

**SEASONAL EFFECT ON STOCK MARKET RETURNS: CASE OF THE
NAIROBI SECURITIES EXCHANGE**

BY:

MWIHIA FRANCIS KIIGU

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DECLARATION

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

Signed.....Date

MWIHIA FRANCIS KIIGU

REG NO. D61/72986/2014

This Research Project has been presented for examination with our approval as the University Supervisor.

Signed..... Date

Supervisor

DR MIRIE MWANGI

Department of Finance and Accounting

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DEDICATION

To my dear wife, Elsie Kiigu, to whom I appreciate for her guidance and support during my entire post graduate journey.

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ABBREVIATIONS

ANOVA	:	Analysis of Variance
CMA	:	Capital Market Authority
CPI	:	Cost Push Inflation
DEM	:	Development and Enterprise market
EMH	:	Efficient Market Hypothesis
NSE	:	Nairobi Securities Exchange
VIF	:	Variance Inflation Factor

ABSTRACT

Stock market returns have been established to be an equal representation of the economic position of a country at a particular period. Therefore any changes in the returns will imply that the country is experiencing significant changes on how economy sectors are performing. Though these changes are hypothesised to influence the investors' behaviour, the nature of influence the seasonal patterns have on the stock market returns is not well established by the available literature. The study sought to determine the influence that seasonality has on the market returns at the NSE. The study was guided by the following specific objectives, to determine the presence of the day of the week effect on the NSE returns and to determine the presence of the month of the year effect on the NSE returns. The study adopted the descriptive research design in obtaining information. The study used secondary data was collected for a period of 5 years, (2012 to 2017) which was obtained from NSE. The NSE 20-share index was selected to represent the overall daily stock prices. The data was analysed using both descriptive and inferential statistics and presented in form of tables and graphs. The study found out that Friday had the lowest negative returns while Monday had the highest positive returns. The study also found out that stock market returns at NSE were established to be relatively higher in January. The study therefore concludes that there is presence of seasonality influence at NSE but its effects are minimal. The study recommends that the regulatory bodies such as CBK should put in place measures so as to ensure stability in the macroeconomic variables which highly determine how the stock market performs. The study also recommends that measures to be undertaken at the NSE to ensure that there is minimal seasonal effect such as controlling the stock returns through the relevant capital market regulation agencies.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Stock exchange markets play a critical role in the country's economy through ensuring efficiency in both capital formation and allocation. Particularly, the Nairobi Securities Exchange in Kenya deals in both fixed income securities and the variable income securities. It consists of both the primary and secondary market (NSE, 2017). The performance of the sector is crucial as it is an equal representation of the current economic status at a particular time. This raises concern on the factors affecting the security returns and how to mitigate these factors as fluctuation in this market will influence personal, corporate entities and the economic health of a country (Onyuma, 2009).

The stock markets have been established to perform differently based on various seasonal variations (Kuria, & Riro, 2013). The seasonal variations have been established to be caused by numerous factors such as climate change, the perceptions by investors and information changes (Kuria & Kamau, 2013). This tends to contradict the efficient market hypothesis whereby the market ought to quickly react and adapt to any anomalies present. The presence of seasonal effect in a market can greatly influence the investors buy and sell decision and hence having an impact on the return (Agathee, 2011).

There are stock variation at the NSE which are caused by various market imperfections, this indicate stock market inefficiency (NSE, 2017). It is therefore imperative to understand these imperfections, when they occur and why they occur so as to take advantage of them. Despite numerous studies in the area, the relationship that exists

between the two variables has not been fully established (Kuria & Kamau, 2013). The current study therefore aimed to present literature from a local perspective.

1.1.1 Seasonal Effect

Seasonality in general is some kind of pattern or fluctuation repeated over known time period (Agrawal & Tandon, 1994). This could also be taken to imply the regular and repeated changes in a particular period which occurs in a year. Similarly, Rauf (2012) terms seasonality as the periodical changes and stock return variations throughout the year. It thus results in the returns being relatively high at particular time and relatively low in others. This may be taken advantage by traders who aim at transacting at times when they may gain the most (Wachira, 2013).

With regards to seasonal anomalies, studies have focused on several areas ranging from the effects caused certain day, weekend, month, and holidays (Lucey 2005). The day of week effect means some certain days provide higher return compare with other weekdays. The weekend effect refers to there is returns variations between Friday and Monday. The month of the year refers to where the stock returns rise in certain months, then later drop in other months. While holiday effect on the other hand entails where the stock returns will change prior, before and after a major holiday. According to this hypothesis, the market should be efficient in that it rapidly responds to the informational changes presented by any anomalies. However, this is not the case as during the seasonal changes, the equity prices are no longer random (Bhattacharya *et al.*, 2003).

1.1.2 Stock Market Returns

Stock market is an economic platform that deals with exchange in securities of the companies that have been public listed and the government. In this regard, the stock market returns will be the time compensation, expected inflation rate and the uncertainty in returns after the stocks have been invested (Reilly & Brown, 2003). The assessment of an efficient market's performance is termed as stock market performance (Garza-Garsia & Yu, 2010).

The stock price performance is measured by using the rate of return on the stock (Osman, 2004). When the stock price obtained is higher than the prior period, the stock record is termed to be superior price performance, and the similar happens when it is lower. This is computed through taking the change in the market price of a stock over the holding period which is divided by the security price at the start of the holding period (Kuria & Riro, 2013). Alternatively, it may be measured using abnormal rate of return (actual return less the expected stock return). The increase or decrease in the stock price performance acts as an indicator on not only the market performance but also the market value.

The stock market performance in Kenya traditionally has been measured by the NSE 20 Share price index. However, the index has been criticized as not being an accurate measure of performance of the stock market performance since it does not include all shares being traded in the market (Wanyoike, 2015). The stock market has been established to be volatile in that there are changes in the stock prices at particular times. Hence an indication that low returns experienced could be due to the market being fragile to internal and external factors (Odhiambo, 2012).

1.1.3 Seasonal Effect and Stock Market Returns

Stock markets are hypothesized to exist in an efficient market paradigm (William, 2002). However, there is empirical evidence which states that there are some unexplained market movements called Stock market anomalies that tend to go against the efficiency. Particularly, seasonal variations have been established to highly cause a change in how the stock market performs (Aggarwal, 2010). Despite the area receiving considerable interest in the recent past both from academicians and researchers, none of the studies seems to be fully conclusive (Barsky & DeLong, 1991).

These contradictory findings are largely due to complexity of the theoretical channels that explain the impact of the seasons on stock market returns (Kandil 2005). In addition, most of the studies tend to give much focus on the determinants of stock market performance not entirely concentrating on the interest rate control. Seasons are always bound to happen, and they may have a diverse effect across the economic spectrum in any country and thus ought to be well evaluating (Chirchir, 2012).

1.1.4 Nairobi Securities Exchange

NSE was originally formulated as Nairobi Stock Exchange in the 1920s during the British colonial era before being changed (Ngugi, 2005). Since then, NSE has seen tremendous development in structure, depth, breadth and regulation to be the third biggest exchange in Africa by 2014 in terms of volume, behind Johannesburg and Nigerian stock exchanges (NSE, 2017). It has been constantly improving since its existence and many developments have set off a chain reaction making it a platform of utmost importance for investment in the country. The NSE deals in both fixed income

securities and the variable income securities. It consists of both the primary and secondary market (NSE, 2017).

Currently, there are 61 listed companies grouped into Agricultural, Commercial, Telecommunication, Automobile, Finance and Investments, Manufacturing, Construction and Allied, Energy and petroleum and Growth Enterprise Market Segment (Omar, 2015).

