THE EFFECT OF TERRORIST ATTACKS ON THE PERFORMANCE OF NAIROBI SECURITIES EXCHANGE

BY

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DECLARATION

This research project is my original work and has not been submitted to any other University for an academic award.

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

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DEDICATION

This work is in memory of my grandfather (kugo) Cheboss Chepsego (1926-2007) who was at hand to accompany me to and from nursery school, including when the fear of the infamous T9 (stray dogs) was so real! My siblings (Faith, Celestine, Mercy, Judy and Maureen) and I will forever remember his love and concern for us with nostalgia and deep appreciation.

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ABBREVIATIONS

AR - Abnormal Returns

CAR - Cumulative Abnormal Returns

CBK - Central Bank of Kenya

CMA - Capital Markets Authority

EMH - Efficient Market Hypothesis

GDP - Gross Domestic Product

IRA - Insurance Regulatory Authority

ISIS - Islamic State in Maghreb and Syria

KDF - Kenya Defence Forces

NSE - Nairobi Securities Exchange

NSE Ltd - Nairobi Securities Exchange Company Limited

UN - United Nations

ABSTRACT

Stock markets are critical drivers of economic growth given their role in savings mobilization and allocation of resources to productive sectors in any economy. The performance of stock markets are, however, affected by a myriad of factors including uncertain political transitions, conflicts, war, and terrorist attacks. The frequency and severity of terrorist attacks has been on the increase with most countries being exposed to its negative impacts. Terrorist attacks are therefore critical events to financial markets since they create uncertainty and increase investment risks thus affecting trading. Kenya has borne the brunt of terrorist attacks especially since the country deployed its military into Somali in 2011 in pursuit of Al Shabaab terrorists who had previous carried out sporadic attacks in the Kenyan Coast targeting mainly tourists. This study sought to establish the effect of terrorist attacks on the performance of Nairobi Securities Exchange (NSE) and it adopted event study methodology. The Westgate (2013), Lamu - Mpeketoni (2014) and Garissa University (2015) attacks were considered given that they are the most recent and major attacks on the basis of life and property lost. Data from NSE was utilized and analyzed using Microsoft Excel before being presented in tables and graphs. The study established that Average Abnormal Return (AAR) reduced in the event period for all the attacks, although to a lesser extent for Westgate, and it was statistically significant at 5% level. Analysis of Cumulative Average Abnormal Return (CAAR) revealed that Garissa and Lamu attacks had significant negative effect on the performance of Nairobi Securities Exchange. CAAR analysis for Westgate attack indicated no impact but it is clear from graphical analysis that over a shorter event window the attack negatively affected the Nairobi Securities Exchange. Since CAAR was negative/declining for all events, the study concludes that terrorist attacks indeed affect negatively the performance of Nairobi Securities Exchange. The study suggests a broader study considering more terrorist attacks and using several event window periods while using both primary and secondary data in order to arrive at a more reliable conclusion. It is recommended that investors should diversify their portfolios to cushion themselves from the negative effect on terrorist attacks while the government should enhance anti-terrorism initiatives and counter misinformation on terrorist attacks in order to reduce panic among investors which compounds the negative impact of such attacks.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Terrorism is not a recent phenomenon and the vice is increasingly becoming a common occurrence world over with most countries, Kenya included, having been exposed directly or indirectly to its negative impacts. Aksoy (2014) points out that despite its prevalence, there is no common, universal definition of terrorism given that the subject is in itself controversial. Its definition is consequently influenced by the perception or narrative being advanced. While one party may regard it as a fitting reaction to oppression, another may say it is an inexcusable abomination, citing the ruthless methods of violence perpetrated by various terrorist organisations. For instance, colonial governments viewed African freedom fighters as terrorists yet Africans themselves viewed them as liberators and heroes.

The European Union defines terrorism, as reflected in Article 1 of the Council Framework Decision on Combating Terrorism (2002), as offences of criminal nature perpetuated against property and persons that could critically undermine vital socio-economic, political and constitutional structures of a state, with an objective of coercing a population or intimidating a government or any other entity into performing or not performing an action of interest to the perpetrator. Similarly, Sandler and Enders (2004) term terrorism as calculated use or threat to use above normal violence as a means to achieve political goals by intimidating a larger population.

Terrorists use various means to exert violence and threats of violence on targeted individuals, groups, communities, entities, institutions and governments in pursuit of their political, ideological and religious goals. Kumar (2013) regards attacks by terrorists as events of geopolitical nature that could have negative effects on national as well as global economy. As averred by Aurangzeb (2012), many economies world over are under serious constraints due to terrorism and Kenya is not an exception. Global Terrorism Index 2015 places Iraq, Afghanistan, Nigeria, Pakistan and Syria as the top five countries which have been most affected by the vice.

Capital markets are critical drivers of economic growth given their role in allocating resources to productive sectors in any economy. Other roles of capital markets are risk allocation, saving mobilization, capital formation, and price determination all of which contribute to a country's economic growth and development. The price determination role leads to fitting pricing of securities as per predominant sentiments in the market and intrinsic fundamentals. As articulated by Selvam and Raja (2008), individual stock prices are often a reflection of hopes and fears held by investors about future stock prices. Other factors that inform the determination of stock prices include company and industry performance, dividend earnings and signals by management such as share buy-back.

Terrorist attacks and other geopolitical events such as conflicts and war, deeper integration of world economies and uncertainty resulting from political transitions have a bearing on the stock prices and overall performance of capital markets. Keitany and Barasa (2012) state that unexpected events of socio-political nature can be regarded as

external shocks affecting capital markets with a direct bearing on risk premium thus boosting volatility besides negatively affecting valuation of assets and investment decisions. Given stock market liquidity, events like terrorism can have immediate effect on the prices of stocks. Selvam and Raja (2008) point out that decisions on buying and selling stocks may be speedily, cheaply and easily be reverted perhaps owing to availability of new information to the investor. Additionally, Keitany and Barasa (2012) posit that terror attacks have their effects on the psychology of investors, consumption power, political environment and economic wealth. The attacks also affect relations and business deals with foreign investors, thus affecting the stock market.

This study sought to review the impact of terrorist attacks on the Nairobi Securities Exchange (NSE), as may be evidenced by changes in share prices and by extension the NSE 20 share index.

1.1.1 Terrorist Attacks

Terrorism has become a worldwide security concern and as Tavor (2011) points out, it is a global phenomenon which has from time to time had negative effects across societies. Several countries are under constant threat of terrorism following the move by various actors to use terrorism as a weapon as they pursue political, ideological, socio-economic and religious goals.

Barry and Nedelescu (2006) averred that terrorism trends have changed with new trends being witnessed, particularly the shift from focusing on military targets to civilian targets.

New targets would include individuals, public gatherings, business premises/activities, religious and critical government installations, and transport infrastructure. Terrorists aim to exert maximum damage and draw global attention as they execute their sabotage operations. As Santifort, Sandler and Brandt (2013) found out, terrorists are moving away from complex terror events toward simpler ones, particularly bombings and use of improvised explosive devices and vehicle borne explosive devices. Other forms of exerting violence include the use of gun and grenade attacks and kidnapping. The most aggressive global actors in terrorism currently are the Islamic State, which operates mainly from Syria and Iraq, as well as Al Qaeda which targets western interests including their perceived allies and has affiliates in several parts of the world.

1.1.2 Performance of Stock Markets

Stock market performance is a measurement of the ability of a stock to grow or negatively undermine the wealth of existing shareholders over a specified time period. A stock price rise is indicative of good performance while the converse portrays poor performance of the stock. Stock performance is also an evaluation of market efficiency. Barasa (2014) avers that a basic feature of an efficient market is continuous liquidity that allows for easy entry and exit for investors. Stock markets world over perform a critical role in the process of economic development since they provide an avenue for money borrowers and lenders to interact at low cost.

Dailami and Aktin (1990) found out that well developed stock markets can boost savings besides providing capital for investment at low cost through use of financial instruments

that enable savers achieve portfolio diversification. As a result, the markets effectively and efficiently play the role of allocating resources to productive investments thus promoting economic growth. For instance, through issuance of shares and bonds, companies can raise funds to expand their operations/business activities to generate profit while governments can issue bonds to finance infrastructure and other development projects thus creating employment and generally aid in economic growth and national development.

1.1.3 Terrorist Attacks and Performance of Stock Markets

Attacks by terrorists have significant potential to negatively impact capital markets globally within a short period of time given the speed with which information travels. Terrorist attacks are therefore critical events to financial markets since they create uncertainty among investors and increase investment risks thus affecting trading. This results in raised stock volatility and an upsurge in risk premiums. In response, as Saxton (2002) points out, investors will be inclined to re-arrange their stock portfolios through exiting from high-risk stocks and opting for assets with comparable liquidity but with more security, for instance government-issued bonds. Terrorist attacks also increase costs to companies as they are forced to adjust their security and insurance arrangements accordingly.

