The Relationship between Lunar Cycle and Stock Returns in Companies Listed at Nairobi Securities Exchange

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Abstract
The belief that Lunar Cycle (LC) affects people's mood and behavior stems from ancient lore. Various psychological studies and behavioral business literature provide proof about effect of mood on the benefit prices. Despite the effects of LC on people's moods by international researchers, there has been no known study that focuses on the impact of LC on stock returns at Nairobi Securities Exchange (NSE). The purpose of this research is to examine the association between LC and stock return among companies listed at NSE. This study adopts descriptive research design and a sample of NSE 20-Share Index to meet the objective of the study. Secondary data collected from NSE reports between 2010 and 2014 is analyzed using event study model and numerical Package for the societal discipline evocative data and statistical association, and the significance of the findings tested using t-statistic at 95% significance level. This study finds that stock returns increases throughout New Moon (NM) and Full Moon (FM) phases compared to the normal trading days of the LC. Further analysis finds that cumulative stock returns are higher during the NM dates. The p–value of -2.72 and -2.404 recorded during NM and FM phases respectively deviates significantly from the t-significant rate of 1.943 under the degree of freedom of 6, subjected to testing at 95% significance level. The results show that there exists significant difference among mean value of stock returns during NM/FM phases compared to the mean return during normal trading days. This study recommends that capital markets authority (CMA) and NSE comes up with regulation which will edge lowest and highest price levels through FM and NM phases so that it can secure price against manipulations and to protect investors against manipulations.
Keywords: Lunar Cycle, Stock Returns, Nairobi Security Exchange

1. Introduction

The belief that the phases of the moon, also known as the lunar cycle (LC), affect people's mood and behaviour stems from ancient lore. During ancient times, notable human activities such as religious functions were regularly planned to coincide with exact periods of the lunar cycle, and calendar years were based on the lunar month. To this day, many popular religious festivals and holidays such as the Easter, Passover and Eid Al Fitr are still timed to coincide with the cycles of the moon (Dichev & Janes, 2001).

This belief that the moon affects behaviour in different ways has been validated by proof from psychological and biological studies. Various psychological studies support the influence of the moon on human mind and behaviour (de Castro and Pearcely, 1995; Tasso and Miller, 1976; Lieber, 1978; Nael and College, 2000). Similarly, biological research also documents the recognisable effects of the moon on the human body (Criss and Marcum, 1981; Law, 1986). Literature from behavioural finance provides proof about the impact of mood on resource costs (Kamstra, Kramer & Levi, 2003; Coral & Shumway, 2005). The conclusions from these studies forms the basis of the view now prevalent in some academic cycles that lunar phases influence human financial behaviour (Karamchandani & Jani,2014).

The expression lunar cycle alludes to the moon's ceaseless circle round the earth, which takes approximately 30 days. The LC is informed by the comparative positions of the sun, the moon and the earth. The progress of the moon in the cycle is seen in phases from the NM when the moon is crescent, to the FM when the entire illuminated portion of the moon can be seen from the earth (Dichev & Janes, 2001). Amid the NM stage, the moon, earth and sun are in close arrangement. The whole lightened part of the moon is on the back side of the moon, the half that can't be clearly seen. Full moon on the other hand occurs when the moon, earth and sun are in close arrangement position and the Moon is on the exact inverse side of the Earth from the Sun. The shadowed portion is entirely hidden from view. The FM date is halfway the 30 days between the two progressive NMs in one LC. The moon phases are observable and predictable cycles. This makes the LC an appropriate proxy variable for unobservable moods and that influence investor's behaviour.

Stock return is the gain or loss on an investment in a particular market, calculated in terms of absolute profits values or as percentage of the amount invested. Stock return is a function of stock prices (Ouma & Ochieng, 2015). Stock prices reflect the firm's value in the market and show the present value of expected future cash flows. This means that there is high positive relationship between low/high organization value and low/high stock return. This is affirmed by the small-firm effect anomaly that explains that stock price is a factor driving the difference in stock returns. Every investor in motivated by the expected returns on the stock, which is the loss or profit of a security in a specific period (Ilmanen, 2011).

