# A STUDY OF MONTH OF THE YEAR EFFECT: EVIDENCE FROM THE UGANDA SECURITIES EXCHANGE

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# DECLARATION

This research report is my original work and has not been submitted for the award of a degree or any other qualification in any other university.

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This research report has been submitted for examination with my approval as the University Supervisor.

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## DEDICATION

This work is dedicated to my baby girl Vivian: my wish is that you will do this one day. To Paulo who went down this path long before I ever thought I would. I hope you are proud of me. To my family and friends for encouraging me.

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# ABBREVIATIONS

| | | |
|---|---|---|
| **ALSI** | - | Uganda All Share Index |
| **APT** | - | Arbitrage Pricing Theory |
| **CDSC** | - | Central Depository and Settlement Corporation |
| **CMA** | - | Capital Markets Authority |
| **DSE** | - | Dar es Salaam Stock Exchange |
| **EMH** | - | Efficient Market Hypothesis |
| **EPS** | - | Earnings Per Share |
| **FDI** | - | Foreign Direct Investments |
| **GDP** | - | Gross Domestic Product |
| **IPO** | - | Initial Public Offering |
| **KSE** | - | Khartoum Stock Exchange |
| **NSE** | - | Nairobi Securities Exchange |
| **NYSE** | - | New York Stock Exchange |
| **SCD** | - | Settlement & Clearing Depository |
| **TLS** | - | Tax Loss Selling Theory |
| **USE** | - | Uganda Securities Exchange |

# ABSTRACT

The objective of this study was to assess the existence of month of the year effect on stock market returns at the Uganda Securities Exchange (USE) for the period between 01 January 2009 and 31 December 2018. All 15 companies listed on the USE were included in the study. The study analysed the monthly closing USE All Share Index (ALSI) for the 10 year period. The researcher used quantitative data analysis methods whereby inferential statistics involved OLS regression and chi square test to analyse the data. The study established a moderate and consistent trend on average monthly returns approaching the end and beginning of the year. Nonetheless the effect is not sufficient or statistically significant enough to provide a solid basis for investment decisions at the USE. It was further established that average monthly returns recorded a moderate correlation apart from January, June and December, respectively. The study further reveals that there is very little difference in USE mean monthly returns across the months in a year. This means there is no observed seasonal pattern and investors cannot take advantage of any seasonal patterns to make abnormal profits. Several studies have been undertaken on the influence of time of month in different stock markets which have shown this as a calendar anomaly which causes the stock market returns to be notably above the average in one or more of the months of the year, January being the one singled out most. The study thus recommends the need for Capital Markets Authority to craft regulations that can enhance efficiency at the USE. These regulations should be geared towards improving the effectiveness of performance monitoring of the stock market. The study restricted itself to only 10 years and thus, it would be prudent for future researchers to do a replica of this research for a longer period to find out whether the study findings will hold. The researcher suggests that future research is undertaken in developing countries that have relatively similar stock exchange markets with that of Uganda and to cover longer periods, so that comparative analysis can be undertaken to further shed light on the occurrence of the effect of time of month in such similar contexts as the USE.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the Study

Market participants and academicians have sought to understand the behavior of stock markets especially the price movement and the return, analyzing historical stock prices in a bid to predict prices for future periods (Chia, 2012). Gultekin and Gultekin (1983) observed that specific calendar events resulted in patterns in certain financial markets. These patterns are now known as calendar or seasonal anomalies and their occurance in the market serves as an indication of abnormality in traditional economic theory because this contradicts the Efficient Market Theory. Market anomalies result from conditions where a stock or group of assets perform in complete contrast to the theory of efficient markets and where stock prices are assumed to be arrived at after considering all the company and market data and information that is publicly available at any one time. According to Selvakumar (2011) of all such anomalies, calendar anomalies are viewed as the most significant ones and have been studied by many researchers and scholars over the years. Selvakumar (2011) further points out that some of the most accepted or recognised calendar anomalies are the effect of month, weekend and January. Many studies in the literature concerning market efficiency have been about changes in stock market returns brought about by the seasonal changes in days, weeks, months or years. Some of the findings of such work in the USA have identified higher returns on trading days in some months of the calendar year (Rosenberg, 2004).

This observation is further supported by Pandey (2002) who indicates that in some of the developed countries like the USA where tax returns are filed in December studies found that stock returns were affected by the "Year end" and "January" effects.

The study is anchored by the following theories: Efficient Market Hypothesis (EMH), Tax-loss selling theory (TLT) and Arbitrage Pricing Theory (APT). EMH opines that in markets that are efficient, share prices are random and reflective of available information (Fama, 1970). This makes it hard for investors to either forecast future prices or make abnormal profits in the market from analysis of market trends. This theory repudiates the presence of anomalies. TLT was postulated by Barron (1991) who maintained that investors that sell off low priced shares especially towards the end of the fiscal year so as to sustain losses that are utilized in off-setting profits or capital gains realized in the course of the year with the objective of lowering tax obligations. APT was propounded by Ross (1976) who argued that the basic belief of the theory was based on the fact that arbitrage is not present in the market. This theory mainly focuses on financial assets pricing and modelling of the predictable return through establishing the level of sensitivity of changes by various factors or market indices. APT seeks to forecast returns from assets out of the relationships amongst these variables and returns through assuming a linear relationship.

Some empirical studies have also ascertained that the January effect can occur in any market, whether developed, undeveloped or developing. For instance, Kumari and Mahendra (2016), used the Indian Stock market to study the occurrence of the monthly calendar anomaly over a 20 year period and observed the month of April returns to be materially or higher and dissimilar in comparison to the rest of the

months in the year. Wong and Dollery (2017) studied the Malaysian stock market returns for a 15 year period with respect to the monthly effect and results supported the fact that the monthly effect was present in varied months and/or periods. Similarly, Bahadur and Joshi (2015) observed the month of the year effect when they studied the Nepal Stock Exchange for a period of 10 years between 1995 and 2004. Fountas and Segredakis (2002) examined 18 stock markets in a number of developing nations for the occurrence of monthly effect for 9 years from January 1987 to December 1995 and reported that the stock returns for the month of January were notably higher in comparison to the rest of the months of the year in only Turkey, Taiwan, Chile, Korea, and Greece.

In other studies stock prices have been shown to be predicable on the premise of past data, like profit yields, seasons and total national output and that normal stock prices contain data that is valuable in anticipating stock costs (Hamrita and Abdelkader, 2011). Changes in patterns include the impact of time of year, January month, time of month, mid-month, intra-month and the-day-of-the-week, and further allude to the tendency of market returns to exhibit orderly trends in given set of conditions brought about by time of day, week, month or year (Chowdhury, 2005).

On the other hand, Basu (1983) found that investors' risk aversion and an inability of the market to absorb demand and supply offers effectively continue to affect the market liquidity, trading activities and stocks performance. Predictable patterns can be exploited by investors to realise abnormal profits. Consequently, the month of the year impact is the subject of this study's examination.

## 1.1.1 Stock Market Returns

Stock market returns are generated by investors from the stock market in the terms of dividends declared by the listed companies or through profit from trading in the shares at prices above the purchase price. Predicting price movements and taking risks is a big element of determining the profit. All share index (ALSI) is the weighted average value of share prices of all the shares listed at a particular securities exchange measured or tracked over time to represent the performance of the exchange. Investors use the indices to track and compare returns. Changes in market capitalization result from share price fluctuation and from issue of new and bonus shares. Thus high activity at the stock market is a sign of more investment. There are two methodologies that are utilized to determine securities exchange returns: that is basic returns arrangement and logarithm returns (Ariss, 2011). The logarithm returns have the advantage of having a normal distribution which is an advantage over the basic returns and which means they are better suited for statistical methods of analysis and are easier to control and manage (Ajayi, et al. 2004). According to Mlonzi, Kruger and Nthoesane (2011) share prices change daily, sometimes more than once on the same day in response to the offers and the uptake in the market.

