# EFFECT OF LOW PRICE ANOMALY ON STOCK MARKET RETURNS AT THE NAIROBI SECURITIES EXCHANGE

**BY**

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## DECLARATION

This research project is my original work and has not been presented for a degree at any other university for examination.

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This research project has been submitted for examination with my approval as the University supervisor.

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## DEDICATION

I dedicate this project to my family for all support and encouragement they accorded me towards making this research project a success.

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## ABBREVIATIONS AND ACRONYMS

**CAPM**- Capital Assets Pricing Model

**CMA** - Capital Markets Authority

**EMH** - Efficient Market Hypothesis

**EPS** - Earnings per Share

**HPR**- Holding Period Return

**MPT** - Modern Portfolio Theory

**NSE** - Nairobi Securities Exchange

## ABSTRACT

Stock market anomalies are deviations from norms in the asset pricing models. They reveal the inefficiencies which exists in the financial markets around the globe. They reveal the inefficiencies in the market concerning the prices of stocks, explains anticipated asset profitability. This study investigated the effect of the low-price anomaly on stock market returns of firms at the Nairobi Securities Exchange. It employed descriptive design. Total population for the research entailed the 64 firms listed at NSE. Secondary data was the method preferred for data collection covering a period of 1 year from January 2016 to December 2016. All stocks were sorted based on the price (P) at a given time to arrive at three separate portfolios of equal sizes; a low-priced portfolio, a mid priced portfolio and a high-priced portfolio. The researcher determined the selection of the cut off prices subjectively. The obtained calculations on low price anomaly were regressed against the calculated market portfolio returns to establish the relationship using MS excel. The coefficient results established that the relationship between the returns on the low priced security and the returns of the market was positive and significant. The results further revealed that the relationship between the returns on the mid priced portfolio the return of the market was negative and significant. However, the findings revealed that the correlation linking market returns and the returns of the high priced portfolio was negative and insignificant. The study concluded that low and mid priced securities have a significant affect stock market returns of the firms listed at NSE. Study recommended that the management of the NSE should encourage investors to invest in low and mid priced securities since they influence the stock market returns

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the study

Stock market anomalies are variations which deviate from the norms of asset-pricing behavior (Schwert, 2003). They unearth inefficiencies in the market concerning the prices of stocks, explains anticipated asset profitability. The discovery of market inefficiency puts a strain on the applicability of the models used in analyzing the anticipated stock prices (Riro & Wambugu, 2015). This inefficiency can occur in any efficient market hypothesis, which can be grouped in various classes. The low security prices contends they will perform better in the long term as compared to the high security prices which are attractive especially to the short term investors (Zaremba et al., 2016).

The catering theory contends the management of a firm can decide to meet the excess demand for their stocks through increasing the supply. This is a decision based on the investors demanding stocks, which are affordable and at a reasonable prices hence need for variety (Zaremba et al., 2016). Efficient market hypothesis (EMH) contends that the prices of properties in the market are the reflections of the prevailing market conditions and future prices can be predicted with certainty. It further reveals that in a market where all conditions are working well there will be no windfall profits made from investing in the securities market(Baker, Greenwood & Wurgler, 2009). The capital assets pricing model (CAPM) contends that the returns of a portfolio are directly correlated to the risks associated with it expressed in beta. For the model to work, it has to conform to the linear function developed (Riro & Wambugu, 2015).

In Kenya, the performance of the capital market in Kenya depends profitability of the firms listed at NSE, which affect the stock return (Ibalai et al., 2017). The NSE provides an avenue for investment by investors and supports trading clearing, payment of equities debt derivatives and other linked instruments and is mandated to list firms on the securities exchange while enabling investors to trade in securities of firms thus its charged with the health of securities exchange (Mukanzi, Mukanzi & Maniagi, 2016). The Nairobi securities exchange NSE has been one of the best performing and top stock market indices in Africa in recent history. The NSE has witnessed massive changes, which have revolutionized the manner in which business is conducted. The market has witnessed technological changes which have increased the efficiency and effectiveness in trading. As a result, the trading hours have been increased (Mghendi, 2014).

### 1.1.1 Low Price Anomaly

This is a notion that stocks which are lowly priced perform better in the long term as compared to the ones with high prices. This anomaly was proposed by Fritzmeier (1936) who revealed that investors intend to make long term investment should purchase lowly priced stocks (Zaremba et al., 2016). Low priced stocks generally tend to be riskier due to their price volatility and the mere fact that their price could actually continue falling contrary to the expectations of the market of them being undervalued (Kiano, 2015). The model assumes as the low stock prices rise the high ones keep falling hence attractive for long term investors. For the firm it's not a catastrophe when the dividends decrease but its alarming when the sales of the firm's stock reduce. The investors monitor these movements and avoid stocks which fluctuate in both sides (Zaremba et al., 2016).

The low-price effect can be measured by first determining the level at which a price is referred to as low price. The low price is determined by defining the level to which a stock must reach in order to be classified as low price. This usually involves a decision which depends on the individual investor and scholar (Zaremba et al., 2016). According to Huku (2014), share prices are ranked in an ascending order. Thereafter, this is where the investors choose their portfolios which are then ranked on their performance annually and shares reallocated to different portfolios in their share price. Even-balance of stock's valuation across all periods leads to elimination of inflation impact. The presence of the low-price anomaly is indicated by higher risk adjusted excess returns by the low-priced portfolio as compared to the mid and high priced portfolios (Kiano, 2015).

### 1.1.2 Stock Market Returns

This is a monetary gain or loss on an investment, which is highly sensitive to both fundamentals and expectations in a market. It is characterized by gains or losses in a certain period consisting of the income gains associated with the earning gained on the securities exchange (Olowoniyi & Ojenike, 2012). Returns are expressed as ratios which emanate from investing in a security for a specified period. The gains emanate from the margins of selling at higher prices than the amount the stocks were purchased at (Ouma & Ochieng, 2015).

The profits made by the investors are in two forms; through dividends and through the capital gain from disposing the stock (Chaopricha, Chan & Pollard, 2007).Stock returns also refers to the gains or losses on the portfolio of all stocks that are on the equity markets in a security exchange. Stock returns are of great importance to the securities

exchange players, which needs accurate forecasting in enhancing investment performance (Huku, 2014). Firms pay the dividends to the shareholders from the revenues generated throughout the financial year (Olowoniyi & Ojenike, 2012).

The profits made by the investors are in two forms; through dividends and through the capital gain from disposing the stock (Chaopricha, Chan & Pollard, 2007). In order to predict the expected market performance, it's based on the previous periods which act as the basis for the future returns of a portfolio or an individual firm's performance. Stock returns can be calculated using the simple or logarithm return methods. The gains are influenced by the rise in the price of a single stock over time as well as the rise in the dividends earnings over time. Average Return given by the sum of each of the values can also be considered by dividing by the total number of the values (Huku, 2014).

