DAY OF THE WEEK EFFECT ON STOCK RETURNS AT THE NAIROBI SECURITIES EXCHANGE

BY

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Declaration

This research project is my original work and has never been presented for the award of a degree in any other university.

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This research project has been submitted for examination with my approval as the University Supervisor;

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Dedication

My dedication goes to my family for the patience and endurance during the whole study period.

Abstract

According to the efficient market hypothesis, stock prices reflect all the market information whether past, publicly held or private information. In an efficient market, investors should expect to make only normal profits by earning a normal rate of return on their investments.

There is an interesting contradiction to this hypothesis. This is the day of the week anomaly. Other researchers have called this Monday effect, Friday effect and Weekend effect. There have been observations in Finance Research that stock returns on Mondays are lower than those of other days of the week. Likewise, equity returns on Fridays are higher than the other trading days of the week.

This research investigates the Kenyan stock market to test whether the day of the week anomaly exists. Daily market capitalization is used to compute the stock return and carry out multiple regression from January 2008 to December 2011. The days excluded are public holidays which fall between Monday and Friday. If a holiday falls on a Sunday, the preceding day which is Monday is excluded since according to the Kenyan Government, this is a public holiday.

The results obtained show that Tuesday has the highest positive return and Wednesday has the highest negative return. Stock return volatility is highest on Tuesday and lowest on Friday. The study concludes that there is no day of the week effect at the Nairobi Securities Exchange.

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List of Abbreviations

NYSE…………………………………   New York Stock Exchange

NSE…………………………………   Nairobi Securities Exchange

NASI………………………………..   NSE All Share Index

CMA………………………………..   Capital Markets Authority

EMH………………………………...   Efficient Market Hypothesis

OTC…………….......…..….............   Over The Counter

IFC…………………………………   International Finance Corporation

CAPM……………………………....   Capital Asset Pricing Model

BE…………………………………..   Book Equity

ME…………………………………   Market Equity

E/P………………………………….   Earnings to Price Ratio

M/B…………………………………   Market to Book Ratio

D/E…………………………………   Debt to Equity Ratio

APT…………………………………   Arbitrage Pricing Theory

SEO…………………………………   Seasoned Equity Offerings

GARCH……………………………..   Generalised Autoregressive Conditional

                                                                    Heteroscedasticity

GCC………………………………...   Gulf Cooperation Council

TSE…………………………………   Tunis Stock Exchange

ASE…………………………………   Athens Stock Exchange

OLS…………………………………   Ordinary Least Squares

PSE………………………………….   Phillipine Stock Exchange

ISE…………………………………   Istanbul Stock Exchange

BSE…………………………………   Bombay Stock Exchange

SEM………………………………...   Stock Exchange of Mauritius

LSE…………………………………   Lagos Stock Exchange

JSE…………………………………   Johannesburg Stock Exchange

KSE…………………………………   Khartoum Stock Exchange

TURKDEX…………………………   Turkish Derivatives Exchange

US…………………………………..   United States

UK…………………………………..   United Kingdom

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In security analysis, there is a basic assumption that markets are efficient. A market is efficient when security prices quickly adjust as new information is received. The market is weak-form efficient if security prices change as a result of past information. However, if prices change as a result of current publicly available information, then the market is strong-form efficient. Security prices also change due to private information. This occurs where markets are strong-form efficient. Anomalies have been discovered which contradict efficient market hypothesis. One of the anomalies is the day of the week effect. Research findings have documented that stock returns are high on Fridays and low on Mondays. This anomaly is not explained by any of the assets pricing models like the Capital Asset Pricing Model and the Arbitrage Pricing Theory. This research tests whether this anomaly exists on the Kenyan stock market.

1.1.1 Stock Return

Jordan and Fischer (2002) defined return as the motivating force and the principal reward in the investment process and it is the key method available to investors in comparing alternative investments. They document that return has two components. The basic component is the periodic cash receipts (or income) on investments, either in the form of interest or dividends. The second component is the change in the price of the asset – commonly called capital gain or loss. This element of return is the difference between the purchase price and the price at which the asset can be sold.

According to Reilly and Brown (2003) on the other hand, stock return is the compensation for the time, the expected rate of inflation and the uncertainty of the return after investing in stocks.

1.1.2 Day of the Week Effect

Day of the week effect is an empirical irregularity in common stocks (Bailey, Alexander and Sharpe, 1999). Certain cross-sectional differences among stock returns have been found to   occur with regularity. Some regularities should occur according to certain asset pricing models. For example, the CAPM asserts that different stocks should have different returns because different stocks have different betas.

According to Bailey, Alexander and Sharpe (1999), seasonal patterns in stock returns should be quite minor (if they exist at all), because they are not suggested by traditional asset pricing models. It is often assumed that the expected daily returns on stocks are the same for all the days of the week. That is, the expected return on a given stock is the same for Monday as it is for Tuesday as it is for Wednesday as it is for Thursday and as it is for Friday. They observed however that a number of studies have uncovered evidence that refutes this belief.

Studies by French (1980) and Gibbons and Hess (1981) found significant variations in daily stock returns. These studies looked at the average daily return on NYSE – listed securities and found that the return on Monday was quite different from the returns on other days. In particular, the average return on Monday was found to be much lower than the average return on any other day of the week. Furthermore, the average return on Monday was negative, whereas the other days of the week had positive average returns.

1.1.3 Nairobi Securities Exchange

The Nairobi Securities Exchange started back in 1954 when it was constituted as a voluntary association of stock brokers registered under the societies Act (www.nse.co.ke). Since Africans and Asians were not permitted to trade in securities until independence, business of dealing in shares was confined to the European Community.

NSE is an example of an emerging stock market that has been characterized by humble beginnings yet has grown considerably over time (Kibuthu 2005). She observed that NSE stands out as an average stock market with great potential for growth, one that is making considerable effort to be a more significant driver of the economy in Kenya and the East African Region.

In 2001, NSE was restructured to give rise to three market segments namely; the Main Investments Market Segment (MIMS), the Alternative Investment Markets Segment (AIMS) and the Fixed Income Securities Market Segment (FISMS) (www.nse.co.ke).

