# TURN OF THE MONTH EFFECT ON STOCK RETURNS: EVIDENCE FROM THE NAIROBI SECURITIES EXCHANGE

**JULIET MUSIMBI**

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# DECLARATION

**BY CANDIDATE**

This project is my original work and to the best of my knowledge has not been submitted for examination or a degree award in any other university.

**Signature _____ DATE_____**

**Juliet Musimbi**

**D63/68000/2013**

**SUPERVISOR**

This project has been submitted for examination with my approval as university supervisor.

**Signature _____ DATE_____**

**Winnie Nyamute**

**Lecturer, Department of Finance & Accounting**

**School of Business**

**University of Nairobi**

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# DEDICATION

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## LIST OF ABBREVIATION

**AMEX**: The American Stock Exchange

**CDSC**: Central Depository and Settlement Corporation

**CMA:** Capital Markets Authority

**EMH**: Efficient Market Hypothesis

**LSE**: London Stock Exchange

**NSE:** Nairobi Securities Exchange

**NYSE:** The New York Stock Exchange

**ROM:** Rest-of-the-month

**TOM:** Turn-of-the-month

# ABSTRACT

The security market faces inconsistency in prices due to various reasons and at different periods. The drifts in prices allow investors capitalize on the abnormal profits showing markets are not as efficient as depicted by Fama. This gap led to the identification of various calendar anomalies including the Turn-of-the-Month anomaly which is a calendar anomaly that suggests temporal increase in security prices during the last few days and the first few days of each month. This study was focused on establishing the effect exists at the Nairobi Securities exchange and which turn-of-the-month window maximizes returns. The study adopted an events study approach. This approach was appropriate since the turn-of-the-month is an occurrence experienced on a continuous basis. The study used Nairobi Securities Exchange data on share prices for the 65 listed companies from 2010 to 2014. A paired t-test was conducted to test if there was a significant difference in mean abnormal returns between the turn of the month period and the rest of the month. The findings showed that the existence of the turn-of-the-month anomaly varies between periods and study windows with the 5 days turn-of-the-month window showing the most significant results. The period 2013 showed a maximum difference in the abnormal returns suggesting a unique occurence. On the overall, the effects offset to minimum significance thereby implying minimal difference in returns between the mean abnormal returns at the beginning of the month and the rest of the month hence failure to confirm the anomaly exists. The study recommends that investors study the market to establish the market trends and develop portfolios that will maximize returns in the long-run considering stock returns are influenced by factors influencing the market like systematic risk factors which may lead to poor performance of some stocks.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

Securities play an important role in our financial and economic lives. They provide a way to hold personal wealth as a divestiture while spreading and reducing risks faced while investing. When the value rises the richer we get and when their value drops the poorer we become. These fluctuations affect the consumption and saving patterns thereby affecting our economic activities. Securities are also a way for companies to obtain financing. Securities and security markets link the financial world to the real economy. Firms considered more valuable in the market place tend to obtain financing easily (Ceccheti, 2008).

Securities -stocks and bonds-are first bought when they are issued by corporations as a means of raising money. After the initial issue, they are traded among investors. These happen in security markets. A security market is a place where you can buy or sell securities (Arthur, 2010). A security market can either be primary or secondary. Newly issued securities are traded in the primary market while previously issued securities are traded in the secondary market. Examples of security markets include: The New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), the London Stock Exchange (LSE), and Nairobi Securities Exchange (NSE).

Mishkin (2007) recognizes that the market sets stock prices. He points out that the price is set by the forces of demand and supply in the securities market through the regular price mechanism-this price may not necessarily be high but it is incrementally greater than what other buyers are willing to pay. The market price is set by the buyer who can best take advantage of the asset.

Malkiel (2003) cites Fama's article "Efficient Capital Markets" (1970) who believed that security markets were extremely efficient in reflecting information about individual stocks and the stock market as a whole. Fama observed that when new information arises, the news spread so quickly that it gets incorporated into the prices with minimal if no delay. This wouldn't allow technical analysts, who study past stock prices in an attempt to predict future prices and fundamental analyst who use company earnings and asset value to determine prices achieve greater returns than those holding random securities.

Real financial markets cannot be considered perfectly efficient and investors seek effective investment strategies that will identify investment opportunities which, based on their past performance and new information, are likely to outperform in the financial markets (Mattarocci, 2014).

Rose (1993) agrees that as much as the Efficient Market Hypothesis (EMH) was supported by a few theories like the random walk, there exists evidence of inefficiencies. The fluctuations in the share prices- as much as they may be random- still allowed agents to enjoy unusually high profits prompting the identification of the Stock Markets Anomalies. These anomalies can either be technical or seasonal. The technical anomalies include: the small-firm effect, the closed-end mutual fund puzzle; low Price Earnings (P/E) ratio effect, seasonal anomalies are also called calendar anomalies. Such seasonal anomalies include: the turn-of-the-month effect, the January effect, the weekend effect, the day of the week effect, the time-of-the-month effect.

### 1.1.1 Turn-of-the-Month Anomaly

Calendar anomalies are recursive trends in the price of securities and their relevance is affected by the characteristics of the market in which the security is trading in (Mattarocci, 2014).

Calendar anomalies include: the January effect, the weekend effect, intra-month effect, intra-day effect, day-of-the-week effect, turn-of-the-month effect. Gagan *et al.,* (2014) recognize that most studies have focused on the seasonal anomalies also called the calendar effects.

The turn-of-the-month effect is positive returns at the beginning of the month, starting on the last trading day of the previous month and continuing through the first half of the new month, followed by predominantly negative returns after the mid-point of the month (Kolahi, 2006). Some analysts credit this effect to the timing of the monthly cash-flow example spread of salary payments and other liabilities, increased liquidity and from the spread of the earnings announcement releases.

The turn-of-the-month effect was first documented by Ariel (1987) after conducting a study for 1963 through 1981. He discovered that there are positive returns for the period starting on the last trading day of the previous month through the first half of the next month followed by negative returns after the mid-point of the month. This study is focused on the turn-of-the-month effect on share prices as experienced in the NSE.

### 1.1.2 Stock Market Returns

Stock Market Returns are the returns that the investors generate out of the stock market. This could be in the form of profit through trading or in the form of dividends given by the company to its shareholders from time-to-time. Stock Market Returns can be made through dividends announced by the companies (Strong, 1992). Generally at the end of every quarter, a company making profit offers a part of the kitty to the shareholders. This is one of the source of stock market return one investor could expect. The most common form of generating stock market

return is through trading in the secondary market. In the secondary market an investor could earn stock market return by buying a stock at lower price and selling at a higher price.

Stock Market Returns are subject to market risks and may change from investor-to-investor depending on the amount of risk one is prepared to take and the quality of his Stock Market Analysis. Ceccheti (2008) identifies that securities can be valued using various approaches like the Fundamental Analysis which analyzes relevant data (cash flow, return on assets, history of profits, etc.) associated with the company, which could have an effect on the intrinsic or face value of the stock. This analysis helps in predicting the price movement of the stock based on its fundamental strength. Fundamental Analysis is generally relevant for the long-term. Technical Analysis tries to evaluate the future trend of stock prices. Technical analysts focus on the historical price movement of a stock and predict accordingly.

Ceccheti (2008) state that as much as securities may have an underlying value, other market factors contribute to the pricing of the securities. These factors basically associate with the information present in the market. This information may include: earnings at the end of a trading period, dividends, and currency effects like inflation.

The current securities Market is associated with derivative instruments like futures and options used for hedging the risk associated with such investments. Derivatives are used by many for arbitraging by utilizing the price discrimination between different markets. Hedging and Arbitraging don't give higher returns but do help in minimizing losses and in protecting the capital.

### 1.1.3: Turn-of-the-Month Effect and Stock Returns

Eberhert *et al.*,(2004) note that most studies have shown that the market is slow to incorporate publicly available information, which is in contrast with the Efficient Market Hypothesis prediction. The undervaluing or overvaluing of stocks during portfolio formation allows investors to enjoy significant positive (negative) returns over a long period of time. Ondiala (2014) define abnormal returns as the differences between the actual and the expected securities returns.