This implies that share prices are controlled by free market forces as well as incorporating organization essentials, market conduct and other factors. Ferris and Hwang (2012) observe that stock market returns in developed economies have generally exhibited a trend whereby stocks that have done poorly during the year experience extreme pressure to be disposed of at the close of the year, which increases the amount of trading and may lower prices. This is particularly true for small-cap

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stocks, which are less liquid and more unpredictable and consequently are more likely to offer opportunities for tax harvesting (Ferris and Hwang, 2012).

**1.1.2 Market Anomalies**

Market anomalies relate to deviations from the efficient market hypothesis which cause market returns to rise or drop and could be anything from a new listing announcement or recommendation of an analyst (Levy and Post 2005). A definition by Tversky and Kahneman (1986) is that an anomaly is a behavior different from the norm or standard that is unacceptable and that is too rampant to be swept aside, too organised to be discharged as coincidence, and so essential that the norm cannot to be softened or changed to entertain it. According to Ariss (2011) critics of the efficient market hypothesis have come up with the concept of anomalies, whereby for example Monday returns become the lowest and are in negative whereas the mean returns for Friday's are the highest and are positive when the effect of the change in trading system is considered. Cao and Wei (2005) report that Januarys' mean returns are the highest but the coefficient is not significant, and that Decembers' mean returns are second highest and the coefficient is highly significant.

Hamrita and Abdelkader (2011) define the small firm effect as the persistent abnormal stock returns obtained by the small capitalization firms and further point out that studies have concluded that initial public offerings (IPO's) largely underperform the market and there is also support that secondary offerings also underperform. Silver (2011) categorises anomalies into those that are time based or calendar effects and those that are triggered by announcements. In addition he mentions the use of superstition to predict market trends and the possibility of exploiting these anomalies

to make abnormal profits. Calendar effects include weekend, January, month end, and year end effects. Announcements are declaration of dividends, stock splits, mergers and acquisitions among others.

### 1.1.3 Month of the Year Effect

As indicated by Rozeff and Kinney (1976) the time of the year impact is a market anomaly in which the capital market demonstrates fundamentally higher than normal returns in the January month. Bepari and Mollik (2009) indicate that if the returns for certain months in the year are higher or notably more positive than the returns for the rest of the months of the year, this means that the effect of month of the year exists. This observation is contrary to what the Efficient Market Hypothesis as traders are able to earn irregular returns by probing past prices and trends and based on this plan to buy or sell certain securities.

Pandey (2012) indicates that the month of the year anomaly results from investors selling shares or stocks which have diminished in value in order to reduce their tax burden at end of tax the year, which in turn puts a forces stock prices to go down and thus resulting into diminished stock returns and profits. Thereafter investors begin buying stocks and share prices begin to rise thus causing greater returns when the new calendar year begins (Pandey, 2012).

Consequently, if there is high activity in the share trading system that flags more interests in the securities exchanges at a particular day or month of the year, it is inferred that the monthly effect exists in that market.

### 1.1.4 Uganda Securities Exchange

Uganda Securities Exchange (USE) started trading in January 1998 and currently has 16 listed securities plus a number of debt instruments. The Settlement and Clearing depository (SCD) electronic system was introduced in 2010 and the exchange operates a T+3 settlement cycle. The weak form efficiency is displayed by Uganda Securities Exchange as well as the presence of volatility clustering in ALSI. This may be due to the fact that with only 15 listed companies, trading volumes and liquidity are low. There is thus the need broaden the market by introducing more products like unit trusts, implementing a second tier and electronic trading all aimed at increasing efficiency (Watundu, 2015).

Birakwate (2008) reported that given the high volatility in USE, there was need to raise expected returns by using strategies designed towards enhancing returns. USE (2015) indicates that several changes in the tasks of the Uganda Securities Exchange such as long term products or funding, liquidity generation as well as enhancement and growth of the financial sectors among others, are geared towards improving service delivery and enhancing the regulatory responsibilities over trading participants. In order to execute these functions effectively, an understanding of the USE stock market trends, specifically the month of the year effect, would contribute highly to the performance and efficiency of the USE.

### 1.2 Research Problem

Changes in capitalization happen because of variances in share costs and issue of new offers, and as a result high action at the share trading system may flag more interests in the securities exchanges at different points in time. Kyereboah, Anthony and

Agyire (2008) argue that market turnover shows inflows and surges in money markets and depends on the effectively exchanged offers. However, Chowdhury (2005) observes that regardless of the possibility that people are not normally into acknowledging the notion of making losses, they are forced to do this in order to realise the tax assessment benefits. At the start of the new calendar year they will buy back of the same stocks causing the costs to shoot up thus creating anomalous significant yields.

Rozeff and Kinney (1976) researched on the monthly effect at the NYSE using data for the 70 year period between 1904 and 1974. They found the January average returns to be notably above the returns of the rest of the months. This was one of the earliest studies on this matter.

In this light, several studies have been undertaken with an aim of verifying the monthly effect. One such study done by King'ori (1995) sought to establish if monthly and quarterly seasonality's exist at Nairobi Securities Exchange (NSE). He observed that the average stock returns for all the periods examined were equal. Otuke (2006) reported that changes in stock market capitalization happen because of variances in share costs and issue of new offers which infers high action at the share trading system and may flag more interests in the securities exchanges. Allan and George (2013) concluded it is obligatory to examine the occurrence of calendar and seasonal anomalies in NSE to facilitate the Capital Markets Authority of Kenya and the NSE in establishing a regulatory structure to safeguard stakeholders' interests; it would also ensure that the actions of investors who try to profit from the use of any existing anomalies would be lawful.

According to USE 2015 annual report USE posted a 60% decline in equity turnover in 2015 compared to 2014 mainly due to a reduction in foreign investors resulting from the weakening shilling against the US Dollar and also due to increased central bank interest rate which spiked investors' interest in fixed income securities. This was in stark contrast to 2014 where USE experienced a 75% growth in equity turnover due mainly to the Umeme secondary offer, DFCU bonus issue and the automation of trading USE (2014). The relatively high business trading volumes at the Uganda Securities Exchange (USE) throughout the most recent ten years is a sign that the investing public has embraced the exchange as a way of accumulating reserve funds and also as a source of financing for potential organizations (USE, 2014). This emerging trend however lags behind other securities exchanges in East Africa as USE privately recorded firms have not pulled in a critical extent of the worldwide capital streams; and the trading trend of the USE, including moth of the year effect, is also not as closely watched as those of its counterparts in East Africa (CMA, 2009). Consequently, this study aimed at answering the following research question: Does the month of the year effect exist in stock market returns at the Uganda Securities Exchange for the period 1st January 2009 to 31st December 2018?

**1.3 Research Objective**

To assess the existence or occurrence of month of the year effect in stock market returns at the Uganda Securities Exchange.

**1.4 Value of the Study**

The study will contribute to bridging the knowledge gap on stock market anomalies at stock markets in developing countries particularly relatively smaller ones like the

USE. In addition, this study will build on existing theory by providing empirical evidence that asserts the theoretical propositions under study.

This study also provides information to government and other people who design economic policy to enable them to draft and execute relevant and feasible policies to be used in the running of the stock market and influencing its contribution to the economy. In addition, the study's findings are of help to the government of Uganda in its policy making decisions as they will provide relevant information which factors the anomalies in the USE market.

Finally, the USE management will benefit from the study findings as they inform their adoption of best practices in the management of stocks trading to manage any anomalies that may reduce the attractiveness of USE. Therefore, the findings of this study should be used by USE management when planning strategies to improve the stock market efficiency. Since there are no legal restrictions on foreign participation in the USE, this study therefore has implications for both Ugandan and non-Ugandan investors.