The effect of a terrorist attack on any targeted economy is enormous. Inter-linkages among world economies due to globalization ensures that the negative impacts of terror attacks, and indeed other socio-economic shocks, are felt far and wide. Collier et

al.(2003), posits that incidents of terrorism have economic implications since they divert Foreign Direct Investments (FDI), limit trade, cause infrastructural damages, and contribute to redirection of public development funds into security. According to Chen and Siems (2004) financial markets speedily absorb and convert news of terrorist attack into economic information that is subsequently incorporated in determination of share prices. Similarly, Johnson and Nedelescu (2006), aver that share prices will instantaneously depict investors' projection on the performance of the shares going forward. Generally, major or sustained terrorist attacks, including threats of attack, would impact negatively on a country's economic growth and development.

1.1.4 Terrorist Attacks in Kenya and Performance of Nairobi Securities Exchange

Kenya has been a victim of several terror attacks especially in Nairobi and Mombasa cities as well as parts of Coastal and North Eastern regions. According to Blanchard (2013) porosity of Kenya's borders, nearness to Arabian Peninsula, weakness in criminal justice system, and endemic corruption as well as non-existence of a functioning state in Somalia over the past 20 years have created a conducive environment for groups with violent extremist ideologies to thrive.

Terrorist attacks on Kenya have been attributed to various extremist groups some of which have evolved or mutated over time. In particular, Blanchard (2013) points out further that Al Qaeda and its affiliates have been active in the East Africa region for about 20 years, even though the intensity of their operations have been fluctuating. The

most prominent affiliate of Al Qaeda that is active in Kenya is Al Shabaab which is an Islamist insurgency group based in Somali.

Kenya continues to face the threat of terrorism from Al Shabaab with frequency of attacks heightening since 2011 when Kenya Defense Forces (KDF) was deployed into Somalia in a bid to pursue and decimate the group (United States Department of State, 2015). Although Al Shabaab has claimed responsibility for several terrorist attacks in Kenya, data from Global Terrorism Database as captured in Appendix I indicate that Al Shabaab carried out over 17 major attacks on Kenyan soil since 2011 with the most devastating ones being executed at Garissa University (152 deaths), Mpeketoni (48 deaths) and Westgate Mall (72 deaths).

Nderitu (2015) points out that Al Shabaab's attacks and continuous threats have posed a real challenge to Kenya's struggling economy. In their study, Keitany and Barasa (2012) showed that activities by terrorists negatively impact on the performance of the Nairobi Securities Exchange (NSE). Malusi (2015), however, studied the effect of terrorist attacks on stock performance of insurance companies listed at the NSE and observed that, contrary to widely held view, investors in the insurance sector may not lose as such in the event of a terrorist attack.

The NSE is the principal bourse in Kenya that offers a platform for listing and trading of multiple stocks and other securities (Nairobi Securities Exchange, 2016). Its major index is the NSE 20 Share Index that keeps track of the performance of 20 top performing

companies as listed at the NSE. The selection of the companies is based on trading activity measures namely: market capitalization, shares traded, number of deals/liquidity and turnover.

1.2 Research Problem

Terrorism is increasingly becoming a global phenomenon and a leading security concern with several countries, Kenya included, being under constant threat of terrorism (Tavor, 2011). Terrorist groups or individuals execute their sabotage operations in different styles targeting critical economic, religious and governance installations as well as persons in a bid to draw global attention to their causes. The impact of a terrorist attack on any targeted economy and other world economies is enormous due to global inter-linkages which ensures that the negative impacts of terror attacks, and indeed other socio-economic shocks, are felt far and wide (Selvam & Raja, 2008). According to Aslam and Kang (2015) terrorist attacks are major events to financial markets since they create uncertainty among investors and increase investment risks thus adversely affecting stock markets and economic growth, besides escalating costs for companies.

Over the years Kenya has suffered increased terrorist attacks perpetuated by Al Qaeda and Al Shabaab elements among other terror groups leading to loss of lives and property, while posing challenges to Kenya's struggling economy which relies heavily on tourism (Nderitu, 2015). Some of the other sectors that are adversely affected by these attacks in varying degrees and intensity as alluded to by Gul et al. (2010) include hospitality, transport, manufacturing, trade and financial sector. The focus of this study is the

financial sector, particularly the Nairobi Securities Exchange (NSE). The NSE is the epicentre of financial activities in the country hence the need to understand events, activities and factors that negatively impact on its smooth functioning and by extension the economy of the country.

Karolyi (2006) clearly states that it is critical for investors, corporations and government policy makers to appreciate the extent of the impact of terrorist attacks. Studies relating to the consequence of terrorism on the economy, particularly in relation to stock market performance, became more widespread after the US September 11 terrorist attack. One of the studies was carried out by Chen and Siems (2004) who did an analysis of reaction of stock markets to fourteen terrorist and military attacks. They concluded that military interventions and attacks by terrorists have significant and prompt effect on stock markets worldwide, even though intensity and period of impact could vary. The effects are normally for a short period and the findings indicate that stock market resilience and absorption capacity have increased. Kollias et al. (2011) studied the impact of London and Madrid bombings on equity sectors and discovered that negative abnormal returns were significant and prevalent across most markets sectors in Madrid but the same case was non-existent in London. Recovery time was also faster in London and key findings allude to a short-lived impact on market return and volatility.

In the Kenyan context, such studies have been few with the one closest to this study having been undertaken by Keitany and Barasa (2012) and was with regard to effect of terrorism on security markets in Kenya. The study focused on events prior to the

deployment of Kenya Defence Forces (KDF) into Somalia in 2011 and it established that stock returns around terrorist event days were significantly negative, an indication of negative effect of terrorism on the stock market in Kenya. Malusi (2015) was keen on establishing the effect of terrorist attacks on the performance of insurance firms listed at the NSE. The results revealed existence of positive association between terrorist attacks and stock performance of insurance companies. It also observed that contrary to the general assumption that terrorist attacks affect the stock market negatively, investors in the insurance sector may not loose as well.

Given the evolving nature of terrorism, communication systems and financial services it is critical to continually study the interrelations between terrorist attacks and performance of stock markets. This is because as market efficiency improves over time, investors may incorporate the risk of terrorism in determining their investment portfolios leading to market resilience to repeated attacks over a period of time. For instance, information flow to the market prior to 2011 was slow given that the social media was not as developed as it is currently. This study therefore sought to extend the work by Keitany and Barasa (2012) by focusing on more recent terrorist events, which actually increased, after the deployment of KDF into Somalia in 2011. The study therefore updates the body of knowledge on the effect of terror attacks on the Nairobi Securities Exchange (NSE) by considering more recent major terror attacks and thereby establish the current level of efficiency of NSE in incorporating information on terrorist attacks.

1.3 Research Objective

The objective of the study was to analyse the effect of terrorist attacks on the performance of the Nairobi Securities Exchange.

1.4 Value of Study

The NSE plays a critical role in Kenya's economy and it is therefore critical for all stakeholders to understand the likely negative effect of unforeseen events like terrorist attacks on its performance. This is more so because of the dynamic nature of terrorism and progression in the efficiency of the market as technological, financial and communication advancements are realised, especially in developing markets like Kenya. The study findings will therefore inform the government, regulatory agencies, companies, investors and the academia on the effects of attacks by terrorist on the NSE.

Specifically, the government will be better apprised on the effect of terrorist attacks on NSE and the economy in general thus enabling it to put in place necessary measures to prevent or mitigate against the vice and safeguard the economy. Similarly, regulators like Insurance Regulatory Authority (IRA), Capital Market Authority (CMA) and Central Bank of Kenya (CBK) will be in a position to devise appropriate policies to regulate the insurance, capital market and financial sectors respectively so as to enhance their stability in the face of existing threats of terrorist attacks.

Investors can use findings from the research to incorporate the risk of terrorist attacks in determining their level of investment and portfolio diversification in publicly traded

companies. Companies can use the findings of the study to gauge the likely impact terrorist attacks can have on their capital mobilization efforts at the NSE and whether they need to mitigate against the impact of terrorist attacks by perhaps taking terrorism risk insurance. The study will additionally update the academia and other interested stakeholders on the level of efficiency at Kenya's stock market in terms of response to terrorist attacks.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covers theoretical background and reviews relevant empirical literature for studies done internationally and locally regarding the effect of terrorist attacks on the performance of financial markets.

2.2 Theoretical Literature Review

This section highlights some of the theories that seek to explain the linkage between terrorist attacks and performance of financial markets.

2.2.1 Efficient Market Hypothesis

Efficient Markets Hypothesis (EMH) states that it is not possible for an investor to earn excess returns by using available information on firm value since current stock prices, having incorporated such information, are indeed reflective of the value of the firm. The hypothesis was advanced by Fama (1965) who reasoned that in an efficient market, inherent competition often causes the full impact of new information on intrinsic values to be promptly reflected in actual prices. Differently put, it states that at any given moment the price of any asset and security being traded is correct and reflects all information available to market participants.