Chandra (2009) surveyed the Bombay Stock Exchange for calendar effects and found that both the Turn of the Month effect as well as the Time of the Month effect displayed significant effect on stock returns. Returns during a month were analyzed by dividing that month into three parts separately. The early days of the month witnessed higher mean returns than later days of the same month. The reason behind this trend could be the cognitive belief of investors with regard to new and positive changes in policies and newer information in the coming month. This results in selling pressure by investors with the hope to get positive benefits, leading to low returns at the end of month (Chandra, 2009).

### 1.1.4 The Nairobi Securities Exchange

The Nairobi Securities Exchange is the major securities market in Kenya. Registered under the Societies Act as a voluntary association of stockbrokers and charged with the responsibility of developing the securities market and regulating trading activities in 1954. NSE was registered as a private company limited by shares in 1991. Association of Kenya stock brokers was formed (1997), CMA published new guidelines and requirements (1998), the Central Depository and Settlement Corporation Limited (CDSC) was incorporated under the Companies Act (Cap 486)

and The East African Community Treaty signed (1999). In 2006 the NSE was automated. The Nairobi Stock Exchange Limited changed its name to the Nairobi Securities Exchange Limited (NSE, 2015).

Past studies acknowledge the existence of seasonal effects at the NSE. Ndegwa (2014) tested the existence of consistent stock performance in the NSE during the years 2001 to 2010, to assess whether consistent stock performance in the NSE is related to: market anomalies, stock value and underlying firm characteristics. He found out that there was insignificant relationship between consistent stock performance and size anomaly in NSE but the market was still not free from calendar anomalies. Muchemi (2013) had carried out a study of Seasonal Effects on Average Returns of Nairobi Securities Exchange and he found out that the NSE experiences seasonal effects.

## 1.2 Problem Statement

The securities market has been defined as efficient (Fama, 1970) meaning the securities prices reflects all information about the securities and market. The security market is where prices rise and fall dependably creating a notion that securities are a risky venture. The random walk theorists identify that all subsequent price changes represent random departures from previous prices. This is so because the securities prices are expected to reflect all present information available to the market.

This randomness of share prices prompted investigations on the efficiency of the capital markets leading to the identification of various anomalies one of them being the turn-of-the-month effect that was first documented by Ariel (1987). He examined the US share returns and found that the

mean return for stock is positive only for days immediately before and during the first half of calendar months, and indistinguishable from zero for days during the second half of the month.

Several studies have been carried out on the Nairobi Securities Exchange however there are a few that closely relate to the trend of share prices with inclination towards the influence from market anomalies. Wambugu (2012) investigated the Turn-of-the-Month Effects in the Foreign Currency Market and found out that the performance of the Kenyan shilling is affected by the turn-of-the-month. Kuria (2013) carried out a study on "Stock Market Anomalies: A Study of Seasonal Effects on Average Returns of Nairobi Securities Exchange". He examined the presence of the week effect anomaly in Nairobi securities Exchange and identified that despite increased use of technology the securities market in Kenya still experiences seasonal anomalies.

Ondiala (2014) employed a TOM window of (-1, +3) in his study 'The Turn-Of-The-Month Effect at the Nairobi Securities Exchange' to find out the TOM effect varied among the segments at the NSE which when merged neutralizes the effect to non-existence minimal. Waithaka (2012) had a study window of (-1, + 8) in her study 'Turn of the Month Effect on Stocks Listed at the NSE' to show that the TOM effect exists at the NSE.

These studies on the turn-of-the-month (TOM) effect at the NSE have shown mixed perceptions of the existence of the Turn-of-the-Month effect at the Nairobi Securities Exchange. This difference may be attributed to a variance in the study window employed. No previous study has been conducted at the NSE to compare returns obtained for the different TOM windows with an aim of establishing which TOM period maximizes returns. This study therefore seeks to identify the turn-of-the-month window that will maximize returns. The study sought to answer the question: does the turn-of-the-month window influence the level of returns?

## 1.3 Study Objective

The study aimed at examining the turn-of-the-month effect at the Nairobi Securities Exchange.

## 1.4 Value of the Study

The study will be of value to investors, both individual and brokers. The assumed character of investors to be rational proposes that they would consider several factors before making a decision on a security portfolio. The knowledge of the anomalies present in the market and their effect on the prices will enable them know when to trade enabling them maximize profits with minimum costs.

The NSE and its regulators example the CMA will also benefit from the study. By establishing the trend due from the anomalies effect, the NSE can predict when to expect the highs and lows of trade. This will help the NSE and CMA come up with policies that will improve market efficiency.

Most companies depend on the stocks to raise basic finance and use part of their profits to pay dividends. Knowing the inconsistencies at the securities markets due to the anomalies will help managers with planning considering the cash flow from stock trade will be limited to certain periods of the month. Other affordable sources of finance during the low trade days will be a better option than stocks.

Findings from this study will contribute to the various studies on market efficiency, building on the theories previously established like the Efficient Market Hypothesis, The Random walk Theory. Other scholars will be able to use this research as a guide to areas that need further research. The study will be used as a reference by students when studying this field of finance.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

Stock market anomalies have been brewed from the gaps that previous studies did not factor in the hypotheses developed which tend to describe the market and the trader. These hypotheses include: Efficient Market Hypothesis, The Random Walk Theory and The behavioral finance concept. This chapter discusses literature on these studies and other empirical studies carried out.

## 2.2 Theoretical Framework

### 2.2.1 Efficient Market Hypothesis

The theory was first developed by Eugene Fama. Fama (1970) identified that security markets were extremely efficient in reflecting information about individual stocks and the market as a whole. When new information arises, the news spreads fast enough and is reflected in the prices immediately discouraging attempts by the technical analysts who use trend to predict future prices and fundamental analysts who use financial information to predict stock price using the determined value of the underlying asset.

Hagin (1979) in the "Modern Portfolio Theory" describes an efficient capital market as an arena in which many participants with similar investment objectives and access to similar information actively compete. Investors, being rational thinkers, are profit minded and would thereby continuously search for mis-valued securities. These investors would prefer high returns, certainty to uncertainty, and low risk to high risk. This would make it impossible to outperform the market. Robert points out that market efficiency does not deny profitability of investing.

Basically, rewards obtainable from investing in highly competitive markets will be fair, on the average, for the risks involved.

Mishkin (2010) adds that the modern efficient market not only reflects market information but the true intrinsic value of the securities. All prices are always correct and reflect market fundamentals i.e. the items that directly influence the future income streams of securities.

Market efficiency can either be weak; semi-strong or strong. The weak form holds past information; the semi-strong form holds public information and the strong form holds information both public and private available to an investor.

### 2.2.2 The Random Walk Theory

Malkiel (1999) defines a random walk as one in which future directions cannot be predicted on the basis of past actions. Short run changes in stock prices cannot be predicted. According to Fama (1965), the random walk dismisses the theories of chartist and fundamental. Chartists believe that history tends to repeat itself and therefore patterns of past prices will be repeated in future. The fundamental analysts factor the principle of intrinsic value. They assume that at a point of time an individual security has an intrinsic value, also known as equilibrium price by economists, which depends on the earning potential of the security.

Random walk theorists first acknowledge that security markets are efficient. In an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value. In an uncertain world, the intrinsic value of securities cannot be determined to its precise creating room for disagreements among market participants. Such disagreements give rise to differences between actual prices and intrinsic value. In an efficient market, however, the actions

of the many market participants should cause the actual prices of the securities to wonder randomly about the intrinsic values (Fama, 1965).

The random walk theorists assume that the successive price changes are independent. This assumption is valid as long as knowledge of past behavior cannot be used to increase expected gains. Any new information impact will not last due to market efficiency and any unique change in the actual price to the intrinsic value is ultimately neutralized to zero mean (Fama, 1965).

### 2.2.3 Behavioral Finance Theory

According to Mishkin (2010), doubts about the EMH developed after stock market crash in 1987. Cecchetti (2008) indicates that in October 1987 stock prices fell nearly thirty percent in a week, this being inclusive of a drop of twenty percent per day. In 2001, the stock prices of the United States' big companies as measured by the Dow Jones Industrial Average (DJIA) fell more than thirty percent. Most stocks did not recover as quickly as expected. The NASDAQ composite index also fell seventy percent from 5,000 to 1,500; later rising to a high of 2,500 and remaining below this mark.

Mishkin (2010) recognizes the emergence of a new field- behavioral finance which captures other fields such as anthropology (study of human's past and present), sociology (study of social behavior, its origin, development, organization and institution) and psychology (study of mind and behavior). The EMH assumed that unexploited profit opportunities are eliminated by smart money market participants. The smart money participants will sell when the price rises rationally with the result that the stock price will fall back to a level justified by fundamentals.

