EFFECTS OF TERROR SHOCKS ON SECURITIES RETURNS AT THE NAIROBI SECURITIES EXCHANGE

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DECLARATION

This research project is my original work and has not been submitted for examination in any other university.

Signed… Date…27th October 2021

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

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DEDICATION

This work is dedicated to my daughter, Pearl Leana Shani who is 1.5 years. You mean the world to me.

ABSTRACT

This study sought to determine the effect of terrorist activities on volatility of returns from NSE 20 share index securities. The occurrence of terrorist events, the region where a terrorist event breaks out, the size and target of the event were investigated to find out whether they influence volatility of securities that make the NSE 20 share index.

Time series daily data on prices of the NSE 20 share index and the volume of traded shares were obtained from the Nairobi Securities Exchange database for the period spanning between 2001-2020. Data on days when terrorist events broke out, the size of the terrorist event, the target and region of occurrence was obtained from the Global Terrorism Database (GTD). Data on political stability of Kenya as a control variable was obtained from World Bank's database on governance indicators.

The Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model was used in carrying out the empirical estimation. Specifically, the Ordinary Least Squares approach was embraced in estimating the causal relationship between outbreak of terrorist events and volatility of returns from the NSE 20 share index securities.

The study findings indicates that the return of securities varies yearly due to the terror shock effect. Figure 4.1 indicates that a year before the terror attack there is a high return and a year after there is a low return due to poor performance. The returns results were non-linear and dependent on some market factors that affect the day-to-day purchase of the stock. The unit root test was conducted and the ADF was negative indicated by -9.23. Since the value was larger and stronger, we accept that the terror attack affected the stock price in the year 2012 to 2014 in the Westgate mall attack. The year that the stock returns were affected at a high rate was given by the year 2013 under Mpeketoni attack where the ADF had a strong negative of 12.05. This was further explained that the sum of the ARCH and GARCH ($\alpha+\beta$) is indicated by 1.20 which explains that the volatility rate to have an increasing return in the year 2014 in Mpeketoni attack. This shows that the terror attack affected the securities return in the years 2013 to 2015. The ADF statistics is indicated by -10.43 and -11.72 for the year 2015 and 2018 respectively this indicates that the terror attack has affected the securities return in the companies listed in NSE. It was indicated that the sum of the ARCH and GARCH ($\alpha+\beta$) in 2019 was indicated by 0.800 which explains that the volatility rate to have an increasing return. The variation coefficient is indicated to be 0.31 this indicates that holding all the factors constant the terror shock affects the securities return with 31%.

The study recommends that there should be further study to determine other effects of terror shock especially economically to determine the chain of the prices of the securities in the security market.

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ABBREVIATIONS

AMISOM	Africa Union Mission in Somalia
CAPM	Capital Asset Pricing Model
CAR	Cumulative Average Abnormal Return
CMA	Capital Markets Authority
DJIA	Dow Jones Industrial Average
EMH	Effective Market Hypothesis
FDI	Foreign direct Investments
GARCH	Generalized Auto Regressive Conditional Heteroskedasticity
GDP	Gross Domestic Product
GICS	Global Industry Classification Standards
GTD	Global Terrorism Database
MIMS	Main Investment Market Segment
MPT	Modern Portfolio Theory
NPV	Net present Value
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Squares
RWH	Random Walk Hypothesis
TIFL	Terrorism Impact Factor Index with Lingering
U. S	United States
UK	United Kingdom

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Securities exchanges work with trade of protections and assume a basic part in a nation's economy. The market of stocks is perhaps the fundamental ways for associations to raise money value, and it furthermore offers liquidity to the partners being referred to. History has shown that the expense of stocks and various assets is a critical piece of the components of monetary activity can affect or be a pointer of social mentality. An economy where protections trade is on the climb is seen as the fundamental marker of a country's money related strength and improvement. Rising offers exchange costs for instance will overall relate to extended business capacities and the opposite way around. Financial exchange execution is influenced by an assortment of factors key among them the activities of legislatures and the general exhibition of the economy (Eckstein and Tsiddon, 2004).

Monetary exercises in the economy do impact the exhibition of the protection's trades. Various factors that impact markets execution join availability of other monetary assets, change in association of monetary patrons, and markets thoughts among various components. Terrorism is really another wonder and its effect on the securities exchange is of remarkable interest to the different parts in the economy. Money related foundations could be locked in with money related bad behavior as setback, as guilty party, or as instrumentality: Financial associations can be dependent upon different sorts of coercion or abuse; they can clearly do financial infringement; or they can be used by untouchables to execute bad behavior. Furthermore, psychological oppression can have various repercussions for money related business areas (Senturk et al., 2014).

The review will be fixed on a few hypothetical endeavors. Effective Market Hypothesis (EMH) is a hypothesis that proposes various efficiencies for various business sectors. The costs of protections in the market should join all data on the lookout. The most productive business sectors ought not just, ready to fuse the past, present, and public data, yet it ought to likewise have the option to fuse the private and future data in the costs of protections. Different speculations that will be pertinent to this review incorporate the arbitrary walk theory hypothesis and Modern

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Portfolio Theory (MPT). These speculations are identified with the danger component of protections and making interests on the lookout. Dread shocks increment hazard levels, and this is along these lines expected to have suggestions on stock returns across the market, yet the impact might shift across various ventures relying upon the idea of fear danger on the business among others (Keitany and Baras, 2012).

As shown by the horrendous assaults of September 11, 2001, cash related business areas at the World Trade Center could, plainly and by implication, be a deferment of fear assaults. Second, cash related associations can be altogether settled to assist with pressure. Third, monetary related associations can be utilized, without their insight, to move fear-based oppressor assault accounts (Barry and Oana, 2005). How monetary exchanging is impacted by different occasions and how odd returns happen is of incredible advantage to funders and specialists. The expense of each stock mirrors the feelings and fears of financial backers regarding what is to come. The panic-based manipulation practice in this manner could begin pledge drives/pledge drives escaping the protection exchange search of elective cash related apparatuses. Utilizing an emphasis occasion on the approach of occasions with various nations, Karolyi, and Martell (2005) investigated the effect of a considerable measure of terrible assaults and showed that the dangers related with these assaults are more prominent when targets are isolated into reasonable or just nations. On September 10, 2001, the Dow Jones Industrial Average (DJIA) shut down at 9,605.51. With the appearance of the terrible assaults of September 11, the market returned on September 17, 2001, and hit a low intraday of 8,755.46. The market would not recuperate for a month. Awful assaults influence an assortment of monetary markers and unpredictability like endeavors, Foreign Direct Investment (FDI), great monetary designation, business movement, expanded monetary shortcoming, monetary help choices, sporadic trades, and exchange protectively by diminishing general corporate benefits (Ramiah et al., 2010).

It is regularly battled for by monetary allies to have the option to help against anticipated occasions, yet not against surprising changes in stock returns. Shortcomings in monetary business sectors are continually tried and stock brings trip back. This appraisal trusts it will explore the outcomes of dread of rebelliousness with monetary business sectors on the NSE. The catalyst for this review is to inspect two unmistakable parts of stock returns and to evaluate whether the activity of dread influences the choices of monetary supporters inside a progression of time activity. In Kenya,

research has been done to decide the effect of fear practice on the travel industry. Keitany and Baras (2012) explored the impacts of weight on the Nairobi Securities Exchange (NSE) where an emphasis on execution was surveyed to evaluate the degree of mental effect on unfriendly occasions in stock administration, assurance, and resource markets.

1.1.1 Terror Shocks

Shock is characterized by the English Oxford word reference as an irritating or amazing experience or experience. Illegal intimidation would thus be able to be said to mean the abrupt, stunning, and horrendous mishap that outcomes from the exercises of psychological oppression. There are various sorts of shock that influence stock costs somehow or another. Financial shocks, for instance, allude to any adjustment of key macroeconomic changes that essentially affect macroeconomic results and other monetary execution measures, which might incorporate swelling, joblessness among others (Arin, Ciferri and Spagnolo, 2008). Monetary shock influences the economy through inventory network or request side. This causes the feed shock or the need shock separately. Different types of monetary shock incorporate monetary shocks from the monetary area, strategy shocks from government strategy changes, innovative shocks, and presently disturbing circumstances emerging from fear monger acts (Saeed and Kaveth, 2011).

Mental abuse is depicted as the use of fury or mercilessness to advance political, moderate, or philosophical change. The U.S. The Code of Federal Regulations depicts unlawful compromising as the illicit utilization of power and shock against people or property to alarm or power an association, normal individuals living, or any piece of it, to advance political or social purposes. One of the best insurance workplaces, Swiss Re perceives mental maltreatment as an appearance or hazard of threat or an authentic danger to human existence, a dependable or speculative resource or foundation with a point or impact on influence any connection or distinguish all individuals or part of everybody in dread (Robert, 2005).

Mental abuse is the coordinated use or danger of the use of violence by people or generally relationship for political or social purposes by compromising a massive, past party of passing difficulties. Nonetheless, the considering affinities fear-based oppressors might change, and their assessments mark a normal model for mental assailant occasions that acknowledge order over a get-together of plans: hijackings, kidnappings, passing's, bombings, calamities, and senseless

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assaults. Fear based oppressor assaults are prepared to utilize the most incredibly awful bits of the association, so it gives political assent. In a circumstance where a confined government sees the typical expense of future dread-based exercise as more tremendous than the expense of in regard to the mentioning of a trained professional, then, at that point, the connection will exchange. According to these lines, normal based hostility, at a principal level, can be found in its nearby unbiased in case it can have the impacts of its focal objective. These impacts might solidify obliterated undertakings, blocks, expanded degree of strain, and a colossal social event of monetary hardships.