## CHAPTER TWO

## LITERATURE REVIEW

### 2.1 Introduction

In this chapter we examine the theories on month of the year and related literature on the monthly effect on the returns of the stock market.

### 2.2 Theoretical Foundation

This section highlights the theories that formed the study's theoretical framework which included the Efficient Market Hypothesis by Fama (1970), the Tax-loss selling theory by Barron (1991), and the Arbitrage Pricing Theory (APT) introduced by Ross (1976).

### 2.2.1 Efficient Market Hypothesis

Efficient Market Hypothesis (EMH) was defined by Fama (1970) to state that in an efficient market stock prices are random and fully incorporate all available information. With this state of affairs it would be difficult for investors to either predict future prices or make abnormal profits in the market as a result of analyzing trends or any other market analysis. This theory in other words denies the existence of anomalies. Based on the type of information, historical, public and private, Fama identified three categories that indicate efficiency of the market, that is weak, semi strong and strong respectively. The efficient market theory assumes that all investors are reasonable and does not expect that business sectors can predict the future, but rather it assumes that business sectors make impartial estimates (Chowdhury, 2005). Lucas (1978) observes that in business sectors where all financial specialists make rational decisions, costs completely incorporate all accessible data.

In addition investors make rational decisions, the information gathering process is efficient in the market and all prices quickly reflect this information at the same time.

According to Fountas and Segredakis (2002) the efficient market hypothesis explains why higher interest rates lower the present value of expected future earnings, which consequently pushes down the stock costs. Under other conditions, lower interest rates for the most part result in a lower opportunity cost of acquisition thus causing increased activity and a rise in the prices.

The efficient market hypothesis is appropriate for this study as it informs of reasons why there could be market anomalies. The study sought to determine if the conditions for efficient market exist in USE and if all publically available data is incorporated in share prices so that investors cannot study monthly patterns to predict share prices and therefore make abnormal profits at certain times of the year.

### 2.2.2 Tax-loss Selling Theory

Tax loss selling (TLS) theory propagated by Barron (1991) involves investors selling off low priced or loss making securities particularly at the close of the tax year with the aim of realising losses which are then used to offset any profits or capital gains made during the year so that these losses can be used to reduce their tax obligations. This action tends to further push down the prices of these securities. On the other hand, investors will tend to hold on to highly priced or profit making securities and only sell them after the end of the tax year. This is due to the fact that profit and losses can only be realised when the sale has taken place and also the fact that a tax cost determined and deducted upfront is better than a deferral of the same (Barron, 1991).

At the start of the next tax year investors will then buy back the securities they sold at year end and this action will push up the prices.

Jones and Apenbrink (1991) examined the TLS with the aid of Cowles Industrial Index. They concluded that before personal income tax was introduced in 1917, the month of January effect was insignificant or not critical as compared to the period after this when it was found to be significant. They thus identified the cause as tied to taxation of income. Poterba and Weisbenner (2001) also made findings that support the TLS theory with similar conclusions.

Cao and Wei (2005) point out that the TLS theory fails to provide reasons why institutional investors who are not subject to taxation don't take advantage of the lower prices in December resulting from sale of loss making stocks by buying these stocks and selling them in January to make higher than normal returns. These investigations may prove that speculators can time their offers to coincide with periods where they can make above normal returns thus pointing to the inefficiency of the stock exchange (Cao & Wei, 2005).

The TLS may offer a possible explanation as to why stock returns at the USE exhibit certain patterns especially if the observations made by this study show that stock returns during the months at the beginning or end of the tax year are significantly more or less than those of other months during the year.

### 2.2.3 Arbitrage Pricing Theory

Arbitrage Pricing Theory (APT) was made known by Ross (1976), and the basic supposition of the theory is the fact that arbitrage does not exist in the market (Wang, 2015). The theory concerns the pricing of financial assets and models the expected

return on these assets as a linear function by determining sensitivity to changes in different factors, variables or market indices. The APT purports to predict asset returns from the relationship between these variables and the returns by assuming a linear relationship. Such factors include inflation, gross domestic product (GDP), exchange rates and market indices and represent the risk involved. APT may be used by investors to analyse their portfolios to determine assets that are not fairly priced for a time. This then gives arbitrageurs the opportunity to take advantage of the situation to make abnormal profits.

Pastor and Stambaugh (2010) indicate that APT is a model for only a single period with the assumption that depositors believe that the presumptive properties of the capital stock returns are in line with the structure of the elements. Therefore, if the prices at the point of equilibrium give no room for arbitrage profits over a fixed set of stocks, this means the stock returns that are anticipated are linked to the factor loadings in linear fashion. The factor loadings are proportional to the returns' covariance's with the said factors (Pastor and Stambaugh, 2010).

Antoniou and Priestley (2008) point out that the arbitrage pricing theory is based on the avoidance of arbitrage. According to them this is indicative of the fact that for equilibrium to hold in a market where the traders need to maximise profit on certain stocks, the linear pricing relation is essential. In addition, the expectation of the avoidance of arbitrage or the equilibrium of maximisation of profit on certain stocks whereby the relationship between the expected returns and the betas is linear is synonymous to being able to compute the price of an asset or stock by the discounting

of the future expected cash flows using a discount factor known as the stochastic discount factor (Antoniou and Priestley, 2008).

According to Mitchell and Pulvino (2011) the arbitrage pricing theory is a replacement for the Capital Asset Pricing Model. They argue that the relationship between anticipated stock returns the covariance between these returns with other variables picked at random is linear. Covariance in this case is taken to measure the amount of risk that cannot be averted by the investors by diversifying their portfolios. A risk premium in this case is the coefficient of the slope in the linear relationship described above.

The APT lends credit to this study in that if indeed the USE is not efficient, which would be indicated if the market returns follow a certain pattern based on certain months of the year being significantly higher or lower than others, then market returns could be predicted by investors. APT is one such method that could be used to do this.

## 2.3 Determinants of Stock Market Returns

This section discusses the reviewed determinants of stock market returns which include calendar anomalies, macroeconomic variables, market performance and risk free rate of returns.

### 2.3.1 Calendar Anomalies

Calendar anomalies result from changes in market returns brought about by particular months of the year, seasons, weeks or days in the week and may be a one off or repeated. Karz (2010) identified some like weekend, turn of the month and year-end effect. The January effect is another calendar anomaly. Anomalies in stock markets

cause results to deviate from those expected under finance theory or the EMH in particular and can lead to investors being able to predict and take advantage of market trends.

According to Sahar Nawaz (2012) various factors like unfair competition, lack of transparency in the market, actions by the regulators, biases in behavior of market participants and time of day, week, month or year usually affect the stock market performance. Specifically, the existence of calendar effects like day, week, month, year or holiday may result into an inefficient stock market which in turn will lead to erratic and strange stock returns patterns.

Galai and Kedar (2015) reported findings that counter the efficient market hypothesis as they stated that calendar anomalies tend to create inefficiency in the stock market. Such anomalies include small firm size effect, January effect, week end effect (weekend has a reverse affect), holiday, month end, and weekday (the returns on Mondays are usually positive and significantly higher in comparison to the returns of other days).

### 2.3.2 Macroeconomic Variables

According to Akbar (2012) changes in macroeconomic variables have a negative effect on business by upsetting the normal course of trade. In this case assessment of and prediction the future movement in macroeconomic variables may assist in predicting the primary direction of stock returns. Akbar (2012) further indicates that studies relating to the effect that macroeconomic growth has on the performance of the stock market demonstrate that the state of the economy greatly affects the stock market and that the existing macroeconomic variables form a very good basis for

forecasting the economic conditions of the future. The determinants and variables will be unique and exclusive for each stock exchange and indeed each country so that there might well be varied and distinct answers to the when the same variables are considered.

