THE EFFECT OF TERRORISM ON KENYA'S SECURITIES MARKET
(THE CASE OF THE NAIROBI SECURITIES EXCHANGE)

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ABSTRACT

The stock market plays a critical role in the national economy since it facilitates fundraising activities, trade, investment and economic growth and development. An understanding of all the factors that affect its performance is crucial.

Socio-political events such as terrorism have been noted to disrupt the flow of financial capital between nations and affect incomes, company profits and stock prices. Terrorism has become a fairly recent global phenomenon which almost every society finds itself exposed to from time to time, hence the need to understand its effect on the stock market. Terrorism is of particular interest to the government, investors and listed companies at the Nairobi Securities Exchange (NSE).

The objective of this research study was to establish the effect of terrorism on the Nairobi Securities Exchange (NSE). This study utilized event study methodology to examine the effect of terrorism and military attacks on the Kenyan stock market and relied heavily on secondary data obtained from the NSE.

The event study analysed the data using excel and Statistical Package for Social Sciences (SPSS) and results presented in tables, figures and appendices. The study suggests that further research studies be conducted to establish the effect of terrorism on other sectors of the economy such as financial institutions as well as the insurance and re-insurance sector.

The study determined that there are significant short term negative stock returns around the terrorist event dates as evidenced by the decline in the NSE 20 share index, abnormal returns (AR) and the cumulative abnormal returns (CAR) around the terrorist event dates. Therefore, terrorism has a negative effect on Kenya's stock market.

PART I: INTRODUCTION AND RESEARCH OBJECTIVES

1.1 Background

The stock market plays a critical role in the national economy since it facilitates fundraising activities, trade, investment and economic growth and development. Stock markets are used to implement privatization programs and they often play an important role in the development of emerging economies (Lee, 1998).

There are a number of factors that influence share prices at the stock exchange which include industry performance, market sentiment, new products and markets, dividends, insider trading, stock splits, earnings results and guidance. These factors could increase or decrease security prices meaning that the stock market could respond positively or negatively.

Socio-political events have been noted to affect stock market behavior and, broadly speaking, it has been shown that major events such as war and terrorism influence capital markets and asset price (Kollias et al., 2010). Essentially, unforeseen socio-political events may be viewed as external shocks to capital markets that can directly affect market risk premium highly increasing volatility and thus exert an adverse impact on asset valuation, investment decisions and portfolio allocation.

Terrorist violence, especially large scale attacks such as the 9/11 New York attacks or indeed the March 2004 and July 2005 bombings in Madrid and London respectively, constitute major external shocks that can directly impact capital markets and also capital movements between countries as Abadie and Gardeazabal (2008) report. Beyond the loss of life and personal injuries that the victims of terrorist actions suffer and the atmosphere of fear terrorists seek to create with their premeditated use of brutal violence, terror also has real economic costs (Kollias et al., 2010).

This study examines the response of Kenya's stock market to terrorist and military attacks. Share prices at the stock market always reflect the investors' fears and hopes about the future. Terrorist events and unforeseen disasters can have serious implications on the stock market. The investors' decisions to buy and sell shares are affected by the information available about a terrorist event, for instance, investors can flee the market in search of safer investment instruments and panic selling ensues (Chen and Siems, 2004).

Terrorist attacks have negative effects on a number of economic indicators and variables such as investments, foreign direct investments(FDI),optimal allocation of capital, tourism, increased economic uncertainty, investors' decisions ,foreign exchange and stock markets through decreasing company's expected profit (Ramiah,et al., 2010;Chesney et al., 2010; Drakos, 2009).

Terrorist attacks lead to regulations being imposed by the government. For instance, measures to not only prevent terrorist events, but also to impose transparency on bank accounts including the lifting of bank confidentiality laws. Consequently, investors experience difficulties in transferring money.

It is expected that terrorist attacks and military attacks have a negative effect on the Nairobi Securities Exchange. This is attributed to uncertainty about what the future holds, constrained resources and panic among investors. Furthermore, there are resultant increased costs of doing business as well as increased financial instability (Karolyi and Martell, 2006).

The increasing integration of global stock markets and advances in technology means reaction to international events also gets quickly incorporated in stock prices. '..Global capital markets today are tightly inter-linked; news spreads rapidly (especially bad news), with quick spill-over or contagion effects' (Chen and Siems, 2004, p. 363). The 9/11 attacks, for example, severely affected not only the U. S. but also the global financial system.