Kenya has turned into a shelter for an assortment of fears that remember less oppressive assaults for psychological militants. On August 7, at 10.30am in any case, at 10.40am, carrying a couple of trucks stacked with explosives were left unattended at government workplaces in Dar-es-Salaam and Nairobi, and they were exploded. Around 213 individuals were killed in Nairobi, and 11 were killed in Dar-es-Salaam. 4,000 harmed in Nairobi, and 85 others in Dar-es-Salaam. The post-bomb seizure study showed strength between 3-17 tons of high-elevation objects. Notwithstanding, the assaults were uncontrolled in the American working environment, with an enormous number of hardships near the occupants of two African nations; Twelve Americans have been killed, explored by two Central Intelligence Agency specialists at a Nairobi government office, and one U.S. Marine authority. , Sergeant Jesse Aliganga, Marine Guard at the Nairobi global government office. In the fallout of the assault, a gathering called "Opportunity for the Holy of Holies" assaulted the assault. American specialists have reported that the name was a cover utilized by Egypt Islamic Jihad, which killed the assault. The assault provoked Osama canister Laden and Ayman al-Zawahiri and their al-Qaeda-connected association in the American popular assessment and helped the Federal Bureau of Investigation (FBI) by sending Bin Laden to its ten most needed crooks.

On November 28, 2002, two rocket dispatches were finished, yet missed, by an Israeli assessor's vehicle from Mombasa air terminal. Following this, there was an assault on the Kikambala vehicle when it discovered Israeli auditors. The store's assault came not long after 60 travelers set out toward home, all from Israel, food specialists said. Sixteen individuals were killed in 3 bombings and 80 were harmed (The Guardian, 2002). Ten Kenyans were killed, nine of whom were utilized at an eatery, a large portion of them said to be specialists who came to welcome 140 Israeli

representatives on an upheld plane and three Israelis, two of whom were kids. With a short walk toward the beginning of the day, four Israeli warplanes Hercules and a gathering of specialists and experts traveled to Mombasa to safeguard the injured Israeli explorers and everybody standing by to leave. Simultaneously, two Strela-2 rockets terminated into the air were found on a similar Boeing 757 airplanes conveying Israeli-based Arkia Airlines as it left the air terminal. The advancement of Arkia's sentences was damaged by an extensive stretch of time for pilots going between Tel Aviv and Mombasa. Kenyan police discovered a rocket launcher and two rocket launchers in the Changamwe space of Mombasa, two kilometers from the air terminal.

In the fallout of this abusive assault, Western relations, with the United States of America and Britain approaching an end, have been given with a notice to travel business for every one of its residents to Kenya in 2003. An excursion to Nairobi, as indicated by Industrial Rules, limits admittance to 90% of Kenya's abroad business premises. The nation was losing more than one billion Kenyan monetary forms. Overlooking the adverse result, the danger turned out to be more than 500,000 direct positions and another 2.5 million positions (Robert, 2005).

In October 2011, a joint activity was sent between Somali soldiers and Kenyan powers against countless Al-Shabaab aggressors in southern Somalia. The activity was formally finished by Somali soldiers, and Kenyan champions gave stable help. Starting here onwards and during the medium term, the effect advancement has shaken different pieces of Kenya, the bombings that give off an impression of being Al-Shabaab's retaliatory assaults. Toward the beginning of June 2012, Kenyan authorities converged with AMISOM (Daily Nation, 2011). As uncovered by the US Embassy in 2011/2012, there have been 17 deceitful assaults suggestive of a Kenyan weapon or an arranged rifle. In any case, 48 individuals were killed in the assault, and around 200 were harmed. Nine of the assaults occurred in the Northeast area, exploring the Dadaab, Wajir and Garissa districts. Four scenes occurred in Nairobi, and four in Mombasa. The objectives have joined police and police vehicles, a dance club and bars, zoos, strong local area issues, the advancement of little midtown shops and a bus stop. The most recent assault adulated two concurrent assaults of genuine resistance in Garissa on July 1, 2012. In this occurrence, 17 individuals were killed and around 50 individuals were harmed. On September 21, 2013, Al-Shabaab-related shooters circulated and shot clients at Nairobi's Westgate Shopping Mall. An aggregate of 67 individuals have been killed in the assault. Between 15 June and 17 June 2014, an

enormous number of more than 60 individuals were killed in assaults in and around Mpeketoni, Lamu area. A convention of Somali aggressors coordinated in Somalia said there was a wrongdoing, however Kenyan President Uhuru Kenyatta affirmed that the assaults were done by chiefs near associations partnered with a specific party. Close reporters called attention to the contention about whether the assault might have been supported by racial or uncontrolled scorn, or by reprisal for land procurement.

In June 2014, on Friday, around 50 shooters got a bakkie and thundered a police camp in Mpeketoni town, burning food joints, suppers, and government work environments. 53 individuals have been killed in the assault, and eight others are unaccounted for since June 18. On June 17, 2014, the aggressors put a match to houses in the towns of Majembeni and Poromoko, close to Mpeketoni. Fifteen individuals were killed. In April 2015, shooters assaulted Garissa University College, killing no under 150 individuals, and hurting two or three others. The aggressors articulated their withdrawal from the Al-Shabaab-based mental attacker gathering and affirmed that they were fighting back considering how non-Muslims were predictable or based on a spot with Muslims. The aggressors got a couple of understudies, freed Muslims and still got Christians.

The Global Terrorism Database (2020) records terrorist events across the world in terms of the day in which the event occurred, the target, and the perpetrator of the event. The database also records terrorist events in terms of their size and region in which they broke out. The database defines large terrorist events as those with at least one casualty or at least one injury whereas small terrorist events are defined as those resulting in no casualty or injury. The database records data on terrorist events that happened in Kenya between 2001-2020. Using the definition embraced by Global Terrorism Database (2020), Kenya has experienced both small and large terrorist events. This study will endeavor to determine, as one of the objectives, how the size of terrorist events affects volatility of returns of the Nairobi 20 Share Index at the Nairobi Securities Exchange.

1.1.2 Stock Returns

Ross (1976) refers to stock returns as the level that stock investors need in their investment in stock when considering stock risk. The higher the risk the higher the return required, as investors may wish to be compensated for the additional risks held. Stock repayment is profit, or the amount that investors generate in stock from any dividend paid to them, or an increase in stock prices. An

increase in stock prices resulting from the development of basic stock conditions and not from a general increase in prices to an increase in stock returns.

The concept of stock prices is an important part of stock returns. Malkiel (2003) suggested that stock prices move in a random way and therefore it may be difficult to find a stock price movement in the future. This is called random walk theory, supported by the fact that current market conditions affecting stock prices change abruptly (Shiller, 2000). According to Brealey & Myers (2003) restitution is determined by summarizing the Net present Value (NPV) of all future benefits and maximum profits from owning the same stock. The main advantage of conventional stock is the increase in real prices which reflects the appreciation of the common stock price. Stock prices are therefore important in determining the return on stock which is important in making investment decisions.

The stock price is the current price that the stock market trades in the market. Rising stock market prices could represent the growth of the shareholders' wealth. For example, short-term shareholders may sell shares at a higher price than they received prior to the announcement of shares, which could result in higher profits. Appreciating company shares can also benefit the company, as it will be seen as a viable investment opportunity that attracts more investors. According to Majanga (2015), rising stock prices could also help company executives by enabling them to contribute to the psychology of existing and potential investors, which can help them plan finances especially if the company needs to raise extra money by floating more stocks in the market. In addition, companies whose rising stock prices are best rated under the NSE 20-Index, which could improve the company's performance in the stock market.

Stock price increases are determined in two main ways: the normal daily return on the stock and the return on the normal accumulated capital (CAR) in the event window. The exceptional daily rate is measured as the difference between the average daily return for each stock (AR) and the actual collateral return within a given day (R). The definition of AR (ARR) is abbreviated to the detection of CAR. Therefore, both ARR and CAR are used to assess shareholder returns that may result from the declaration of benefits.

1.1.3 Nairobi Securities Exchange

The Nairobi Bank was established in 1954 as a deliberate partnership of stockbrokers registered under the Social Order Act. The NSE has been sent to 64 organizations with a market capitalization of Ksh 2.248 trillion as of 24 October 2014. It is located on the first floor of the Nation focus building, Kimathi Street, Nairobi. The exchange is responsible for protecting money, part of the same money as increasing the number of financial backers properly. It also empowers years of consensus to encourage stocks. It authorizes the retention of domestic travel goods and makes interests ultimately ineffective by enabling security improvements among financial backers (Lee et al., 1998).

NSE empowers activation of reserve funds for investments in productive ventures as an option in placing investment funds in bank accounts, land speculations or simply consumption. It likewise offers space to the development of related monetary service sectors, for example, protection benefits plan, which encourages the culture of investment. It makes it simple to check against the flight of capital that happens because of local inflation and currency devaluation. It allows the owners of funding to "divorce" managing their capital. This is a significant cycle because the proprietors of capital may not really have the aptitude to deal with the capital venture effectively. It upgrades improved access to funds both to new and small organizations, which may otherwise find it difficult to get funds for operations among other functions.

1.2 Research Problem

The prices of shares and the movement of such prices influence stock returns of securities. The movement of stock prices is affected by different factors in which case most of these factors can be predicted by economic and financial models. On the other hand, scholars argue that it is not possible to predict future market prices as they are deemed to move in a random manner. The two different school of thoughts, however, agree that external factors affect movement of stock prices but do not agree on the kind and magnitude of movement because of an external factor. Market shocks are therefore deemed to affect prices of stocks more so when there is great impact because of the shock. For an efficient market, the market players can predict changes as the impact of the shock is already included in the stock prices. However, markets with weak efficiency would take time in incorporating the effect of such shocks into the prices (not until the shock has already taken

place). Fear shocks may consequently distinctively affect stock costs relying upon the kind of market, effect of the dread action and the rate at which such fear exercises were equipped for being anticipated.