A number of empirical studies have already been undertaken to understand the impact of LC on stock returns. For instance, empirical study by Dichev and Janes (2001) done in the U.S. stock indexes showed a strong effect of LC on stock returns. The study found that stock recorded double returns 15 days around new moon (NM) dates compared the returns recorded amid the 15 days around full moon (FM) dates. A comparable study by Yuan, Zheng and Zhu (2006) explored on how lunar stages and stock returns are related in 48 nations and found that stock returns are less for the periods closer to the FM than on other periods around another moon with a size return difference of somewhere around 3% and 5% for every annum. Karamchandani and Jain (2014) in India found statistical significance in the volatility of daily returns of stock prices amid the NM and FM phases in some of the sectors. Despite the effects of LC on people's moods attracting research by international researchers, there has been no known study that focuses on the impact of LC on stock returns at the NSE, hence the motivator of this research to fill this gap and understand whether lunar cycle influences stock returns in NSE.

Proponents of rational investor theories like the Efficient Market Hypothesis (EMH), Theory of Modern Portfolio (MPT), Model of Capital Asset Pricing (CAPM), and the theory of Arbitrage Pricing (APT) consider exogenous events, such as the lunar cycle to have no tangible impact on people's investment choices. Underlying these theories is the assumption that investors are 'rational agents' who seek to maximize their utility by seeking to make the most profit out of their investments (Elton, 2010). However, Behavioural Finance Theories argue that people are not as rational as traditional finance theory explains in so far as making investment decisions is concerned. The alternative notion that investors are often influenced by emotions and biases that drive their investment choices and share prices is the base of behavioural finance. The central idea is that investor psychology and moods drives stock market movements and prices (Hirshleifer, 2001). This means that anything that is known to have effect on people's mood can influence human financial behaviour in the stock market. Therefore, this study intends to either confirm or refute this behavioural finance argument by undertaking the study of the relationship between stock returns and LC in companies listed at Nairobi Securities Exchange.

The main objective of the study is to investigate the relationship between lunar cycle and stock returns in companies listed at NSE.

2. Literature Review

The chapter outlines the behavioural finance theories that include; Efficient Market Hypothesis, Behavioural Portfolio Theory, Behavioural Corporate Finance Theory, and Adaptive Markets Hypothesis theory that show the relationship between lunar cycle and share prices and returns, and outline the experiential studies that have been done by other researchers on effect of LC on share prices and returns.

2.1 Efficient Market Hypothesis

According to Eugene Fama (1970) proclaimed Efficient Market Hypothesis (EMH). This hypothesis is associated with the view that since all information spread quickly, and without delay, subsequent price changes represent random departures from previous returns. Therefore, one cannot study past stock returns in an attempt to predict future returns. Despite the existence of a large body of evidence in support of EMH, all sorts of anomalies have been documented extensively in financial literature to dispute this theory. The common anomalies include; January anomaly, anomaly of the week effect, holiday anomaly, little size impact, and weekend effect. From another perspective this study seeks to test the efficiency of the Nairobi Securities Exchange and to establish the existence of lunar anomaly.

2.2 Behavioural Portfolio Theory

The theorem was initiated by Shefrin and Statman (2000). The theory argues that behavioural investment portfolios take the shape of distinct layered pyramids in which each layer is aligned to a particular objective. The base layer is formulated in a way that it is meant to avert any financial catastrophe and to protect the investors against poverty, while the upper layer is intended to try maximize returns, and to give hope for riches. Behavioural investors in this case do not consider the covariance existing between the layers as is the case in the capital asset pricing theorem, Arbitrage Pricing Model, and Modern Portfolio theorem that put forward that the ultimate motivation for investors is the profit maximization of their portfolios. In this theory, investors choose their portfolio according to their individual goals either to get returns, based on the access to information, utility of the assets or for loss aversion among other objectives instead of holding a well-diversified portfolio with relatively obvious benefits (Statman, 2004). This theory thus points out that other factors related to investor behaviour influence the choice of investment and the portfolio.

2.3 Behavioural Corporate Finance Theory

Behavioural finance theory borrows heavily from cognitive psychologists Daniel Kahneman and Amos Tversky (1974), who related behavioural finance actions by investors to psychological concepts. Thaler (1983) later brought the behavioural theory into perspective by integrating finances and psychology in research finding of

human ruling hence bias in making decision in improbability circumstances. This theory considers individual propensity to act illogically while making decisions about savings, hence those fiscal decisions are prejudiced by how people understand and take action on data available, that isn't forever reasonable. According to Thaler (1983), behavioural finance is fundamentally economics founded on the realistic descriptions of people's actual behaviour.

