AN INVESTIGATION ON THE MONTH OF THE YEAR ANOMALY IN THE NAIROBI SECURITIES EXCHANGE IN KENYA

BY

GREGORY RURU NDUNGU

D63/76236/2012

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN FINANCE, SCHOOL OF BUSINESS UNIVERSITY OF NAIROBI.

OCTOBER 2014

DECLARATION

This research project is my original work and has not been presented for an award of a Degree in this or any other University.

Gregory R. Ndungu

Reg. No.D63/76236/2012

Signature _____ Date _____

This research project has been submitted for examination with my approval as university Supervisor:-

Dr. Aduda Josiah O
Dean,
Department of Finance and Accounting
School of Business
University of Nairobi

Signature _____ Date _____

DEDICATION

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents and siblings whose words of encouragement and push for tenacity ring in my ears. I also dedicate this dissertation to my many friends and church family who have supported me throughout the process. I will always appreciate all they have done.

ACKNOWLEDGEMENTS

I take this opportunity to express my profound gratitude and deep regards to my guide Dr. Josiah Aduda for his exemplary guidance, monitoring and constant encouragement throughout the course of this thesis. The blessings, help and guidance given by him time to time shall carry me a long way in the journey of life on which am about to embark.

ABSTRACT

The question of whether there exists market anomaly in stock market has been the subject of research. Anomalies are the indicator of inefficient markets; some anomalies happen only once and vanish, while others happen frequently, or continuously. This study sought to investigate whether monthly market anomalies exist at the NSE and whether they are persistent over time if present. The study relied on monthly closing NSE 20- share index data from 1st January 2010 to 31st December 2013 from the Nairobi Securities Exchange. Data collected from NSE database was analyzed by use of descriptive statistics with the help of Statistical Package for Social Science (SPSS Version 21.0). The t-test statistic with significance level of 0.05 was employed to test the significance of the average monthly returns while p-value was used to test for persistence.

The summary statistics reveal that the average returns and standard deviation on each month of the year varies .Two months presented significant P-value; March (the second period), and July (the whole period).Apart from March and July, no other Month-of-the-Year effect was observed from the data .Finally it was evident that there is no persistence of the monthly effect, since the March effect (2012-2013) and the July effect (the whole period 2010-2013) only appear one time respectively. The results are inconsistent with the efficient market hypothesis, thus suggesting that the Nairobi Securities Exchange is inefficient. These findings may have useful implications for trading strategies and investment decisions; investors may look to gain from managing the risk of their portfolios due to time varying volatility documented in the findings of this thesis.

Table of Contents

LIST OF FIGURES

LIST OF ABBREVIATIONS

ASE – Athens Stock Exchange

CDF -Cumulative Distribution Function (CDF)

DSE – Dhaka Stock Exchange

EMH - Efficient Markets Hypothesis (EMH)

KSE – Kuwait Stock Exchange

N20I – Nairobi 20-Share Index

NASI – Nairobi All-Share Index

NASQAD – National Association of Securities Dealers Automated Quotations

NSE – Nairobi Securities Exchange Limited

NYSE – New York Stock Exchange

S & P 500 – Standard & Poor 500 Index

SPSS - Statistical Package for the Social Sciences

TLS – Tax-Loss Selling

U.K – United Kingdom

U.S – United States

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

A stock market anomaly is any event or time period that can be used to produce abnormal profits on stock markets. Stock market anomalies can be classified in different categories, like for example firm anomalies, accounting anomalies, event anomalies, weather anomalies and calendar anomalies. If a stock market anomaly depends solely on certain periods in a calendar year, it refers to a calendar anomaly. Stock market calendar anomalies have been a subject of a large amount of studies in the last decades. Innumerable researchers reported about different stock market calendar anomalies and tried to find explanations for them. Over the years this has resulted in a large variety of explanations.

Anomalies are the indicator of inefficient markets; some anomalies happen only once and vanish, while others happen frequently, or continuously. Tversky and Kahneman (1986) defined market anomalies as “an anomaly is a deviation from the presently accepted paradigms that is too widespread to be ignored, too systematic to be dismissed as random error and too fundamental to be accommodated by relaxing the normative system”.

Gerlach (2007) came up with an alternative explanation for stock market anomalies in the U.S. He stated that five of the six stock market calendar and weather anomalies are not present when only trading days are considered where no macroeconomic news was made public. In his research he used eleven different macroeconomic announcements, such as the Gross Domestic Product (GDP), the Employment Report, the Consumer Price Index and Housing Starts. The anomalies that he focused on are the turn-of-the-month effect, the January effect, the fall effect, the lunar effect, the rain effect and the temperature effect.

The existence of market anomalies has been attested even in the most advanced markets of the world. Fama (1965a) evolved a model which is known as “Random Walk Theory” which asserts that asset price changes cannot be projected and then he (1970) put forward his most noted work

i.e. Efficient Markets Hypothesis (EMH) which states that no investor can out-perform the market and make profit by taking advantage of any information.

Stock returns exhibits systematic patterns at certain times of the day, week or month (Aly *et al.*, 2004). The most common of these are monthly patterns; certain months provide better returns as compared to others i.e. the month of the year effect. Similarly, some days of the week provides lower returns as compared to other trading days i.e. days of the week effect (Hossain, 2004).

The existence of anomalies in stock returns however violates an important hypothesis in finance that is efficient market hypothesis. The efficient market hypothesis is a central paradigm in finance. The EMH relates to how quickly and accurately the market reacts to new information (William, 2002). New data are constantly entering the market place via economic reports, company announcements, political statements, or public surveys. If the market is informational efficient then security prices adjust rapidly and accurately to new information. According to this hypothesis, security prices reflect fully all the information that is available in the market. Since all the information is already incorporated in prices, a trader is not able to make any excess returns. Thus, EMH proposes that it is not possible to outperform the market through market timing or stock selection (Mokua, 2003).

In the context of financial markets and particularly in the case of equity market seasonal component have been recorded. They are called calendar anomalies (effects) in literature (Board, 1988).The presence of anomaly in stock returns violates the weak form of market efficiency because equity prices are no longer random and can be predicted based on past pattern. This facilitates market participants to devise trading strategy which could fetch abnormal returns on the basis of past pattern. For instance, if there are evidences of 'day of the week effect', investors may devise a trading strategy of selling securities on Fridays and buying on Mondays in order to make excess profits. Aggarwal and Tandon (1994) and Pandey (2002) pointed out that mean stock returns were unusually high on Fridays and low on Mondays. One of the explanations put forward for the existence of anomaly in stock returns is the tax-loss-selling hypothesis. In the

USA, December is the tax month. Thus, the financial houses sell shares whose values have fallen to book losses to reduce their taxes. As of result of this selling, stock prices decline. However, as soon as December ends, people start acquiring shares and as a result stock prices bounce back. This leads to higher returns in the beginning of the year known as the 'January effect' (Balaban, 1995).

Cadsby and Ratner (1992) studied turn of the month effect for USA, Canada, Switzerland, Germany, UK and Australia while no such effect they found in Japan, Hong Kong, Italy and France.Nosheen et al. (2007) reported Turn of the month effect in KSE of Pakistan and stated that turn of the month effect and time of the month effect is almost same. While turn-of- the-month effect which is the large returns on the last trading day of the month was found in fourteen countries (Agrawal and Tandon 1994).

Kiandu and Dickson (1990) investigated if successive share price returns on the Nairobi Stock Exchange are independent of random variables so that price returns cannot be predicted from historical price returns. They improved on the quality and quantity of data by creating a database. Unlike other studies before theirs, the results they obtained were consistent with the weak form of the EMH. John (2012) investigated the presence of seasonal effect in stock returns at NSE. The study included 50 companies listed in the NSE as at December 2011. Using simple regression and correlation analysis, she concluded that January effect had no significant relationship with the stock returns at the NSE.

In the real world, it is unlikely that one would find an efficient market where there is availability of information, homogenous expectations and zero transaction cost i.e. where no investor can outperform the other and arbitrary profits are eliminated. There are market imperfections and these lead to stock returns anomalies. It is therefore important to understand stock market anomalies to be able to take advantage of them. One of the main concerns of investment analysts is the predictability of stock returns. The more predictable the returns are, the lower the risk. This concern gives value to the study of stock market behavior (Choudhry, 2000). Knowledge of

stock market anomalies is vital to investors. Through this knowledge investors will apply the principle of buy low and sell high to make high profits, in perfectly efficient markets; however these arbitrage profits are not possible. Despite strong evidence that stock market is highly efficient there have been scores of studies that have documented long term historical anomalies in the stock market that seem to contradict the EMH.

1.1.1 Market Returns

The stock market has become an essential market playing a vital role in economic prosperity that fostering capital formation and sustaining economic growth. Stock markets are more than a place to trade securities; they operate as a facilitator between savers and users of capital by means of pooling of funds, sharing risk, and transferring wealth. Stock markets are essential for economic growth as they insure the flow of resources to the most productive investment opportunities.

Share prices change in stock markets on a daily basis. Moreover, during certain times of the year, it is easy to notice that stock prices appreciate every morning, and this may take place many times in one day for some stocks. This means that share prices are determined by supply and demand forces (Mlonzi, Kruger and Nthoesane, 2011). There is no foolproof system that indicates the exact movement of stock prices. However, the factors behind increases or decreases in the demand and/or supply of a particular stock could include company fundamentals, external factors, and market behavior.

Market movements are measured by the total value of stock in a particular stock market by aggregating the market value of the quoted stocks. Changes in market capitalization occur due to fluctuations in share prices or issuance of new share prices or issuance of new shares and bonus issues. This implies that high activity at the stock market may signal more investments in the stock markets. Market turnover indicates inflows and outflows in the stock market and is based on the actively traded shares. A change occurs due to the actively traded shares and to fluctuations in share prices or number of shares traded in a given day (Otuke, 2006).

1.1.2 Market anomalies

A market anomaly is any event or time period that can be used to produce abnormal profits on stock markets. Stock market anomalies occur on multiple equities and stock market indices across the world. They do not correspond with existing equilibrium models, where risk is the only factor which is likely to cause possible variations in stock market excess returns. The occurrence of patterns in time series of stock market returns, independent of time-varying risk, would indicate that not all relevant information is captured in stock prices, which is inconsistent with the EMH. Stock market anomalies exist in every form of the EMH and can be classified in different categories, like for example firm anomalies, accounting anomalies, event anomalies, weather anomalies and calendar anomalies (Levy and Post, 2005).

Firm anomalies are a consequence of firm-specific characteristics (Levy and Post 2005). One well known firm anomaly is the size effect, which states that returns on small firms are higher compared to returns on large firms, even after risk-adjustment. Banz (1981) discovered this size effect especially for the smallest firms in his sample based on total market value of NYSE stocks from 1936 - 1975. Keim (1983) presented the same conclusion for NYSE and AMEX firms in the period 1963 - 1979.

Another firm anomaly is the effect that firms which are followed by only a few analysts earn higher returns. This effect is known as the neglected firm effect. Arbel, Carvell and Strebel (1983) looked at 510 firms from the NYSE, the AMEX and the over-the-counter markets and divided them into three groups of institutional holding (intensively held, moderately held and institutionally neglected) and three groups of size (small, medium and large). For the period 1971 - 1980 they found that the neglected firms earn significantly higher returns than firms intensively held by institutional investors for both the small and the medium size firms.