The MIMS is the main quotation market, the AIMS provide an alternative method of raising capital to small, medium seized and young companies that find it difficult to meet the more stringent listing requirements of the MIMS while the FISMS provides an independent market for fixed income securities such as treasury bonds, corporate bonds, preference shares and debenture stocks, as well as short term financial instruments such as treasury bills and commercial papers (www.nse.co.ke).

1.2 Research Problem

Various studies have been done on market anomalies in different markets. The findings have been different for the majority of these markets including the Nairobi

Securities Exchange. The Capital Markets Authority has formulated and implemented several policy reforms aimed at strengthening and growing the capital markets in Kenya. After the introduction of all these capital market development initiatives, no research has been done to test existence of day of the week effect on the Nairobi Securities Exchange. Based on these regulatory developments therefore, this research answers the following questions:

i. Is there a significant variation in daily stock returns at the NSE?
ii. Are these variations consistent with the past variations as observed by researchers before the policy developments were implemented?

1.3 Objectives of the Study

The objective of this study is to carry out the following investigations:

i. To determine the daily stock market returns from January 2008 to January 2011 for each of the five days of the week.
ii. To establish if there is a significant change in stock returns arising from the day of the week that is not based on new market information.

1.4 Value of the Study

This study will benefit current and future investors to devise trading strategies to maximize their returns based on the days of the week. Peterson and Philpot (2011) noted that the existence of calendar effects allows a genuine opportunity for long term and regular investors to enhance returns. They observe however that transaction costs may negate such a strategy. Even in the presence of transactions costs, an investor who is planning a trade can optimize returns by timing the transactions to fall on those days with the advantage expected price movements.

Government policy makers like the Capital Markets Authority will also benefit from the findings of this research. CMA will be in a better position to formulate trading

rules and regulations which encourage market growth and development for example short selling and arbitrage regulations.

This research project will also increase the robustness of the observations by Onyuma (2009) and encourage other related research activities in this field.

Finally, the study will make a great contribution to the existing literature for use by academicians and finance practitioners in Kenya and the entire world. Bowers and Dimson (1988) and Lakonishok and Smidt (1988) state that more proof for or against specific time period anomalies can only be obtained by investigating markets other than the USA during different periods. Furthermore, Jaffe and Westerfield (1985) point out that the use of data from countries other than the USA may provide support for or against the proposition that these anomalies are a worldwide phenomenon and are not due to specific institutional arrangements in the USA

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter starts by reviewing the models which have been developed by researchers to determine the stock returns. These models are the Capital Asset Pricing Model and the Arbitrage Pricing Theory. It continues by focusing on the empirical studies which have been carried out in the recent past. One of the anomalies that will be extensively discussed in this chapter is the day of the week effect in relation to stock returns. The chapter ends by delving into the reasons which have been suggested by researchers to explain some of the anomalies discussed.

2.2 Capital Asset Pricing Model

The most widely used model in determining stock return is the Capital Asset Pricing Model (CAPM), put forth by Sharpe (1964). Similar parallel research on this topic was also done by Lintner (1965) and Mossin (1966). According to CAPM, there is a direct linear relationship between the return on an asset and its non-diversifiable risk above the risk free rate. The model determines the equilibrium prices and in turn the equilibrium returns in the market. In other words, in a market where the static CAPM holds, actual returns should be consistent with equilibrium returns. The CAPM assumes that the investors eliminate all diversifiable risk and what matters is only the non-diversifiable or systematic risk measured by beta.

Further research on CAPM has documented anomalous factors which have cast doubt on the practicability and application of the model. Such anomalies may be due to market inefficiency or due to misspecification of static CAPM (Fama, 1970). Reinganum (1981) and Ball (1978) find that anomalies are caused by model

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misspecification rather than market inefficiency. Few of the important anomalous factors identified are explained below.

2.2.1 Size Effect

Banz (1981) and Reinganum (1981) investigated the impact of size on expected returns. The studies found a significant negative relationship between size of a firm and the expected returns. According to Banz, this was due to insufficient information on small firms leading to limited diversification hence higher risk adjusted return on these small stocks.

Reinganum (1981) tested the relationship between size and E/P of a firm and its returns. He found that E/P and size were important factors in explaining asset returns. Fargher and Weigand (2009) examined cross-sectional differences in the profits, returns and risk of high and low-market-to-book ratios (M/B) stocks before and after the initiation of regular cash dividend payments. Low-M/B stocks displayed the most positive price reaction to dividend initiation announcements. High-M/B firms had larger profits, cash levels and capital expenditure before and at the time of dividend initiation, but more closely resembled the low-M/B firms. Excess returns earned by low-M/B firms were related to decreases in systematic risk, while the returns of high-M/B firms were related to their higher profitability.

2.2.2 Value Effect

Another interesting anomaly was the positive relationship between the book to market value equity and the stock returns. Stattman (1980) and Rosenberg, Reid and Lanstein (1985) found that value (BE/ME) was positively related to expected returns indicating that BE/ME provided valuable information to investors wishing to earn higher returns

than those associated to that particular level of risk. Chan and Chen (1991) attributed the value effect to mismanagement and higher financial leverage.

Fama and French (1993) evaluated the impact of size and value effect in addition to beta on expected returns in a three-factor model. They found that abnormal returns from this three-factor model were not very different from zero when portfolios were formed by sorting stocks according to size, value, dividend yield or earnings-to-price ratios. This again highlighted relevance of factors other than beta in explaining expected returns. Fama and French (1995) provided evidence that size and BE/ME not only proxied for the risk factors that helped to explain cross-sectional variation in common stock return but were also related to profitability. Firms with higher BE/ME tended to be persistently distressed.

2.2.3 Leverage Effect

Asset returns have also been related to debt to equity ratio of assets. Bhandari (1988) investigated expected returns against leverage of a firm as measured by its Debt to Equity ratio (D/E). He found that on controlling for size and beta, D/E was positively related to expected returns. He concluded that beta along with D/E was able to capture the risk better.