The behavioural corporate finance theory further recognizes that psychological biases that influences investor's decisions and affect financial markets may also influence managers and corporate decisions related to investment appraisal, capital structure and dividends (Adler, 1993). This means that other than the experience and management styles of the managers, personality of the managers that is the basis of their temperament and behaviour is key to the decisions made by managers in challenging and uncertainty conditions. When executives are overconfident or overoptimistic, they tend to push toward optimal behaviour (Eric, 2011). The finding of this study either refutes or confirms this theory.

2.4 Adaptive Markets Hypothesis
This theory was proposed by Andrew Lo (2004) in a move to resolve financial fiscal theorems which are attached on efficient market hypothesis, as of behavioural financial economics, applying ideology of progression to fiscal connections in relation to adaptation to market environment and conditions, natural selection of investment opportunities and competition. The theory argues that the examples cited by the proponents of behavioural finance touching on economic rationality such as loss aversion, overreaction of investors, overconfidence of investors and managers, and other behavioural biases often displayed by investors are essentially dependable with the evolutionary theorem of people adapting to ever changing surroundings using easy heuristics (Lo, 2015). With reference to this study, the overreaction and overconfidence associated with the adaptive market hypothesis relate to psychological and personality concepts that explain behavioural finance. The adaptation to market environment and conditions is a behavioural attribute adopted by investors after consistent responses and reinforcements.

2.5 Empirical Review
Dichev and Janes (2001) carried out research finding on impact of lunar cycle on the store proceeds. The study focussed on four major U.S. Stock Indexes and the stock markets for other 24 countries drawn from North America, Europe, Asia, Africa and South America. The study found significant influence of lunar cycle on stock returns. In an analysis that covered a period of over 100 years, it was found that the stock returns recorded for fifteen days about original moon were almost doubling the proceeds recorded in fifteen days about full moon dates in the four most important U.S. stock indexes. Similar results were found in almost every foremost stock index where the 24 previous nations included in study of an analysis that covered a period of over the last 30 years. Further the study found no economically significant proof of lunar cycle impact on return unpredictability and quantity of trading. The findings discussed points out human beings to be really enthusiastic to invest at the start of new-fangled moon season compared to complete moon season.

Yuan, Zheng and Zhu (2002) in another empirical study examined relationship among astral phases and stock market income of forty-eight nations around the world including Kenya. The study concluded that stock returns seem to be going up at the start of a new moon compared to time during the full moon season. Analysis using both equal-weighted and value-weighted global portfolios found magnitude of difference in return to have range between 3% and 5% per annum. The researchers noted lunar effect cannot be triggered by the announcing of macroeconomic indicator affecting the securities market and is free of calendar-related market anomalies. The study recommended going beyond reasonable asset pricing structure to explore shareholder behaviour and this informs the investigation lunar effects at NSE.

Another study by Liu and Tseng (2009) also found that lunar cycle affects returns from the stock. Objective of research was Bayesian investigation of lunar impact on return from stock for twelve countries. Using two-rule autoregressive theorem with GARCH (1,1) to analyse GARCH volatility and the association among successive each day returns, using Bayesian approach to analyse the day after day returns from stock of twelve nations, comprising G7 markets and 5 promising markets in Asia, study found that lunar cycle affects daily stock returns. In most of G7 markets, unpredictability of stock returns varies based on the lunar phase, with increasing instability recorded during complete moon season. Study concludes that lunar phases influence human financial behaviour.

Floros and Tan (2013) studied the Moon Phases with respect to Mood and Stock Market Returns in 59 globally mature and emerging security markets world over to offer evidence of impact lunar cycle has on their returns from the stock market. Researchers utilised TGARCH model to determine the link between calendar-related effects, efficient-market theory hence mood of investors arising among different moon phases. Analysis showed important complete moon phase impact on stock returns among 6 markets, then statistically important effect of original moon phase on stock returns in 8 markets. Further, the study found major helpful impact of

new moon phase on stock market returns particularly from United Kingdom, Bangladesh, Cyprus and Chile stock markets, where else the negative impact of full moon recorded in Jordan market. Several markets, especially the emerging markets (Brazil, Cyprus, Chile, Bangladesh, Tunisia, and Belgium) showed proof of full/new moon impact as well as January and Monday impact on their stock returns. The research studies are suggested to financial managers, financial analysts and investors, handling the international stock indices hence the desire for this further research.