Throughout the span of the stream, because of the developing number of psychological militant assaults all throughout the planet, the income created from specialists has subscribed with the impacts of terrible shocks on the protection and monetary market in a comprehensive way. Eckstein and Tsiddon (2004) while utilizing the VAR test in Israel, have shown that psychological oppression rapidly influences major Macroeconomic factors like utilization, theory, and remaining resources. A couple of more tests along these lines have researched the effect of fits of anxiety on the economies (Abadie & Gardeazabal, 2003; Nitsch & Schumacher, 2004). Regardless, the impact of the horrendous assaults on the monetary business climate has not yet been met with a near degree of reasoning.

Some portion of the tests led on the relationship among fear-based oppressors and transport reactions included Arin et al. (2008), Eldor and Melnick (2004) and Karolyi and Martell (2005). These tests have been performed principally in the US and other European nations. Apparently, Keitany and Baras (2012) are presently directing examination on the impacts of illegal terrorizing on the Kenyan money (NSE) in which the focal point of the technique is to gauge the effect of negative thinking on stock administration, safeguard, and improvement.

Nearby investigations incorporate a concentrate by Kamau (2014) who tried the appropriateness of CAPM just as Fama-French Three factor model on stocks recorded at NSE more than six years' time span (2008-2013). Then again, Otweyo and Onyango (2017) examined the impact of market return on portfolio returns of organizations in the Main Investment Market Segment (MIMS) at the NSE. Ekisai (2015) then again attempted a review that evaluated the connection among hazard and return at NSE utilizing disadvantage hazard CAPM. These studies therefore indicate a conceptual gap where different concepts from effect of terror shocks on stock returns are undertaken. On the other hand, contextual gaps are undertaken where similar studies are advocated and carried out in different markets apart from NSE that indicates that different efficiency level of the market is investigated. The studies also indicate a methodological gap where distinct methods are advocated by the studies apart from the use of GARCH model.

This study sought to find out the effect of terrorism events on the activities of NSE and analyze the volatility of returns for the period under study by use of GARCH multivariate model. To the best of my knowledge, there has not been any other research done using the GARCH model looking into the effects of terrorism at NSE. The study covered a longer period spanning from 2001-2020 and included more recent terrorist attacks which have attracted international attention.

1.3 Research Objective

The objective of this study was to determine the effect of terror shock on securities return for stocks listed at the NSE.

1.4 Value of the Study

The study will be helpful to Kenyan government in providing insight on how to devise mechanisms on how to enhance resilience of financial markets from the effect of terrorism at the NSE. It will provide a basis for mitigative action plan against threats related to terrorism and perhaps provide a reprieve to investors who might have undertaken huge investments in the terror threatened industries.

The study will contribute to the literature by looking at the characteristics of volatility of stock markets to shocks produced by terror events. This study will be helpful to investors in making their investment decisions and designing their portfolios. This would ensure they maximize their returns while minimizing losses relating to terrorism risk.

Monetary experts would also the research valuable in providing useful knowledge to advise investors on purchase, hold or offer decisions that would augment returns. In this manner, monetary investigators would enhance the financial status of investors. The ideal planning of when to execute shares trade would work with abundance creation of wealth by investors.

Insurance and re-insurance agencies would benefit from the research in assessing hazards and payments in relation to terrorist activities. The insurance fraternity intervenes crucially in reestablishing the monetary status of its customers in case of losses associated with a terror assault.

Controllers like the capital markets authority (CMA) would benefit from the research in proactively advocating the stability of the capital market. This would be done through the

activation of monetary institutions and the bond and stock exchanges to give satisfactory liquidity. Strategy makers, for example, the Central Bank of Kenya will find the research valuable in making alterations to the current strategies to counter terrorism. The research would give pertinent guidelines to the Central Bank of Kenya and other monetary organizations to give result in sufficient liquidity and decide on suitable large scale financial choices which would promote stability of the Kenyan securities exchange.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Various hypotheses have been put forward in the theoretical literature review to clarify the connection between information and stock exchange performance. This section will subsequently analyze the connection between information and the securities exchange performance in respect of existing theories and scholastic argument and look at previous studies done both nationally and internally on the impact of terrorism on stock exchanges.

2.2 Theoretical Review

As of late, because of the certainly big number of psychological militant demonstrations around the world, developing interest from specialists has been given with the impacts of fear based oppressor assaults on the worldwide economy. Eckstein and Tsiddon (2004), utilizing the VAR examination in Israel, have shown that psychological warfare adversely affects major financial factors like utilization, speculation, and lingering sends out. A couple of extra examinations have additionally explored whether a dread put together oppressor assaults any contact with respect to macroeconomic factors (Abadie & Gardeazabal, 2003; Nitsch & Schumacher, 2004). Notwithstanding, the effect of the assault on mental brutality in the monetary area has not yet gotten a similar degree of thought.

Various studies, for example, by Abadie and Gardeazabal (2003), as well as Barry and Oana (2005) have shown the relationship between psychological stress and trade defense to negative. All horrible reactions have been observed and triggered by highly significant exercise based on fear (Drakos, 2009). By increasing the speculative crates, the unfriendly effect of these oppressive efforts based on fear can diminish. Illegal intimidation does not negatively affect the financial market (Eldor & Melnick, 2004).

2.2.1 Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH), introduced by Markowitz (1952) and later invented by Fama in 1970, acknowledges that business-related business areas include all open data and ensures that it provides recognition that reflects all relevant data. EMH states that cash-related business entities can operate, because of which financial assets are successfully assessed and suggests that a person will not be able to achieve reimbursement by relying on normal market reimbursement based on data opened at the time the transaction is accepted. Market efficiency is affected by the number of people in the market and the importance of the researcher's inclusion, access to information and limitations in trading.

There are three kinds of proficient business areas, every ward on what is seen as the information used in resources valuation. In the weak design, asset costs totally reflect all market data, which implies all previous expense and exchanging volume information. In the semi-solid construction, asset costs reflect all openly known and open data. In the strong construction, asset costs totally reflect all information, which fuses both public and private information. Unrests every now and again deliver counterrevolutions and the proficient market theory in finance is no exceptional case. The academic transcendence of the effective market upheaval has more been tested by monetary examiners who stress mental and conduct parts of stock-esteem assurance and by econometricians who battle that stock returns are, to a huge degree, unsurprising. Protections trades are more capable and less unsurprising (Burton, 2003). The hypothesis is important to this exploration since it will upgrade the comprehension on whether markets are productive and regardless of whether they catch and factor all new data, like new data from psychological oppressor occasions, on their costs.

2.2.2 Random Walk Hypothesis

Unusual travel speculation is a monetary-related theory that suggests that the costs of financial transactions have improved as direct travel and in the same way cannot be expected. It is accompanied by an informed market hypothesis. One of RWH's most important initiatives was made by Cowles and Jones (1937), who investigated a repetition of progress and a reversal of a previous stock return, in which the past is a set of consecutive sets that return with a comparison mark, and the latter is a set. The sequence returns with retrospective symbols. French and Roll

(1986) reports a special linked event: stock recovery varies over the weekend and exchange times are much lower than reversal changes in the number of comparable days when markets are open. This discrepancy suggests that the actual manifestation of the trade has caused a discrepancy, which may have been the appearance of Black's opposing agents (1986).

The use of analysts to predict future price changes using past and current information is futile as this information is already calculated on stock prices. This theory is therefore related to research as it provides that collateral prices go hand in hand with terrorist incidents occurring in the country. Changes in prices can therefore take on an unexpected turn of events even after a fear-related activity. Theory therefore seeks to provide that it is not possible to demonstrate the impact of terrorist-related incidents on mortgage rates.

2.2.3 Modern Portfolio Theory

This view of Markowitz (1952) states that investors are not naturally willing to take risks, which means that given the two portfolios that offer the same expected return, financial investors will be more likely to be safe. In this way, the financial trader will be involved in high-risk businesses if he is paid a higher expected return. Then again, an investor who needs a higher expected return should face an additional risk. There is a good correlation between risk and normal financial return. At a time when the risk of an instrument increases, so does its normal return. This means that if the investor takes a significant risk, he or she will be expected to be compensated for agreeing to do so in high yield. Similarly, if an investor needs to increase the rate of business return, he or she should be prepared to face additional risk (Markowitz, 1952).

The criticism of MPT theory is that portfolios are assessed based on variability and not at low risk. This means that a portfolio may have a small common loss while another has a very small but large loss. The two portfolios will have the same variability and will be rated as equally desirable using MPT. However, investors as they are anti-risk will prefer a portfolio with a modest but low loss compared to a large loss. Perhaps the criticism brought by MPT points to the fact that after all there may be no way to assess the full portfolio that can guarantee future returns (Ndirangu, 2014).

MPT theory is therefore important in this study because investors in the securities market are interested in understanding how their return on investment in their portfolio is affected by terrorist

incidents related to instability and risk, increasing market risk and therefore MPT suggests that it is possible. Determining the portfolio that will grow investors the required return rate and as a result resulted in an increase in the share price of each stock in the portfolio.

2.3 Determinants of Stock Returns

There are different factors that affects stock returns in different markets both in the local context as well as in the international forums. The factors that were singled out in this study include terror shocks, economic growth, political interference as well as interest rates.

2.3.1 Terror Shocks

Illegal intimidation is the arranged use or risk of use of viciousness by individuals or subnational gatherings to get a political or social objective through the threatening of a colossal group, past that of the quick setback. But the points of view of fear imposers might shift, their exercises notice a standard example with psychological oppressor events taking a combination of structures: plane hijackings, kidnappings, deaths, bombings, dangers, and self-destruction attacks. Dread attacks are outfitted towards applying satisfactory squeezing components to an organization, so it grants political concessions. On the off chance that a barricaded government sees the normal costs of future dread-based exercises as more essential than the costs of respecting fear mongers' solicitations, then an organization will make some trade off. Thusly, a typical psychological militant based affiliation can, on an essential level, show up at its goal quicker in case it can build the consequences of its main goal. These outcomes might incorporate wrecked designs, setbacks, an expanded nervousness level, and load of money related misfortunes (Kallandranis & Drakos, 2011).