Fama et al., (1969) presented three forms of EMH namely, the weak, semi-strong and strong form. The weak form of efficiency states that current stock prices reflect fully the

information contained in past price data only and consequently no one can select mispriced securities and beat the market by conducting historical analysis of prices. The semi-strong market efficiency states that present security prices reflect fully all information available publicly and investors would rarely beat the market by conducting an analysis of public news. The strong-form market efficiency asserts that current prices of securities fully incorporate public and private information. This implies that insiders in corporate companies can't realize abnormal gains by exploiting inside information.

The EMH theory is one of the bedrock of classical finance as it fundamentally explains how and why prices change in security markets. The theory is of critical importance to investors and financial managers as it informs their actions, reactions and strategies in response to changing dynamics in financial markets.

2.2.2 Behavioral Finance Theory

According to Shiller (2003), financial literature has evolved substantially since when EMH was largely regarded as proved beyond question, to the current paradigm where behavioral finance, which is in sharp contradiction to EMH, has been relatively embraced. As indicated by Subrahmanyam (2007), behavioral finance seeks to provide an explanation of financial situations based on irrational behavior among investors who may suffer from cognitive and emotional biases. As a result, there could be discrepancy between market price and fundamental value occasioned by heuristic-driven biases and errors, dependence on mind frame as well as influence of emotions and society.

The behavioral finance field therefore attempts to enlighten on biases, discrepancies and inefficiencies prevalent in financial markets that influence investment decisions given that investors may not necessarily directly incorporate new information as postulated by EMH. For instance, Liargovas and Repousis (2010) argue that unlikely events can put a strain on financial markets and as a result participants in the market can fail to rationally assess the impact of events on stock positions held.

2.2.3 Rational Choice Theory

Rational Choice Theory is an approach employed by social scientists to study and understand human thinking and behavior. According to Green and Fox (2007), the theory is predicated on the idea that individuals pursue their goals and targets efficiently. Consequently, irrespective of whether they have little or much information, they will select a course of action that would be most beneficial to them depending on their understanding of the alternatives before them.

Rational Choice is therefore a means of establishing existing options and then selecting the most ideal one based on a consistent criteria (Levin & Milgrom, 2004). The actor in such a case is cognisant of the consequences of his selection hence the choice must be prudent and logical to provide the greatest benefit or satisfaction as compared to other choices available.

2.3 Factors Affecting Performance of Stock Markets

Many factors can affect the performance of a stock market with some being of a local nature while others could be international, with impact being determined by how interlinked the market under review is to the global market. Terrorism as well as war have a significant potential of undermining the performance of capital markets since they instill fear, change investment habits and affect the overall economy.

In his study, Tavor (2011) discovered that events of terrorism nature affect financial markets but the level of influence is non-uniform. The intensity of the effect of a terrorist attack on capital market would depend on the event location, nature of force or violence applied, and response to the event by relevant stakeholders. Other factors that affect the performance of stock markets as discussed below are global events, local economic situation, company news, and politics.

2.3.1 Global Events

Events at the world stage, whether good or bad, have a bearing on the performance of stock markets. These include, fluctuation of major currencies, shifting of international relations, global recession, and political as well as security situation in key trading partners.

Koch and Baumler (2013) established that there was a significant negative effect of European sovereign debt crisis on the stock markets in Portugal, Greece, Slovenia and

Spain. Significant strengthening or weakening of the US dollar has similarly been observed to have an impact capital markets across the world.

2.3.2 Local Economic Situation

In his study, Paramati and Gupta (2011) found out that economic growth plays a critical role in the determination of stock price movement. Additionally, economic growth often stimulates and promotes the development of stock market through suitable allocation of resources. A stable stock market is often indicative of economic health of country. The converse also holds true in the sense that a healthy economy indicates a strong stock market.

A robust economy would create an environment where unemployment, inflation and interest rates are low thus availing/freeing more resources for investment in the stock market. In an era where the prospects of economic expansion hold sway, stock prices may generally rise, while if the economic outlook is uncertain, investors may shy away from the market leading to prevalence of dampened stock prices.

2.3.3 Company News

Company specific factors can have a bearing on overall stock market especially if the company's market capitalization is among the highest in the market. Positive or negative news can lead to a rise or fall in stock prices, or cause an increase or decline in the stock prices for competing firms.

News related to earnings and profits, dividends, employee layoffs, management changes, anticipated takeovers or mergers, among others, affect share prices with a bearing on overall performance of the stock market. Waweru (2010) in his study on the link between stock prices and Initial Public Offering (IPO) news at the NSE, established that IPOs impacted negatively and in some cases positively on the daily mean returns.

2.3.4 Politics

Internal political events, by and large, affect the performance of stock markets. Multiple studies have confirmed that stock markets are affected by the national election cycle as well socio-economic, macro-economic, legal and regulatory policies adopted by a regime.

Barasa (2014) established that NSE 20-Share Index and macro-economic variables such as Consumer Price Index (CPI), supply of money and per Capita Gross Domestic Prices (GDP) deteriorated just before, during and immediately after the general elections held in Kenya between 2000 and 2013.

2.4 Empirical Literature Review

Before the September 11, 2001 terrorist attack on the US soil, there existed little literature on terrorism in finance and economics field particularly with focus on the terrorist attacks on world economies (Dheeriya, 2005). Studies largely focused on explaining terrorism, its causes and consequences. The September 11 terrorist attack on the US jolted developed countries into realizing that terrorism is a real threat to world peace. As a

reflex, research contributing to finance literature on terrorism gained traction and has been growing after the September 11 attack.

Gul et al., (2010) examined the effect of terrorism on Pakistan's financial markets between 2006 and 2008. With the use of multiple regression model, the research delved into the extent and direction of interrelation between terrorist activities and the financial markets of Pakistan, namely; Karachi Stock Exchange, the Interbank market and the FOREX market. The study established that terrorist attacks adversely affected the financial markets under study, but the significance varies across the markets.

Kumar and Liu (2013) employed national stock indices to investigate the financial effect of terrorism on international stock markets by analyzing thirty terrorist attacks across the globe that led into greatest human losses between 1990 and 2010. A systematic event study of the effect of these terrorist attacks on market indices of sixty three large countries as ranked by GDP was conducted in a bid to discover the financial effects of terrorist attacks. The research established that there exists a negative financial effect of terrorist attacks beyond national borders. When an economy suffers a terrorist attack, the spillover is greater for trading partners, especially the smaller ones, while economically larger partners do not experience significant negative effects.

Aurangzeb and Tasfoura (2012) utilized four variables (bombing, armed isolation, assassination and hostage taking) in examining the effect of terrorist activities on stock returns focusing on Pakistan (Karachi Stock Exchange- KSE 30 index). Time series

monthly data of the 30 companies that constitute the index were collected for the period 2004 to 2010. Subsequently, regression and granger causality analysis was carried out to determine the impact of terrorist attacks on stock returns of listed companies. The study established a negative relationships between stock returns and terrorism but the significance of variation exists.

Muhammad (2012) studied the impact of terrorist attacks on volatility and returns at Pakistani's Karachi Stock Exchange (KSE) by employing univariate asymmetric GARCH model. The findings show that terrorism significantly affects negatively the returns of KSE 100 index, financial and industry, as well as oil and gas sectors' index. The news of these events was found to raise the volatility of KSE 100 and financial sector indices but they don't impact on the volatility of oil & gas and industry sectors.

Selvam and Raja (2008) carried out an event study on the effect of September 11, 2011 attack in the US on capital markets in Asia, specifically Hong Kong, India (National Stock Exchange and Bombay Stock Exchange), Indonesia, Japan, Malaysia, Singapore, South Korea, Taiwan and Thailand. The study found out that most stock markets sampled witnessed significant negative abnormal returns on the event day (terrorist attack carried out on September 11, 2001). Indian stock markets were, however, more resilient given that they recovered faster than the other sampled Asian stock markets.

Fathi and Shahraki (2011) carried an empirical study on the impact of terrorist attacks on financial markets in Iran and considered attacks executed in Iran over the period between

1992 and 2008. The study found out that terrorist related events significantly affected Tehran Stock Price Exchange Price Index (TEPIX).

Aksoy (2014) analyzed how the stock markets in Turkey reacted to terrorism events in Turkey (between 1996 and 2007) and the US (September 11, 2001 terrorist attack). The study used daily data and adopted abnormal returns and time series analysis methodology. The study established that event day abnormal returns (ARs) were not of statistical significance for most of the sampled events but negative returns were witnessed in some events. Additionally, the event day cumulative abnormal returns (CARs) were found to be higher than ARs for event day, especially for 5 and 10 days event windows. The import of this is that Turkish stock markets declined on the days after terrorist attacks, a fact that was confirmed by volatility models that showed sensitivity of the market to terrorist attacks.