Karamchandani1, Jain and Mohadikar (2014) also did a study on the effects of astrophysical phases in the Indian stock market. Using return calculation and descriptive statistics for analysis of six sectors of the Indian economy for a period between 2008 and 2012, the study found statistically significant difference in aggregate returns and volatility of daily returns of stock prices in some of the sectors particularly between returns of new moon phase and full moon phase.

In conclusion, the reviewed empirical evidences show that lunar cycle affects stock prices. For instance according to Dichev and Janes (2001) in their research concluded that stock returns recorded within fifteen days approximately close to NM were about double the returns recorded in the 15 days around full moon dates in the four most important U.S. stock indexes, Liu and Tseng (2009) using Bayesian analysis GARCH model lunar found cycle to have effect on daily stock returns. Similar results were found by Karamchandani1, Jain and Mohadikar (2014) and Floros and Tan (2013).

3. Research Methodology
This study adopts descriptive research design using event study model to find out the overall behaviour of stock returns during different phases of the LC for firms trading at the NSE. Descriptive design is a scientific technique that encompasses observation as well as description of the behaviour of the subjects without their being any form of manipulation (Christensen, Johnson & Turner, 2011). This design was chosen by the researcher since the collected information of stock returns around the new and FM phases was analysed as they are without impacting the data, so as to determine real behaviour of stock returns around the LC.
The researcher collected daily stock prices for 20 listed firms and sectors of the economy at the NSE. The researcher identified the new and FM dates in the LC and the data collection included stock returns around the NM and FM dates, particularly for 3 days before the new/FM dates and 3 days after the new/FM dates. Finally, the data also included the volumes of shares traded by the sampled firms within the study window of six days. This is represented in the figure below.

Figure 3.1: Window Period
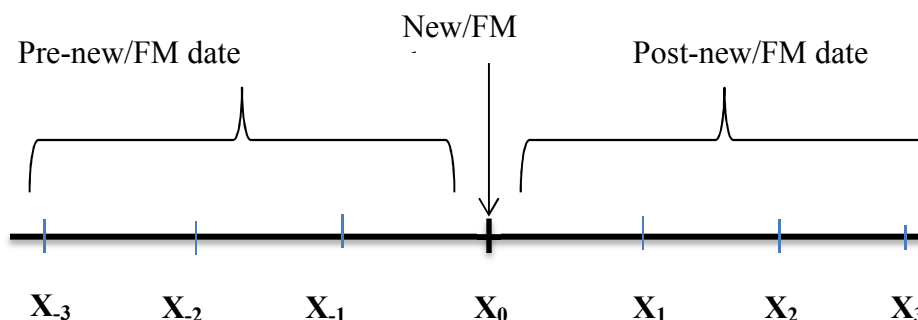
Analytical Model
Step One: This step involved price calculation by determining the actual daily closing returns within the window period of the study. The raw series of daily closing prices was converted into percentage change in order to determine the stock price volatility around the new and FM phases of the LC. The change in returns was calculated by following market model:

$$CG_i = \frac{(P_1 - P_0)}{P_0} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{i}$$

Where;

CG_it = Expected capital gains/loss for security i at time t

P_1 = Actual price during the new/FM phase

P_0 = required stock price based on normal days of LC

Step Two: Mean returns. The descriptive statistics for the daily closing returns for the sectors under study including; banking, agricultural, energy and petroleum, commercial and services, insurance, and the manufacturing and allied sectors was carried out for the period from 2010 to 2014 in order to investigate any mean changes in stock returns during the NM and FM phases of the LC. The mean returns was calculated for the window period covering 3 days before the new/ FM date (X_{-3}) and 3 days after the new/ FM dates (X_{+3}).

