

**STOCK MARKET EFFICIENCY IN THE SEMI-STRONG FORM: A CASE STUDY
OF COVID-19 ANNOUNCEMENTS IN THE NAIROBI SECURITIES EXCHANGE**

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DECLARATION

This research project is my original work, and has never been submitted to any other institution for any academic qualification

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

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DEDICATION

I dedicate this paper, as an early Christmas gift to my family dotting the I's and crossing T's to finish my Masters in Finance. It has taken time years but you know late than never

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LIST OF ABBREVIATIONS

BSK:	Bombay Stock Exchange
CMA:	Capital Markets Authority
EMH:	Efficient Market Hypothesis
GDP:	Gross Domestic Product
GNP:	Gross National Product
NSE:	Nairobi Securities Exchange
SPSS:	Statistical Package for Social Sciences
UK:	United Kingdom
WHO:	World Health Organisation
SCAR:	Standardized cumulative abnormal returns
P/E:	Price Earnings
EPS:	Earnings per Share
DY:	Dividend Yield
AR:	Abnormal Return
MP:	Market Price
ER:	Expected Return
CAR:	Cumulative Abnormal Return
SMD:	Stock Market Development

ABSTRACT

Movement in share prices are subject to the stock market efficiency, which indicates how the prices of individual securities incorporate and reflect the available past, present and future information. However, calamities, pandemics, political instability, among other news items are postulated to have a significant negative effect on financial markets. The study endeavoured to determine the efficiency of the Nairobi Securities Exchange in the semi strong form, using a case study of the covid-19 announcement in Kenya. The theories anchoring the study included; the efficient market hypothesis, the prospect and the rational expectations theories. Secondary data used for analysis in the current study, which entailed daily stock prices. The current study was an event analysis of the Covid-19 pandemic outbreak announcement. The current study analysed the reaction of stock returns of listed firms 30 days before and after the pandemic. The study population was the 64 listed firms at the Nairobi Securities Exchange. Convenience sampling was utilized to derive a sample size comprising of a single company from each of the 11 sector of the economy categorised on the Nairobi Securities Exchange resulting into a sample size of 11 firms. Line graphs were used to observe the trend of the individual firms' stock returns before the Covid-19 pandemic outbreak announcement event date and after the event date. T-test statistic was conducted to establish the significance of the Covid-19 pandemic outbreak announcement on stock prices. The study findings established that only 9.09% of the listed firms at the Nairobi Securities Exchange reacted negatively to Covid-19 pandemic. All the other firms (90.91%) reacted positively. The study further established that seven firms (63.64%) recorded negative abnormal returns, three firms (27.27%) recorded positive abnormal returns, and one firm (9.09%) recorded zero abnormal returns in reaction to the Covid-19 pandemic outbreak announcement. However, none of the abnormal returns were established by the current study findings to be statistically significant.. The study findings further found out that there was a steady decrease in Cumulative Average Abnormal Returns of the eleven listed firms at the NSE before the event date but stabilized as we approached the event date and this trend continued even after the event date. This implies that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 did not have a cumulative effect on the stock returns for the eleven listed firms at the NSE. We suggest to policy makers and market regulators to formulate policies to enhance market efficiency for predictability of market behaviour by market players, which will enhance investor confidence in the operations of the securities market in the strong form because the Nairobi Securities Exchange is semi-strong form efficient as there are insignificant abnormal returns and investors cannot beat the market as a result of publicly available information. Recommendations are made to consultants and management of listed as well as other firms not to consider earnings as a factors that influence share prices/ firm value in the market but they should focus on intrinsic firm specific factors as they formulate strategies and policies to increase firm value. Recommendations are also made to investment banks, equity analysts, and individual investors not to consider earnings in order to increase their wealth or their clients' wealth, but focus on intrinsic firm specific factors when analysing whether the firm is undervalued or overvalued. Finally, recommendations are generated to individual investors not to rely on positive earnings announcement by companies in which they want to post a long, hold, or short position, but should instead focus on intrinsic firm specific factors to analyse whether firms' are undervalued or overvalued.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Stock markets play a pivotal role in an economy as they offer an investment avenue for both local and foreign investors (Hismendi, Masbar, Nazamuddin, Majid & Suriani, 2021). Stock markets are also an indicator of the economy performance, as they consider the movements in their market capitalization. Kenya's only securities market is the Nairobi Securities Exchange (NSE). The stock market makes it possible for investors to generate returns as they can speculate on stock price movements to get capital gains or obtain dividends, a reward for holding onto stocks (Yadav, 2017). The stock prices movement is subject to the efficiency of the stock market, which is an indication of how the stock market prices incorporate and reflect the available past, present and future information.

Market efficiency, is experienced at different forms, which include; the weak, semi-strong, and strong form (Kelikume, Olaniyi & Iyohab, 2020). This study will focus on the semi-strong form of efficiency, which indicates how security prices reflect all publicly available as well as past information. We will also highlight on how dividend payment information reflects on the prices of stocks. We have several theories that try to explain market efficiency among them, the efficient market hypothesis (EMH), the prospect and rational expectations theories. Although they play a critical role in explaining efficiency, we acknowledge they all fall short in some ways, as market efficiency remains a notion (Degutis & Novickyte, 2014).

The efficient market hypothesis has been useful in pricing, as noted by Malkiel (1989), but falls short due to its assumption that there is a fair flow of information in the market. In many instances, some parties have had a better hand than the others have, making the theory not hold (Malkiel, 2003). This leaves a gap in literature, as one of the assumptions is violated and hard

to control. A finding by Degutis and Novickyte (2014) also noted that actual stock prices might differ substantially from the actual value of stocks.

The prospect theory on the other hand has been criticised for first its emphasis on risk consideration and second its relevance to investments in the stock market as it is deemed relevant to gambling (Cochran, 2001). This deficiency leaves a gap in explaining efficiency in stock markets and more room for researches like this one to aim to address. On its part, though hyped for its consideration of expectations, previous experience and rationality, the Rational Expectations Theory was criticised for its lack of a cut-off in the three considerations. This study sought to understand efficiency in NSE, and help in fill gaps in the theories and literature. Having in mind that information reaches all investors at the same, time and that ideally they are they rational investors, their response to information should match (Muth, 1961).

However, with different decisions made on buying and selling of stocks, clearly indicates that investors respond differently to information, or that they do not process the information the same way. There could also be misinterpretations by the investors leading to less uniform decision making with every information released. This study therefore sought to establish the efficiency in the Nairobi Securities Exchange, using information, which affected all sectors almost similarly, and which was released by an external force to reduce the chances that some parties could have been privy to the information before it was released (Sargent, 2013).

1.1.1 Covid-19

As identified by Felsenstein, Herbert, McNamara and Hedrich (2020), covid-19 has threatened millions of human beings and therefore is a pandemic. It started in China in Dec 2019, and has continued to spread around the world (Beigel, Tomashek, Dodd, Mehta, Zingman, Kalil &

Lane, 2020). The spread reached different countries at different times, and each adopted different mechanisms to control its spread and tame it. However, to date, countries have struggles with the disease, with the world reporting waves after waves, and variations of the original virus (WHO, 2020^a; WHO, 2020^b).

Some of the response mechanisms included limited travelling, need for use of some products like hand washing detergents, and isolation of infected people (WHO, 2020^a). As noted by Hale, Petherick, Phillips and Webster (2020), schools closure, restricted travelling, and contact tracing were some of the measures adopted by governments, but the response was in overall, less coordinated. Generally, the economic position and business suffered impact, and after countries announced their first cases, the stock markets were likely to respond. The degree of response was expected to vary depending on the degree of efficiency of the stock markets (Odhiambo, 2020).

This study sought to analyse how such responses were in NSE, and hence use it to determine how efficient the market is, in the semi-strong form. Studies done in Kenya show that Covid-19 had an effect on the stock market, and therefore complemented by this study as it seeks to determine how efficient the NSE is. A study by Orege (2020) found that Covid-19 had a significant negative impact on the performance of NSE. Though it is an indication that the shares responded, it is hard to know their degree of response, and therefore cannot deduce efficiency merely from the negative impact.

Noting that the African stock markets are not that developed as identified by Nanziri and Zimuto (2021), there are chances that other factors affected the response. In their study, Nanziri and Zimuto (2021) found that different sectors were affected separately. Based on this, a study

that looks at the NSE in totality may miss some crucial aspects. This study noted efficiency at the industry level, as it sought to provide specific conclusions and recommendations. It would therefore sealed some of the gaps in past research.

1.1.2 Stock Market Efficiency

Stock market efficiency is a notion that stock markets respond to any information availed to them. It can take several forms, depending on the timeliness when the information is availed, whether past, present or future (Ogundina, Ajala, & Soyebo, 2014). There are different types of information for consideration. These include fiscal policy information as identified by Stoian and Iorgulescu (2020), dividend payments as identified by Ogundina, Ajala and Soyebo (2014), and occurrence of pandemics. Other information also include economic announcements, merger and takeover announcements, firm performance among others (Ross, Westerfield, Jordan, & Etling, 2003).

The market can exhibit weak, semi strong as well as strong form of market efficiency (Maverick, 2021). The efficiency can also be exhibited in the short run or in the long run depending on the market characteristics. Different markets have depicted different levels of efficiency. A study by Ali, Shahzad, Raza and Al-Yahyaee (2018) found that developed markets were more efficient. This finding implies that, depending on the level of development in the Nairobi Securities exchange, its efficiency may be different. The study also noted that Islamic stock markets were more efficient compared to their conventional counterparts. This implies that the nature and characteristics of a market affect its efficiency, though the idea behind investment remains the same. It is also good to note that efficiency in a market can present opportunities for speculation by knowledgeable parties, which can cause loses on less knowledgeable ones (Stoian & Iorgulescu, 2020).

Some markets can also be efficient in the long run, as opposed to the short run. Such markets can therefore facilitate buy-and-hold decisions, as opposed to short-term speculation in stock markets (Tiwari, Aye & Gupta, 2019). With these identified differences in levels of efficiency, it is important that the efficiency in NSE be determined, to keep investors informed on the current levels. With this knowledge, investors can make well-informed decisions and help them make wise investment decisions. There are possibilities of finding a market to be inefficient, like Pervez, Rashid, Ur, Chowdhury, Iqbal and Rahaman (2018), established it for the Dhaka Stock Exchange. With this possibility, it is important to determine efficiency levels of NSE to help even the market regulators.

1.1.3 Nairobi Securities Exchange

The Nairobi Securities Exchange (NSE) is the stock market for Kenya. The NSE is considered one of the developed markets in Africa, competing with Nigeria Stock Exchange and Johannesburg Stock Exchange (CMA, 2016). The market was ranked 8th best performing in 2021 according to Business Insider Africa (2022). This shows that in the year 2021, there was an overall growth in share prices. Though this could have been in response to the loosening of covid-19 restrictions, it is also an indicator that the exchange, and the economy, has good measures in place to cushion itself against some shocks. It is also an indication that its level of development is high, and it may indicate the market had a high efficiency in the semi-strong form.

Ayako, Kungu and Githui (2015) found that corporate governance was one of the factors that affected performance in NSE. Based on the dynamics of corporate governance, there are chances that different firms may have responded differently, and therefore gave different levels of confidence to investors. Kirui, Wawire and Onono (2014) introduced shocks on different

macroeconomic variables and established that, they actually affected return on the NSE. However, they found that the effect was significant in some, and insignificant in others. This degree of significance shows that the market degree of response, and therefore efficiency, would be different depending on the factor analysed and other factors.