Illegal intimidation shocks are diffused cross-broadly in a way which is non-uniform from the other. The way a nation is coordinated with the world monetary exchange designs is exceptionally pivotal in deciding the greatness of dread shocks experienced. The liquidity of the market just as the monetary binds with the ground-zero nation are central questions that would decide the extent just as the mental effect brought about by terrorism episode (Kallandranis & Drakos, 2011).

2.3.2 Economic Growth

As per Senturk, et al. (2014) monetary business sectors are profoundly identified with financial development just as a few macroeconomic factors. This suggests that the exhibition of monetary business sectors is profoundly affected by the condition of macroeconomic factors like financial development. Financial development which is characterized as the expansion or the improvement in the swelling changed market worth of the labor and products that are created by the economy over the long run, proposes that with expansion in the creation of merchandise then, at that point, securities exchanges might react along these lines and subsequently work on stock returns. Monetary development might be dictated by the GDP of a country in a particular period, normally one year.

2.3.3 Political Factors

Political interference is a macro-economic factor that have adverse effects on market returns. This is informed by the fact that increase in political interference means that the market returns are subjected to other pressures that may defy the normal market pressures of demand and supply. These pressures increase the risk of stock and therefore would have an adverse effect on stock market returns (Maqbool et al., 2018).

In Kenya, political news and political decisions are among main factors that influence stock returns for a good number of firms. Firms in the public sector are more susceptible to political interference as factors such as corruption, nepotism among other social ills come into play. Political news, events and political decisions brings out political instability that serves to increase the risk profile of stocks, though the effect may vary from one sector to the other. Political instability in Kenya is experienced during general elections.

2.3.4 Interest Rates

Interest rates on the other hand refer to the amount a lender charges for the use of the assets, and it is expressed in form of percentage of the principal amount. The costs at which investors can obtain funds for making their investments is very crucial and it guides on the available investments. Low interest rates would mean that there are more projects that would have positive NPV and

therefore become viable projects for investments. A higher interest rates on the other hand would have an opposite effect and would have an adverse effect on stock returns.

2.4 Empirical Literature Review

Tahir (2012) made an audit to look at the effect of the terrible assault on stock exchanging conduct. He inspected the impacts of the awful assaults on exchange returns and flimsiness. Utilizing information identified with the awful assault and the bit-by-bit information from the Karachi Stock Exchange saw the impact of the fear assault on the protection exchange. Also, he has examined the advantages of various regions to decide if they are influenced by alarm assaults. The analysis utilized a GARCH model that didn't change the equilibrium, to survey the effect of disturbing assaults on benefits and unpredictability. The outcomes showed that stunning news conflictingly impacts the advantages of a scope of neighborhood records. In any case, information on these assaults increments the danger of the KSE100 record and the neighborhood document related document. He further added that the impacts of postponements in oil and gas, just as industry are not actually major considering the fear monger assaults, which shows that such information doesn't influence the precariousness of the two regions. Moreover, instability is more regrettable in the absolute region including the KSE100 of proof of impact.

Rigobon and Sack (2005) analyzed the impact of war hazard on various monetary components. They track that ten week before the beginning of the contention with Iraq, the danger of a crash implies thirteenth spot and a 63 percent change in cash parts like the S&P 500, oil costs, gold expenses, besides, the US dollar.

Karolyi and Martell (2005) inspected the impact of the most noticeably terrible assaults on stock costs utilizing an assortment of stress-related occasions specialists. They depicted exhaustively the 75 episodes of assault in a space close to 1995 and 2002 that neighborhood affiliations were zeroing in on. They utilized the unmistakable quality every now and then when they tried and tracked down a negative response pace of the stock - 0.83%, contrasting the overall authoritative episode with each of the $ 401 million beats in the solid market capitalization. Furthermore, the randomized controlled preliminary evaluates the impact of fits of anxiety on the singular association and later the following association subordinate association and occasion.

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Chen and Wei (2005) in the utilization of street centered minutes have inspected the impacts of illicit terrorizing in enormous business regions. They inspected the reaction of the US cash-flow to the 14 significant fear-based oppressor assaults that followed back in 1915 and the reaction of enormous organizations to two continuous occasions - Iraq's intrusion of Kuwait in 1990 and the psychological militant assaults on September 11, 2001. of associations in the capital US powers are even more effectively engaged with late memory and are recuperating quicker than horrendous assaults than other significant demonstrations. The declaration raises a developing doubt: that these arising business area vacillations can here and there be connected to a steady banking/monetary climate that gives sufficient inventory of products to further develop market satisfaction and a state of caution.

Ahmed and Farooq (2008) thought about the impacts of the September 11, 2001, mental assaults, and their effect on the security of the security trade. They utilized day by day return information from the Karachi Stock Exchange and assessed the result of the 9/11 assaults by thinking about the advantages in the period before 9/11 and after 9/11. They followed that the negative response to the immediate variance, changed during the foundation after 9/11, with these parts during the pre-9/11 period. What's more they followed that unexpected conduct changed at a huge rate after the awful assaults on 9/11. They additionally investigated that this stunning change in shaky conduct can't be clarified by making the executives changes. Maybe that is truly about the fittingness of the assault and the outcomes and your approved effect on the difference in direct monitors.

Eldor and Melnick (2004) used customary data to perceive how stock exchanges and non-stock exchanges react to fears. The data perceived the region, kind of attacks and spotlights on, the number of misfortunes, and the amount of consistently attacks with 639 appalling attacks some place near 1990 and 2003 in which 1212 people were killed in Israel and 5726 people were hurt. Progressive inconsequential attacks an influence both the stock and the extraordinary exchange market, as do the proportion of setbacks, while the space of the mental breakdowns has not impacted any market. Markets didn't incapacitate in fear. Business-related business districts continued to work successfully; Past market moderate cycles clearly helped on an exceptionally fundamental level to bestow fear. The uncommon cases yet considering fear of the general

population living in Israel, have broad implications for western nations considering Israel's Israeli-based framework, boundless economy, and significantly coordinated financial business zones.

Carter and Simkins (2004) using the event focused in on the strategy Chen and Siems (2004) separated the degree of the effects of New York's 9/11 manipulator attacks on the overall business industry and US Capital. They uncovered a huge impact, whatever it was, that was phenomenal at some irregular time in a recorded vision and included some political, money related, or general shock. Their exposures show the huge improvement of the detached US markets in some gigantic business areas. Also, they saw that the last seemed to have made a more grounded ability to fear the attack than they were, because of the consistent events they seemed to recover speedier.

Arin et al. (2008) present in their article the astounding outcomes comparable with the impacts of disastrous occasions in the security exchange that activity and information from six new nations (Indonesia, Israel, Spain, Thailand, Turkey, and the UK) considering the exchange safeguard, in any case as alarming. They track the effect of this sort of occasion on a huge and huge scope in building up business conditions.

Nikkinen and Vähämaa (2010), dissecting the FTSE 100 Index reaction after 9/11, 3/11 and 7/7 hours showed that these assaults essentially added to the decrease in monetary administration of monetary organizations. They have drastically expanded the shortage of monetary design (contingent upon the circumstance in a past report by Burch et al., 2003 and Glaser and Weber, 2005 which after 9/11 saw an inconsistent example in the utilization of monetary related monetary supervisors). Also, specialists call attention to that there has been however much genuine trade as could be expected between the mental scenes, demonstrating that monetary specialists are searching for a high possibility of a sharp decrease in the FTSE record, regardless of the way that it is just transitory.

The vicinity of the interest in assaults (9/11, 3/11 and 7/7) is inspected by Baumert (2010) who sees the impact of such forceful assaults on significant US records, the European and Japanese Stock Indices, showing that solid presumptions, both effect size and degree are diminished, a reality that actions two measurements. These are: (a) Investors squashed their 9/11 episode and changed the objective administration way to deal with survey the effect of solid monetary fear monger assaults and (b) Investors are more mindful of the dangers of mental fighting, including

intentionally hazard related danger sharing. The eventual outcomes of their paper show that the effect of the Boston bombings on the audit of key monetary foundations for the general business-related business, most remarkably Dow Jones, Ibex, FTSE, CAC40, MIB, DAX and Nikkei, is certainly pushing ahead; that is, it could be viewed as astounding around 30-day work plans before the assault. Then again, with past mental assaults (9/11, 3/11 and 7/7) business regions have fused stable and declining size and relationship time (aside from, for clear reasons, Dow Jones, the just one with a local of dread). Then again, it might make the feeling that limitless input between records is similarly low as significant, which incorporates an essential relationship between business elements, a nittier gritty appraisal of the monetary outcomes of these assaults by foreordained monetary experts or hazard taking. Regarding how to manage monetary issues. Such assaults are really compounded by the expense of the offers. Openness guides the way to a persistent danger of illicit dangers (not a solitary assault, not cautiously thinking about your level) that lastingly affects sharing expenses, can be mental pressure "brightened" with any new, potential, unlawful PC psychological militants.

Kollias et al. (2011) utilized the chance to zero in on the GARCH family framework and family models, looking into the effect of Madrid and the London bombings on locales. The colossal negative benefits relax up to an enormous piece of the Spanish business districts whenever and not due to London. Additionally, the back market of ricochet is unimaginably quick in London and has arisen in a consistent way towards the Spanish business locale where the assailants were not an idiotic plane. Nonetheless, all genuineness creates a brief outcome on recuperation and doesn't continue to endure.

Arif and Suleman surveyed the effect of long-haul mental assaults on stock expenses at different areas recorded on the Karachi Stock Exchange utilizing the factor illegal threatening impact (TIFL) and month to month information from 2002 to 2002. 2011. Johansen and Jeuselius' inclusion have been uncovered as a pioneer connected between an illicit danger and stock expenses. Ordinary co-blend vectors are utilized to survey the impact of mental obstruction on stock expenses. The outcomes displayed at the lower levels joined the positive and irritating impact of the drawn-out illicit danger to the supplies of different areas and showed that the market didn't lament the expanded forceful assaults.

