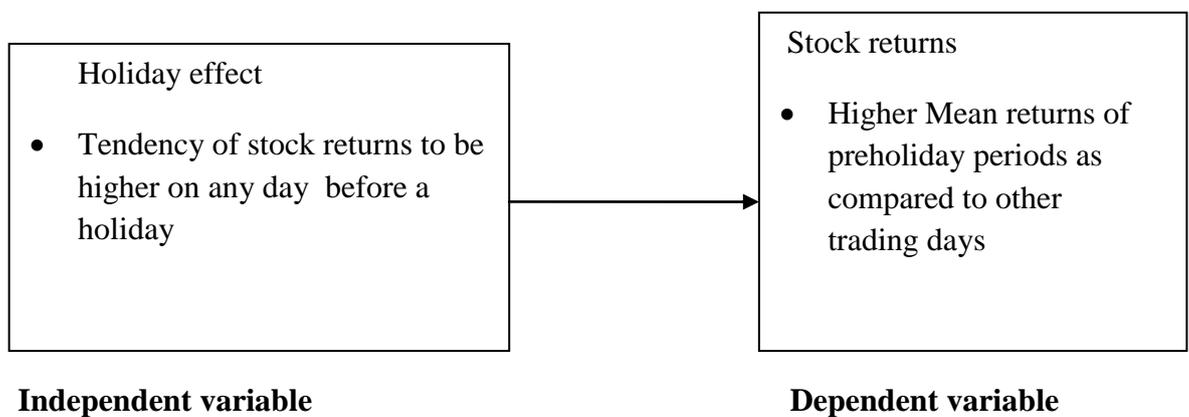
Rasugu (2005) in his 5 year study of the holiday effect at the NSE for period from January 1998 to December 2002 divided the trading days as preholiday days and other trading days. Regression was used whereby it was found that mean returns of days before the holidays were 62 times higher than those of other days however a t-test on

the mean returns did not find a statistically significant difference. The study therefore concluded that no holiday effect exist at the NSE .The study did not isolate holidays that are followed by a non trading day for example; holidays falling on a Friday or a weekend or Christmas holidays since these holidays do not have a post holiday as defined in the study.

2.5 Conceptual Framework

The conceptual framework seeks to define in a measurable terms the research study concept (Mugenda, 2008). The independent variable for this study is the holiday effect while the dependent variable is stock returns. The relationship between the variables is as presented in Figure 2.1.

Figure 2.1: Conceptual Framework



2.6 Summary of Literature Review

Stock return compensates investors for the risk and time associated with their investment and is affected by among other factors, stock market anomalies, profitability, size effect and stock trading volume of a company.

From the empirical literature reviewed, the holiday effect is present in stock markets in other parts of the world implying that the theories of capital assets pricing and the EMH have been questioned. Among the probable explanations for the holiday effect include; specific clients buy or sell decision, short selling of risky positions in advance of holidays and the happy mood of investors before holidays in anticipation of high future cash flows. Research on the holiday effect at the NSE, has been inconclusive with some research findings showing presence of the anomaly while others showing its absence. Additional investigations will therefore be required in order to establish the position of the holiday effect on stock returns at the NSE.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology used to conduct the study. It is organized into six parts namely; the research design, population and sample of the study, data collection methods, data analysis techniques and operationalization of the study variables.

3.2 Research Design

A descriptive research design approach was deployed to determine the holiday effect at the NSE. In a descriptive research design, things are reported the way they are and phenomenon is usually described from collected data (Hemed, 2015). The study used the NSE All Shares Index (NASI) index data for the period 1st March 2008 to 31st August 2016.

3.3 Population of the Study

A population represents a set of homogeneous people, services, elements, events, group of things or households being investigated (Kanja, 2014). The population for this study consisted of the 65 listed companies at the NSE as at 31st August 2016 (See Appendix A).

3.4 Data Collection Method

Data comprised all the NASI indexes for the period 1st March 2008 to 31st August 2016 which was obtained from the NSE.

3.5 Data Analysis Techniques

To test for the holiday effect, the NASI indices as appearing in Appendix C were used to compute the return of the NSE on a daily basis and the cumulative daily returns for the preholiday and post holiday periods.

The actual daily return at the NSE was calculated as follows;

$$r_{j,t} = \frac{P_{j,t} - P_{j,(t-1)}}{P_{j,(t-1)}}$$

Where; $r_{j,t}$ is the stock market return from date (t-1) in year (j).

$P_{j,t}$ is the stock market closing price index on date (t) in year (j). This will be computed using the NASI.

$P_{j,(t-1)}$ is the stock market opening price index on date (t) in year (j). This will be computed using the NASI.

Pre holiday cumulative returns were calculated as follows;

(Return on day 5 of preholiday period – Return on day 1 of preholiday period)

Return on day 1 of preholiday period

Post holiday cumulative returns were calculated as follows;

(Return on day 5 of post holiday period – Return on day 1 of post holiday period)

Return on day 1 of post holiday period

The cumulative daily return for the NSE was calculated as follows;

$$CR_j(T) = \prod_{t=1}^T (1+r_{jt})$$

Where; $CR_j(T)$ is the cumulative return for T days in the neighborhood of the holiday in year j.

$r_{j,t}$ is the stock market return from date (t-1) in year (j).

The difference between annualized cumulative return and the actual annual return (C_i) for each holiday for each year was computed.

Actual annual return for each year was calculated as follows;

(NASI at end of year) less (NASI at start of year) divided by (NASI at the start of the year)

3.5.1 Operationalization of Study Variables

The last five trading days before the public holiday were classified as the preholiday period while the first five trading days after the public holiday represented the postholiday period. The holidays that were considered were those with specific dates namely; New Years day, Labour Day, Madaraka Day, Mashujaa Day (in years 2008 and 2009, it was referred to as Kenyatta day), and Jamhuri day and Christmas day. National holidays that do not have a specific date were left out. Moi Day has been left out because it was only commemorated in years 2008 and 2009.

3.5.2 Test of Significance

To test the significance of abnormal returns, the Wilcoxon signed rank test following Yen and Shyy (1993) was used. The following hypothesis was tested:

H0: Holiday effect does not exist at the NSE.

H1: Holiday effect exists at the NSE.

The analysis of abnormal returns was done using the statistical package R.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

In this chapter results of data analysis and findings are discussed in reference to the objective of the study. This chapter presents the following key areas; section 4.2 gives the data analysis while section 4.3 gives the results and discussion which includes tables and figures to explain the results of data analysis and section 4.4 gives the test of significance of the abnormal returns.

4.2 Data Analysis

Data analysis was done using the statistical package R and the details appear in Appendix B. Data was read from the CSV file. The date column was converted to date format. The data was converted to ZOO object which is good for time series.

Preholiday daily return and cumulative return for 5 days before the holiday was calculated. Postholiday daily return and cumulative return for 5 days after the holiday was calculated. The data was merged and saved and read as a data frame. The name of the index column was changed to date and another table that counts the number of days was generated. The holiday dates and actual return were derived. The annualized holiday returns were calculated. The two data sets were merged ensuring only data on holiday dates was picked. The difference between actual return and preholiday and postholiday returns was calculated.