Baumert, Buesa and Lynch (2013) did a comparison of the impact of Boston bombings and preceding terrorist attacks on leading international stock markets. The study showed that the reaction of the selected stock markets following Boston bombings was considerably abnormal given the significant difference from the mean in the previous month. It also established that the impact from September 11, 2001 attack to Boston bombing has been diminishing over time and a considerable reduction was noted in the spread between reactions in the various markets. This is a pointer to the tendency of the markets to be resilient over time and to avoid overreacting but instead evaluate

objectively the economic impact of terrorist attacks before incorporating its impact on share prices.

Malusi (2015) applied event study methodology in studying the effect of terrorist attacks on the performance of stocks of insurance companies trading at the Nairobi Securities Exchange. Results showed that a positive relationship existed between terrorist attacks and stock performance of insurance companies. The study established that investors in the insurance sector may not actually loose as a result of a terrorist attack, a finding that is contrary to the general assumption that terrorist attacks affect the stock market negatively.

Shyamala (2015) studied the impact of terrorism in the operations of licenced foreign banks in Kenya by adopting a descriptive cross-sectional survey design. The study found out that terrorism activities witnessed in the Country increased the level of exposure for foreign banks besides raising insurance and compliance cost thus diluting operating profits.

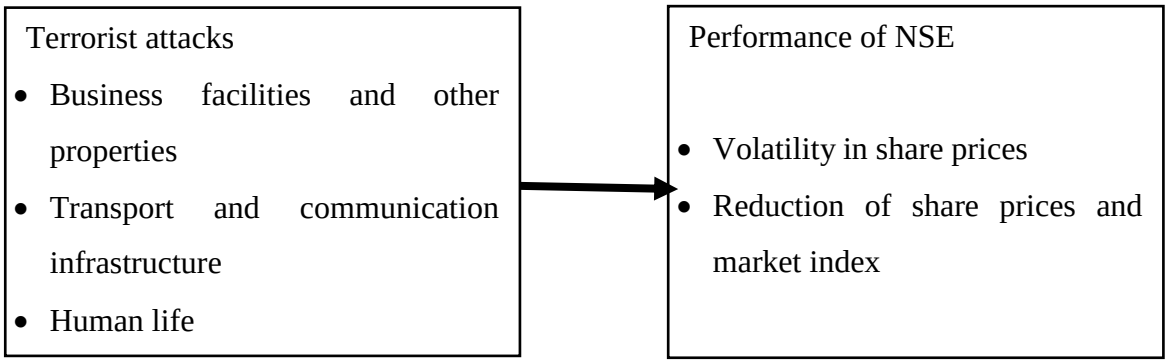
Keitany and Barasa (2012) investigated the effects of terrorism in Kenya on the securities markets using event study methodology. The research established existence of significant negative short term returns around the sampled terrorist event dates as demonstrated by a drop in NSE 20 share index as well as abnormal returns and cumulative abnormal returns during the cited events. The study consequently concluded that terrorist events negatively affect the stock market in Kenya.

Kinyanjui (2014) examined the effect of terrorism on Foreign Direct Investments (FDI) in Kenya. The author utilized secondary data and Foreign Direct Investment (FDI) data for the period from 2010 to 2012, which was analyzed using multiple regression method. The study established that terrorism had a negative effect on FDI in Kenya, a factor that is attributable to reduction in investor confidence due to increased risk factor.

Kuto and Grooves (2004) investigated the effect of terrorist attacks by reviewing the tourism crisis in Kenya with a view of aiding the development of crisis management plan. They reviewed researches done with regard to the link between terrorism and tourism. They noted that terrorism has led to loss of business to the tourism sector due to the fear instilled by terrorist attacks and hence there was need to have a plan at hand to help minimize such negative effects.

2.5 Conceptual Framework

A quick preview of the study is as illustrated below with the independent variable showing possible targets:



2.6 Summary of Literature Review

The Efficient Markets Hypothesis has been a subject of extensive research and review since it was introduced into the literature of financial economics in the 1960s. Most of the research have proved that stock markets are actually efficient although the degree/form of efficiency varies. However, behavioural finance is gaining traction in the sense that markets may not always respond efficiently to new information. Centrally, behavioural finance is concerned with establishing and elucidating on mispricing and inefficiencies in financial markets. Behavioural finance therefore introduces a new approach in financial decision making by adding an extra burden to researchers in determining whether investors indeed act rationally or irrationally with respect to information at their disposal. Rational Choice Theory posits that individual actors make choices, in this case if to hold, sell or buy shares on the ground of their understanding of alternatives and consequences of their choices.

Most of the research done on the relationship between terrorism and performance of financial markets have established that the relationship is indeed negative. The above literature review largely indicate that terrorism has the potential of adversely affecting the performance of markets across the globe, in some cases over a short time span depending on how interlinked the target is to the global economy. This is more-so given that in the face of advances in Information Communication Technology, news travels very fast.

Similarly in the Kenyan context, studies so far conducted have highlighted the negative effect of terrorist attacks on FDI inflows, performance of banks, capital markets and

national economy in general. The study by Malusi (2015), however, established that terrorist attacks did not negatively affect the stock returns for insurance companies listed at the NSE. This study, to the best of my knowledge, is different from prior studies done in Kenya, some of which were previously highlighted, in the sense that it focuses on the effect of three most-recent-and-major terrorist attacks in Kenya on the performance of Nairobi Securities Exchange. As such it would shed more light on the current level of efficiency at the stock market.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter lays out the methodology used in conducting the study. It presents the design approach, methods of collecting data and techniques of data analysis.

3.2 Research Design

A research design refers to the method used to carry out research. This study adopted event-study methodology which is premised on Efficient Market Hypothesis. The theory was advanced by Fama et al., (1969) and states that in an efficient market stock prices adjust promptly to information as they become available to the market. Event studies evaluate stock returns to establish the influence of events like mergers, acquisitions, corporate news, new stock issues among others, on stock prices. It specifically examines what happens to the stock price, prior to, during and after the event.

Many scholars in the fields of finance, accounting and finance have employed event study methodology in their research studies. For instance Chen and Siems (2004), Selvam and Raja (2008), Keitany and Barasa (2012), and Malusi (2015), among others, have applied event study methodology in their studies which are mainly with regard to the reaction of capital markets to terrorist attacks.

The methodology is about investigating existence, or otherwise, of abnormal returns to companies from a specific event, in this case terrorist attacks. When a terrorist event is

analysed vis a visa composite stock index (which in this study is the NSE 20 share index), the response of capital market to the event is established by assessing abnormal returns around the event day. Positive abnormal return and cumulative abnormal return of stocks would be registered around the event day should investors respond positively to the event, but if they don't, then the returns would be negative.

Given that terrorist attacks have the potential to dim return prospects of stocks, it is plausible to anticipate that a decline in stock performance would be registered following an attack.

3.3 Data Collection

Secondary data was obtained from the Nairobi Securities Exchange Limited for use in this study. The data mainly relate to NSE 20 share index figures and stock prices for related stocks, as tabulated and stored by the NSE ltd, for the period around each of the selected event dates. The event period for each terrorist attack date consists of forty one (41) days (20 days before attack, day of attack, and 20 days after attack)

3.4 Data Analysis

Data analysis is the process of transforming raw data into profitable information usable to the research in making conclusions about the research topic (OECD, 2001). This study used both descriptive and inferential statistics in order to analyse the effect of terrorist attacks on stock market performance. Specifically, event study methodology was conducted by calculating the abnormal returns (AR) of each stock constituting NSE 20

share index, average abnormal returns (AAR), and cumulative average abnormal return (CAAR) 20 days prior and after the terrorist attack (event window).

To calculate the abnormal return, market model was employed by regressing the daily stock return with the corresponding market return during the estimation period. After the estimation model is determined expected returns was computed for all days within the event window. The difference between actual and expected returns gave AR for each event day, which was aggregated for all sampled stocks to give AAR. Microsoft Excel Software was used in regression analysis, computations and presentation of results in graphs and tables for ease of understanding. Excel data analysis tool kit was also used to analyse statistical significance of the results.

3.4.1 Study Period, Event Days and Event Period

The study period is 2011-2015 which coincides with the period the KDF has been engaged in active military offensive against Al Shabaab following its deployment into Somalia in 2011. According to Global Terrorism Database and as captured in Appendix I there were over seventeen major terror attacks executed on Kenyan soil since 2011. Three major events were, however, selected for this study on the basis of the magnitude of the attack in relation to estimated value of property destroyed as well as deaths and injuries caused. The events are the 2013 Westgate attack in Nairobi, the 2014 attack in Lamu (Mpeketoni) and the Garissa University attack of 2015.