2.2.4 Earnings Price Ratio Effect

Basu (1977) found that returns on stocks with low P/E ratios tended to be larger than warranted by the underlying risk and vice versa. In a later study by Ball (1978), not only was E/P found to be an important factor in explaining asset returns but it was also seen that that E/P contains information on all factors not explained by the CAPM.

2.3 Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) is a substitute for the Capital Asset Pricing Model (CAPM) in that they both assert a linear relation between assets' expected returns and their covariance with other random variables. APT was developed primarily by Ross (1976a, 1976b). APT holds that there are several non-diversifiable risk factors (different from CAPM, since CAPM assumes only one risk factor) that are systematic or macroeconomic in nature and thus affect the returns of all stocks to some degree.

It is a one-period model in which every investor believes that the stochastic properties of returns of capital assets are consistent with a factor structure. Ross argues that if equilibrium prices offer no arbitrage opportunities over static portfolios of the assets, then the expected returns on the assets are approximately linearly related to the factor loadings. (The factor loadings, or betas, are proportional to the returns' covariances with the factors.). Ross' (1976a) heuristic argument for the theory is based on the preclusion of arbitrage. Ross' formal proof shows that the linear pricing relation is a necessary condition for equilibrium in a market where agents maximize certain types of utility.

2.4 Empirical Studies

2.4.1 Calendar anomalies in Developed Markets

Early research done by Cross (1973) found a very puzzling observation that spurred a great deal of debate and further research in calendar anomalies. Cross found out that Monday had a negative return of -0.18% while Friday had a positive return of +0.12%. He analysed the Standard and Poors composite index from 1953 to 1970.

Cross established further that the index performance on Monday was dependent on the Friday's performance.

Findings by French (1980) were consistent with those of Cross (1973). French studied the Standard and Poors composite index from 1953 to 1977. He observed that returns remained dependent on the day of the week. Further tests revealed that Monday mean returns over the study period were significantly negative while Wednesday through Friday returns were significantly positive. On the other hand Aggrawal and Tandon (1994) also found a day-of- the-week effect in 18 equity markets.

Two independent studies conducted by French(1980) and Gibbons and Hess(1981) found evidence consistent with the hypothesis that there are significant differences in the expected percentage changes for stocks depending on the day of the week. The study covered more than 4,000 trading days from 1962 through 1968. The expected percentage change on Mondays appeared to be negative and the expected percentage change on Wednesdays and Fridays appeared to be larger than on Tuesdays and Thursdays.

Recently, Marrett and Worthington (2011) examined month of the year effect in Australian daily returns using a regression-based approach. The results indicated that marketwide returns are significantly higher in April, July and December combined with evidence of a small cap effect with systematically higher returns in January, August, and December. The analysis of the sub-market returns was also supportive of disparate month of the year effects.

McGowan and Ibrihim (2009) carried out an analysis of the day of the week effect in the Russian Stock Market using the Russian trading System Index for the period when

the market opened in 1995 to August 2003. They established that Wednesday had the lowest returns and infact negative but not statistically significant. They noted that Friday had the highest positive returns which was however not statistically significant. Returns for Monday, Tuesday, and Thursday were all similar.

Solnik and Bousquet (1990) test day of week effect for Paris Bourse, reporting a strong and persistent negative return on Tuesday, which is in line with studies on Australia and Japan. Barone (1990) reports similar results for the Italian Stock Market, with the largest decline in stock prices occurring in the first two days of the week and more pronounced on Tuesday.

2.4.2 Calendar anomalies in Emerging markets

Studies in calendar anomalies have also been carried out in emerging markets in Asia and Africa. Choudhry (2000) examined calendar anomaly in Asian emerging markets, including India, and reported significant positive Friday returns in the Indian stock market for the period 1990 to 1995. The finding of positive Friday returns conforms to the majority of previous empirical findings (Cross, 1973; and Gibbons and Hess, 1981) in the US markets.

Bhattacharya et al. (2003) examined the day of the week effect in returns and its volatility in the Indian capital market, from 1991 to 2000. They used reporting and non-reporting weeks to study the day of the week effect. The study found significant positive returns on Monday.

Sarma (2004) examined the day-of-the-week effects during the post reform era in the Indian stock market using multiple indices to detect the day-of-the-week effect by

employing the Kruskal-Wallis test statistics. This study concluded that the Indian stock market exhibited some seasonality in daily returns over the study period.

Findings by Kumari and Raj (2006) contradicted those of Bhattacharya et al. (2003) and Sarma (2004). Kumari and Raj (2006) tested the efficiency of the Indian stock market through a number of hypotheses. Week day effects, day-of-the-week, weekend, January and April effects are examined by applying a variety of statistical techniques. The negative Monday effect and the positive January effects are not found in India. Instead the Monday returns are positive while Tuesday returns are negative.

Ariss, Rezvanian and Mehdian (2011) tested the calendar anomalies in the Gulf Cooperation Council (GCC) stock markets and investigated further whether the occurrence of the month of Ramadhan has a special bearing on returns and on the day-of-the-week anomaly. They found that returns are positive and significant on Wednesday which is the last trading day of the week. They also found out that market returns were significantly different in the month of Ramadhan relative to other months of the lunar calendar year.

Al-Khazali, Koumanakos, and Pyun (2008) found a strong day effect and weak week and January effects in Athens stock exchange. Dimitris and Samitas (2008) also documented a study on the day of the week effect patterns on stock market return and volatility. Evidence also exists in Athens stock exchange for a period of 2001 to 2005.

Al-Khazali (2008), found out that there is day-of-the-week effect in published daily prices, while daily effect vanishes when data are corrected to remove any measurement bias arising from thin trading. The stochastic dominance results show

that the day-of-the-week effect in the United Arab Emirates equity markets is not present when raw data is corrected for thin and infrequent trading.

Almonte (2004) examined the day of the week effect in Phillipine. She analysed the daily stock returns of the Phillipine Stock Exchange (PSE) composite index from January 3 2000 to July 23 2004. It was observed that the day of the week effect exists in the Phillipine stock market as confirmed by the results of the Kruskal-Wallis H test.