He despised the notion claiming that the smart money investor must be able to engage in short sales; borrow from broker in the market, sell in the market with the aim of making a profit by

buying stock again when prices have fallen. Psychologists have observed that the smart money investors tend to suffer loss intensely when they do not gain as much. Investors and people in general tend to be more confident in their own judgments. They therefore trade their beliefs than the pure market facts. This brings out the unpredictability of trade patterns that cannot be explained by the EMH. Behavioral finance has also been observed as a contributor to the stock market anomalies.

### 2.2.4 Summary of Theoretical Framework

The TOM effect is the most recent calendar anomaly- first documented by Ariel (1987). Being a calendar anomaly, TOM is guided by three theories as discussed in this chapter. The Efficient Market Hypothesis that tells of security markets being efficient with the security prices reflecting all information present to investors. The Random Walk theory recognizes that markets are efficient. However in an uncertain world there are bound to be indifferences among investors which results to different prices. The subsequent change in price is independent and thereby random. The behavioral finance concept holds that the smart money participants will sell when the price rises rationally with the result that the stock price will fall back to a level justified by fundamentals. These smart investors would not prefer short sales as they suffer losses extremely if they do not gain as much as expected.

## 2.3 Turn-of-the-Month Effect

### 2.3.1 Definition

Kolahi (2006) defines a trading month as extending from the last trading day of the month (inclusive) to the last trading day of the following month (exclusive). He also defines the turn-of-the-month effect as positive returns at the beginning of the month, starting on the last trading day

of the previous month and continuing through the first half of the new month, followed by predominantly negative returns after the mid-point of the month.

An anomaly is an inconsistency with the existing paradigm. Inefficiencies can coexist with random walks in security prices. Rose (1993) defines Security market anomalies as departures from efficient markets that allow economic agents to enjoy unusually high (risk-adjusted) returns The Turn-of-the-Month anomaly is a calendar effect plus the January effect, Weekend effect, Monday effect. Technical anomalies include the small size effect.

### 2.3.2 Evidence of the Turn-of-the-Month Effect

This effect was first documented by Ariel (1987) who reported a monthly seasonal pattern of equally weighted stock portfolios between 1963 and 1987 using data from the Centre for research in Security Prices. In his study, stock returns in the first nine trading days of the month plus the last day of the previous month are considerably higher than stock returns in the second half of the month identified as the last eight trading days of the month exclusive of the last trading day.

Lokonishok and Smidth (1988) conducted a study of various seasonal patterns on the DJIA over a 90 year period. They suggest that the monthly jump in returns may be liquidity-driven and as a result of the buying and selling activity of pension fund managers around the turn-of-the-month. Ogden (1990) proves that the anomaly is liquidity driven. Other than pension fund activities, cash receipts such as wages, dividends, interests and principal payment at the end and beginning of the month are quickly re-invested resulting in the surge in stock returns. He suggested a standardized payment system.

Cadsby and Ratner (1992) define the turn-of-the-month as the last and the first three trading days of each month. They examined stock market indices in ten countries, CRSP value-weighted and equally-weighted stock index returns for USA, Toronto stock exchange equally-weighted for Canada, Nikkei index for Japan, Hang Seng for Hong Kong, Financial times 500 share or UK, All ordinaries index for Australia, Banca Commerciale index for Italy, Swiss Bank Corporation Industrial index for Switzerland, the Commerzbank index for west Germany and the Compagnie des Agents de Change General Index for France. The dates vary in each index ranging 1962-1989. Using t-statistics they obtained mixed results, Australia showed significant positive returns. Canada and United Kingdom showed positive returns but not significant enough. Japan experiences a negative effect with returns higher in the second half. This study contradicts Ariel (1987) who identified higher returns in the beginning of the month than the other half.

Hensel and Ziemba (1996) examined the occurrences using the daily returns of the S&P 500 Index for the 65-year period from 1928 to 1993. They studied returns during the last trading day of the month andfirst four days of trading of the following month (TOM period); second week; the first half of the month and during the rest of the month. The average daily return during the TOM was significantly above average and more than six times greater than the average daily return for the entire 65-year period. Daily returns for the first half of the month were also significantly above average, but returns during the rest of the month were significantly negative and below average. They show that after adjustment for risk, a strategy for being long in the S&P 500 index during the turn-of-the-month period and long in treasury bills at other times dominates other strategies. They demonstrated that by switching between the index and an interest bearing cash account of the turn-of-the-month, one can increase the average returns for a simple buy and hold strategy on the index. They however claim that the turn-of-the-month effect is not a result

of a few ‘significant’ days and that large gain and losses are proportionally distributed between the turn-of-the-month period and the rest of the month.

Kunkel and Compton (1998) built up on Henzel and Ziemba’s demo by testing whether individual investors can explore the turn-of-the-month effect by implementing a switching strategy in a tax deferred no cost retirement plan. The switching strategy involves moving funds from the money market account to the stock market account at the beginning of the TOM period and switching back to money market on the last day of TOM. They used retirement fund data from the corporate office of the Teachers Insurance and Annuity Association-College Retirement Equities Fund from 1988 through to 1997. Returns were calculated for the stock market and money market. Performance results for switching versus buy and hold strategies showed that switching was a better strategy. This increase in returns will however create room for additional taxes and agents pay cannot be avoided as most of them would rather earn on a comparative basis when returns exceed a certain limit.

## 2.4 Review of Empirical Studies

Several studies have been done both locally and internationally on the turn-of-the-month effect. This section summarizes these studies providing evidence of the existence or nonexistence of the turn-of-the-month affect.

### 2.4.1 Local Studies

Ondiala (2014) investigated the TOM effect at the NSE with focus on the different segments present in the market. He sought to establish whether TOM effect at the NSE can be segmented. He compared the market share prices per segment with the stock price indices to establish the change in stock prices. He used a paired t-test for the test of significance for the difference in

mean returns. The insurance sector showed a p-value of below 5% thereby showing no TOM effect over a study period. The agriculture sector showed a significance of below 0.05 for 2009 to 2012, however for 2013 the p-value was more than 5% showing the presence of TOM. The commercial and service segment also registered mixed results. 2009 registered a significant mean difference, 2010 and 2011 showed no significant change, 2012 had a p-value higher than 5% significance level, and 2013 registered no significant change. The manufacturing, banking, construction and allied sectors also showed mixed results. 2009 and 2013 showed had a p-value of more than 5%, 2010-2012 had a p-value lower than 5%. Energy and petroleum, automobile and accessories showed no significant change. He concluded that when these mixed results are summarized together; the effect is neutralized showing no TOM effect at the NSE.

Muchemi (2013) studied seasonal effects on average returns of the Nairobi Securities Exchange to examine the presence of day-of-the-week effect, weekend effect and monthly effect anomalies. He used the t-test, F-test and ANOVA analysis models for the study. His data covered 12 years of daily closing prices of NSE indices. His results showed that the mean returns on Mondays was negative while other days showed positive mean returns, Thursdays' was significant at 1%, declaring the day-of-the-week effect present at the NSE. The day-of-the-week builds up to the weekend effect. The coefficient of Monday being not significant at 5% significance level indicated non-existence of the weekend effect at the NSE. May was used as a benchmark for the seasonality in monthly returns analysis as it provided negative returns. December had the most significant returns (1%); January, July and September were significant too showing a biased existence of the monthly effect.

Kai (2012) in his study 'The Turn-of-the-Month Effect; Evidence from The Nairobi Securities Exchange', sought to investigate the existence of the TOM effect at the exchange. He used the

last trading day and the first three days versus the rest of the month (ROM) and the 20 share index as the sampling frame. The daily indices were used to compute the daily returns. Kai could not confirm the existence of TOM effect at the NSE. The coefficient was not significant. He concluded that the anomaly had no traces or had minor traces at the NSE. He therefore declared the market efficient.