Accounting anomalies relate to stock price movements after the release of accounting information. An example of an accounting anomaly is the earnings momentum anomaly, which implies that firms with a rising growth rate of earnings are likely to have stocks that outperform

the market. Another accounting anomaly is that if the market-to-book value (M/B) ratio is low, the stocks are likely to outperform the market. (Levy and Post 2005). This phenomenon is investigated by Fama and French (1992). They divide their total sample of stocks on the NYSE, AMEX and NASDAQ into ten groups based on M/B ratio and found that the group with the lowest M/B ratio had an average monthly return of 1.65%, while the group with the highest M/B ratio only had an average monthly return of 0.72%.

1.1.2.1 The Day of the Week Effect

The day-of-the-week effect (also called as weekend effect or Monday effect) indicates that the average daily return of the market is not the same for all the days of the week, as we would expect on the basis of the efficient market theory. The weekend effect describes the tendency of stock prices to decrease on Mondays, meaning that closing prices on Monday are lower than closing prices on the previous Friday. Hence it would be advisable for traders to sell late on Fridays and purchase on Mondays. For some unknown reason, returns on Mondays have been consistently lower than every other day of the week. In fact, Monday is the only weekday with a negative average rate of return (invesopedia.com).

Several hypotheses have been extended to explain the day-of-the-week effect; the most prominent among them are the information release hypothesis, the information processing hypothesis and the settlement regime hypothesis. The information release hypothesis (French,1980; Rogalski, 1984; Penman, 1987; Damodaran, 1989;) suggests that business leaders delay in release of negative information until after the closure of stock exchange on Friday so that the investors get some time to cool down before they react on next trading day. On the other hand, good news is released as soon as it is available. Clustering of negative information release at weekends is responsible for bearish environment in the stock market on its reopening on Monday.

The information processing hypothesis according to Abraham and Ikenberry, (1994) argues that the behavior of individual investors is responsible for observed Monday-effect. It is argued that

gathering information during weekdays trading hours is particularly costly for individual investors as most of them are employed with other activities during that period. For them, weekend provides a convenient opportunity to gather and process the information and to reach at investment decisions. On the other hand, the institutional investors use Monday morning to frame the trading strategy for the coming week (Osborne, 1959), therefore there is less trading from institutional traders on Monday. This situation produces a downward pressure on prices on that day. The settlement regime hypothesis (Gibbons and Hess, 1981; Lakonishok and Levi, 1982; Solnik and Bousquet, 1990,) suggests that the delay in cash payment for the security can lead to escalation of rate of returns on specific days due to extra credit period availability. On the other hand, the trading time hypothesis postulates that market considers only the trading time while determining the period of credit available for settlement and does not expect any interest for the delay in settlement because of holidays.

1.1.2.2 Turn-of-the-Month Effect

This indicates that average daily rate of returns on common stock around the turn-of-the-month is different to that of average rate of return of remaining days of the calendar month. There are two accepted lines of definition regarding the turn of- the-month days. These include that of Ariel (1987) and Lakonishok and Smidt (1988). Ariel defines turn-of-the-month days to include the last trading day of the previous month and the first four trading days of the month. He analyzes the value weighted CRSP index for 19 years period (1963-1981) and provides some evidence that days around the turn-of-the-month (-1 to +4) exhibit a high rate of return.

Lakonishok and Smidt (1988) analyzed Dow Jones Industrial Average for turn of month effect with an event window of (-1, +3) i-e last working day of previous month and first three days of new month. He analyzed a ninety year period, 1897 to 1986, and found a cumulative average return of 0.473% for his event window which is higher than cumulative average return for rest of the month. Hensel and Ziemba (1996) used five day event window i-e (-2, +3) for U.S stock market to show the existence of TOM effect. He analyzed data for 1928 to1993 and found that returns on -1, +2 and +3days are significantly higher.

Different hypothesis have been formulated to explain the existence of turn of month effect. Pay Day Hypothesis explains that the turn of the month effect takes place because at end of the month, usually investors need cash to pay the compensation of employees or for other business purposes like dividend and interest. So they take their money out of the market at end of month and reinvest the amount in new month. This gives birth to high stock prices at turn of month (Bahadur and Joshi 2005, Ogden 1990). Secondly, the Window Dressing Hypothesis asserts that at the end of the month investors, especially institutional investors tend to wipe out their portfolios in order to come up with only winners in hand at month end as an indicator of their high performance over the month. As the month changes, investors start buying back the stocks which push the stock prices up in market (Lakonishok'et al 1991). Lastly, the Time of release of information points out that Positive returns at beginning of a month may be a result of some positive news arrived in market. As Penman (1987) reported that investors launch positive news in beginning of new quarter and so positive returns along with new announcement are observed especially in beginning of quarter.

1.1.3 Market Anomalies and Market Returns

Market anomalies relate to price movements after an obvious event. This can be for example the announcement that a firm will be listed on a major stock exchange. After such an announcement, the price of the stock rises. The recommendation of an analyst is another example of an event anomaly. Depending on the type of recommendation, the stock price will rise or fall (Levy and Post 2005).

Basu (1983) examined the empirical relationship between earnings yield, firm size and returns on the common stock of NYSE firms. His results confirm that stocks with high earnings to price (E/P) ratio earn on average higher risk adjusted returns than the stocks with low E/P ratio. High E/P ratio implies that the stock is valued lowly in relation to its earnings. The effect is significant even if the size effect is taken into account. However, Basu (1983) state that the size effect practically disappears when returns are controlled for differences in risk and E/P ratios. Basu

(1983) believes that neither size nor E/P ratio can be considered to cause expected returns but both variables are proxies for more fundamental determinants of expected returns for common stocks.

Rosenberg et al. (1985) study returns of stocks listed in the NYSE, ASE and NASDAQ exchanges for the time period of 1973 -1984. They report a positive relation between high book-to-price ratio and stock returns. Firms that are valued lowly in relation to their book value of equity have higher returns on average.

Chen, Roll and Ross (1986) studied whether some macroeconomic variables are risks that are rewarded in the stock market. They estimate monthly excess stock returns with an asset pricing model that have several macroeconomic risk factors. They assume these factors to be variables that systematically affect stock market returns. The estimation period is from 1953 to 1983. Risk factors that they use are annual and monthly growth rates in industrial production change in expected inflation, unexpected inflation, and term and defaults spreads. They also estimated an additional model where they add an equity factor which is the return of either the value-or equally weighted NYSE index. As a result they showed that their model with macroeconomic factors is capable for explaining the cross section of excess stock returns for the estimation period.

To investigate the influence of exchange rate and interest rate changes on stock returns was an important contribution towards capital market research as Joseph (2002) studied the affect of foreign exchange and interest rate changes on UK firms in the chemical, electrical, engineering and pharmaceutical industries for the period of 1988 to 2000. The study employed two different measures of foreign exchange rate, along with a measure of interest rate changes. The results revealed that industry returns were more negatively affected by interest rate changes than by foreign exchange rate changes. The negative effects of interest rate changes and foreign exchange rate changes appeared more evident for the electrical and engineering sectors whereas these effects were positive for the pharmaceutical industry

Saunders (1993) explores whether the stock market returns on the Dow-Jones Industrial Average and NYSE/ AMEX for the period 1927 – 1989 are affected by weather conditions. His results suggest that the weather does have significant influence on the stock market returns. This is especially the case for 100% cloudy days and for sunny days (with 0-20% clouds), where the mean return for the latter group differs most from the overall mean for all days. Saunders (1993) states that his results are robust to other anomalies like the January effect, the weekend effect and the size effect. Cao and Wei (2005) investigate the possible relationship between stock market returns and temperature. They test whether lower temperatures lead to higher stock market returns due to aggression and therefore risk-taking and higher temperatures lead to higher or lower returns depending whether aggression (which causes risk taking) or apathy (which causes risk-aversion) dictates. Returns on nine stock market indices around the world between 1962 and 2001 are used. Overall, Cao and Wei (2005) find that stock returns are significantly negatively correlated to temperature.

1.1.4 Nairobi Securities Exchange

NSE was established in July 1953 as Nairobi Stock exchange as an overseas stock exchange. However, in 1954 the Nairobi Stock Exchange was then constituted as a voluntary association of stockbrokers registered under the Societies Act. Since Africans and Asians were not permitted to trade in securities, until after the attainment of independence in 1963, the business of dealing in shares was confined to the resident European community. 1988 saw the first privatization through the NSE, of the successful sale of a 20% government stake in Kenya Commercial Bank.
In 1996, the largest share issue in the history of NSE, the privatization of Kenya Airways, came to the market. Having sold a 26% stake to KLM, the Government of Kenya proceeded to offer 235,423,896 shares (51% of the fully paid and issued shares of Kshs.5.00 each) to the public at Kshs.11.25 per share. More than 110,000 shareholders acquired a stake in the airline and the Government of Kenya reduced its stake from 74% to 23%.

In July 2011, the Nairobi Stock Exchange Limited changed its name to the Nairobi Securities Exchange Limited. The aim was to reflect the strategic plan of the Nairobi Securities Exchange to evolve into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments. In the same year, the equity settlement cycle moved from the previous T+4 settlement cycles to the T+3 settlement cycle. This allowed investors who sell their shares, to get their money three (3) days after the sale of their shares. In September 2011 the Nairobi Securities Exchange converted from a company limited by guarantee to a company limited by shares and adopted a new Memorandum and Articles of Association reflecting the change.

Nairobi Securities Exchange All Share Index (NASI) was introduced complimentary to the NSE 20 share index in 2008, with a base value of 100 as of January 2008.This was part of some of the recommendations by the International Finance Corporation (IFC) and regulators of world stock markets to ensure a comprehensive dissemination of market information to investors. Unlike the 20 Share Index, which measures price movement in selected, relatively stable and best performing 20 listed companies, NASI incorporates all listed companies irrespective of their performance and their time of listing. NASI is calculated based on market capitalization rather than the price movements of the counters, meaning that it reflects the total value of all listed companies at the NSE. Prices are based on last trade information from NSE's Automated Trading System

1.2 Research Problem

In finance, the Efficient Market Hypothesis (EMH) states that security prices on financial markets reflect all relevant information. On an efficient market there are no investment opportunities which can lead to abnormal returns. Abnormal returns are the differences between the actual and the expected returns of securities. Bodie and Kane (2002) define efficient market hypothesis that the prices of securities fully reflect available information. Investors buying securities in an efficient market should expect to obtain an equilibrium rate of return. Weak-form EMH asserts that stock prices already reflect all information contained in the history of past

prices. The semi-strong form hypothesis asserts that stock prices already reflect all publicly available information. The strong-form hypothesis asserts that stock prices reflect all relevant information including insider information.

Boudreaux (1995) employed the Global stock indices (indexes reported by the Morgan Stanley Capital International) to investigate the monthly seasonality in seven countries. The results indicate a positive monthly effect for Denmark, Germany and Norway stock markets. A significant negative effect was found in Singapore/Malaysia. Further investigation indicated that the monthly effect is either confounded or manifested by the January effect. Arsad and Coutts (1997) examined stock market anomalies for the London Stock Exchange (LSE) and depicted significantly negative Mondays for both categories of sample periods. Hussain (1999) performed investigation on Pakistani equity market for a phase starting from January 1989 and ending in December 1993 and found anomalies to be nonexistent. Coutts & Sheikh (2000) analyzed "all gold index" with respect to the "Johannesburg stock exchange" and pointed out that there seemed to be no January effect present in that index.