Haug and Hirschey (2006) indicate that macroeconomic factors like growth in gross domestic product (GDP), foreign exchange and inflation rates influence stock returns. Kyereboah, Anthony and Agyire (2008) argue that when a country is experiencing high GDP growth rate especially as a result of increased foreign direct investments (FDI), there is a tendency of stock returns to exhibit similar growth. They further add that speculators in the stock market use macroeconomic indicators as tools to either invest or divert funds away from the stock market, which in turn impacts on the stock market returns.

### 2.3.3 Market Performance

Market performance is determined by all the securities or financial instruments offered and exchanged at the stock exchange and are a pointer of general market development in a given period (Levine & Zervos, 1998). Stock market indices record the changes in stock prices in a securities exchange. A stock market index measures a stock market or a sector or segment of the stock market and is determined by taking the weighted average of the stock prices. It is used by investors and other interested parties to determine the condition of the market and the economy. Indices are normally weighted by market capitalization (Levine & Zervos, 1998).

Any upward changes in the stock market indices will generally suggest that the financial specialists are certain about the future prospects of the market and economy

in general and will cause increased interest in the economy (Kyereboah, Anthony & Agyire, 2008). In any case, a fast increment in money markets that is not legitimized by the essentials is stressing all things considered an ascent can't be maintained and in the end the record will fall imperiling the monetary and budgetary strength. It is therefore of fundamental importance for the policymakers keep tabs on changes in the stock exchange and be prepared to take any required actions (Kyereboah, Anthony & Agyire, 2008).

### 2.3.4 Risk Free Rate of Return

According to Mabhunu (2004) the risk free rate of return is the rate used in computing the cost of holding capital and is equivalent to the interest earned on government long term loans and bonds, which are considered to be free of default. In any case, the cost of capital will change as changes in interest rates occur and in specific circumstances the present interest free rate may appear to be too high or too low when contrasted with past rates or similar cash investments; hence any adjustments on the risk free rate will directly affect returns on capital (Mabhunu, 2004). Agrawal and Tandon (1994) demonstrate the risk free rate of return as that which any investor would expect to get when he invests without any risk. They went on to explain that as the rate of return increases, so does the risk related with the project.

Carleton and Lakonishok (2015) observe that the market risk premium refers to the discrepancy between the anticipated return on a common stock and the rate of return on the risk free asset; because of the market risk premium, investors expect to earn from any investment they make a return higher than the return on risk free assets. Esqueda, Assefa and Mollick (2012) similarly indicate that this higher than normal

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return on stocks will vary in different economic environments (like un developed, developing, developed countries), because the changes in the activity at the stock market are directly impacted by variations in financial and economic advancement of the economy.

## 2.4 Empirical Studies

Using data from the NYSE for the years between 1904 and 1974, Rozeff and Kinney (1976) discovered that the January average returns were greater than the returns of the rest of the months at 3.48% compared to 0.42%. They concluded that the January effect existed at NYSE and was generally attributed to the effect of the TLS theory where investors sell securities that are not so profitable or are making losses at the close of the tax year and then subsequently buy them again when the new tax year began.

Gultekin and Gultekin (1983) studied sixteen countries for seasonal anomalies and concluded that the January effect occurred in some of the countries researched on (15 of them) evidenced by significant increase in the returns for the month of January in comparison to the returns of the rest of the months in the year. This confirmation of January impact/effect made it a worldwide issue and incited many similar studies outside the United States.

Muragu (1990) investigated the price movements at the Nairobi stock exchange with focus on the market efficiency levels in the stock market. He concluded that the random walk is present in Nairobi Stock Exchange. The presence of the random walk means that no predictable cycle or pattern can be discerned from the movement of

prices and that prices in the future cannot be predicted by studying this pattern or other methods as they bear no resemblance and are unconnected to past prices.

King'ori (1995) tested whether Nairobi Securities Exchange displays seasonality over the months and quarters. He concluded that there were no apparent patterns as stock returns for the tested months and quarters were similar.

Hamori (2001) carried out a study of seasonality in the prices of stock at the Tokyo Stock Exchange. He studied data for the period 1971 to 1997 for the small, medium and large companies that were listed on this market. Whereas seasonality was found in the small and medium stocks, it was negative for the large company stocks. He found that the seasonality at the Tokyo Stock Exchange is not random but rather determined by the month of the year.

Nyamosi (2009) however found elaborate existence of the month of the year effect at the Nairobi Securities Exchange. He utilized relapse examination by creating negative coefficients affirming that the returns in the month of January were greater than in alternate months. Wong et al. (2006) looked at the mean stock returns at the Stock Exchange of Singapore and found the month of January to be greater than the rest of the months during the pre-crisis period. This effect however was found to have no effect during the later periods.

A study by Ariss (2011) on the Gulf Cooperation Council (GCC) indices meant to establish the January anomaly instead found out that the returns in December were positively higher and more significant when compared with those of other months in the year. He concluded that the December effect existed in the GCC.

Chia (2012) studied the Tokyo Stock Exchange Nikkei 225 Index in a bid to establish the presence of the effect of month of the year. The study covered the period from January 2000 to June 2009 and confirmed significantly positive returns in the month of November which they said could be attributed to tax loss selling. They concluded that investors could take advantage of this trend or result to make abnormal profits in the share market.

In the study by Kuria and Riro (2013), they found the presence of the seasonal anomaly for the NSE-20 at the Nairobi Securities Exchange (NSE). The study looked at day of the week, the weekend and month of the year anomalies and used NSE indices of 12 years. The study found the Monday returns to be negative and the Thursday returns to be notably positive and came to the conclusion that extensive day of the week effect existed for NSE-20. The study also established the December effect at the NSE. They however found no weekend effect.

It was noted by the study that these findings were despite the relative advancement in regulation and use of technology present at the NSE which could prevent investors from making abnormal profits.

Maswere and Kaberuka (2013) undertook a study to establish the factors that determine stock market prices at USE between January 2003 and March 2011. The study revealed that exchange rates, money supply, rate of inflation and rate of interest significantly affect stock market price in the long term and when lagged, the value of money supply and interest rate are not significant enough to explain the stock market price in the short-run.

Abdalla (2015) assessed the monthly effect on the Khartoum Stock Exchange (KSE) between January 2008 and December 2014. He could not establish any evident patterns in any of the months and therefore found that the occurrence of the monthly effect does not hold for KSE. He also concluded that the KSE is informationally inefficient with prices not fully reflecting all the available information. The investor is thus unable to make abnormal profits by doing any market analysis. Reasons attributed to the absence of this anomaly include the fact that the market is still developing and that there is lack of transparency as far as information is concerned. At that time of the study 59 companies were listed at the KSE.