In Kenya, research has been done to establish the effect of terrorism on tourism according to studies by Kuto (2004). However, no research has been done to examine the effect of terrorism on the Nairobi Securities Exchange. I hereby consider terrorist activities in Kenya and their effect on the Nairobi Securities Exchange.

Fluctuations in the stock prices are due to change in the investors' attitude, perception, information, rumors, economic conditions, political instability and corporate decisions. This paper tests the effect of various terror attacks on the prices of the shares of particular industries. Terror attacks have their effects on the psychology of investors,

consumption power, political environment and economic wealth. These attacks sometimes hinder the relations and business deals from foreign investors, thus affecting the stock market.

1.2.1 Terrorism activities in Kenya

Terrorism can be defined as premeditated, politically motivated violence perpetrated against non-combatant targets by sub national groups or clandestine agents, usually intended to influence an audience. One of the largest reinsurance companies, Swiss Re defines terrorism in the following way: "Terrorism means an act or threat of violence or an act harmful to human life, tangible or intangible property or infrastructure with the intention or effect to influence any government or to put the public or any segment of the public in fear" (Brauner and Galey, 2003).
Terrorism refers to the killing of innocent people by a private group in a way to create feeling of hatred and panic as well as physical and psychological destruction among the common people of the nation. Terrorism in Kenya has been manifested in attacks by Somalia's militant group called Al-Shabaab which is an Al Qaeda linked terrorist group.

On the 7th of August, 1998, the Al Qaeda network simultaneously executed twin attacks in Tanzania and Kenya, targeting the U.S. embassy. As a result of the embassy bombing, hotels in Kenya received numerous cancellations. The U.S. embassy in Kenya was severely damaged and the news spread throughout the world via the media. A few Americans and over two hundred Kenyans lost their lives while thousands were injured (Kelley, et al., 2003).
On 28th November, 2002, terrorists believed to be linked to Al Qaeda bombed the Paradise hotel in Kikambala on the North Coast of Kenya in a deadly attack. The Israeli-owned hotel was severely damaged by the terrorist bomb. Sixteen people died in the hotel attack, including three suicide bombers (*Daily Nation*, Friday, November 29, 2002). Simultaneously, two rocket propelled grenades were fired at an Israeli airliner at the Moi International Airport, Mombasa. Both missiles narrowly missed the aircraft. These attacks triggered fears in the hospitality industry, with tourism suffering a setback due to a drop in the number of incoming tourists (Agutu,2003).Both attacks specifically targeted Israeli tourist interests on Kenyan soil.

Following these attacks of terrorism, Western governments led by the United States of America and Britain issued travel advisories to all their citizens against travelling to Kenya in 2003.The Kenya Tourism Federation stated that the suspension of British Airways regular and charter planes flying to Nairobi, coupled with travel advisories, closed down access to 90% of Kenya's oversees markets. The country was losing an estimated amount of over 1 Billion Kenya shillings per week. In addition to the revenue loss, at stake were over 500,000 direct jobs and another 2.5 million indirect jobs (Gitu, 2003).

On 16th October, 2011, after the kidnapping of three tourists in Lamu and two aid workers in the Dadaab refugee camps, Kenya sent its troops under "Operation Linda Nchi" to southern Somalia to fight Al Shabaab, a fundamentalist group with links to Al Qaeda. The Kenyan government intervened and coordinated with Somali and Ethiopian Armies under the African Union Mission to Somalia (AMISOM) in the attempt to preserve tourism which is a key source of foreign currency. Lamu is of strategic importance owing to infrastructural project for a new port and an oil refinery as well as a pipeline, motorway and railway linking the Lamu port to South Sudan and Ethiopia (LAPSSET).

On 24th October, 2011 the Al Shabaab attacked a bar in Nairobi and one person died and twenty others were injured. The same day, terrorists attacked the Machakos bus terminus in Nairobi and five people died and twenty others were injured. Other terrorist attacks happened on 29th April, 2012 where worshippers were attacked in a church in Ngara, Nairobi and on 15th May, 2012 when a nightclub in Mombasa was attacked, killing one person and injuring five others. On 24th June 2012, terrorists attacked a pub in Mombasa, killing three people and injuring thirty people.

1.2.2 The Nairobi securities exchange (NSE)

The Nairobi Securities Exchange (NSE) was formed in 1954 as a voluntary organization of stock brokers and is now one of the biggest and most active capital markets in Africa. It is located on the first floor of Nation centre, Kimathi Street, Nairobi. The securities exchange is responsible for investor protection, capital allocation as well as raising shareholders' equity cheaply. It also facilitates an accurate price discovery .It helps mobilize domestic savings for investments and makes long term investments liquid by facilitating transfer of securities between shareholders((Lee,1998).