### 1.1.3 Low Price Anomaly and Stock Market Returns

According to Zaremba et al. (2016**),** the low stock prices are risky as they are mainly from the start up firms whose potential may never be realized. The efficient market contends that the prices of properties in the market are the reflections of the prevailing market conditions and future prices can be predicted with certainty. Investors pay keen attention to the information pertaining to the securities and this is the major reason for frequent variations in stock prices (Latif et al., 2011). The market efficient theories assert that it is impossible to exhibit superior returns in securities exchange market. On the contrary, low price effect implies that an investor can make superior returns from trading on low priced stocks (Huku, 2014).

Hwang and Lu (2008) studied the effects of low price stocks where the study findings revealed a negative correlation exists between the two variables under study. The study revealed that the idea of investing in low priced stocks has huge benefits but it's attractive to the risk takers as it's associated with huge risks. Another study by Baker, Greenwood and Wurgler (2009) revealed in his research that management of a firm reacts to the investors' expectations by further reducing the stock prices for low priced stocks and increasing prices for highly priced stocks. A study by Savor (2012) indicated there exist a positive correlation linking stock prices with availability of the information concerning their future prices to their earning. Zaremba et al (2016) on the research on the effect of low stock prices in Poland where the results concluded that it's mainly caused by many lottery securities listed at stock market in the country.

### 1.1.4 Nairobi Securities Exchange

NSE previously known as Nairobi Stock Exchange was constituted under the society act. The NSE major duty is regulating the purchasing and selling of stocks in order to ensure those in need of money and those with excess funds can transact at low cost (Mukanzi, Mukanzi & Maniagi, 2016). This is the largest stock exchange in the East African region consisting countries such as Uganda, Tanzania, Rwanda, Burundi and South Sudan. CMA is a regulatory body, which comes up with the rules governing the market to ensure smooth running of NSE (Ibalai et al., 2017). It's a requirement for each and every firm at NSE to follow the laws designed by the CMA in an effort to ensure improved performance of all firms (Mukanzi, Mukanzi & Maniagi, 2016).

The market has experienced and overcome numerous challenges before growing to the size it is today. It's one of the highly ranked not only in the East African region but at the African continent at large making it the major driver of Kenyan Economy and those of its neighboring countries (Sifuna, 2012). The NSE is, characterized by liquidity, market capitalization and turnover; hence, it may be classified as both an emerging market and a frontier market (Ibalai et al., 2017)

Most studies done at the NSE have focused on the other types of stock market anomalies among the calendar anomalies, accounting anomalies and the event anomalies. For instance, Mutua and Mutothya (2013) investigated whether shares at NSE operate under a perfect market condition theorem where they revealed the model is not applicable to NSE. Kuria and Riro (2013) analyzed the impact of the weekly stock fluctuations where they established the existence of positive correlation are present at the NSE and concluded the market is still young and is still faced with extreme daily fluctuations. Riany (2016) investigated the presence of January effect on stock performance at the NSE and found that there was a January effect across 9 of the 10 sectors that were sampled.

## 1.2 Research Problem

Capital market anomalies arise from when the existing literature is not able to correctly predict the expected stock returns according to various models like (CAPM) (Schwert, 2003). The securities markets are characterized by perfect information and the stock prices are reflective of the information in the market (Latif et al., 2011). However, the behavioral finance indicates that the efficient market hypothesis and the CAPM are not

able to explain the variations experienced on the stock prices since some events are unexpected and unpredictable (Latif et al., 2011).As such, the number of documented anomalies is large and continues to grow. However, many scholars have not focused on the issue of low stock prices despite it being a common phenomenon in the securities market (Zaremba et al., 2016).

In Kenya and the East Africa in general, the NSE is the largest stock market in the region and one of the largest stock exchanges in Africa with the fourth largest trading volume across the continent (Mghendi, 2014). The NSE is among the leading financial market in developing nations as well as investing in stocks and it is the 5$^{th}$interms of size in the African continent. However, the exchange has been reported to currently experiencing flight due to low share prices. Statistics from the Capital Markets Authority indicate that thousands of local investors have left the equities segment of the NSE in a move analysts say is a reflection of their frustration with the persistence of low share prices (Huku, 2014).

A series of studies have also been conducted on low-price anomaly around the world by various scholars. A study by Zaremba et al. (2016) investigated the low-price effect on the Polish stock market and established that the reverse low-price effect is no longer significant after the exclusion of New Connect companies. However, a similar study on the polish stock exchange by Zaremba and Żmudziński (2014) on the characteristics of the low-price anomaly and concluded that although the low-price effect was present on the Polish market, its effect was insignificant. This evidently shows an existence of correlation linking the low-price anomaly and stock returns is not clearly defined in finance literature.

Locally, there are some studies on the topic under study, for example, Huku (2014) conducted a study on the presence of low price impact where she concluded that the low-price effect exists on stock returns at NSE in the Kenyan market. Conversely, Kiano (2015) also tested the existence of the low share price effect at the Nairobi Securities that concluded that the low share price effect did not exist at the NSE, which implied increase in market efficiency. The studies by Kiano (2015) and Huku (2014) gave conflicting findings on the existence of the low-price anomaly at the NSE. Additionally, the studies did not test the effect of the low-price anomaly on stock returns of the listed firms. This clearly indicates empirical work on the low-price anomaly and its effect on stock returns especially in Kenya is non-existence. This creates an empirical literature gap, which requires an investigation. Hence the research question: what is the effect of the low-price anomaly on stock returns of firms at the Nairobi securities exchange?

## 1.3 Research Objective

To determine the effect of the low-price anomaly on stock market returns of firms at the Nairobi securities exchange

## 1.4 Value of the Study

The results of this study will also be relevant to academicians to attain knowledge and understanding of low price anomaly on stock returns and the relative strength of the various factors that affect low prices and will add more to financial literature.

The Government and Regulators will be interested in understanding the right price to issue shares to avoid under pricing as they are constantly in the stock market to raise capital for infrastructural development. The regulator has an interest to ensure that firms

are optimally priced to improve the confidence of investors in correcting low price anomaly in the capital market in Kenya.

Firms have an interest to raise funds in the market and as such they would be interested in understanding the factors that they need to take into account in pricing their firms. Particularly firms would be interested to ensure that initial public offers do not diminish their opportunities to raise capital in future.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

This section previews several theories under theoretical review, the various determinants of stock returns and the empirical literature review. The chapter also presents the conceptual model and the summary of the reviewed literature.

## 2.2 Theoretical Review

The efficient market hypothesis, the catering theory, the modern portfolio theory and the capital assets pricing theory were adopted as the key theoretical underpinnings for this research.