NSE is represents a market which is emerging whist having high potential if well developed (Ogum *et al*,2000). Hence the NSE returns ought to be well monitored and appropriate measures to be made so as to mitigate any challenges that are prone to occur.

NSE provides a platform through which investors are able to trade securities and realize the returns through capital returns or dividends distribution. Though this has contributed significantly to the economy growth in the country, the stock markets returns have been established to have seasonal variations. These calendar effects have been noted to occur at specific times of the year, causing varying rates of stock returns (Sifuna, 2012). This raises concern as the anomalies influence greatly the investors' decision to either sell or buy securities and the level of returns accrued in the stock market.

1.2 Research Problem

Stock market returns have been established to be an equal representation of the economic position of a country at a particular period (Onyuma, 2009). Therefore any changes in the returns will imply that the country is experiencing significant changes on how economy sectors are performing. Stock market returns have been established to fluctuate significantly when faced with various anomalies. Seasonal patterns constitute a major part of these anomalies with certain days of the weeks, month of the year and holidays

providing lower or higher returns as compared to others (Hossain, 2004). Though this is hypothesised to influence the investors' behaviour, the nature of influence the seasonal patterns have on the stock market returns is not well established by the available literature (Sanaullah, *et al*, 2012).

Empirically, this has resulted in an intensive debate as to why and how the seasonal effect occur despite the stock market been hypothesized to be efficient as evidenced by numerous studies conducted both locally and internationally. Ayodgan and Geoffrey (2003) established that market returns display a market anomaly in Turkey. Kuria and Riro (2013) found that seasonal anomalies are persistent in the Kenyan market. In addition, Alagidede (2008) found, significant pre-holiday effects for the South African Markets which led to higher returns.

However other studies established no relationship at all between the study variables. To begin with, Maghayereh (2003) conducted a study on seasonality at the Australian Stock Market Exchange. In a similar way, Floros (2008) conducted a study on the Athens Stock Exchange and found out that the calendar effects had no influence on the stock market returns. This relates to who Osman (2004) investigated whether the existed a holiday effect at the NSE and found out holidays had no effect on the stock market activities. This implies inconsistency in the findings on the impact that seasonal changes have on the stock market returns.

Though the available literature brings about the existence of seasonal effect in the stock market and also tries to pre-determine its impact on the stock market returns, there is scarcity of studies conducted on the relationship that exists especially in the Kenyan context. Despite the Nairobi Securities Exchange undertaking various measures so as to

enhance the returns, the sector still underperforms. Could it be that the particular day or month plays a role on these returns? Based on this knowledge gap, this study sought to establish the seasonal effect of the stock market returns. It answered the research question; what is the seasonal effect on the stock market performance, a case of Nairobi Securities Exchange Market?

1.3 Study Objective

The study sought to determine the seasonal effect on the stock market returns at the Nairobi Securities Exchange.

1.4 Value of the Study

The findings assist the investment advisors to have enough financial knowledge on how various time periods affect stock market returns. Since investor choices are influenced by behavioural biases and market efficiency, knowledge on possible return outcomes given seasons will help investment advisors to explain to their clientele the informed view of investing and returns.

For the policy makers, the study will enable them to be informed on how various timeframes influence the stock market returns. This will be useful in formulation and implementation of policies and regulations to be able to control and stabilize the performance of stock through the relevant capital market regulation agencies. This will also allow the government to attract, restore and maintain investor confidence in the capital markets of the country.

This study will contribute to the scant local literature on the seasonal effect and adds to theory in the sense that the findings confirm either the existence or nonexistence of the

anomaly and also provides possible explanations for the same. Through this study, academicians would generate more topics for further research in the market anomalies. Academicians can also generate criticism based on the study findings and research models.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter highlights the existing literature on seasonal effect on stock market returns. The chapter comprises of the theoretical background, the determinants of stock market returns and the empirical studies done related to the study. The chapter finalizes with a summary of the reviewed literature and a summary of the research

2.2 Theoretical Review

The theoretical section uncovers whether or not existing theories suggest that there exists a relationship between seasonality and the performance of the NSE.

2.2.1 Efficient Market Hypothesis

The theory introduced by Eugene Fama (1970). This is a finance theory which tries to explain how the available information is directly related to the share prices in that stock market. The theory holds that the share markets prices are unpredictable and as such cannot be forecasted. This results in a situation whereby the investor is able to predict on the particular times that will result in them gaining the most. Hence the market is efficient due to this randomness and will rapidly respond to any information or anomalies presented to it.

According to the efficient market hypothesis, the non-randomness of returns will suggest possibilities strategies that are time oriented to yield performance out of the expected during unfavorable economic conditions. The theory importance to the study was that it

indicates that the stock market returns are independent hence ought not to be influenced by any anomalies present such as the seasonal changes. However, this is not always the case and this study aimed at investigating what exactly causes this market inefficiency.

2.2.2 Arbitrage Pricing Theory

Arbitrage pricing theory was initially proposed by Stephen Ross (1976). The theory provides a theoretical framework of understanding the relationship between stock prices and macroeconomic fundamentals. The theory holds that individual stock returns depend on both anticipated and unanticipated factors (Chen & Ross, 1986). The theory however is straight forward in its use in determining the factors which influences expected returns.

In spite of these, the suitability of the theory in explaining most macro-economic situations is that it permits the researcher to select whatever factors (Groenewold & Fraser, 1997). The theory's proposition to the study was that all macro-economic factors may directly or indirectly affect the stock prices and subsequently expected returns may be analyzed. The theory was important to the study in that it enabled the determination of the expected return.

2.2.3 Random Walk Model

The random walk model was proposed by Kendall (1953) and it was later developed by Fama (1965). According to this theory, the performance of the stock market is completely independent (1965). This means not even the seasonal changes have a direct influence in the performance of NSE. This is because the stock markets are efficient. Hence the particular time or period of the year cannot be used in determining the stock market return levels due to the randomness. The theory states that the stock prices are completely

random based on the current market situation. These are the macro-economic variable such as the interest rate and market capitalization that influence how various sectors in the economy perform. Hereafter, the performance of the NSE is completely independent on its own and it's not pre-determined by the seasonal changes.

2.3 Determinants of Stock Market Returns

Stock returns are generally considered to be a reflector of the performance of the stock market, in this case the Nairobi Securities Exchange. There are various factors that highly determine how the stock market will perform, namely;

2.3.1 Seasonal Effect

Seasonal effect also known as the calendar effects has remained a topic that has interested research in all sectors (Schwert, & William, 2002). This is attributed to the stock market constantly and repeatedly experiencing changes in the returns at particular times and periods. Particularly, three seasonal effects have been identified to exist in the stock market. This includes the day of the week effect, the month of the year effect and the holiday effect. The day of the week as defined by French, (1980) is where the average stock returns are slightly higher in certain days and lower in the other with the main days being Monday and Friday.

The month of the year effect is whereby certain months such as January and December have different yields in stock market returns (Rozeff and Kinlay, 1976). This may be due to the end of the year of most company and thus will aim to sell their securities. Additionally, also slight effect has been noticed during the months of April and May.

While holiday effect on the other hand is when the stock returns fluctuate during main holidays such as *Ramadan* and Christmas Holidays (Nyamosi, 2011).