Ho (1990) examines weekday effects for ten Asian Pacific equity markets from 1975 through 1987. He documented a pervasive presence of the day-of-the-week effect. Additionally, Koh and Wong (2000) examine the day-of-the-week effect in Asian equity markets. They find negative returns for Monday and Tuesday and positive returns for Wednesday to Friday in the equity markets in Hong Kong, Malaysia, the Philippines and Singapore. Yakob et al. (2005) examined seasonal effects in ten Asian Pacific stock markets for the period January 2000 to March 2005. They find evidence to support the presence of the day-of-the-week effect in five countries.

Chukwuogor (2007) examined day of the week effect and volatility in stock returns from East Asian financial markets using daily closing values market indices from January 1998 to October 31, 2003. The results show that China, Malaysia, South Korea, and Taiwan have highest returns on Wednesday. Highest returns also occurred on Friday for Singapore and Thailand. India and Philippines recorded their highest returns on Monday. Japan and Indonesia recorded their highest return on Tuesday and Thursday, respectively. Even though there is mixed results with respect to which day the highest return occurs, in general, high returns mostly occur on Friday and Wednesday. McGowan, Yener, and Johnson (1989) find a day-of-the-week effect for the Manila Mining Index for the period November 1976 to May 1987.

Other emerging markets exhibit a day-of-the-week effect. Mookerjee and Yu (1999) test the efficiency of Chinese stock markets from the period December 19, 1990 to December 17, 1993 for the Shanghai stock exchange and from the April 3, 1991 to December 17, 1993 for the Shenzhen stock exchange. They find significant weekend and holiday effects, but no January effects. Their results show that both exchanges are characterized by a statistically significant negative weekend and positive holiday effect.

Al-Jafari (2011) investigated the impact of the global financial crisis on the monthly effect of returns of Bahrain stock market. The study employed daily returns of Bahrain All Share Index from 1 January 2003 to 31 July 2011. The sample was tested by using the equality for means tests (F-test, Chi-square test, and Kruskal-Wallis test) and the equality for variance tests (Bartlett test, Levene test, and Brown- Forsythe test). The results showed that there were no significant differences of the monthly effect for daily returns of the Bahrain stock market before the occurrence of the global financial crisis and during the period of the financial crisis.

Khan et al (2011) conducted study to investigate the day of week effect in Karachi stock exchange in Pakistan. They calculated daily market returns for each day of week, by using KSE-100 index daily data. They found out that mean return of the Tuesday is higher than the rest of the week. This observation contradicts the results of Jaffe and Westerfield (1985b), Aggarwal and Rivoli (1989), Barone (1990) and Dubois and Louvet (1996) who documented that stock returns on Tuesday are often the lowest throughout the week for many developed and emerging countries.

Dastan and Aksoy (2011) investigated the day of the week effect and the weekend effect on short selling for the Istanbul Stock Exchange (ISE) from 2005 to 2009. The

study tested the presence of the day of the week effect on stock market for short selling by using the ISE short selling data during the period of 2005-2009. The findings showed that the day of the week effect is present in short selling equations. The highest short selling is observed on Monday and after holidays. The lowest short selling is observed on Tuesday. The short selling pattern across the days of the week is also statistically different.

Recently, Liew and Chia (2010) examined the existence of day-of-the-week effect and asymmetrical market behavior in the Bombay Stock Exchange (BSE) over the pre-9/11 and post-9/11 sub-periods. This study found the existence of significant positive Monday effect and negative Friday effect during the pre-9/11 sub-period.

2.4.3 Calendar anomalies in Africa

Agathee (2008) investigated the day of the week effects in the Stock Exchange of Mauritius (SEM) using regression analysis. The results indicated no significant presence of the day of the week effect across the years and for the whole period of 1998 - 2006. The study also showed that Friday returns were high compared to the other days for the whole period. However, the mean returns, noted by descriptive analysis, showed lower returns on Tuesdays. His findings indicate that, except for the month of January, returns are not dependent on the month of the year.

Similarly, Bundoo (2008) carried out tests on day of the week and January effect on the Stock Exchange of Mauritius. The study found that SEM had positive and statistically significant Wednesday and Friday effects. The study also found a positive and significant Monday effect but smaller in magnitude. Further analysis revealed a significant positive September effect. No January effect was observed on the SEM.

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Wyeme and Olfa (2011) examined the month of the year effect for Tunis Stock Exchange (TSE) over the period January 2, 2003 to December 31, 2008. They found an April effect in which they documented that the mean daily market returns are significantly higher in April than the rest of the year.

Aly, et al. (2004) studied the existence of the day-of-the week effect in the Egyptian stock market using Capital Market Authority Index for the period April 26, 1998 until June 6, 2001. The empirical results indicated that while Monday stock returns were significantly positive, they were not significantly different from returns during the rest of the week. Furthermore, Monday returns were significantly more volatile than returns from Tuesday to Thursday. They concluded that the significantly positive returns on Monday were associated with returns that are more risky.

In the tests of anomalous turn-of-the-year study of stock return seasonalities in low-income African emerging markets using monthly market indices for the Ghanaian stock market (1991-1996), Nigerian stock market (1984-1995), and Zimbabwean stock market (1987-1995), Ayadi (1998) found that the results of both the Kruskal-Wallis and Friedman tests suggested the absence of seasonality in stock returns on the Nigerian and Zimbabwean stock markets while the Friedman test confirms the presence of seasonality in stock returns for Ghana.

Chukwuogor (2008) investigated the indices in Botswana, Egypt, Ghana, Nigeria and South Africa for the period 1997-2004 to determine the daily returns, day-of-the-week effect and volatility of stock returns. Even though there were observed daily negative returns for three of the indexes, the results of the Kruskal-Wallis test did not support the existence of the day-of-the-week effect on stock returns in the five stock indexes of Botswana, Egypt, Ghana, Nigeria and South Africa. Similarly, Malambo and

Biekpe (2006) investigated seasonal effects in 17 indices on nine African stock markets. They discovered a weekday effect in three indices only.