Saeed and Kaveth (2011) explored the impact of unlawful compromising on cash related business premises in Tehran. A central issue of this current paper's cluster is to consider seeing the effect of weight on business-related business regions. They examined the fear-based oppressor scenes that occurred in Iran during the whole 17-year time interval and drove our layout utilizing thinking about frameworks. The motivation driving this review was to review the effect of mental battling on the Tehran Stock Exchange (TEPIX) regard record and to isolate the effect of dread assaults on rich metropolitan relationship in the Tehran Stock Exchange advantaged document. The disclosures of this review show that occasions of unlawful compromising in Iran will affect the security exchange. Resulting to testing with coefficients, periods of mental pressure doubtlessly impacted the Tehran Stock Exchange's part regard record. In like way, the openness of this review shows that one of the parts impacting exchange security of political things like unlawful compromising and in this definition its implications for watch exchange ought to be seen and controlled.

Ramiah et al (2010) inspected the effect of five constant awful assaults (September 11 bombings in London, Madrid, Bali, and Mumbai) on recorded figures in Australian stock exchanging. They utilize everyday stock returns, not really positioned on the All-Ordinaries stock record, and the 10-year security level for the period, August 1999 to August 2006, got from DataStream. They have a sum of 1191 stocks in their model. They gather industry portfolios dependent on Global Industry Classification Standards (GICS). As per the Global Industry Classification Standard, they are looking at the meaning of these occasions in different pieces of Australia. Utilizing parametric and non-parametric tests, they inspected the relationship between stock advantages from recorded components there and notice assaults. They have given remarkable advantages since the September 11 assaults and less significantly, bombings in Madrid and London. Their assertion shows a positive response to the Bali assault, and there is no reaction from the Mumbai assault on the Australian market. Also, they have gotten a shocking 37.30% everyday benefits in the Utilities area. Their revelation shows that the obvious danger of opening associated spaces after the time of September 11 is at present unaltered because of different assaults.

Chesney et al (2010) broke down the effect of mental maltreatment in a cash related climate. The area of their paper gathering manual for think about the effect of weight on direct monetary exchanging, security and capitalization. They audited the horrendous accidents that occurred in 25

nations over an 11-year time span and finished their conjectures utilizing the system of the structure: a close by centered occasion, an unhindered construction, and an option in contrast to GARCH. What's more, they consider the effect of genuine business property assaults on the effect of other clashing occasions like monetary dangers and appalling occasions. The unavoidable aftereffects of their investigations recommend that the reasoning is the most reasonable of the three to consider the effect of mental clash on business-related business regions. Generally, 66% of saw ready assaults lead to critical bar of results in under one exchange being explored. Swiss money related exchanging is influenced by a critical number of assaults, exchanging American cash whenever. The arrangement of the vehicle and security business portfolio shows the most noteworthy shortfall in unlawful transportation, while the monetary related business is generally imperfect. This improvement of monetary related dangers mirrors a solid adverse consequence on the monetary circumstance. Effect appraisals that decide the region to be thought of drug store/biotech and oil/gas show both positive and negative responses. These records are generally receptive to crises and monetary related dangers. Show the strength of this cycle as it advances, market cycles, floods and late results are controlled. They show how the aftereffects of these associations can be utilized in ways of broadening the monetary intermediary program against the danger of illicit dangers.

Kamau (2014) then, at that point, simultaneously, re-tried the truth of CAPM as a Fama-French Three figure model stocks recorded on the NSE for over six years (2008-2013). He explored CAPM's month to month data while quarterly data was tried by the Farm-French Three Factor Model. To decide the beta test an incentive for CAPM, floods return as the test worth to alpha degree 5%. The review followed that the contrast between the typical return of CAPM and the real return was little. He found that CAPM was pretty much as exact as the stock list recorded on the NSE. Review discoveries go against past discoveries. Review checks out CAPM introductions, for example, the French Farm-Model in stocks recorded on the NSE. This is especially obvious in the effect of NSE stock recuperation concerns. The review period likewise gives a chance to assessment to be stayed up with the latest.

Otweyo and Onyango (2017) examined the impact of market returns on the return of the organization's portfolio in the Main Investment Market Segment (MIMS) on the NSE. The review attempted to clarify all statistical studies where the statistical study was accepted from all 45

recorded organizations on MIMS during the first review of January 2009 to December 2013. of OLS. The findings of the review indicated that the portfolio is returning if market returns are determined and fully aligned. The negative results of the return board have shown that positive and important interactions with market returns and portfolio. The review period provides a possible loophole to receive a new report that may not be sufficiently tested by this review.

Ekisai (2015) embraced a review that surveyed the connection among hazard and return at NSE utilizing disadvantage hazard CAPM. Time series information was utilized in the review for the period January 2010 to December 2014. A registration study was attempted yet information was gotten to from 47 out of a potential 62 firms. Real stock returns were contrasted with returns as caught by D-CAPM utilizing Z – scores where the discoveries of the review demonstrated that the genuine returns were not measurably the same as stock returns dictated by D-CAPM. It subsequently showed that D-CAPM could be utilized in extending stock returns at the NSE. The key review hole is the strategy that was taken on by the review, where the stock gets back from CAPM were contrasted with genuine stock returns by utilization of Z-scores at 95%. This review will anyway utilize CAPM model in endeavor the review, and subsequently shows a methodological gap.

2.5 Conceptual Framework

Conceptual framework refers to the pictorial relationship between the studies variables. It provides a clear representation of the way the study variables are related to each other, or the way the variables influence each other.

INDEPENDENT VARIABLES

TERROR EVENT

DEPENDENT VARIABLE

STOCK RETURNS

VARIANCE
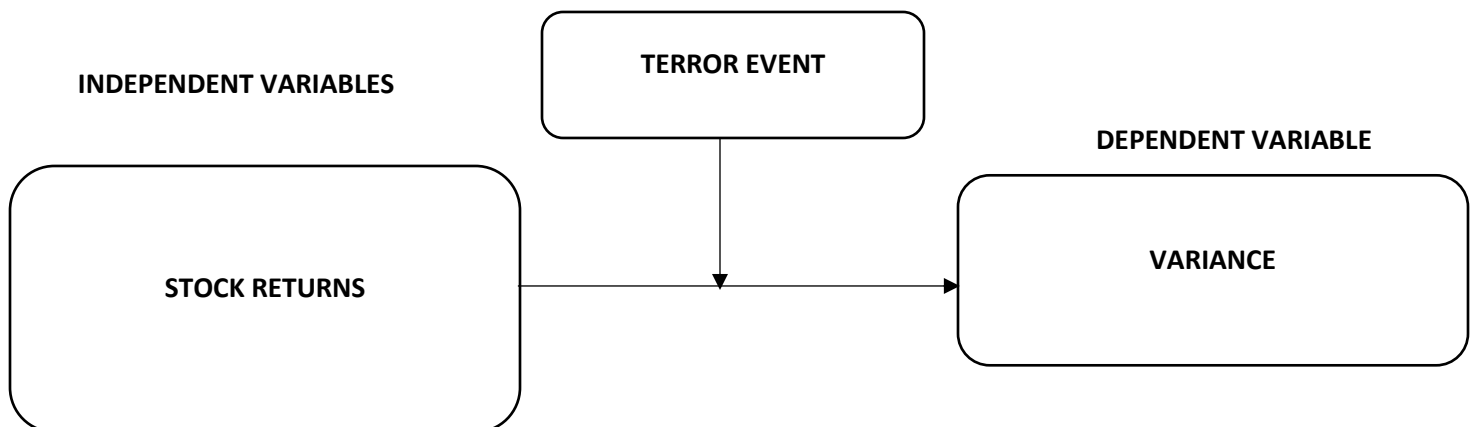
CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

The design and the methodology of the study are set out in this chapter. The sources of data to be used their method of collection and how the analysis was carried out is detailed in this section.

3.2 Research Design

The study adopted quantitative research and specifically adopted a descriptive research design. The design is effective in describing relationship among variables without interference on the variables or the relationship between the variables (Cooper & Schindler, 2003). The design has been selected because the emphasis of this study is to establish the effect of terrorism events on volatility of returns for securities listed at the NSE.

Quantitative research gathers information with an aim of answering queries with regards to the present status of the topic under study (Mugenda & Mugenda, 2003). The choice of the quantitative design was because in this study, the researcher was interested on secondary data extracted from reputable sources without manipulating any variable. This study was consequently able to extrapolate the findings to a greater populace.

3.3 Population

A population is described as a comprehensive set of individuals, cases or objects with mutually visible appearances (Mugenda and Mugenda, 2003). The target population of the study comprised of all 61 listed companies at the NSE as of 31st December 2020 as shown in the Appendix 1. The companies are clustered in different sectors which are Agricultural, Automobile & Accessories, Banking, Commercial and Services, Construction & Allied, Energy & Petroleum, Insurance, Investment, Investment Services, Manufacturing & Allied, Telecommunication & Technology and Real Estate Investment Trust.

3.4 Sample Design

The sampling design implies the undertaking of a proportion or a portion of the population, which is studied, and the findings of that chosen group inferred to mean the findings of the entire

population. A sample should therefore be as representative as possible. This means that a sample should be capable of capturing all the aspects of the population from which the sample is drawn if it needs to be representative. This study will however study the entire population since the number of firms listed at the NSE are not as much, and therefore a census study would be preferred.

3.5 Data Collection

Secondary data was collected from individual company's website for data relating to its annual returns one year before a terror event took place and one year after a terror event took place. Data in respect to stock returns was also be collected from NSE publications and websites.

3.6 Data Analysis

Quantitative data analysis was used in the study where the data collected was first tested for completeness and accuracy before it was used in the analysis. Data sorting was done using the Microsoft Excel Package. Similarly, IBM Statistical Packages for Social Scientists (SPSS) was used to conduct further analysis, in which case research was conducted. Event research examines the behavior of commodity prices and changes in other types of variables near and after major business or economic events. Based on an effective market vision as developed by event research pioneers; Fama, Fisher, Jensen, and Roll (FFJR), in their paper to adjust stock prices for new information (Fama, Fisher, Jensen, & Roll, 1969). Its four main pillars are the content of the event information, the market efficiency of the collection of that information, the market response test model and metaphorical analysis metaphors in the profits from the event.