1.2 Research Problem

We have numerous studies on market efficiencies, but every other time markets keep on advancing and new developments in economies make it necessary for new researches to confirm status. There has also been different conclusions on the studies done, and this leaves stock market interested parties uninformed, which can increase chances of making wrong investment decisions, and even wrong policies. Similarly, several theories exist on the subject matter, but their limitations still leaves gaps. This study therefore sought to advance knowledge on efficiency in stock markets, using covid-19 information and help validate past studies while addressing existing gaps. On the global scale, a study in Asia by Afshan, Sharif, Nassani, Abro, Batool and Zaman (2021) found that internet penetration improved on the efficiency of the stock markets.

This finding implies that depending on the level of internet penetration in Kenya, the efficiency can be high, holding all other factors constant. In the Greek Stock Market, a study noted that the market does not fully account for all accounting information in the prices of their stocks. Based on this finding, Alexakis, Patra and Poshakwale (2010) concluded that the market was inefficient in the semi-strong form. Pearson (1991) noted that there was an inability of financial markets to process some types of market information owing to the limitation in trading hours in the US market. Availability of buyers and sellers at the same time in the market points out that the information released is interpreted differently by investors, or that there are irrational

investors in stock markets. Since markets still close limiting trading hours, there are chances that inefficiency is still prevalent in stock markets, necessitating further research.

Regionally, several researchers have studied and documented their work. In Nigeria, Gimba (2012) conducted a study pertaining to the degree of weak form market efficiency and the study established that the stock exchange was inefficient in the weak form. Another study by Ogundina, Ajala and Soyebó (2014), using dividend payments established that the market was efficient in the semi-strong form. These findings agree with Ayodele, Oshadare and Ajala (2018), but contradict with Onoh (2016) who noted inefficiency in the Nigerian Stock Exchange. In South Africa, Harjito, Alam and Dewi (2021) found that the market showed a positive semi-strong form of market efficiency. The divergence in the findings of these past studies suggest gaps in literature, Current research works come in to possibly explain , close or complement those older studies.

A study by Maringa, Riro and Kiarie (2018) found that NSE was efficient in 4 of the 5 years they were studying. This finding shows that in some instances, the market is efficient and in others, the market is inefficient. They studied using dividend payment information. Since there is different types of information that released to markets, it is necessary to test how efficient the market it with different information released. It would also help to identify whether efficiency is dependent on the kind of information released.

Looking at individual companies, Gichaiya, Mhuri, Muchina, Munyua, Weru and Kamau (2018) found that there were inconsistencies and that some companies were efficient in one test, and inefficient in another test. These inconsistencies in results need harmonising to establish the correct position if any. This study will focus on NSE for a single incidence, using

Covid-19 announcement information, and will analyse at the industry level. It will complement the previous studies and help advance knowledge. Points of divergence and convergence with existing findings noted will determine the current position of efficiency in NSE, as well as determine other possible factors that can influence it. This study therefore answered the question; is Nairobi Securities Exchange efficient in the Semi-Strong form?

1.3 Objective of the Study

The broad objective of my study was to determine the efficiency of the Nairobi Securities Exchange in the semi strong form through using a case study of the covid-19 announcement in Kenya.

1.4 Value of the Study

This study is beneficial to investors, market regulators, policymakers, firm management, academicians, among other practitioners and stakeholders. Knowledge of the degree of efficiency of the NSE will aid investors in making investment decisions, the information will hint to market regulators whether there is need to advance the efficiency level. Firm management will get better understanding on how the information they release about their company flows and the possible impact on stock prices with the focus being at the industry category. Academicians will also upgrade their knowledge by understanding the efficiency level of the stock market. The findings will seal the gap in literature and help finance and stock investment students and researchers understand more on how efficient the Nairobi Securities Exchange is, in the semi strong form.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The literature review section focussed on the existing studies in the area of study so far. In this section, the study will review relevant studies from the global, regional, and local focus. The section will specifically cover theoretical review, literature review, a conceptual framework, and a summary of the research gaps and literature review.

2.2 Theoretical Review

Scholarly work has been having different opinion on the research variables under consideration. In this section, we will focus on existing theories on the variable of this study. The theories considered are; the efficient market hypothesis, the prospect and the rational expectations theories.

2.2.1 The Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH) is among the broadly applied theories in diverse fields of study as advanced by Roberts (1959). The theory argues that if the markets were effective, the forces of the economy will dictate the level of prices or performance in the market. The theory is highly postulated on the assumption that there is fair flow of information in the market that no party has privileged information. In most cases, the theory is linked to be behind the pricing of the stocks based on information available in the market (Malkiel, 1989). If the information available indicates that a certain stock will gain value in the future, every investor will aim at holding such a stock and therefore the demand will have to rise.

Given the fact that the supply of shares may not be elastic, this will lead to an increased price of that security. On the other hand, if the value of any stock is foreseen to decline based on the

existing information, every shareholder holding the shares will have a mission to dispose the shares before they loss value. As a result, there will be higher supply of the stock in the market causing the share prices to decline (Malkiel, 1989). However, critical analysis has shown some weaknesses of the theory. For instance, Degutis and Novickytė (2014) indicated that there was a high chance that the actual value of the stocks may deviate from the intrinsic value that indicates failure of accuracy in prediction of the future value.

Hence, the forces of demand and supply will be misleading as they the price is derived from the expected intrinsic value for the shares. Furthermore, Malkiel (2003) in his critical review of the theory indicated that perfect information may fail, and evidence show that information in the markets are not fairly distributed questioning the assumption of fair distribution of information that is the building block of the theory. The call for government and other stakeholders in the markets over the years has also be a concern indicating that the efficient market hypothesis conditions may be failing from one occasion to the other.

According to Yen and Lee (2008), however, there has been a lot of empirical support indicating that the efficient market hypothesis still holds waters in the current market and confident that it will still exist in the future. The fact that the forces of demand and supply still are found relevant in determination of the share prices continue to make the theory a priority in the economic and financial fields. It is on the basis that the theory explains the pricing of shares in the market and derives the performance of security markets that makes it relevant in the current study to support the dependent variable of the study. The theory therefore guided the current study to test if the NSE is Semi-strong form efficient.

2.2.2 The Prospect Theory

The prospect theory has been an important theory of argument whenever risk and uncertainty is considered in the decision making process. The theory that advanced by Kahneman and Tversky (1979) indicates that if investors were to make a decision of alternative courses of investment, rationale investors will make a move of selecting the investment that shows higher potential for returns rather than the one that seems to be presenting low risk of losses. Every investor knows to value their investment giving the best returns.

Therefore, returns informs the investment decisions according to prospects theory. According to Kahneman and Tversky (2013) when investors are presented with the possible outcomes, they will be willing to avoid risk by considering the accuracy of predicted outcomes and rely upon the weights of the expected results rather than mere probabilities, as was the case in the previous theories. Considering the critics of the theory, it has been clear that the theory is more prominent in the application of the gambling environment were investors are known to have high appetite for risk (Cochran, 2001).

However, in reality, fair investors in the stock markets are ranked in the three risk categories; the risk averse who will prefer less but sure return, risk moderate investors who are indifferent in the decision making process, and the risk lovers who are characterized by pursuing investments promising the highest returns even if they are not certain. This therefore leads us to conclude the assumptions of the theory does not cater for the risk averse and moderate risk takers who may account for substantial number of investors (Cochran, 2001).

However, despite the weaknesses of the theory, Sagnak et al. (2020) indicated that there was a great deal in the operation of the theory and therefore it remains relevant in the operations of

the current market. The theory was of importance to the current study on the account that it explain most of decision-making processes that support the independent variable of the study based on decisions influenced by the current information. The theory therefore guided the current study to test if the NSE is Semi-strong form efficient.

2.2.3 The Rational Expectations Theory

The theory, as advanced by Muth (1961), explains the decision-making process as a complex role that and that it cannot for sure be explained by a single cause. The theory argues that decision-making is a function of one's expectations, previous experience and rationale. The factors inform ideas with each factor having its weight and cumulative results based on whichever factor has greater influence in an individual's life.

The theory floats an all-inclusive model that utilizes all the three conditions of available information including the past as indicated in the experience, current information represented by the rationale of the investor, and the future information based on the expectations that individuals have regard to different alternative at their disposal (Sargent, 2013). According to the critics, the theory does not have a cut point in terms of the three factors. Sheffrin (1996) indicated that individual's experiences will never be the same and thus it will not be easy to figure out how different people respond to different conditions in the market.

Again, rationale on its own does not pass as a constant factor especially when the aspect of the people's attitude towards risk is highlighted (Obrimah, 2021). Therefore, Obrimah (2021) indicated that the equilibrium rational expectations will never be defined and thus limiting the application of the theory for general markets performance. On the flip side, as the three factors are found inclusive for decision makers, lack of defined equilibrium market conditions will not

validate dismissal of the theory. In the current study, the theory becomes important as an anchoring theory explaining the courses of action investors may take including the influence of the market performance. The theory therefore guided the current study to test if the NSE is Semi-strong form efficient. Thus, guiding investors on decisions based on current information.

2.3 Determinants of Stock Returns

This section elaborated on various determinants of stock returns. The determinants considered in this section are; news, financial ratio's, macro-economic variables, and firm size.

2.3.1 News

Calamities, pandemics, political instability, among other news items have a significant negative effect on financial markets. For instance, economic turmoil which was as a result of the COVID-19 pandemic, had far-reaching ramifications on several financial markets that included; stock, bond, and commodities financial markets (Cavallo et al., 2013; Bergholt & Lujala, 2012; Skidmore & Toya, 2002; Cuaresma, Hlouskova & Obersteiner, 2008; Kim, 2011).

In Kenya, post-election violence and global financial crisis were found to have reduced NSE market capitalization by 20 billion between 2008 and 2009. The study by Osoro (2020) confirms that happenings in the global space can affect the NSE performance. It can be likened to Covid-19 which was also a global pandemic and the findings by Osoro (2020) gives some insights on the probable conclusion. In a different study by Amoro (2019) found that political events, money supply, and exchange rates had a statistically significant impact on both stock trading volumes and return. These findings are in line with others done in Asian countries and suggests that NSE is as responsive to relevant factors as stock markets in developed countries.

It is therefore relevant and necessary that a study on how it responded to Covid-19 news is determined to test its current efficiency.

2.3.2 Dividend Yield

Dividend yield is the expected return on a stock investment in form of dividends. If the dividend on a stock does not increase or reduce, the yield will increase, and subsequently, the value of the stock will decline. However, the yield will decrease when the stock appreciates and subsequently, the value of the stock will appreciate. Maina (2000), postulated that since it has been established that dividend yields adjust relative to the stock price, it can often appear to be abnormally high for securities whose value is rapidly falling. Upcoming firms, which are relatively small but growing rapidly may issue lower dividends on average as compared to mature firms within the same industry. Basically, well established firms, which do not develop rapidly have highest dividend yields. Zhou and Ruland (2006) and Pandey (2004) opine that non-cyclical stocks, which sell/provide essential products or services, have the highest yields on average. A dividend yield is calculated as the dividends issued out in a certain period divided by the share price at the beginning of the period (Botha, 1985).

Earnings per Share (EPS) significantly impacts on Stock Prices. Furthermore, Dividend Yield (DY) has a positive relationship with stock prices. Investors usually gauge dividends as an indicator about the future prospects of a firm (Kanwal et al., 2011). Therefore, issuing of dividends lowers firm risk, which in turn impacts the stock price. Additionally, DY and dividend pay-out ratios are often indicators of the level of expected growth opportunities of firms (Bitok, 2004). Nevertheless, there are various reasons why firms pay dividends. One of the reasons is that dividend payment greatly influences the stock price of firms. However, there are several reasons why a high dividend yield can post low returns. One of the reasons is that

the lack of opportunities for investments which can offer sufficient returns. In addition, the cash-flow position of a firm is critical for dividend timing (Karanja, 1987).