Mean values were calculated using the following equation:

$$\pi = \frac{1}{N}\sum_{i=1}^{N} X_I \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{ii}$$

Where;

X_i = daily price series of respective sectors for FM and NM.

N = Number of days in the study window, which is 7

Step three: This involved determining the standard deviation in order to inspect volatility in investors' investing decisions based on the LC. This was calculated covering between X_{-3} and X_{+3} for both the NM and FM.

$$SD_t = \sqrt{\frac{1}{t}\sum_{i=1}^{N}(X_i - \pi)^2} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{iii}$$

Where π = mean return for new/FM phases

4. Data Analysis, Results and Discussion

The objective of the study was to investigate the relationship between lunar cycle and stock return in companies listed at the NSE. This section uses descriptive statistics to outline the relationship of LC and return. Table 4.1 to table 4.5 gives the summary of descriptive statistics including; minimum, maximum, mean, standard deviation and variance of stock returns during the LC. The analysis finds that stock return is higher during the NM and FM dates compared to the Normal trading days.

Table 4.1: 2010 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Mean Return NM	20	-.01252	.02111	.0046913	.00846844	.000
Mean Return FM	20	-.01312	.04008	.0128169	.01455494	.000
Valid N (listwise)	20					

Source: Research Findings

The 2010 results show that during the NM window period, the mean of stock returns was 0.0046913 (0.469%) higher than the normal trading days with as minimum return of -0.01252 and a maximum of 0.02111. Similarly, mean of stock returns during the FM window period is 0.0128169 (1.282%) higher than the return on normal trading days, with a minimum of -0.01312 and a maximum of 0.04008. Further, the standard deviation of 1.455% was recorded during FM period, indicating that there is higher volatility in investors' investing decisions during FM compared to NM period, which recorded 0.85%. Based on the results, the study finds that stock returns are higher during FM window period of the LC.

Table 4.2: 2011 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Mean Return NM	20	-.00088	.08326	.0205690	.01886732	.000
Mean Return FM	20	-.02626	.01588	-.003610	.00980113	.000
Valid N (listwise)	20					

Source: Research Findings

The 2011 results show that during NM period, the mean stock return was 0.020569 (2.06%) higher than the returns reported during the normal trading days, with minimum of -0.00088, a maximum of 0.08326 and standard deviation of 1.8867% during the NM window period. Conversely, mean return for Full Mean period was much lower than the returns recorded during normal returns by -0.00361 (-0.36%) with a minimum of -0.0262, a maximum of 0.01588and standard deviation of 0.98%. This results show that in 2010, stock returns are higher during NM period, but negative during FM period.

Table 4.3: 2012 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Mean Return NM	20	-.03285	.01689	.0046640	.01068685	.000
Mean Return FM	20	-.01520	.04251	.0127556	.01650241	.000
Valid N (listwise)	20					

Source: Research Findings

The 2012 results show higher performance in stock returns during FM period with a mean of 0.0127556 (1.276%) above the normal days return and standard deviation of 1.65%. indicating that there is higher volatility in investors' investing decisions during FM compared to NM period. Based on the findings, LC, particularly the NM and FM periods positively influences the stock returns, with the FM period recording higher returns.

Table 4.4: 2013 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Mean Return NM	20	-.01797	.02732	.0057674	.00993857	.000
Mean Return FM	20	-.01858	.02925	.0074842	.01442762	.000
Valid N (listwise)	20					

Source: Research Findings

The 2013 results show that during the NM window period, the mean of stock returns was 0.0057674 (0.58%) higher than the normal trading days with as minimum return of -0.01797 and a maximum of 0.02732. The mean of stock returns during the FM window period was 0.074842 (0.748%) higher than the return on normal trading days, with a minimum of -0.01858 and a maximum of 0.02925. The standard deviation of 1.44% for FM and 0.99% for NM show that investment decisions are more during FM period of the LC. Based on the results, the study finds that the 2013 stock returns are higher during FM window period of the LC.