The NSE enables Kenyans to buy and own shares of companies listed at the NSE. Stock brokers act as financial advisors to their clients and carry out their orders as per the NSE website.
The NSE deals in both variable and fixed income securities. Variable income securities are the ordinary shares that do not have a fixed rate of dividend payable since the dividend is dependent on both the company's profitability and the board of directors' decision. Fixed income securities, on the other hand, covers treasury and corporate bonds, preference shares and debenture stocks which have a fixed rate of interest or dividend irrespective of profitability.
A robust stock market assists in the rational and efficient allocation of capital which is a scarce resource. The stock market is considered as the most efficient in allocating scarce capital to its highest value users. This requires that the stock market has the expertise, the institutions and the means to prioritize access to capital by competing users so as to achieve optimum production.

The NSE is an emerging market with opportunities for making high returns with high levels of risk, thus presenting challenges for investors given that share prices respond to events including earnings reports, product releases, trade shows, presentations, bonus issues and dividend announcements.

1.3 Research Problem

In the last few years, there have been increased terrorist attacks in Kenya intensifying concerns about the terrorist threat and renewed calls to better understand terrorism including its causes and effects. Some of the research studies that have been done on the relationship between terrorism and the behaviour of the stock markets include Arin, Ciferri and Spacnolo (2008), Chen and Siembs (2004), Eldor and Melnick (2004) and Karolyi and Martell (2006).These studies have been done mainly in the US and other European countries. To the best of my knowledge, no research study has been done in Kenya to establish the effect of terrorism on the stock market.

Studies on the effect of terrorism on emerging stock markets are very important as more and more local and foreign investors participate in these markets.

This research study investigates the effect of terrorism on the Nairobi Securities Exchange (NSE) so as to facilitate informed decision making by institutional and individual investors, policy makers, government and other stakeholders.

The research question that the study intends to address is as follows:

Do acts of terrorism and military attacks have a significant negative effect on the Nairobi Securities Exchange?
Therefore, the research study will bridge the knowledge gap existing as far as the effect of acts of terrorism on the Kenyan stock market is concerned.

1.4 Objective of the Study

The objective of the study is to establish the effect of terrorism on the Nairobi Securities Exchange. Terrorism could have a positive, nil or negative effect on the securities market.

1.5 Importance of the Study

The study will make a significant contribution to the Government of Kenya as it will provide a lot of insight about the effect of terrorist activities on the Nairobi Securities Exchange and by extension the Kenyan economy. Consequently, the government would be in a better position to devise mechanisms of preventing terrorist attacks.

Terrorism is a wide area of study, to scholars who would like to look into other areas; this study will provide the necessary background and reference to enable them carry out a successful study. This study would form part of the first literature reviews specific to Kenya, thus building the body of knowledge in Kenya.

Policy makers such as the Central Bank of Kenya will find the study useful in making amendments to the existing policies to counter terrorism. The study would provide guidelines for the Central Bank of Kenya and other financial

institutions to provide adequate liquidity and make the appropriate macro-economic decisions which would facilitate the stability of the Kenyan stock market.

Investors will find the study findings useful in making informed investment decisions. The study findings can be used in formulating investors' portfolio diversification strategies against terrorism risk. This would enable investors maximize returns while minimizing losses relating to terrorism.

Insurance and re-insurance companies would find the study useful in assessing risk and compensation with respect to terrorist activities. The insurance sector plays a key role in restoring the financial status of its clients in the event of loss relating to a terrorist attack.

Regulators such as the capital markets authority (CMA) would find the study useful in proactively championing the stability of the capital market. This would be done through the mobilization of financial institutions and the bond and stock markets to provide adequate liquidity.

Financial analysts would find the study useful in providing insights for advising investors on when to buy, hold or sell shares to maximize returns. In so doing, financial analysts would be adding value to investors. The optimal timing of when to transact would facilitate wealth creation by investors.

PART II: THEORETICAL BACKGROUND AND INFORMING LITERATURE

2.1 Introduction

This chapter covers theoretical and empirical literature reviews for studies done both internationally and in the local context. It also provides a summary of the findings.
Sandler and Enders (2002) define terrorism as the premeditated use, or threat of use, of extra normal violence to obtain a political objective through intimidation or fear directed at a large audience.