The GARCH model was used in this study. This is because an unusual return to the event window is a return to what you see i-day t minus the recognition return rate i in the rating window:

The basic empirical results in this study were based on the model for prediction errors in returns and factor variables that would take the form.

3.7 The Model

The ARCH and GARCH models are the most popular instruments for measuring volatility dynamics in financial time series. The GARCH model makes a current conditional variance dependent on lags of its previous variance. Nevertheless, one of the limitations is that it enforces

symmetric responses of volatility to both negative and positive volatility market shocks (Bollerslev et al., 1994).

GARCH (1.1) model

$$\sigma t^2 = w + \alpha_1 \varepsilon^2 t_{-1} + \beta_2 \sigma^2 t_{-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Equation 1 is a function of variables with an error term. $\sigma t2$ (Conditional variance) is one period ahead of forecast variance based on past information. w is a constant term; $\varepsilon^2 t_{-1}$ (ARCH term) is news about volatility from the previous period measured as a lag of squared residual from the mean equation. $\sigma^2 t_{-1}$ (GARCH term) is the last period forecast variance. The (1,1 in the GARCH refers to the presence of first order autoregressive GARCH term and the first order moving average ARCH term. An ARCH model is a special case of GARCH specification in form of GARCH (0,1). Additionally, by adding the lagged $\varepsilon^2 t$ terms to both sides of the above equation and moving $\sigma^2 t$ to the right-hand side, the GARCH (1,1) model can be rewritten as an ARMA (1,1) process for the squared errors: $\varepsilon^2 t = \alpha_0 + (\alpha_1 + \beta_1) \cdot \varepsilon^2 t_{-1} + vt - \beta_1 \cdot v_{t-1} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (2)$

where $v_t = \varepsilon^2 t - \sigma^2 t$. GARCH (1,1) is termed stationary in variance if $\alpha_1 + \beta_1 < 1$. This is the case were the unconditional variance of εt is constant and given by the following equation:

$$va(\varepsilon_t) = \alpha_0/(1-(\alpha_1+\beta_1)) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The non-stationarity in variance is the case where $\alpha_1 + \beta_1 \geq 1$ and the unconditional variance of ε_t is not defined. Moreover, $\alpha_1 + \beta_1 = 1$ is known as a unit root in variance, termed as IGARCH.

In this paper, historic time series data will be analysed to determine the volatility of returns at the Nairobi Stock Exchange (NSE) because of terrorist activity.

3.8 Significance Test

The study employed an independent sample t test at a confidence level of 95%. This test is adequate for this study as it allows the researcher to compare the sample mean of one population with the sample mean of the other population and state whether these sample means are significantly equal, or they are not equal. The two populations in this study were represented by the one year of data collected for each study variables before the terror event took place while the second population was represented by the data collected one year after the terror event took place

for each study variable. A p-value of less than 0.05 would lead to the rejection of the null hypothesis that indicates that the two populations mean are not equal and therefore suggest that terror shocks have a significant impact on stock returns and the vice versa is true.

CHAPTER FOUR
DATA ANALYSIS

4.1 Introduction

The aim of the research was to determine the effects of terror shocks on securities returns at the Nairobi securities exchange. The research companies are all the companies listed in the NSE. The terror shock depends on the terror attack that occur in the country where individuals and property are destroyed. The terror attacks in study Westgate mall attack of 2013, Mpeketoni near Lamu attack of 2014, Garissa university attack of 2015 and DusitD2 Hotel in Nairobi that occurred in 2019. Kenya has experienced both small and large terrorist events. Therefore, the main objective of the study, how the size of terrorist events affects volatility of returns of the Nairobi Securities Exchange. The stock prices move in a random way and therefore it may be difficult to find a stock price movement in the future.

The volatility of return is used to measure the distribution of values expected for price of securities in the NSE. If the volatility is high, then the security prices is fluctuating at a high rate and have a high variation. The lower the volatility this is indicated that the prices of the security are stable and are not fluctuating. The sample used in this study consists of yearly national indexes representing market price of companies listed in the NSE. Each of the company stock price broadly represents stock composition in different years.

4.2 Diagnostic Tests

The study started with the daily returns of companies listed in NSEs between the period of 2012 to 2020. The results in Figure 1 show that the movement of stock returns is both positive and negative. It can be noted that the returns fluctuate around the mean value, but close to zero. Larger fluctuations tend to cluster together followed by periods of calmness. This is the general norm with stock returns. Stock returns tend to fluctuate thereby exhibiting volatility clustering, where large returns are usually complimented by small returns. To interpret figure 1 the stock values seem to be large during a specific period and the majority are indicated with the lowest return. This is an indication that during terror shock there is an effect in the economic conditions which affect the values of stock and availability of money in the public to purchase securities thus causing a low return in the stock market. The returns results were non-linear and dependent on some market

factors that affect the day-to-day purchase of the stock. Often, it can be summed up that when stock volatility changes, stock returns tend to move the same way as well.

Figure 1 Stock Returns

Yearly return (2012 to 2020)
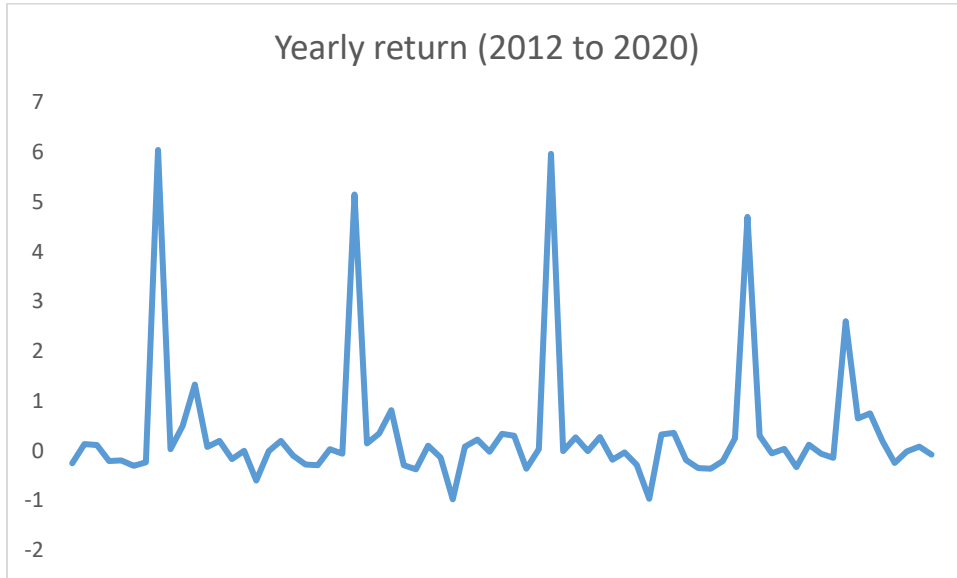
4.3 Unit root test

We conduct an Augmented Dickey Fuller (ADF) test to test for stationarity. The results from the test show that the time series data is stationary. The ADF test statistics reject the null hypothesis that there is an existence of a unit root in the return data series. The ADF statistic is less than the critical values. The null hypothesis is rejected against the one sided alternative if the test statistics are less than the critical. In this case, the test rejects the null hypothesis of a unit root in time series in all four levels of significance. Consequently, we reject that the time series is nonstationary.

Table 1 ADF results

	2012-2014 (Westgate mall attack)	**2013-2015 (Mpeketoni Attack)**	**2014-2016 (Garissa university attack)**	**2018-2020 (DusitD2 hotel attack)**
ADF statistics	-9.22675	-12.0467	-10.4321	-11.71823
	0.0000*	0.0000*	0.0000*	0.0000*
Critical values:				
1% level	**-4.11222**	-4.46307	**-4.13636**	**4.22594142**

5% level	**3.812903**	-3.87583	**-3.97674**	**-3.02047782**
10% percent	**-2.02048**	**-2.30244**	**2.081448**	**2.33797909**

4.4 Empirical Results

In this section, we report the results of the GARCH model. The coefficients on both the lagged squared residual and lagged conditional variance in the Variance Equation are highly statistically significant. Furthermore, the sum of the ARCH and GARCH ($\alpha+\beta$) coefficients of the period of terror shock year 2012 to 2014, 2013 to 2015, 2014 to 2016 and 2018 to 2020 in NSE companies is very close to one.

Table 2 GARCH (1.1) Results for 2012 to 2014

	2012-2014 (Westgate mall attack)		
Variance	**Coefficient**	**z-statistics**	**prop**
C	1.6713665	3.562144	0.0000***
	Variance equation		
C	0.227451	1.68124	0.563421
RESID (-1) ^2 (α)	0.136739	3,.33313	0..08124
GARCH (-1) (β)	0.727081	13.34120	0.0000
α + β	0.86382		
R-Squared	-0.11979		
Sum Squared resid	6397.844		
Log-Likelihood	-493.2019		
Durbin-Watson stat	2.45418		
	Note. **Significant at 5% level;		

Table 2 indicates the impact of Westgate mall attack in the years 2013; the study indicates that the coefficient is low represented by 1.67 and the variance intercept "C' is indicated to be 0.23. This explains that there is appositive return in the future forecast of securities returns. The ARCH term is indicated by 0.14 and the GARCH term is indicated by 0.73. The ARCH term is less that the GARCH term which can be interpreted that conditional volatility is persistent in the securities returns of companies listed in NSE within the period of Westgate mall attack in 2013. The model

is said to be significant since the R-squared is less than the significant level ($R^2 < 0.05$). The sum of the ARCH and GARCH ($\alpha+\beta$) is indicated by 0.864 which explains that the volatility rate to have an increasing return in securities. The variation coefficient is indicated to be 0.23 which indicates that holding all the factors constant the terror shock affected the securities returns with 23%.