Waithaka (2012) conducted a study on 'The Turn-of-the-Month effect on stocks listed at the Nairobi Securities Exchange' to TOM from 15th January 2003 to 31st December 2007;using daily observations of the NSE-20 share index. She defined TOM as the tendency of stock prices to rise on the last trading day of the month and the first eight trading days of the next month. She compared the means and standard deviation of TOM and ROM. Her results showed higher returns for TOM except for 2004. She observed that using the last day of the month and the first three days showed no evidence of the TOM existence. However using the first eight trading days showed TOM existed. This is equivalent to findings by Ariel (1987) that positive returns occur just before and during the first half of the month. He defined the first half trading days to be the first eight trading days of the month.

Nyoike (2012) did a study on 'The Turn of the Month Effects in the Foreign Currency Market; Evidence from Kenya. He investigated the existence of TOM effects in the performance of the Kenya Shilling in the Kenya foreign currency market. He studied the US dollar, the Euro, British Pound exchange rates to the Kenya shilling. This study covered a ten-year period, subdivided in to 240 sub-periods halved to represent TOM and ROM. TOM period was defined as the last five working days of the month plus the first three working days of the following month. All other days belonged to ROM. The constant mean return was used to derive excess returns at the TOM for each of the three currencies. In summary, the excess returns for the US dollar were 5%; the

British pound recorded 11 % while the Euro reported 31 %. These returns were higher at the turn of the month compared to the rest of the month. He however considered the drift not significant to be exploited by market participants with an aim of making superior returns consistently. The drift in the performance of the Kenya shilling to the Euro was significant to be exploited by investors to make higher returns consistently. He concluded that the performance of the Kenya shilling in the foreign currency market is affected by the turn of the month in Kenya. He suggested that similar studies are conducted using other models, methods or different time periods to confirm his findings.

### 2.4.2: International Studies

Satish (2015) examined the presence of the turn-of-the-month effect in the Indian currency market for selected currency pairs i.e. USD-INR, EUR-INR, GBP-INR and JPY-INR from 1999 to 2004. He used the ordinary least square regression to analyze the presence of TOM and test the efficiency of the Indian currency market. He subdivided his periods to be pre and post 2008 as India had faced financial crisis in 2008. He found that the pricing patterns were unique for each currency. USD and JPY showed TOM effect and the returns in the TOM trading days were lower than the returns during the rest-of-the-month (ROM) days. In the pre-2008 period all currencies showed TOM effects and the result was lower than those in ROM; in the post-2008 the effect diminished except for USD. These results suggested that the investors may not be able to earn excess profits by taking advantage of TOM for some currencies. This showed that the Indian money market has become efficient.

Giovanis (2014) carried out a research on "The turn-of-the-month-effect: Evidence from Periodic Generalized Autoregressive Conditional Heteroskedasticity (PGARCH) Model". He aimed to investigate the turn of the month effect in stock market indices around the globe and to test its

pattern, which can be used for the optimum asset allocation with result the maximization of profits. He believed different stock markets behaved differently. He found out that despite these differences the effect was persistence in 19 out of the twenty countries examined.

The Turn-of-the-month and Intra-month anomalies were noticed on the stock and bond markets but had not been investigated in the EU bond market during the debt crisis. Vahamaa (2013) sought to determine whether TOM and Intra-month anomalies exist in Germany, Greek, Italian and Spanish government bond markets. He investigated the scheduled U.S macroeconomic news releases on bond markets- whether they are the cause of the TOM and Intra-month effects on the bond markets. He studied daily government bond prices from 2006 to 2011 (2 year and 10 years) for each country. He used simple regression for data analysis; first to test the effect then measure the effect on bond returns. The results showed that the anomalies were also tested for control of the news release and it was found that the anomalies were "erased", proof that the U.S macroeconomic news release was the cause of the anomalies.

Xu and Mcconell (2006) found that TOM effects persisted 19 years after Lokonishok and Smidt (1998) identification. All of the excess market return occurred during the four-day turn-of-the-month interval, during the other sixteen trading days of the month the investors-on average-received no reward for bearing market risk. They claim that the TOM effect is not confined to small or low-priced stocks, or the December- January turn-of-the-month, or the calendar quarter ends, or is it due to market risk as traditionally measured. The standard deviation of returns at the turn-of-the-month is no higher than during other days. They attribute this persistent equity returns peculiarity to the 'rational' and 'behavioral' models challenges in asset pricing.

All these studies present literature from markets that have different operating environment and policies from the NSE. This study will be based on the local perspective.

### 2.4.3 Summary of Empirical studies.

Several studies have been carried out to test its existence and try establishing the cause of the anomaly that threatens market efficiency. Satish (2015) examined the presence of the turn-of-the-month effect in the Indian currency. He found that the pricing patterns were unique for each currency. Giovanis (2014) found out that despite the markets behaving differently, the seasonal effects were persistent. Vahamaa (2013) sought to determine whether TOM and Intra-month anomalies exist in Germany, Greek, Italian and Spanish government bond markets with bias to U.S macroeconomic news releases on bond markets. He found out that the control of the news release erased the anomalies. Xu and Mcconell (2006) found that TOM effect is not confined to small or low-priced stocks, or the Dec- Jan turn-of-the-month, or the calendar quarter ends, or is it due to market risk as traditionally measured.

The local studies include: Ondiala (2014) who studied TOM at the NSE from a market segments perspective with a study window of 3 trading days. His results were mixed suggesting the TOM effect will be non-existent if the market is to be tested as a whole. Muchemi (2013) studied the presence of the day-of-the-week effect, weekend effect and monthly effect. He proved that the day-of-the-week existed as Thursday showed the highest returns. Monday showing low returns indicated the weekend effect does not exist at the NSE. Kai (2012) investigated the presence of TOM at the NSE. His spread was the last day of trading and the first three of the next month. His results showed the traces of TOM were insignificant. Waithaka (2012) used the Last trading day and the first eight of the following month as her spread and her results showed TOM existed. Nyoike (2012) studied the existence of TOM at the foreign currency market and he found out

that different currencies reaction towards the shilling was random but generally the shilling was affected by TOM effect.

## 2.5 Research Gap

These studies clearly show that the significance of the Turn-of-the-Month effect is influenced by the turn-of-the-month window studied. The results obtained from these studies are contradictory of each other despite the studies being based on the Nairobi securities exchange reports data on share prices. Each study focused on the predetermined turn-of-the month period with no comparison to the other trading days in the period; that is the last trading day of the month plus 8 trading days of the following month as defined by Ariel (1987). This study seeks to compare returns for: three days, five days and eight days turn-of-the-month window to establish which period will enable investors maximize returns. No previous study has been conducted to compare the returns for the TOM periods with an aim of maximizing returns.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter discusses the methods that were used in gathering, analyzing and reporting findings. It describes the research design, population of the study, sampling design, data collection, data analysis and methodology employed.

## 3.2 Research Design

Events study examines the behavior of firms' stock prices around corporate events. The event might take place at different points in calendar time or it might be clustered at a particular date. (Kothari and Warner, 2004). The turn-of-the-month anomaly is a calendar effect that is experienced every month which assumedly influences security prices. This project adopted an events study research approach to examine stock returns at the turn-of-the-month period.

## 3.3 Population

A research population is generally a large collection of individuals or objects of main focus in a query. All items in any field of inquiry constitute a population (Kothari, 2004). This study was a census of the NSE covering 65 listed companies at the Nairobi Securities Exchange for the period 2010 to 2014.

## 3.4 Data collection

The study used secondary data. The data collected was: daily share prices for the 65 listed companies for 5 years from 2010 to 2014 and dividends per share for the 65 listed companies as at the end of a financial period from 2010 to 2014. This data was obtained from the Nairobi Securities Exchange website. The returns on stock and returns on market were computed.

## 3.5 Data analysis

### 3.5.1 Hypotheses

My null hypothesis was: **Ho: $R_1$= R2** and my alternate hypothesis: **$H_1$: $R_1 \neq$ R2,** where R1 represents the returns at the turn-of-the-month period and R2 represents the returns for the rest of the month. The null hypothesis (Ho) aimed at showing that there is no significant change in returns as the month turns-over as compared to other trading days. The alternate hypothesis ($H_{1)}$ aimed at providing evidence of change in returns during the turn of the month as compared to other trade days for each tested TOM period.

### 3.5.2 Analysis Model

In order to determine the existence of the turn-of-the-month effect at the Nairobi Securities Exchange, a paired t-test was conducted to test if there is a significant difference in the mean abnormal returns as per the equation below. The study was a comparative of the **abnormal returns** between the turn-of-the-month and the rest-of-the-month. My turn-of-the-month periods were the last trading day of the previous plus the first three, five and eight days of the following month while the rest-of-the-month begins from the fifteenth day of the month plus three, five and eight days following.