Abdalla (2012) investigated the existence of the day of the week effect in the Sudanese stock market for both the returns and conditional variance (volatility) using daily observations of the general price index series from Khartoum Stock Exchange (KSE), from 2006 to 2011. Empirical results of the different models found negative and statistically insignificant mean returns for all days of the week which indicated the absence of the day of the week effect in both return and volatility equations for the Khartoum stock exchange.

Onyuma (2009) analysed data derived from the NSE 20 share index using regression analysis to identify the behavior of stock returns in Kenya during 1980-2006. Results indicated that Monday produces the lowest negative returns, while Friday and January produce the largest positive returns.

2.4.4 Calendar anomalies in fixed income instruments and derivatives market

Gibbons and Hess (1981) found evidence of a significant negative Monday return in US Treasuries between 1962 and 1968. However, Jordan and Jordan (1991) conducted seasonality tests for corporate bonds on the Dow Jones composite bond average for the period 1963-1986. They did not discover any meaningful difference in mean daily returns for fixed income securities. Kohers and Patel (1996), Adrangi and Ghazanfari (1996) have all detected various degrees of daily seasonality.

Oduncu (2012) examined the day of the week effect on the Turkish Derivatives Exchange (TURKDEX). As a result of empirical analysis, it was found that the day of the week effect is not present at TURKDEX.

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2.5 Cloud Cover Effect

Another puzzling observation of the effect of cloud cover and the stock return was made by Roush and Keef (2007). They investigated the casual influence of daily cloud cover on stock index returns for 26 international stock exchanges. Their study was aimed to test whether the results are influenced by the location of the stock exchange and the development of the economy. A cloud cover effect does not exist at the equator.

2.6 Explanation for the Calendar anomalies

Some explanations proposed for calendar anomalies are risk-based. Risk may vary throughout the week. Other reasons are related to the microstructure of the markets or to the trading behaviour of market participants. For instance, Keim and Stambaugh (1984) suggested that the frequency at which transactions were made at the bid or at the ask during the week could have contributed to the Day-of-the-week effects in the United States (U.S.). Settlement procedures could also have helped create this pattern. These made investors in certain days of the week unwilling to buy at the same price levels as in other days because they did not get the two days of extra credit granted by the weekend (Lakonishok and Levi, 1982).

According to Floros (2008) most researchers find evidence of a January effect. He provides the following reasons for the January effect:

1. Year-end tax-loss selling. Most people come to the end of the year, and start thinking about their tax liability. They sell their losers sometime in December, and then they buy them back in January to lock in a tax loss (causing stock prices to rise).

2. Many traders go on vacation around this time. Most traders sell all their positions before leaving on vacation.

3. People spend more money at Christmas than at other times of the year.

Other explanations of the January effect include the portfolio rebalancing (Ritter and Chopra, 1989) and the information arrival/insider trading hypothesis (Williams, 1986). The former states that the high returns in January are caused by systematic shifts in the portfolio holdings of investors at the turn of the year. The information arrival/insider trading hypothesis predicts that not informed traders are more likely to trade in January. The January effect is an important factor in seasonality. The same sentiments are shared by Al-Saad and Moosa (2005).

Besides explaining the January effect, some empirical studies have focused on explaining the April effect. Gultekin and Gultekin (1983) and Reinganum and Shapiro (1987) explained the existence of the April effect on the UK stock market by the tax-loss selling hypothesis because the UK tax year starts on 6 April and ends on the following 5 April. Alagidede and Panagiotidis (2009) argued that the presence of April effect in Ghana stock exchange is due to the submission of firm reports in late March.

2.7 Conclusion

Various studies have been done and continue to be conducted on this market irregularity. This chapter has reviewed the past studies on day of the week effect in different markets in the world. The findings have been inconsistent based on the location of the market and the timing of the study.

There have been explanations for this day of the week anomaly. Some researchers have attributed the anomaly to new negative information originating from the long weekend. Other researchers have not been able to provide any information. The findings of this research hopefully will add to the available literature on day of the week effect.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter systematically provides the explanation of the research design that will be adopted by this research, the target population, the data sample, data collection method and the techniques that will be used to analyse the data. The study period is between the year 2007 and 2011.

3.2 Research Design

According to Cooper and Schindler (2001), research design constitutes the basis for collection, measurement and analysis of data. This is an empirical study which will focus on finding out if there exist the day of the week effect on the NSE for the period between 2007 and 2011.

3.3 Population

The population of interest for this research is composed of all the listed companies on the Nairobi Securities Exchange. This is because daily market capitalization includes all the listed companies on NSE.

3.4 Data Collection

The data for this study will be collected from the Nairobi Securities Exchange. Secondary data for the daily market capitalization from 2007 to 2011 will be used. The data will be checked for accuracy by comparing with daily equity statistics from CFC Stanbic and publications by the Daily Nation business reports.

3.5 Data analysis

The study will test the day-of-the-week effect in the Kenyan Stock Market from the opening of NSE from January 2nd, 2007 to December 31st 2011. Daily market capitalization will be used to compute daily returns, Rt.

$$Rt = \ln (C_t / C_{t-1}) \times 100\%$$

where, ln is the natural logarithm operator,

C is the daily market capitalization.

Daily returns computed this way are the continuously, compounded, percentage returns from day to day. Initially, the research will employ dummy variable regression to determine the day-of-the-week effect in the NSE. A linear regression is run where each day is represented by a dummy variable equal to one if the return is for the day and equal to zero if the return is for another day.

Rd = DMRM + DTRT + DWRW + DRRR + DFRF + ☐t (2)

where, the D's represent the dummy variables for each day, Monday, Tuesday, Wednesday, Thursday, and Friday and the R's represent the return for each day. This model assumes that the error terms and variances are constant across time. In addition, Wooldridge (2003) shows that multiple linear regression assumes that the parameters are linear, the sample is random, the error terms are mean zero, none of the variables are perfectly collinear, and the regression coefficients are unbiased.

The research will use five dummy variables as independent variables and the stock return as a dependent variable. The t-test will be used to test if there is a significant difference in stock returns across the five days of the week. The research will also use the F-test to test the extent to which the deviations of these daily stock returns are different.