Acts of terrorism have significant negative effects on the economies in which they occur. For example, the September 11th terrorist attack had significant economic repercussions for the U.S. and the world markets. The New York Stock Exchange, the American Stock Exchange and NASDAQ did not open on September 11th and remained closed until September 17th. The New York Stock Exchange member firms, customers and markets were unable to communicate due to major damage to the telephone exchange facility near the World Trade Centre. When the stock markets re-opened on September 17, 2001, the Dow Jones Industrial Average (DJIA) stock market index fell 684 points, to 8920, its biggest ever one day point decline (IMF 2002). U.S. stocks lost $1.2 trillion in value for the week. Furthermore, the attacks led to decreased travel and as of 2006, the airline industry had not fully recovered.
The attack on the World Trade Centre in the US led to huge insurance claims with many insurance companies throughout the world having to disclose the impact of the attack in their financial statements (PricewaterhouseCoopers, 2001).

2.2 Theoretical Literature review

The core objective of terrorism is to influence the government and it is a deliberate act that creates fear, violence and anxiety among people. Terrorism has direct and indirect effects on the economy. Direct effects involve immediate and quick negative responses of economy and businesses such as decline in investments, growth and consumptions of different sectors while long term negative effects on firms, economy and stock markets are known as indirect effects of terrorism and need government policies to be overcome.

Many studies such as by Abadie and Gardeazabal (2003), Chen and Wei (2005) and Johnston and Nedelescu (2005) have proved the relationship of terrorism and stock market to be negative. Worse reactions have been witnessed and attributed to bigger terrorism activities (Drakos, 2009). By diversification, the negative impact of these terrorist activities can be reduced. Terrorism does not have negative impact on currency market (Eldor & Melnick, 2004).

2.2.1 Efficient market hypothesis (EMH)

Efficient market hypothesis (EMH) is based on the notion that investors behave rationally, maximize the expected utility accurately and process all the available information (Shiller, 2000). It asserts that financial markets are

efficient, hence financial assets are correctly priced and implying that one cannot consistently achieve returns in excess of the average market returns given the information available at the time the investment is made.

Stock prices represent random walks through time ,the price changes being unpredictable since they occur in response to genuinely new information which by the very fact that it is new, is unpredictable (Shiller, 2000).

There are three forms of the efficient market hypotheses namely the weak, the semi-strong and the strong hypotheses. The weak form hypothesis claims that prices on traded assets reflect all past publicly available information. The semi-strong form hypothesis claims both that prices reflect all publicly available information and that prices instantly change to reflect new public information. The strong-form hypothesis additionally claims that prices instantly reflect even hidden or inside information.

2.2.2 Dividend signaling hypothesis

According to the dividend signaling hypothesis, dividend change announcements trigger share returns because they convey information about management's assessment of the firm's future prospects.

One of the most important assumptions of the signaling hypothesis is that dividend change announcements are positively correlated with share price reactions and future changes in earnings. Bhattachrya (1979), John and Williams(1985) and Miller and Rock (1985) developed the dividend signaling classic models, showing that in a world of asymmetric information, better informed insiders use the dividend policy as a costly signal to convey their firm's future prospects to less informed outsiders. So a dividend increase signals an improvement on firm performance while a decrease suggests a worsening of its profitability.

Consequently, a dividend increase (decrease) should be followed by an improvement (reduction) in a firm's profitability, earnings and growth. Moreover, there should be a positive relationship between dividend changes and subsequent share price reaction.

2.2.3 The Socio-political theory

Adolph Wagner advocated that social and political objectives should be deciding factors in choosing taxes. Wagner did not believe in individualist approach to a problem. He wanted that each economic problem should be looked at in its social and political context and an appropriate solution found thereof. The society consisted of individual, but was more than the sum total of it individual members. It had an existence and entity of its own which needed preservation and taking care of. Accordingly, a tax system should not be designed to serve individual members of the society, but should be used to cure the ills of society's whole. Wagner, in other words, was advocating for a modern welfare approach in evolving and adopting a tax policy. He was specifically in favour of using taxation for reducing income inequalities.

He maintained that private property and inheritance were the result of state policies and not because of any God given rights. The state therefore had the right to control the ownership of property and its inheritance in the interests of the society as a whole. Wagner's ideas, though much criticized at that time are now the hall marks of fiscal policies of modern state.