Brooks and Persand (2001) investigated the weekday anomaly in the South East Asian stock markets. The markets they explored included "Taiwan", "South Korea", "Philippines", "Malaysia" and "Thailand". Their findings offered substantiation in favor of the subsistence of the day of the week effect. Mehdian and Perry (2001) enticed to explore the Monday effect in three and two large capitalization and small capitalization indices, respectively. Peter Klein (2003) also presented his findings in favor of the abnormally greater yet significant returns in January for the stocks that had suffered heavy losses in the previous year. Paul and Theodre (2006) examined calendar anomalies in Ghana stock market. They found an April effect for Ghana stock prices contrary to the usual January effect. Further, Yakob, Beal and Delpachitra (2005) examined seasonal effects in ten Asian Pacific stock markets, including the Indian stock market, for the period January 2000 to March 2005. They state that this is a period of stability and is therefore ideal for examining seasonality as it was not influenced by the Asian financial crisis of the late nineties.

Yakob, et al., concluded that the Indian stock market exhibited a month-of-the-year effect in that statistically significant negative returns were found in March and April whereas statistically significant positive returns were found in May, November and December. Of these five statistically significant monthly returns, November generated the highest positive returns whereas April generated the lowest negative returns. Paul Alagidede (2012), examined the month of the year and the pre-holiday effects, and their implications for stock market efficiency in the biggest markets in Africa. He used monthly market indices for the markets namely; NSE All Share Index for Nigeria, N20I for Kenya, Tunn nindex for Tunisia, MASI index for Morocco and FTSE/JSE All Share index, CASE30 Share Index and ZSE Industrial index for South Africa, Egypt and Zimbabwe respectively. The January seasonality is evident in Egypt, Nigeria and Zimbabwe. There is a February effect for Morocco, Kenya, Nigeria and South Africa. The hypothesis that returns for all months are equal can be rejected for Egypt, Nigeria and Zimbabwe. For four markets (Morocco, Kenya, Tunisia and
South Africa) there is insignificant variation between monthly returns, and none of them exhibit any January seasonality. These results contrast with those of Claessens et al. (1995), who find no evidence of a month of the year effect for Zimbabwe.

Locally, John (2013) investigated the presence of seasonal effect in stock returns at NSE. The study included 50 companies listed in the NSE as at December 2011. Using simple regression and correlation analysis, she concluded that January effect had no significant relationship with the stock returns at the NSE. Allan & George (2013) examined the NASI and N20I for a period of 12 years up to 2011. Using t-test and F-test they found that the coefficients of July, September and January were significant at 5% level. Therefore, they reported that monthly effect exists in NSE. They further reported that the return in December month is generally lower and in January month higher, as compared to return for other months. This study sought to establish if market anomalies exist at the NSE by using more recent data (2010-2013) which have not been covered by any study. This study sought to answer the following research questions:

i. Do monthly market anomalies exist at the NSE?

ii. Is the monthly anomaly effect persistent over times?

1.3 Objectives of the Study

To investigate whether there exists a month of the year effect in Nairobi Securities Exchange

1.3.1 Specific Objectives

i. To investigate the existence of monthly market anomaly at the NSE

ii. To investigate if the monthly anomaly effect is persistent over time

1.4 Significance of the Study

This study intended to deal comprehensively with market anomaly issues at the Nairobi Securities Exchange. The findings of this study will be of great importance to the following:

Investors: The study looks at the various recurring anomalies that can be exploited by arbitragers to make abnormal profit. If investors specify a certain pattern in volatility, then it would be easier to make investment decisions based on both return and risk. This will give investors another tool to design profitable investment strategies.

The government and policy makers: The findings will be of help to the Kenyan government in its policy making decisions, factoring the anomalies in the securities market. Existence of anomalies is an alarming situation for policy makers as they should concentrate on the market situation and make arrangements to control the anomalous behavior

To economists: Knowledge of the properties of the daily exchange rate has important implications for economists. The effects of exchange rate movements on international trade and capital flows can be vital, especially for small open economies where foreign exchange variability could affect the economic performance significantly.

Research and Academicians: The pursuit of knowledge is a major human endeavor; information on market anomalies at NSE will improve the existing academic body of knowledge. Exploration into an area of study helps scholars better understand the topic and questions related to that area of research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section of the study presents the theoretical and empirical review. In the theoretical review, the researcher discusses theories related and that guide the study while in the empirical, the study discusses works of other authors in relation to market anomalies.

2.2 Theoretical Review

This study was anchored on three theories; Efficient Market Hypothesis, Behavioral Finance Theory and Tax-loss Selling Theory

2.2.1 Efficient Market Hypothesis

In an efficient market, competition among the many intelligent participants leads to a situation where, at any point in time, actual prices of individual securities already reflect the effects of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its inherent value (Fama, 1965).

The basis of the efficient market hypothesis is that the market consists of many rational investors who are constantly reading the news and react quickly to any new significant information about a security. There are also many funds whose managers are constantly reading new reports and news, and with the aid of high-speed computers, is constantly sifting through financial data looking for mispriced securities

Efficiency management hypothesis was first given form by Paul Samuelson (1965), who posited that in an informational efficient market, price changes must be unforecastable if they are properly anticipated, that is, if they fully incorporate the information and expectations of all market participants. After developing a series of linear-programming solutions to spatial pricing models with no uncertainty, Samuelson came upon the idea of efficient markets through his

interest in temporal pricing models of storable commodities that are harvested and subject to decay. Samuelson‘s abiding interest in the mechanics and kinematics of prices, with and without uncertainty, led him and his students to several fruitful research agendas including solutions for the dynamic asset-allocation and consumption-savings problem, the fallacy of time diversification and log-optimal investment policies, warrant and option-pricing analysis and, ultimately, the Black and Scholes (1973) and Merton (1973) option-pricing models.

After Samuelson‘s (1965) and Fama‘s (1965; 1970), many others extended their framework to allow for risk-averse investors, yielding a neoclassical version of the EMH where price changes, properly weighted by aggregate marginal utilities, must be unforecastable (for example, LeRoy, 1973; M. Rubinstein, 1976; and Lucas, 1978). In markets where, according to Lucas (1978), all investors have rational expectations‘, prices do fully reflect all available information and marginal-utility-weighted prices follow martingales. The EMH has been extended in many other directions, including the incorporation of non-traded assets such as human capital, state-dependent preferences, heterogeneous investors, asymmetric information, and transactions costs. But the general thrust is the same: individual investors form expectations rationally, markets aggregate information efficiently, and equilibrium prices incorporate all available information instantaneously.

Fama (1981) argues that expected inflation is negatively correlated with anticipated real activity, which in turn is positively related to returns on the stock market. Therefore, stock market returns should be negatively correlated with expected inflation, which is often portrayed by the short-term interest rate. In theory, the interest rates and the stock price have a negative correlation (Hamrita & Abdelkader, 2011). This is because a rise in the interest rate reduces the present value of future dividend’s income, which should depress stock prices. Conversely, low interest rates result in a lower opportunity cost of borrowing. Lower interest rates stimulate investments and economic activities, which would cause prices to rise.

2.2.2 Behavioral Finance Theory

The assumption that investors are rational and behave in a rational manner is at the core of the EMH. Over the years another school of thought has emerged. This school of thought

hypothesizes that investors are not always rational and therefore the study of market efficiencies and security pricing should take into account the behavior of investors. This school of thought has evolved into a branch of finance known as Behavioural Finance.

As Barberis and Thaler (2003) points out Behavioural Finance has emerged by combining emotions and cognitive errors and their influence to investors and the decision making process. Various researchers have defined Behavioural Finance with considerable agreement between them. Sewell (2005) defines it as a study of the influence of psychology on investors and the effect of this influence to the market. Lintncr (1998) defines it, as a study of human decision-making errors when interpreting and acting on information. Kahneman and Tversky (1979), Shefrin and Statman (1994), Shiller (1995) and Shleifer (2000) are among the leading researchers who have used Behavioural Finance to explain investors behaviour.

Different researchers have defined Behavioural Finance with considerable agreement between them. Lintncr (1998) defines it, as a study of human decision-making errors when interpreting and acting on information. Kahneman and Tversky (1979), Shefrin and Statman (1994), Shiller (1995) and Shleifer (2000) are among the leading researchers who have used Behavioural Finance to explain investors behaviour.

Belsky and Gilovich (1999) referred to behavioral finance as behavioral economics in that "Behavioural economics combines the twin disciplines of psychology and economics to explain why and how people make seemingly irrational or illogical decisions when they spend, invest, save, and borrow. Much of economic and financial theories presume that individuals act rationally and consider all available information in the investment decision-making process.

In the global financial markets, application of investment ideas based on the notion that the market is predictable, complete price flexibility, and complete knowledge of the other players in the markets are increasingly unrealistic (Fromlet, 2001). Thus, markets are irrational as stated by Burton Malkiel (1973) and when it comes to investing, people generally follow their emotions and not their reason.

De Bondt (2004) views Behavioural Finance theory as a model that applies cognitive psychology to explain the market and investor behaviour. In essence, this theory argues that investors do not apply full rationality while making choices, and it attempts to understand the investment market phenomena by dropping two key assumptions of Traditional Finance paradigm that is agents fail to update their beliefs correctly and there is a systematic deviation from the normative process in making investment choices (Fromlet, 2001).

Behavioural Finance theory has successfully explained stock price anomalies related to overreaction, under reaction, and momentum strategies and herding behaviour. Studies done by Barberis, Shleifer, and Vishny, (1996), Lakonishok, Shleifer and Vishny, (1997), Daniel, Hirshleifer, and Subramanyam, (1998), Daniel and Titman, (2000) and Barberis and Shleifer, (2003) have focused on these trading strategies and refers to them as trading anomalies. They argue that these anomalies violate the trading rules of the EMH theory and hence render the CAPM and other rational based models inappropriate in relating investment risk and returns.

2.2.3 Tax-loss Selling (TLS) Theory

TLS as defined by Barron in 1991 consist in "selling of securities, usually at year end, to realize losses which can be used to OFFSET capital gains and thereby lower an investor's tax liability." Therefore, it represents the tendency of investors to sell securities whose value has declined through the year in order to minimize the fiscal tax liabilities, which would affect the individual income. Vice versa, investors hold stocks whose value has grown through the holding period and wait until after year-end to sell it. This is due to the method of tax calculation according to which capital gains and losses are recognized only when realized, therefore after their sales. Moreover, mutual consent suggests that "an immediate tax deduction is preferred to a deferral". The latter strengthen the decision to sell the "loser" assets and keep the appreciated ones. In addition, even if individuals are not naturally into the idea of realize loss, they might be pushed to it by the taxation benefits. Considering the market, if all investor would take this attitude, there will be an increase of offers of losing asset, whose quotation will plummet. When the New Year starts in

January, the investors repurchase the stocks, driving up their prices and producing abnormally high returns.