2.3.3 Price Earnings Ratio

Inspired by Solomon and Pringle (1978), the Price Earnings (P/E) ratio is key to measuring the stock market. It is calculated as the ratio of the current stock price divided and the organization's previous one year earnings per share from continuing activities. Trailing ratio utilizes the net income for the last 12 months, the result over weighted average of the number of common shares issued in the duration. The calculation utilized depends on if the earnings in question are expected or known, alongside the form of earnings. In summary, by comparing the stock price and EPS for a firm, it is possible to gauge a firm's market capitalization with its income.

An apparent association between stock prices and the P/E ratios exists (Hammel & Hodes, 1967). Bower and Bower (1969) highlight that higher P/E ratios result in higher earnings growth and stock prices while P/E ratio conversely results in low earnings and price growth accompanied by higher price volatility. Basu (1977), a leading researcher who carried out a research on systematic values and growth of stock investment approaches, established that the return on an annual holding period of a low P/E portfolio was higher as compared to a high P/E portfolio.

According to Shen (2000), who investigated link between P/E ratios and resulting stock market performance, revealed a strong historical evidence that high P/E ratios result in insufficient stock market performance, both in the short-run and long-run. To be specific, high P/E ratios are characterized by slow growth in the stock price in the long-run. Moreover, when high P/E ratios diminished, the stock returns performed poorly as compared to the returns of other investment, and additionally, the performance of stock market was poor in the short-run.

Nevertheless, Shen (2000) also established the probability that the historical associations can be of slight significance currently cannot be disregarded because of the major changes in the economy.

2.3.4 Economic Growth

The aspect reflects the percentage increase in a country's productivity, which is basically comparing the current period's productivity to the preceding period's productivity. Economic growth can be measured in nominal or real terms. To measure economic growth, the Gross Domestic Product (GDP) and/or Gross National Product (GNP) measures are commonly utilized, even though there are other economic growth measures (Liu & Ryan, 1995).

There are four different perspectives on how stock market performance and economic growth relate. The supply-leading perspective holds that there is causal bi-directional relationship between Stock Market Development and economic growth whereas the demand following perspective stipulates that Stock Market Development is impacted real GDP. The third perspective holds that economic growth and Stock Market Development have a common effect on each other. The fourth perspective contends that there Stock Market Development impacts on economic growth (Zegada, 2011).

2.3.5 Inflation

Inflation is a reduction in buying power of the Kenyan shilling (Payne, 2008). Friedman (1992) is known to say, "inflation is always and everywhere a monetary phenomenon." This statement implies that that unrelenting inflation is due to of growth in money supply. The real economic output is impacted by inflation through increment in costs, which renders the prices as a way of fair resource allocation (Rahman & Serletis, 2009; Friedman, 1977).

An intense inflationary climate inversely affects stock prices and stock returns (Chinzara, 2011). Stock prices are related to inflation. Thus, in the event of an increase in general price levels, the household's purchasing power will decrease and this will lead to decrease in demand of stocks, which therefore decline stock prices and output (Olweny & Omondi, 2011).

2.3.6 Exchange Rate Fluctuations

The exchange rate variation is as a result of existence of floating exchange rate system, that is the normally the case in the liberalized economies. There are various factors both technical and fundamental, which affect the exchange rate of currencies. These factors comprise of economic performance, currency demand and supply, inflation rate outlook, changes in interest rates, support and resistance levels, capital flow among others. As these components are by and large in a condition of perpetual flux, perpetually (Kandil & Mirzaie, 2002).

Dornbusch and Fischer (1980) recommended that conversion scale changes sway on the intensity of organizations since swapping scale instability impacts on the pay esteems and expenses of tasks on the grounds that numerous organizations obtain as far as unfamiliar monetary standards for venture and everyday activities. A depreciation of domestic currency makes a nation's fares more serious, and subsequently more interest for nearby fares by outsiders. This at last prompts increment in association's benefits and costs of the protections, while increment in the estimation of the domestic currency money produces inverse outcomes.

2.3.7 Firm Size

Firm size refers to the scale of a firm's operations (Ehikioya, 2009). Three firm size measures are generally utilized and these are; total assets, sales, and market capitalization. Guest (2008) also opined that the aforementioned measures are the most utilized proxies of firm size empirical corporate performance studies. Additionally, Dogan (2013) insinuated that some firm characteristics, for example, leverage and firm size, both have a relationship with firm value. Amongst other firm characteristics, firm size is most often perceived as having the strongest relationship with firm value. This is because large firms are usually considered as having the capacity and capability of exploiting economies of scale, and thus have the ability to diversify and especially formalizing and codifying set of procedures. Additionally, because large firms have a larger capital base as compared to small firms, they can always take advantage of any profitable opportunities that may arise.

However, larger firms are incline to have organizational rigidity and bureaucracy, which might lead to loss of profitable opportunities that require more urgent attention and reaction and thus making large firm to be less profitable as compared to small firms. (Goddard et al., 2005; Banchuenvijit, 2012). Therefore, this implies that firm size is considered as a significant predictor of enterprise value. However, the link between firm size and firm performance has had varied empirical evidence. For example, Hossain et al (2001), Amran and Ahmad (2009), and Coleman and Biekpe (2006), established an inverse relationship between firm size and firm performance. In contrast, Guest (2008), Ehikioya (2009), and Haniffa and Hudaib (2006) revealed a positive relationship between firm size and firm performance.

2.4 Empirical Literature Review

On a global, regional and in the local context. Among such researches, Batista, Maia, and Romero (2018) focused on the existence of semi-strong market efficiency in the context of the famous 2016 presidential impeachment that took place in three discrete times. The study employed a quantitative research design with an event study approach to evaluate the reaction of the markets. The results indicated that the null hypothesis was to be rejected based on the differences from the mean that indicated non-statistical significance with value approaching to zero.

The difference indicated that the markets reacted towards the available information as it was expected. However, the study differs from the current study both in context and in scope as the Covid-19 pandemic and impeachment of a president are far from one another on the basis of expected impact. Brazilian market may also have different orientation from the Kenyan condition as indicated in the NSE performance calling for the current study within Covid-19 error. Yet another study in the context of UK by Uusipere (2021) sought to establish the reaction of the stock markets following the adoption Covid-19 intervention measures by the government.

The study employed an event study approach on the intervention measures taken by the government to contain the pandemic. The results indicated that social distancing was among the leading measure that affected most of the industries in a negative way with a short-term semi-strong efficiency. However, the intensity of the pandemic and measures taken by each government seemed to vary requiring investigation in each single country. It is in lieu of this requirement that the current study shall seek to address the condition of the Kenyan market as

evident through announcement of the first case in the nation based on the NSE market performance.

Still in the global context, Alam, Alam, and Chavali (2020) did their study in the context of Indian markets. The study employed a Market Model event study focusing on a sample of 31 firms in the Bombay Stock Exchange. The scope of the study was on the lockdowns. The evidence indicated that there was a positive relation between the lockdowns and the performance of the BSE security market. The expected containment of the pandemic by lockdown gave confidence to investors that allowed the positive returns. However, the stability of the health department in India and the economic stability of their market is so different compared to the Kenyan market calling for the current investigation in NSE market.

From Nigeria context, a number of studies sought to establish semi-strong market efficiency in the Nigerian markets. Ogundina, Ajala and Soyebó (2014) tested the existence of semi-strong market efficiency of the market against the dividends payments. Even though the event study established efficiency of the market, Onoh (2016) established none existence of semi-strong efficiency in the same market. Even though the economic orientation of Nigeria may be similar to Kenyan economy, the contradicting results on the same attributes indicates necessity for the current study in the NSE market.

Harjito, Alam, and Dewi (2021) in their multinational approach on the existence of semi-strong market efficiency among selected economies following the announcement of the international sporting events. They employed an Event Study Model. Among the nations considered, South Africa was found to exhibit a positive semi-strong market efficiency in such events. In most of the nations, it was clear that the stock prices represented all the necessary information that was

at the disposal of the investors. However, considering the event in their study, it was clear that sporting activities were presenting an opportunity for the investors while in the current study; the pandemic announcement is considered a threat calling for an investigation to ascertain Kenyan condition.

From the local market, Ongere (2020) sought to establish the existence of weak form market efficiency in the NSE market. The study tested for unit roots in testing serial correlation between the variables for a period between 2002 and 2019. The results indicated that the null hypothesis was not rejected indicating that the weak form market efficiency did not exist indicating the possibility of other forms. Thus, the study will seek to establish the possibility indicated in Ongere's study of a semi-strong form of market efficiency. Again, the methodology of the study will seek to provide implication of the short-term condition as opposed to the previous consideration that focused on long-term efficiency.

Odhambo (2020) sought to establish market efficiency of the NSE market. The study employed a descriptive research design for six years to 2017 for all firms listed in the NSE market. The study indicated a possibility of either weak or semi strong forms of market efficiency. Furthermore, Maringa, Riro, and Kiarie (2018) established that there was evidence of both efficient for three year and ineffective semi-strong markets for one year in the study that considered four years. The results indicates that there is a lot that need to done before establishing a concrete conclusion on the semi-strong efficiency of the markets. Therefore, the current study will be part of the advances that are necessary in the field in order to ascertain the real state in the Covid-19.

2.5 Conceptual Framework

A conceptual framework represents the relationship between variables graphically and helps bring clarity on a study. According to Northcentral University (n.d), the conceptual framework brings clarity of concepts and helps in organising a study. In this study, the conceptual framework is as shown in Figure 2.1, and shows how Covid-19 announcement affected the NSE market efficiency.

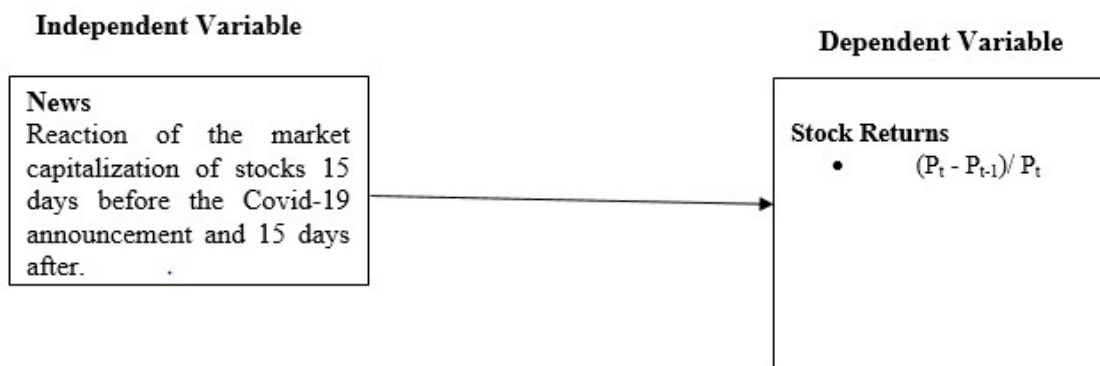


Figure 2.1: Conceptual Model

2.5 Summary of Literature Review

From existing researches, different scholars attempted to establish the existence of a semi-strong form market efficiency in different contexts. Among such studies Batista, Maia, and Romero (2018) found positive evidence, which was supported by results by Uusipere (2021), Alam, Alam, and Chavali (2020), Ogundina, Ajala and Soyebó (2014), and Harjito, Alam, and Dewi (2021). However, Onoh (2016) established evidence of non-existence of a semi-strong form of market efficiency while Ongere (2020) found unclear direction in the market. It is on the base of these contraindicating results together with the lack of evidence in the Kenyan market that the current study aimed at establishing existence of semi-strong form market efficiency in the case of announcement of the first Covid-19 in the Nairobi Securities Exchange.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter is centred on research design adopted, the population of the study, how samples are derived, approach of collecting data. Additionally, the chapter contains subsections on the ways to analyse collected data.