Adopting the McWilliams and Siegel (1997) approach to obtaining **abnormal returns**, the first step to an events study is to estimate a market model, then calculate abnormal returns. The market model generates the expected stock returns; the coefficients will be obtained by regressing the actual returns on stock against the returns on market; in this case $\boldsymbol{R_e = \alpha_i + \beta_i R_{mt.}}$ The abnormal returns are assumed to reflect the securities market reaction to new information. The abnormal returns were thereby actual stock returns less expected stock returns: $\mathbf{AR= R_{it} - R_e}$ Where:

$R_{it}$ is the rate of return on the share price of the firm ***i*** on day ***t*** computed as: **(P1-Pt-1+div) /Pt-1.** P1 is the price of firm *i* at time t, div is the cash dividends payable by firm *i* at time t.

$R_{mt}$ is the rate of return on a market portfolio of stocks (in this case the NSE 20 share index). This is the change in the share prices computed as: (**P1-Pt-1) /Pt-1.**

$\boldsymbol{\alpha}$ is the intercept term (constant).

$\boldsymbol{\beta_i}$ is the systematic risk of stock ***i*** also beta factor.

The standard error estimate was adopted as a test of confidence in the estimates because of the likelihood of the data to vary from one sample to another. The significance level was a measure of the p-value: when the significance level/ p-value is below 5% (0.05) the null hypothesis is rejected. Statistical Package for Social Sciences (SPSS) was adopted for the data analysis because of its ability to generate the; means, standard error mean, p-value, all in one table making it easier to compare and discuss findings.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS, DISCUSSIONS

## 4.1 Introduction

This chapter covers the analysis, findings and discussions of the study. The study used secondary data from the NSE of the share prices and dividends per share for the listed companies from 1st January 2010 to 31st December 2014. The return on the stock and return on market were calculated. The standard error estimated was adopted as a test of confidence in the estimates. Statistical package for Social Sciences was used to aid in the data analysis.

### 4.2 Descriptive Analysis

This section presents the descriptive statistics of the population studied. These statistics summarize the abnormal returns for the 65 listed companies at the Nairobi Securities exchange covering a period between 2010 and 2014. The study presented descriptive statistics for the three turn-of-the-month windows i.e. 3-days, 5-days and 8-days.

**Table 4.1: 3 TOM days Descriptive Statistics**

| | *Minimum* | *Maximum* | *Mean* | *Std. Deviation* |
|---|---|---|---|---|
| 2010 | -.29 | 56.17 | .0248 | 1.12381 |
| 2011 | -122.61 | 95.70 | -.0572 | 5.12628 |
| 2012 | -136.03 | 560.58 | .8029 | 15.46177 |
| 2013 | -127.67 | 20.53 | .2204 | 4.28607 |
| 2014 | -87.06 | 646.69 | .3381 | 11.44613 |

The 3-days TOM data of the abnormal returns have a minimum of negative 0.29, a high of 56.17, a mean of 0.0248 and a standard deviation of 1.12381 in 2010. The period 2011 shows a minimum of negative 122.61, a high of 95.70, a mean of negative 0.0572 and a standard deviation of 5.12628. The period 2012 shows a minimum of negative 136.03, a high of 560.58, a mean of 0.8029 and a standard deviation of 15.46177. The period 2013 shows a minimum of negative 127.67, a high of 20.53, a mean of 0.2204 and a standard deviation of 4.28607. The period 2014 shows a minimum of negative 87.06, a high of 646.69, a mean of 0.3381 and a standard deviation of 11.44613. The summary from table 4.1 above implies the 3-day TOM window experienced an abnormal loss of 136.03 and a gain of 646.69. The mean values however suggest that most returns ranged below 1.

**Table 4.2: 5 TOM days Descriptive Statistics**

| | *Minimum* | *Maximum* | *Mean* | *Std. Deviation* |
|---|---|---|---|---|
| 2010 | -.29 | 56.17 | .0140 | 1.04668 |
| 2011 | -122.61 | 95.70 | -.0240 | 4.83358 |
| 2012 | -136.03 | 560.58 | .6015 | 13.52186 |
| 2013 | -127.67 | 59.97 | .2688 | 4.17439 |
| 2014 | -116.40 | 646.69 | .3130 | 10.82427 |

Table 4.2 shows the 5-days TOM data of the abnormal returns. There is a minimum of negative 0.29, a high of 56.17, a mean of 0.0140 and a standard deviation of 1.04668 in 2010. The period 2011 shows a minimum of negative 122.61, a high of 95.70, a mean of negative 0.0240 and a standard deviation of 4.83358. The period 2012 shows a minimum of negative 136.03, a high of 560.58, a mean of 0.6015 and a standard deviation of 13.52186. The period 2013 shows a minimum of negative 127.67, a high of 59.97, a mean of 0.2688 and a standard deviation of

4.17439. The period 2014 shows a minimum of negative 116.40, a high of 646.69, a mean of 0.3130 and a standard deviation of 10.82427. The summary implies the 5-day TOM window experienced an abnormal loss of 136.03 and a gain of 646.69. The loss is mainly attributed to a drop in share prices while the gain is an increase in share prices as well as dividends payout. The mean values however suggest that most returns experienced were below 1%.

**Table 4.3: 8 TOM days Descriptive Statistics**

| | *Minimum* | *Maximum* | *Mean* | *Std. Deviation* |
|---|---|---|---|---|
| 2010 | -.29 | 56.17 | .0020 | .91084 |
| 2011 | -122.61 | 95.70 | -.1112 | 4.68960 |
| 2012 | -138.96 | 560.58 | .5599 | 12.91837 |
| 2013 | -127.67 | 59.97 | .2334 | 4.03922 |
| 2014 | -116.40 | 646.69 | .2605 | 9.68076 |

Table 4.3 shows the 8-days TOM abnormal returns summary. There is a minimum of negative 0.29, a high of 56.17, a mean of 0.0020 and a standard deviation of 0.91084 in 2010. The period 2011 shows a minimum of negative 122.61, a high of 95.70, a mean of negative 0.1112 and a standard deviation of 4.68960. The period 2012 shows a minimum of negative 138.96, a high of 560.58, a mean of 0.5599 and a standard deviation of 12.91837. The period 2013 shows a minimum of negative 127.67, a high of 59.97, a mean of 0.2334 and a standard deviation of 4.03922. The period 2014 shows a minimum of negative 116.40, a high of 646.69, a mean of 0.2605 and a standard deviation of 9.68076. The summary implies the 5-day TOM window experienced an abnormal loss of 136.03 and a gain of 646.69 just as the other TOM windows. The mean values however vary suggesting that some returns that were not effected in the three to five TOM windows may have an effect on the overall abnormal returns experienced.

## 4.3 Regression Analysis

The market model derivable from the formula: $R_e = \alpha + \beta_i R_{mt}$ was adopted to generate expected yearly stock returns for the study period 2010 to 2014. Its coefficients were as shown below for each year:

**Table 4.4: Coefficients**

| *Period* | *Constant* | *Beta* | *Std. Error of the Estimate* | *Coefficient of Determination ($R^2$)* |
|---|---|---|---|---|
| 2010 | 0.107 | 0.998 | 0.87087 | 0.996 |
| 2011 | 0.039 | 0.983 | 0.03242 | 0.967 |
| 2012 | 0.219 | 0.993 | 1.39279 | 0.987 |
| 2013 | 0.032 | 0.780 | 0.04324 | 0.609 |
| 2014 | 0.022 | 0.998 | 0.39343 | 0.995 |

The market had positive beta values as illustrated by table 4.4. The period 2010 had a constant of 0.107, beta (systematic risk) of 0.998, a standard error of estimates of 0.87087 and $R^2$ of 0.996. The period 2011 had a constant of 0.039, beta of 0.983, a standard error of estimates of 0.03242 and $R^2$ of 0.967. The period 2012 had a constant of 0.219, beta of 0.993, a standard error of estimate of 1.39279 and $R^{2\ of}$ 0.987. The period 2013 had a constant of 0.032, beta of 0.780, a standard error of estimates of 0.04324 and $R^2$ of 0.609. 2014 had a constant of 0.022, beta of 0.998, a standard error of estimates of 0.39343 and $R^2$ of 0.995. Positive beta values imply that when the stock price moves positively by one unit, the market gains by the values of the betas stated above. The standard error of estimates is a measure of the variance of the estimates from the actual values. The coefficient of determination ($R^2$) is a measure of how close the data is to the line of fitness. The study shows that: 100%, 97%, 99%, 61% and 100% of the variance in

2010, 2011, 2012, 2013 and 2014 has been accounted for respectively. The year 2013 had the highest range in price fluctuations.