The three event days were studied and analysed independently but comparisons drawn. The event day does not, however, necessarily refer to the specific day that the event took

place but it refers to the market day when the market's most informed and interested participants reasonably anticipated the information. The event window will be 41 days, twenty (20) days prior to attack and twenty (20) days following the attack, with event day taken as day 0. The long period of event window is meant to determine if the attacks under examination significantly affected the stock market on long term period. This is because initial uncertainties may either persist thus keeping stock prices down and volatile, or the fears could be reduced as a result of policy intervention and/or disclosure of material information that lessens tension and promotes stability in the market.

3.4.2 Daily Security/Stock Returns

The returns of each stock along the estimation window and the event window was calculated using the formula below.

$$R_{it} = \frac{(P_t - P_{t-1})}{P_{it-1}}$$

Where R_{it} is the return of stock i at day t,

P_{it} is the closing price of stock i at day t

P_{it-1} is the closing price of stock i at day $(t-1)$

3.4.3 Daily Market Returns

The corresponding market return was calculated along the estimation window and the event window. The researcher used the NSE 20-share index as a proxy for the market returns.

$$R_{mt} = \frac{(P_{mt} - P_{mt-1})}{P_{mt-1}}$$

Where R_{mt} is the market return at day t,

P_t is the closing price of market return at day t

P_{t-1} is the closing price of market return at day $(t-1)$

A regression analysis was conducted using the actual daily return of each stock (R_i) as dependent variable and the corresponding daily market return (R_m) of the NSE as independent variable over the estimation window in order to obtain the intercept alpha and the slope beta for each stock separately.

3.4.4 Normal/Expected Returns

The normal return is defined as the return that would be expected if the event did not take place, also known as the expected return. In this research, the Market model was used to estimate the normal return. The market model posits that the only factor determining the return on stock *i*, at time *t*, is the return on the market at time *t*. This relation is modelled linearly, as in following equation (1):

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where *t* is the time index, *i*= 1, 2, 3… N stands for stock, R_{it} and R_{mt} are the returns on security *i* and market portfolio, respectively, during period t, ε_{it} is the zero mean disturbance term. Alpha (α) and beta (β) are the parameters of the market model. These parameters were estimated via ordinary least squares regression.

3.4.5 Abnormal Returns

The abnormal return is the prediction error. With the estimates α_i and β_i from equation (1), a normal return is predicted during the days covered by the event window. The abnormal return (AR) is the difference between the actual return and the expected/predicted normal return for each security at each point in time during the event window, as in equation (2), as follows:

ARit = Rit – E [Rit |Xt]

Where ARit: Abnormal returns, Rit: Actual returns, E [Rit |Xt]: the expected returns,

Xt : Conditioning information, excluding the event in question.

3.4.6 Average Abnormal Returns (AAR)

This aggregates the abnormal returns for all N stocks to find the average abnormal return at each time *t*, i.e. each day in the event window. This helps eliminate idiosyncrasies in measurement due to particular stocks. AAR is calculated each day using the formula:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it}$$

Where N is 20 the number of companies that constitute NSE 20 share index.

3.4.7 Cumulative Average Abnormal Returns (CAAR)

Finally, the sum of Average Abnormal Returns (AARs) over the T days in the event window (i.e. over all times t) is computed to form the Cumulative Average Abnormal Return (CAAR).

$$CAAR_i(T1, T2) = \sum_{t=T1}^{T2} AAR_t$$

$CAAR_T = \sum_{t=1}^{T} AAR_t$

The CAAR is a useful statistical analysis in addition to the AAR because it helps us get a sense of the aggregate effect of the abnormal returns. Particularly, if the influence of the event during the event window is not exclusively on the event date itself, the CAAR can prove very useful. To see the movement of aggregated Abnormal Returns across stocks and over time, CAAR and AAR is then plotted through time during the event window (day -20 to +20).

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter focuses on the analysis of the collected data from the Nairobi Securities Exchange Ltd in a bid to establish the effect of terrorists attack on the performance of Nairobi Securities Exchange (NSE). Section one is on data analysis method adopted while the second part presents study findings with relevant tables, graphs and figures. The last section is on the summary of findings and interpretation.

4.2 Data Analysis

The objective of this study was to establish the effect of terrorist attacks on the performance of the NSE. The research adopted event study methodology to determine the effect on the NSE of three most recent terrorist attacks, which were chosen based the magnitude of their impact in terms of property and lives lost.

Secondary data was collected from NSE Ltd and compiled/analysed using data analysis tools kit in Microsoft Excel software. The statistical significance of the results, particularly Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) over the event period, was analysed using t-test. The research used an event period of 41 days (20 days before event, day 0 being event day, and 20 days after the event).

4.3 Results Analysis

The following is a discussion on the trend of NSE 20 share index during the event windows for terrorist attacks selected for the study as well as statistical tests for AAR and CAAR.

4.3.1 NSE 20 Share Index Trend

An analysis of the effect of terrorist attacks chosen for the study was done with the background of the prevailing overall trend of the market pre and during the event period in mind as depicted in figure 4.1 and discussed thereafter.