In support of TLS, Reinganum (1983) argues that the prices of firms (in NYSE) which have previously declined in price will decline further in the later months of the year as owners sell off the shares to realize capital losses. Then, after the New Year, prices bounce up in the absence of selling pressure. It must be stressed that this argument is not based on rational behaviour by all market participants. In fact Richard Roll (1983) calls the argument "patently absurd". He points out that even if some investors were motivated by taxes to trade in this manner other investors could buy in anticipation of excess returns in January. While Roll describes the hypothesis with obvious scorn, Reinganum finds some evidence consistent with it. He reports that stocks with negative returns over the previous year have higher returns in January.

Jones, Lee & Apenbrink (1991) tested the hypothesis on the Cowles Industrial Index before and after 1917, when a personal income tax was introduced. The conclusion they arrived at was that whereas the January effect was not significant for the period before 1917, it proved significant for the latter period, thus the January effect was related to income taxation. Their finding is also supported by Sias and Starks (1997), and Poterba and Weisbenner (2001). They present evidence consistent with the TLS hypothesis. Chen and Singal (2004) present a comprehensive study of several explanations and find evidence in favor of the tax-loss selling hypothesis and little or no evidence for the other hypothesis.

Some economists also suggest that while taxes seem relevant to the January effect, they are not the entire explanation. First, the effect is observed in Japan where no capital gains or loss offsets exist (Kato and Schallheim, 1985). Second, Canada had no capital gains tax before 1972, yet did have a January effect before 1972 (Berges, McConnell, and Schlarbaum, 1984). Third, Great Britain and Australia have January effects, even though their tax years begin on April 1 and July 1, respectively. (Still, returns are high in April in Great Britain, and in July in Australia, so taxes do seem to be part of the story).

Other opponents of this hypothesis argue that tax-loss does not explain why institutional investors such as private pension funds, which are not subject to income taxes, do not take advantage of the abnormal returns in January and buy stocks in December, thus bidding up their price and eliminating the abnormal returns. Although most evidence supports the tax-loss selling hypothesis the discussion still remains open.

2.3 Determination of Market Returns

Market returns are the gains or losses from a market in a particular period and are usually quoted as a percentage. It is calculated by as a percentage change in a market index based on the previous period's closing index. There are two methods that are used to calculate returns; simple returns formation and continuously compounded (logarithm) returns.

Simple returns

$$R_t = \frac{p_t - p_{t-1}}{p_{t-1}} \times 100\%$$

or

log returns

$$R_t = \ln\left(\frac{p_t}{p_{t-1}}\right) \times 100\%$$

Where:

Rt = Market return

Pt = Market value at time t.

Pt-1= Market value at month t-1.

ln is the natural logarithm.

For the purpose of this study, market returns will be calculated as the natural log of (Index Value at time t / Index value at time t-1):

$$R_t = \ln\left(\frac{p_t}{p_{t-1}}\right) \times 100\%$$

The reasons to choose logarithm returns over general return are justified by both theoretically and empirically. Theoretically, logarithmic returns are analytically more tractable when linking

together sub-period returns to form returns over longer intervals. Empirically, logarithmic returns are more likely to be normally distributed which is prior condition of standard statistical techniques (Strong, 1992).

2.4 Empirical Review

Gibbons and Hess (1981) studied the Day of the week effect in US stock returns. The sample period was 1962-1978 and the data covered S & P 500 and CRSP indices. They first tested time patterns for overall sample period and then divided that data to sub periods. They found that for the overall sample period, the average annual return for Monday ranges from -33.5% (S & P 500) to -26.8% (the equally weighted CRSP).When they divided the data to sub periods they found that for all periods except one the hypothesis of equality was rejected for each index and lowest returns appeared on Mondays. Only for the period from November 1974 to December 1979 the negative returns occurred on Tuesdays. In addition Gibbons and Hess reported significantly higher returns on Wednesdays and on Fridays. Later e.g. Lakonishok and Smidt (1988) documented similar results with negative Monday returns on US stock market.

Jaffe and Westerfield (1985) studied the Day of the week effect on four international stock markets. Their study was the first to provide some international evidence of this anomaly. Their paper examined stock returns in the U.K, Japan, Canada and Australia. The indices and time periods were: Japan- the Nikkei Dow from 1970 to1983, Canada- the Toronto stock exchange index from 1976 to 1983, Australia- the Statex actuaries index from 1973 to 1982 and the U.K- The Financial Times ordinary share index from 1950 to 1983. Their results clearly documented similar time patterns on international stock markets as well. For the returns in the UK and Canada the lowest returns occurred on Mondays, but in contrast of the earlier studies based on US stock market, they found that the lowest mean returns for both Japanese and Australian stock market occurred on Tuesdays. These results are partly similar with the results documented by Gibbons and Hess (1981). However Jaffe and Westerfield documented new evidence of the negative Tuesday effect.

De Bondt and Thaler (1985) investigated whether the stock market over-reacts to information. Their focus was on shares that had experienced large capital gains or losses, rather than some firm-generated piece of information. They termed those firms experiencing extreme capital gains as "winners" and those that had experienced extreme capital losses as "losers". They then formed two portfolios based on winners and losers. Their reported results indicated that over the last 50 years, loser portfolio outperformed the market on the average by about 19.6% thirty six months after the portfolio formation while the "winner" portfolio underperformed the market on the average by about 5%. They interpreted their results as being consistent with the overreaction hypothesis, which postulates that extreme movements in share prices are followed by reversal movements that adjust for the initial movement. If the initial movement is very extreme, the adjustment process will be very large. If prices behave in such a manner, it clearly implies weak-form market inefficiency. De Bondt and Thaler (1987) examined the issue of market overreaction and stock market seasonality further, and concluded that the hypothesis still held in spite of the criticism that the market's overreaction and the seasonality in share prices could be due to the market's response to the changing risk characteristics of firms.

Schallheim and Kato (1985) reported more evidence of the anomalies in the Tokyo Stock Exchange over the period 1952-1980. They documented a positive January effect but in addition they found statistically significant positive returns for June as well. Shallheim and Kato suggested that there might have been some relation between the firm size and the positive June returns because it appeared mainly for small firms.

Condoyanni and al. (1987) studied six national stock exchanges in Canada, UK, Australia, France, Japan and Singapore during a period from 1969 to 1984. The results for Canada and the UK showed that negative returns occurred on Mondays. On the other hand the results for France, Japan, Australia and Singapore showed negative returns on Tuesdays. These results were partly similar with the results documented by Jaffe and Westerfield (1985) on the same markets. However, Condoyanni et al. proved that these patterns are not necessarily similar across the

markets on the same continent e.g. within Europe. At least results were different between France and the UK.

Arsad and Coutts (1997) reexamined security price anomalies in the London international stock exchange over a 60 year period from roughly 1935 to 1994 by using the FT 30 index. Their results broadly supported the former studies e.g. made by Jaffe and Westerfield. They found that for both the whole sample period and the sub-periods the Monday return was significantly negative compared with the other days. When it comes to monthly patterns they also documented significantly positive returns on January for the whole time period. In addition they found positive returns also in the months of April and December. For the sub-periods the month of April was the only month which displayed positive returns for the all periods.

Mehdian and Perry (2001) restudied the Monday effect on US equity markets using returns from three large-cap indices and two small-cap indices over a period of 1964-1998. Their results showed that in the full sample period and in the sub-period from 1964 to 1987 returns for all indices were significantly lower on Mondays compared with other days. Instead in the second sub-period from 1987 to 1997 they found that the Monday returns were significantly positive for the large-cap indices but for the small-cap indices Monday returns remained negative and significantly lower compared with the other days. Therefore, they documented that the Monday effect had declined over time and that it had also been partly reversal of the traditional Monday effect e.g. documented by Gibbons and Hess (1981).

Market efficiency is an important hallmark of a sophisticated market. For this reason, markets in developed countries have been able to attract greater attention from global investors. Considering the current level of interest and importance investors place on market efficiency, African stock markets have to prove that they are becoming more efficient in order to increase their share of global investment funds (Agathee, 2008). Capital markets are normally assumed to be efficient in relation to the instantaneous incorporation of all known and newly arriving information into prices of securities.

McQueen and Roley (1993), Boyd et al (2005) and Andersen et al. (2007) investigated the influence of macroeconomic news on stock market returns, thereby looking at the state of the economy. McQueen and Roley (1993) concluded that the market's response to macroeconomic news depends on the state of the economy. This is especially the case for higher than expected real activity, which leads to lower stock prices when there is high economic activity (a strong economy), but leads to higher stock prices when there is low economic activity (a weak economy). Boyd et al. (2005) investigated the influence of unemployment rate announcements and concluded that stock markets rise in response to bad employment news during expansions and drop in response to bad employment news during contractions. The explanation that was given for these findings is that stock pSrices are most influenced by changes in the equity risk premium during expansions and most

Ariel (2002) observed monthly return in United States stock index return. It was found that stocks earn positive average return in beginning and first half of month and zero average return in second half of month. Weak monthly effects have been observed in foreign countries (Jaffe & Westerfield 1989). Australia, United Kingdom and Canada showed same pattern as Ariels found in United States while Japan had opposite effect. Australia and Canada had positive monthly effects while Japan market had negative monthly effects (Boudreau, 1995). Boudreau (1995) extended Jaffe & Westerfield (1989) results and observed monthly effects in Denmark, France, Germany, Norway, Switzerland and negative effect is founded in Asian pacific basin market of Singapore/Malaysia.

Mehdian and Perry (2001) also investigated monthly patterns on the same market during the same time period. For the full sample period the found that January returns were positive and significant in all three indices. In the first sub-period (1964-1987) the returns in January were also significantly positive, but in the second sub-period (1987-1998) there did not appear any significant January effect and therefore it had disappeared.

Mehdian and Perry (2002) reported that while January mean returns are positive in U.S. stock markets, they are not statistically significant after the 1987 U.S. stock market crash. Lindley, Liano and Slater (2004) demonstrated that many years during the period 1962-2000 did not have a significant January effect and that some years had a negative January effect.

Yamori and Mourdoukow (2003) investigated the day of the week effect for the Yen/US dollar exchange rate. They reported the presence of the day of the week effect for the 1973–1989 periods. They further argued that the day of the week effect disappeared in the 1990s, an occurrence they ascribed to the financial deregulation in Japan that increased the efficiency of the financial markets. Furthermore, Yamori and Kurihara (2004) found some support for the day of the week effect for 29 foreign exchange markets in the 1980s. They also stated that the day of the week effect disappeared for almost all 29 countries in the 1990s. Aydogan and Booth (2003) argued that the day of the week effect was present in the daily depreciation of the local currency in Turkey for the 1986–1994 periods. Berument,Coskun and Sahin (2006) in a similar study on the depreciation and volatility of the Turkish lira (TL) against the US dollar (USD), reported discovered the day-of- the-week effect in both return and volatility equations This was later confirmed by Berument, H. C. (2007) who later found a significant day-of-the-week-effect in the Turkish foreign exchange market, while Ke, M. C., Chiang, Y. C., & Liao, T. L. (2007) indicated that higher returns appear on the first three days of the week across different trading-day regimes in the Taiwan foreign exchange market.