### 2.2.1 Efficient Market Hypothesis

The theory was put forward by Fama (1970) the prices of properties in the market are the reflections of the prevailing market conditions and future prices can be predicted with certainty (Akkaya & Cimen, 2013). It further reveals that in a market where all conditions are working well there will be no windfall profits made from investing in the securities market (Lawrence, McCabe & Prakash, 2007). The theory indicates that perfect markets are those where there is no insider information where some investors take advantage of the information unavailable to other public to make profits. These markets are also characterized by stocks which adjust according to the prevailing market conditions. The statement above reveals that even one uses information available pertaining to market condition they will still earn normal profits (Drogalas et al., 2007).

EMH makes an assumption no investor has insider information concerning the market. The statement therefore indicates that initial public offers reflect the true value of their valuation and they will adjust accordingly in the future. This eradicates the cases where some of the stocks have high or lower values to their actual values hence encouraging some investors make windfall profits while others suffer huge capital losses (Akkaya & Cimen, 2013).

The efficient market hypothesis is simply used where there are competing portfolios in the economy. It further assumes there exist no additional costs on purchasing and selling (Lawrence, McCabe & Prakash, 2007). The major factor considered when making investment decisions is the present stock returns a factor expected to continue for unforeseeable future. There are factors which make it difficult for this model to hold such as the market fluctuation and economic instability (Lawrence, McCabe & Prakash, 2007). It further reveals that forecasting about stock prices is not easy due to the factors mentioned above. Many investors are influenced by new information in the market which may encourage them to purchase of dispose off their stocks.

### 2.2.2 The Catering Theory of Nominal Stock Prices

The theory was put forward by Baker and Wurgler (2002).The reasoning behind this theory is that the management of a firm can decide to meet the excess demand for their stocks through increasing the supply. This is a decision based on the investors demanding stocks which are affordable and at a reasonable price hence need for variety (Baker, Greenwood & Wurgler, 2009). This theory thus explains that only price variations are the most important factor in the investors' decision on whether to invest in a particular stock.

The main reason for maintaining normal stock prices is to ensure the investors get value for their money and also to have variety of stock prices which are affordable. This is the reason behind firms decision to practice share splitting especially where stocks are highly valued forcing many investors to shy away (Baker, Greenwood & Wurgler, 2009). Catering theory is supported by managerial actions like stock splits whose aim is make the stocks affordable to each and every investor and to encourage many investors to purchase the firms stocks (Rajgopal, Shivakumar, & Simpson, 2007).

### 2.2.3 Capital Assets Pricing Theory

CAPM as its commonly known was put forward by Sharpe (1964) and Lintner (1965) states that the returns of a portfolio are directly correlated to the risks associated with it expressed in beta. For the model to work, it has to conform to the linear function developed (Akkaya & Cimen, 2013). Each stock is matched with its corresponding beta co-efficient when the investor intends to identify the returns expected from a particular portfolio. Returns are thus determined by the prevailing economic conditions, which are the proxies towards attaining efficient market (Drogalas et al., 2007). Risks associated with a portfolio are major factors, which influence whether an investor is going to invest in that particular portfolio or not.

The CAPM expresses a positive relationship between an asset's returns and its systematic risk as measured by beta. The resulting regression line that describes this relationship is known as the Security Market Line (Akkaya & Cimen, 2013). CAPM assumes a well hedged portfolio where all the unsystematic risks are eliminated through portfolio building leaving the systematic risks as the only relevant risk which is measured using the

beta coefficient. The theory therefore reveals that there exist a direct association linking returns to risks associated with a portfolio.

### 2.2.4 Modern Portfolio Theory

The modern private equity practice Markowitz (1952) is considered the pioneer authority behind the portfolio theory and posits that investors can reduce variance in their investment by investing in various securities. The model presupposes that diversification is vital to investors as they provide the balance as an investor is going to experience loses in some securities and gains in others. Therefore, the main argument behind this theory is for the investors to be rational when choosing the mix of their investments and focus on the securities which yield higher returns. Crouhy et al, (2012) on their study on the impact of diversification on securities returns found a strong and positive correlation between the two phenomenon. This theory is considered to be a strong basis in financial investment sector and the cornerstone to finance Kaplan and Scholar (2008).

The modern portfolio theory presents an investment rule that is considered to be reasonable as investors want to maximize their wealth and generate a high utility as possible. The rule states that an investor should diversify his portfolio among those securities that are expected to generate the highest return (Riro & Wambugu, 2015). Accordingly, investor's choice of the assets forming part of their portfolio is dependent on their risk tolerance on the efficient frontier whether risk averse, risk taker or risk neutral

This theory advocates that the investors aim at reducing their risks while increasing their returns and thus they should diversify to avoid risking everything on one endeavor.

Through buying securities, investors stand a chance of increasing their returns since they purchase the shares at a discount. The risk and return of any given stock can be duplicated in many ways through various combinations of other stocks (Ogada, 2014). This theory assumes that stock returns are unpredictable and no one can speculate the market prices and end up making windfall returns (Drogalas et al., 2007).

## 2.3 Determinants of Stock Market Returns

### 2.3.1 Liquidity

This is a term used to refer to the ease of converting an asset into one which can yield cash easily (Dalgaard, 2009). Many investors prefer liquid markets especially the speculators. Firms with many liquid assets are more preferred by the investors and can easily raise capital from the public without much struggle. Stocks can be purchased and sold easily on the stock exchange or on the stock market (Tahir et al., 2015). Liquidity of an asset affects the future cash flows of the asset. Stocks which are more likely to be affected by the fluctuations in liquidity have to pay higher dividends to act as the cushion for the risks taken by the investors (Dalgaard, 2009).

### 2.3.2 Company Size

Huge firms enjoy the fact that their stocks are not highly affected by the fluctuations in stock prices which is the opposite case for small firms which have to pay high dividends to act as compensation for the risks associated to their stocks (Schwert, 2003). The risk occurs due to the transactional costs which are associated with these firms. This is the major reason behind the huge dividend returns offered by these firms. However, this

comes with its own challenges as investi9ng in small firms can lead to huge capital loss (Schwert, 2003).

### 2.3.3 Profitability

This refers to the ability of the firm to convert its assets in such a way that it outweighs its costs of operations. This is revealed through the stock payout ratio which is a major indicator of the profitability of a firm as payout ratios are directly correlated with the firms returns (Tahir et al., 2015). The financial statements where the financial performance of a firm is reported are the sources of information investors use to make their decision on what portfolio to choose. Firms with unpredictable growth patterns are not appealing to many investors as they fear making capital losses (Ogilo & Muiva, 2015).