Figure 4.1: Linear Plot for NSE 20 Share Index

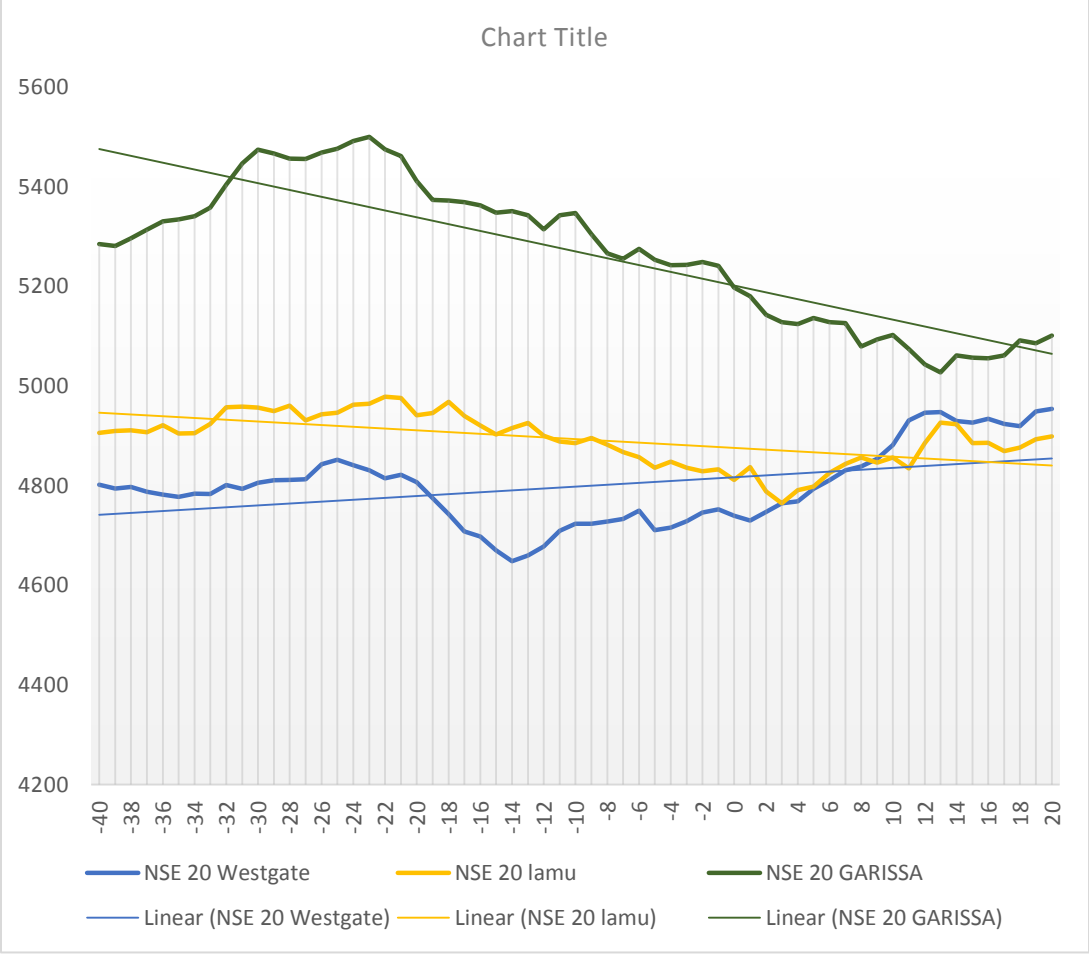


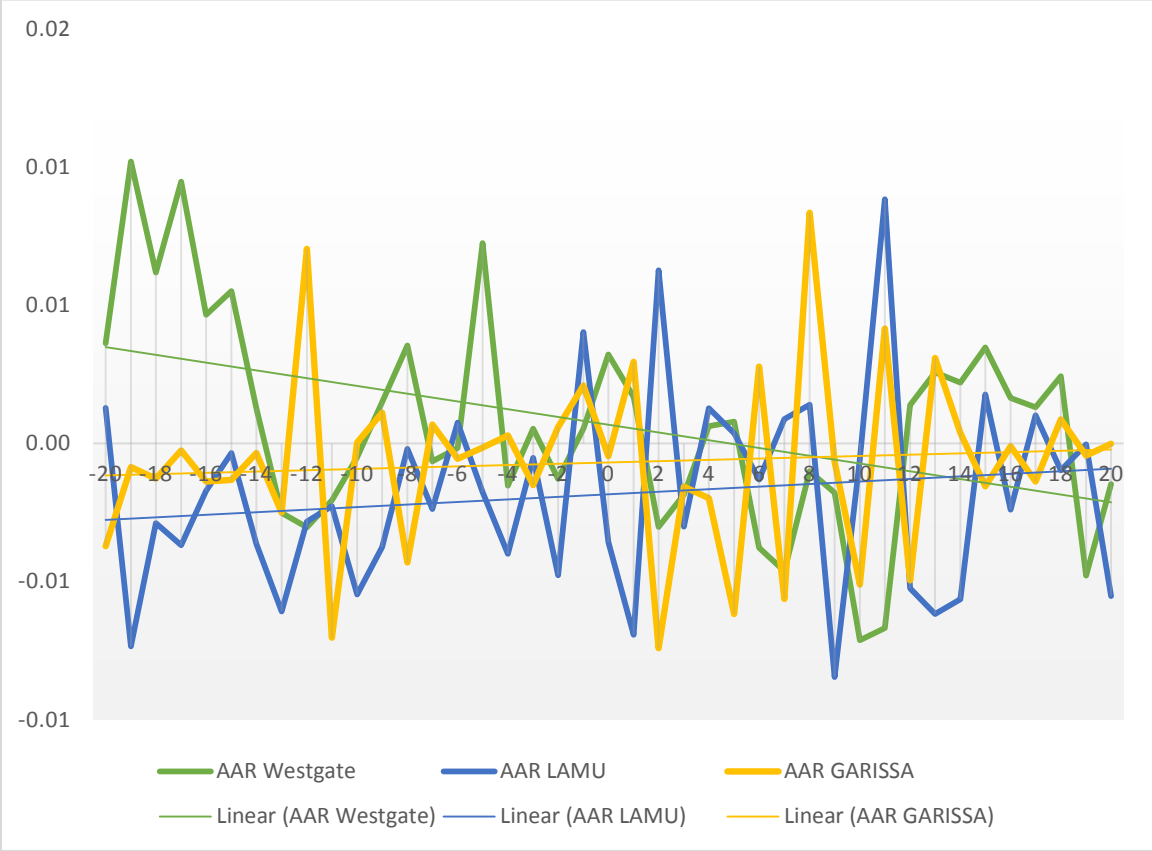
Figure 4.1 shows that the NSE 20 share index for Westgate attack was on a decline as from 25th to 14th day before the attack and it registered a general upward trend for the remaining days in the event window except for days -5, 0 and 1. For Lamu attack, the NSE 20 share index was on a declining trend over the event period with the lowest point being three days after the attack. The index recovered gradually thereafter. In the case of Garissa attack, the NSE 20 share index declined for the most part of the event period until day +13 when the index started registering positive gains.

From figure 4.1, it can be seen that NSE 20 share index generally declined around the terrorist event dates, with the decline being minimal for Westgate attack. This generally indicates that terrorist events under study had a negative effect on the performance of NSE.

4.3.2 Average Abnormal Returns and Cumulative Average Abnormal Returns

Event study methodology was used in this study to establish the effect of terrorist attacks on the performance of NSE. The market model was used to compute expected returns with a 20 day estimation period before the event period being utilised. The expected return for companies constituting NSE 20 share index was computed and used to determine Average Abnormal Return and Cumulative Average Abnormal Return for each of the three events is as indicated in appendix III and IV respectively. Subsequently, test of significance was conducted for the results of each of the events using t-statistic.

Figure 4.2: Linear Plot of Average Abnormal Returns



As shown in figure 4.2, the AAR for event period before Westgate attack was generally higher as compared to similar event period for the other attacks. The AAR, however, declined from +0.003 on day 0 and even though the returns were random they were largely negative with the lowest value being recorded on day +10 (-0.007). On day +12 the AAR started being on the positive territory. The AAR for Lamu attack was negative for most part of the event period. However, as from day -2 to day +14, the AAR was markedly random. The lowest AAR was -0.009 which was recorded on day +9. The behaviour of AAR for Lamu attack is comparable for the period -20 to -1 and +14 to +20. Similarly, during the event period for Garissa attack, the AAR were mostly negative but

random. The returns became more erratic from day +1 to day +14 when relative normalcy returned. The lowest AAR of –0.007 was registered on day +2.

Figure 4.3: Linear Plot of Cumulative Average Abnormal Returns

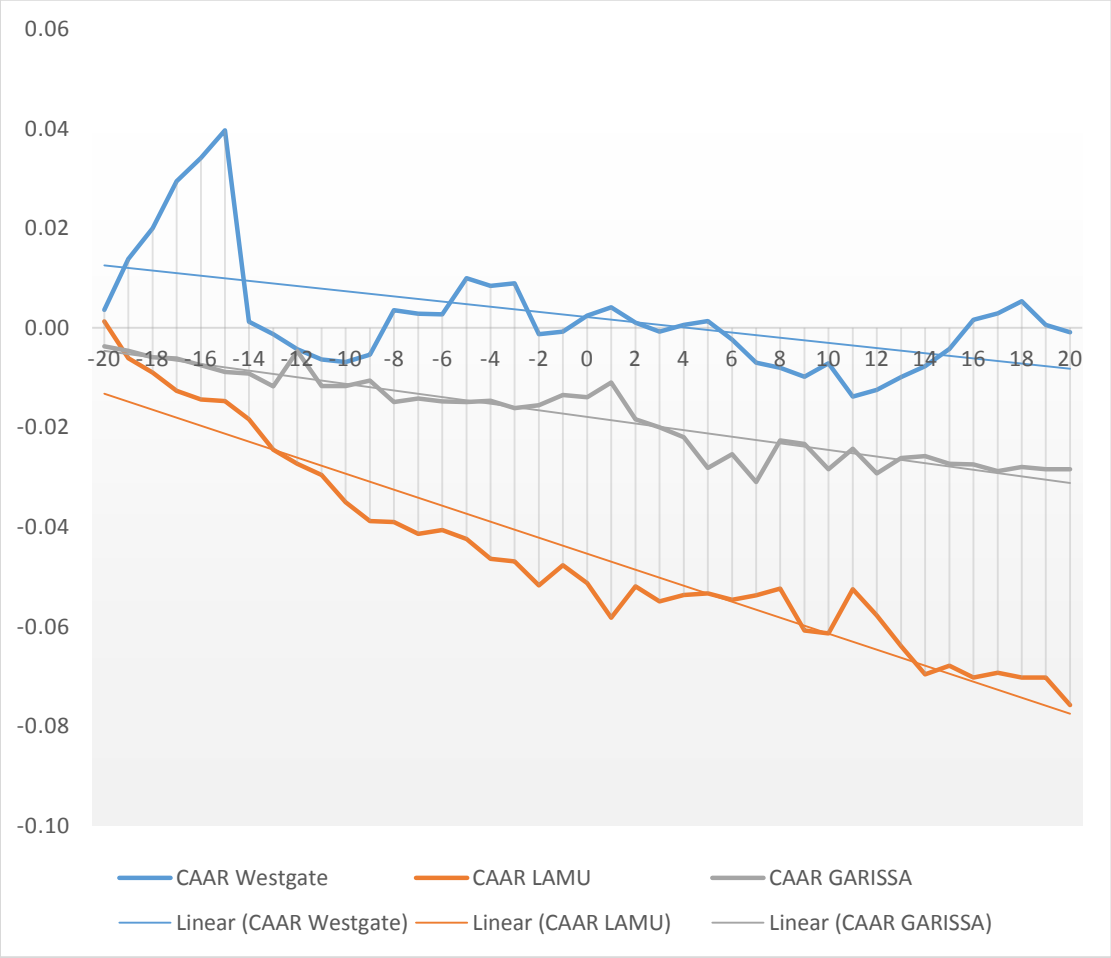


Figure 4.3 shows that CAAR for all the three events were on overall negative over the event window. The CAAR for Westgate attack was higher as compared to figures for the other events with the highest figure of 0.04 being realised on day -15. A closer look reveals that CAAR witnessed a decline from +0.04 on day +1 to a low of -0.014 on day +11 after which an upward trend of CAAR is realised. For the Lamu event, the CAAR appears to be on a steep decline over the event window although minimal changes were

noticed from day +1 (-0.058) to day +8 (CAAR -0.052). Thereafter the CAAR continues to decline more steadily over the remaining event window period. A gentle decline is evident for CAAR in the event window for the case of Garissa attack. However, the decline is more steep and random from day +1 (CAAR -0.011) to day +12 (CAAR -0.03)

4.3.3 Statistical Test

t-test was done to determine statistical significance of the results for the three events with the hypotheses being as follows:

Null hypothesis: Terrorist attacks has no effect on the performance of NSE

Alternative hypothesis: Terrorist attacks affects the performance of NSE

i. T-test for Average Abnormal Returns

Table 4.1: t-Test: Two-Sample Assuming Unequal Variances

	Westgate	**Lamu**	**Garissa**
Mean	0.000674	-0.00185	-0.00166
Variance	1.49E-05	1.29E-05	1.67E-05
Observations	41	41	41
Hypothesized Mean Difference	0	0	0
df	79	77	77
t Stat	-0.18797	-1.6452	-1.17818
P(T<=t) one-tail	0.425691	0.052003	0.121176
t Critical one-tail	1.664371	1.664885	1.664885
P(T<=t) two-tail	0.851382	0.104006	0.242353
t Critical two-tail	1.99045	1.991254	1.991254

The output as per table 4.1 shows the means, degrees of freedom, t stat figures, p values as well as one tail and two tail significance. The results show that the p value for all the three events is greater than 0.05 while the t Stat was lower than t Critical for all the events. The results are therefore significant at 5% level of significance and we fail to reject the null hypothesis.

ii. T-test for Cumulative Average Abnormal Returns

Table 4.2: t-Test: Two-Sample Assuming Unequal Variances

	Westgate	**Lamu**	**Garissa**
Mean	0.002163398	-0.045312888	-0.017848864
Variance	0.000132296	0.0004049	7.10793E-05
Observations	41	41	41
Hypothesized Mean Difference	0	0	0
df	51	44	58
t Stat	0.685969633	-13.96180061	-11.06402831
P(T<=t) one-tail	0.247919505	4.49504E-18	3.2051E-16
t Critical one-tail	1.67528495	1.680229977	1.671552762
P(T<=t) two-tail	0.49583901	8.99009E-18	6.41021E-16
t Critical two-tail	2.00758377	2.015367574	2.001717484

As per table 4.2, P value for Westgate attack is greater than 0.05 while computed t Stat < t Critical therefore we fail to reject the null hypothesis and find the results to be significant. The t Stat< t Critical and p values are less than 0.05 for both Lamu and Garissa events so we accept the alternative hypothesis that terrorist attacks affect the performance of NSE. The results are also statistically significant.

4.4 Discussion of Findings

The aim of the research was to establish the effect of terrorist attacks on the performance of Nairobi Securities Exchange using event study methodology. The results indicated that the AARs and CAARs witnessed a general decline, as depicted in figure 4.2 and 4.3 respectively. Graphical presentation of the figures of NSE 20 share index over the three events windows as depicted in figure 4.1 showed declining trend for Lamu and Garissa attack event windows, a general indication of negative impact of these events on the performance of NSE. As for Westgate attack, the index declined only on day -24 to -14 and on day -5, 0 and +1. This shows the minimal effect of Westgate attack on NSE perhaps due to strong investor interest and positive sentiment that was evident even before the attack.

A statistical analysis of AARs showed that the null hypothesis that terrorist attacks have no effect on NSE could not be rejected. The results were also statistically significant at 5% level of significance. However, AARs provide only a means of assessing the capital market's response to terrorist attack under study since they give immediate investors' reaction on the terrorist event. The graphical presentations of AARs for events shows random movements especially after a terrorist attack. This indicates erratic reaction of investors as they seek to incorporate terrorist attack news to their investment decisions.

On the other hand, values of CAARs are of more interest than the values of AARs since they show the impact of the event on the market over the event period chosen. Significant negative CAARs would reveal that an event had a strong negative impact on the markets,

and insignificant negative CAARs would indicate the markets' resilience to the event and their ability to recover quickly. The CAARs for the Westgate attack were higher as compared to the figures for Lamu and Garissa attacks thus showing that the effect of Westgate attack on the performance of the NSE was relatively milder. The CAARs for Westgate were above 0 for some event days as compared to Garissa and Lamu events where all CAARs were negative. This is indicative of resilience of the market to Westgate attack. A statistical analysis showed a p value > 0.05 and t Stat< t Critical. The results therefore confirmed that Westgate attack had no significant negative impact on the performance of NSE. This result is comparable to the finding by Malusi (2015) that terrorist attacks do not necessarily impact negatively on the performance of insurance companies at the NSE. However, a cursory look at the linear trend for NSE 20 share index in the period around the event dates shows that the market was generally on an upward trend around Westgate attack day, hence the effect of the attack may have been suppressed by the prevailing optimistic sentiment at the market. In addition, figure 4.3 on CAARs chart shows CAARs declined as from day +1 to day +11, an indication of negative impact of Westgate attack on the performance of NSE. It can therefore be argued that a shorter event period (say 21 days) would have shown that Westgate attack affected negatively the performance of NSE, especially given that the market actually recovered steadily as from day +12.

The analysis of CAAR for Lamu and Garissa attacks led to the acceptance of the alternative hypothesis that terrorist attacks affect negatively the performance of NSE since p values was less than 0.05 for both cases. The result were also statistically

significant. The findings are in line with postulation by Efficient Market Hypothesis that markets are efficient although forms of efficiency varies as it can be seen that the arrival of new information (on terrorist attacks) appears to stir the market as investors seek to incorporate the news and its implications on their investment choices. The results are also supportive of findings from other empirical studies that have established that terrorist attacks do affect negatively the performance of financial markets. This includes the findings by Keitany and Barasa (2012) who studied the effect on the performance of the NSE of 1998 US embassy bombing, 2002 Paradise hotel bombing and 2011 kidnapping of tourist at Kenyan coast. Other studies with similar outcome are Kumar and Liu (2013) and Selvam and Raja (2008).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The purpose of this study was to investigate the effect of terrorist attacks on stock performance at the Nairobi Securities Exchange. This chapter presents a summary of research findings, conclusion, limitations encountered during the study, recommendations and suggested areas for further research.

5.2 Summary of Findings

The study sought to establish the effect of terrorist attacks on the performance of NSE. Three most recent and major terrorist attacks were selected for this study on the basis of the magnitude of the attack in relation to estimated value of property destroyed as well as deaths and injuries caused. The events are the 2013 Westgate attack in Nairobi, the 2014 attack in Lamu (Mpeketoni) and the Garissa University attack of 2015. The study adopted an event study research design. Secondary data was obtained from Nairobi Securities Exchange and was analysed using Microsoft Excel software.

The results show that during the Westgate attack, the AARs dropped from 0.003 on event day to reach –0.03 on day +3 before recovering thereafter. The CAARs for Westgate event was relatively stable from day -2 to +5 when it started registering a downward trend until day +11 when recovery became largely sustained for the remaining part of the event window. This shows that by day +11 investors had incorporated fully the news of

the attack in their investment portfolios. The CAAR results were found to be statistically significant.

In the Lamu attack, the AARs were largely erratic over the event window with the highest point of +0.009 realised on day +11 and the lowest point of -0.008 on day 9. The CAARs also declined sharply over the event window with statistical analysis confirming that the attack had negative effect on the performance of NSE with the results being statistically significant.

For the case of Garissa attack, an analysis of AARs shows erratic movement as from day +1 to day +14. Although CAARs were generally declining over the event window, the decline was steeper from day +1 to day +6 when the lowest CAAR of -0.015 was observed. The results showed Garissa attack significantly affected negatively the performance of the NSE.

5.3 Conclusion

The findings of the study indicate that there is a significant negative relationship between terrorist attacks and the performance of Nairobi Securities Exchange. This is demonstrated by negative AAR and CAAR realised around the event windows for selected terrorist attacks. The AARs were found to be statistically significant for all events.

CAAR analysis for Garissa and Lamu attacks showed that the results were statistically significant and in line with alternative hypothesis that terrorist attacks affect the performance of NSE. The negative effect of Lamu attack on NSE was greater than the effect of Garissa attack as evidenced by the larger gradient for CAAR graph.

Analysis of Westgate CAAR showed that the event did not have a negative impact on NSE. This outcome can be attributed to the fact that the market appears to have been bullish around the event days, hence its resilience to the negative effects of the attack. However the market declined, as per other empirical studies, as from day +1 to day +11 when an upward trend was subsequently recorded. This shows that a major attack on a commercial establishment on a season when the market is not bullish would lead to a negative effect on the performance of NSE. If the market is resilient, the negative impact would be noted over a shorter event window.

Despite the findings for Westgate attack (whose possible explanations for deviation from other empirical studies have been elucidated above), it is the considered view of the researcher that, on overall, the findings of this study confirm that terrorist attacks affect negatively the performance of Nairobi Securities Exchange.

5.4 Recommendations

It is observed from the study that terrorist attacks negatively affect performance of Nairobi Securities Exchange. There is therefore need for investors, regulatory agencies

and other stakeholders to take keen interest on the stated interrelationship with a view instituting appropriate responses to such events.