3.2 Research Design

This study used an Event Study research design. This method is appropriate because it enables comparison of the stock market reaction to an event by making an observation on performance before or after the event. The event study methodology was adopted by Pandey and Kumari (2020) in a study assessing market reaction on developed and emerging markets to Covid-19 declaration as a public pandemic. Nagm and Kautz (2007) also used the event study methodology in defining the event and estimating whether the stock price changes beyond normal or expected changes in response to the announcement of the stock-split. Thus, the event study methodology investigates how markets respond to new information in the market. In this case, whether the NSE is efficient in the semi-strong form. The current study focussed on the stocks listed on NSE price movements before, the outbreak of the Covid-19 pandemic in Kenya on 15 March 2020 when the President announced the outbreak and initially instituted measures to curb the spread of the virus, and after announcement.

3.3 Population of Study

Population refers to all elements sharing a common characteristic, which in this case, is the firms trading at the Nairobi Securities Exchange. Banerjee and Chaudhary (2010) defined population as the totality of all elements, from which to generate a certain information. The

population for this study was the 64 companies, whose stocks trade at the Nairobi Securities Exchange.

3.4 Sampling

The study utilized convenience sampling to derive a sample that is representative of the whole population. This was done because analysing the whole population was encountered by time and financial limitations. The sample size comprised a single company from each sector of the economy categorised on the NSE. There are 11 sector categories in the NSE. Thus, the study sample entailed 11 listed companies from each of the sector categories. Stratified simple random sampling was utilized to obtain the one firm in each single sector. It was done in form of lottery in each sector.

3.5 Data Collection

The current study utilized secondary data. Quantitative data from the NSE was obtained and utilized. The data mainly related to stock prices of the sampled quoted companies. Computations of returns in the market was done using the stock prices. The current study was an event study of the stock prices analysis of movements 30 days before, during announcement of the outbreak of the Covid-19 pandemic in Kenya on 15 March 2020 when the President initially instituted measures to curb the spread of the virus, and 30 days after the announcement. The study analysed the reaction of the market capitalization of the stocks of 11 listed quoted firms in each sector category. The data collection window is for 30 days before and 30 days after the event date, which entailed the Covid-19 outbreak announcement.

3.5 Data Analysis

Event research technique was utilized for data analysis, and the analysis focussed on quantitative aspects. The Covid-19 announcement signified the beginning of something and the event day was the day, 15 March 2020, when the President announced the outbreak of the Covid-19 pandemic and initially instituted measures to curb the spread of the virus. The event duration will be 61 days long. The current research analysed the data using Microsoft's Excel (2017) where line graphs depicted the trend of the movement of the market capitalization were generated. It also aided in generating market returns and abnormal returns. Although strategies to be applied to deal with dependences could be effective in standard operation modes, these could be unprepared to deal with the hyper nature of effect of pandemics on stock returns that are typically time-sensitive hence a call for test to be executed. To discover if the Covid-19 announcement affected the stock returns, T-tests were performed. With excellent coverage capacity for most typical statistical analysis, and highly methodical, Statistical Package for Social Sciences (SPSS) version 25 was utilized for the current study's analysis. SPSS can help in calculating the significance of the data for statistical testing.

3.5.1 Analytical Model

The Abnormal Returns (AR) is used to assess the Covid-19 announcement on the efficiency of the stock market. The average return, excluding any variable that results in an expected result, is regarded to be a normal value. In order to find out the anticipated return on the stock, the current study utilized the Market Model. Taking systematic risk, the investor will get more return. R is the calculation that shows how real stock returns will be computed:

$$R = \frac{(MP_t - MP_{t-1})}{MP_{t-1}}$$

Where;

MP = Market Price of the shares time at t

The dividends were disregarded in this research, thus returns solely represent movements in the share price. The accompanying budget plan was used to determine the expected/normal values;

$$ER_{xt} = \alpha_x + \beta_x R_{mt}$$

Where

ER_{xt} is expected returns on stock x at time period t.

R_{mt} is the returns in the market at time t.

α is a constant.

β (beta) which is the security's price volatility with respect to the total market

In order to compute the market model coefficients α and β , the market index's prices throughout the estimate period and the commodity's previous costs were utilized. Once Alpha and Beta were determined, the ER was calculated by utilizing the equation.

$$ER_t = \alpha + \beta R_{mt}$$

The important information concerning the event was then be measured through calculating the Abnormal Returns (AR) that is derived from the variance of the Actual and the expected or normal rate of return.

The model below was applied to estimate the Abnormal Returns;

$$AR_{xt} = R_{xt} - ER_{xt}$$

The below formula was used in calculating the cumulative abnormal returns;

$$CAR_{xT} = \sum_{i=1}^N AR_t$$

Where;

CAR_{xT} = Cumulative abnormal return on x share obtained in the event window T,

T – The event window

Standardized cumulative abnormal returns (SCAR) was computed as:

$$SCAR_{iT} = \frac{(CAR_{it})}{\sigma(CAR_{it})}$$

Where;

$\sigma(CAR_{it})$ - The standard deviation of CAR's adjusted for forecast error.

The T-test statistic was utilized to determine whether or not the previously mentioned devices are significantly above or below the accepted values, and whether or not the recorded SCARs are significant. A T-test statistic presupposes that the data is normally distributed.

$$t = ((\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)) / \sqrt{S_1^2/n_1 + S_2^2/n_2}$$

CHAPTER FOUR: DATA ANALYSIS, RESULTS, INTERPRATATIONS, AND DISCUSSION

4.1 Introduction

This chapter analyses, presents and discusses findings of the study. The study sought to determine the efficiency of the Nairobi Securities Exchange in the semi strong form, using a case study of the covid-19 announcement in Kenya. Secondary data applied in undertaking the research were collected from the NSE for all 11 listed companies from each sector category. This was an event study analysis of the outbreak of the Covid-19 pandemic in Kenya on 15 March 2020 when the President announced the outbreak and initially instituted measures to curb the spread of the virus. Although strategies that are applied to deal with dependences could be effective in standard operation modes, these could be unprepared to deal with the hyper nature of pandemics that are typically time-sensitive thus called for the necessity of the study. The current study conducted an analysis of the stock prices reactions of 11 listed firms 15 days before the President announced the outbreak and initially instituted measures to curb the spread of the virus and 15 days after. The data analysis was done through use of Microsoft's Excel (2013). To determine the significance of the covid-19 outbreak and the instituting of measures to curb the spread of the virus on stock returns T-test was done. This was achieved through the utilization of the Statistical Package for Social Sciences (SPSS) version 25.

4.2 Reaction of Stock Prices to the Covid-19 Announcement

The current study sought to establish the impact of the Covid-19 pandemic outbreak and consequent announcement on stock prices of 11 listed firms at the NSE. The study did analysis of the stock prices reactions of 11 listed firms 15 days before the President initially announced the outbreak and instituted measures to curb the spread of the virus on 15 March 2020 and 15

days after. Additionally, the stock returns abnormality and cumulative abnormality are discussed in this section.

The Expected Return was obtained by regressing the historical price data of a stock against the market index during the estimation period and employing the equation indicated in the subsequent page after the values of alpha and Beta are known.

$$ER_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$

Where;

R_{it} = Return of stock at time t

R_{mt} = market return at time t

The values of the alpha and beta were obtained using the OLS regression which utilised the following formula.

$$\beta = \frac{\sum R_{it} R_{mt} - (t * \bar{R}_t * \bar{R}_{mt})}{R_{mt}^2 - (t * \bar{R}_{mt})}$$

$$\alpha = \bar{R}_t - (\beta * \bar{R}_{mt})$$

4.2.1 Barclays Bank Limited Stock Returns

The response Barclays Bank Limited stock to the President initially instituted measures to curb the spread of the virus on 15 March 2020 event is as shown in Figure 4.1.

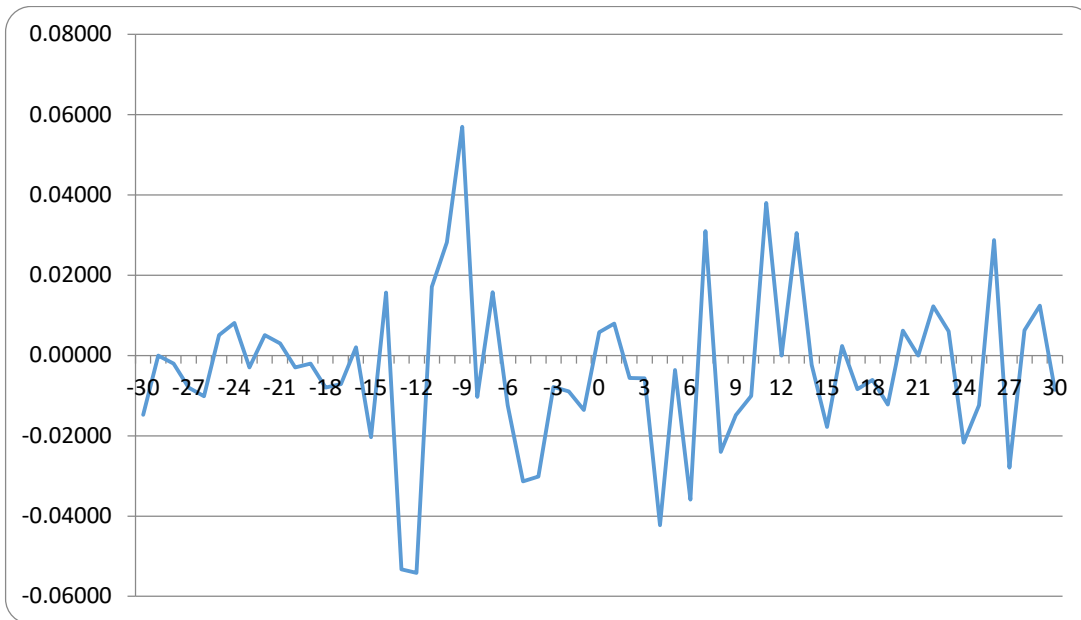


Figure 4.1: Barclays Bank Limited Stock Returns

The findings in Figure 4.1 showcase that Barclays Bank Limited’s stock reacted erratically to the Covid-19 pandemic outbreak announcement. Generally, Barclays Bank Limited’s reaction to the Covid-19 pandemic outbreak announcement was positive as exhibited by an increment of the average stock returns from a -0.5% before to -0.3% after the event. The lowest return in the event window was a value of -5.4% registered 12 days before the event date whilst the peak price during the event window was a value of 5.7% registered 9 days before the event date.

4.2.2 Eaagads Limited Stock Returns

The Figure 4.2 shown below indicated how the Eaagads Limited share price reacted. The findings in figure 4.2 display that Eaagads Limited share prices had ups and downs both after and before the Covid-19 pandemic announcement. The result was marginally positive. Averaging -0.2% pre event and grew to -0.15% after. The least return registered in the event window by Eaagads Limited was -6.5% which was registered 13 days pre event date and highest return was a value of 5.2% registered 13 days after the event date.