2.3.2 Inflation

Inflation is termed as an increase in the prices of common goods and services in a country (Tucker 2007). Inflation has been determined to exist in two forms namely the cost push inflation and the demand pull inflation. Cost push inflation refers to where there is constant rise in the costs incurred by the companies leading to a proportional increase in the cost of commodities. Demand inflation on the other hand is as a result in an increase in demand for the products which causes the firms to also increase their prices. Due to the many price differences relating to the various sectors in the economy, there are many ways of accessing the inflation. (Muriuki, 2014). The impacts of inflation may range from positive to negative based on the sectors affected.

2.3.3 Exchange Rate

Exchange rate is termed the value of a particular country's currency compared to another one (Chirchir, 2012). It is the rate and amount the currency will be exchanged at the foreign exchange market. This tends to have a proportional implication to the stock market returns due to the currency value. The sectors of the economy that are directly affected by the exchange rate changes are mainly those organization that are dealing directly with the foreign currencies such as multinational companies, banks and hotels.

Kenya as country experiences challenges in management of exchange rates owing to being a net importer with most of the imports being oil and machinery. Over the years,

the shilling has been unstable against the hard currencies of the world implying that even the foreign debts denominated in forex end up becoming a great burden on Kenyan economy.

2.3.4 Interest Rate

Interest rate may be termed as the changes in the prices charged to a borrower by a lender so as to be give a certain loan amount (Chirchir, 2012). In the Kenya, the CBK aims to regulate the interest rates charged through measures such as interest rate capping. The interest rates tend to influence the stock performance through altering the investors and customers' savings and borrowing trends. This has seen many companies either report losses or reduced profits especially because interest rates repaid on the loans and other debts ended up expensive resulting to additional financial expense in the books of accounts of these companies (Okoth, 2014). Lending interest rates are viewed critically by investors in the short run against stock returns. Therefore a balance should be created such as neither party is disadvantaged.

2.4 Empirical Literature

The influence that calendar effects have on the stock market returns has received considerable attention from scholars and academicians both locally and internationally. The exact calendar effects in existence and their impact on how the stock market performs is what the researchers have aimed to establish. Aly *et al.* (2004) examined the daily returns on the Egyptian Stock Market using a ten year period. The results showed that the mean returns were statistically equal across the days, consistent with the weak

form market efficiency. This implies that Monday was prone to experience relatively low returns. The study however did not give reasons as to why this was the scenario.

Agathee, (2011) examined the day of the week effect on the Development and Enterprise market as well as the official market of the Stock Exchange of Mauritius. The study used data from year 2006 to 2009. Finally, it is observed that returns are jointly insignificant across all trading days for the official market. The study was however only able to obtain little support for Development and Enterprise market variations.

Giovanis (2009) conducted a study on a comparative analysis of monthly effect using evidence from fifty sampled stock markets. The study used the GARCH model in the analysis. The study established that two month of the year effects where experienced namely the December effect and the January effect with only few experiencing the April effect. However the findings obtained from the study cannot be generalized as the study was done in an international setting. This study will aim at providing local evidence.

Rauf (2012) investigated the seasonality presence in the Australia Stock Market. The study used mainly the secondary data. The study found the monthly effect of stock return during the period of 1985 to 2012. He reported the positive return in April and December. The study however was not able to establish any relationship between the study variables which will be addressed by this study.

Raharjo, *et al* (2013) conducted a study on the Indonesian Stock Market. The study sought to determine whether there was a December effect in the Indonesian Stock Exchange Market. The study used descriptive statistics such as mean and averages. The study found out that December effects causes there to be a positive effect on the Indonesian Stock Market Returns. This in turn influences the trends in investments. The

study cannot be used to determine whether the same will be applicable to NSE, due to the difference in the stock market structures. This study will aim to address this.

Onyuma (2009) sought to determine the existence of daily seasonal anomalies in the NSE and found out that there exists the day of the week. The study findings infer that first trading day of the week (Monday) has the lowest negative returns, while the last day of the week (Friday) has the largest positive returns when compared to other trading days. This shows that anomalies were only experienced during the start and weekends. The study however wasn't able to establish the relationship that existed between the variables.

King'ori (2005) conducted an empirical study on stock market seasonality at the NSE. The study population was all NSE listed companies as at 1994 December with the sample being those that listed continuously from January 1985 to December 1994. He used the Kruskal-Wallis test to evaluate the null hypothesis. His finding was NSE means stock returns are equal over the months and quarters of the year tested indicating that January effect was not present at the NSE.

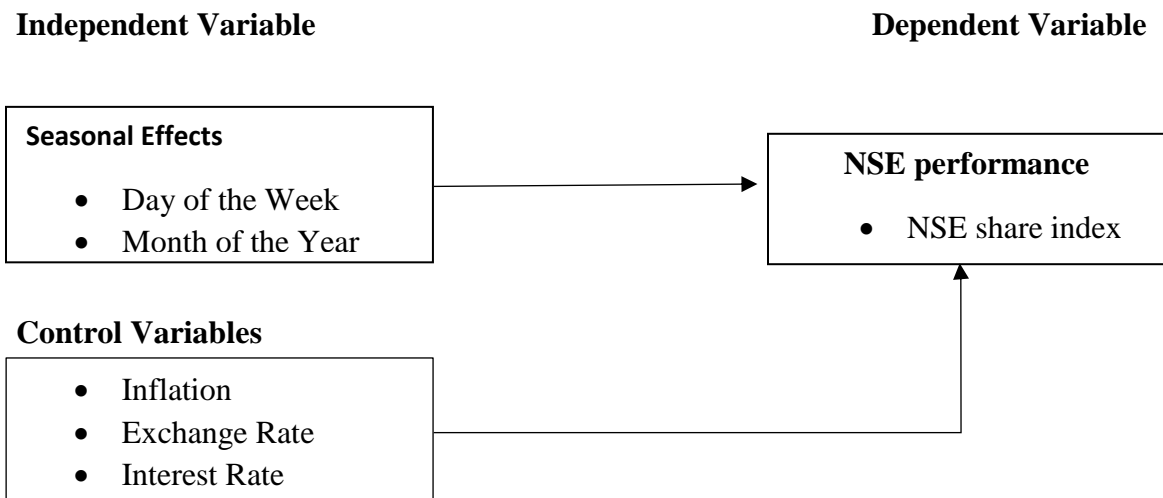
John (2011) investigated the presence of January effect at the NSE. The population of study was 50 NSE listed companies for 10 years to December 2011. Method of data analysis was linear regression and correlation analysis. There was no significant relationship between January and returns. The study was however not comprehensive enough in explaining whether there was any impact on the other months.

2.5 Conceptual Framework

The dependent variables for the study were the various determinants of NSE performance namely; Seasonal Effects, Interest Rates, Exchange Rates and Inflation while the

dependent variable will be the NSE performance. The relationship that exists between the variables is shown in Figure 2.1.

Figure 2.1 Conceptual Framework



2.6 Summary of Literature Review and Research Gap

Seasonal or calendar anomalies has been established to be a common occurrence in many economies. This refers to the tendency in the stock market to portray different returns at particular time period. Yet how this influences the market performance has been a subject of great debate. Though the theoretical framework such as the efficient market hypothesis hold that the market returns ought to be constant despite the time period, the studies conducted have found out otherwise. Particularly, the stock market returns are established to be high in certain time of the year and month and relatively low in other periods.

Despite numerous studies being undertaken in the sector, the findings do not seem to be in consensus. Empirical literatures by different authors reveal that some have established a positive relationship, while others have established otherwise. Studies conducted both

locally and internationally, also made different conclusions. Hereafter, both the theoretical framework and empirical studies have failed to establish linkage between seasonality and stock exchange. Also few studies have been conducted concerning the NSE performance. This therefore creates gaps between literature and necessities further research. This study sought to address the gaps and determine the influence of seasonality on the performance of stock markets, this case being the Nairobi Securities Exchange.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter represents the approach that was undertaken in conducting the research giving insights on the relevant information on how the study is structured. Specifically, the chapter explains the research design to be adopted by the study, the study population, the data collection technique and the data analysis technique to be employed.