## 2.5 Conceptual Framework

Miles and Huberman (2014) asserted that when a diagram or writing is used to narratively or graphically explain the main concepts, factors or variables to be studied, and the assumed relationships between the identified variables this is described as a conceptual framework. This study hypothesized that the determinants of stock market return: calendar anomalies, macro-economic variables, market performance and risk free rate of returns (independent variables) affected month of the year effect (dependent variable) as explained by stock market returns. The study's conceptual framework is illustrated in Figure 2.1 below:

**Independent Variables**                                    **Dependent Variable**

```
┌─────────────────────────┐
│                         │
│   Calendar Anomalies    │──────┐
│                         │      │
└─────────────────────────┘      │
                                 │
┌─────────────────────────┐      │
│                         │      │    ┌──────────────────────────┐
│  Macroeconomic Variables│──────┤    │                          │
│                         │      │    │ Stock Market Returns - Month │
└─────────────────────────┘      ├───▶│                          │
                                 │    │    of the Year Effect     │
┌─────────────────────────┐      │    │                          │
│                         │      │    └──────────────────────────┘
│   Market Performance    │──────┤
│                         │      │
└─────────────────────────┘      │
                                 │
┌─────────────────────────┐      │
│                         │      │
│  Risk Free Rate of Return│─────┘
│                         │
└─────────────────────────┘
```
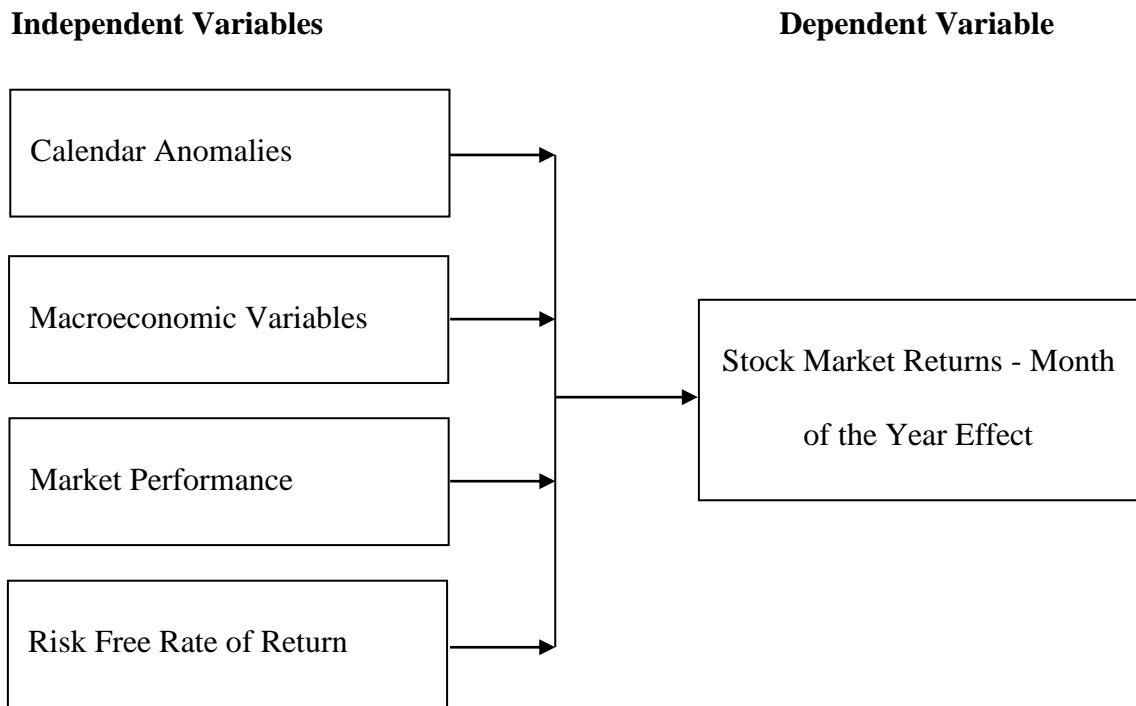
**Figure 2.1: Conceptual framework**

**2.6 Chapter Summary**

From the reviewed literature it is evident that various studies have been done and continue to be conducted on the occurrence of the monthly effect on the returns of the stock market in many stock exchanges over the world. Findings from reviewed empirical literature have been inconsistent based on the where the market is located and the timing of the study. Some studies have established seasonality while others, mostly in the developing countries have not. Some researchers have attributed the anomaly to new negative information originating from the yearend tax breaks, cash flows and investor perceptions while other researchers have not been able to provide significant information on the existence of the month of the year effect.

Moreover, the literature reveals several findings that dig deep into the economies of stock both in small and large economies; however major studies done in foreign and developed countries pay little attention to the emerging economies mainly in Africa and those that have mixed reports with regard to the existence of market anomalies in developing counties. In addition, even fewer studies have been carried out on the USE. Similarly, studies that have looked into the end of the month effect in stock market returns have exhibited mixed results. This necessitates the need for this study as it aims at gathering empirical data from the USE which can assist in filling the gap in literature.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

Chapter three sets out the methodology used in this study and includes subsections on; research design, target population and census method, data collection and data analysis. It defines process the researcher used, the data that was used, how it was compiled and the methods that were used to analyse it for the purposes of this study.

## 3.2 Research Design

This study used a descriptive research design. The method was suitable as it aids in presenting the information without altering or manipulating the variables. It was therefore suitable to establish the existence of the effect of the month of the year on stock market returns at the Uganda Securities Exchange (USE).

## 3.3 Target Population

Target population was the whole group or chosen number of people or items considered to have a common attribute that can be used for a study. According to Nsubuga (2006), a population is a group of people, elements, items, or things being investigated. Therefore, the study used a target population of 15 companies listed at the USE represented by the All Share Index (Appendix 1). Owing to the small number of listed companies at USE, there was no sampling as all the listed companies participated in this study. This is because the target population was small and accessible. Therefore, all the 15 listed companies participated in the study.

Kothari (2004) recommends census to be applied when the target population is small and accessible. USE is only a little more than a decade old hence a longer period would face challenge of missing data.

## 3.4 Data Collection

Secondary data was used for the purpose of this study. This is because it was readily available on the USE website. This study relied on monthly closing USE All Share Index prices from 1$^{st}$ January, 2009 to 31$^{st}$ December, 2018 from the Uganda Securities Exchange database. This data was adequate to establish the occurrence of the monthly effect.

## 3.5 Data Analysis

To analyse the data, the researcher used quantitative data analysis methods. Descriptive and inferential statistics involving OLS regression and chi square test were used. The researcher used SPSS Statistics 21 as an aid to help in the analysis. The results are presented in tables and graphs. The study utilized an analytical model as the month of the year effect exists if returns tend to be notably higher or lower in particular months of the year, in comparison with the other months of the year. Monthly continuously compounded log returns were calculated as;

$$R_t = \log\left\{\frac{P_t}{P_{t-1}}\right\} * 100 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

$$R_t = \alpha_1 M_1 + \alpha_2 M_2, \dots, \alpha_{12} M_{12} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

The presence of monthly seasonality implies;

$H_0: \alpha_1 = \alpha_2, \dots, \alpha_{12} = 0$ against

$H_1: \alpha_i \neq 0 \; for \; i = 1, \dots, 12$ .................................................................... (3)

The similarity of returns in the various months was tested using the non-parametric Kruskal-Wallis test. The aim of this was to observe any noteworthy differences or similarities between the data represented in the various months. This test uses the ranks of the data or observations instead of the actual data or observations using the KW formula:

$$KW = \frac{12}{n(n+1)} \sum_{i=1}^{k} \frac{R_i^2}{n_i} - 3(n+1) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

Where $n$ represents total number of sample observations, $k$ represents monthly returns and therefore $k= 12$, $n_i$ represents sample size for $i$ month, and $R_i$ represents the rank sum of the $i$ month. The chi-square distribution for this test has degrees of freedom amounting to ($k$-$1$) which implies eleven degrees of freedom (12-1) with a 5% level of significance for this study.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTS AND DISCUSSIONS

## 4.1 Introduction

The results from analyzed data, interpretation and discussion of findings are provided in this chapter. These include normality tests, descriptive statistics, graphical presentation of monthly average stock returns and correlation analysis. The analysis, results and findings have been done in line with the research objective which was assessing the occurrence of the effect of month of the year on the returns at the USE.

## 4.2 Tests of Normality

Normality tests were conducted to find out if the data set was normally distributed and to determine if it was likely that there was an underlying random variable for the data set to a normal distribution curve. The results are set out in Table 4.1.