Most past research works on daily market anomalies have used the method of regression using dummy variables. This is the reason why this research adopts the same methodology. This will make it easy to compare the results with the earlier findings.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter constitutes the analysis of data collected from the Nairobi Securities Exchange from January 2008 to December 2011. The daily market capitalization is used to compute the daily stock return for each trading day. The Nairobi Securities Exchange does not open over the weekend. Saturdays and Sundays have been excluded as a result of this. The natural logarithmic operator is used to calculate the daily stock returns from market capitalization.

Table 1 reports preliminary statistics for the returns for the entire study period as well as the return for each day of the week. The average return for the entire study period is 0.043%. The variance of the return is 2.09318% and the t-statistic is 0.539. A total of 1044 days were observed for the study period.

Table 1

Statistics	All Days	Monday	Tuesday	Wednesday	Thursday	Friday
Observations	1044	207	209	209	210	209
Mean	0.043	0.1148	0.2797	-2.771	0.0886	-.0011
t-statistic	0.539	0.622	0.940	-2.488	0.407	-0.011
Variance	2.09318	2.29805	3.71486	1.39565	2.73954	1.27878

Table 2 below presents the R^2 and the F-test statistic for the study period. R^2 is 0.006 which is very low and F-statistic indicates that the overall fit of the model is poor.

Table 2   **Model Summary**

Model	R	R Square(a)	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.080 (b)	.006	.000	2.09218	.006	1.008	5	1039	.412

a. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

b. Predictors: FRIDAY, THURSDAY, WEDNESDA, TUESDAY, MONDAY

At 95% confidence interval, the F-test is not significant. This therefore means that the days of the week do not affect the stock returns. This is inconsistent with the earlier results of Cross (1973), Gibbons and Hess (1981) and others who observed that the days of the week have a significant influence on stock returns.

4.2 Daily stock Returns

The daily stock returns were different based on the day of the week. The table below shows the mean returns for each of the five trading days of the week. Wednesday has the lowest negative return whereas Tuesday has the highest positive return. Early empirical tests of market anomalies found out that Monday had the lowest return whereas Friday had the highest return.

Daily Stock Returns
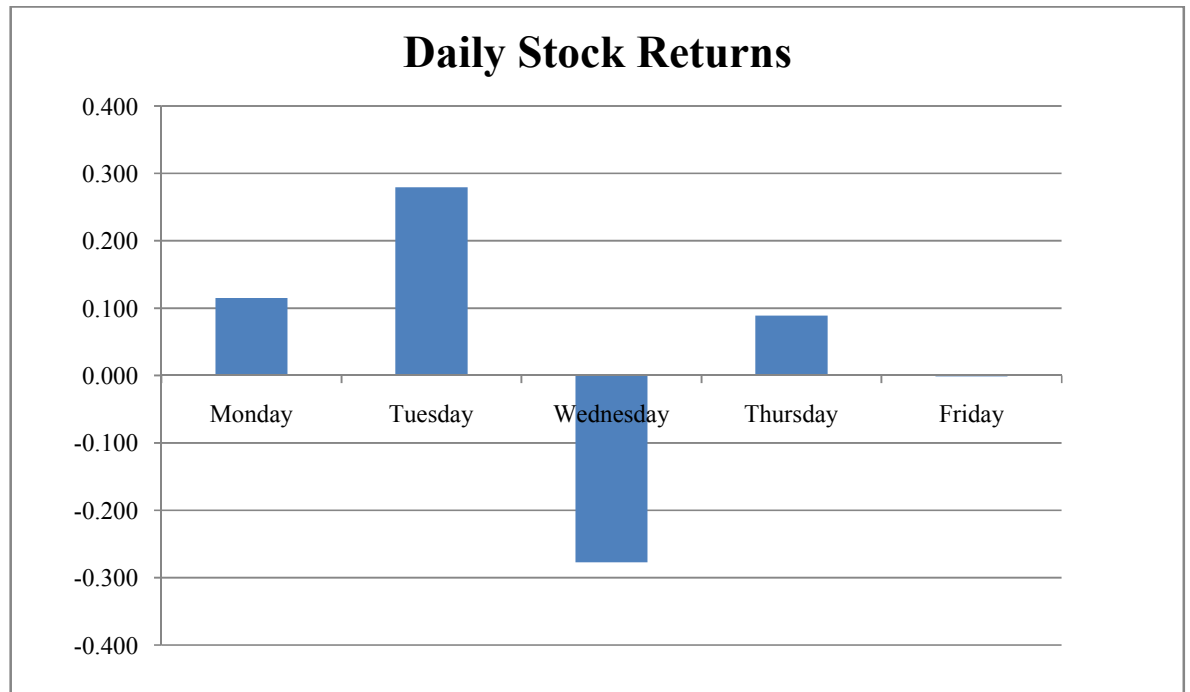
Source: Research data

A total of 1044 trading days were analyzed as shown in the SPSS output below. Except for the public holidays and weekends where no trading took place, the returns of all trading days were analysed as summarized below.

Table 3   **Case Processing Summary**

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
RETURN * MONDAY	1044	100.0%	0	.0%	1044	100.0%
RETURN * TUESDAY	1044	100.0%	0	.0%	1044	100.0%
RETURN * WEDNESDAY	1044	100.0%	0	.0%	1044	100.0%
RETURN * THURSDAY	1044	100.0%	0	.0%	1044	100.0%
RETURN * FRIDAY	1044	100.0%	0	.0%	1044	100.0%

4.21 Monday

At the NSE, Monday is the first trading day of the week. A total of 207 Mondays for the four year period were examined. Monday had a mean return of 0.1148% for the four year period from 2008 to 2011. The return volatility of 2.29805 on Monday was higher than that of Wednesday and Friday. The return on Monday however is not significant at 95% confidence interval.

Table 4   **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
RETURN	207	-6.13	23.53	.1148	2.29805
Valid N (listwise)	207				

4.22 Tuesday

This is the second trading day. It had a mean return of 0.2797% for the entire period of study which is also not significant at 95% confidence interval. A total of 209 observations were made. This was the day that had the highest return of all the five days of the week. For the four year study period; Tuesday had the highest volatility of 3.71486. Though it had the highest positive mean return, it is the most uncertain day at the Nairobi Securities Exchange in terms of stock returns.