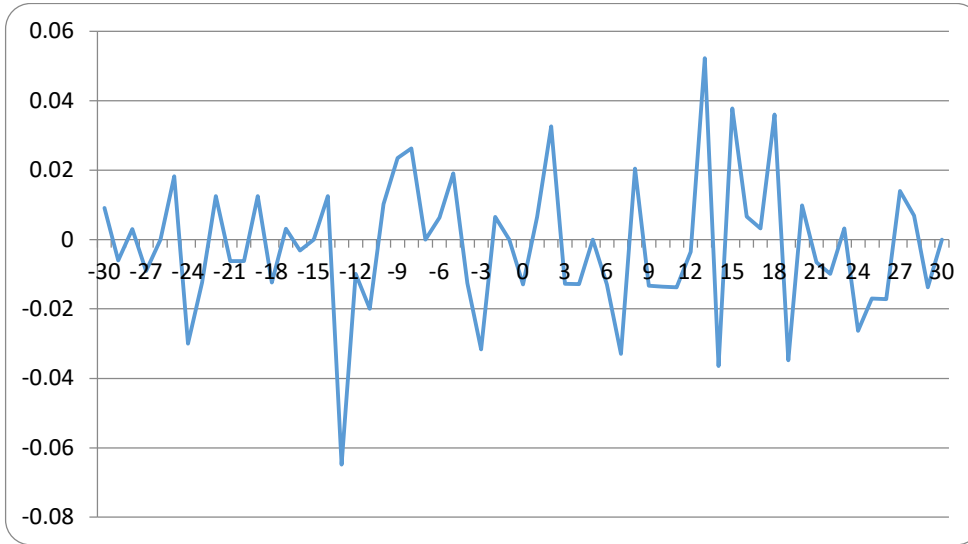


Figure 4.2: Eaagads Limited Stock Returns

4.2.3 Car and General Kenya Stock Returns

The outcomes for the reaction of Car and General stock before and after the President initially announced the Covid-19 outbreak and instituted measures to curb the spread of the virus on 15 March 2020 event are as shown in Figure 4.3.

The findings in Figure 4.3 display that Car and General Kenya registered positive weighted stock returns before the event date and consequently posted negative average returns post Presidential Covid-19 outbreak announcement and initially instituted measures to curb the spread of the virus event. The average stock return decreased from 0.2% to -0.7% after the event date. This led to a decrease in the average stock returns by 0.9%. The best stock return in the event window, which was 7.3%, was registered 9 later and lowest -9.6%, was registered 12 days after the event date.

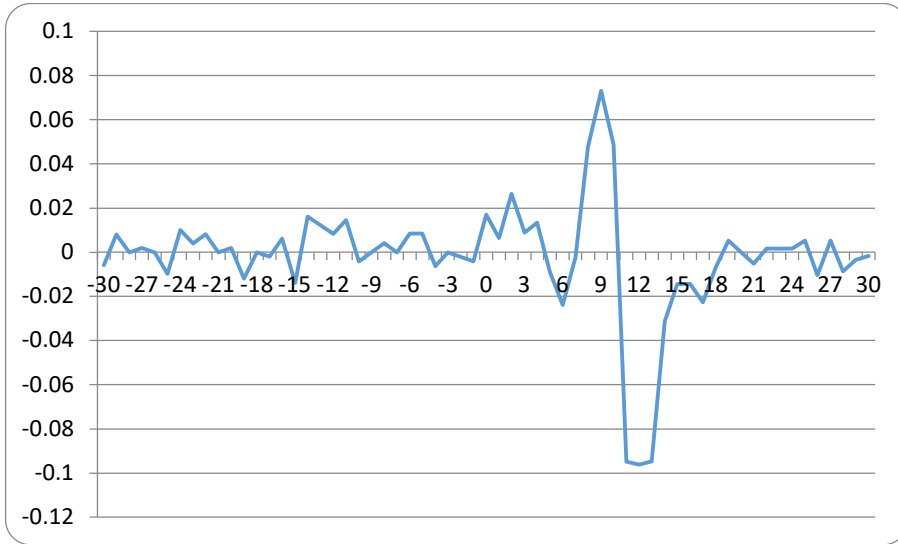


Figure 4.3: Car and General Stock Returns

4.2.4 Express Kenya Limited Stock Returns

The end reaction of Express Kenya Limited share prices during the event are as indicated in Figure 4.4.

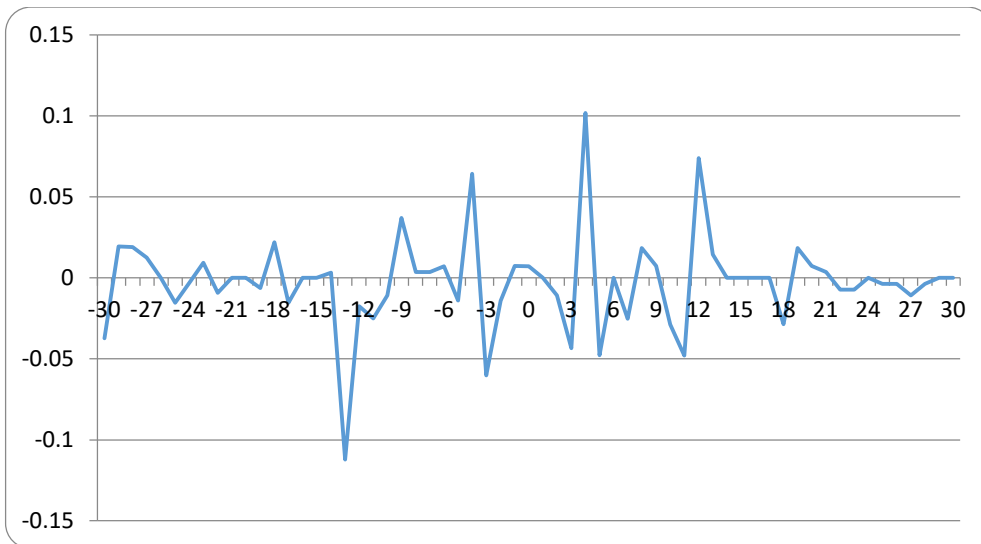


Figure 4.4: Express Kenya Limited Stock Returns

Findings in Figure 4.4 indicate that Express Kenya Limited stock returns reacted positively to the President announcing the outbreak of the Covid-19 pandemic and initially instituting

measures to curb the spread of the virus on 15 March 2020, the event date, by increasing from a 30-day average return of -0.4% to -0.08% after the Covid-19 pandemic outbreak announcement event. The response in the event window, which was lows of -11.2% day 13 before event highs 10.2% on day 4 after event.

4.2.5 Bamburi Cement Limited Stock Returns

The reaction of Bamburi Cement Limited stock returns subsequent to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 event is as illustrated in Figure 4.5.

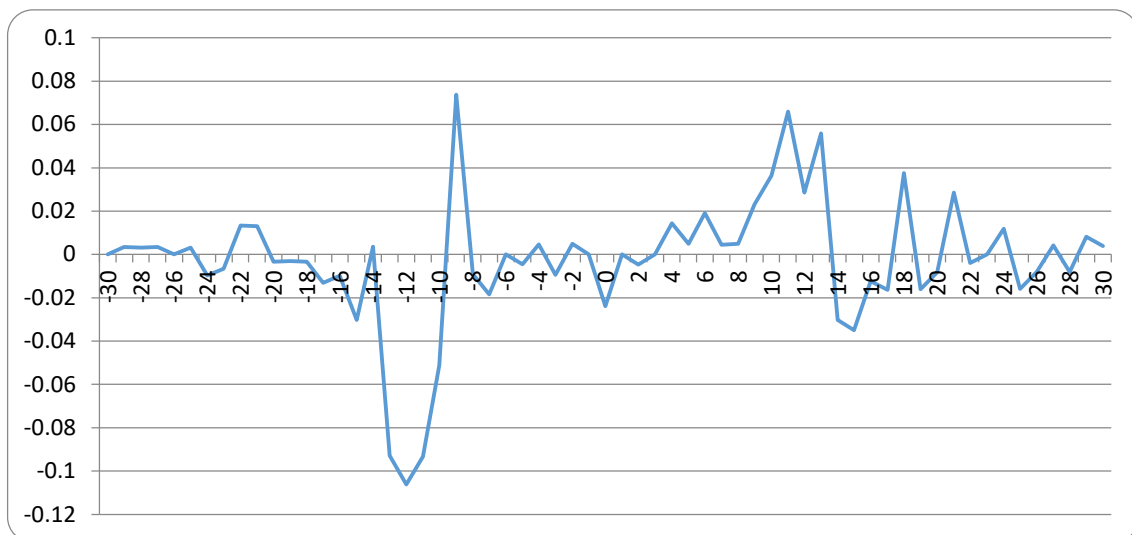


Figure 4.5: Bamburi Cement Limited Stock Returns

The findings in Figure 4.5 illustrate that the stock returns of Bamburi Cement Limited reacted positively to the President initially instituting measures to curb the spread of the virus event. This was evidenced by a change of weighted returns from 1.8% to -1.1%. A sharpness of 0.7%. Sharp reactions were registered between the 8th to 14th day before and after the event date. The highest stock return in the event window, which was 7.4%, was registered 9 days before the

event date whilst the lowest stock return in the event window, which was -10.6%, was registered 12 days before the event date. Findings in Figure 4.5 further exhibit that on the event date, Bamburi Cement Limited registered a negative stock return, which was -2.4%.

4.2.6 Kengen Stock Returns

The outcomes for the reaction of Kengen share prices subsequent to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 event are as indicated in Figure 4.6.

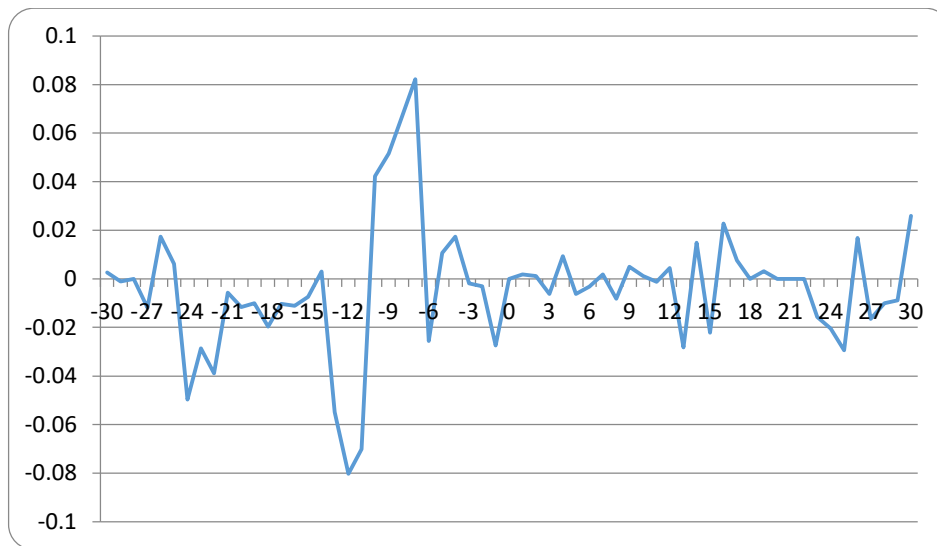


Figure 4.6: Kengen Stock Returns

The findings in Figure 4.6 reveal that Kengen reacted positively to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus event. The average returns during the event window, saw an increment from an average return before the event day of -0.6% to an average return after the event of -0.2%. The lowest stock return in the event window, which was, -8% was registered 12 days before the event date whilst the highest stock return in the event window, which was, 8.2%, was registered on the 7th day before the event date.

4.2.7 British American Investment Company Stock Returns

The indication of British American Investment Company's share prices to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 event is as shown in Figure 4.7.