**Table 4.1 Normality Tests**

**Tests of Normality**

|  | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
|  | Statistic | Df | Sig. | Statistic | df | Sig. |
| January | .159 | 10 | .200[*] | .947 | 10 | .631 |
| February | .204 | 10 | .200[*] | .871 | 10 | .103 |
| March | .175 | 10 | .200[*] | .943 | 10 | .581 |
| April | .141 | 10 | .200[*] | .970 | 10 | .892 |
| May | .147 | 10 | .200[*] | .944 | 10 | .596 |
| June | .208 | 10 | .200[*] | .888 | 10 | .159 |
| July | .191 | 10 | .200[*] | .911 | 10 | .290 |
| August | .162 | 10 | .200[*] | .971 | 10 | .896 |
| September | .146 | 10 | .200[*] | .911 | 10 | .289 |
| October | .137 | 10 | .200[*] | .936 | 10 | .505 |
| November | .154 | 10 | .200[*] | .899 | 10 | .215 |
| December | .195 | 10 | .200[*] | .928 | 10 | .432 |

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Results depict that all the study variables fall under a normal distribution curve since their significance levels (p-values) exceed 5% (0.631, 0.103, 0.581, 0.892, 0.596, 0.159, 0.290, 0.896, 0.289, 0.505, 0.215 & 0.432, respectively).

## 4.3 Descriptive Statistics

Involves use of simple summaries of a sample with observations made. It is measured using some of the following common measures: mean, standard deviation, maximum values, minimum values, coefficient of variation, 95% confidence interval and skewness as provided in Table 4.2 below.

**Table 4.2 Descriptive Statistics for the monthly returns**

| | N | Minimum | Maximum | Mean | Std. Deviation | Kurtosis | Coeff Var% | 95% CI |
|---|---|---|---|---|---|---|---|---|
| Month | No. | % | % | % | % | % | % | % |
| January | 10 | -0.03 | 0.04 | .0135 | .02090 | -0.195 | 154 | 1.498 |
| February | 10 | -0.06 | 0.02 | -.0018 | .02620 | 0.388 | -1454 | 1.874 |
| March | 10 | -0.04 | 0.05 | .0083 | .02847 | 0.426 | 344 | 2.036 |
| April | 10 | 0.00 | 0.06 | .0223 | .01754 | 0.597 | 79 | 1.254 |
| May | 10 | -0.02 | 0.03 | .0080 | .01917 | -0.828 | 240 | 1.371 |
| June | 10 | -0.03 | 0.02 | .0015 | .01784 | 0.318 | 1152 | 1.276 |
| July | 10 | -0.02 | 0.04 | -.0009 | .02022 | -0.339 | 2247 | 1.447 |
| August | 10 | -0.02 | 0.03 | .0000 | .01448 | 0.596 | 29843 | 1.036 |
| September | 10 | -0.04 | 0.02 | -.0125 | .02214 | -1.634 | 177 | 1.584 |
| October | 10 | -0.06 | 0.03 | -.0023 | .02923 | -0.230 | 1293 | 2.091 |
| November | 10 | -0.02 | 0.02 | .0021 | .01334 | -0.040 | 623 | 0.954 |
| December | 10 | -0.02 | 0.03 | -.0040 | .01509 | 0.545 | 377 | 1.080 |
| Valid N (listwise) | 10 | | | | | | | |

Average Monthly Return 2009 to 2018
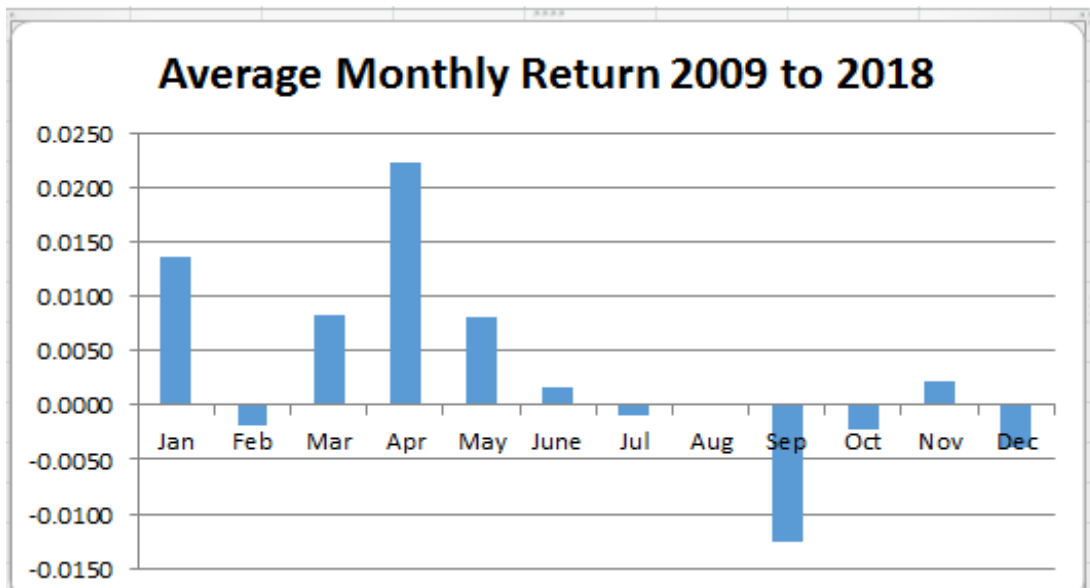
In Table 4.2, the results showed that on January, minimum stock return was -0.03 and the maximum was 0.04with a mean monthly return of 0.0135 and standard deviation of 0.0209. Skewness was recorded at 0.034 implying that the data was normally distributed. On the month of February, stock returns increased from -0.06 to 0.02 in the study period. The mean value was recorded at -0.002 and standard deviation at 0.026 implying that the effect of stock returns varied significantly on the month of February in the study period.

Highest increase in stock returns was recorded in the month of March from (-0.04-0.05), with a difference of 10 points. The increase recorded a mean score of 0.0083 and standard deviation of 0.02847 implying a significant variation in stock returns in the month of March.

The month of April recorded increase in stock returns from 0.00 to 0.06. April's mean score was 0.0223 with a standard deviation of 0.01754 showing limited variation of stock returns.

The month of May recorded a small increase in stock returns with a margin of 0.1 in the study period. The mean score was 0.0080 and standard deviation of 0.1917 which implied a significant variation of stock returns in the Month May. On the month of June, a slight increase in stock returns from -0.03 to 0.02 was attained. The mean score was 0.0015 and standard deviation of .01784 implying a slight variation in stock returns. A slight increase in stock returns in the month of July from -0.02 to 0.04 was attained. The mean score was -0.0009 with a standard deviation of 0.02022, implying that there was a slight variation in stock returns in the month of July.

The months of August and September recorded slight increase in stock returns with margins of 0.01 and -0.02. Their mean scores were 0.0000 and -0.0125 and standard deviations of 0.01448 and 0.02214 implying that stock returns for both months had limited variations.

Just like the month of April, the month of October recorded the highest stock returns with a difference of 10 points from -0.06 to 0.03 with a mean score of -0.0023 and standard deviation of 0.02923; which was an indication that stock returns for the month varied significantly. The month of November recorded a low of -0.02 and a high of 0.02 resulting in standard deviation of 0.013. The month of December had a low of -0.02 and a high of 0.03 with standard deviation of 0.015. This implies that there was minimal variation in stock returns for both months.

## 4.4 Discussion of Findings

In testing for normality, research showed that the probability values of the average monthly returns were higher than the level of significance, 0.05. Hence, with regard to the Kolmogorov-Smirnov test, this implied that the data used in the study was normally distributed. In line with the findings is a study by Marrett and Worthington (2011) carried out at the Australian stock market with regard to the occurrence of the effect of month of the year. The results disclosed that probability values that were higher than the level of significance, 0.05 which signaled that there was normality in the data; the data showed presence of normality in line with the normal distribution curve since the probability values were higher than 0.05. Additionally, Ondiala (2014) established that probability values of the average monthly returns that were higher than 5% implied normality of the data.