3.2 Research Design

Research design refers to the scheme or blue print that is adopted by a particular study so as to address the various research questions pertaining to the study (Creswell, 2003). This study adopted the descriptive research design since the study is seeking to establish the influence that seasonality has on the market returns at the NSE. This research design used to obtain information whereby the researcher has minimal control over the study variables. This is because their manifestation has already happened or the variables cannot be manipulated inherently. It thus enables identification of the phenomena exactly the way it is without any biasness and where appropriate makes valid conclusions hence the most appropriate for the study.

3.3 Data Collection

This study used purely secondary data. The data series comprised of the market index, market prices and weighted average price of the firms listed at the Nairobi Securities Exchange. As at 31st December, 2016, there were 61 firms listed at the NSE as per appendix I and data was collected from all these firms. Data for a five year period 2012 to

2017 was sourced. The NSE 20-share index was selected to represent the overall daily stock prices.

3.4 Data Analysis

The data was analysed with descriptive statics measures like mean and standard deviation. The nature and direction of the relationship that exist was tested using correlation analysis and regression models. The results were then presented in tables from which the interpretations were drawn.

3.4.1 Analytical Model

The following models were used to determine the effect of seasonality on performance of the stock market performance:

- i). Day of the week effect

To determine the weekend effect and days of the week effects, the following dummy variable regression was used;

$$NSE\ Returns = \alpha + \beta_1 Monday + \beta_2 Tuesday + \beta_3 Wednesday + \beta_4 Thursday + \mu$$

The variables which are the days of the week are defined as: 1 if it is that particular trading day and 0 if otherwise. The model makes the assumption that the error terms and variances are constant across time. The t-test was used to test if there was a significant difference in stock returns across the five days of the week.

ii). Month of the year effect

To test the presence of monthly effect, the following model was used:

$$\begin{aligned} NSE\ Returns = & \alpha + \beta_1 D_{Jan} + \beta_2 D_{Feb} + \beta_3 D_{Mar} + \beta_4 D_{April} + \beta_5 D_{May} + \beta_6 D_{Jun} \\ & + \beta_7 D_{July} + \beta_8 D_{Aug} + \beta_9 D_{Sep} + \beta_{10} D_{Oct} + \beta_{11} D_{Nov} + \mu \end{aligned}$$

Where; D is 1 if it is that particular trading month and 0 if otherwise, α represents the mean return on the December month whereas β_1 to β_{11} indicate the shift in mean returns across months.

3.5 Diagnostic Tests

Diagnostic tests to be include normality, auto-correlation, multi-collinearity, heteroscedasticity and root tests. Auto-correlation was tested using Durbin Watson test. Auto-correlation is an assumption of regression analysis where the residuals are purely random and that the residuals would not correlate with anything else, including with each other at different time points. To test heteroscedasticity, Breusch-Pagan/ Cook-Weisberg test of detecting heteroscedasticity in linear models were used.

Multicollinearity tests were conducted on the regression model so that incorrect conclusions about the relationship between dependent variable and predictor variables will be avoided. Variance Inflation Factor (VIF) and tolerance degree was used to indicate presence of multicollinearity test. Multicollinearity occurs where the independent variables are strongly correlated and hence results of regression analysis are as a result of the correlation on independent variables. Normality was tested using degree of skewness and kurtosis.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

The chapter represents the analysis, findings obtained and interpretations of the study on the influence that seasonality has on the market returns at the NSE. Secondary data was collected for a period of 5 years, (2012 to 2017). The NSE 20-share index was selected to represent the overall daily stock prices. The data was interpreted using inferential and descriptive statistics.

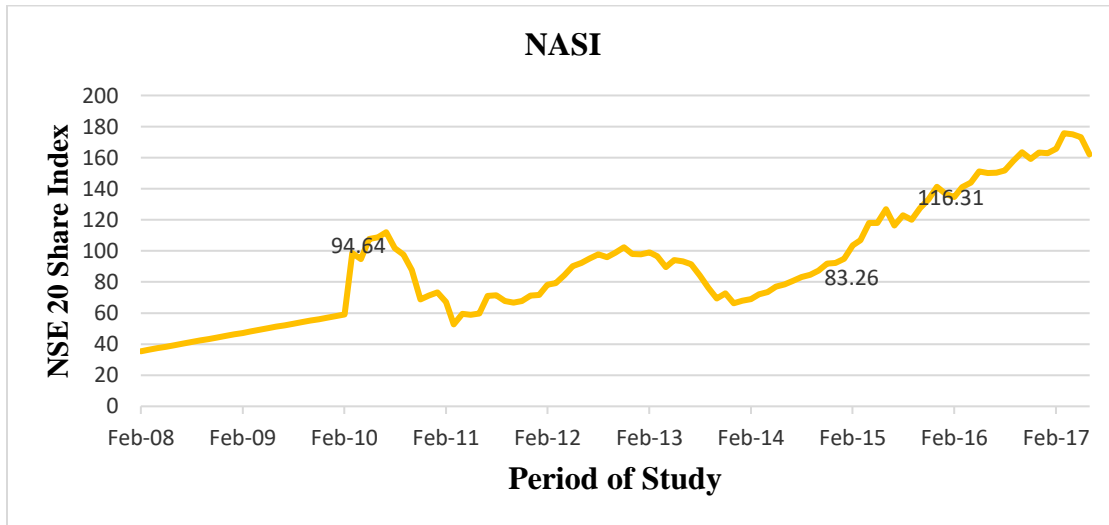
4.2 Description of study variables

This section aimed to describe the research variables and to establish any particular trends over the five year study period. This includes the NSE share index trends, daily stock returns and the monthly stock returns.

4.2.1 NSE Share Index Trends

The NASI was adopted and put into practice in 2008 and is used in measuring the performance of the shares of the firms listed. The study sought to determine how the stock exchange market has been performing and the findings are shown by Figure 4.1.

Figure 4. 1 NSE Share Index Trends



Source: Research Data, 2017

As shown, the NSE returns, despite being in an unstable it has been constantly improving over the recent years. The lowest of 67.17 was recorded in February 2012 then later rose to 83.26 in March 2015. The NSE returns further increased to close at 165.5 in 2017. The increase may have been brought about by current economic and political changes. In the same period, a mean of 107.99 was obtained with a mode of 121.34 as per Table 4.1.

Table 4. 1 Descriptive Statistics for NSE Returns

Segment	Mean	Mode	Std. Deviation	Skewness	Kurtosis
NASI	107.99%	121.34%	28.54%	6.34	40.21

Source: Research Data, 2017

4.2.2 NSE Daily Stock Returns

The study sought to determine whether there was any variation in the daily stock returns. The daily stock returns were computed using the daily market capitalizations on each

trading day. Due to NSE not opening over the weekend, Saturday and Sunday were excluded and the results obtained are as shown by Table 4.2.