Hong, H., & Yu, J. (2009) studied stock markets in 51 countries and found that due to vacations and lessened investing activity asset prices, mean returns and turnovers are significantly lower during the summer (July-September) than throughout the rest of the year in the Northern Hemisphere countries. These results support the possible existence of the abnormal November-April returns. Also Lucey and Whelan (2002) obtain significant results on the existence of Halloween anomaly for the Irish equity markets.

Brooks and Persand (2001) studied the five Southeast Asian stock markets namely Taiwan, South Korea, The Philippines, Malaysia and Thailand. The sample period was from 1989 to 1996. They found that neither South Korea nor the Philippines has significant calendar effects. However, Malaysia and Thailand showed significant positive return on Monday and significant negative return on Tuesday.

Pandey (2002) reported the existence of seasonal effect in monthly stock returns of BSE Sensex in India and confirmed the January effect. Ajayi and al. (2004) examined eleven major stock market indices on Eastern Europe using data from 1990 to 2002. They found negative return on Monday in six stock markets and positive return on Monday in rest of them.

Bodla and Jindal (2006) studied Indian and US market and found evidence of seasonality. Kumari and Mahendra (2006) studied the day of the week effect using data from 1979 to 1998 on BSE and NSE. They reported negative returns on Tuesday in the Indian stock market. Moreover, they found returns on Monday were higher compared to the returns of other days in BSE and NSE.

Wong et al. (2006) also analyzed the January effect inherent in the Singaporean stock market. Tests of January effect revealed that during the pre crisis period the average returns in January were higher than the average returns for the rest of the year, difference however not being very noticeable. Average daily returns for the Straits times' index were negative for the entire time period under consideration, depicting a vanishing January effect in the later years.

Using daily DSE composite index data from December 1988 to November 2001, Chowdhury (2005) found turn of the year effects for both traditional (English) and the financial year in Bangladesh. He found that the first day of January produces on average 0.45491% return per day (or, 125% annual return). Choudhary and Choudhary (2008) studied 20 stock markets of the world using parametric as well as non-parametric tests. He reported that out of twenty, eighteen markets showed significant positive return on various days other than Monday.

According to Hensel (2011) cause of occurrence of higher short-term equity return anomalies i.e. Cash flow increased just after and before specific period causes anomalous return, Behavioral constraints as investors feeling and emotions that leads towards sale and purchase of specific equities, Timing constraints like delay in unfavorable reporting, and slow react of market towards new information.

Muragu (1990) examined the price movements at the NSE. His focus was on the level of market efficiency in the stock market. The study found out that the random walk holds for the NSE, which implies that there is no systematic pattern in the price movements and future prices are independent of past prices. This was supported by King'ori (1995) who examined whether NSE exhibits monthly and quarterly seasonalities and found that the mean stock returns are equal over all the months and quarters tested. She did not find existence of January effect.

Mokua (2003) sampled 43 companies listed in the NSE continuously for 5 years from 1st April 1996 to 31st March 2001. Secondary data was obtained daily on transaction prices extracted from NSE records. The data collected was analyzed using linear regression and comparison of mean done under independent sample t test. His study concluded that Monday returns are not significantly lower than the other days nor are Friday returns significantly higher than the other days of the trading week. This was later confirmed by Elima (2007) who studied the reverse weekend effect in the Nairobi Stock exchange Market. The data for the study consisted of daily stock returns of 32 sampled companies listed on the NSE from 1st January 2001 to 31st December 2005. The data was split into two sub samples for large and small companies and analyzed using regression analysis. The study found out that Monday returns are highly significant though their coefficient was not positive, hence there was no day of the week effect at the Nairobi Stock exchange market.

Onyuma (2009) studied month of the year effect at NSE from 1980 to 2006. He found that January had the largest positive returns thus confirming a January effect. Nyamosi (2009) also

reported existence of his effect in this market. He used regression analysis from which negative coefficients were generated confirming higher returns in January than the other months. Their findings were later supported by Allan and George. In their paper on Stock Market Anomalies in the NSE Allan & George (2013) examined the NASI and N20I for a period of 12 years up to 2011. Using t-test and F-test they found that the coefficients of July, September and January were significant at 5% level. Therefore, they reported that monthly effect exists in NSE. They further reported that the return in December month is generally lower and in January month higher, as compared to return for other months.

John (2012) also investigated the presence of seasonal effect in stock returns at NSE. The study included 50 companies listed in the NSE as at December 2011. Using simple regression and correlation analysis, she concluded that January effect had no significant relationship with the stock returns at the NSE. Wachira (2013) concluded that January effects exist at the NSE. He concluded that stock market returns in January differ significantly with the other months of the year implying that the NSE is not efficient.

2.5 Summary of Literature Review

The literature review reveals that most studies on market anomalies have concentrated extensively on developed economies. The few existing studies in developing economies pay little attention to the emerging equity markets of Africa. In fact very few researches have been done on Nairobi Securities Exchange. The ones that have been done have given mixed results on existence of market anomaly. It is therefore important to extensively study and analyze this gap to enable the players make informed decisions that benefits them to a great extent

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research design and data collection methods that will be used by the researcher in the study. It discusses the aspects such as research design, study population, sample and sampling techniques, data collection and analysis.

3.2 Research Design

The study adopted a descriptive research design. Descriptive research design seeks to provide the frequency of a given event and it is usually used when the problem is clear and there exist theories and information. This research design was employed because the study looks into the existence of market anomalies and whether the anomaly effect is persistent over time.

3.3 Population of the Study

This study used the monthly all share index data for the Nairobi Securities Exchange (NSE). The All share index includes all listings on the exchange. Given that using daily or weekly prices in a return series comprising of infrequently traded stocks may lead to significant biases in the results (Lo and MacKinlay, 1988). Additionally, the study used index prices, rather than individual stock prices, to provide market-wide evidence.

3.4 Sample and Sampling Techniques

The monthly closing NSE 20- share index was used in this study .The sample will include 60 monthly observations from the sample period of 1st January 2010 to 31st December 2013 .The study time was long enough to avoid minimal effects of economic fluctuations on the study. In addition this time period has never been covered by any documented study.

3.5 Data Collection

This study will rely on monthly closing NSE 20- share index data from 1st January 2010 to 31st December 2013 from the Nairobi Securities Exchange database through their official website.

This form of data collection is appropriate since the study will compare past stock prices to test for any anomaly and persistent of the effect.

3.6 Data Analysis

Data collected from NSE database was analyzed by use of descriptive statistics with the help of Statistical Package for Social Science (SPSS Version 21.0). The monthly index returns derived from the index levels were transformed into continuously computed returns as:

R_{mt} = Ln ($P_t - P_{t-1}$) where R_{mt} represents monthly market return for period *t*, P_t and P_{t-1} denote market prices for period *t* and period *t-1* respectively and *Ln* denotes natural logarithm. Tests of statistically significant dependence or correlation in stock price changes, as defined by the random walk model, are traditionally used to test for anomaly in a market (Mabhunu, 2004).

3.6.1 The Analytical Model

This study employed the following model by Mehdian and Perry (2001)

$R_{it} = a_{1i} D_{1+} a_{2i} D_{2+} a_{3i} D_{3+} .....+ a_{12i} D_{12+ Vit}$

Where R_{it} is the monthly return of the index *i* as defined, D_1 through D_{12} are dummy variables for each month of the year such that *D1* takes a value of 1 for all January observations and zero otherwise and so on. The coefficients a_1 through a_{12} are estimates of the return for each month from January through December. V_{it} is the disturbance term.

The null hypothesis at 95% confidence level will be considered as follows

$H_0 = a_1 = a_2 = a_3 = a_4 ..... = a_{11} = a_{12}$

This was used to test if stock returns in e.g. May differ from the returns in other months. We reject the null hypothesis if we find some form of monthly seasonality that is statistically significant.

3.6.4 Persistence Test

To analyze the persistence of the Month of the Year effect between the time periods, data was tested in two periods: 2010-2011 and 2012-2013 .SPSS was used to convert the daily closing price into log and calculate the mean and standard deviation. Further, SPSS was used to perform the T- test with significance level of 0.05, F test and get the P-value. The null hypothesis tested for persistence is:

H_0: The mean return for each month is stable between the study periods

T-test was used to estimate the null hypothesis. An assumption for the T-test is the two populations should have same standard deviation, in case the two comparative populations are of same origin. And F-test is used to test the standard deviation is significantly same or not before the T-test is employed to test the significance of the difference between average returns. The formula is:

$$T= ((X_1-X_2)-(\mu_1-\mu_2)) \ / \ Sp\ [(1/n_1) + (1/n_2)]^{½}$$

Where $Sp^2= (n_1S_1^2+n_2S_2^2) \ / \ (n_1+ n_2-2)$

Here, Sp^2 is the pooled variance, n_1 is the number of observations in population 1 and n_2 is number of observations in population 2, $(\mu_1-\mu_2)$ is the difference between the two population means and (X_1-X_2) is the difference between sample means.

Alpha working like a benchmark, the decision was made by the test of significant level, so called p-value. If p-value is smaller than α, H_0 was rejected and if the p-value is larger than α, the null hypothesis H_0 cannot be rejected

CHAPTER FOUR

Data Analysis, Presentation and Findings

4.1 Introduction

This chapter describes the empirical work and results of our study about the monthly anomaly and persistence. Firstly, we analyze the results of the statistical test about the monthly effect during different periods 2010-2011 and 2012-2013 and then we evaluate the stability of the monthly effect over times. Secondly, we analyze the hypothesis tests of the monthly effect for the two periods of study, followed by evaluating the stability of the month of the year effect.

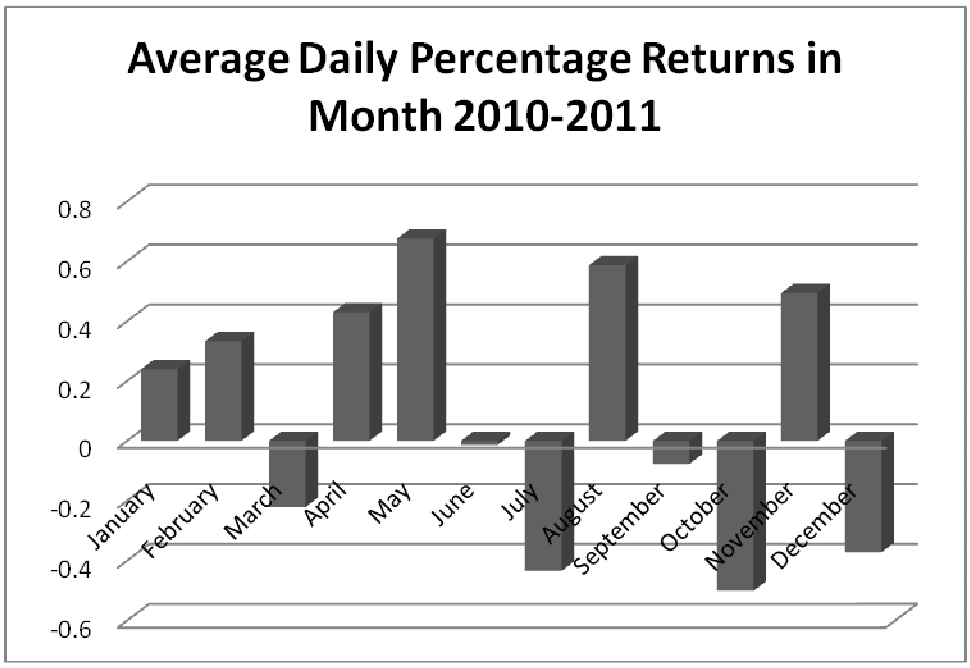

Figure 4.1: Average daily percentage return for month of the year effect

From the figure, it is evident that the negative mean returns is March, June, July, September, October, and December, the lowest of which is October with a value of -0.5006.May has the highest mean return, but just a little higher than the second high August.