Table 5   **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
RETURN	209	-5.25	29.08	.2797	3.71486
Valid N (listwise)	209				

4.23 Wednesday

There were 209 observations on this day which is the third trading day. It had the highest negative return of all the five trading days. The return over the four year period was -0.2771% which like other days is not significant at 95% confidence interval. Volatility on Wednesday is lower than the first three trading days of the week.

Table 6   **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
RETURN	209	-4.83	7.47	-.2771	1.39565
Valid N (listwise)	209				

4.24 Thursday

This is the fourth trading day at the NSE.210 observations were made over the period. Thursday had a positive return of 0.0886%. It is the most volatile day after Tuesday. Its mean return is not significant however at 95% confidence interval. This is one of the three days of the week that yield a positive return for the whole period of study.

Table 7   **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
RETURN	210	-3.63	31.69	.0886	2.73954
Valid N (listwise)	210				

4.25 Friday

This is the last trading day of the week at the NSE. It had a negative return of -0.0011% that is also not significant at 5% level of significance. A total of 209 observations were made for the whole period. It is worth noting however that Fridays has the lowest volatility of stock returns for the whole period.

Table 8   **Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
FRIDAY	209	-3.64	7.64	-.0011	1.27878
Valid N (listwise)	209				

4.3 Variations in stock Returns

The analysis sought to find out if there was a significant difference among the five days of the week. The results are shown in the following tables. According to the research findings, the mean returns of all the five days of the week are not significant at 95% confidence interval.

Table 9   **Coefficients(a,b)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	MONDAY	.223	.168	.048	1.334	.183	-.105	.552
	TUESDAY	.197	.168	.042	1.176	.240	-.132	.526
	WEDNESDAY	-.217	.167	-.047	-1.302	.193	-.545	.110
	THURSDAY	-.050	.167	-.011	-.297	.766	-.377	.278
	FRIDAY	.050	.167	.011	.302	.763	-.277	.378

a. Dependent Variable: RETURN

b. Linear Regression through the Origin

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter provides a summary, discussion, conclusion and details of recommendations for the research findings in line with the objectives of the study. It ends by outlining suggestions for further study and the limitations encountered in carrying out the research.

5.2 Summary

The objective of the study was to determine the daily stock returns for the all five days of the week. It also sought to determine if there is a significant difference in stock returns for all the five trading days. Data was bought from the Nairobi Securities Exchange. It was then analysed using excel sheets and SPSS to compute the daily stock market returns.

From the analysis, Tuesday had the highest return than any other day of the week. Wednesday on the other hand had the lowest negative return. This contradicts the observation by researchers such as Cross(1973), Gibbons and Hess(1981), Onyuma (2009) and many others who observed that Monday had the lowest negative return while Friday had the highest positive return.

The results show that there is an insignificant relationship between the dependent variable which is the stock market return and independent variables which are the five days of the week. The regression model does not help to explain the stock market return.

The research findings indicate that there is little stock return volatility on the NSE. Tuesday has the highest volatility, then Thursday, Monday and then Wednesday. Friday has the lowest return volatility of all the five trading days.

5.3 Conclusion

The primary objective of this paper was to investigate the day-of-the-week effect on stock market returns at the Nairobi Securities Exchange for the period from January 2008 to December 2011. From the research findings as presented, Tuesday had the highest positive return and Wednesday had the lowest negative return. The mean returns among the five days are significant at 5% confidence level.

The performance was also noticeably better in the first two days of the week compared to the last three days. The study strongly concludes that the day of the week does not affect the stock return. This implies that there is no day of the week effect at the Nairobi Securities Exchange. Investors should focus on their investment strategies and should not allow the day of the week to distort their decisions.

5.4 Recommendation

The study recommends that investors should not consider the days of the week in their trading transactions at the Nairobi Securities Exchange. Investors should carry out fundamental and a detailed market analysis to identify the key factors that affect stock returns at the NSE.

Though the Wednesday negative return is not significant, NSE should carry out research to find out why it had the highest negative return. It should also find out why Tuesday had the highest market volatility. This will bring in more confidence among the investors and develop the Kenyan capital market further.

5.5 Suggestions for Further Study

More research on market anomalies should be carried out with different methodologies to determine if results are consistent with other studies. Other statistical tests should be performed to test if the null or alternate hypothesis can still be accepted.

Further research should also be carried out using data for different time periods. This will help in determining the consistency of the results obtained. It will also help to make more conclusive recommendations to investors at the NSE.

Day of the week in market anomalies should also be carried out in fixed income instruments to find out if the day of the week effect anomaly exists. Trading in fixed income instruments like Treasury Bills and Treasury Bonds is different from the way equity instruments are traded. The study therefore cannot conclude that that there is no day of the week without carrying out a similar study in fixed income instruments.

Day of the week effect studies should also be extended to the returns of individual stocks. Individual equity stocks have different trading characteristics. Safaricom for example will generate more returns on Friday because most calls are made at the close of the weekend. On the contrary, the Standard Media Group will generate more returns on Monday for example, because of the Crazy Monday publication.

5.6 Limitation of the Study

The study was limited to four years due to the cost of data. A longer duration should have been used to increase the number of observations.

This study considers the cyclic factors influencing the stock market returns rather than the fundamental factors. Amongst the cyclic factors, the research has considered only

daily variation in the stock returns. There might be seasonal variations (January effect), monthly variations, or even intraday (mid-day swoon) variations in the returns, which can also be studied in combination with the day of the week effect.

This study also does not differentiate between institutional traders and others and their effect on the trades. Institutional traders have more market information than individual investors. They can carry out research to obtain more market information to base their investment decisions. The returns of equities held by institutional investors might be different from those held by individual investors.

The results presented in the study are not adjusted for transaction costs. Transaction costs definitely affect the market stock returns. Some of these costs are fixed and others are variable based on volume of trade and the day of the week. This research did not factor in the costs of carrying out equity trade.