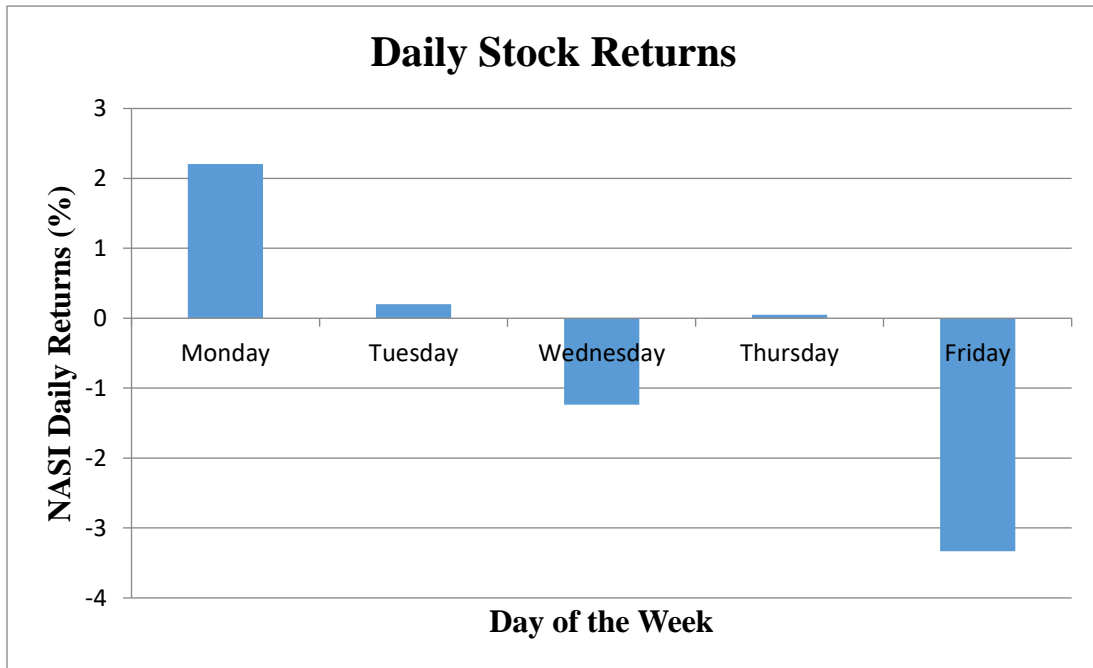
Table 4. 2 NSE Daily Returns

Daily Returns	Mean (%)	Min (%)	Max (%)	Std. Deviation (%)
Monday	1.2057	-5.23	21.34	0.3202
Tuesday	0.1996	-4.25	28.79	2.09318
Wednesday	-3.2342	-3.05	6.43	2.29805
Thursday	0.0499	-3.21	30.23	3.71486
Friday	-4.3303	-8.09	8.62	1.39565
All days	-1.22186	-4.766	19.082	1.964388

Source: Research Data, 2017

The findings indicate that Monday had a mean of 1.2057%, Tuesday had a mean of 0.1996%, Wednesday had a mean of -3.2342%, Thursday had a mean of 0.0499% while Friday had a mean of -4.3303%. This shows that Friday had the lowest negative returns while Monday had the highest positive returns. This implies an increase in the stock during the opening or starting of the week and a decrease during the closing of sales of the week. However, apart from Friday, Wednesday also had negative returns as shown by Figure 4.2.

Figure 4. 2 Mean Daily Stock Returns



Source: Research Data, 2017

4.2.3 NSE Monthly Returns

The study also sought to determine the trends in the monthly stock returns at NSE. The findings obtained are shown by Table 4.3.

Table 4. 3 NSE Monthly Returns

Descriptive Statistics (NASI Average Monthly Returns)	Minimum (%)	Maximum (%)	Mean (%)	Std. Deviation (%)
Jan	-0.0125	0.7746	0.0756	0.0428
Feb	-0.0244	0.0413	-0.0127	0.0343
Mar	-0.0521	0.1834	-0.0185	0.0321
Apr	-0.0513	0.1897	0.0180	0.0312
May	-0.0504	0.1255	0.0175	0.0303
Jun	-0.0496	0.1212	0.0169	0.0294
Jul	-0.0488	0.0433	-0.0164	0.0285
Aug	-0.0479	0.0436	-0.0159	0.0276
Sept	-0.0471	0.0440	-0.0154	0.0267
Oct	-0.0462	0.1443	0.0149	0.0258
Nov	-0.0454	0.1546	-0.0143	0.0248
Dec	-0.0446	0.1758	0.0138	0.0240

Source: Research Data, 2017

As shown, January had the highest mean of 0.07656%, with a maximum of 0.7746% and a minimum of -0.0125%. While February was the lowest with a mean of -0.0127% followed by November, with -0.0143%. This thus shows that the stock market at NSE is relatively higher in January, which confirms the presence of the January Effect.

4.3 Diagnostic Tests

4.3.1 Augmented Dickey-Fuller (ADF) Test

The Augmented Dickey-Fuller (ADF) test was undertaken so as to solve any issues pertaining to the unit roots. The criteria for acceptance or rejection are mainly by assessing the test statistic against the critical values by MacKinnon. This is aimed at determining the stationary nature of the variables. The results of the ADF test are shown by Table 4.4.

Table 4. 4 Results of ADF Test on Daily Stock Returns

	t-statistics	Prob*
Augmented Dickey-Fuller Test Statistic	-7.031	0
Test critical values:		
1%	-3.090	
5%	-2.150	
10%	-2.10	

Source: Research Data, 2017

Table 4. 5 Results of ADF Test on Monthly Stock Returns

	t-statistics	Prob*
Augmented Dickey-Fuller Test Statistic	-7.465	0
Test critical value:		
1%	-3.090	
5%	-2.181	
10%	-2.534	

Source: Research Data, 2017

The obtained statistics for both the daily and the monthly returns are -7.0312 and -7.4652 lie to the left of the critical values. Hence, the variables are concluded to be stationary.

4.3.2 Multicollinearity

Multicollinearity tests was conducted on the regression model so that incorrect conclusions about the relationship between the study variables to be avoided. The findings obtained are presented by Table 4.5.

Table 4. 6 Test for Multicollinearity

Model	Variable	Tolerance	VIF
1	NSE Monthly Variations	0.96	1.054
2	NSE Daily Variations	0.92	1.031

Source: Research Data, 2017

NSE Monthly Variations had a Tolerance value of 0.96 and a VIF value of 1.054 while NSE Daily Variations had a Tolerance value of 0.92 and a VIF value of 1.031. All variables had tolerance of greater than 0.1 and VIF less than 10 and thus implying there was no multicollinearity problem.

4.3.3 Test for Auto Correlation

Auto-correlation is an assumption of regression analysis where the residuals are purely random and that the residuals would not correlate with anything else, including with each other at different time points. The findings obtained for the auto correlation test are presented by Table 4.7.

Table 4. 7 Test for Auto Correlation

Model	Variables	Durbin-Watson
1	Predictors: (Constant), NSE Monthly Stock Returns; Dependent Variable: NSE Returns	2.022
2	Predictors: (Constant), NSE Daily Stock Returns; Dependent Variable: NSE Returns	1.689

Source: Research Data, 2017

The Durbin Watson obtained is 2.022 for the monthly stock returns and 1.689 for the daily stock returns which are within the critical, therefore there was no linear serial correlation in the multiple regression models.

4.3.4 Test for Heteroscedasticity

This study used Breusch-Pagan/ Cook-Weisberg to test for heteroscedasticity. The findings obtained as presented by Table 4.8 indicate that the variables were heteroscedastic and thus reliable.