4.2 Result of Month of the Year Effect for the Time Period 2010 to 2011

The table in appendix 1 presents the means and standard deviations of daily return in month over the 2010-2011 periods. For most of months, the higher the volatility, the higher return.
However, October and November have abnormally higher volatility with lower return. Compared with November (3.9236), October has similar volatility of 3.9647, but a much lower negative return (-0.5006). May has the highest volatility of 8.3677 and also the highest mean of daily percentage return of 0.6749.

The table also describes the results of T-test for period 2010-2011.The P-value for January is 0.548, which is higher than 0.05, so there is no significant January effect. Although May has the highest return of all the months, the difference from others is still far away from the significant level. So there is no positive Month-of-the-Year effect for this period. October presents the lowest mean return of all, but the P-value for October is 0.141($>\alpha=0.05$), not significant either. Actually, the result is that none of the months is significantly higher or lower than the other months, so there is no significant Month-of-the-Year effect found for 2010-2011.

Result of Month of the Year Effect for the Time Period 2012 to 2013

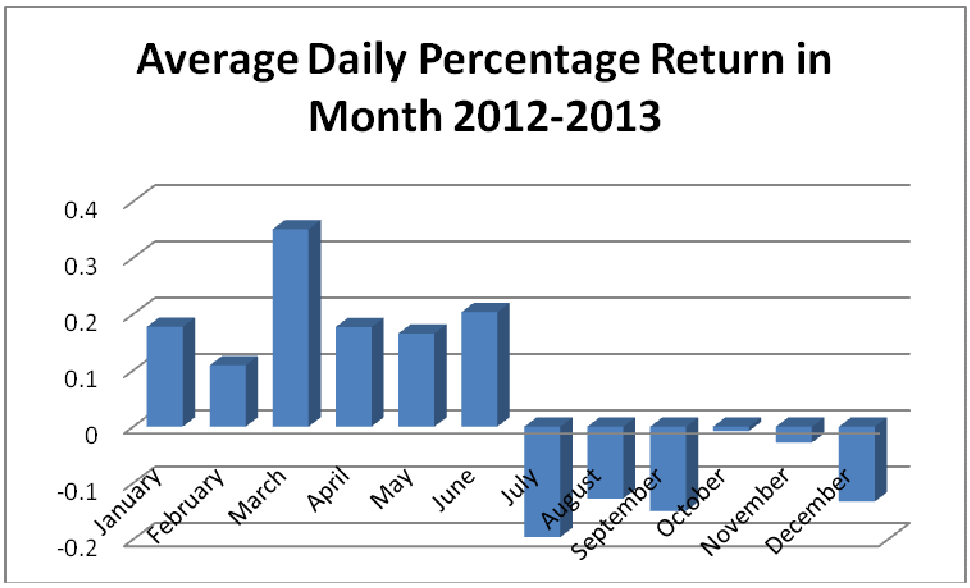

Figure 4.2: Result of Month of the Year Effect for the Time Period 2012 to 2013

For the period 2012-2013, all the first 6 months have positive mean return, while the other 6 months all have negative mean return except November. The highest mean return is March while the lowest is July. January still keeps a positive mean return and December remains a negative mean return in the second period.

The table in appendix 2 presents the means and standard deviations of daily return in month over the 2012 -2013 period. The mean returns for each month are low in general, so is the volatility, compared with the first period. But we can still see the difference between each other. The most risky month is February with a standard deviation of 2.2364, and the second is May for this period. March has the best mean return of 0.3507 with a lower volatility of 1.3391.

The table also describes the results of T-test for period 2012-2013. From it, we can see July presents the lowest mean return of -0.1961, but P-value is not significant, therefore, there is no

statistically negative July effect. P-value for March is 0.04, which is lower than α=0.05, so the null hypothesis that the average daily return of March is equal to that of all the other months together of the year can be rejected. The mean return of March is significantly different from that of other months, and it is much higher than the others, therefore there is positive March effect during this period.

4.3 Result of Month of the year Effect for Whole Period 2010-2013

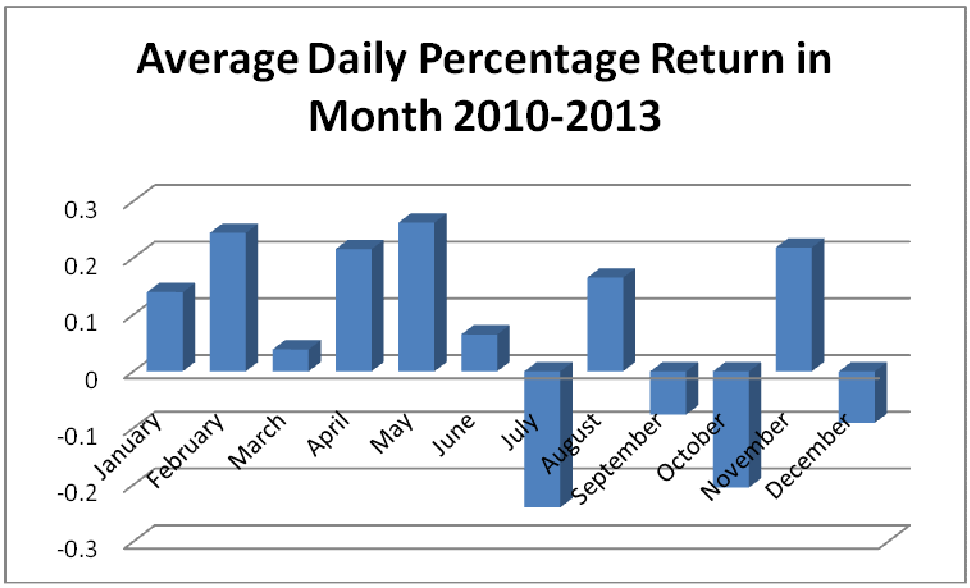

Figure 4.3: Result of Month of the year Effect for Whole Period 2010-2013

The Figure shows the mean return of every month through the whole period from 2010 to 2013. We can notice that the months that have negative mean return are July, September, October, December, while the rest of months have positive mean return. July has the lowest return, and May has the highest.

As is shown from the table in appendix 3 for the whole period, May has the highest standard deviation (5.0004) and also the highest return (0.2624), means that the investors can get a high return in May, at the same time they have to take a high risk when investing in the Nairobi

Securities Exchange. January presents the lowest standard deviation of 1.8692 and positive mean return of 0.1396.

The table also describes the results of T-test for the whole period 2010-2013. A January effect is not found in the period, either. Since January does not present the highest or the lowest mean return of all the months, and also the P-value of January is 0.578, much higher than the significance level α=0.05, indicating that mean return of January is not significantly different from that of all the others. May presents the highest mean return through the whole period from 1992 to 2006, the value of which is 0.2624, but still far away from the significant level, so there is no positive May effect. Instead, a July effect exists during this time period. We find the mean return of July is much lower than that of other months, and the P-value of 0.035 is lower than 0.05, the T-test is significant, hence the null hypothesis that the average daily return of July is equal to that of all the other months of the year can be rejected. A significant negative July effect is found.

As evident from the table in appendix 3, the mean return for each month is not stable between the study periods. All months have at least one negative return through the four periods except January, February, April and November, especially July, September and October have negative mean return during all the four periods. Not like the theoretical framework in the western stock market that January has a higher return than all the other months, the positive mean return for January is on a quite average level in Chinese stock market, and April and November are in the same situation as January that has a positive return but not significantly higher than all the other months during the four periods of study. For February, the return is positive and even the highest one during the third period of study.

As to March, the return is negative in the first period (2010-2011), however, it has become the highest of all months in the second period and it holds a positive return for the whole period. For May, the return in the first period is the highest one with a value of 0.6749, and then reduces to 0.1655 in the second period, and goes down to a negative value of -0.0391, informing that the

return of May is quite unstable. Thanks to the high return of the first period, May is still the highest month in the whole period (2010-2013). The biggest difference of return between periods is the August's reduction from the first period to the second period, which is 0.7143 from 0.5865 to -0.1278. In accord with the theoretical framework, December has a negative return in the first and second and the whole period. From what we discuss above, it is found that none of months has a steady return between the two periods. However, investors should notice that July, September, October and December mostly have a negative return, which is not good time to invest in the stock.

4.4 Stability of the standard deviation between the study periods

The standard deviation is most commonly used to evaluate the statistical dispersion around the mean as well as functioning as a risk indicator. As we can see from the table, the standard deviation of return is not stable through the time. It is the first period (2010-2011) that has the highest standard deviation of all three periods, which means the volatility of return from 1992 to 1996 is very high and investing in Kenyan stock market is more risky in that time than in the other two periods. And during that time, May has the highest standard deviation of 8.3677, the highest value of all periods as well. If we take mean return into consideration, May also has the highest return of all the periods, which is in accord with the "high risk, high return" rule, and it is a good time to make deal in the Kenyan stock market for those risk-lover investors. During the second period, the volatility of May sharply decreases to 2.1111and keeps decreasing to 1.3564 in the third period and due to the high volatility of first period; May still has the highest volatility of 5.0004 for the whole period. The movement of August's volatility is almost the same as that of May, with a second highest volatility and mean return in the first period and reduced volatility in the second and third period, also the second highest volatility through the whole period of study. On the other hand, June presents the most steady volatility change from the second period to the third period, with value of 1.8125 and 1.8059 respectively. So when focusing on standard deviation, it can be seen that the standard deviation for all of the months decrease from the first time period to the second.

4.5 Stability of the P-value between the study periods

Concerning the stability of the P-value between the two periods, the table shows that no month presents stable results. As to January, the P-values of all the two periods are much larger than the significant level 0.05, so there is no January effect in Kenyan stock market. February presents the positive returns during both periods, but the p-value 0.254 for whole period is still larger than the significance level and the other two periods are also much higher than 0.05, so there is no February effect either. As to March, we find a significant P-value during the second period, so there is March effect in Kenyan stock market from 2012 to 2013; however, the P-value is insignificant in the first time period, so we can conclude that the March effect is not persistent through times.

The P-value of July is not significant in all the periods of study, but significant in the whole period from 2010 to 2013, which means there is a July effect in Kenyan stock market in the whole 2010-2013 period of study, but it is not true in each separate period. In our study, the P-value of December is insignificant in all periods of study, so there is no December effect in Kenyan stock market. In conclusion, the only two months presenting significant P-value are March (the second period), and July (the whole period); apart from March and July, no other P-value is significant.