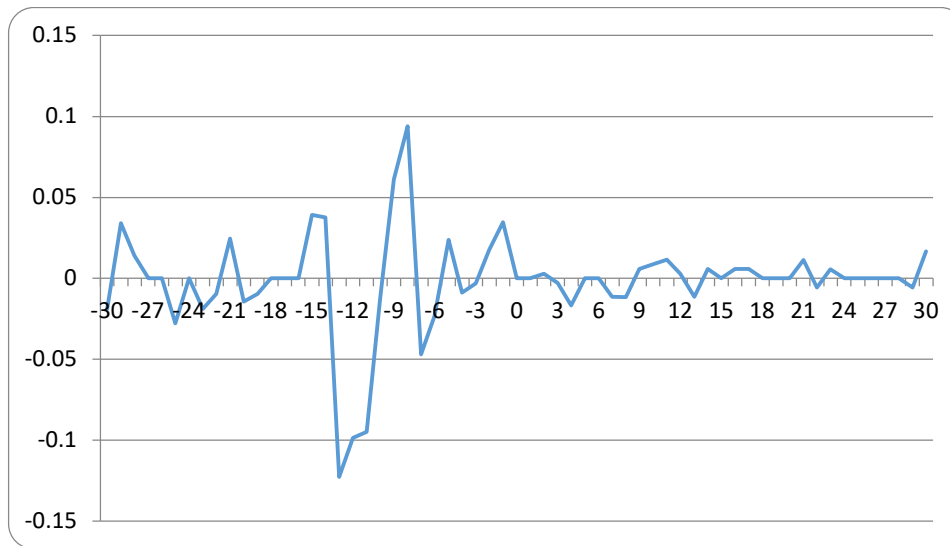


Figure 4.7: British American Investments Company Stock Returns

The findings in Figure 4.7 display that during the pre-event period, the average stock return of the British American Investments Company was -0.4% whilst after post-event average stock return was 0.06%. Therefore, this indicates an increment in the stock returns by 0.46%, inferring a positive reaction of the British American Investments Company's stock returns to the event. The highest return in the event window, which was 9.4%, was registered 8 days before the event date whilst the lowest return in the event window, which was -12.3%, was registered 13 days before the Covid-19 pandemic outbreak announcement event.

4.2.8 Centum Investments Company Stock Returns

The reaction of Centum Investments Company's stock returns to the President announcing the covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 event is as shown in Figure 4.8.

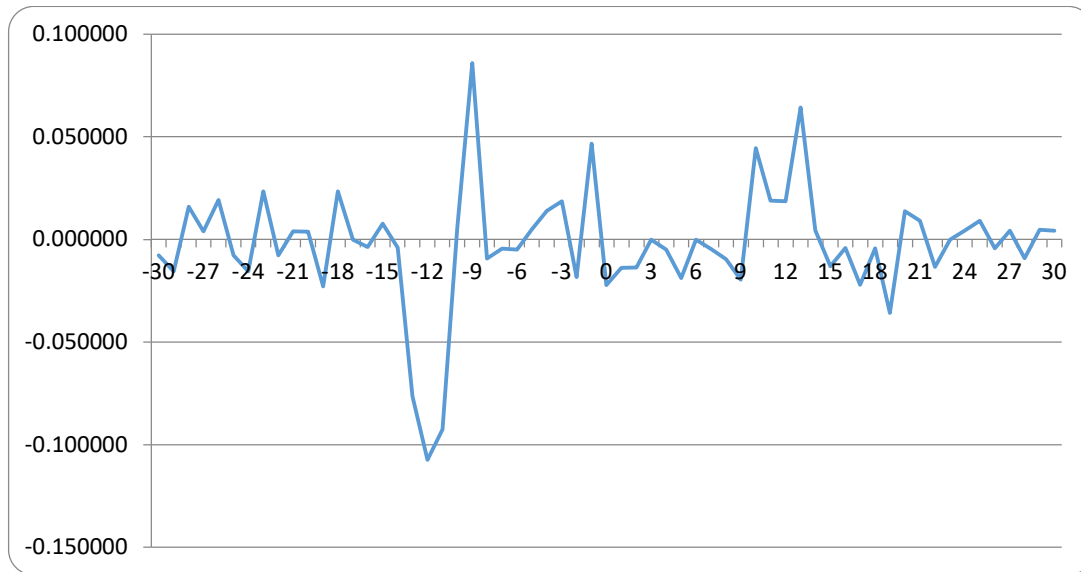


Figure 4.8: Centum Investments Company Stock Returns

The findings in Figure 4.8 showcase that the stock returns for Centum Investment Company reacted positively to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus event. The 30 days pre-event date average return was -0.4% pre and 0.03% after 15th March 2020. Therefore the was a difference between the pre and post event date returns of 0.43%, indicating a positive reaction due to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus event. The lowest stock return in the event window, which was -10.7%, was registered on day 12 pre event, highest stock return in the event window, which was 8.6%, was registered 9 days after the event date. However, Centum Investment Company's reaction to the Covid-19 pandemic outbreak announcement event was not sharp.

4.2.9 Nairobi Securities Exchange Stock Returns

The response of Nairobi Securities Exchange stock returns to the President announcing the advent of the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 event is as shown in Figure 4.9 below.

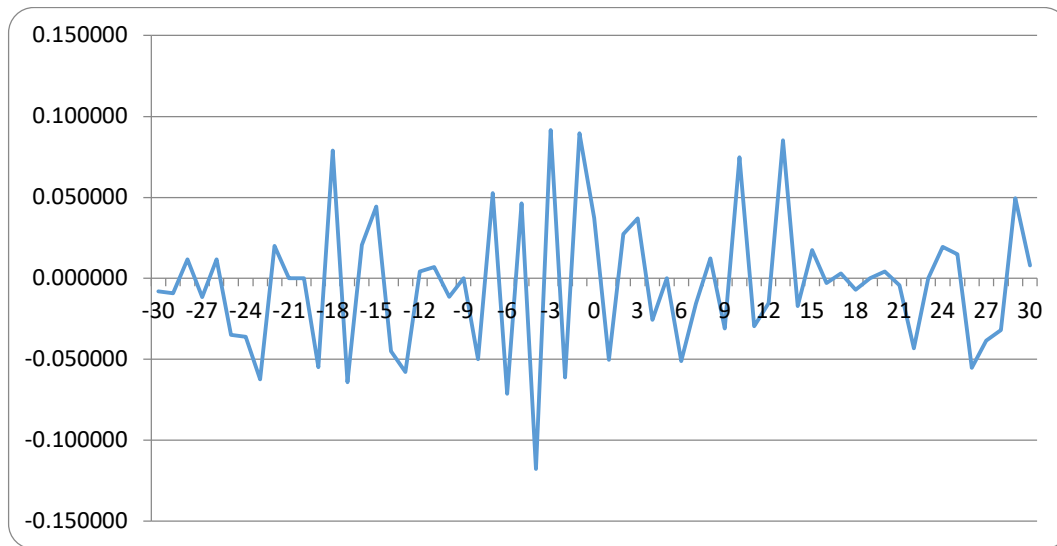


Figure 4.9: Nairobi Securities Exchange Stock Returns

The findings in Figure 4.9 display that the stock returns of the Nairobi Securities Exchange counter reacted erratically to the event of the President initially announcing the advent of the Covid-19 pandemic outbreak and instituting measures to curb the spread of the virus. This shows cases that Nairobi Securities Exchange's share price was very sensitive to the event. Generally, Nairobi Securities Exchange's reaction to the event was positive as evidenced by an increment of pre-event date average return of -0.7% to a post-event date average return of -0.2%. The lowest stock return in the event window, which was -11.77% was registered 4 days before the event whilst the highest stock return in the event window, which was 9.2%, was registered 3 days before the event.

4.2.10 BOC Kenya Limited Stock Returns

The reaction of BOC Kenya Limited's stock price following the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 event is as shown in Figure 4.10.

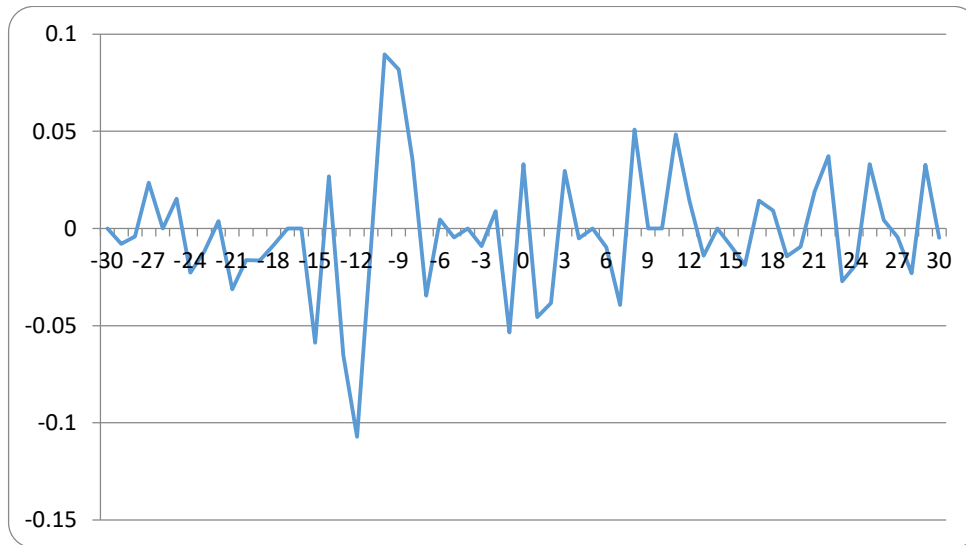


Figure 4.10: BOC Kenya Limited Stock Returns

The findings in Table 4.10 reveals that price of BOC Kenya Limited response was positive to Covid-19 pandemic outbreak announcement and initially instituting measures to curb the spread of the virus event. The mean increased from -0.6% to 0.05% after the event. The lows were recorded at -10.7%, on 12th day before the event date whilst the highest mean, which was 9%, was registered 10 days before the event date.

4.2.11 Safaricom PLC Stock Returns

The outcomes for the reaction of Safaricom PLC share prices before and after the President announced the Covid-19 pandemic outbreak and initially instituted measures to curb the spread of the virus on 15 March 2020 event is shown in Figure 4.11.

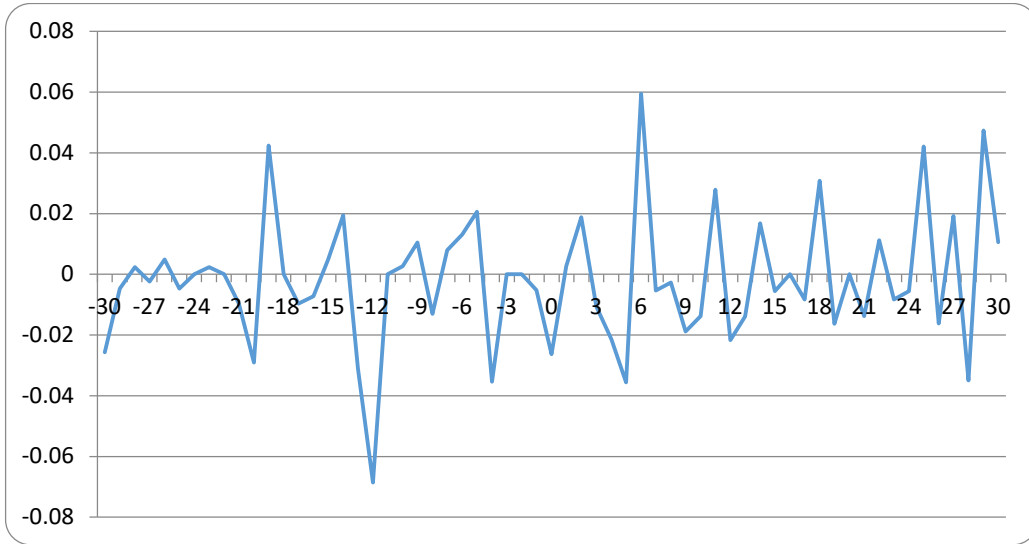


Figure 4.11: Safaricom PLC Stock Returns

The study outcomes in Figure 4.11 revealed that Safaricom PLC’s stock returns were significantly reactive to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus event. This is evidenced by the erratic reaction of Safaricom PLC’s stock returns. Generally, Safaricom PLC reacted positively to the event by posting the pre-event average return of -0.4% increasing to 0.1% post-event average return. The lowest stock return in the event window, which was -6.9%, on day 12 pre event whilst the highest of 6%, 6 days post 15th.