## 4.4 Paired T-Test for Difference in Means

The study conducted a paired t-test for the three turn-of-the-month windows at the NSE for the years 2010 to 2014. A paired t-test was used to test whether there is a significant difference in the mean abnormal returns. The level of significance was 0.05 (5%). The null hypothesis for the turn-of-the month effect was **Ho: $R_1$= R2** indicating no difference in returns between the turn-of-the-month and the rest-of-the-month and the alternate hypothesis was **$H_1$: $R_1 \neq$ R2** which aimed at showing the difference between the turn-of-the-month period and the rest-of-the-month is significant. The level of significance between the turn-of-the-month windows detects the most profitable period.

**Table 4.5: Paired t-test for 3-Days TOM Window**

| *Period* | *Mean abnormal returns 3 days TOM period (%)* | *Mean abnormal returns 3 days ROM period (%)* | *Difference* | *Turn-of-the-Month effect* | *P-VALUE* |
|---|---|---|---|---|---|
| 2010 | 0.0695 | -0.0211 | 0.0906 | Positive | 0.010 |
| 2011 | -0.0835 | -0.0120 | -0.0715 | Negative | 0.651 |
| 2012 | 0.8093 | 0.7773 | 0.0320 | Positive | 0.947 |
| 2013 | 0.4823 | 0.0209 | 0.5032 | Positive | 0.000 |
| 2014 | 0.2481 | 0.4514 | -0.2033 | Negative | 0.540 |

Table 4.5 shows the paired t-test statistics for the 3-days turn-of-the-month window. The mean abnormal returns show a positive TOM effect for 2010, 2012 and 2013 except for 2011 and 2014 which experienced negative turn-of-the-month effect. The window's p-value for 2010, 2012 and 2013 were 0.010, 0.947, and 0.000 respectively. Only 2012 had a p-value higher than 0.05

showing that the difference in abnormal returns between the TOM and ROM days are not significant to declare that the anomaly exists. However, 0.010 for 2010 and 0.000 for 2013 were below 0.05 implying that the anomaly was experienced during the studied period. This shows mixed results as the market experienced the anomaly in some periods significantly. When netted the effect may be minimal to declare the market did not experience the turn-of-the-month effect for the 3 days turn-of-the-month window.

**Table 4.6: Paired t-test for 5-Days TOM Window**

| *Period* | *Mean abnormal returns 5 days TOM period (%)* | *Mean abnormal returns 5 days ROM period (%)* | *Difference* | *Turn-of-the-Month effect* | *P-VALUE* |
|---|---|---|---|---|---|
| 2010 | 0.0498 | -0.0218 | 0.0751 | Positive | 0.007 |
| 2011 | -0.0353 | -0.0125 | -0.2276 | Negative | 0.853 |
| 2012 | 0.5533 | 0.6180 | -0.0985 | Negative | 0.770 |
| 2013 | 0.5973 | -0.6140 | 0.6588 | Positive | 0.000 |
| 2014 | 0.3580 | 0.2732 | 0.0849 | Positive | 0.737 |

Table 4.6 shows the paired t-test statistics for the 5-day turn-of-the-month window. The null hypothesis cannot be rejected for the turn-of-the-month window except for 2010, 2013 and 2014 which experienced positive turn-of-the-month effect. The p-values for the 2014 was however above 0.05, which is 0.737 implying the difference was not significant enough to declare that the anomaly existed. However 2010 and 2013 had p-values of 0.007 and 0.000 showing that the difference in mean returns was significant enough to declare that the anomaly existed. This implies that the market, in general, experienced the turn-of-the-month effect for the 5 days turn-of-the-month window despite the periods of negative returns.

**Table 4.7: Paired t-test for 8-Days TOM Window**

| *Period* | *Mean abnormal returns 8 days TOM period (%)* | *Mean abnormal returns 8 days ROM period (%)* | *Difference* | *Turn-of-the-Month effect* | *P-VALUE* |
|---|---|---|---|---|---|
| 2010 | 0.0258 | -0.0221 | 0.4794 | Positive | 0.011 |
| 2011 | -0.1857 | -0.0344 | -0.1513 | Negative | 0.115 |
| 2012 | 0.5375 | 0.5806 | -0.0431 | Negative | 0.870 |
| 2013 | 0.4108 | 0.0577 | 0.3530 | Positive | 0.000 |
| 2014 | 0.2910 | 0.2291 | 0.06184 | Positive | 0.737 |

The difference in the mean abnormal returns for the 8 day turn-of-the-month period varied between the periods as shown in table 4.7. The null hypothesis holds for the (-1, +8) turn-of-the-month window except for 2010, 2013 and 2014 which experienced positive TOM effects. The p-values were 0.011 for 2010, 0.115 for 2011, 0.870 for 2012, 0.000 for 2013 and 0.737 for 2014. The change in abnormal returns for 2014 was not significant enough to declare that the anomaly exists; however for 2010 and 2013 the p-values were below 0.05 that is 0.011 and 0.000 respectively implying that the difference was significant to declare the anomaly existed. This shows mixed results for the study window in terms of the market experienced the turn-of-the-month effect for some periods just as the 5 day TOM period before.

## 4.5 Interpretation of Findings and Discussions

The 3-days TOM data of the abnormal returns showed minimum negative values of: 0.29, 122.61, 136.03, 127.67, and 87.06 for 2010, 2011, 2012, 2013 and 2014 respectively. The maximum values were: 56.17, 95.70, 560.58, 20.53 and 646.69 for 2010, 2011, 2012, 2013 and 2014 respectively. The means obtained were: 0.0248, -0.0572, 0.8029, 0.2204 and 0.3381 for 2010, 2011, 2012, 2013 and 2014 respectively. The standard deviation values of: 1.12381, 5.12628, 15.46177, 4.28607 and 11.44613 for 2010, 2011, 2012, 2013 and 2014 respectively were a measure of confidence for the data.

The 5-days TOM data of the abnormal returns showed minimum negative values of: 0.29, 122.61, 136.03, 127.67, and 116.40 for 2010, 2011, 2012, 2013 and 2014 respectively. The maximum values were: 56.17, 95.70, 560.58, 59.97 and 646.69 for 2010, 2011, 2012, 2013 and 2014 respectively. The means obtained were: 0.014, -0.0240, 0.6015, 0.2688 and 0.3130 for 2010, 2011, 2012, 2013 and 2014 respectively. The standard deviation values of: 1.04668, 4.83358, 13.52186, 4.17439 and 10.82427 for 2010, 2011, 2012, 2013 and 2014 respectively.

The 8-days TOM data of the abnormal returns showed minimum negative values of: 0.29, 122.61, 138.96, 127.67, and 116.40 for 2010, 2011, 2012, 2013 and 2014 respectively. The maximum values were: 56.17, 95.70, 560.58, 59.97 and 646.69 for 2010, 2011, 2012, 2013 and 2014 respectively. The means obtained were: 0.002, -0.1112, 0.5599, 0.2334 and 0.2605 for 2010, 2011, 2012, 2013 and 2014 respectively. The standard deviation values of: 0.91084, 4.68960, 12.91837, 4.03922 and 9.68076 for 2010, 2011, 2012, 2013 and 2014 respectively.

The maximum minimum value for the study was negative 138.96 experienced for the 8-day window and the maximum high value was 646.69 experienced for all the windows studied that is

three, five and eight TOM periods. This implies the 3-day TOM window experienced an abnormal loss of 138.96 while all windows enjoyed a gain of 646.69. The period 2011 had negative mean values for the three windows studied; implying the period experienced more abnormal loss than gains.

The regression analysis showed positive beta values for all the periods implying that when the stock price moves positively by one unit, the market gains by the values of the betas stated above. The standard error of estimates is a measure of the variance of the estimates from the actual values. The coefficient of determination ($R^2$) measured the closeness of the data to the line of fitness. The study shows that: 100%, 97%, 99%, 61% and 100% of the variance in 2010, 2011, 2012, 2013 and 2014 has been accounted for respectively.