4.6 Summary and Interpretation of the Findings

This study sought to empirically investigate the presence of the month of the year anomaly in the Nairobi Securities Exchange. The study further sought to establish whether the anomaly if present is persistent over time. For the period 2010-2011, for most of months, it was evident from the data that the higher the volatility, the higher the return. The months of October and November were found to have abnormally higher volatility with lower return. The month of May had the highest volatility and also the highest mean of daily percentage return for the period under study. The p-values for all months in the period 2010-2011 were greater than the 0.05 implying that there is no significant Month-of-the-Year effect found for that period. The study supported the findings by King'ori (1995) who examined whether NSE exhibits monthly and quarterly seasonalities and found that the mean stock returns are equal over all the months and

quarters tested. These results are inconsistent with the findings of John (2013) who investigated the presence of seasonal effect in stock returns at NSE. The study included 50 companies listed in the NSE as at December 2011. Using simple regression and correlation analysis, he concluded that January effect existed although it had no significant relationship with the stock returns at the NSE.

For the period 2012-2013, all the first 6 months had positive mean return, while the other 6 months all have negative mean return except November. The highest mean return was March while the lowest was July. The mean returns for each month are low in general, so is the volatility, compared with the first period. The most risky month was February with the highest standard deviation, and the second was May for this period. March had the best mean return with a lower volatility. P-value for March for the period 2012-2013 which was lower than $\alpha=0.05$, so the null hypothesis that the average daily return of March was equal to that of all the other months together of the year was rejected. The mean return of March was significantly different from that of other months, and much higher than the others, therefore there was positive March effect during this period. These findings contradict the findings by Onyuma (2009) who studied month of the year effect at NSE from 1980 to 2006. He found that January had the largest positive returns thus confirming a January effect. Nyamosi (2009) also reported existence of this effect in this market. He used regression analysis from which negative coefficients were generated confirming higher returns in January than the other months.

For the whole period 2010-2013, May has the highest standard deviation and also the highest return implying that the investors can get a high return in May, at the same time they have to take a high risk when investing in the Nairobi Securities Exchange. This conforms to the findings by Patel and Evans (2003) who investigated seasonal patterns in the stock markets of the seven most industrialized (G7) nations. They examined seasonality for the period from January 1960 to December 2001, and found that, in all G7 countries mean stock returns for December through May were significantly greater than mean returns for June to November. A significant negative July effect exists during this time period. It was established that the mean return of July is much

lower than that of other months, and the P-value is lower than 0.05, the T-test is significant, hence the null hypothesis that the average daily return of July is equal to that of all the other months of the year was rejected.

Although March had a significant P-value during the second period, the P-value is insignificant in the first time period indicating that the March effect is not persistent through times. The P-value of July is not significant in all the periods of study, but significant in the whole period from 2010 to 2013, which means there is a July effect in Kenyan stock market in the whole 2010-2013 period of study, but it is not true in each separate period. These results implied that no month presented stable results. The results partially agree with the findings of Allan & George (2013) who examined the NASI and N20I for a period of 12 years up to 2011. Using t-test and F-test they found that the coefficients of July, September and January were significant at 5% level. They reported that monthly effect exists in NSE.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The chapter presents the summary of the study findings derived from the research. The chapter also looks at the limitations of the study and suggests areas identified by the researcher that require further studies.

5.2 Summary

This objective of this study was to investigate the existence of month of the year anomaly and persistence at the Nairobi Securities Exchange. To achieve this objective, monthly returns were calculated for both N20I and NASI. From these returns, differences between mean month returns and other months of the year were calculated. The p- values for all the months in the period 2010 -2011 were found to be greater than 0.05 and were found to be statistically insignificant implying that there existed no month of the year anomaly at the NSE during that period. In the sub-period 2012-2013, March had the best mean return with a lower volatility.

Further the P-value for March in this period was smaller than the significance level and the null hypothesis that the average daily return of March was equal to that of all the other months together of the year was rejected. This in turn indicated the existence of market anomaly in March at the NSE. For the whole period 2010-2013, a month of the year effect was found to exist in July at NSE. The p-value for this month was found to be smaller than the significant level of 0.05 hence statistically significant. The month of May was found to have the highest standard deviation in this period and also the highest return implying that the investors can get a high return in May, at the same time they have to take a high risk when investing in the Nairobi Securities Exchange.

5.2 Conclusion

We find that for the first period, May has the highest mean return, but the P-value is insignificant, either. For the period 2012-2013, the highest mean return is March, and P-value for March is 0.04, which is significant, therefore there is positive March effect during this period. At last, we study the whole period from 2010 to 2013. May has the highest mean return again, and a insignificant P-value of 0.428.So we conclude that there is only a positive March effect found in Kenyan stock market for the short period (2012-2013), no other positive Month-of-the-Year effect found either short term or long term.

During the first period 2010 to 2011, the lowest return is October with value of -0.5006; however, the P-value is not significant. None of the months is significantly higher or lower than the other month; there is no Month-of-the-Year effect for 2010-20111. For the period 2012-2013, July has the lowest mean return; however, P-value is insignificant. For the whole period of study, we find the mean return of July is much lower than that of other months, and the p-vale of 0.035 is lower than 0.05, the T-test is significant. A significant negative July effect is found in the long term.

Although January effect or December effect is found in many stock markets, in our study, the P-value of both January and December is insignificant in all period of study, so there is neither January effect nor December effect in Kenyan stock market. Instead, the only two months presenting significant P-value are March (the second period), and July (the whole period); apart from March and July, no other Month-of-the-Year effect.

When investing the stability of the statistical data, it is found that not any month presents a steady result between the periods. However, investors should notice that July, September, October and December mostly have a negative return, not standing for a good time to invest in the stock market during the past time. When focusing on standard deviation, it is the first period (2010-2011) that has the highest standard deviation of all three periods, which means that the volatility of return from 2010 to 2011 is very high and investing in Kenyan stock market is more

risky in that time than in the other period. May has the highest standard deviation of 8.3677 in the first period of study, the highest value of all the periods as well. There is no stability of the seasonality effect, since the March effect (2012-2013) and the July effect (the whole period 2010-2013) only appear one time respectively.

5.3 Policy Recommendation

The recommendation for this study is that investors should consider selling their shares in March since they can earn higher returns that are not commensurate with the risk. Those who wish to buy stocks should avoid buying them in March and July as their prices would dip in other months of the year

The presence of anomalies indicate, stock market inefficiency and therefore, NSE as a regulator of Kenya's Securities market need to take steps in order to increase the informational efficiency of the stock market operation. This will enable investors to reap fully benefits of investing at NSE.

Educational programmes should be implemented especially to the general public in order to increase awareness about stock market activity. This will not only attract an increased number of participants, but it will also boost market returns

Large institutional and foreign investors should be attracted and encouraged to participate at the NSE. This would be achieved by increasing investor confidence through establishing relevant policies to enhance the efficiency of the stock market. Since Institutional and international investors have a greater capacity to conduct extensive security analyses they will help improve availability of relevant financial information and the overall quality of the information environment of the NSE.

Policy makers and regulators at the NSE are encouraged to; Encourage more research on the NSE form of efficiency, this will provide a forum for investors to get the information on the form of efficiency of the market and boost their confidence when investing at the NSE

The stock market should also be encouraged to maintain a record of the various event dates in a way that they are easily accessible so as to aid in event studies as opposed to the current way where these are not kept in a summarized form and a researcher has to rummage through so much information to extract the vital information.

The regulatory authorities should ensure compliance to insider trading laws by market participants. The authorities need to strengthen their capacity to effectively monitor activities in the market, and to effectively deal with offenders. Reduction in unequal access to information not only boosts investor confidence but it also helps improve the competiveness and informational efficiency of emerging stock markets

5.4 Limitations of the Study

Though this study established the existence of market anomaly it failed to explain why this anomaly exists at the Nairobi Securities Exchange.

The study considered duration of four years. A longer period, say ten years is usually recommended for modeling financial time series data.

This study is limited in scope to one developing securities market, future work may be carried out for other developing markets in the Africa region to ascertain the extent to which the findings are generalizable.

The existence of March and July effect in the study could be as a result of other factors other than the depiction that there exist month of the year effect at NSE

5.5 Suggestions for Further Studies

There should be attempts to undertake research that establishes the causes of these anomalies because it is yet debatable

Further research should use the same index to test other seasonality effect, like weekend effect, turn of the year and holiday effect etc.

The same study effect could also be investigated using a longer period, say ten or fifteen years. This will give a longer period to model the financial data.

Results on the distribution of returns on the NSE suggested that they are not normally distributed. The nature of the distribution underlying returns in this market should be investigated.

REFERENCES

Agrawal, A., & Tandon, K. (1994). Anomalies or illusions? Evidence from stock markets in eighteen countries. *Journal of International Money and Finance,* 13, pp.83-106.

Ariel, R. A. (1987). A Monthly Effect in Stock Returns. *Journal of Financial Economics,* 18(1), pp.161-174.

Ariel, R. A. (2002). A Monthly Effect in Stock Returns. *Journal of Financial Economics,* 18(1), pp.161-174.

Berument, H. C. (2007). Day of the week effect on foreign exchange market volatility: Evidence from Turkey. *Research in International Business and Finance,*21(1), 87-97.

Blandón, J.G, M.M.Blasco, et al. (2009). *The Ex-Dividend Day Anomaly in the Spanish Stock Market.* 9th Global Conference on Business and Economics. Cambridge University, UK.

Bodie, Z.A.Kane.A.J. Marcus. (2007*). Essentials of investments* (6th Ed.). McGraw-Hill/Irwin

Brealey, R. A. S. C. Myers.A. J. Marcus. (1999). *Fundamentals of corporate finance* (2nd ed.). McGraw-Hill.

Boudreaux, D. O. (1995). The Monthly Effect In International Stock Markets: Evidence and implications. *Journal of Financial and Strategic Decisions, volume* 8 number 1.

Brock, W. Josef lakonishok, et al. (1992). Simple Technical Trading Rules and the Stochastic Properties of Stock Return. *Journal of Finance,* 47.

Cadsby, C.B.and M.Ratner (1992). Turn-Of-Month and Pre-Holiday Effects On Stock Returns: Some International Evidence. *Journal of Banking & Finance, 16*(3), pp. 497-509.

Doran, J., Jiang, D., & Peterson, D. (2009). *Gambling Preference and the New Year Effect of Assets with Lottery Features.* MPRA Paper.

Fama.E.F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance 2*, 383-417.

Fama, E. F. (1991). Efficient Capital Markets. *The Journal of Finance,* 46(5), pp.1575-1617.

Fama, E. F. & French, K. (1988). Dividend Yields and Expected Stock Returns. *Journal of Financial Economics, 22*(1), pp. 3-25.

French, E. F. & French, K. (1993). Common Risk Factors in the Returns On The Stocks And Bonds. *Journal of Financial Economics,* pp.33-53.

Hong, H., & Yu, J. (2009). Gone fishin': Seasonality in trading activity and asset prices. *Journal of Financial Markets, 12(4,* 672 - 702.

Ke, M. C., Chiang, Y. C., & Liao, T. L. (2007). Day-of-the-week effect in the Taiwan foreign exchange market. *Journal of Banking & Finance,31(9),* 2847-2865.

George M. Frankfurtera, Elton G. Mcgoun (2001). Anomalies in Finance What Are They and What are They Good For? *International Review of Financial Analysis*, 10, pp. 22.