The months of March and October recorded the highest average returns. This is according to the descriptive findings where the returns were measured by stock prices in terms of the capital gains in the USE. However, January, November and December recorded the lowest average returns. In addition to this the months of February, July, September, October and December showed negative mean returns. August and November mean returns were low thus indicating below par performance during the latter part of the year. Nonetheless the first half of year performance is not too strong either. The study further revealed that there were no statistically significant differences of the average monthly returns, that is, there was no noticeable difference in stock returns in the duration of study. The study revealed that for 10 years (2009-

2018) there was a predictable and consistent trend with regard to the month-of-the-year effects.

This was in accordance to the monthly returns at the start and end of year as demonstrated by the marginally increasing average returns from February to October. The findings somewhat conform to the study by Gultekin and Gultekin (1983) which revealed that for all the European 15 countries studied, the returns for the month of January was exceptionally higher. Correspondingly, there is a positive link between the findings and the study by Abdalla (2015) which revealed that the early months of the year reported higher returns and the last months of the year reported lower returns. It also revealed that the trends were consistent for the years in the study period. The correlation test results showed that February, June, July, August and November months recorded weak correlation as follows :R=0.488, R=0.486, R=0.419,R=0.428 and R=0.416. This implies that the investors should consider that affect stock returns before making key investment decisions in the USE. According to Mouselli and Al-Samman (2013), when investors are making critical decisions on investments, they should consider the advantage of the single month of the year information. They also revealed that DSE was an important market in getting the information. From their finding, the investors realized anomalous returns and also consider the calendar anomaly when creating portfolios. The study also revealed that the monthly returns were affected by the elements of the stock market. This was so since the month of December recorded the highest correlation of 0.711.

# CHAPTER FIVE

## SUMMARY, CONCLUSION AND RECOMMENDATION

### 5.1 Introduction

The chapter presents a discussion of study findings, conclusion, recommendations, challenges and constraints faces by the researcher and also suggests areas for the carrying out of additional research on the same topic. This has been done in line with the objective of the study which was establishing the existence of the monthly effect in stock market returns at the USE.

### 5.2 Summary of Findings

Tests of normality were undertaken using sample Kolmogorov-Smirnov test. Results revealed that average monthly returns were all higher than 0.05, which means that the data utilized in the research was normally distributed. Further, no significance difference in the monthly average returns was noted during the study period. These results are consistent to a study by Marrett and Worthington (2011) studied Australian stock market for the monthly effect and established that normality tests exhibited p-values higher than 5% which was an indication that data that had been utilized in the study maintained a normal distribution curve. These views conform to the findings of Ondiala (2014), who established that average monthly returns recorded higher p-values than 5%; meaning that the research data utilized was distributed normally.

The descriptive findings depict that the highest average return as measured by capital gains in stock prices in the USE was in the months of March and October. However, the lowest average return in stock prices was in November and December; the average stock returns remained marginally constant during the study period. The findings further established that on a month-to-month effect for the 10 year duration (2009-2018) there was a fairly consistent and predictable trend in the "year end' or "January" average monthly returns as evidenced by a constant increase in average stock returns from February to October in study period. These results are marginally in line with Gultekin and Gultekin (1983), who pointed out that January returns were exceptionally high in all the 15 countries studied in Europe. Correspondingly, these findings concur with the views of Abdalla (2015) who reported that there were some signs of positive returns mainly in the first few months of the year and some little negative returns towards the last few months of the year, and that these trends formed a pattern for some years in the study period.

Correlation results established that the months of February, June, July, August and November recorded a weak correlation (R=0.488, 0.486, 0.419, 0.428 & 0.416) which implies that stock returns is moderately affected by stock market determinants hence investors needs to consider these factors prior making investment decisions in the USE. In support of these findings is a study by Mouselli and Al-Samman (2013), who found that DSE was an information efficient market hence investors took advantage of information regarding a single month of the year when making important decisions on investment to achieve abnormal returns and consequently calendar anomaly was highly regarded when crafting portfolios.

On the other-hand, the month of December recorded a strong correlation (R=0.711), this is an indication that stock returns is affected by stock market determinants.

## 5.3 Conclusion

The objective of this research was to assess the existence of month of the year effect on stock market returns at the Uganda Securities Exchange. The study concludes from the descriptive results that on month to month for a period of 10 years (2009-2018) there was a moderately consistent and predictable trend of average monthly returns towards the year end thus the January effect. From the theoretical foundation of this research, this finding is an indication of existence of a high action at the USE share trading system that flags more interests in the Securities exchange towards the year end that motivates investors to sell more of their stocks, and thus creating a downward pressure of stock prices from December to January.

This could be as a result of cash demands on the part of the investors in these two particular months which are normally linked to an increase in consumer spending in the two months due to extended holiday seasons and cash commitments at the beginning of the year in an economy where most of the investors depend solely on a steady monthly income. On the other hand, the research findings depict that average monthly returns were moderately correlated apart from the months of January, June and December respectively.

The study concludes that while there is an observable pattern in average monthly returns of the USE towards the end of the year and the month of January, that effect is not adequately significant to provide a basis of sound investment decisions in the USE. Therefore, investors should consider relying on other determinants of stock

market returns such as macroeconomic variables like GDP growth rate, foreign exchange rates, interest rates and rate of inflation rate that are expected to influence stock returns; market performance whereby investors need to review actions of policy makers and regulatory agents in the USE with a view of interpreting the effect of such actions on the overall performance of the USE; and, risk free rate of returns whereby it is normal for investors to expect a return on investment that is higher than the return that would be earned from investment in risk free assets.

## 5.4 Recommendations for Further Study

Research has established the existence of stock market anomalies. It would be appropriate for the Capital Markets Authority to formulate regulations that can improve efficiency at the NSE. The regulations should seek towards improving performance monitoring of the stock market and consequently ensure a stable economy.

In addition, researchers can study how the other macro economic factors affect stock returns. These are interest rates, inflation and the economic climate.

The effect of other issues like the political climate and company specific information like changes in management, stock splits, declaration of dividend and changes in management should also be studied to aid in planning.

## 5.5 Limitations of the Study

The study was limited itself to fifteen companies listed at the USE that were operational in the study period (2009-2018). The findings established that trading did take place in some days of the months. In addition to this, not many of the companies

were listed from 2009 when the study begins but joined at different times. These factors greatly affected the uniformity of average returns thus somewhat limiting comparability. However, the study has countered this limitation by increasing the study period to 10 years so as to provide sufficient data for analysis.

The study made use of a descriptive form of research which cannot be used to detect the cause and effect between variables considered in the study. A descriptive form of research does not explain the reason as to why an event takes place or why variables interact the way they do because that exceeds the bounds of the statistics.

The research durations span for a period of 10 years; it would be prudent for researchers to conduct a longitudinal study that exceeds this duration. With a wider time period, the researcher will be able to establish more accurate and reliable findings with respect to the effect of month of year.

## 5.6 Suggestions for Further Research

The study insists on the need to conduct future research in other developing countries that have relatively similar stock exchange markets like that of Uganda so as to conduct a comparative analysis to shed more light regarding the monthly effect in similar situations and conditions as the USE. As such, researchers can compare findings and this will form a basis of a more concrete conclusion.

The environment where firms and businesses do business is turbulent because of macro-economic factors for example government regulations, competition, evolving customer needs and technology. It is important that future researchers consider

replicating this research after certain duration of time like 15 years and find out whether the findings obtained in this research will hold.

A duplicate of this study needs to be done using different approaches for instance use of a longitudinal design. This will enhance the understanding of the researcher on the occurrence of the monthly effect and how this affects stock returns. By comparing the findings, the researcher will be able to detect the behaviour of stock returns in various months and with the changes in seasons and provide a basis for more conclusive and reliable findings.