Table 3 GARCH (1.1) Results for 2013 to 2015

	2013-2015 (Mpeketoni attack)		
Variance	**Coefficient**	**z-statistics**	**prop**
C	2.978311	4.156320	0.0000***
	Variance equation		
C	0.486317	1.43196	0.4713
RESID (-1) ^2 (α)	0.631940	2.21423	0.0131
GARCH (-1) (β)	0.568130	12.5412	0.0000
α + β	1.20007		
R-Squared	-0.37962		
Sum Squared resid	8915.844		
Log-Likelihood	-314.1192		
Durbin-Watson stat	2.45418		
	Note. **Significant at 5% level;		

Source: Researcher own Data

Table 3 indicates the Mpeketoni Attack that happened in the year 2014. The model is said to be significant since the R-squared is less than 0.05, (R <0.05). The coefficient is given by 2.9783 and since it is positive the return has indicated a positive on the securities return in the companies listed in NSE. The GARCH item is represented by 0.57 and the ARCH item is represented by 0.63. The sum of the ARCH and GARCH ($\alpha+\beta$) is indicated by 1.20 which explains that the volatility rate to have an increasing return in securities. The variation coefficient is indicated to be 0.49 this indicates that holding all the factors constant the terror shock affects the securities return with 49%. Therefore, it can be concluded that the GARCH model indicates that the conditional volatility is persistence during the period of 2013 to 2015.

Table 4 GARCH (1.1) Results for 2014 to 2016

	2014-2016 (Garissa University attack)		
	Mean Equation		
Variable	coefficient	z-statistics	prop
C	0.777	3.5123	0.0000***
	Variance equation		
C	0.511393	4.69868	0.03125
RESID (-1) ^2 (α)	0.812903	2.1472	0.25136
GARCH (-1) (β)	0.137979	19.6571	0.0000
α + β	0.950882		
R-Squared	-0.13826		
Sum Squared resid	584.761		
Log-Likelihood	-778.171		
Durbin-Watson stat	0.302083		
	Note. **Significant at 5% level;		

Source: Researcher own Data

Table 4 indicates the Garissa University attack that happened in the year 2015. The model is said to be significant since the R-squared is less than 0.05, (R^2=-0.13826 <0.05). The coefficient is given by 0.777 and since it is positive the securities return has indicated a positive return in the companies listed in NSE however since it is less than 1 the growth will increase at a low rate. The GARCH item is represented by 0.14 and the ARCH item is represented by 0.81 which is higher than the ARCH. The sum of the ARCH and GARCH (α+β) is indicated by 0.951 which explains that the volatility rate to have an increasing return in the securities of the companies listed in the NSE. The variation coefficient is indicated to be 0.51 this indicates that holding all the factors constant the terror shock affects the securities return with 51%. Therefore, it can be concluded that the GARCH model indicates that the conditional volatility is persistence during the period of 2014 to 2016.

Table 5 GARCH (1.1) Results for 2018 to 2020

	2018-2020 (DusitD2 Hotel attack)		
	Mean Equation		
Variable	coefficient	z-statistics	Prop
C	0.7542	3.5123	0.0000***
	Variance equation		
C	0.31913	3.9784	0.16754
RESID (-1) ^2 (α)	0.62903	3.9875	0.56123
GARCH (-1) (β)	0.17134	14.95467	0.0000
α + β	0.80037		
R-Squared	-0.486215		
Sum Squared resid	671.330		
Log-Likelihood	-662.177		
Durbin-Watson stat	0.20833		
	Note. **Significant at 5% level;		

Table 5 indicates the DusitD2 Hotel in Nairobi attack that happened in the year 2019. The model is said to be significant since the R-squared is less than 0.05, (R^2=-0.4862 <0.05). The coefficient is given by 0.7542 and since it is positive the securities return has indicated a positive return on securities in the companies listed in NSE however since it is less than 1 the growth will increase at a low rate. The GARCH item is represented by 0.17 and the ARCH item is represented by 0.63 which is higher than the ARCH. The sum of the ARCH and GARCH (α+β) is indicated by 0.800 which explains that the volatility rate to have an increasing return on securities in the long term. The variation coefficient is indicated to be 0.32 this indicates that holding all the factors constant the terror shock affects the securities return with 32%. Therefore, it can be concluded that the GARCH model indicates that the conditional volatility is persistence during the period of 2018 to 2020.

The findings support the Efficient Market Hypothesis which states that markets are efficient and asset prices reflect the available information, although, we have three different forms of efficiency, and it can be seen new information (in our case it is terrorist attacks) influence the securities market

as investors analysis how this information affects their investment portfolio and their investment decisions. In addition, the results of this research support findings from other empirical studies both nationally and internationally that terrorist activities do negatively affect securities market performance. These are findings done by Keitany and Barasa (2012), Kumar and Liu (2013), Selvam and Raja (2018) and Patrick Kiptoo (2018).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The chapter discusses the summary of the findings. Included are the summary of findings, conclusion, and recommendations represented from the quantitative analysis presented in chapter 4 of the study. From the analysis of data collected the following findings, conclusions and recommendations were made based on the objectives of the study. Investors in the economic market create wealth using shares securities and bonds. This is normally used as a wealth creation process which require no formality and process but only the capital resources. The stock prices are affected by external factors such as political factors, environmental factors, and economic factors. This however may increase the demand or decrease the demand and thus affect the returns. The market of shares and securities is a form of external investment which affects the long-term return of the companies. The price of stock and securities are determined by the total shares available in the companies and the lesser the shares the more expensive it is. Therefore, the study focused on the effects of terror shocks on the securities returns in the NSE. Terror shock affect the securities returns indirectly by affecting the economic conditions and the environmental condition which leads to the increase in the demand of money especially in consumption and therefore the saving reduces.

5.2 Summary of the Findings

The summary of the analysis indicates that the return of securities varies yearly due to the terror shock effect. Figure 4.1 indicates that a year before the terror attack there is a high return and a year after there is a low return due to poor performance. The returns results were non-linear and dependent on some market factors that affect the day-to-day purchase of the stock. The unit root test was conducted and the ADF was negative indicated by -9.23. Since the value was larger and stronger, we accept that the terror attack affected the stock price in the year 2012 to 2014 in the Westgate mall attack. The year that the stock returns were affected at a high rate was given by the year 2013 under Mpeketoni attack where the ADF had a strong negative of 12.05. This was further explained that the sum of the ARCH and GARCH $(\alpha+\beta)$ is indicated by 1.20 which explains that the volatility rate to have an increasing return in the year 2014 in Mpeketoni attack. This shows

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that the terror attack affected the securities return in the years 2013 to 2015. The ADF statistics is indicated by -10.43 and -11.72 for the year 2015 and 2018 respectively this indicates that the terror attack has affected the securities return in the companies listed in NSE. It was indicated that the sum of the ARCH and GARCH ($\alpha+\beta$) in 2019 was indicated by 0.800 which explains that the volatility rate to have an increasing return. The variation coefficient is indicated to be 0.31 this indicates that holding all the factors constant the terror shock affects the securities return with 31%.

According to the summary statistics it can easily be interpreted that the prices of shares and the movement of such prices influence stock returns of securities. Market shocks are deemed to affect prices of stocks more so when there is great impact because of the shock. The kind of magnitude is affected by external factors such as terror attack, political disagreement, unfavorable weather conditions and cultural differences. The movement of stock prices is affected by different factors in which case most of these factors can be predicted by economic and financial models. However, markets with weak efficiency would take time in incorporating the effect of such shocks into the prices (not until the shock has already taken place). On the other hand, companies with more profit and shares may not necessarily be affected by all the eternal factors. The problem statement of this research was to find out the effect of terrorism event on the activities of companies listed in NSE and analyze the volatility of returns for the period under study by use of GARCH multivariate model.

5.3 Conclusion

This paper focused on similarities and differences in volatility clustering in different terror shock period where analysis was carried out using GARCH model in the stock market. According to DSF in (2016), volatility signal opportunities for investors. For instance, in 2012, phases of high volatility were trailed by periods of excellent returns. Notwithstanding, in 2007, volatility indicators such as the volatility index (VIX) were all time low, not an indication of low risk, but calm before the storm. During volatility times in the market, there is a lot of negative news flow. Therefore, most investors are prone to making emotional decisions regarding their investment considering the terror shock in the country. On the empirical review for the findings for the year 2012 to 2014 on the Westgate terror attack the GARCH model indicate that $\alpha + \beta = 0.86382$. This means that the terror attack affected the stock market by 86.38% since the value is close to one

then the terror shock affected with a high rate. In the year 2014 to 2016 of the Garissa university attack the GARCH model indicated that $\alpha + \beta = 0.950882$ indicating that this was much closer to one. This explained that the terror shock in that period affected the return of securities by 95.09%. This can be explained that the Garissa university attack affected the return on securities compared to Westgate terror attack. This is supported by Kallandranis & Drakos, (2011), who stated that the liquidity of the market just as the monetary binds with the ground-zero nation are central questions that would decide the extent just as the mental effect brought about by terrorism episode.

This can be concluded that terror shock does not affect the stock return fully that is 100%, there are other factors such as economic growth, political factors, and interest rate. In economic factor there must be financial development which leads to improvement in livelihood and poverty eradication. Individuals can invest in securities that are profitable in the future which in turn increases the return in the stock market. Political factors depend on the leadership and management in the government using policies that are introduced by the government bank, which is the Central bank of Kenya, in terms of taxes. Poor political leadership leads to an expensive lifestyle which leads to an increase in demand for money for use other than saving. Low interest rates would mean that there are more projects that would have positive Net Present Value and therefore become viable projects for investments. A higher interest rates on the other hand would have an opposite effect and would have an adverse effect on stock returns. This explains how rate charged can affect the stock prices and the prices as well.