Table 4. 8 Test for Heteroscedasticity

Model	Variables	Chi2 (4)	Prop>Chi 2
1	Constant variance NSE Monthly Variations,NSE Returns	0.0112	0.643
2	Constant variance NSE Daily Variations,NSE Returns	0.0327	0.834

Source: Research Data, 2017

4.4 Correlation Analysis

4.4.1 Day of the Week Effect

The study aimed at determining the relationship between the day of the week and the NSE returns. The results obtained from the correlation analysis are shown by Table 4. 9.

Table 4. 9 Correlation Analysis for the Daily Stock Returns

Day	Coefficient Of Variation	t-value	p-value
Monday	-0.321	2.24**	0.0022
Tuesday	1.133	1.29	0.1294
Wednesday	1.421	0.82	0.4021
Thursday	1.273	3.89**	0.0001

Source: Research Data, 2017

As shown by Table 4.9, Monday had a coefficient of -0.321, Tuesday had 1.133, Wednesday had 1.421 while Thursday had 1.273. This shows that only Monday had a negative effect while the rest had positive effects to the stock market returns. However, only Thursday and Monday were significant as their p-values were less than 0.05. Therefore implying that these days were able to explain changes in the stock returns.

4.4.2 Month of the Year Effect

The study aimed at determining the relationship between month of the year and the overall NSE returns. The results obtained from the correlation analysis are shown by Table 4.10

Table 4. 10 Correlation Analysis for the Daily Stock Returns

Variables	Coefficients	t- statistic	P-Value
January	3.1714*	2.06	0.04
February	2.0179	1.05	0.67
March	1.8887	0.07	0.72
April	1.7595	0.39	0.35
May	1.6304	0.71	0.23
June	-1.5012	0.38	0.51
July	1.3720	0.31	0.49
August	1.2428	0.24	0.67
September	1.1136	0.04	0.25
October	-0.9845	-0.108	0.13
November	0.8553	-0.256	0.11

Source: Research Data, 2017

As shown by Table 4. 10, January had a coefficient of 3.1714, February had 2.0179, March had 1.8887, April had 1.7595, May had 1.6304, June had -1.5012, July had 1.3720, August had 1.2428, September had 1.1136, and October had 0.9845 while November had 0.8553. This implies that only July and October had a negative effect to the NSE returns while the rest of the months had a positive effect on the NSE returns. However, only January was significant at the 95% confidence level as it had a p-value of less than 0.05. This implies the presence of the January effect in the stock market that leads to a significant increase in the returns. However, this contradicts Maghayereh (2003) who conducted a study on seasonality at the Australian Stock Market Exchange.

4.5 Regression Analysis

In this study, the results of this regression was undertaken so as to determine the relationship that existed between seasonality and stock returns at the NSE.

4.5.1 Day of the week effect

A multiple regression model was used to establish the relationship between the day of the week (predictor variables) and NSE returns (dependent variable). The Regression Model as shown by Table 4.11, indicate that the days of weeks; Monday, Tuesday, Wednesday and Thursday account for only 28.5% of the NSE returns ($R^2=0.285$). This shows that 71.5% of changes in the NSE returns may be accounted for by other variables not present in the model.

Table 4. 11 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.342a	0.285	0.201	0.322

a. Predictors: (Constant), Monday, Tuesday, Wednesday, Thursday

b. Dependent Variable: NSE Returns

Source: Research Data, 2017

ANOVA analysis was undertaken so as to determine the overall usefulness of the regression model in explaining the relationship between the variables. As shown by Table 4.12, the $F_{(5,67)}= 4.502$ was not significant at the 5% level of significance as the p-value of 0.670 is more than 0.05. Therefore, at 95% confidence level, the model was not relevant in explaining the relationship between the daily of the week and the NSE returns.

Table 4. 12 ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	18.573	5	3.517		
Residual	43.408	67	0.404	4.502	.670a
Total	61.981	72			

a. Predictors: (Constant), Monday, Tuesday, Wednesday, Thursday

b. Dependent Variable: NSE Returns

Source: Research Data, 2017

The results in Table 4.13 indicate that based on the model coefficients obtained, for the dummy variables, whereby Monday has a coefficient of 0.129, Tuesday has a coefficient of 0.8314, Wednesday has a coefficient of -1.4439 and Thursday has a coefficient of -0.6594. This implies that Wednesday and Thursday have a negative effect on the NSE returns while Monday and Tuesday have a positive effect on the stock returns. However, the variables were not significant as their p-values were less than 0.5.

Table 4. 13 Model coefficients

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.021	0.3474		2.404	0.0468
Monday	0.129	0.3958	0.061	0.5588	0.0501
Tuesday	0.8314	0.4048	0.0088	0.0745	0.1522
Wednesday	-1.4439	0.4138	0.0434	-0.4098	0.3443
Thursday	-0.6594	0.4228	0.059	-0.8941	0.2364

a. Dependent Variable: NSE Returns

Source: Research Data, 2017

4.5.2 Month of the Year

A multiple regression model was used to establish the relationship between the month of the year (predictor variables) and NSE returns (dependent variable). The Regression Model as shown by Table 4.12, indicate that month of year accounts for only 32.1% of

the NSE returns ($R^2=0.321$). This shows that 67.9% of changes in the NSE returns may be accounted for by other variables not present in the model.

Table 4. 14 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.424a	0.321	0.231	0.4328

a. Predictors: (Constant), Monthly Stock returns

b. Dependent Variable: NSE Returns

Source: Research Data, 2017

ANOVA analysis was undertaken so as to determine the overall usefulness of the regression model in explaining the relationship between the variables. As shown by Table 4.15, the $F_{(2,131)}= 6.601$ was significant at the 5% level of significance as the p-value of 0.002 is less than 0.05. Therefore, at 95% confidence level, the model was significant in explaining the relationship between the month of the year and the NSE returns.

Table 4. 15 ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	13.058	2	2.406	6.601	.002a
Residual	37.703	131	0.404		
Total	50.761	133			

a. Predictors: (Constant), Monthly Stock returns

b. Dependent Variable: NSE Returns

Source: Research Data, 2017

The results in Table 4.16 indicate that based on the model coefficients obtained, all the variables have a negative impact on the NSE returns. This is because all the dummy variables were negative. Hence, taking the independent variables' value at zero, the market return would be 2.6% ($\beta_0=2.6045$, $P =0.0337$). Therefore, a unit increase in January, February, March, May, June, July, August, September, October or November

would cause a reduction in the stock market returns. However all the variables except January were not significant as their pvalues were less than 0.05.

Table 4. 16 Model coefficients

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	T	
(Constant)	2.6045	0.2746		3.0602	0.0337
DJan	-0.3219	0.2629	-0.4107	2.3543	0.03664
DFeb	-0.7005	0.2512	-0.4629	4.9246	0.3959
DMar	-0.2791	0.2395	-0.5151	0.8568	0.4254
DApril	-0.3433	0.2278	-0.5674	0.6270	0.4550
DMay	-0.2647	0.2161	-0.6196	-2.7212	0.4845
DJun	-0.7931	0.2044	-0.6719	-3	0.5141
DJuly	-0.9717	0.1927	-0.7241	-4.4586	0.5436
DAug	-0.8503	0.1811	-0.7764	-3.0518	0.5731
DSep	-0.8945	0.1694	-0.8286	-0.6450	0.6027
DOct	-0.2075	0.1577	-0.8809	-0.3822	0.6322
DNov	-0.5861	0.1460	-0.9331	-0.8314	0.6618

Source: Research Data, 2017

4.6 Discussion of Findings

4.6.1 Day of Week Effect

The study sought to determine the presence of the day of the week on the NSE returns. Pertaining, the variations in the daily returns, the results showed that Friday had the lowest negative returns while Monday had the highest positive returns. Additionally, Wednesday also obtained negative returns. This implies an increase in the stock during the opening or starting of the week and a decrease during the closing of sales of the week. The findings concur with Onyuma (2009) who sought to determine the existence of daily seasonal anomalies in the NSE and found out that the first trading day of the week

(Monday) has the lowest negative returns, while the last day of the week (Friday) has the largest positive returns.