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Appendix

Monday Descriptive

			Statistic	Std. Error
RETURN	Mean		.1148	.18458
	95% Confidence Interval for Mean	Lower Bound	-.2498	
		Upper Bound	.4795	
	5% Trimmed Mean		-.0432	
	Median		-.1000	
	Variance		5.281	
	Std. Deviation		2.29805	
	Minimum		-6.13	
	Maximum		23.53	
	Range		29.66	
	Interquartile Range		.9100	
	Skewness		6.915	.195
	Kurtosis		70.593	.387

Tuesday Descriptive

			Statistic	Std. Error
RETURN	Mean		.2797	.29743
	95% Confidence Interval for	Lower Bound	-.3079	
		Upper Bound	.8672	
	Mean			
	5% Trimmed Mean		-.1294	
	Median		-.0200	
	Variance		13.800	
	Std. Deviation		3.71486	
	Minimum		-5.25	
	Maximum		29.08	
	Range		34.33	
	Interquartile Range		1.0975	
	Skewness		6.244	.194
	Kurtosis		43.961	.386

Wednesday Descriptive

			Statistic	Std. Error
RETURN	Mean		-.2771	.11138
	95% Confidence Interval for Mean	Lower Bound	-.4971	
		Upper Bound	-.0571	
	5% Trimmed Mean		-.2531	
	Median		-.1400	
	Variance		1.948	
	Std. Deviation		1.39565	
	Minimum		-4.83	
	Maximum		7.47	
	Range		12.30	
	Interquartile Range		1.1000	
	Skewness		.388	.194
	Kurtosis		7.077	.385

Thursday Descriptive

			Statistic	Std. Error
RETURN	Mean		.0886	.21795
	95% Confidence Interval for Mean	Lower Bound	-.3419	
		Upper Bound	.5191	
	5% Trimmed Mean		-.0725	
	Median		-.0200	
	Variance		7.505	
	Std. Deviation		2.73954	
	Minimum		-3.63	
	Maximum		31.69	
	Range		35.32	
	Interquartile Range		.9100	
	Skewness		9.845	.193
	Kurtosis		114.238	.384

Friday Descriptive

			Statistic	Std. Error
FRIDAY	Mean		-.0011	.10206
	95% Confidence Interval for Mean	Lower Bound	-.2027	
		Upper Bound	.2005	
	5% Trimmed Mean		-.0590	
	Median		.0000	
	Variance		1.635	
	Std. Deviation		1.27878	
	Minimum		-3.64	
	Maximum		7.64	
	Range		11.28	
	Interquartile Range		.8050	
	Skewness		1.731	.194
	Kurtosis		10.246	.385

Firms listed on Nairobi Securities Exchange as at 31st January, 2012.

AGRICULTURAL
Eaagads Ltd Ord 1.25
Kapchorua Tea Co. Ltd Ord Ord 5.00
Kakuzi Ord.5.00
Limuru Tea Co. Ltd Ord 20.00
Rea Vipingo Plantations Ltd Ord 5.00
Sasini Ltd Ord 1.00
Williamson Tea Kenya Ltd Ord 5.00
COMMERCIAL AND SERVICES
Express Ltd Ord 5.00
Kenya Airways Ltd Ord 5.00
Nation Media Group Ord. 2.50
Standard Group Ltd Ord 5.00
TPS Eastern Africa (Serena) Ltd Ord 1.00
Scangroup Ltd Ord 1.00
Uchumi Supermarket Ltd Ord 5.00
Hutchings Biemer Ltd Ord 5.00

TELECOMMUNICATION AND TECHNOLOGY
AccessKenya Group Ltd Ord. 1.00
Safaricom Ltd Ord 0.05
AUTOMOBILES AND ACCESSORIES
Car and General (K) Ltd Ord 5.00
CMC Holdings Ltd Ord 0.50
Sameer Africa Ltd Ord 5.00
Marshalls (E.A.) Ltd Ord 5.00
BANKING
Barclays Bank Ltd Ord 2.00
CFC Stanbic Holdings Ltd ord.5.00
Diamond Trust Bank Kenya Ltd Ord 4.00
Housing Finance Co Ltd Ord 5.00
Kenya Commercial Bank Ltd Ord 1.00
National Bank of Kenya Ltd Ord 5.00
NIC Bank Ltd 0rd 5.00
Standard Chartered Bank Ltd Ord 5.00
Equity Bank Ltd Ord 0.50

The Co-operative Bank of Kenya Ltd Ord 1.00
INSURANCE
Jubilee Holdings Ltd Ord 5.00
Pan Africa Insurance Holdings Ltd 0rd 5.00
Kenya Re-Insurance Corporation Ltd Ord 2.50
CFC Insurance Holdings
British-American Investments Company (Kenya) Ltd Ord 0.10
INVESTMENT
City Trust Ltd Ord 5.00
Olympia Capital Holdings ltd Ord 5.00
Centum Investment Co Ltd Ord 0.50
Trans-Century Ltd
MANUFACTURING AND ALLIED
B.O.C Kenya Ltd Ord 5.00
British American Tobacco Kenya Ltd Ord 10.00
Carbacid Investments Ltd Ord 5.00
East African Breweries Ltd Ord 2.00
Mumias Sugar Co. Ltd Ord 2.00

Unga Group Ltd Ord 5.00
Eveready East Africa Ltd Ord.1.00
Kenya Orchards Ltd Ord 5.00
A.Baumann CO Ltd Ord 5.00
CONSTRUCTION AND ALLIED
Athi River Mining Ord 5.00
Bamburi Cement Ltd Ord 5.00
Crown Berger Ltd 0rd 5.00
E.A.Cables Ltd Ord 0.50
E.A.Portland Cement Ltd Ord 5.00
ENERGY AND PETROLEUM
KenolKobil Ltd Ord 0.05
Total Kenya Ltd Ord 5.00
KenGen Ltd Ord. 2.50
Kenya Power & Lighting Co Ltd

Source: NSE website, http://www.nse.co.ke/listed-companies