### 2.3.4 Financial Leverage

This refers to the mixture an institution uses to finance its business whether it's through debt or equity or both. This in the financial statement represents the financed by section. Many firms have opted to use debt financing to finance their businesses although this method is risky as it dilutes the earnings of the shareholders as the debt financing attracts huge interests which has an inverse correlation to the dividend earnings. Many investors will avoid firms with high debt financing as their returns will be highly affected and the risks associated with high leverage (Tahir et al., 2015).

### 2.3.5 Inflation

Inflation is a term used to refer to the persistent increase in the prices of commodities and the eroding purchasing power. This means that the citizens are incurring higher costs to purchase goods and access services. According to Azar (2014), there exist inverse correlations linking profitability to inflation. This is because when the inflation is high, the investors expect to be compensated for taking risk in investing in that stock. Inflation is also negatively related to economic performance (Azar, 2014).

## 2.4 Empirical Review

Akkaya andCimen(2013) studied the presence of abnormal day of the month return at Borsa Istanbul. The study also sought to determine whether investors have higher returns from day of the month anomalies. The researcher used daily percentage returns between January 4, 2000 and December31, 2012 and the Z statistics used to test the research hypothesis. The result of the study found that only 11 days were statistically significant days at Istanbul Stock Exchange. The study also found that seven days had abnormal positive return while 4 days had an abnormal negative return.

In Tunisia, Gouider, Kaddour and Hmaid(2015)analyzed the impact of securities anomalies with focus on the calendar anomalies. The researchers examine weekend effect, end month effect, January effect and public holiday's effect. Using the GARCH specification model the study found that the most of the anomalies existed on the Tunisian stock market included the weekend effect, which was determined, there is a yield variation between the beginning of the week (low and negative returns) and the end

of the week. The study concluded that the weekend effect variation was affected in terms of significance between the two periods under different political regimes.

Mateev (2015) investigated the relationship linking stock returns with its coefficients in Bulgarian stock market. The researcher focused coefficients measured from daily, weekly and monthly returns. The study covered a five year period from 1998 to 2002. The study indicated a strong direct correlation exists among the variables under study in the Bulgarian stock market.

Zaremba (2017) investigated the momentum effect in country-level anomalies in global equity markets. The study collected data from 70 nations which covered a 20 year period 1995 to 2015. His findings on the research found were, half of the return patterns serve as reliable and robust sources of returns, to provide convincing evidence that the anomalies with good performance over the past 6-12 months tend to outperform in the future revealing that people who invest on stocks with low performance earn high returns in the long term as they outperform better performing stocks in long term.

Cao et al (2009) explored the impact of pre-holiday to reveal whether it has any effect to stock prices in New Zealand. The research found a direct correlation among the variables and revealed that pre-holiday effect in the country had increased over time. The researchers also found an inverse correlation linking pre-holiday effect to the size of the size of the firm. The researchers did not find any evidence of pre-holiday effect on medium firms.

Mukanzi and Maniagi (2016) investigated the impact of nonfinancial factors on returns of firms listed at NSE. The research assessed how business risk, liquidity risk and credit risk

influence stock returns of non-financial firms. The study retrieved secondary data from forty-six non-financial firms. Through the regression model, it was established that business risk and credit risk had a negative and significant influence on stock return. The results also found that liquidity risk had a positive correlation and significant influence on stock return of non-financial firms on NSE

Sifuna (2012) carried out an investigation to determine whether the day of the week effect exists. The study used the daily market variations to analyze data, which was collected for a five year period between 2008 and 2011. It was revealed that that Tuesday had posted higher returns compared to other days of the week and Wednesday posted lowest returns. The study also revealed that Tuesday had the highest stock variations while Saturday posted lowest variations. The author concluded, there was no significant correlation linking the study variables.

Thuranira (2014) examined the retained profits effect on returns of the firms listed at NSE through a descriptive study design and used secondary data for the period between 2009 and 2013. The regression model was adopted to analyze the collected data. The results of the study revealed that the relationship between stock returns and retained earnings was statistically insignificant. The results also show an insignificant correlation linking retained profits to securities returns.

Mghendi (2014) tested the existence of small firm effect on stock market returns at NSE. The study constructed four quartile portfolios that were arranged in an ascending order based on their market value and then divided into four portfolios. The study used secondary data collected using data collection sheet. The researcher revealed that

monthly returns had varying degrees but small sized firms displayed a more positive influence on the monthly returns for the six year period at the NSE. The researcher concluded that small sized firms revealed a strong direct impact on Monthly Returns of companies at the NSE thus showing existence of small firm effect

Ondiala (2014) investigated the turn of the month effect at NSE via a descriptive design. The authors carried out a census of the 61 firms listed at the NSE and used secondary data from the exchange. The findings of the study established that the many segments did not have pronounced turn of the month effect. It was further established that there was no significant variation of mean at the end of the month and the mean for the rest of the month hence failure to confirm the existence of calendar effects at the NSE.

## 2.5 Conceptual Framework

This is the schematic representation of the link between the independent and dependent variables. For this study, it will comprise of the low-price anomaly as the independent variable and stock market returns as the dependent variable.

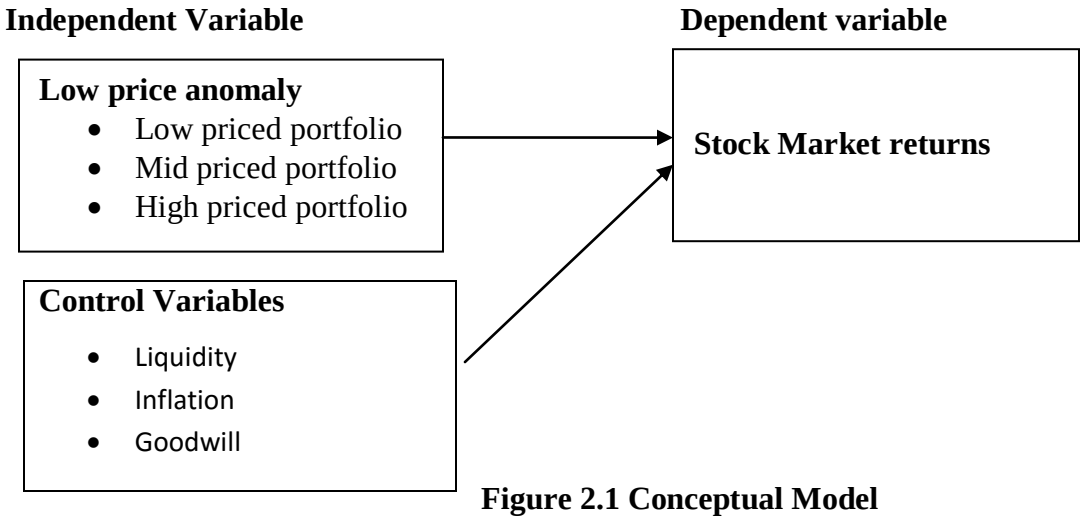


**Figure 2.1 Conceptual Model**

## 2.6 Summary of the Literature Review

The chapter explored the efficient market hypothesis, the catering theory of nominal stock price, the capital assets theory and the modern portfolio theory respectively. The EMH states that security prices fully reflect all the available information an indication that arbitrage opportunities are not possible in an efficient market. The catering theory of nominal stock price support that the management of a firm can decide to meet the excess demand for their stocks through increasing the supply. This is a decision based on the investors demanding stocks which are affordable and at reasonable prices hence need for variety**.** The CAP states that the returns of a portfolio are directly correlated to the risks associated with it expressed in beta. The modern portfolio theory contends that the investors can reduce variance in their investment by investing in various securities.