Table 4.5: 2014 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Mean Return NM	12	-.00229	.03232	.0060392	.01004003	.000
Mean Return FM	12	-.01706	.02214	.0065859	.01187785	.000
Valid N (listwise)	12					

Source: Research Findings

The analysis in table 4.5 shows similar directions of stock returns during the NM and FM window periods as in 2010, 2012, and 2013, which had positive stock returns. The NM results show 12 month mean of 0.0060392 (0.6%) above the return for normal trading days, and FM mean of 0.0065859 (0.67%) above the normal days trading returns. Similarly the volatility in investor decisions for investment is higher for the FM at 1.19% compared to 1% recorded during the NM. This finding leads to a conclusion that LC positively influences investment and returns, with more returns being recorded around the FM dates.

Correlation Analysis

The correlation analysis was undertaken to establish the degree to which stock returns during a NM window moves together with the stock returns on FM window. This helped to investigate if there is a relationship between investors' decisions in relation to FM phase and NM phase of the LC. This is presented in table 4.6.

Table 4.6; Cumulative Correlation

Correlations

		Mean Return NM	Mean Return FM
Mean Return NM	Pearson Correlation	1	-.937[*]
	Sig. (2-tailed)		.019
	N	5	5
Mean Return FM	Pearson Correlation	-.937[*]	1
	Sig. (2-tailed)	.019	
	N	5	5

 *. Correlation is significant at the 0.05 level (2-tailed).

Source: Research Findings

Table 4.6 indicates that there is a negative cumulative correlation of the mean returns of -0.937 for the five years under analysis. This means that cumulatively, as the mean return during the NM increases, the mean return during the FM phase decreases. This relationship is also presented by figure 4.1 below, which shows that as cumulative return on NM increases, the cumulative mean return on FM decreases.

Figure 4.1: Cumulative Mean Return
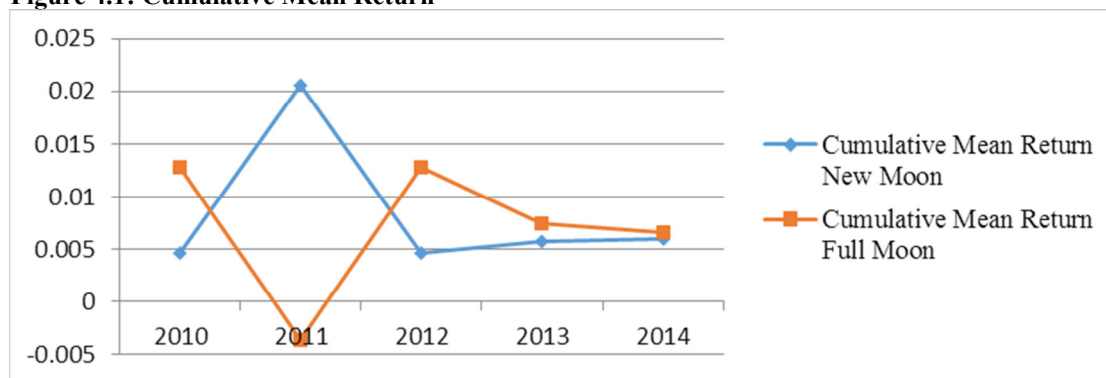
Source: Research Data

The test of significance was performed using paired samples t-test to determine whether there is a major variation in the mean value of returns during NM, FM phases and compared to other normal days. This was done at 95% significance level and result presented in Table 4.7 below.

Table 4.7: Test of Significance

Paired Samples Tests

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Mean Return Normal Days - Mean Return NM	-.00834618	.00686090	.00306829	-.01686511	.00017275	-2.720	6	.053
Pair 2	Mean Return Normal Days - Mean Return FM	-.00720634	.00670349	.00299789	-.01552982	.00111714	-2.404	6	.074

Source: Research Data

The t-test value that compares the cumulative mean return during the NM phase of the LC found p-value to be -2.720. The p-value is less than the t-critical value of 1.943 at degree of freedom of 6 tested under 95% significance level. The p–value shows that there is a significant difference in the mean value of returns during NM phases compared to the normal days. Similarly, the p-value for the FM phase of the LC is -2.404, which is much lower than the t-critical value of 1.943 an the degree of freedom of 6 tested at 95% significance level. This shows that there is a significant difference in the mean value of stock returns during FM phases compared to the mean stock during normal trading days.

Summary and Interpretations of the Findings

Table 4.8 summarises the finding of the study that focuses on the relationship between LC and stock return in companies listed at Nairobi Securities Exchange. The outcomes in table 4.8 were processed out of the cumulative mean stock return for 2010 to 2014 within the study event window of t-3 to t+3.