The study also conducted the Correlation analysis to establish the relationship between day of the week and the NSE returns whereby, Monday had a coefficient of -0.321, Tuesday had 1.133, Wednesday had 1.421 while Thursday had 1.273. This shows that only Monday had a negative effect while the rest had positive effects to the stock market returns. However, only Thursday and Monday were significant as their p-values were less than 0.05. This relates to the studies conducted by King'ori, (2005) on the stock market Seasonalities at the Nairobi Stock Exchange.

On the overall effect that the day of the week has on the NSE returns, the coefficient of determination obtained was 0.285 implying that Monday, Tuesday, Wednesday and Thursday account for only 28.5% of the NSE returns. This shows that 71.5% of changes in the NSE returns may be accounted for by other variables not investigated by the study. The model coefficients obtained however showed that the variables were not significant as their p-values were less than 0.5. Hence implying there was no significant day of the week effect on the NSE returns. This is supported by a study by Sifuna, (2012) who found out that there is no day of the week effect at the Nairobi Securities Exchange.

4.6.2 Month of the Year Effect

The study sought to determine the presence of the month of the year effect on the NSE returns. The findings on the monthly returns variations at the NSE, the stock market returns at NSE were established to be relatively higher in January, which confirms the presence of the January Effect. While the lowest returns were obtained in the months of February and November. This may be explained by the change in behavior of the

investors as some months are perceived to yield better stock returns than others. Hence most people or firms would prefer doing the transactions during the start of the year.

The study also conducted the Correlation analysis to establish the relationship between month of the year and the NSE returns whereby, January had a coefficient of 3.1714, February had 2.0179, March had 1.8887, April had 1.7595, May had 1.6304, June had -1.5012, July had 1.3720, August had 1.2428, September had 1.1136, October had 0.9845 while November had 0.8553. This implies that only July and October had a negative effect to the NSE returns while the rest of the months had a positive effect on the NSE returns. The regression analysis further conducted attained a coefficient of determination of 0.321 implying that month of year accounts for only 32.1% of the NSE returns. This shows that 67.9% of changes in the NSE returns may be accounted for by other variables not investigated by the study.

Further, the model coefficients obtained, all the variables have a negative impact on the NSE returns. This is because all the dummy variables were negative. Hence, taking the independent variables' value at zero, the market return would be 2.6% ($\beta_0=2.6045$, $P=0.0337$). Therefore, a unit increase in January, February, March, May, June, July, August, September, October or November would cause a reduction in the stock market returns. This relates to Abdalla (2012) who conducted a study on the Sudanese Stock Market so as to determine the presence of the month of the year effect and found out negative and insignificant mean returns on all the months.

However all the variables except January were not significant as their pvalues were less than 0.05. Thus confirming the presence of the January effect on the stock Market returns. This implies that most share trades are conducted in January, hence the increase

in returns. Similarly, Ayodgan and Geoffrey (2003) conducted a study on the stock market returns at Turkey. The study established that market returns display a market anomaly in Turkey whereby January tends to perform better, which contradicts the Efficient Market Hypothesis.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study findings guided by the objective of the study which was to determine the seasonal effect on the stock market returns at the Nairobi Securities Exchange Market. Conclusions and recommendations are also given for future action and research direction.

5.2 Summary of Findings

The study sought to determine the influence that seasonality has on the market returns at the NSE. The study adopted the descriptive research design in obtaining information. The study used secondary data was collected for a period of 5 years, (2012 to 2017) which was obtained from NSE. The NSE 20-share index was selected to represent the overall daily stock prices. The findings obtained are summarized as below as per the study's specific objectives.

5.2.1 Day of the Week Effect

The study aimed at determine the presence of the day of the week on the NSE returns. Pertaining to the variations in the daily returns, the results showed that Friday had the lowest negative returns while Monday had the highest positive returns. This implies an increase in the stock during the opening or starting of the week and a decrease during the closing of sales of the week. The study also conducted the Correlation analysis to

establish the relationship between the research variables whereby, only Monday had a negative effect while the rest had positive effects to the stock market returns.

On the overall effect that the day of the week has on the NSE returns, the coefficient of determination obtained was 0.285 implying that Monday, Tuesday, Wednesday and Thursday account for only 28.5% of the NSE returns. This shows that 71.5% of changes in the NSE returns may be explained by other variables not investigated by the study. The model coefficients obtained however showed that the variables were not significant as their p-values were less than 0.5. Hence implying there was no significant day of the week effect on the NSE returns.

5.2.2 Month of the Year Effect

The study sought to determine the presence of the month of the year effect on the NSE returns. The findings on the monthly returns variations at the NSE, the stock market returns at NSE were established to be relatively higher in January, which confirms the presence of the January Effect. While the lowest returns were obtained in the month of February and November. The study also conducted the Correlation analysis to establish the relationship between month of the year and the NSE returns whereby, only July and October had a negative effect to the NSE returns while the rest of the months had a positive effect on the NSE returns.

The regression analysis further conducted attained a coefficient of determination of 0.321 implying that month of year accounts for only 32.1% of the NSE returns. This shows that 67.9% of changes in the NSE returns may be accounted for by other variables not investigated by the study. Further, the model coefficients obtained, all the variables have a negative impact on the NSE returns. Therefore, a unit increase in January, February,

March, May, June, July, August, September, October or November would cause a reduction in the stock market returns. However all the variables except January were not significant as their pvalues were less than 0.05.

5.3 Conclusions

The study aimed at determining the influence that seasonality has on the market returns at the NSE. The trend analysis at NSE revealed that the stock market returns have not been constant throughout the study period with both very high and very low returns being experienced. This may be due to various macroeconomic factors such as inflations, interest rates, and exchange rates which determine the stock market returns. The study thus concludes that they are fluctuations in the stock market returns at NSE.

Particularly, the study investigated both the day of the week effect and the month of the year effect on the stock market returns at NSE. On the day of the week effect, the study found out that Friday had the lowest negative returns while Monday had the highest positive returns. This shows that stock market returns tend to increase when the week begins, and reduce when the week ends. However, variables were not significant hence the study concludes no presence of the day of the week effect at NSE. The study thus concludes that there are variations in the daily returns at the NSE.

However, there was no consistency in the returns as both high and low periods being experienced. This contradicts Hussain, Hamid, Akash and Khan (2011) who made the assumption that the expected daily stock returns are the same for all the days of the week.

The differences in returns thus shows to the presence of volatility in the stock returns which is mainly caused by changes in the investors behaviors. The study therefore concludes that in decision making processes, both the variance and volatility of returns ought to be accessed.

The study also established that March also had also had lower returns which may be due to this being the last financial year in some companies. Therefore, the companies which are experiencing losses maybe hedged off. The study thus concludes that the month of the year effect mainly occurs during the closing and ending of the financial years. The study thus concludes that the stock market tend to vary based on the particular month. This concurs with Gao et al, (2005) who did a study on calendar effects in Chinese Stock Market.

On the contrary, Hommes (2005) argues that the occurrences in seasonality effects is mainly due to the norms and perceptions of people. Hence, people will tend to follow a particular trend in their share activities thus end up maintaining the seasonality even though it was not supposed to be there. This could be the reason why despite numerous measures being put in place to ensure that there is stability in the stock market returns, their effects have been minimal. The study thus concludes that the people's norms and routine practices could also play a role in the seasonal anomalies.