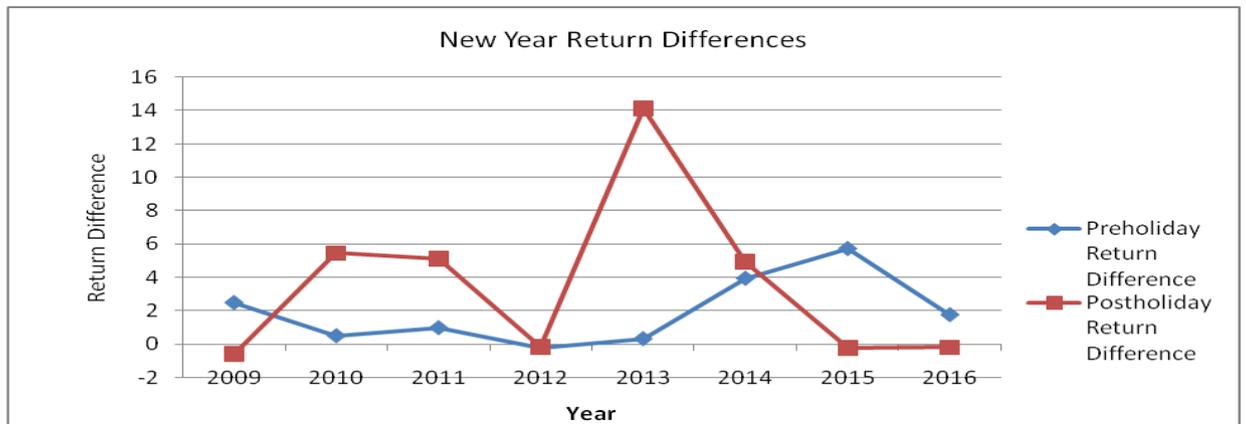
4.3: Results and Discussion of Findings

Table 4.1: Summary of Annual, Preholiday and Postholiday Returns for New Year Day

Year	Actual Annual Return	5-day cumulative Annualized Preholiday return	5-day cumulative annualized Postholiday return	Difference between Annualized Preholiday return and Actual Annual Return	Difference between Annualized Postholiday return and Actual Annual Return
2008	N/A	N/A	N/A	N/A	N/A
2009	0.965498652	3.46497796	0.38821935	2.499479308	-0.577279302
2010	1.360829044	1.86438134	6.81977406	0.503552296	5.458945016
2011	0.68567934	1.67306957	5.79425355	0.98739023	5.10857421
2012	1.3870449	1.1949353	1.2457354	-0.1921096	-0.1413095
2013	1.430141287	1.75788376	15.5455951	0.327742473	14.11545381
2014	1.192809022	5.15532329	6.14604162	3.962514268	4.953232598
2015	0.892550845	6.64334909	0.69907322	5.750798245	-0.193477625
2016	0.92419244	2.69575993	0.74485494	1.77156749	-0.1793375
Mean	1.104843	3.05621	4.672943405	1.951366839	3.56810021

Source: Research Data

Figure: 1: New Year Day Return Differences



Source: Research Data

Table 4.2: Wilcoxon Statistic Values for New Year Day

New Year Day.statistic.V	Postholiday 36	Preholiday 35
New Year Day.p.value	0.00390625	0.0078125
New Year Day.null.value.location	0	0
New Year Day.alternative	greater	greater
New Year Day.method	Wilcoxon signed rank test	Wilcoxon signed rank test
New Year Day.data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

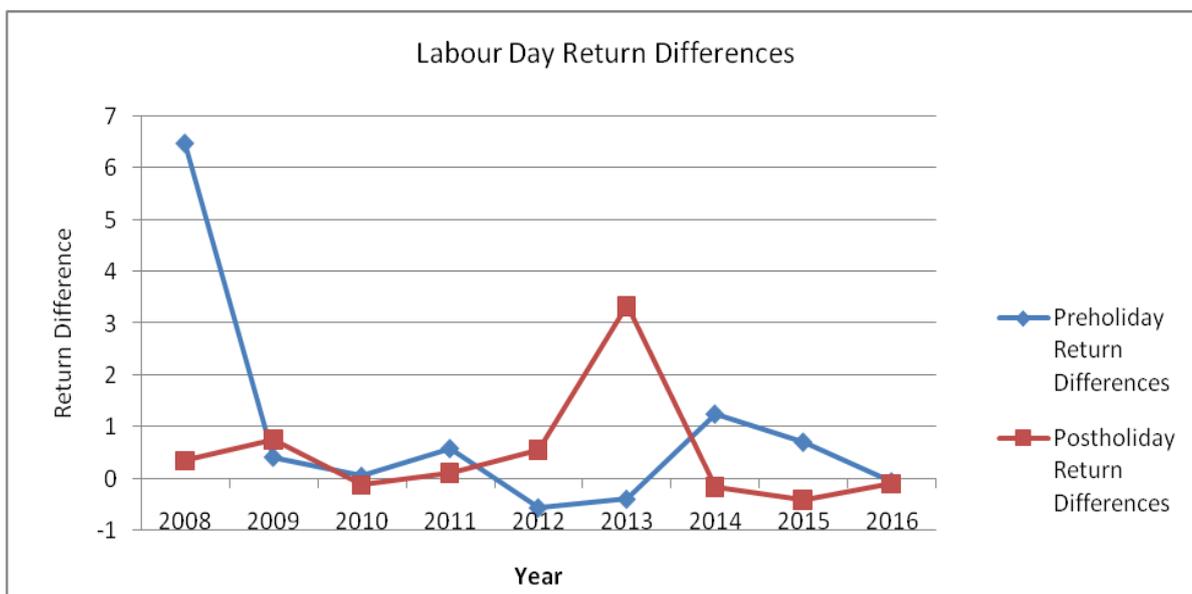
For both preholiday and postholiday returns the P-value is less than 0.01 and therefore New Year holiday has a holiday effect on stock returns.

**Table 4.3: Summary of Annual, Preholiday and Postholiday returns
for Labour Day**

Year	Actual Annual Return	5-day cumulative Annualized Preholiday return	5-day cumulative annualized Postholiday return	Difference between Annualized Preholiday return and Actual Annual Return	Difference between Annualized Postholiday return and Actual Annual Return
2008	0.73472862	7.22178767	1.08763296	6.48705905	0.35290434
2009	0.965498652	1.38602112	1.72837377	0.420522468	0.762875118
2010	1.360829044	1.41004981	1.24542183	0.049220766	-0.115407214
2011	0.68567934	1.27302075	0.80783181	0.58734141	0.12215247
2012	1.3870449	0.8278443	1.947485	-0.5592006	0.5604401
2013	1.430141287	1.03823014	4.77896182	-0.391911147	3.348820533
2014	1.192809022	2.44686243	1.03360021	1.254053408	-0.159208812
2015	0.892550845	1.60279306	0.48326545	0.710242215	-0.409285395
2016	0.92419244	0.8680695	0.82618027	-0.05612294	-0.09801217
Mean	1.063719	2.008298	1.548750347	0.944578292	0.485031

Source: Research Data

Figure: 2: Labour Day Return Differences



Source: Research Data

Table 4.4: Wilcoxon Statistic Values for Labour Day

	Postholiday	Preholiday
Labour Day.statistic.V	32	35
Labour Day.p.value	0.150390625	0.08203125
Labour Day.null.value.location	0	0
Labour Day.alternative	greater	greater
Labour Day.method	Wilcoxon signed rank test	Wilcoxon signed rank test
Labour Day.data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