Table 4.8: Summary of Cumulative Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Mean Return NM	5	.00466	.02057	.0083462	.00686090	.000
Mean Return FM	5	-.00361	.01282	.0072063	.00670349	.000
Valid N (listwise)	5					

Source: Research Findings

The NM results show mean of 0.0083462 (0.83%) above the return for normal trading days, and FM mean of 0.0072063 (0.72%) above the normal days trading returns. Similarly the volatility in investor decisions for investment is higher for the NM at 0.69% compared to 0.67% recorded during the FM. This finding leads to a conclusion that LC positively influences investment and returns, with more returns being recorded around the NM dates. This means that increase in returns recorded during the NM is sustained to the FM phase of the LC.

The study also finds that there is a negative cumulative correlation of the mean returns of -0.937 for the five years under analysis. This means that cumulatively, as the mean return during the NM increases, the mean return during the FM phase decreases, leading to the marginal difference in the volatility of investor decisions from

0.69% during the NM phase to 0.67% during the FM phase. This relationship is also presented by figure 4.1 which shows that as cumulative return on NM increases, the cumulative mean return on FM decreases.

Finally, the test of significance show that the calculated p-value of the NM of -2.72 is less than the t-critical value of 1.943 at degree of freedom of 6, tested under 95% significance level. The p–value shows that there is a significant difference in the mean value of returns during NM phases compared to the normal days. Similar direction also found during the FM phase of the LC with a p-value of -2.404, which is much lower than the t-critical value of 1.943 an the degree of freedom of 6 tested at 95% significance level. The study concludes that there is a significant difference in the mean value of stock returns during FM phases compared to the mean stock during normal trading days.

5. Summary, Conclusion and Recommendations

From the findings of the study on the relationship between LC and stock return in companies listed at NSE, it is found that in the 20 Share Index firms at the NSE, LC had major influence on the returns on stock. Prices of shares and stock returns for the 20 organizations used in the study recorded a positive growth of 0.83% above the normal trading days during the NM and 0.72% return above the normal trading days during FM phases of the LC. The cumulative stock mean return for the five years (2010-2014) under study found that stock returns were marginally higher on the days around NM date compared to the days around the FM phase of the LC. The p–value of -2.72 and -2.404 recorded during NM and FM phases respectively significantly deviates from the t-critical value of 1.943 under the degree of freedom of 6 tested at 95% significance level showing that there is a significant difference in the mean value of stock returns during FM phases compared to the mean stock during normal trading days.

This study concludes that lunar cycle positively influences investor decisions and results into an increase in stock returns particularly around the NM and FM phases compared to the normal trading days of the of the LC for the 20 share index traded at NSE. Further, the study concludes that stock returns are higher around the NM dates. This study is consistent with other studies such as Kamstra, Kramer and Levi,2003, Dichev and Janes (2001) done in the U.S. stock indexes that found that stock recorded double returns 15 days around NM dates compared the returns recorded during the 15 days around FM dates and the study by Yuan, Zheng & Zhu (2006) that investigated the relationship between lunar phases and stock returns in 48 countries and found that stock returns are higher r on the days around a NM than on the days around a FM.

Recommendations for Policy

Investment banks need to comprehend the direction of stock returns during different stages of LC in order to accurately advice their clients on the best phases to invest at the NSE. It is therefore recommended that CMA and NSE to come up with a policy that recognizes investors' psychology, mood and behaviour affect asset prices will limit the price floor and price ceilings levels, especially during FM and NM phases to prevent the prices from being manipulated and so as to guard the interest of the shareholders. This will limit the price floor and price ceiling during the different stages of the LC.

Limitations of the Study

The study faced the limitation of having some firms in the 20Share index trading for less than 20 days in a month. This left the researcher with few normal days outside the window period of seven days around the NM and seven days around the FM date. The study also notes that there are other market anomalies such as day of the week effect, calendar month effect and holiday effect anomalies that are likely to influence stock return but was not considered in this study. The study also faced a limitation of in in accessibility of data particularly for 2015. For further study, the study recommends looking at the relationship of LC on the All Share Index (NASI) of NSE and to consider a much longer study period.

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