Investors are urged to consider diversifying their portfolio to include investments in sectors or securities that are not significantly negatively affected by the risk of terrorist attacks. They should also take insurance policies to cushion themselves in the event of a terrorist attack targeting their investments and assets.

The government should enhance anti-terrorism initiatives with a view of minimising the effects of terrorist attacks on property/lives, the NSE, financial sector and the economy in general. It should also ensure prompt relaying of information on any terrorist attack in order to counter misinformation and panic among investors which compounds the negative impact of such attacks. Regulatory agencies within the financial sector may also need to institute relevant policies that would cushion players in the sector from the negative effects of terrorist attacks.

5.5 Limitations of the Study

The study was based on three recent and major terrorist attacks on Kenyan soil between 2011 and 2015. However, according to Global Terrorism Database Kenya has faced over seventeen major terror attacks since 2011. A study taking into account all these terrorist attacks including the minor ones would have given a broader dimension of the problem.

Secondary data was used in the study and it can be argued that a review of the problem using a hybrid of secondary data and primary data sourced from experts in the stock market might bring out a different and more authoritative outcome. The researcher decided to use secondary data on NSE 20 share index and stock prices from companies that constitute the index because it is reflective of actual decisions taken by investors at the NSE in response to terrorist events under study.

For data analysis purposes, the market model was used to determine expected returns. The shortcomings of using regression models is therefore applicable to this study. More vibrant and reliable analytical techniques may yield results that can be generalised with greater certainty.

5.6 Suggestions for Further Research

A broader and inclusive study on the effect of terrorist attacks on performance of NSE should be undertaken to confirm or fail to confirm the findings of this study. Such a study should consider more terrorist activities the country has faced in the recent past while using all companies registered at the NSE.

A study of this nature should also consider having several event window periods (shorter and longer) and longer estimation period to arrive at a more reliable conclusion. Similar studies can also be carried out using both primary and secondary data to capture some pertinent information that this study may not have been able to capture due to limitations highlighted above.

An analysis of the effect of terrorist activities can be carried out to establish if a terrorist attack on one country within the East African Community affects the performance of stock markets in other member countries. This would show how interlinked or interconnected these markets are.

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APPENDICES

Appendix I: List of Major Terror Attacks in Kenya, 2011-2015

No.	Date	Location	Perpetrator (s)	Deaths	Injuries	Target
1	7/7/2015	Mandera	Al-Shabaab	14	11	Business
2	14/6/2015	Baure	Al-Shabaab	13	Unknown	Military
3	25/5/2015	Yumbis	Al-Shabaab	13	2	Police
4	**2/4/2015**	**Garissa**	**Al-Shabaab**	**152**	**104**	**Garissa University College students**
5	3/12/2014	MadoGashi	Al-Shabaab	15	0	Private Citizens & Property
6	2/12/2014	Mandera	Al-Shabaab	36	0	Karomey quarry workers
7	22/11/2014	Unknown	Al-Shabaab	28	Unknown	Nairobi-bound bus
8	5/7/2014	Hindi	Al-Shabaab,Mombasa Republican Council (MRC) (suspected)	12	2	Private Citizens & Property
9	23/6/2014	Witu and Pandanguo	Al-Shabaab (suspected)	11	Unknown	Private Citizens & Property
10	16/6/2014	Poromoko and Mapenya	Al-Shabaab (suspected)	10	Unknown	Government (General), Police,Private Citizens & Property
11	**15/6/2014**	**Mpeketoni**	**Al-Shabaab (suspected)**	**48**	**3**	**Private Citizens & Property**
12	19/5/2014	Mandera	Al-Shabaab	12	Unknown	Private Citizens & Property
13	16/5/2014	Nairobi	Al-Shabaab	10	70	Gikomba market
14	**21/9/2013**	**Nairobi**	**Al-Shabaab**	**72**	**201**	**Business-Westgate shopping mall**
15	23/6/2013	Banisa	Unknown	15	21	Government (General),Other
16	18/4/2013	Garissa	Al-Shabaab	10	8	Business
17	18/11/2012	Nairobi	Al-Shabaab	10	30	Transportation

Source: Global Terrorism Database

http://www.start.umd.edu/gtd/search/Results.aspx?country=104

Appendix II: NSE 20 Share Constituent Companies

NO.	WESTGATE EVENT WINDOW	LAMU EVENT WINDOW	GARISSA EVENT WINDOW
1	SASINI	SASINI	SASINI
2	KENYA AIRWAYS	KENYA AIRWAYS	KENYA AIRWAYS
3	NATION MEDIA GROUP	NATION MEDIA GROUP	NATION MEDIA GROUP
4	SCAN GROUP	SCAN GROUP	SCAN GROUP
5	UCHUMI	CENTUM	CENTUM
6	KCB	KCB	KCB
7	COOPERATIVE BANK	COOPERATIVE BANK	COOPERATIVE BANK
8	BARCLAYS	BARCLAYS	BARCLAYS
9	EQUITY	EQUITY	EQUITY
10	MUMIUS	CFC	CFC
11	EABL	EABL	EABL
12	BAT	BAT	BAT
13	ARM	ARM	ARM
14	BAMBURI	BAMBURI	BAMBURI
15	KENOL	KENOL	KENOL
16	KPLC	KPLC	KPLC
17	KENGEN	KENGEN	KENGEN
18	KAKUZI	BRITAM	BRITAM
19	SAFARICOM	SAFARICOM	SAFARICOM
20	STANDARD CHARTERED	STANDARD CHARTERED	STANDARD CHARTERED

Appendix III: Event Day Average Abnormal Returns

Event Day	AAR Westgate	AAR LAMU	AAR GARISSA
-20	0.00	0.001	0.00
-19	0.01	-0.007	0.00
-18	0.01	-0.003	0.00
-17	0.01	-0.004	0.00
-16	0.00	-0.002	0.00
-15	0.01	0.000	0.00
-14	0.00	-0.004	0.00
-13	0.00	-0.006	0.00
-12	0.00	-0.003	0.01
-11	0.00	-0.002	-0.01
-10	0.00	-0.005	0.00
-9	0.00	-0.004	0.00
-8	0.00	0.000	0.00
-7	0.00	-0.002	0.00
-6	0.00	0.001	0.00
-5	0.01	-0.002	0.00
-4	0.00	-0.004	0.00
-3	0.00	-0.001	0.00
-2	0.00	-0.005	0.00
-1	0.00	0.004	0.00
0	0.00	-0.004	0.00
1	0.00	-0.007	0.00
2	0.00	0.006	-0.01
3	0.00	-0.003	0.00
4	0.00	0.001	0.00
5	0.00	0.000	-0.01
6	0.00	-0.001	0.00
7	0.00	0.001	-0.01
8	0.00	0.001	0.01
9	0.00	-0.008	0.00
10	-0.01	-0.001	-0.01
11	-0.01	0.009	0.00
12	0.00	-0.005	0.00
13	0.00	-0.006	0.00
14	0.00	-0.006	0.00
15	0.00	0.002	0.00
16	0.00	-0.002	0.00
17	0.00	0.001	0.00
18	0.00	-0.001	0.00
19	0.00	0.000	0.00
20	0.00	-0.006	0.00

Appendix IV: Cumulative Average Abnormal Returns

Event Day	CAAR Westgate	CAAR LAMU	CAAR GARISSA
-20	0.00	0.00	0.00
-19	0.01	-0.01	0.00
-18	0.02	-0.01	-0.01
-17	0.03	-0.01	-0.01
-16	0.03	-0.01	-0.01
-15	0.04	-0.01	-0.01
-14	0.00	-0.02	-0.01
-13	0.00	-0.02	-0.01
-12	0.00	-0.03	0.00
-11	-0.01	-0.03	-0.01
-10	-0.01	-0.04	-0.01
-9	-0.01	-0.04	-0.01
-8	0.00	-0.04	-0.01
-7	0.00	-0.04	-0.01
-6	0.00	-0.04	-0.01
-5	0.01	-0.04	-0.01
-4	0.01	-0.05	-0.01
-3	0.01	-0.05	-0.02
-2	0.00	-0.05	-0.02
-1	0.00	-0.05	-0.01
0	0.00	-0.05	-0.01
1	0.00	-0.06	-0.01
2	0.00	-0.05	-0.02
3	0.00	-0.05	-0.02
4	0.00	-0.05	-0.02
5	0.00	-0.05	-0.03
6	0.00	-0.05	-0.03
7	-0.01	-0.05	-0.03
8	-0.01	-0.05	-0.02
9	-0.01	-0.06	-0.02
10	-0.01	-0.06	-0.03
11	-0.01	-0.05	-0.02
12	-0.01	-0.06	-0.03
13	-0.01	-0.06	-0.03
14	-0.01	-0.07	-0.03
15	0.00	-0.07	-0.03
16	0.00	-0.07	-0.03
17	0.00	-0.07	-0.03
18	0.01	-0.07	-0.03
19	0.00	-0.07	-0.03
20	0.00	-0.08	-0.03