A number of studies have also been reviewed among them Akkaya and Cimen (2013) who studied the presence of abnormal day of the month return. Gouider, Kaddour and Hmaid (2015) examined four calendar anomalies namely the weekend effect, the end of the month effect, the January effect and Ramadhan effect. Mateev (2015) investigated the relationship between average return and beta. Zaremba (2017) investigated the momentum effect in country-level anomalies in global equity markets. Sifuna (2012) who carried out an investigation the Kenyan stock market to determine whether the day of the week anomaly exists. Mghendi (2014) tested the existence of small firm effect on stock market returns and Ondiala (2014) investigated the turn of the month effect at the Nairobi Securities Exchange. From the sampled studies its evident that most studies focus on other types of financial anomalies and the low-price anomaly has not been explored to a great expect and more so in Kenya.

# CHAPTER THREE: RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter illustrates the study design, the research population, data collection method and data analysis techniques

## 3.2 Research Design

This is the design the researcher intends to adopt in order to connect the study problems to the applicable and achievable manner (Saunders, Lewis & Thornhill, 2009). This research employed a descriptive research design. A descriptive design is defined as a situation whereby the variables are free from manipulation as they occur without any manipulation (Saunders, Lewis & Thornhill, 2009).

## 3.3 Population

A population is the total number of items used in the study to make conclusion about the study variables. This population of this research entailed the 64 firms listed at NSE. The study collected data from all the firms hence there was no sample.

## 3.4 Data Collection

The research used secondary data. The secondary data under included the average monthly closing prices for individual shares from the NSE database. The study used average monthly closing prices in order to reduce the problem of autocorrelation inherent in short-interval share prices from daily data. The data was obtained for a period of 1 year from January 2016 to December 2016.

## 3.5 Data Analysis

The study adopted the analysis technique by Zaremba and Żmudziński (2014). All stocks were sorted based on the price (P) at a given time to arrive at three separate portfolios of equal sizes; a low-priced portfolio, amid priced portfolio and a high-priced portfolio. The researcher determined the selection of the cut off prices subjectively. Additionally, the Jensens (1968) alpha model was used to calculate the performance of the market portfolio. The Jensen alpha model took the following form

Jensen's (1968) alpha: $R_{pt} - R_f = \alpha_i + \beta_i (ER_m - R_f)$

Where,

$R_{pt}$ is the portfolio return

$R_f$ is the risk free rate of return proxied using the average rate of return on government securities

$\alpha_i$ isthe Jensen Alpha

$\beta_i$ isthe beta coefficient of each portfolio

$ER_m$ isthe market portfolio (NSE 20 Share index) return

The monthly stock returns were computed as follows:

$$R_{i,t} = \frac{P_{i,t} - P_{i,t-1} + D_{i,t}}{P_{i,t-1}}$$

Where,

$R_{i,t}$ is the return on the share *I* in day *t*

$P_{i,t}$is the price of share *i* at the end of day *t*;

$P_{i,t-1}$isthe price of share *I* at the end of day *t-1;*

$D_{i,t}$is the dividend paid during the day t.

The obtained calculations on low price anomaly were regressed against the calculated market portfolio returns to establish the relationship using MS excel. The F and t test statistics were used to establish the statistical significance of the regression model and the coefficients respectively. The regression equation was formulated as follows

$$R_{pt} - R_f = \beta_0 + \beta_1(Low\ priced\ shares\ return) + \beta_2(Mid\ priced\ shares\ returns) + \beta_3(High\ priced\ shares\ returns) + \varepsilon$$

Where,

$R_{pt} - R_f$ = Dependent variable, which is the portfolio performance as a measure of stock returns calculated using the Jensen's (1968) alpha

$\beta_0$ = Constant/intercept

$\beta_1$ - $\beta_3$ = Regression coefficients

$\varepsilon$ = Stochastic error

# CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

## 4.1 Introduction

This section presents the descriptive statistics results, the correlation results, regression findings and the findings interpretations.

## 4.2 Descriptive Statistics

Secondary data was employed in the study, which was collected for 1 year using the average monthly share prices and the monthly NSE 20 share index from January2016 to December 2016. All stocks were sorted based on the price (P) at a given time to arrive at three separate portfolios of equal sizes; a low-priced portfolio, a mid-priced portfolio and a high-priced portfolio.

Data was obtained from 64 firms, which generated 768 data points. The researcher determined the selection of the cut off prices subjectively by dividing the collected data into three sections where the first 256 entailed the low priced portfolio, the other 256 entailed the mid priced portfolio and the last 256 formed the high-priced portfolio. However, after calculating for returns on the portfolios the $256^{th}$ entry was left out hence a count of 255. Table 4.1 indicates the descriptive results

**Table 4.1 Descriptive Statistics**

| | Portfolio Return | Low priced | Mid priced | High priced |
|---|---|---|---|---|
| Mean | 0.02825 | 0.07235 | 0.044188 | 0.028579 |
| Standard Deviation | 0.068989 | 0.0357 | 0.12416 | 0.103783 |
| Kurtosis | 0.593862 | 0.468551 | 1.65074 | 1.1042 |
| Skewness | -0.58996 | 1.697355 | 1.211662 | 1.321232 |
| Minimum | -0.16242 | -0.12676 | -0.02222 | -0.276 |
| Maximum | 0.113821 | 0.158273 | 0.666667 | 0.528947 |
| Count | 255 | 255 | 255 | 255 |

**Source: Research findings**

The descriptive results on table 4.1 show that the average portfolio (market) return is 0.02825 and the minimum and maximum return being -0.16242 and 0.113821 respectively. According to the results, the average return of the low priced portfolio is 0.07235 with a minimum return of -0.12676 and maximum return of 0.158273 respectively. The results also indicate that the average return on mid priced portfolio is 0.044188 with a minimum return of -0.02222 and maximum return of 0.666667 respectively. The results further show that average return for the high-priced portfolio is 0.028579 with a minimum return of -0.276 and maximum return of 0.528947 respectively.