4.3 Abnormality of Stock Returns following the Covid-19 Pandemic

The variance of the firms’ actual stock returns versus the expected or normal returns were calculated so as to determine the abnormal returns of the eleven listed firms’ derived from each sector at the NSE Kenya. Table 4.1 following shows the summary of the abnormal returns as well as their significance level.

Table 4.1: Abnormality of Stock Returns in the Advent of the Covid-19 Pandemic

Average Abnormal returns	STDEV	t-test	Significance
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Barclays Bank Limited	-0.0033	0.018	-1.4201	0.8545
Eaagads Ltd	-0.0021	0.019	-0.8561	0.9120
Car and General (K) Ltd	0.0022	0.025	0.6816	0.9299
Express Ltd	0.0004	0.028	0.1107	0.9886
Bamburi Cement PLC	-0.0025	0.026	-0.7448	0.9234
KenGen Ltd	-0.0029	0.027	-0.8320	0.9145
Britam Holdings Ltd	-0.0016	0.033	-0.3756	0.9613
Centum Investment Co Ltd	0.0116	0.011	8.1685	0.2916
Nairobi Securities Exchange Ltd	-0.0037	0.043	-0.6665	0.9314
B.O.C Kenya Ltd	0.0000	0.030	0.0000	1.0000
Safaricom PLC	-0.0031	0.022	-1.0915	0.8879

The conclusion 7 entities had negative abnormal returns, 3 had positive abnormal returns and one firm recorded a zero abnormal return in reaction to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15th March 2020. However, the study findings from Table 4.1 outlines p-values which were all greater than 0.05 showing no results was significant. The firms that recorded positive response are; Car and General (K) Ltd, Express Ltd, and Centum Investment Co Ltd. The firms that had negative response were; Barclays Bank Limited, Eaagads Ltd, Bamburi Cement PLC, KenGen Ltd, Britam Holdings Ltd, Nairobi Securities Exchange Ltd, and Safaricom PLC. B.O.C Kenya Ltd had no response. It is worthwhile to note that none of the abnormal returns recorded were greater than 1 or below -1 suggesting that none of the investors benefited or lost abnormally as a consequence of the Covid-19 pandemic outbreak announcement. The trend of the abnormality after the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15th March 2020 event is exhibited in Figure 4.12.

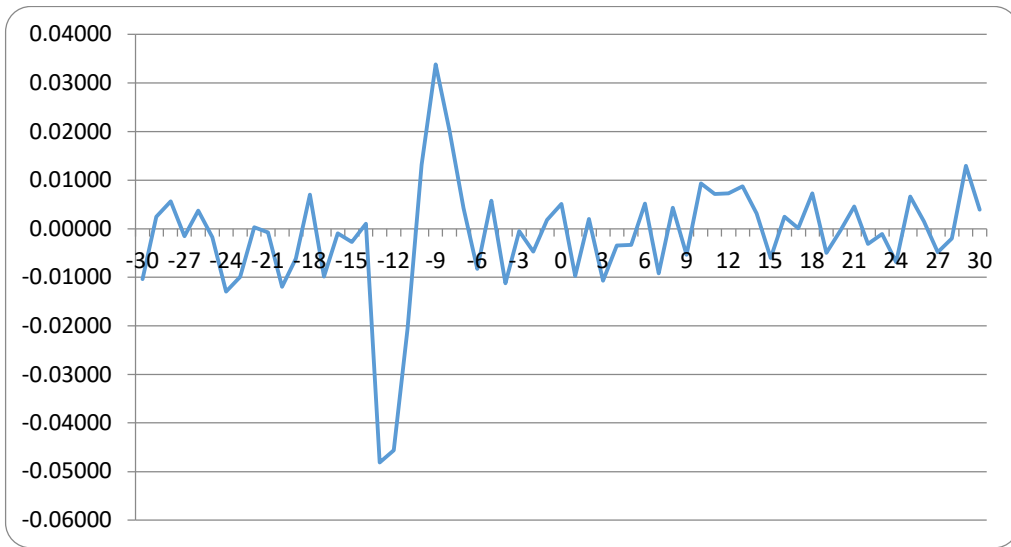


Figure 4.12: Average Abnormal Returns

Figure 4.12 displays that the greatest abnormality in the event period, which was 3.4% was registered 9 days before the event date whilst the lowest abnormality in the event period, which was -4.81%, was registered 13 days before the event date.

4.4 The Cumulative Abnormal Returns

The findings on Cumulative Average Abnormal Returns of the listed firms selected from each sector at the NSE following the President initially announcing the Covid-19 pandemic outbreak and instituting measures to curb the spread of the virus on 15 March 2020 are as shown in Figure 4.13.

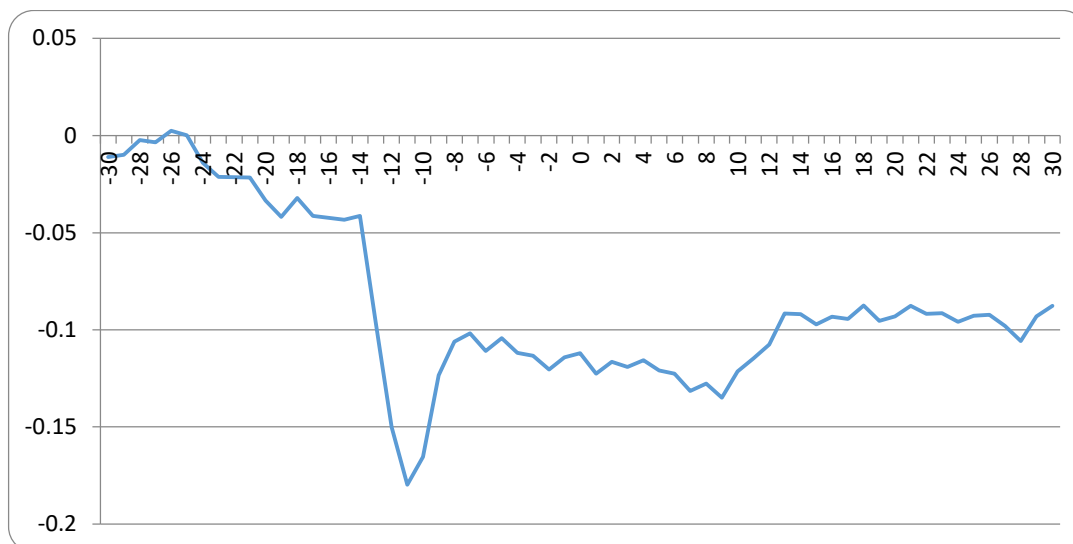


Figure 4.13: Cumulative Abnormal Returns (CAR)

The study findings in Figure 4.13 established that there was a negative Cumulative Average Abnormal Returns 30 days before the Covid-19 pandemic outbreak announcement and 30 days after the President announced the Covid-19 pandemic outbreak initially instituting measures to curb the spread of the virus on 15 March 2020. Throughout the event period, the study findings in Figure 4.13 registered a negative decrease in Cumulative Average Abnormal Returns. The cumulative average returns declined steeply on the 26th day before the event up to the 12th day before the event. It then rises gradually and the stabilizing on the 6th day before the event. This implies that the President initially announcing the Covid-19 pandemic outbreak and instituting measures to curb the spread of the virus had a no cumulative impact on entities outcome.

4.5 Interpretation and Discussion of Research Findings

The goal was to determine the efficiency of the Nairobi Securities Exchange in the semi strong form, using a case study of the covid-19 announcement in Kenya. We analysed the reaction of share price of 11 listed companies from each sector category at the NSE 30 days before President announced the Covid-19 pandemic outbreak and initially instituted measures to curb the spread of the virus on 15 March 2020 and 30 days after. The study focused on abnormal

returns and their respective cumulative. The variance of the listed firms' actual stock returns versus the expected or normal returns were calculated so as to determine the abnormal returns of the eleven listed firms.

The study found out that that seven-listed firms recorded positive abnormal returns, three recorded positive abnormal returns, while one recorded zero abnormal returns in reaction to the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus. However, none of the abnormal returns were found to be statistically significant. As the range between 1 and -1.

We observed a downward slope on Cumulative Average Abnormal Returns of the sample before the event date but stabilized as we approached the event date and this trend continued even after the event date. These implies that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 was fruitful.

A study in Asia by Afshan, Sharif, Nassani, Abro, Batool and Zaman (2021) found that internet penetration improved on the efficiency of the stock markets. Alexakis, Patra and Poshakwale (2010) established that in the Greek Stock Market, the market does not fully account for all accounting information in the prices of their stocks. The current study finding that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that zero market plays lost or gained huge a result of the Covid-19 pandemic outbreak announcement contradicts Afshan, Sharif, Nassani, Abro, Batool and Zaman (2021) and Alexakis, Patra and Poshakwale's (2010) findings.

Ogundina, Ajala, and Soyebó (2014), using dividend payments established that the market was efficient in the semi-strong form. These findings agree with Ayodele, Oshadare and Ajala (2018). However, Onoh (2016) who noted inefficiency in the Nigerian Stock Exchange. In South Africa, Harjito, Alam and Dewi (2021) found that the market showed a positive semi-strong form of market efficiency. The current study finding that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that investors were indifferent to the Covid-19 pandemic outbreak announcement is in tandem with Ogundina, Ajala, and Soyebó (2014) and Ayodele, Oshadare, and Ajala's (2018) findings but contradict with Onoh's (2016) findings.

A study by Maringa, Riro and Kiarie (2018) found that NSE was efficient in 4 of the 5 years they were studying. This finding shows that in some instances, the market is efficient and in others, the market is inefficient. They studied using dividend payment information. The current study finding that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that not one or many of the investors profited from the Covid-19 pandemic outbreak announcement is in tandem with Maringa, Riro and Kiarie's (2018) findings.

Gichaiya, Mhuri, Muchina, Munyua, Weru and Kamau (2018) found that there were inconsistencies and that some companies were efficient in one test, and inefficient in another test. The current study finding that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an

insignificant impact on the stock returns for eleven listed firms at the NSE and that that absolutel zero market playes gained or lost a result of the Covid-19 pandemic outbreak announcement is not in tandem with Gichaiya, Mhuri, Muchina, Munyua, Weru and Kamau's (2018) findings.

Calamities, pandemics, political instability, among other news items have a significant negative effect on financial markets. For example, economic tumult which occurred as a result of the COVID-19 pandemic had far reaching ramifications on financial markets, which included stock, bond, and commodities financial markets (Cavallo et al., 2013; Bergholt & Lujala, 2012; Kim, 2011; Cuaresma, Hlouskova & Obersteiner, 2008; Skidmore & Toya, 2002). The current study finding that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that none of the investors benefited or lost abnormally as a result of the Covid-19 pandemic outbreak announcement is not in tandem with Bergholt and Lujala (2012), Cavallo et al. (2013), Cuaresma, Hlouskova, and Obersteiner (2008), Kim (2011), Skidmore and Toya's (2002) assertions.

CHAPTER FIVE: SUMMARY, CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

5.1 Introduction

In this chapter, we summarize outcome of chapter four conclude and offer recommendation stakeholders. Further, limitations encountered as the current study was conducted, are enumerated. Additionally, the chapter also provides recommendations to key stakeholders as well as policy makers. Finally, the chapter also offered suggestions on areas to be covered by other academicians and scholars in future researches.