2.3 Empirical Literature review

Karolyi and Martell (2006) state '…...stock and bond prices arguably incorporate investor's beliefs and views about future cash flows and discount rates and because the liquidity of financial markets provides an efficient conduit for these views to be quickly reflected in asset prices'.

2.3.1 Holiday Effect

This is the tendency for a stock market to gain on the final trading day before an exchange mandated long weekend or holiday such as Christmas. It is the unusually good performance by stocks on the day prior to market-closing holidays. Lakonishok and Smidt (1988) found evidence of anomalies related to returns around the turn of the week, the turn of the month and the turn of the year and holidays in the Dow Jones Industrial Average. Kim and Park in their study concluded that there are abnormally high returns on trading before holidays in the U.S, UK and the Japanese stock markets, even though each country has different holidays and institutional arrangements.

Empirical findings report the presence of abnormally high stock returns on the day before holiday. Abnormal pre-holiday returns on the US have been documented by Merrill (1965) and Fosback (1976).

2.3.2 Weekend Effect

This is the phenomenon in the financial market in which stock returns on Mondays are often significantly lower than those of the immediately preceding Friday, hence the daily returns of the market are not the same for all the days of the week which we would expect in an efficient market (French, 1980).

Lakonishock and Maberly (1990) attribute some of the Monday –Friday differential returns to the different trading patterns of institutions and individuals. Damodaran (1989) explores whether a tendency of corporations to release bad news on Friday after the markets close could account for depressed Monday share prices and reports evidence of only a weak connection.

Miller (1988) attributes the negative returns over weekends to a shift in the broker-investor balance in decisions to buy and sell. During the week, Miller argues, investors, too busy to do their own research, tend to follow the recommendations of their brokers, recommendations that are skewed to the buy side. However, on weekends, investors, free from their own work as well as from brokers, do their own research and tend to reach decisions to sell. The result is a net excess supply at Monday's opening.

2.3.3 January Effect

This is the tendency of January stock returns to be higher than stock returns for the rest of the months of the year. This is attributed to savings in the previous year as well as bonuses paid by companies in the month of December.

It is the general increase in stock prices during the month of January. This rally is generally attributed to an increase in buying, which follows the drop in price that typically happens in December when investors, seeking to create tax losses to offset capital gains, prompt a sell-off.

January effect is a calendar-related market anomaly in the financial market where financial security prices increase in the month of January. This creates an opportunity for investors to buy stocks for lower prices before January and sell them after their value increases.

Onyuma (2009) examined the day of the week and the month of the year effects in the Kenyan stock market. He found that the largest positive returns are produced Friday and January, while Monday provided the lowest negative returns. Therefore, the main characteristics of the January effect are an increase in buying securities before the end of the year for a lower price and selling them in January to generate profit from the price differences. The recurrent nature of this anomaly suggests that the market is not efficient.

2.3.4 Other empirical studies

Karolyi (2006) discusses what is known and what is not known about the effects of terrorist events on financial markets. It also provides a summary of the research that has been done in this area. According to the author, there is still little known about the economic and financial consequences of terrorism.

Arin, Ciferri, and Spagnolo (2008) show interesting results in relation to the effect of terrorist events on the markets' behaviour based on the evidence from six different financial markets (Indonesia, Israel, Spain, Thailand, Turkey and UK). In their
work, the authors investigate the effects of terrorism not only on the stock markets, but also on the stock market volatility. They found that the magnitude of terrorist effects is larger in emerging markets.

Johnston and Nedelescu (2005) examine cases where financial markets are directly or indirectly affected by terrorist acts. They review the reaction of the markets to the 9/11 attacks in the U.S. and attacks in Madrid in March, 2004. The main conclusion of their study is that financial markets are not only confronted with major disruptions caused by the massive damage to property and communication systems, but also with high levels of uncertainty and market volatility, especially in the case of the 9/11 attacks in New York (IMF (2001)). However, there are some differences in the stock market reaction to these two terrorist events. While attacks in Madrid were perceived as mostly having a regional effect, those in New York were seen as having repercussions on the global financial system. The authors

view the timing of attacks as a possible explanation for different impacts. Attacks in New York occurred in a period of economic downtown. In contrast, the attacks in Spain happened when the world economy was experiencing growth. I think that the difference in the impact can also be explained by looking at the targets of the attacks. The 9/11 attacks
happened in Manhattan, the financial centre, while the bombings in Madrid were targeted at a transport system.