The paired t-tests conducted on the abnormal returns for the three day TOM window showed positive TOM effect experienced for periods except for 2010, 2012 and 2013. The periods 2011 and 2014 experienced negative turn-of-the-month effect. The p-values for 2010, 2011, 2012, 2013 and 2014 were 0.010, 0.651, 0.947, 0.000, and 0.540 respectively. Only 2012 had a p-value higher than 0.05 showing that the difference in abnormal returns between the TOM and ROM days are not significant to declare that the anomaly exists; 0.010 for 2010 and 0.000 for 2013 were below 0.05 implying that the anomaly was experienced during the studied period. This shows mixed results as the market experienced the anomaly in some periods significantly. When netted the effect may be minimal to declare the market did not experience the turn-of-the-month effect for the 3 days turn-of-the-month window. These findings relate to Ondiala (2014) who investigated the existence of the anomaly with focus on the segments at the NSE. His TOM window was the last trading day and three first days of the following month. He obtained mixed results for the segments at the NSE. He stated that when netted the effect is neutralizing showing

no TOM effect at the NSE. Kai (2012) also investigated the anomaly at the NSE. His study window was (-1,+3). He however declared there were no traces of the anomaly. His findings contradict this study as the presence of the anomaly has been identified. This difference may be due to a difference in the study period. The factoring of the dividends may also be a contributor to the difference.

The 5-day TOM window showed the null hypothesis holds for 2011 and 2012 which had negative TOM values. The periods 2010, 2013 and 2014 experienced positive turn-of-the-month effect. The p-value for the 2014 of 0.737 was above 0.05 implying the difference in mean abnormal returns was not significant enough to declare that the anomaly existed. The periods 2010 and 2013 had p-values of 0.007 and 0.000 showing that the difference in mean abnormal returns was significant enough to declare that the anomaly existed. This implies that the market, in general, experienced the turn-of-the-month effect for the 5 days turn-of-the-month window despite the periods of negative returns. No previous study has been conducted on the NSE covering this study window thereby allowing no relatedness of the findings.

The difference in the mean abnormal returns for the 8 day turn-of-the-month period showed the effect was experienced in 2010, 2013 and 2014. The null hypothesis holds for periods 2011 and 2012 which had negative values of 0.1513 and 0.4314 respectively. The p-values were 0.011 for 2010, 0.115 for 2011, 0.870 for 2012, 0.000 for 2013 and 0.737 for 2014. The change in abnormal returns for 2014 was not significant enough to declare that the anomaly exists; however for 2010 and 2013 the p-values were below 0.05, that is 0.011 and 0.000 respectively, implying that the difference was significant to declare the anomaly existed. This shows mixed results for the study window in terms of the market experienced the turn-of-the-month effect for some periods. However when netted the findings may favor the existence of the anomaly. This

study both agrees and disagrees with Waithaka (2012) who conducted a study on The Turn-of-the-Month effect on stocks listed at the Nairobi Securities Exchange. Her study window was eight days and she found out that the effect exists declaring that the anomaly is experienced at the NSE. The agreement is focused on the periods that have positive abnormal returns significant enough to declare the anomaly exists. However other periods experienced negative TOM anomaly. This difference in findings might be due to some various factors for example the study period. Her study period covered 2003 to 2007. There were several occurrences that happened between 2007 and 2010 that might have influenced the present findings. The year 2007 saw Kenya experience the post-election violence that affected the purchasing power of her citizens and the economy in general. The inflation rate as at December 2007 was 5.9%, up from5.8% in November 2007. The inflation rate as at January 2010 was 4.7% low from 5.3% in December 2009. This implies increased purchasing power for investors in 2010 as compared to 2007.

This study has also factored the concept of dividends payouts which are a form of additional returns gained from the investment apart from the increased share prices. The calculated return on stock used to generate the market model was a ratio of the difference in the closing and opening prices plus cash dividends and the opening price. Not all companies pay their ordinary shareholders dividends at the end of each financial period. Centum investments and Eveready have never paid their ordinary shareholders dividends since 2010 through to 2014. These factors and the difference in the population of study affect the findings on the expected return of the NSE in general despite the market being the same.

# CHAPTER FIVE

# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Introduction

This chapter presents the summary of the data findings, conclusions drawn and recommendations for the study which aimed at establishing whether the turn-of-the-month effect exists at the Nairobi Securities exchange and which turn-of-the-month window maximizes returns for the effect.

## 5.2 Summary of Findings

This study aimed at investigating the turn-of-the-month effect at the Nairobi securities exchange with a bias towards establishing which turn-of-the-month window maximizes returns for stocks traded. The events study approach was adapted to derive the returns on stock versus the returns on the market (indices). These were captured in the market model that derived the abnormal returns. A paired t-test was carried out to compare the means on the abnormal returns between the turn-of-the-month and the rest-of-the-month periods.

The market had positive betas for 2010, 2011, 2012, 2013 and 2014 which showed that for every additional unit of return the market gains 0.998, 0.983, 0.993, 0.780, and 0.998 for each year respectively to factors affecting the market in entirety. These factors include: political stability experienced especially for the period 2013 which experienced the highest levels of returns after the 2012 elections which were peaceful comparatively. Government policies that influence trade for example the minimum paid-up capital requirement by the NSE of Ksh 50 million worth of issued and fully paid-up capital for the Main Investment Market and Ksh 20 million for the Alternative Investment Market Segment. The firms intending to do IPOs should have a minimum

worth assets of Ksh 100 million and Ksh 20 million for each market respectively (www.nse.co.ke, 2015). The CMA also requires that all listed companies publish their financial reports to the public as a form of communication and accountability (www.nse.co.ke, 2015). This created a market environment that promotes competition and improves investor confidence in the market, making the firms trading at the NSE highly valuable.

The three-day turn-of-the-month window showed mixed results of the anomaly. The difference in the mean abnormal returns for the period varied. The Nairobi Securities exchange experienced the turn-of-the-month anomaly in years 2010, 2012 and 2013. With a p-value of 0.010 and 0.000, 2010 and 2013 had a difference in the mean abnormal returns significant enough to declare the anomaly exists. However, when the results are netted the effect is neutralized to non-existence. Ondiala (2014) has suggested that when the market is studied as a whole for the anomaly using a 3-day turn-of-the-month period, the results will be non-existing. This tally with the study findings however the market in general still experienced mixed 'feelings' of the effect just as the segments differ. This study finding also confirms Kai (2012) findings although both based their analysis on the market returns only.

The five-day turn-of-the-month window also showed that the market experienced the effect at some point. The Nairobi Securities exchange experienced the turn-of-the-month anomaly in years 2010, 2013 and 2014. Years 2010 and 2013 had p-values of 0.007 and 0.000 respectively implying that the difference in the mean abnormal returns were significant enough during these periods to declare the anomaly exists. When the results are netted the effect is neutralized to minimal considering that the period had two negative periods, three positive periods with one being insignificant.

The eight-day turn-of-the-month window also showed that the market experienced the effect at some point. The Nairobi Securities exchange experienced the turn-of-the-month anomaly in years 2010, 2013 and 2014. These periods had p-values of 0.011, 0.000 and 0.737 respectively. This implies the periods 2010 and 2013 had a difference in the mean abnormal returns between the TOM and ROM days significant enough to declare the anomaly exists at the NSE.

Comparing the results for the three turn of the month windows studied, that is three days, five days and eight days; all windows experienced mixed effects of the anomaly. However, basing on the significance levels, with the period 2013 having a constant of 0.000' the window -1+3 had the next minimum of significance level of 0.010 in the year 2010 hence implying the three days turn-of-the-month maximizes returns. The variance in the significance levels is however minimal implying the effect of new information relied during the turn-of-the-month period, that is the last trading and the first eight trading days (Ariel, 1987), is experienced with evenness throughout the TOM period.