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## APPENDICES

## APPENDIX I: COMPANIES LISTED AT THE UGANDA SECURITIES EXCHANGE

| | |
|---|---|
| 1 | Uganda Clays Ltd listed in January 2000 |
| 2 | British American Tobacco (BAT) Uganda Ltd listed in October 2000 |
| 3 | Bank of Baroda (U) Ltd listed in November 2002 |
| 4 | DFCU Ltd listed in October 2004 |
| 5 | New Vision Printing and Publishing Co Ltd listed in December 2004 |
| 6 | Stanbic Bank Uganda Ltd listed in January 2007 |
| 7 | National Insurance Corporation listed in 2010 |
| 8 | UMEME Limited Listed in 2012 |
| 9 | East African Breweries Ltd listed in March 2001 |
| 10 | Kenya Airways listed in March 2002 |
| 11 | Jubilee Holdings Ltd listed in February 2006 |
| 12 | Equity Bank Ltd in June 2009 |
| 13 | Kenya Commercial Bank Ltd in November 2008 |
| 14 | Nation Media Group listed in 2010 |
| 15 | Centum Investment Company Limited listed in 2011 |

## APPENDIX II: MONTHLY RETURNS

| Year | Months | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Monthly Average | 753.24 | 662.27 | 597.20 | 680.24 | 723.46 | 747.55 | 814.86 | 793.86 | 745.71 | 702.58 | - | 713.30 |
| 2009 | Monthly Returns % | 0.0% | -12.1% | -9.8% | 13.9% | 6.4% | 3.3% | 9.0% | -2.6% | -6.1% | -5.8% | 0.0% | 0.0% |
| | Monthly Average | 770.64 | 807.88 | 858.52 | 931.37 | 988.31 | 1,032.56 | 1,020.15 | 1,055.98 | 1,080.27 | 1,160.05 | 1,207.49 | 1,188.27 |
| 2010 | Monthly Returns % | 8.0% | 4.8% | 6.3% | 8.5% | 6.1% | 4.5% | -1.2% | 3.5% | 2.3% | 7.4% | 4.1% | -1.6% |
| | Monthly Average | 1,255.84 | 1,202.98 | 1,124.98 | 1,199.65 | 1,208.77 | 1,115.96 | 1,059.90 | 1,005.71 | 941.71 | 823.40 | 830.92 | 795.03 |
| 2011 | Monthly Returns % | 5.7% | -4.2% | -6.5% | 6.6% | 0.8% | -7.7% | -5.0% | -5.1% | -6.4% | -12.6% | 0.9% | -4.3% |
| | Monthly Average | 808.73 | 852.90 | 964.42 | 1,016.26 | 1,019.31 | 1,034.50 | 1,071.53 | 1,084.29 | 1,124.87 | 1,160.85 | 1,194.24 | 1,191.48 |
| 2012 | Monthly Returns % | 1.7% | 5.5% | 13.1% | 5.4% | 0.3% | 1.5% | 3.6% | 1.2% | 3.7% | 3.2% | 2.9% | -0.2% |
| | Monthly Average | 1,312.81 | 1,375.92 | 1,462.08 | 1,539.49 | 1,661.76 | 1,590.00 | 1,544.24 | 1,541.11 | 1,500.36 | 1,617.61 | 1,603.24 | 1,527.71 |
| 2013 | Monthly Returns % | 10.2% | 4.8% | 6.3% | 5.3% | 7.9% | -4.3% | -2.9% | -0.2% | -2.6% | 7.8% | -0.9% | -4.7% |
| | Monthly Average | 1,528.27 | 1,428.03 | 1,489.16 | 1,522.03 | 1,596.47 | 1,650.13 | 1,739.63 | 1,759.00 | 1,818.64 | 1,836.34 | 1,862.07 | 1,905.94 |
| 2014 | Monthly Returns % | 0.0% | -6.6% | 4.3% | 2.2% | 4.9% | 3.4% | 5.4% | 1.1% | 3.4% | 1.0% | 1.4% | 2.4% |
| | Monthly Average | 1,967.40 | 2,046.91 | 2,040.27 | 2,050.12 | 1,938.60 | 1,975.03 | 1,916.59 | 1,905.14 | 1,914.18 | 1,841.34 | 1,757.10 | 1,757.24 |
| 2015 | Monthly Returns % | 3.2% | 4.0% | -0.3% | 0.5% | -5.4% | 1.9% | -3.0% | -0.6% | 0.5% | -3.8% | -4.6% | 0.0% |
| | Monthly Average | 1,770.41 | 1,791.33 | 1,797.17 | 1,777.79 | 1,776.07 | 1,750.43 | 1,659.38 | 1,612.77 | 1,467.88 | 1,560.03 | 1,593.00 | 1,511.66 |
| 2016 | Monthly Returns % | 0.7% | 1.2% | 0.3% | -1.1% | -0.1% | -1.4% | -5.2% | -2.8% | -9.0% | 6.3% | 2.1% | -5.1% |
| | Monthly Average | 1,424.28 | 1,390.63 | 1,451.82 | 1,560.77 | 1,601.45 | 1,673.85 | 1,685.07 | 1,798.18 | 1,727.21 | 1,682.47 | 1,745.95 | 1,855.65 |
| 2017 | Monthly Returns % | -5.8% | -2.4% | 4.4% | 7.5% | 2.6% | 4.5% | 0.7% | 6.7% | -3.9% | -2.6% | 3.8% | 6.3% |
| | Monthly Average | 2,010.21 | 2,067.13 | 2,133.01 | 2,232.03 | 2,143.81 | 2,116.16 | 2,063.21 | 2,050.52 | 1,862.36 | 1,786.24 | 1,708.80 | 1,686.39 |
| 2018 | Monthly Returns % | 8.3% | 2.8% | 3.2% | 4.6% | -4.0% | -1.3% | -2.5% | -0.6% | -9.2% | -4.1% | -4.3% | -1.3% |

**APPENDIX III: LOG RETURNS**

| Year | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2009 | | -5.59 | -4.49 | 5.65 | 2.68 | 1.42 | 3.74 | -1.13 | -2.72 | -2.59 | 0.00 | 0.00 |
| 2010 | 3.60 | 1.85 | 2.64 | 3.54 | 2.58 | 1.90 | -0.52 | 1.50 | 0.99 | 3.09 | 1.74 | -0.70 |
| 2011 | 2.40 | -1.87 | -2.91 | 2.79 | 0.33 | -3.47 | -2.24 | -2.28 | -2.86 | -5.83 | 0.39 | -1.92 |
| 2012 | 0.70 | 2.31 | 5.34 | 2.27 | 0.13 | 0.64 | 1.53 | 0.51 | 1.60 | 1.37 | 1.23 | -0.10 |
| 2013 | 4.20 | 2.04 | 2.64 | 2.24 | 3.32 | -1.92 | -1.27 | -0.09 | -1.16 | 3.27 | -0.39 | -2.10 |
| 2014 | 0.00 | -2.95 | 1.82 | 0.95 | 2.07 | 1.44 | 2.29 | 0.48 | 1.45 | 0.42 | 0.60 | 1.01 |
| 2015 | 1.40 | 1.72 | -0.14 | 0.21 | -2.43 | 0.81 | -1.30 | -0.26 | 0.21 | -1.68 | -2.03 | 0.00 |
| 2016 | 0.30 | 0.51 | 0.14 | -0.47 | -0.04 | -0.63 | -2.32 | -1.24 | -4.09 | 2.64 | 0.91 | -2.28 |
| 2017 | -2.60 | -1.04 | 1.87 | 3.14 | 1.12 | 1.92 | 0.29 | 2.82 | -1.75 | -1.14 | 1.61 | 2.65 |
| 2018 | 3.50 | 1.21 | 1.36 | 1.97 | -1.75 | -0.56 | -1.10 | -0.27 | -4.18 | -1.81 | -1.92 | -0.57 |