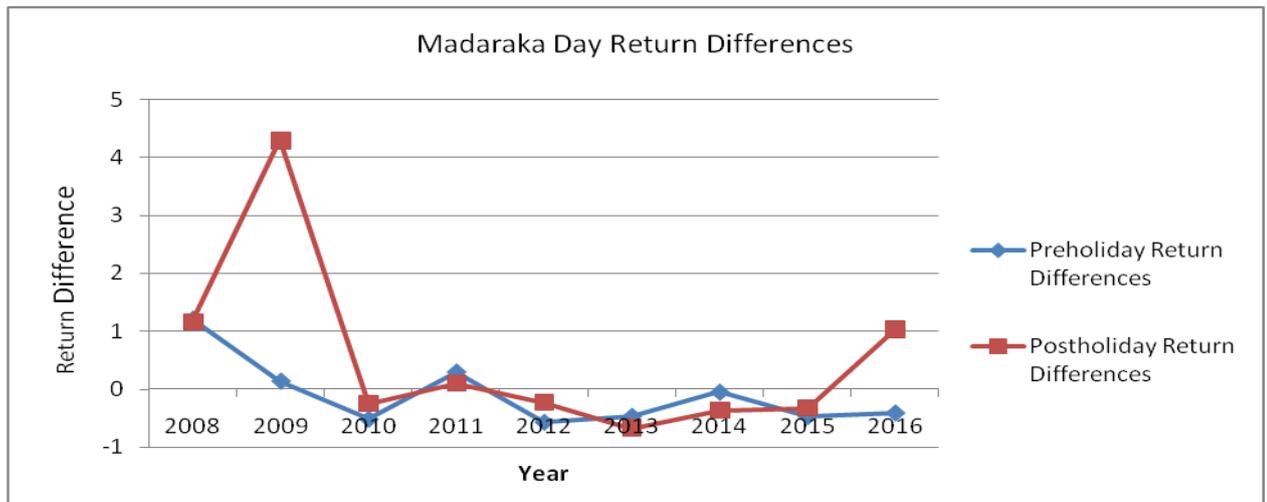
For both preholiday and postholiday abnormal returns, the P-value is greater than 0.05 and hence there is no evidence to show that the Labour Day holiday is associated with a holiday effect on stock returns.

**Table 4.5: Summary of Annual, Preholiday and Postholiday returns
for Madaraka Day**

Year	Actual Annual Return	5-day cumulative Annualized Preholiday return-	5-day cumulative annualized Postholiday return	Difference between Annualized Preholiday return and Actual Annual Return	Difference between Annualized Postholiday return and Actual Annual Return
2008	0.73472862	1.9427405	1.89350042	1.20801188	1.1587718
2009	0.965498652	1.10663462	5.26604804	0.141135968	4.300549388
2010	1.360829044	0.84862003	1.1097221	-0.512209014	-0.251106944
2011	0.68567934	0.98391199	0.78456003	0.29823265	0.09888069
2012	1.3870449	0.8204503	1.1514377	-0.5665946	-0.2356072
2013	1.430141287	0.96569353	0.74980083	-0.464447757	-0.680340457
2014	1.192809022	1.14324047	0.82071553	-0.049568552	-0.372093492
2015	0.892550845	0.42463994	0.55934267	-0.467910905	-0.333208175
2016	0.92419244	0.51789568	1.94958726	-0.40629676	1.02539482
Mean	1.063719	0.972647	1.587190509	-0.091071899	0.52347116

Source: Research Data

Figure 3: Madaraka Day Return Differences



Source: Research Data

Table 4.6: Wilcoxon Statistic Values for for Madaraka Day

	Postholiday	Preholiday
Madaraka Day.statistic.V	24	14
Madaraka Day.p.value	0.455078125	0.849609375
Madaraka Day.null.value.location	0	0
Madaraka Day.alternative	greater	greater
Madaraka Day.method	Wilcoxon signed rank test	Wilcoxon signed rank test
Madaraka Day.data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

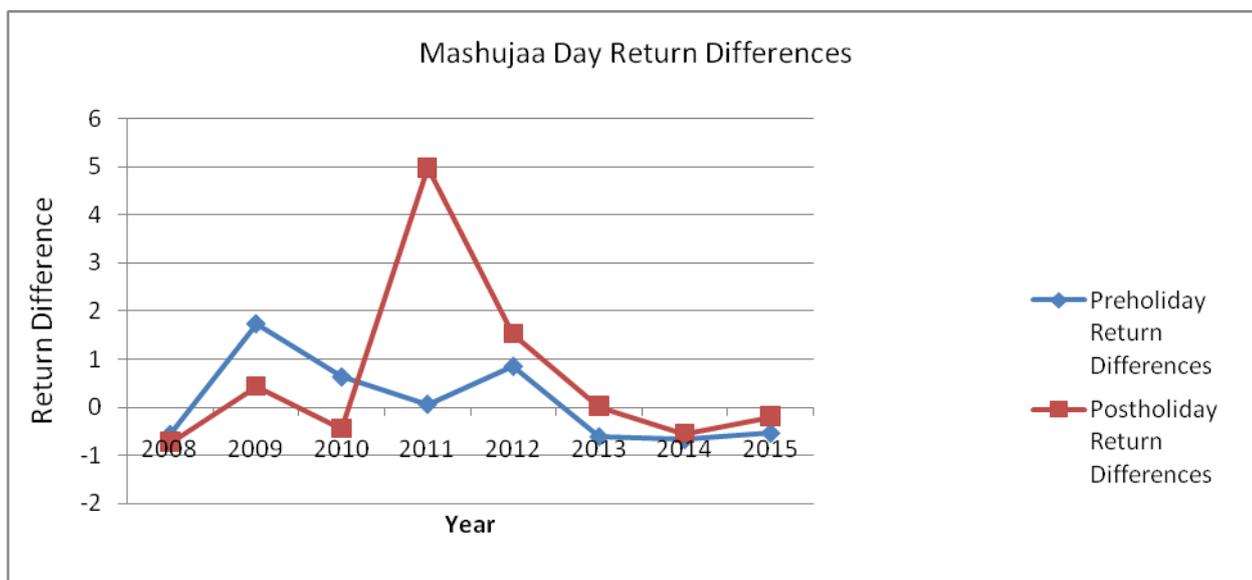
For both preholiday and postholiday returns the P-value is greater than 0.05 and therefore there is no evidence that there is a holiday effect on stock returns around Madaraka Day holiday.

**Table 4.7: Summary of Annual, Preholiday and Postholiday returns
for Mashujaa Day**

Year	Actual Annual Return	5-day cumulative Annualized Preholiday return	5-day cumulative annualized Postholiday return	Difference between Annualized Preholiday return and Actual Annual Return	Difference between Annualized Postholiday return and Actual Annual Return
2008	0.73472862	0.16602481	0.00251235	-0.56870381	-0.73221627
2009	0.965498652	2.70809433	1.39261599	1.742595678	0.427117338
2010	1.360829044	1.99346504	0.91009696	0.632635996	-0.450732084
2011	0.68567934	0.74717441	5.65434626	0.06149507	4.96866692
2012	1.3870449	2.2394158	2.9020278	0.8523709	1.5149829
2013	1.430141287	0.81413326	1.45362575	-0.616008027	0.023484463
2014	1.192809022	0.51733574	0.63690635	-0.675473282	-0.555902672
2015	0.892550845	0.350819	0.703529	-0.541731845	-0.189021845
2016	N/A	N/A	N/A	N/A	N/A
Mean	1.08116	1.192058	1.706957558	0.110897585	0.62579734

Source: Research Data

Figure: 4 : Mashujaa Day Return Differences



Source: Research Data

Table 4.8: Summary of Annual, Preholiday and Postholiday returns for Mashujaa Day

Wilcoxon Statistic Values	Postholiday	Preholiday
Mashujaa Day.statistic.V	26	21
Mashujaa Day.p.value	0.15625	0.37109375
Mashujaa Day.null.value.location	0	0
Mashujaa Day.alternative	greater	greater
Mashujaa Day.method	Wilcoxon signed rank test	Wilcoxon signed rank test
Mashujaa Day.data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