The study further found out that all the variables have a negative impact on the NSE returns based on the coefficients obtained. Yet, all the variables except January were not significant as their pvalues were less than 0.05. Hence the study concludes the presence of the January effect at the NSE with the other months having minimal effect. The study therefore concludes that there is presence of seasonality influence at NSE but its effects

are minimal. In a similar way, Onyuma, (2009) also obtained an insignificant influence of the calendar anomalies on the stock performance.

5.4 Recommendations

Based on the study findings, the study makes several recommendations. To begin with, the study found the presence of fluctuations in the NSE returns. The study therefore recommends that the regulatory bodies such as CBK should put in place measures so as to ensure stability in the macroeconomic variables which highly determine how the stock market performs. This will act greatly in reducing the unfavourable conditions that are experienced during macroeconomic instability.

The study recommends that the governments should come up with ways through which they will be able to enhance the efficiency of the stock markets. This may be done through the regulatory bodies such as Capital Market Authority which will put regulations to ensure minimal variations in the stock returns. By ensuring that there is economic stability, the government will be able to regulate the stock markets even better.

The study also found out there exists anomalies at the NSE that contradict the Efficient Market Hypothesis. The study thus recommends investors to carefully study the relevant market information before undertaking transactions as the market movements cannot be easily predicted. The study also recommends that measures to be undertaken at the NSE to ensure that there is minimal seasonal effect such as controlling the stock returns through the relevant capital market regulation agencies.

5.5 Limitations to Study

The study was faced by limitations which were experienced during collection information pertaining to the study. Firstly, the NSE index was introduced in the year 2008, and therefore information on the NSE performance was only available from 2009. The study was thus limited as it could not cover a wide range of data to enable more comparison. Secondly, the period in which the study was conducted experienced many monetary and policy change which may have influenced the share prices and returns.

The study was also conducted within a shorter duration of only a five year period. Hence comparison of trends of the variables for a longer duration was not possible. Additionally, within the study period, there were holidays which were not catered for by the study. This may have resulted in the interference of the findings of the study. However, the researcher ensured accuracy and validity by undertaking the appropriate diagnostic tests and by ensuring comprehensive data collection and interpretation.

Additionally, the study's findings were not adjusted for the transaction costs which affect the stock market returns. These may be either fixed or variable based on the time. The study was thus limited by not factoring the costs of equity trade. The study period may also be faced by many policies and monetary changes which might have played a role on how the share prices performed.

5.6 Suggestions for Further Research

The study was conducted only for a five year period due to the limited availability of data. The study thus suggests that future studies to be conducted covering a longer duration of time. This will enable complete comparison of the results obtained. Also,

further studies to be conducted at a different time frame to establish whether the same phenomenon will be prevailing.

The study also suggests that all the stock market sectors to be used rather than the share index priced. This will yield a much more accurate result and enable comparison. The studies should also look at the micro-economic variables rather than the macro economic variables only. In addition, the study makes the suggestion that the seasonality should also be investigated in the fixed income instruments such as Treasury Bonds and Treasury Bills as they are traded differently as compared to the equity instruments.

Additionally, the study only concentrated on two season anomalies namely the day of the week effect and the month of the year effect. Therefore, the study suggests that further research to be undertaken will incorporating other seasonal anomalies such as the weekend effect and the holiday effect. This will enable comprehensive generalization of the study's findings in describing the influence of seasonality on NSE returns.

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APPENDICES

Appendix I: Firms listed at the Nairobi Securities Exchange per sector

AGRICULTURAL

1. Eaagads Ltd Ord 1.25
2. Kapchorua Tea Co. Ltd Ord 5.00
3. Kakuzi Ord.5.00
4. Limuru Tea Co. Ltd Ord 20.00
5. Rea Vipingo Plantations Ltd Ord 5.00
6. Sasini Ltd Ord 1.00
7. Williamson Tea Kenya Ltd Ord 5.00

COMMERCIAL AND SERVICES

8. Express Ltd Ord 5.00
9. Kenya Airways Ltd Ord 5.00
10. Nation Media Group Ord. 2.50
11. Standard Group Ltd Ord 5.00
12. TPS Eastern Africa (Serena) Ltd Ord 1.00
13. Scangroup Ltd Ord 1.00
14. Uchumi Supermarket Ltd Ord 5.00
15. Hutchings Biemer Ltd Ord 5.00

TELECOMMUNICATION AND TECHNOLOGY

16. AccessKenya Group Ltd Ord. 1.00
17. Safaricom Ltd Ord 0.05

AUTOMOBILES AND ACCESSORIES

- 18. Car and General (K) Ltd Ord 5.00
- 19. CMC Holdings Ltd Ord 0.50
- 20. Sameer Africa Ltd Ord 5.00
- 21. Marshalls (E.A.) Ltd Ord 5.00

BANKING

- 22. Barclays Bank Ltd Ord 2.00
- 23. I & M Holdings Ltd Ord 1.00
- 24. CFC Stanbic Holdings Ltd ord.5.00
- 25. Diamond Trust Bank Kenya Ltd Ord 4.00
- 26. Housing Finance Co Ltd Ord 5.00
- 27. Kenya Commercial Bank Ltd Ord 1.00
- 28. National Bank of Kenya Ltd Ord 5.00
- 29. NIC Bank Ltd Ord 5.00
- 30. Standard Chartered Bank Ltd Ord 5.00
- 31. Equity Bank Ltd Ord 0.50
- 32. HF Group Holdings Ltd Ord 5.00
- 33. The Co-operative Bank of Kenya Ltd Ord 1.00

INSURANCE

- 34. Jubilee Holdings Ltd Ord 5.00
- 35. Pan Africa Insurance Holdings Ltd Ord 5.00
- 36. Kenya Re-Insurance Corporation Ltd Ord 2.50
- 37. CIC Insurance Holdings
- 38. British-American Investments Company (Kenya) Ltd Ord 0.10

INVESTMENT

- 39. City Trust Ltd Ord 5.00
- 40. Olympia Capital Holdings ltd Ord 5.00
- 41. Centum Investment Co Ltd Ord 0.50
- 42. Trans-Century Ltd

MANUFACTURING AND ALLIED

- 43. B.O.C Kenya Ltd Ord 5.00
- 44. British American Tobacco Kenya Ltd Ord 10.00
- 45. Carbacid Investments Ltd Ord 5.00
- 46. East African Breweries Ltd Ord 2.00
- 47. Mumias Sugar Co. Ltd Ord 2.00
- 48. Unga Group Ltd Ord 5.00
- 49. Eveready East Africa Ltd Ord.1.00
- 50. Kenya Orchards Ltd Ord 5.00
- 51. A.Baumann CO Ltd Ord 5.00

CONSTRUCTION AND ALLIED

- 52. Athi River Mining Ord 5.00
- 53. Bamburi Cement Ltd Ord 5.00
- 54. Crown Berger Ltd Ord 5.00
- 55. E.A.Cables Ltd Ord 0.50
- 56. E.A.Portland Cement Ltd Ord 5.00

ENERGY AND PETROLEUM

- 57. KenolKobil Ltd Ord 0.05
- 58. Total Kenya Ltd Ord 5.00
- 59. KenGen Ltd Ord. 2.50
- 60. Kenya Power & Lighting Co Ltd
- 61. Umeme Ltd Ord 0.05

Source; Nairobi Securities Exchange (2017): <http://www.nse.co.ke/listed-companies>