## 4.3 Correlation Analysis

The correlation findings on table 4.2 indicate that the correlation linking returns on the low priced portfolio and the returns on the market portfolio is weak and negative. The results also show that the returns on the mid priced portfolio and high priced portfolio have a weak positive relation with the returns on the market portfolio.

**Table 4.2 Correlation Analysis**

| | **Portfolio Return** | **Low priced** | **Mid priced** | **High priced** |
|---|---|---|---|---|
| Portfolio Return | 1 | | | |
| Low priced | -0.04660 | 1 | | |
| Mid priced | 0.024218 | -0.05446 | 1 | |
| High priced | 0.028112 | 0.11622 | -0.05309 | 1 |

**Source: Research findings**

## 4.4 Regression Analysis

### 4.4.1 Regression Summary

**Table 4.3 Regression Summary**

| Regression Summary | |
|---|---|
| Multiple R | 0.32342434 |
| R Square | 0.104603304 |
| Adjusted R Square | 0.093901351 |
| Standard Error | 0.033982184 |
| Observations | 255 |

**Source: Research findings**

The regression summary results on table 4.3 shows that the R square value, which indicates the coefficient of determination, is 0.10460 thus an indication that the independent variables account for 10.46% of the variation in the dependent variable. The multiple R-value, which indicates the overall correlation coefficient is 0.3234 thus an indication that the overall correlation between the dependent and independent variables is weak.

### 4.4.2 ANOVA

**Table 4.4 ANOVA**

| ANOVA | | | | | |
|---|---|---|---|---|---|
| | *Df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 3 | 0.0338615 | 0.011287167 | 9.774226063 | 4.02534E-06 |
| Residual | 251 | 0.289851989 | 0.001154789 | | |
| Total | 254 | 0.32371349 | | | |

**Source: Research findings**

The ANOVA results indicate that the adopted regression model is significant since the F value of 9.7742 and the P value of 4.02534E-06 are significant at 95% confidence level. The model is therefore fit and a good predictor of the relationship between the variables.

### 4.4.3 Coefficients

**Table 4.5 Coefficients**

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 1.0427270 | 0.0186308 | 55.96775 | 8.781E-14 | 1.0060343 | 1.0794197 |
| Low-priced | 0.0108152 | 0.0024636 | 4.3899068 | 1.671E-05 | 0.0059631 | 0.0156673 |
| Mid-priced | -0.004475 | 0.001462 | -3.061124 | 0.002444 | -0.0073547 | -0.001596 |
| High-priced | 2.860E-06 | 1.409E-05 | 0.2029233 | 0.839359 | -2.499E-05 | 3.069E-05 |

**Source: Research findings**

The coefficient results indicate that the relationship between the returns on the low priced security and the returns of the market is positive and significant. The results also show that the relationship between the returns on the mid priced portfolio the return of the market is negative and significant. However, the results indicate an inverse correlation

linking market returns to the returns of the high priced portfolio is negative and insignificant.

## 4.5 Discussion of the Findings

The research results established that the relationship between the returns on the low priced securities and stock market returns are positive and significant. This result indicates that there is a direct correlation linking returns on the low-priced securities and stock market returns of firms listed at the NSE. A study by Hwang and Lu (2008) on the effects of low price stocks where the study findings revealed a negative correlation exists between the two variables under study. The study revealed that the idea of investing in low priced stocks has huge benefits but it's attractive to the risk takers as it's associated with huge risks. Additionally, according to Huku (2014) low price effect implies that an investor can make superior returns from trading on low priced stocks.

The research findings established that the relationship between the returns on the mid priced securities and stock market returns are negative and significant. This result indicates that there is a strong and inverse correlation linking returns on the mid priced securities and stock market returns of firms listed at the NSE. A study by Savor (2012) indicated there exist a positive correlation linking stock prices with availability of the information concerning their future prices to their earning. Further, Zaremba et al (2016) on the research on the effect of low stock prices in Poland where the results concluded that it's mainly caused by many lottery securities listed at stock market in the country.

The study finally, established that the relationship between the returns on the high-priced securities and stock market returns are negative and insignificant. It implies an

insignificant association linking returns on the high-priced securities and stock market returns of firms listed at the NSE. A study by Baker, Greenwood and Wurgler (2009) revealed in his research that management of a firm reacts to the investors' expectations by further reducing the stock prices for low priced stocks and increasing prices for highly priced stocks.

# CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

This chapter presents the findings summary, the research conclusions, recommendations, limitations and recommendation for further research

## 5.2 Summary

The objective of this study was to investigate the effect of the low-price anomaly on stock market returns of firms at the Nairobi securities exchange. The efficient market hypothesis, the catering theory, the modern portfolio theory and the capital assets pricing theory were adopted as the key theoretical underpinnings for this research. The research employed a descriptive research design and population entailed the 64 firms at NSE. The research used secondary data which the data was obtained for a period of 1 year from January 2016 to December 2016. All stocks were sorted based on the price (P) at a given time to arrive at three separate portfolios of equal sizes; a low-priced portfolio, a mid priced portfolio and a high-priced portfolio. The researcher determined the selection of the cut off prices subjectively. Additionally, the Jensens (1968) alpha model was used to calculate the performance of the market portfolio.

The descriptive results revealed that the average portfolio (market) return was 0.02825 and that the average return of the low priced portfolio was 0.07235 respectively. The results found that the average return on mid priced portfolio was 0.044188 and that average return for the high-priced portfolio was 0.028579 respectively. The correlation findings established that the correlation between the returns on the low priced portfolio and the returns on the market portfolio was weak and negative. The results also revealed

that the returns on the mid priced portfolio and high priced portfolio had a weak positive relation with the returns on the market portfolio.

The regression summary established that the coefficient of determination was 0.10460 hence an indication that the independent variables accounted for 10.46% of the variation in the dependent variable. The ANOVA results revealed that the adopted regression model was significant, fit and a good predictor of the relationship between the variables. The coefficient results established that the relationship between the returns on the low priced security and the returns of the market was positive and significant. The results further revealed that the relationship between the returns on the mid priced portfolio the return of the market was negative and significant. However, the findings revealed that correlation linking the market returns and the returns of the high priced portfolio was negative and insignificant.

## 5.3 Conclusions

The research findings established that the relationship between the returns on the low priced securities and stock market returns are positive and significant. The study therefore concludes that there is a direct and significant correlation linking returns on the low priced securities and stock market returns of firms listed at the NSE. The research revealed that the relationship between the returns on the mid priced securities and stock market returns are negative and significant. The study concludes that there is an inverse and significant relationship between returns on the mid priced securities and stock market returns of firms listed at the NSE.