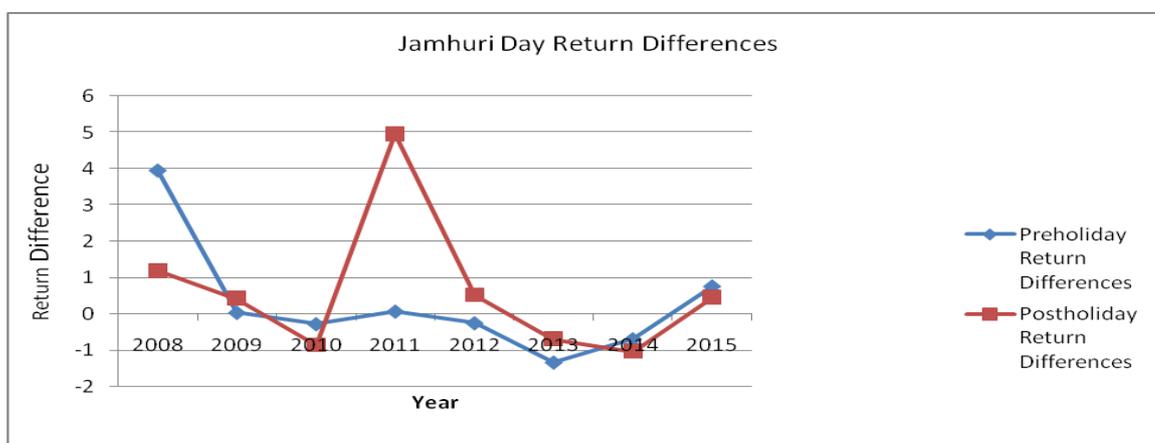
For both preholiday and postholiday returns the P-value is greater than 0.05 and therefore there is no holiday effect around Mashujaa Day holiday.

Table 4.9: Summary of Annual, Preholiday and Postholiday returns for Jamhuri Day

Year	Actual Annual Return	5-day cumulative Annualized Preholiday return-	5-day cumulative annualized Postholiday return	Difference between Annualized Preholiday return and Actual Annual Return	Difference between Annualized Postholiday return and Actual Annual Return
2008	0.73472862	4.67978223	1.92193753	3.94505361	1.18720891
2009	0.965498652	0.99284267	1.39099947	0.027344018	0.425500818
2010	1.360829044	1.07540912	0.49868666	-0.285419924	-0.862142384
2011	0.68567934	0.74717441	5.65434626	0.06149507	4.96866692
2012	1.3870449	1.127414	1.905943	-0.2596309	0.5188981
2013	1.430141287	0.08929	0.744046	-1.340851287	-0.686095287
2014	1.192809022	0.49301	0.156682	-0.699799022	-1.036127022
2015	0.892550845	1.64625116	1.34165205	0.753700315	0.449101205
Mean	1.08116	1.356397	1.701786621	0.275236485	0.62062641

Source: Research Data

Figure: 5: Jamhuri Day Return Differences



Source: Research Data

Table 4.10: Wilcoxon Statistic Values for Jamhuri Day

	Postholiday	Preholiday
Jamhuri Day.statistic.V	21	19
Jamhuri Day.p.value	0.37109375	0.47265625
Jamhuri Day.null.value.location	0	0
Jamhuri Day.alternative	greater	greater
Jamhuri Day.method	Wilcoxon signed rank test	Wilcoxon signed rank test
Jamhuri Day.data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

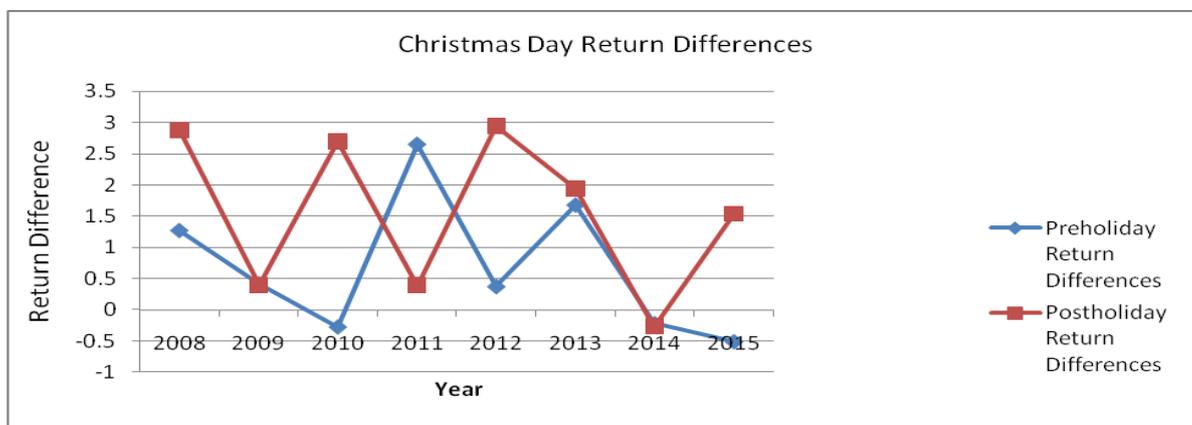
For both preholiday and postholiday returns the P-value is greater than 0.05 and therefore there is no evidence of a holiday effect around Jamhuri Day holiday.

Table 4.11: Summary of Annual, Preholiday and Postholiday returns for Christmas Day

Year	Actual Annual Return	5-day cumulative Annualized Preholiday return-	5-day cumulative annualized Postholiday return	Difference between Annualized Preholiday return and Actual Annual Return	Difference between Annualized Postholiday return and Actual Annual Return
2008	0.73472862	2.00269947	3.6135338	1.26797085	2.87880518
2009	0.965498652	1.37607515	1.36233947	0.410576498	0.396840818
2010	1.360829044	1.08159572	4.05975021	-0.279233324	2.698921166
2011	0.68567934	3.33702045	1.0766878	2.65134111	0.39100846
2012	1.3870449	1.7549772	4.337439654	0.3679323	2.950394754
2013	1.430141287	3.10689197	3.37227305	1.676750683	1.942131763
2014	1.192809022	0.96612516	0.92258765	-0.226683862	-0.270221372
2015	0.892550845	0.37653195	2.42942882	-0.516018895	1.536877975
Mean	1.08116	1.75024	2.646755057	0.66907942	1.56559484

Source: Research Data

Figure 6: Christmas Day Return Differences



Source: Research Data

Table 4.12: Wilcoxon Statistic Values for Christmas Day

	Postholiday	Preholiday
Christmas Day.statistic.V	33	28
Christmas Day.p.value	0.01953125	0.09765625
Christmas Day.null.value.location	0	0
Christmas Day.alternative	greater	greater
Christmas Day.method	Wilcoxon signed rank test	Wilcoxon signed rank test
Christmas Day.data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

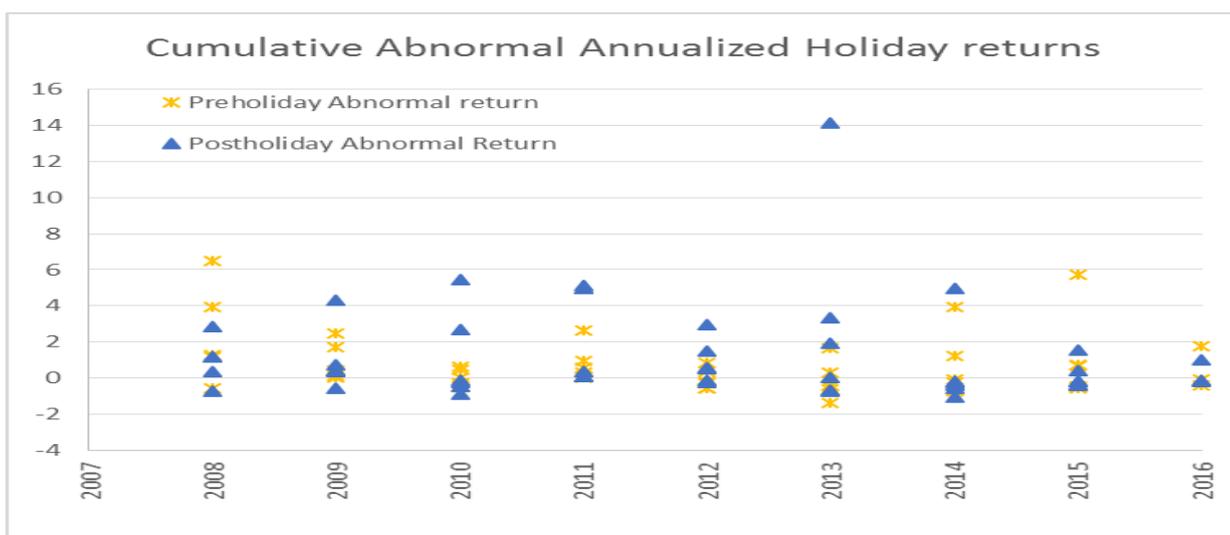
For preholiday abnormal returns, the P-value is greater than 0.05 while for postholiday abnormal returns the P-value is greater than 0.01 and thus implies the absence of a holiday effect around Christmas Day holiday.