Goodman, D. A. & Peavy, J. W. (1983). Industry Relative Price-Earnings Ratios as Indicators of Investment Returns. *Financial Analysts Journal*, *39*(4), pp. 60-66.

Graham, D. Cottle. (1962). *Security Analysis: Principles and Techniques*. New York, McGraw-Hill.

Gultekin M. N., Gultekin N. B., (1983). Stock Market Seasonality: International Evidence. *Journal of Financial Economics, 12, 469-81*.

Haug, M., & Hirschey M. (2006). The January Effect. *Financial Analyst Journal*, 62, 78 88.

Haugen R., & Lakonishok, J., (1988). *The Incredible January Effect*. Homewood, Jones Irwin

Haugen, R. A. & Jorion, P. (1996). The January Effect: Still there after all these years. *Financial analyst journal, vol. 52*, Issue 1, pp. 27-31

Kato, K. & Schallheim, J. S. (1985). Seasonal and Size Anomalies in the Japanese Stock Market. *The Journal of Financial and Quantitative Analysis, vol. 20,* No. 2., pp. 243-260

Kendall, M. G. (1953). The Analysis of Economic Time-Series-Part I: Prices. *Journal of the Royal Statistical Society*. A (General) 116 (1): 11–34.

Jaffe J. F., &Westerfield R., (1989). Is There a Monthly Effect in Stock Market Return? *Journal of Banking and Finance, 13*, 237-44.

Jensen, M. (1978). Some anomalous evidence regarding market efficiency. *Journal of Financial Economics 6*, 95-101.

John, M. (2012). *January Effect on Stock Returns: Evidence from Nairobi Securities Exchange.* Unpublished Research Project (MBA), School of Business, university of Nairobi.

Keim, D. (1983). Size-related anomalies and stock return seasonality: Further empirical evidence. *Journal of Financial Economics 12,* no.1, 13-32.

Kibuthu, G. (2005). *Capital markets in emerging economies: A case study of the Nairobi Stock Exchange*. A Thesis, Tufts University.

Kienjeku, S. (2003). *Calendar Anomalies in Nairobi Stock Exchange*. Unpublished Thesis (MA), Faculty of Arts The University of Nairobi.

King'ori, E. (1995). *Stock Market Seasonalities at the Nairobi Stock Exchange*. Unpublished project, Department of Finance and Accounting, University of Nairobi.

Lian, K.K., & Chen, W.Y. (2004). Seasonal Anomalies of Stocks in Asian Equity Markets. *Sunway College Journal*, 1, 1-11.

Lucey,, B. M., & Whelan, S. F. (2002). *A promising timing strategy in equity markets.*

Mugenda, O. M. & Mugenda, A. G. (1999). *Research Methods: Quantitative and Qualitative Approaches.* Nairobi, Kenya

Nyamosi, J. (2011). *Testing the Existence of January Effect at the Nairobi Stock Exchange*. Unpublished Research Project (MBA), School of Business, university of Nairobi.

Osango, C. (2009*). Interrelationship of Size effect and January Effect at The Nairobi Stock Exchange (NSE): An Empirical Investigation*. Unpublished MBA Project, University of Nairobi, School of Business.

Pandey, I. (2002). *Is There Seasonality in the Sensex Monthly Returns*? IIMA Working Paper, IIM Ahmadabad.

Paul, A., & Theodore, P. (2006). Calendar Anomalies in an emerging African Market: Evidence from the Ghana Stock Exchange. *Journal of Economics, Vol.52,* No. 12, pp. 58-96

Reinganum, M.R., (1983). The anomalous stock market behavior of small firms in January: Empirical test for tax-loss selling effects. *Journal of Financial Economics* 12, 89-104

Ritter, J. R., & Chopra, N. (1989). Portfolio rebalancing and the turn-of- the year effect. *Journal of Finance* 44, 149-166.

Rozeff, M.S., & Kinney, W. (1976). Capital Market Seasonality: The Case of Stocks Return. *Journal of Financial Economics*, October, 3 (4), 379-402.

Samuel, D. (2003). *Turn of the Month and January Effects on Stock Prices at Nairobi Stock Exchange.* Unpublished MBA project University of Nairobi School of Business.

Starks, Laura T., Yong, Li, & Lu Zheng. (2006). Tax-loss selling and the January Effect: Evidence from municipal bond closed-end funds. *Journal of Finance 61*(6), 3049-3067.

Thaler, R. (1985). Mental accounting and consumer choice. *Marketing Science* 4, 199- 214.

Yamori, N. &. (2003). Does the day-of the week effect in foreign currency markets disappear? Evidence from the Yen/Dollar market. *International Financial Review, 4* (pp. 447 -463).

Wachtel, S. (1942). Certain Observation on Seasonal Movements in Stock Prices. *The Journal of Business of the University of Chicago, April, 15,* 184-193.

Wong, W. K., Agarwal, A., & Wong, N.T. (2006). The disappearing Calendar Anomalies in the Singapore stock market. *The Lahore Journal of Economics, 11*(2), 123-139.

Appendix 1

Table 1.1: Average daily percentage return in month 2010-2011

Calendar month	N	Mean	Sd	F-test	Sig.	T-test	Df	P-value
January	102	0.2386	2.3833	4.672	0.031	0.373	1258	0.709
Other months	1158	0.0776	4.3057			0.601	166.22	0.548
February	81	0.3322	3.0328	0.762	0.383	0.537	1258	0.591
Other months	1179	0.0740	4.2508			0.719	102.925	0.474
March	111	-0.2211	3.2652	0.891	0.345	-0.822	1258	0.411
Other months	1149	0.1207	4.2608			-1.022	148.648	0.308
April	107	0.4291	3.0185	1.034	0.309	0.875	1258	0.382
Other months	1153	0.0592	4.2743			1.164	108.523	0.246
May	106	0.6749	8.3677	12.385	0	1.504	1258	0.133
Other months	1154	0.0370	3.5627			0.779	108.523	0.438
June	107	-0.0136	2.8697	2.716	0.1	-0.269	1258	0.788
Other months	1153	0.1003	4.2850			-0.374	153.798	0.709
July	110	-0.4343	2.8914	0.531	0.466	-1.378	1258	0.168

Other months	1150	0.1408	4.2834			-1.896	158.902	0.06
August	111	0.5865	5.3445	7.694	0.006	1.308	1258	0.191
Other months	1149	0.0427	4.0526			1.1043	122.523	0.299
September	107	-0.0764	3.4613	0.011	0.918	-0.432	1258	0.666
Other months	1153	0.1061	4.2444			-0.511	137.4	0.61
October	100	-0.5006	3.9236	0.945	0.331	-1.474	1258	0.141
Other months	1160	0.1416	4.1987			-1.547	118.973	0.125
November	108	0.4932	3.9236	0.102	0.75	1.046	1258	0.296
Other months	1152	-0.0529	4.2058			1.108	131152	0.27
December	110	-0.3717	3.8583	0.24	0.624	-1.214	1258	0.225
Other months	1150	0.1348	4.2133			-1.305	135.091	0.194

Appendix 2

Tables 1.2: Result of Month of the Year Effect for the Time Period 2012 to 2013

Calendar month	n	Mean	Sd	F-test	Sig.	T-test	df	P-value
January	98	0.1774	1.4486	0.185	0.667	0.827	1242	0.408
Other months	1146	0.0357	1.6415			0.919	119.348	0.36
February	73	0.1090	2.2364	2.542	0.111	0.336	1242	0.737
Other months	1171	0.0429	1.5825			0.248	76.561	0.804
March	110	0.3507	1.3391	0.873	0.35	2.054	1242	0.04
Other months	1134	0.0173	1,6498			2.438	143.163	0.016
April	107	0.1768	1.1168	4.121	0.043	0.865	1242	0.387
Other months	1137	0.0346	1.6669			1.198	154.472	0.233
May	106	0.1655	2.1111	3.455	0.063	0.785	1242	0.433
Other months	1138	0.0358	1.5751			0.617	116.143	0.539
June	107	0.2032	1.8125	2.888	0.09	1.04	1242	0.299
Other months	1137	0.0321	1.6086			0.942	122.234	0.348
July	110	-0.1961	1.8749	3.308	0.069	-1.641	1242	0.101
Other months	1134	0.0704	1.5999			-1.441	124.882	0.152
August	110	-0.1278	1.6921	0.729	0.393	-1.179	1242	0.239
Other months	1134	0.0638	1.6203			-1.138	129.155	0.257
September	107	-0.1497	1.7355	1.543	0.214	-1.307	1242	0.191
Other months	1137	0.0653	1.6160			-1.232	123.927	0.22
October	100	-0.0077	1.8317	0.828	0.363	-0.349	1242	0.727

Other months	1144	0.0516	1.6087			-0.313	112.755	0.755
November	107	0.0284	1.0155	10.166	0.001	-0.122	1242	0.903
Other months	1137	0.0485	1.6734			-0.183	166.087	0,855
December	109	-0.1331	0.9186	10.119	0.002	-1.209	1242	0.227
Other months	1135	0.0641	1.6786			-1.95	186.55	0.053

Appendix 3

Persistence of Effect

Calendar month		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Mean	2010-2011	0.2386	0.3322	***-0.2211***	0.4291	0.6749	**0.0136**	***-0.4343***	0.5865	***-0.0764***	***-0.5006***	0.4932	***-0.3717***
	2012-2013	0.1774	0.1090	0.3507	0.1768	0.1655	0.2032	***-0.1961***	**-0.1278**	***-0.1497***	***-0.0077***	0.0284	***-0.1331***
	Whole period	0.1396	0.2440	0.0386	0.2155	0.2624	0.0651	***-0.2398***	0.1652	***-0.0761***	***-0.2047***	0.2183	***-0.0908***
Standard deviation	2010-2011	2.3833	3.0328	3.2652	3.0185	8.3677	2.8697	2.8914	5.3445	3.4613	3.9647	3.9236	3.8583
	2012	1.44	2.23	1.33	1.11	2.11	1.812	1.87	1.692	1.73	1.8317	1.0	0.9

	– 2013	86	64	91	68	11	5	49	1	55		155	186
	Whole period	1.8692	2.2269	2.1537	1.9969	5.0004	2.2149	2.1089	3.2964	2.3318	2.5500	2.4515	2.4002
P - value (two – tailed)	2010 - 2011	0.548	0.591	0.411	0.382	0.438	0.788	0.168	0.299	0.666	0.141	0.296	0.225
	2012 - 2013	0.408	0.737	0.040	0.233	0.433	0.299	0.101	0.239	0.191	0.727	0.855	0.053
	Whole period	0.578	0.254	0.89	0.273	0.428	0.961	***0.035***	0.529	0.35	0.073	0.264	0.293
coefficient	2010 - 2011	0.0153	0.0164	0.0057	0.0345	-0.0465	-0.0239	-0.0294	-0.1024	-0.0343	-0.0365	-0.0297	0.0733
	2012 - 2013	0.1309	0.0192	0.0002	-0.0180	-0.0610	0.0327	0.0249	-0.0007	0.0873	0.0727	0.0419	0.0610
	Whole period	0.0731	0.0178	0.0030	0.0082	-0.0538	0.0044	-0.0022	-0.0515	0.0265	0.0181	0.0061	0.0671