5.2 Summary of Findings

The research aimed to establish the efficiency of the Nairobi Securities Exchange in the semi strong form, using a case study of the covid-19 announcement in Kenya. Secondary data applied in undertaking the research were collected from the NSE for 11 listed companies from each sector category at the NSE. This was an event study analysis of the announcement of the Covid-19 pandemic outbreak in Kenya on 15 March 2020 when the President initially announced the outbreak of the pandemic and instituted measures to curb the spread of the virus. The study did analysis of the stock prices reactions of the 11 listed companies 30 days before and after the President announced the outbreak of the Covid-19 pandemic and initially instituted measures to curb the spread of the virus. The data analysis was done through use of Microsoft's Excel (2013). To determine the significance of the announcement of the outbreak of the pandemic on stock returns T-test was done. This was established through SPSS Version 25.

The study found out that only 9.09% of the firms quoted at the Nairobi Securities Exchange reacted negatively to Covid-19 pandemic. All the other firms (90.91%) reacted positively. The

study further established that seven firms (63.64%) recorded negative abnormal returns, three firms (27.27%) recorded positive abnormal returns, and one firm (9.09%) recorded zero abnormal returns in reaction to the President initially announcing the outbreak of the Covid-19 pandemic and instituting measures to curb the spread of the virus. However, the current study findings established that none of the abnormal returns were statistically significant with all companies being within 1 and -1 range.

The study showed a steady decrease in Cumulative Average Abnormal Returns of the eleven listed firms at the NSE before the event date but stabilized as we approached the event date and this trend continued even after the event date. This implies that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 was a success.

5.2 Conclusion

The current study conclusions were made in line with the study's objective. The current study concluded that the Covid-19 pandemic outbreak announcement had an insignificant impact on the stock returns for eleven listed firms at the NSE and it did not lead to abnormal returns. The study also concluded that the Nairobi Securities Exchange is semi-strong form efficient since investors in the Nairobi Securities Exchange cannot beat the market and earn an above normal return on publicly available information.

The Efficient Market Hypothesis (EMH) states that outperforming the stock market is impossibility since the market efficiency will ensure that stock prices replicate all the applicable information (Fama, Fisher, Jensen & Roll, 1969). This hypothesis implies that an investor would not out do the market by concentrating on present information since the price

already incorporates the relevant information. The hypothesis further posits that one of the key principles in an efficient market is that the stock prices ought to replicate all the newly received information immediately and the price movement ought to be fair as per the information received and that in a perfectly efficient market, predictable patterns for instance market overreactions and under reactions, and the ensuing corrections, should just not exist (Fama, 1970). Thus, the Efficient Market Hypothesis insinuates that in an efficient market, market anomalies should not exist. The current study conclusion that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that none of the investors benefited or lost abnormally as a consequence of the Covid-19 pandemic outbreak announcement is in tandem with the Efficient Market Hypothesis.

The prospect theory by Kahneman and Tversky (1979) indicates that if investors were to make a decision of alternative courses of investment, rationale investors will make a move of selecting the investment that shows higher potential for returns rather than the one that seems to be presenting low risk of losses. Thus, the decision-making processes can impact on performance of securities. The decisions can in turn be influenced by the current information. The current study conclusion that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that no market player gained or lost big as a consequence of the Covid-19 pandemic outbreak announcement contradicts the prospect theory.

The rational expectations theory as advanced by Muth (1961) explains the courses of action investors may take including the influence of the market performance. The courses of action

can in turn be influenced by the current information. The current study conclusion that the President announcing the Covid-19 pandemic outbreak and initially instituting measures to curb the spread of the virus on 15 March 2020 had an insignificant impact on the stock returns for eleven listed firms at the NSE and that that party benefited or lost abnormally as a consequence of the Covid-19 pandemic outbreak announcement contradicts the rational expectations theory.

5.3 Recommendations

The current study findings will assist in further studies conducted on the field of market efficiency. The current study findings will offer a valuable basis on which future studies on capital markets efficiency will be done. The current study findings will also advance not only researcher's knowledge of market efficiency, but the scholarly community's knowledge as well, and also aiding the relevant security market regulators to gain experience in the subject matter. The current study findings can be used as referral by later scholars and academicians keen on researching on market efficiency.

Policy recommendations to government officials and policy makers in the Treasury and the security markets regulator, the Capital Markets Authority, are to formulate and implement policies that enhance market efficiency for predictability of the market behaviour by market players, which will in turn enhance investor confidence in the operations of the securities market in the strong form since it has been established in the current study that the Nairobi Securities Exchange is semi-strong form efficient as there are insignificant abnormal returns and investors cannot beat the market as a result of publicly available information. Recommendations are made in order to guide government regulators in making policies and

practices to capital markets to boost their financial deepening since they are a form resource allocation from surplus to deficit units.

The current study established that the Nairobi Securities Exchange is semi-strong form efficient and investors cannot beat the market as a result of publicly available information. Recommendations are made to consultants and management of listed as well as other firms not to consider earnings as a factors that influence share prices/firm value in the securities market but they should focus on intrinsic firm specific factors as they formulate strategies and policies as it was established that the Nairobi Securities Exchange was semi-strong form efficient. Recommendations are also made to investment banks, equity analysts, and individual investors not to consider earnings in order to increase their wealth or their clients' wealth, but they should focus on intrinsic firm specific factors when analysing whether the firm is undervalued or overvalued. Finally, recommendations are made individual investors not to rely on positive earnings announcement by companies in which they hold shares or they want to post a long or short position, but they should instead focus on intrinsic firm specific factors to analyze whether the firm is undervalued or overvalued.

5.4 Limitation of the Study

The study was only conducted on the regulated capital markets due to time and cost constraints. It is not certain whether the current study findings would hold if similar studies were replicated on Over-the-Counter markets. Besides, greater uncertainties would arise if similar studies were replicated in different jurisdictions and countries. Additionally, due to time limitations, this research focused on a 60 day event window, thirty days before Covid-19 pandemic outbreak announcement. It is not ascertained if the study findings would hold if studies covering a longer event window were done. Additionally, due to time and cost constraints, a sample of 11 listed

firms in each sector/category was chosen for the study analysis. It is not ascertained if the study findings would hold if studies covering more firms were done.

The researcher of the current study encountered struggled to buy data from NSE licensed players. It was quite expensive. Additionally, data had be collected and analysed in Microsoft Excel to obtain descriptive graphs and also the data had to be subsequently uploaded into SPSS in order to conduct inferential analysis and draw conclusions. A large amount of time was needed to analyse the data and infer conclusions.

5.5 Suggestions for Further Research

Centring on the knowledge and understanding acquired form the current study, it has been recommended that some areas for advance future studies to be conducted on. First, there might be other determinants of stock returns apart from public information. Further research can be done to identify and analyse them. Additionally, there are other modes of public information apart from pandemic/catastrophes announcements. Further research can be done to identify and analyse them. Additionally, there might be factors that moderate, intervene, or mediate the relationship between public information and stock returns. Further research can be done to identify and analyse them.

The current study was carried out in the regulated capital markets' context. Further, similar studies could be carried out in Over-the-Counter markets to find out if the current study findings will hold. The current study was only carried out in the Kenyan context. Thus, further similar studies could be carried out of Kenyan context; similar studies can be carried out in the African region or global jurisdictions to find out whether the current study findings would hold. The current research focused on a 60 day event window, thirty days before the Covid-19

pandemic outbreak announcement and thirty days after. Thus, the current study was done in the short run. A study entailing a longer event period might be conducted to ascertain if the current study findings can hold in the long-run. The current study was conducted on the 11 listed firms in each sector/category. A study entailing a greater sample size might be conducted to ascertain if the current study findings would hold.

Secondary data were employed in this study; future research relying on primary data such as detailed questionnaires and organized interviews provided to CMA staff, firm management, consultants, equity analysts, staff of investment banks, or individual investors can be done, which might disapprove the current study findings. The event study methodology and paired t-test statistical approach was used in the research, however future studies may utilize additional methods such; multiple linear regression by using dummy variables, correlation analysis, component analysis, cluster analysis, discriminant analysis, and granger causality.

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APPENDICES

Appendix 1: Listed Firms in NSE

Agricultural	
Ticker	Company Name
EGAD	Eaagads Limited
KUKZ	Kakuzi Limited
KAPC	Kapchorua Tea Company Limited
LIMT	Limuru Tea Company Limited
SASN	Sasini Tea and Coffee
WTK	Williamson Tea Kenya Limited
Automobiles and Accessories	
Ticker	Company Name
G&G	Car & General Kenya
Banking	
Ticker	Company Name
BBK	Barclays Bank of Kenya
CFC	CfC Stanbic Holdings
DTK	Diamond Trust Bank Group
EQTY	Equity Group Holdings Limited
HFCK	Housing Finance Company of Kenya
I&M	I&M Holdings Limited
KCB	Kenya Commercial Bank Group
NBK	National Bank of Kenya
NIC	National Industrial Credit Bank
SCBK	Standard Chartered of Kenya
COOP	Cooperative Bank of Kenya
Commercial and Services	
Ticker	Company Name
XPRS	Express Kenya Limited
KQ	Kenya Airways
LKL	Longhorn Kenya Limited
EVRD	Eveready East Africa
SCAN	Scangroup
NMG	Nation Media Group
SGL	Standard Group Limited
FIRE	Sameer Africa Limited
TPSE	TPS Serena
UCHM	Uchumi Supermarkets

Construction and Allied	
Ticker	Company Name
ARM	ARM Cement Limited
BAMB	Bamburi Cement Limited
BERG	Crown-Berger (Kenya)
CABL	East African Cables Limited
PORT	East Africa Portland Cement Company
Energy and Petroleum	
Ticker	Company Name
KEGN	Kengen
KENO	KenolKobil
KPLC	Kenya Power and Lighting Company
TOTL	Total Kenya Limited
UMME	Umeme
Insurance Segment	
Ticker	Company Name
BRIT	British-American Investments Company
CIC	CIC Insurance Group
CFCI	Liberty Kenya Holdings Limited
JUB	Jubilee Holdings Limited
KNRE	Kenya Reinsurance Corporation
PAFR	Sanlam Kenya Plc
Investments	
Ticker	Company Name
ICDC	Centum Investment Company
OCH	Olympia Capital Holdings
HAFR	Home Afrika Ltd
TCL	TransCentury Investments
Investment Services	
Ticker	Company Name
NSE	Nairobi Securities Exchange
Manufacturing and Allied	
Ticker	Company Name
BOC	BOC Kenya Limited
BAT	British American Tobacco Limited
CARB	Carbacid Investments Limited
EABL	East African Breweries
EVRD	Eveready East Africa
ORCH	Kenya Orchards Limited
MSC	Mumias Sugar Company Limited
UNGA	Unga Group

Telecommunication and Technology	
Ticker	Company Name
SCOM	Safaricom

Source: Nairobi Securities Exchange Website (2021)

Appendix 2: Data Collection Form

Name of Company.....		
Industry of operation.....		
Duration	Day	Stock price
Pre Covid-19 period	-30	
	-29	
	-28	
	-27	
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Covid-19 Announcement	0	
Post covid-19 announcement	1	
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Historical Price Data	1	
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Appendix 3: Sampled Listed Firms

	Company	Sector
1	Barclays Bank Limited	Banking
2	Eaagads Ltd	Agricultural
3	Car and General (K) Ltd	Automobiles and Accessories
4	Express Ltd	Commercial and Services
5	Bamburi Cement PLC	Construction and Allied
6	KenGen Ltd	Energy and Petroleum
7	Britam Holdings Ltd	Insurance
8	Centum Investment Co Ltd	Investments
9	Nairobi Securities Exchange Ltd	Investment Services
10	B.O.C Kenya Ltd	Manufacturing and Allied
11	Safaricom PLC	Telecommunication and Technology