Table: 4.13 Summary of Mean Returns

Holiday	Annual Mean Return	5-day cumulative Mean Annualized Preholiday Return	5-day Cumulative Annualized Postholiday Return
New Year	1.1048	3.0562	4.6729
Labour Day	1.0637	2.0083	1.5488
Madaraka Day	1.0637	0.9726	1.5872
Mashujaa Day	1.0812	1.1921	1.7070
Jamhuri Day	1.0812	1.3564	1.7018
Christmas Day	1.0812	1.7502	2.6468

Source: Research Data

Table 4.14: Cumulative Abnormal Holiday Returns



Source: Research Data

4.4 Test of Significance of Abnormal Returns

The study being anchored on EMH, the following hypothesis was used:

H0: Holiday effect does not exist at the NSE.

H1: Holiday effect exists at the NSE.

Table 4.15: Joint Wilcoxon Signed Rank Test for Abnormal Returns for all Holidays

	PostHoliday	Preholiday
statistic.V	964	870
p.value	0.000824863	0.01255973
null.value.location	0	0
alternative	greater	greater
method	Wilcoxon signed rank test with continuity correction	Wilcoxon signed rank test with continuity correction
data.name	d\$ReturnDifference	d\$ReturnDifference

Source: Research Data

From the joint Wilcoxon signed rank test results for all holidays, the preholiday abnormal returns were significantly greater than zero ($P < 0.05$) implying that abnormal returns before holidays exist at a statistically significance level of 95% . On the other hand, the postholiday abnormal returns were significantly greater than zero ($P < 0.01$) implying that abnormal returns after the holidays also exist at a statistically significance level of 99%.

From these results, we reject the null hypothesis (H_0) for both preholiday and postholiday and conclude that holiday effect exists on stock returns at the NSE. These results therefore, indicate that if one buys shares five days before and five days after a holiday consistently over a period of time, they stand to gain abnormal returns. The results show that the NSE is an efficient market in the weak form and that trading according to observed stock returns patterns around holidays can help investors make higher gains.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings of the study and draws conclusions based on the findings. This chapter subsequently makes recommendations arising from the conclusions of the study and makes suggestions for further research in areas related to this study.

5.2 Summary of Findings

The objective of the study was to test the holiday effect on stock market returns at the NSE. The study used the Wilcoxon signed rank test procedure to compute annualized cumulative returns for holidays at the NSE. The highest and lowest annual returns at the NSE were recorded in the years 2013 and 2011 respectively. Fluctuations in the difference between the annual returns and the annualized holiday returns were witnessed with preholiday days and postholiday days reporting both positive and negative cumulative returns.

Analysis of the mean preholiday returns showed that New Year Day and Labour Day had the highest returns while Madaraka day had the lowest returns. Further, New Year Day and Christmas Day recorded the highest mean cumulative annualized post holiday returns while Labour Day had the lowest cumulative annualized postholiday returns. In comparison to cumulative returns occurring around other holidays, higher returns were observed around Christmas Day and New Years Day.

The results of the joint Wilcoxon signed rank test for all holidays show that preholiday abnormal returns have a P –value of 0.0126 while postholiday returns have a P-value of 0.0008 leading to the rejection of the null hypothesis. These results indicate that trading in shares five days before and five days after a holiday can enable an investor to make higher profits at the NSE.

5.3 Conclusion

The study concludes that there is a holiday effect on stock returns at the NSE.

5.4 Recommendations

From the study findings, there is a holiday effect at the NSE implying that the NSE is inefficient and that investors can make abnormal returns by making trading strategies based on patterns of stock returns observed on holidays. The Capital Markets Authority should give guidelines to ensure NSE is strengthened towards becoming an more efficient market. The higher mean returns occurring around Christmas and New Year holidays should be investigated further.

5.5 Limitations of the Study

The study covered a nine year period from 1st March 2008 to 31st August 2016 which may be a short period in comparison to similar researches carried out in the developed world such as Ariel, (1990) and Bhana, (2002) that used longer periods of 30 years and 16 years respectively.

5.6 Suggestions for Further Studies

The study findings reveal that there is a holiday effect at the NSE. Due to the cross listing of securities at the Uganda Securities Exchange and Dar es Salam Stock

Exchange, a study should be conducted to determine if the holiday effect exists in these other securities markets. A study should be done to determine whether there is a holiday effect on returns from bonds and preference shares traded at the NSE. A study should also be done to determine if there are stock anomalies associated with the various companies shares traded at the NSE.

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Appendix A: Companies Listed at the NSE

1	Athi River mining	34	Kenya Commercial Bank Ltd
2	Atlas Development and Support Services	35	Kenya Orchards Ltd
3	B.O.C. Kenya Ltd	36	Kenya Power & lighting Co.Ltd
4	Bamburi Cement Ltd	37	Kenya Re- Insurance Corporation Ltd
5	Barclays Bank Ltd	38	Kurwitu Ventures
6	British- American Investments Company (Kenya) Ltd.	39	Liberty Kenya Holdings Ltd
7	British American Tobacco Kenya Ltd	40	Limuru Tea Co.Ltd
8	Car and General (K) Ltd	41	Longhorn Kenya Ltd
9	Carbacid Investments Ltd	42	Marshalls (E.A) Ltd
10	Centum Investment Co. Ltd	43	Mumias Sugar Co. Ltd
11	CFC Stanbic Holdings Ltd	44	Nairobi Securities Exchange Ltd
12	CIC Insurance Group	45	Nation Media Group
13	Crown Berger Ltd	46	National Bank of Kenya Ltd
14	Diamond Trust Bank Kenya	47	NIC Bank Ltd
15	E.A. Cables Ltd	48	Olympia Capital Holdings
16	E.A. Portland Cement Ltd	49	Pan Africa Insurance Corporation Ltd
17	Eaagads Ltd	50	Rea Vipingo Plantations Ltd
18	East Africa Breweries Ltd	51	Safaricom Ltd
19	Equity Bank Ltd	52	Sameer Africa Ltd
20	Eveready East Africa Ltd	53	Sasini Tea Ltd
21	Express Kenya Ltd	54	Scangroup Ltd
22	Flame Tree Group Holdings Ltd	55	Standard Chartered Bank Ltd
23	Home-Afrika Ltd	56	Standard Group Ltd
24	Housing Finance co, Ltd	57	Stanlib Fahari I- REIT
25	Hutchings Biemer Ltd	58	The Co-operative Bank of Kenya Ltd
26	I & M Holdings Ltd	59	Total Kenya Ltd
27	Jubilee Holdings Ltd	60	TPS Eastern Africa (Serena) Ltd
28	Kakuzi Ltd	61	Trans- Century Ltd
29	Kapchorua Tea Co. Ltd	62	Uchumi Supermarket Ltd
30	KebolKobil Ltd	63	Umeme Ltd
31	KenGen Ltd	64	Unga Group Ltd
32	Kenya A. Baumann Co. Ltd	65	Williamson Tea Kenya Ltd
33	Kenya Airways Ltd		