It also presented some valuable empirical results that partly identified the causes of stock return volatility in the companies listed in NSE. It did not try to measure volatility with other methods such as EGARCH, IGARCH, but it was mainly grounded on the GARCH and ARCH models. The paper utilized the GARCH (1, 1) model since the objective was to estimate the volatility of stock return in time series and to test the existence of dependence in stock returns. The model is sufficient to capture the dynamics of the stock returns, particularly the volatility clustering, mesokurtic, platykurtic and leptokurtic features. We found that all the terror shock period there exhibiting the same features in terms of volatility clustering. The most plausible cause for such a similarity may be that there is more trading between these two economic systems.

5.4 Recommendation

The main aim of the study was to determine the effects of terror shocks on securities returns at the Nairobi securities exchange in the companies listed in NSE. Therefore, there should be further study to determine other effects of terror shock especially economically to determine the chain of the prices of the securities in the security market. On the other hand, security return are affected by different economic, political and environmental conditions such as pandemic, inflation, changes in interest rate and Central Bank of Kenya regulation therefore there should be further study to determine the effect of the factors on security return. The Prices of stock are determined by the availability of the stock in the company the more the stock the lesser the price of the stock and vice versa and therefore, there should be a study that indicate how the volume the stock in a company can affect the price of stock in the industry. The method of analysis was GARCH, and ARCH models used in time series and thus there should be use of other models such as ANOVA analysis, EGARCH and IGARCH to measure volatility in the stock exchange in the market. The paper did not try to identify all the possible causes of this phenomenon between the two stock exchanges because the model used cannot fully capture the aspect of leverage and asymmetry in the stock returns therefore it is recommended that there should be further study.

It is concluded that there are other determinants of stock returns other terror shock since a typical psychological militant based affiliation can, on an essential level, show up at its goal quicker in case it can build the consequences of its main goal. These outcomes might incorporate wrecked designs, setbacks, an expanded nervousness level, and load of money related misfortunes. In terms of terror shock the government should invest more on security which means an increase in security personnel and equipment since terror attack do not only affect the stock returns but also the livelihood and the life of the individual citizens. The interest rate charged should be considered in order to determine a fair price of stock in the market. The interest rate should not be too high to avoid the attraction of investors in in inventing on the securities. The leaders should focus on the appropriate leadership that will not bring disagreement and war between the citizens. This explains that peace and harmony should be introduced by the leaders through proper management of resources and ensuring the resources are well allocated.

5.5 Limitation of the Study

Limitation represents challenges that the researcher faced while carrying out the study. With the research aiming at secondary data for all the companies listed in the Nairobi Stock exchange, it was a challenge getting the information since some companies had not updated their information. Also, by the fact that the study was dated from 2013-2020, it is a long period. Thus, it was a not easy getting the information for the entire period all at once. Though with the help of the companies' websites and that of the Nairobi Stock Exchange, I was able to gather most of the data there which was so helpful to the study.

This study is limited to the Kenyan setting and the companies listed in NSE only but not the entire companies due to the time limitation. The model that was used was GARCH model which include time series analysis. However, this approach simplified and met the academic requirements; Moreover, enough control was gained over the variables and the data being observed and analyzed in the study. Some of the companies were difficult in accessing and acquiring the prices of stock but this was solved by collecting field data to have a bias and viable data analysis. Due to time the researcher did an analysis on the companies only listed in NSE. There was no previous data that was carried out on terror effect on stock prices with GARCH model and therefore reference was difficult, but this was overcome by researching on the effect of securities return with other models to identify their weakness and therefore the need for improvement.

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APPENDIX

APPENDIX 1: LIST OF COMPANIES LISTED AT NSE

SECURITIES	ISIN CODE	TRADING SYMBOL	TOTAL NUMBER OF ISSUED SHARES
AGRICULTURAL			
Eaagads Ltd	KE0000000208	EGAD	32,157,000.00
Kakuzi Ltd	KE0000000281	KUKZ	19,599,999.00
Kapchorua Tea Co. Ltd	KE4000001760	KAPC	7,824,000.00
The Limuru Tea Co. Ltd	KE0000000356	LIMT	1,800,000.00
Sasini Ltd	KE0000000430	SASN	228,055,500.00
Williamson Tea Kenya Ltd	KE0000000505	WTK	17,512,640.00
AUTOMOBILES & ACCESSORIES			
Car & General (K) Ltd	KE0000000109	C&G	40,103,308.00
Marshalls (E.A.) Ltd	KE0000000364	MASH	14,393,106.00
Sameer Africa Ltd	KE0000000232	FIRE	278,342,393.00
BANKING			
Barclays Bank of Kenya Ltd	KE0000000067	BBK	5,431,536,000.00
CFC Stanbic of Kenya Holdings Ltd	KE0000000091	CFC	395,321,638.00
Diamond Trust Bank Kenya Ltd	KE0000000158	DTK	266,321,115.00
Equity Group Holdings Ltd	KE0000000554	EQTY	3,773,674,802.00
Housing Finance Group Ltd	KE0000000240	HFCK	352,416,667.00
I&M Holdings Ltd	KE0000000125	I&M	392,362,039.00
KCB Group Ltd Ord	KE0000000315	KCB	3,066,056,647.00
National Bank of Kenya Ltd	KE0000000398	NBK	308,000,000.00

NIC Bank Ltd	KE0000000406	NIC	639,945,603.00
Standard Chartered Bank Kenya Ltd	KE0000000448	SCBK	343,510,571.11
The Co-operative Bank of Kenya Ltd	KE1000001568	COOP	4,889,316,295.00
COMMERCIAL AND SERVICES			
Atlas African Industries Ltd	KE4000004095	ADSS	1,497,370,885.00
Express Kenya Ltd	KE0000000224	XPRS	35,403,790.00
Hutchings Biemer Ltd	KE0000000257	HBER	360,000.00
Kenya Airways Ltd	KE0000000307	KQ	1,496,469,035.00
Longhorn Publishers Ltd	KE2000002275	LKL	369,940,476.00
Nairobi Business Ventures Ltd	KE5000000090	NBV	23,600,000.00
Nation Media Group Ltd	KE0000000380	NMG	188,542,286.00
Standard Group Ltd	KE0000000455	SGL	81,731,808.00
TPS Eastern Africa Ltd	KE0000000539	TPSE	182,174,108.00
Uchumi Supermarket Ltd	KE0000000489	UCHM	364,959,616.00
WPP Scan group Ltd	KE0000000562	SCAN	378,865,102.00
CONSTRUCTION & ALLIED			
ARM Cement Ltd	KE0000000034	ARM	495,275,000.00
Bamburi Cement Ltd	KE0000000059	BAMB	362,959,275.00
Crown Paints Kenya Ltd	KE0000000141	BERG	71,181,000.00
E.A. Cables Ltd	KE0000000174	CABL	253,125,000.00
E.A. Portland Cement Co. Ltd	KE0000000190	PORT	90,000,000.00
ENERGY & PETROLEUM			

KenKen Co. Ltd	KE0000000547	KEGN	6,243,873,779.00
KenolKobil Ltd	KE0000000323	KENO	1,471,761,200.00
Kenya Power & Lighting Co Ltd	KE0000000349	KPLC	1,951,467,045.00
Kenya Power & Lighting Ltd 4% Pref 20.00	KE4000001877	KPLC.P0004	1,800,000.00
Kenya Power & Lighting Ltd 7% Pref 20.00	KE4000002982	KPLC.P0007	350,000.00
Total Kenya Ltd	KE0000000463	TOTL	175,028,706.00
Umeme Ltd	KE2000005815	UMME	1,623,878,005.00
INSURANCE			
Britam Holdings Ltd	KE2000002192	BRIT	1,938,415,838.00
CIC Insurance Group Ltd	KE2000002317	CIC	2,615,538,528.00
Jubilee Holdings Ltd	KE0000000273	JUB	65,884,500.00
Kenya Re Insurance Corporation Ltd	KE0000000604	KNRE	699,949,068.00
Liberty Kenya Holdings Ltd	KE2000002168	CFCI	535,707,499.00
Pan Africa Insurance Holdings Ltd	KE0000000414	PAFR	144,000,000.00
INVESTMENT			
Centum Investment Co Ltd	KE0000000265	ICDC	665,441,775.00
Home Afrika Ltd	KE2000007258	HAFR	405,255,320.00
Kurwitu Ventures Ltd	KE4000001216	KURV	102,272.00
Olympia Capital Holdings Ltd	KE0000000166	OCH	40,000,000.00
Trans-Century Ltd	KE2000002184	TCL	281,426,593.00
INVESTMENT SERVICES			
Nairobi Securities Exchange Ltd Ord 4.00	KE3000009674	NSE	259,500,000.00

MANUFACTURING & ALLIED			
A.Baumann & Co Ltd	KE0000000018	BAUM	3,840,066.00
B.O.C Kenya Ltd	KE0000000042	BOC	19,525,446.00
British American Tobacco Kenya Ltd	KE0000000075	BAT	100,000,000.00
Carbacid Investments Ltd	KE0000000117	CARB	254,851,988.00
East African Breweries Ltd	KE0000000216	EABL	790,774,356.00
Eveready East Africa Ltd	KE0000000588	EVRD	210,000,000.00
Flame Tree Group Holdings Ltd	KE4000001323	FTGH	161,866,804.00
Kenya Orchards Ltd	KE0000000331	ORCH	12,868,124.00
Mumias Sugar Co. Ltd	KE0000000372	MSC	1,530,000,000.00
Unga Group Ltd	KE0000000497	UNGA	75,708,873.00
TELECOMMUNICATION & TECHNOLOGY			
Safaricom Ltd	KE1000001402	SCOM	40,065,428,000.00
REAL ESTATE INVESTMENT TRUST			
STANLIB FAHARI I-REIT. Ord. 20.00	KE5000003656		180,972,300.00

APPENDIX 2: Data Collection Form

Companies Listed at NSE	Daily Prices 30 days before Terror Shock	Daily Prices 30 Days After Terror Shock	Beta	Daily Risk-Free Rate (90 days Treasury Bills)	Market Return (NASI)