In addition, the results of the research established that the relationship between the returns on the high priced securities and stock market returns are negative and insignificant. The study based on this finding concluded that there is an insignificant relationship between returns on the high priced securities and stock market returns of firms listed at the Nairobi Securities Exchange.

## 5.4 Recommendations

The researcher concluded that there was a direct and significant relationship between returns on the low priced securities and stock market returns of firms listed at the NSE. The study recommends that the management of the NSE should encourage investors to invest in low priced securities since they influence the stock market returns

The study also concluded there exists a negative and significant correlation linking returns on the mid priced securities and stock market returns of firms listed at the NSE. The study recommends that the management of the NSE should encourage investors to invest in mid priced securities since they influence the returns on the market portfolio.

Finally, the study concluded that there is an insignificant relationship between returns on the high priced securities and stock market returns of firms listed at the NSE. The study nonetheless recommends that the management of the NSE should encourage also investors to invest in high priced securities since they may offer high returns on their investments.

## 5.5 Limitations of the Study

This study assessed the effect of the low-price anomaly on stock market returns of firms at the Nairobi securities exchange using average monthly secondary data for I year from January 2016 to December 2016. The findings therefore are limited to the selected research period. In addition, the determination of the low-priced portfolio, the mid priced portfolio and the high-priced portfolio was carried out subjectively by the researcher and no statistical method was applied.

## 5.6 Suggestion for Further Research

This study used average monthly share prices and the month NSE 20 share index to determine the returns of the returns of the low-priced portfolio, the mid priced portfolio and the high-priced portfolio and the stock market returns respectively. However, there are also the daily share prices and the daily NSE 20 share index. This study recommends a study on the effect of the low price anomaly using the daily share prices to calculate the returns on the portfolio and the daily NSE 20 share index to calculate the return on the market portfolio.

## Appendix I: Research Data (Average monthly price and annual dividend)

| Firm | Month | Share price | Dividend |
|---|---|---|---|
| Sasini | January | 19.50 | 0.25 |
| | February | 17.95 | 0.25 |
| | March | 17.05 | 0.25 |
| | April | 18.75 | 0.25 |
| | May | 17.85 | 0.25 |
| | June | 17.20 | 0.25 |
| | July | 17.45 | 0.25 |
| | August | 18.85 | 0.25 |
| | September | 19.70 | 0.25 |
| | October | 20.25 | 0.25 |
| | November | 17.90 | 0.25 |
| | December | 18.40 | 0.25 |
| Barclays | January | 13.35 | 0.20 |
| | February | 13.10 | 0.20 |
| | March | 13.05 | 0.20 |
| | April | 12.70 | 0.20 |
| | May | 12.40 | 0.20 |
| | June | 12.50 | 0.20 |
| | July | 12.45 | 0.20 |
| | August | 12.70 | 0.20 |
| | September | 12.80 | 0.20 |
| | October | 12.85 | 0.20 |
| | November | 10.10 | 0.20 |

| | | | |
|---|---|---|---|
| | December | 10.05 | 0.20 |
| CFC Stanbic | January | 81.50 | 1.77 |
| | February | 81.00 | 1.77 |
| | March | 89.00 | 1.77 |
| | April | 80.00 | 1.77 |
| | May | 84.00 | 1.77 |
| | June | 80.50 | 1.77 |
| | July | 82.00 | 1.77 |
| | August | 85.00 | 1.77 |
| | September | 85.50 | 1.77 |
| | October | 92.50 | 1.77 |
| | November | 86.00 | 1.77 |
| | December | 90.00 | 1.77 |
| Equity Bank | January | 40.75 | 2.00 |
| | February | 40.25 | 2.00 |
| | March | 40.00 | 2.00 |
| | April | 39.25 | 2.00 |
| | May | 38.50 | 2.00 |
| | June | 39.00 | 2.00 |
| | July | 39.50 | 2.00 |
| | August | 40.50 | 2.00 |
| | September | 40.25 | 2.00 |
| | October | 39.75 | 2.00 |
| | November | 39.25 | 2.00 |
| | December | 40.00 | 2.00 |

| | | | |
|---|---|---|---|
| Kenya Commercial Bank | January | 43.00 | 1.00 |
| | February | 43.50 | 1.00 |
| | March | 42.75 | 1.00 |
| | April | 41.75 | 1.00 |
| | May | 39.75 | 1.00 |
| | June | 39.50 | 1.00 |
| | July | 41.75 | 1.00 |
| | August | 41.25 | 1.00 |
| | September | 39.25 | 1.00 |
| | October | 39.00 | 1.00 |
| | November | 39.75 | 1.00 |
| | December | 39.50 | 1.00 |
| Standard Chartered | January | 203.00 | 6.00 |
| | February | 202.00 | 6.00 |
| | March | 195.00 | 6.00 |
| | April | 190.00 | 6.00 |
| | May | 191.00 | 6.00 |
| | June | 192.00 | 6.00 |
| | July | 198.00 | 6.00 |
| | August | 205.00 | 6.00 |
| | September | 195.00 | 6.00 |
| | October | 201.00 | 6.00 |
| | November | 208.00 | 6.00 |
| | December | 207.00 | 6.00 |
| Co-operative Bank | January | 17.70 | 0.80 |

| | | | |
|---|---|---|---|
| | February | 16.90 | 0.80 |
| | March | 16.65 | 0.80 |
| | April | 16.50 | 0.80 |
| | May | 17.75 | 0.80 |
| | June | 18.30 | 0.80 |
| | July | 21.00 | 0.80 |
| | August | 20.25 | 0.80 |
| | September | 19.90 | 0.80 |
| | October | 18.60 | 0.80 |
| | November | 18.30 | 0.80 |
| | December | 18.15 | 0.80 |
| KQ-Kenya Airways | January | 5.00 | 0.00 |
| | February | 4.85 | 0.00 |
| | March | 4.65 | 0.00 |
| | April | 4.74 | 0.00 |
| | May | 4.80 | 0.00 |
| | June | 4.75 | 0.00 |
| | July | 4.65 | 0.00 |
| | August | 4.50 | 0.00 |
| | September | 4.40 | 0.00 |
| | October | 4.00 | 0.00 |
| | November | 3.95 | 0.00 |
| | December | 3.90 | 0.00 |
| Nation Media Group | January | 190.00 | 7.50 |
| | February | 177.00 | 7.50 |