## 5.3 Conclusion

Using events study and paired t-test on daily data of a five year period that is 2010 to 2014, correlation was used to determine the returns on the market and stock and thereby identifying the abnormal returns. Comparative means identified the significance levels of the differences in the abnormal returns between the TOM and ROM periods. From the analysis, the three turn-of-the-month windows studied; that is three days, five days, eight days; showed that the market experienced mixed results which when netted shows minimal significance levels of the effect. Each TOM window had periods that experienced the effect, although one year 2013 was constant across all windows to have difference in abnormal returns between the TOM and ROM periods significant enough to declare the anomaly exists at the Nairobi Securities Exchange with the 5

day turn-of-the-month window showing the most significant returns. In general, the market experiences the anomaly but with minimal effects on the returns. This implies minimal difference in the abnormal returns between the turn-of-the-month days and the rest-of-the-month. The market is thereby efficient.

## 5.4 Limitations of the Study

Obtaining all data that is the daily closing share prices and dividends per share for all listed companies from the Nairobi Securities exchange website was not easy. The missing information had to be obtained from the companies' website. The reliability of the data obtained from the companies' websites depends solely on how much information the companies are willing to make available for public display.

Some companies did not trade from 2010 through to 2014 for example Atlas Development Support Services that started trade in December 2014 thereby breaking the continuity of data. This inconsistency in data suggests inconsistency for findings thereby reducing the value of the findings. Using data of the companies that have traded across the study periods reduces inconsistency in the data hence increased value of findings.

The data was bulky. The study used closing daily share prices for all listed companies at the Nairobi Securities Exchange for five years from 2010 to 2014. The analysis of this data was time-consuming considering the limited time available to conduct the analysis and generate findings. A sample like a segment in the NSE would provide manageable data within the study period.

The study focused on the turn-of-the-month effect whereas there are other calendar anomalies; for example the January effect, the weekend effect, the day of the week effect that influence returns of stocks at the Nairobi Securities exchange.

The model adopted to generate the market returns only considered cash dividends when payable as a factor influencing stock returns ignoring other factors example inflation rate that may influence returns.

## 5.5 Recommendations for Further Research

### 5.5.1 Recommendation for Policy and Practice

The study findings have shown that no turn-of-the-month window experiences as maximum returns than the others. The investors should therefore study the market carefully to establish which market trends maximize returns. The turn-of-the-month may not necessary imply additional returns because of the liquidity factor that is attributable to the TOM effect. The investors should base their research on the information at the market other than adopting the behavioral finance aspect of trading.

Mishkin (2007) stated that the market sets stock prices. This implies that stock returns are also influenced by factors influencing the market. The investors should thereby opt for a portfolio that ensures continuous returns despite poor performance of some stocks at some time due to systematic risks and thereby avoiding incidences of total loss.

### 5.5.2 Suggestions for Further Research

This study concentrated the turn-of-the-month effect at the Nairobi securities exchange with a bias to establishing with turn-of-the-month period maximizes returns among three days, five

days and eight days turn-of-the-month days. Further studies should be done on the existence of other calendar anomalies example the January effect and the technical anomalies example the small firm effect.

The study employed the market model that factored cash dividends as a factor that influenced stock returns. Further studies should be done factoring other aspects of trade that influences either market returns or stock returns like inflation.

The study has employed a paired t-test to compare abnormal returns findings which limits the comparison to similar data. Further research can be done employing other models of analysis example the chi-square that compares expected or predetermined values to actual values.

A study period of five years for all listed companies at the NSE has provided bulky data for analysis. Considering the period for data analysis, future analysis may narrow the sample to the organizations that share some aspects of trade for example segment-wise or companies that have traded across the study period. This will improve consistency of data thereby improving value of findings.

The study employed daily closing share prices and dividends to obtain stock and market returns. A security market however is a place that trades both equity and debt instruments. Further research can be done using data on the debt instruments of the market like bonds in comparison to the findings on equity instruments like shares.

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# APPENDICES

## Appendix 1: Listed Companies at the Nairobi Securities Exchange

| | |
|---|---|
| AccessKenya Group Limited | Atlas Development & Support Services |
| ARM Cement Limited | Bamburi Cement Limited |
| British American Tobacco Kenya Limited | A.Baumann & Co Limited |
| Barclays Bank of Kenya Limited | Crown Paints Kenya Limited |
| B.O.C Kenya Limited | British-American Investments Co. (Kenya) Limited |
| East African Cables Limited | Carbacid Investments Limited |
| CFC Stanbic of Kenya Holdings Limited | Liberty Kenya Holdings Limited |
| Car & General (K) Limited | CIC Insurance Group Limited |
| Co-operative Bank of Kenya Limited | Diamond Trust Bank Kenya Limited |
| East African Breweries Limited | Eaagads Limited |
| Equity Group Holdings Limited | Eveready East Africa Limited |
| Sameer Africa Limited | Flame Tree Group Holdings Limited |
| Home Afrika Limited | Hutchings Biemer Limited |
| Housing Finance Co.Kenya Limited | I&M Holdings Limited |
| Centum Investment Co Limited | Jubilee Holdings Limited |
| Kapchorua Tea Company Limited | Kenya Commercial Bank Limited |
| KenGen Company Limited | KenolKobil Limited |
| Kenya Reinsurance Corporation Limited | Kenya Power & Lighting Co Limited |
| Kenya Airways Limited | Kakuzi Limited |
| Kurwitu Ventures Limited (GEMS) | Limuru Tea Company Limited |
| Longhorn Kenya Limited | Marshalls East Africa Limited |
| Mumias Sugar Co. Limited | National Bank of Kenya Limited |
| NIC Bank Limited | Nation Media Group Limited |
| Nairobi Securities Exchange Limited | Olympia Capital Holdings Limited |
| Kenya Orchards Limited | Pan Africa Insurance Holdings Limited |
| East African Portland Cement Co Limited | Rea Vipingo Plantations Limited |
| Sasini Limited | Scangroup Limited |
| Standard Chartered Bank Kenya Limited | Safaricom Limited |
| Standard Group Limited | Trans-Century Limited |
| Total Kenya Limited | TPS Eastern Africa Limited |
| Uchumi Supermarket | Umeme Limited |
| Unga Group Limited | Williamson Tea Kenya Limited |
| Express Kenya Limited | |

# Appendix 2: Periodical Descriptive Statistics

| | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| 2010 | -.29 | 56.17 | .0002 | .87081 |
| 2011 | -158.29 | 2357.11 | .2801 | 28.73094 |
| 2012 | -192.03 | 1985.09 | .6827 | 23.33490 |
| 2013 | -17.11 | 1.79 | -.0419 | 1.16009 |
| 2014 | -.03 | .65 | -.0194 | .04251 |

# Appendix 3: Paired Sample Tests 3- day TOM

| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| 2010 | .09065 | 1.56755 | .03508 | .02186 | .15944 | 2.584 | 1996 | .010 |
| 2011 | -.07153 | 7.01989 | .15832 | -.38203 | .23896 | -.452 | 1965 | .651 |
| 2012 | .03201 | 22.06638 | .47993 | -.90918 | .97319 | .067 | 2113 | .947 |
| 2013 | .50318 | 6.09614 | .12858 | .25104 | .75532 | 3.913 | 2247 | .000 |
| 2014 | -.20331 | 16.21905 | .33135 | -.85307 | .44644 | -.614 | 2395 | .540 |

# Appendix 4: Paired Sample Tests 5- day TOM

| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| 2010 | .07152 | 1.45887 | .02654 | .01949 | .12356 | 2.695 | 3021 | .007 |
| 2011 | -.02276 | 6.87172 | .12300 | -.26394 | .21842 | -.185 | 3120 | .853 |
| 2012 | -.09850 | 19.12801 | .33740 | -.76004 | .56305 | -.292 | 3213 | .770 |
| 2013 | .65877 | 5.82745 | .09966 | .46337 | .85418 | 6.610 | 3418 | .000 |
| 2014 | .08485 | 15.19611 | .25285 | -.41089 | .58059 | .336 | 3611 | .737 |

# Appendix 5: Paired Sample Tests 8- day TOM

| | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| 2010 | .04794 | 1.26754 | .01877 | .01114 | .08474 | 2.554 | 4559 | .011 |
| 2011 | -.15129 | 6.56962 | .09598 | -.33946 | .03688 | -1.576 | 4684 | .115 |
| 2012 | -.04314 | 18.29123 | .26281 | -.55837 | .47208 | -.164 | 4843 | .870 |
| 2013 | .35304 | 5.70734 | .07935 | .19748 | .50861 | 4.449 | 5172 | .000 |
| 2014 | .06184 | 13.58823 | .18408 | -.29902 | .42271 | .336 | 5448 | .737 |