Source: Nairobi Securities Exchange, 31st August 2016

Appendix B: R Code for Data Analysis

```
#Reading data from the csv file
NasiData<-read.csv('NasiData.csv')

library(zoo)

#Convert the Date column to date format
IndexDate<-as.Date(NasiData$Date, format="%Y-%m-%d")

#Convert the data to ZOO object which is good for time series analysis
NasiData.z = zoo(x=NasiData$Nasi,order.by=IndexDate)

#Calculate pre holiday daily return
PreEventReturn<-1+((NasiData.z-lag(NasiData.z, k=-1))/lag(NasiData.z, k=-1))

#Calculate the Cumulative return for 5 days before the holiday
PreHolidayCumReturn<-rollapply(PreEventReturn,5,prod,align='right')

#Calculate post holiday daily return
PostEventReturn<-1+((lag(NasiData.z, k=1)-NasiData.z)/NasiData.z)

#Calculate the Cumulative return for 5 days before the holiday
PostHolidayCumReturn<-rollapply(PostEventReturn,5,prod,align='left')

#Merge the calculated data
NasiDataMerge<-cbind(NasiData.z,PreHolidayCumReturn,PostHolidayCumReturn)

#Save the data to the computer
write.zoo(NasiDataMerge,"NasiAnalysis.txt",sep="\t")

#Read the data from the computer as a data frame
Nasi<-read.table('NasiAnalysis.txt', header=TRUE)

#Change the name of the index column to date and generate another table that counts
number of days
names(Nasi)[1]<-paste("Date")

Nasi$year<-substring(Nasi$Date, first=1,last=4)

AnnualDays<-aggregate(cbind(count = Date) ~ year, data = Nasi, FUN =
function(x){NROW(x)})

Nasi1<-merge(x=Nasi,y=AnnualDays,by='year',all.x=TRUE)
```

```

#Calculate annualized holiday returns
Nasi1$PreHolidayAnnualized<-Nasi1$PreHolidayCumReturn^(Nasi1$count/5)
Nasi1$PostHolidayAnnualized<-Nasi1$PostHolidayCumReturn^(Nasi1$count/5)
#Read the holiday dates and actual annual return from the computer
HolidayDate<-read.csv('HolidayDates.csv')
#Merge the two data set ensuring only data on holiday dates is picked
HolidayData<-merge(x=HolidayDate,y=Nasi1,by='Date',all.x=TRUE)
#Calculate the difference between actual annual return and holiday return
HolidayData$PreHolidayDifference<-HolidayData$PreHolidayAnnualized -
HolidayData$Annual_Return
    PreHData<-HolidayData[which(HolidayData$State=="PreHoliday"),]
    PreHData<-
data.frame(PreHData$Year,PreHData$Holiday,PreHData$State,PreHData$PreHolid
ayAnnualized, PreHData$Annual_Return,PreHData$PreHolidayDifference)
    colnames(PreHData)<-
c("Year","Holiday","State","CummulativeReturn","AnnualReturn","ReturnDifference
")
HolidayData$PostHolidayDifference<-HolidayData$PostHolidayAnnualized -
HolidayData$Annual_Return
    PostHData<-HolidayData[which(HolidayData$State=="PostHoliday"),]
    PostHData<-
data.frame(PostHData$Year,PostHData$Holiday,PostHData$State,PostHData$PostH
olidayAnnualized, PostHData$Annual_Return,PostHData$PreHolidayDifference)
    colnames(PostHData)<-
c("Year","Holiday","State","CummulativeReturn","AnnualReturn","ReturnDifference
")
AnalysisData<-rbind(PreHData,PostHData)
library(lattice)
#rm(list = ls()) # clear objects

```

Appendix C: NSE All Share Index

NSE ALL SHARE INDEX

Year 2008 Labour Day NASI Indices

Date	NASI
24-Apr-08	103.78
25-Apr-08	104.37
28-Apr-08	105.26
29-Apr-08	106.66
30-Apr-08	107.78
02-May-08	107.79
05-May-08	107.93
06-May-08	108.56
07-May-08	109.72
08-May-08	109.31

Year 2009 New Year Day NASI Indices

Date	NASI
23-Dec-08	71.56
24-Dec-08	71.79
29-Dec-08	71.67
30-Dec-08	72.63
31-Dec-08	73.37
02-Jan-09	74.20
05-Jan-09	74.14
06-Jan-09	73.94
07-Jan-09	73.56
08-Jan-09	73.07

Year 2008 Madaraka Day NASI Indices

Date	NASI
23-May-08	106.97
26-May-08	106.65
27-May-08	106.54
28-May-08	107.39
30-May-08	108.82
03-Jun-08	110.14
04-Jun-08	111.94
05-Jun-08	114.20
06-Jun-08	115.20
09-Jun-08	116.24

Year 2009 Labour Day NASI Indices

Date	NASI
24-Apr-09	58.76
27-Apr-09	58.88
28-Apr-09	58.98
29-Apr-09	59.00
30-Apr-09	58.86
04-May-09	58.63
05-May-09	58.84
06-May-09	58.80
07-May-09	58.98
08-May-09	59.00

Year 2008 Mashujaa Day NASI Indices

Date	NASI
13-Oct-08	78.92
14-Oct-08	78.12
15-Oct-08	77.98
16-Oct-08	77.61
17-Oct-08	76.10
21-Oct-08	74.09
22-Oct-08	72.54
23-Oct-08	71.01
24-Oct-08	68.55
27-Oct-08	66.81

Year 2009 Madaraka Day NASI Indices

Date	NASI
25-May-09	59.47
26-May-09	59.40
27-May-09	59.58
28-May-09	59.70
29-May-09	59.75
02-Jun-09	59.98
03-Jun-09	60.69
04-Jun-09	61.01
05-Jun-09	61.38
08-Jun-09	61.61

NSE ALL SHARE INDEX

Year 2008 Jamhuri Day NASI Indices

Date	NASI
05-Dec-08	67.21
08-Dec-08	67.41
09-Dec-08	67.97
10-Dec-08	68.52
11-Dec-08	69.36
15-Dec-08	70.07
16-Dec-08	70.52
17-Dec-08	70.59
18-Dec-08	71.19
19-Dec-08	71.35

Year 2009 Kenyatta Day NASI Indices

Date	NASI
13-Oct-09	65.89
14-Oct-09	65.90
15-Oct-09	66.16
16-Oct-09	66.71
19-Oct-09	66.93
21-Oct-09	66.74
22-Oct-09	66.97
23-Oct-09	67.09
26-Oct-09	67.25
27-Oct-09	67.09

Year 2008 Christmas Day NASI Indices

Date	NASI
16-Dec-08	70.52
17-Dec-08	70.59
18-Dec-08	71.19
19-Dec-08	71.35
22-Dec-08	71.19
23-Dec-08	71.56
24-Dec-08	71.79
29-Dec-08	71.67
30-Dec-08	72.63
31-Dec-08	73.37

Year 2009 Jamhuri Day NASI Indices

Date	NASI
07-Dec-09	69.53
08-Dec-09	69.81
09-Dec-09	69.83
10-Dec-09	70.14
11-Dec-09	70.16
14-Dec-09	70.02
15-Dec-09	70.38
16-Dec-09	70.59
17-Dec-09	70.82
18-Dec-09	70.71