| | | | |
|---|---|---|---|
| | March | 184.00 | 7.50 |
| | April | 174.00 | 7.50 |
| | May | 178.00 | 7.50 |
| | June | 180.00 | 7.50 |
| | July | 174.00 | 7.50 |
| | August | 175.00 | 7.50 |
| | September | 176.00 | 7.50 |
| | October | 159.00 | 7.50 |
| | November | 164.00 | 7.50 |
| | December | 163.00 | 7.50 |
| Scangroup | January | 27.50 | 0.50 |
| | February | 29.50 | 0.50 |
| | March | 32.00 | 0.50 |
| | April | 30.25 | 0.50 |
| | May | 29.75 | 0.50 |
| | June | 28.25 | 0.50 |
| | July | 27.50 | 0.50 |
| | August | 29.00 | 0.50 |
| | September | 23.00 | 0.50 |
| | October | 22.50 | 0.50 |
| | November | 21.50 | 0.50 |
| | December | 21.00 | 0.50 |
| Athi River Mining | January | 40.25 | 0.00 |
| | February | 39.75 | 0.00 |
| | March | 35.00 | 0.00 |

| | | | |
|---|---|---|---|
| | April | 36.50 | 0.00 |
| | May | 36.75 | 0.00 |
| | June | 34.00 | 0.00 |
| | July | 33.75 | 0.00 |
| | August | 31.00 | 0.00 |
| | September | 34.50 | 0.00 |
| | October | 34.75 | 0.00 |
| | November | 35.75 | 0.00 |
| | December | 35.50 | 0.00 |
| Bamburi Cement | January | 175.00 | 6.00 |
| | February | 170.00 | 6.00 |
| | March | 172.00 | 6.00 |
| | April | 174.00 | 6.00 |
| | May | 176.00 | 6.00 |
| | June | 179.00 | 6.00 |
| | July | 190.00 | 6.00 |
| | August | 198.00 | 6.00 |
| | September | 194.00 | 6.00 |
| | October | 192.00 | 6.00 |
| | November | 189.00 | 6.00 |
| | December | 195.00 | 6.00 |
| KenGen | January | 6.95 | 0.65 |
| | February | 6.15 | 0.65 |
| | March | 6.40 | 0.65 |
| | April | 7.85 | 0.65 |

| | | | |
|---|---|---|---|
| | May | 7.75 | 0.65 |
| | June | 8.00 | 0.65 |
| | July | 8.50 | 0.65 |
| | August | 8.20 | 0.65 |
| | September | 8.10 | 0.65 |
| | October | 7.15 | 0.65 |
| | November | 7.05 | 0.65 |
| | December | 6.55 | 0.65 |
| Kenya Kobil | January | 8.85 | 0.15 |
| | February | 9.35 | 0.15 |
| | March | 9.00 | 0.15 |
| | April | 9.90 | 0.15 |
| | May | 11.45 | 0.15 |
| | June | 10.90 | 0.15 |
| | July | 10.55 | 0.15 |
| | August | 10.70 | 0.15 |
| | September | 10.65 | 0.15 |
| | October | 10.50 | 0.15 |
| | November | 10.75 | 0.15 |
| | December | 10.85 | 0.15 |
| Kenya Power | January | 13.20 | 0.30 |
| | February | 13.00 | 0.30 |
| | March | 12.10 | 0.30 |
| | April | 12.00 | 0.30 |
| | May | 11.00 | 0.30 |

| | | | |
|---|---|---|---|
| | June | 10.90 | 0.30 |
| | July | 11.60 | 0.30 |
| | August | 11.90 | 0.30 |
| | September | 11.85 | 0.30 |
| | October | 12.00 | 0.30 |
| | November | 10.95 | 0.30 |
| | December | 10.80 | 0.30 |
| | November | 17.95 | 11.00 |
| | December | 18.00 | 11.00 |
| British-American Investments | January | 13.65 | 0.30 |
| | February | 13.80 | 0.30 |
| | March | 11.70 | 0.30 |
| | April | 12.15 | 0.30 |
| | May | 12.00 | 0.30 |
| | June | 11.95 | 0.30 |
| | July | 11.35 | 0.30 |
| | August | 11.00 | 0.30 |
| | September | 10.90 | 0.30 |
| | October | 16.40 | 0.30 |
| | November | 15.40 | 0.30 |
| | December | 14.75 | 0.30 |
| Centum Investment | January | 47.00 | 1.00 |
| | February | 47.50 | 1.00 |
| | March | 43.25 | 1.00 |
| | April | 44.00 | 1.00 |

| | | | |
|---|---|---|---|
| | May | 46.75 | 1.00 |
| | June | 47.00 | 1.00 |
| | July | 45.75 | 1.00 |
| | August | 44.00 | 1.00 |
| | September | 46.00 | 1.00 |
| | October | 46.25 | 1.00 |
| | November | 42.25 | 1.00 |
| | December | 41.50 | 1.00 |
| British American Tobacco | January | 782.00 | 46.00 |
| | February | 785.00 | 46.00 |
| | March | 799.00 | 46.00 |
| | April | 802.00 | 46.00 |
| | May | 804.00 | 46.00 |
| | June | 805.00 | 46.00 |
| | July | 796.00 | 46.00 |
| | August | 800.00 | 46.00 |
| | September | 842.00 | 46.00 |
| | October | 824.00 | 46.00 |
| | November | 835.00 | 46.00 |
| | December | 826.00 | 3.50 |
| East African Breweries | January | 270.00 | 5.50 |
| | February | 276.00 | 5.50 |
| | March | 279.00 | 5.50 |
| | April | 298.00 | 5.50 |
| | May | 288.00 | 5.50 |

| | | | |
|---|---|---|---|
| | June | 279.00 | 5.50 |
| | July | 270.00 | 5.50 |
| | August | 273.00 | 5.50 |
| | September | 274.00 | 5.50 |
| | October | 300.00 | 5.50 |
| | November | 299.00 | 5.50 |
| | December | 302.00 | 5.50 |
| Safaricom | January | 16.35 | 0.76 |
| | February | 16.60 | 0.76 |
| | March | 16.50 | 0.76 |
| | April | 16.40 | 0.76 |
| | May | 16.25 | 0.76 |
| | June | 16.00 | 0.76 |
| | July | 15.15 | 0.76 |
| | August | 15.55 | 0.76 |
| | September | 15.25 | 0.76 |
| | October | 16.95 | 0.76 |
| | November | 17.25 | 0.76 |
| | December | 17.10 | 0.76 |

## Appendix II: Research data (NSE 20 share index and Risk free rate)

| Month | Nse 20 share index | Rf |
|---|---|---|
| January | 4,786.74 | 11.756 |
| February | 4,906.07 | 9.316 |
| March | 4,404.72 | 8.41 |
| April | 4,176.59 | 8.77 |
| May | 4,173.52 | 7.711 |
| June | 3,868.83 | 7.059 |
| July | 4,016.18 | 7.919 |
| August | 4,040.75 | 8.607 |
| September | 3,773.17 | 7.89 |
| October | 3,862.24 | 8.03 |
| November | 3,982.09 | 10.371 |
| December | 4,009.26 | 8.561 |

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