Year 2009 Christmas Day NASI Indices

Date	NASI
18-Dec-09	70.71
21-Dec-09	70.48
22-Dec-09	70.62
23-Dec-09	70.76
24-Dec-09	71.27
28-Dec-09	71.50
29-Dec-09	71.75
30-Dec-09	71.41
31-Dec-09	71.64

NSE ALL SHARE INDEX

Year 2010 New Year Day NASI

Indices

Date	NASI
24-Dec-09	71.27
28-Dec-09	71.50
29-Dec-09	71.75
30-Dec-09	71.41
31-Dec-09	71.64
04-Jan-10	71.89
05-Jan-10	71.94
06-Jan-10	72.75
07-Jan-10	73.62
08-Jan-10	73.85

Year 2011 New Year Day NASI Indices

Date	NASI
27-Dec-10	96.52
28-Dec-10	96.70
29-Dec-10	96.93
30-Dec-10	97.27
31-Dec-10	97.83
03-Jan-11	99.23
04-Jan-11	99.62
05-Jan-11	100.59
06-Jan-11	102.69
07-Jan-11	103.53

Year 2010 Labour Day NASI Indices

Date	NASI
26-Apr-10	90.32
27-Apr-10	90.57
28-Apr-10	90.33
29-Apr-10	90.31
30-Apr-10	90.13
03-May-10	89.72
04-May-10	89.66
05-May-10	90.54
06-May-10	91.26
07-May-10	91.18

Year 2011 Labour Day NASI Indices

Date	NASI
21-Apr-11	93.83
26-Apr-11	93.66
27-Apr-11	94.03
28-Apr-11	93.82
29-Apr-11	94.18
03-May-11	94.67
04-May-11	94.92
05-May-11	95.31
06-May-11	95.33
09-May-11	94.89

Year 2010 Madaraka Day NASI

Indices

Date	NASI
25-May-10	92.58
26-May-10	91.87
27-May-10	90.70
28-May-10	91.86
31-May-10	92.33
02-Jun-10	92.25
03-Jun-10	92.65
04-Jun-10	92.93
07-Jun-10	92.85
08-Jun-10	92.87

Year 2011 Madaraka Day NASI Indices

Date	NASI
25-May-11	93.35
26-May-11	93.38
27-May-11	93.30
30-May-11	93.16
31-May-11	93.21
02-Jun-11	93.70
03-Jun-11	93.63
06-Jun-11	93.23
07-Jun-11	93.46
08-Jun-11	93.49

NSE ALL SHARE INDEX

Year 2010 Mashujaa Day NASI Indices

Date	NASI
13-Oct-10	100.29
14-Oct-10	100.45
15-Oct-10	100.85
18-Oct-10	101.28
19-Oct-10	101.91
21-Oct-10	102.15
22-Oct-10	102.78
25-Oct-10	102.91
26-Oct-10	103.37
27-Oct-10	102.25

Year 2011 Mashujaa Day NASI Indices

Date	NASI
13-Oct-11	68.53
14-Oct-11	68.50
17-Oct-11	68.80
18-Oct-11	69.11
19-Oct-11	68.97
21-Oct-11	69.20
24-Oct-11	69.18
25-Oct-11	69.41
26-Oct-11	69.88
27-Oct-11	70.45

Year 2010 Jamhuri Day NASI Indices

Date	NASI
06-Dec-10	97.27
07-Dec-10	97.25
08-Dec-10	97.47
09-Dec-10	97.75
10-Dec-10	97.51
14-Dec-10	97.39
15-Dec-10	96.91
16-Dec-10	96.49
17-Dec-10	96.69
20-Dec-10	96.55

Year 2011 Jamhuri Day NASI Indices

Date	NASI
05-Dec-11	65.38
06-Dec-11	65.24
07-Dec-11	65.15
08-Dec-11	65.41
09-Dec-11	65.89
13-Dec-11	65.91
14-Dec-11	66.07
15-Dec-11	65.99
16-Dec-11	66.12
19-Dec-11	66.27

Year 2010 Christmas Day NASI Indices

Date	NASI
20-Dec-10	96.55
21-Dec-10	96.06
22-Dec-10	96.25
23-Dec-10	96.50
24-Dec-10	96.84
27-Dec-10	96.52
28-Dec-10	96.70
29-Dec-10	96.93
30-Dec-10	97.27
31-Dec-10	97.83

Year 2011 Christmas Day NASI Indices

Date	NASI
16-Dec-11	66.12
19-Dec-11	66.27
20-Dec-11	66.48
21-Dec-11	67.23
22-Dec-11	67.80
23-Dec-11	67.72
27-Dec-11	68.16
28-Dec-11	68.25
29-Dec-11	67.86
30-Dec-11	68.04

NSE ALL SHARE INDEX

Year 2012 New Year Day NASI Indices

Date	NASI
23-Dec-11	67.72
27-Dec-11	68.16
28-Dec-11	68.25
29-Dec-11	67.86
30-Dec-11	68.04
03-Jan-12	68.39
04-Jan-12	68.26
05-Jan-12	68.31
06-Jan-12	68.50
09-Jan-12	68.82

Year 2013 New Year Day NASI Indices

Date	NASI
20-Dec-12	94.00
21-Dec-12	94.13
24-Dec-12	94.24
27-Dec-12	94.74
31-Dec-12	94.86
02-Jan-13	95.55
03-Jan-13	96.07
04-Jan-13	97.30
07-Jan-13	97.55
08-Jan-13	98.91

Year 2012 Labour Day NASI Indices

Date	NASI
24-Apr-12	77.91
25-Apr-12	78.29
26-Apr-12	77.12
27-Apr-12	76.71
30-Apr-12	76.91
02-May-12	77.06
03-May-12	77.93
04-May-12	78.57
07-May-12	78.50
08-May-12	78.09

Year 2013 Labour Day NASI Indices

Date	NASI
24-Apr-13	118.38
25-Apr-13	117.47
26-Apr-13	117.41
29-Apr-13	117.36
30-Apr-13	118.07
02-May-13	119.49
03-May-13	120.06
06-May-13	120.99
07-May-13	121.95
08-May-13	122.90

Year 2012 Madaraka Day NASI Indices

Date	NASI
25-May-12	78.25
28-May-12	78.40
29-May-12	78.20
30-May-12	78.15
31-May-12	78.48
04-Jun-12	78.21
05-Jun-12	78.16
06-Jun-12	78.19
07-Jun-12	78.62
08-Jun-12	78.62

Year 2013 Madaraka Day NASI Indices

Date	NASI
27-May-13	126.25
28-May-13	126.76
29-May-13	126.47
30-May-13	126.72
31-May-13	126.80
03-Jun-13	126.81
04-Jun-13	126.68
05-Jun-13	126.68
06-Jun-13	126.58
07-Jun-13	126.19

NSE ALL SHARE INDEX

Year 2012 Mashujaa Day NASI Indices

Date	NASI
15-Oct-12	87.89
16-Oct-12	88.02
17-Oct-12	88.50
18-Oct-12	88.85
19-Oct-12	89.13
22-Oct-12	89.51
23-Oct-12	89.78
24-Oct-12	90.28
25-Oct-12	90.62
26-Oct-12	91.18

Year 2010 Mashujaa Day NASI Indices

Date	NASI
14-Oct-13	131.31
15-Oct-13	130.90
16-Oct-13	130.87
17-Oct-13	130.67
18-Oct-13	131.32
22-Oct-13	131.03
23-Oct-13	131.56
24-Oct-13	131.56
25-Oct-13	131.06
28-Oct-13	130.73

Year 2012 Jamhuri Day NASI Indices

Date	NASI
05-Dec-12	91.86
06-Dec-12	91.52
07-Dec-12	91.95
10-Dec-12	91.87
11-Dec-12	92.20
13-Dec-12	92.80
14-Dec-12	93.03
17-Dec-12	93.19
18-Dec-12	93.38
19-Dec-12	93.80

Year 2013 Jamhuri Day NASI Indices

Date	NASI
05-Dec-13	137.91
06-Dec-13	136.70
09-Dec-13	136.22
10-Dec-13	134.62
11-Dec-13	133.92
16-Dec-13	133.53
17-Dec-13	132.14
18-Dec-13	132.23
19-Dec-13	132.06
20-Dec-13	132.17

Year 2012 Christmas Day NASI Indices

Date	NASI
18-Dec-12	93.38
19-Dec-12	93.80
20-Dec-12	94.00
21-Dec-12	94.13
24-Dec-12	94.24
27-Dec-12	94.74
31-Dec-12	94.86
02-Jan-13	95.55
03-Jan-13	96.07
04-Jan-13	97.30

Year 2013 Christmas Day NASI Indices

Date	NASI
16-Dec-13	133.53
17-Dec-13	132.14
18-Dec-13	132.23
19-Dec-13	132.06
20-Dec-13	132.17
23-Dec-13	132.73
24-Dec-13	135.22
27-Dec-13	135.12
30-Dec-13	135.83
31-Dec-13	136.65

NSE ALL SHARE INDEX

Year 2014 New Year Day NASI Indices

Date	NASI
23-Dec-13	132.73
24-Dec-13	135.22
27-Dec-13	135.12
30-Dec-13	135.83
31-Dec-13	136.65
02-Jan-14	136.56
03-Jan-14	136.74
06-Jan-14	138.50
07-Jan-14	139.63
08-Jan-14	140.35

Year 2015 New Year Day NASI Indices

Date	NASI
23-Dec-14	159.10
24-Dec-14	160.18
29-Dec-14	162.12
30-Dec-14	163.25
31-Dec-14	162.89
02-Jan-15	163.24
05-Jan-15	162.17
06-Jan-15	161.86
07-Jan-15	161.80
08-Jan-15	161.78

Year 2014 Labour Day NASI Indices

Date	NASI
24-Apr-14	149.95
25-Apr-14	150.46
28-Apr-14	150.45
29-Apr-14	151.18
30-Apr-14	151.13
02-May-14	151.85
05-May-14	151.60
06-May-14	151.43
07-May-14	151.77
08-May-14	151.78

Year 2015 Labour Day NASI Indices

Date	NASI
24-Apr-15	172.55
27-Apr-15	171.59
28-Apr-15	171.70
29-Apr-15	172.35
30-Apr-15	173.20
04-May-15	173.14
05-May-15	173.94
06-May-15	173.49
07-May-15	171.52
08-May-15	171.47

Year 2014 Madaraka Day NASI Indices

Date	NASI
26-May-14	149.41
27-May-14	149.24
28-May-14	149.17
29-May-14	149.84
30-May-14	150.20
03-Jun-14	149.12
04-Jun-14	149.24
05-Jun-14	149.29
06-Jun-14	149.33
09-Jun-14	149.61

Year 2015 Madaraka Day NASI Indices

Date	NASI
25-May-15	164.14
26-May-15	162.80
27-May-15	161.31
28-May-15	161.46
29-May-15	162.13
02-Jun-15	164.25
03-Jun-15	164.23
04-Jun-15	164.22
05-Jun-15	163.78
08-Jun-15	162.53

NSE ALL SHARE INDEX

Year 2014 Mashujaa Day NASI Indices

Date	NASI
13-Oct-14	161.95
14-Oct-14	161.73
15-Oct-14	161.88
16-Oct-14	161.59
17-Oct-14	160.42
21-Oct-14	159.84
22-Oct-14	160.58
23-Oct-14	160.82
24-Oct-14	159.22
27-Oct-14	158.76

Year 2015 Mashujaa Day NASI Indices

Date	NASI
13-Oct-15	139.87
14-Oct-15	136.33
15-Oct-15	135.71
16-Oct-15	136.94
19-Oct-15	138.01
21-Oct-15	138.96
22-Oct-15	139.43
23-Oct-15	139.54
26-Oct-15	138.28
27-Oct-15	137.86

Year 2014 Jamhuri Day NASI Indices

Date	NASI
05-Dec-14	166.50
08-Dec-14	167.54
09-Dec-14	166.85
10-Dec-14	165.58
11-Dec-14	163.52
15-Dec-14	162.76
16-Dec-14	162.37
17-Dec-14	160.29
18-Dec-14	157.56
19-Dec-14	156.19

Year 2015 Jamhuri Day NASI Indices

Date	NASI
07-Dec-15	143.61
08-Dec-15	144.04
09-Dec-15	144.39
10-Dec-15	144.28
11-Dec-15	144.72
14-Dec-15	144.76
15-Dec-15	144.94
16-Dec-15	146.08
17-Dec-15	145.31
18-Dec-15	145.55

Year 2014 Christmas Day NASI Indices

Date	NASI
18-Dec-14	157.56
19-Dec-14	156.19
22-Dec-14	156.86
23-Dec-14	159.10
24-Dec-14	160.18
29-Dec-14	162.12
30-Dec-14	163.25
31-Dec-14	162.89
02-Jan-15	163.24
05-Jan-15	162.17

Year 2015 Christmas Day NASI Indices

Date	NASI
18-Dec-15	145.55
21-Dec-15	145.61
22-Dec-15	144.77
23-Dec-15	142.85
24-Dec-15	142.51
28-Dec-15	142.94
29-Dec-15	143.97
30-Dec-15	144.37
31-Dec-15	145.70
04-Jan-16	145.50

NSE ALL SHARE INDEX

Year 2016 New Year Day NASI Indices

Date	NASI
24-Dec-15	142.51
28-Dec-15	142.94
29-Dec-15	143.97
30-Dec-15	144.37
31-Dec-15	145.70
04-Jan-16	145.50
05-Jan-16	145.49
06-Jan-16	146.81
07-Jan-16	146.74
08-Jan-16	145.24

Year 2016 Labour Day NASI Indices

Date	NASI
25-Apr-16	146.25
26-Apr-16	145.69
27-Apr-16	145.12
28-Apr-16	146.56
29-Apr-16	146.93
03-May-16	146.47
04-May-16	145.72
05-May-16	145.63
06-May-16	145.61
09-May-16	145.64

Year 2016 Madaraka Day NASI Indices

Date	NASI
25-May-16	146.27
26-May-16	145.78
27-May-16	145.54
30-May-16	144.43
31-May-16	143.61
02-Jun-16	143.51
03-Jun-16	143.49
06-Jun-16	143.84
07-Jun-16	144.63
08-Jun-16	145.43

Beginning and Closing NASI Indices for each Year

Year	State	Date	NASI
2008	Opening NASI	03-Mar-08	99.86
	Closing NASI	31-Dec-08	73.37
2009	Opening NASI	02-Jan-09	74.20
	Closing NASI	31-Dec-09	71.64
2010	Opening NASI	04-Jan-10	71.89
	Closing NASI	31-Dec-10	97.83
2011	Opening NASI	03-Jan-11	99.23
	Closing NASI	30-Dec-11	68.04
2012	Opening NASI	03-Jan-12	68.39
	Closing NASI	31-Dec-12	94.86
2013	Opening NASI	02-Jan-13	95.55
	Closing NASI	31-Dec-13	136.65
2014	Opening NASI	02-Jan-14	136.56
	Closing NASI	31-Dec-14	162.89
2015	Opening NASI	02-Jan-15	163.24
	Closing NASI	31-Dec-15	145.70
2016	Opening NASI	04-Jan-16	145.50
	Closing NASI	01-Sep-16	134.47