Chen and Wei (2005) examine the U.S. capital market reaction to 7 terrorist and 7
military attacks over the period 1915-2001, using an event study approach. They apply their analysis to some other capital markets as well, but focus on the impact of only two events: the 9/11 terrorist attacks and Iraq's invasion of Kuwait in 1990. They find that U.S. capital markets rebound and stabilize quicker after these two events compared to other markets, and that US markets are more resilient now than in the past, which they explain by the strength of the banking and financial sectors in the U.S. One of the main conclusions of their paper is that financial markets are efficient in absorbing the shocks caused by terrorist attacks and can continue to function in an effective way.

Eldor and Melnick (2004) study how stock and foreign exchange markets react to terrorism in Israel. The authors consider 639 terror attacks during the period from 1990 to 2003 and distinguish the data by location, target, type of attack and number of casualties. They show empirically that terrorism has a permanent negative effect on the stock market but not on the foreign currency market. They conclude that these markets are efficient in incorporating news about terrorist attacks and that there is no evidence that markets have become desensitized to the terror over time.

Carter and Simkins (2001) examine the impact of this event on airline stock returns. They test whether market reaction on the first trading day after the attack is the same for each airline or, alternatively, whether it distinguishes among airlines based on firm characteristics. They find that market differentiates among various airlines based on their ability to cover short-term obligations as measured by a ratio of cash and equivalents to total assets. According to their study, airlines with low liquidity are penalized the most. No statistical significance is found for such firm characteristics as size, leverage and firm performance.

Drakos (2004) investigates the effects of terror attacks of 9/11 on a set of airline stocks listed at various international stock markets. The study found that conditional systematic risk has on average more than doubled which would have implications for portfolio diversification and the cost (and ability) of airlines in raising capital.

In their papers, Abadie and Gardeazabal (2003), Abadie and Gardeazabal (2005) study the effects of terrorism on economic activity. Krugman (2003) refers to direct economic damage costs, the budget costs of government responses to terrorism and the cost imposed by the way people respond to fears of terrorism.

The long-term economic impact of terrorism is also studied by Karolyi and Martell (2006). Authors examine the stock price impact of terrorist attacks in which traded firms are targets. They find that the impact of attacks differs according to the home country of the target firm and the country in which the incident occurs. They conclude that in countries that are wealthier and more democratic, attacks are associated with larger share price reactions.

According to Raby (2003), airline, travel, tourism, accommodation, restaurant, postal and insurance industries are particularly susceptible to increased terrorism risks. Regions and economies where these industries are concentrated are likely to suffer most from falls in output and employment.

Ramiah et al (2010) investigate the impact of five recent terrorist attacks (September 11 attacks and bombings in London, Madrid, Bali and Mumbai) on equities listed on the Australian Stock Exchange. They use daily stock returns indexes, returns calculated from the All Ordinaries share price index, and the 10-year bond rate for the period, August 1999 to August 2006, obtained from DataStream. They construct industry portfolios based on the Global Industry Classification Standards (GICS). Following the Global Industry Classification Standard, they analyse how these events affect the different sectors in Australia. Using parametric and non-parametric tests, they investigate the relationship between stock returns for equities listed in these sectors and terrorist attacks. They report significant short term negative abnormal returns around the September 11 attacks and to a lesser extent, the Madrid and London bombings. Their evidence shows a weak positive equity response to the Bali bombing, and no response from the Mumbai attack in the Australian market. They also document negative industry abnormal returns as high as 37.30% on the day in the Utilities sector. Their findings show that systematic risk of certain sectors increased after the events of September 11 but remained unchanged for the other attacks.

Chesney et al (2010) investigated the impact of terrorism on financial markets. The main focus of their paper is to study empirically the impact of terrorism on the behavior of stock, bond and commodity markets. They consider terrorist events that took place in 25 countries over an 11-year time period and implement their analysis using different methods: an event-study approach, a non-parametric methodology, and a filtered GARCH–EVT approach. In addition, they compare the effect of terrorist attacks on financial markets with the impact of other extreme events such as financial crashes and natural catastrophes. Approximately two-thirds of the terrorist attacks considered lead to significant negative impact on at least one stock market under consideration. The Swiss stock market is affected by the highest number of attacks, the American stock market by the lowest. The airline industry and insurance sector exhibit the highest susceptibility to terrorism, while the banking industry is the least sensitive. This is in contrast to financial crashes which demonstrate a strong negative impact on the banking sector. The analysis of the impact on the aero/defense, pharma /biotech and oil/gas sectors shows both a positive and a negative reaction. These indices behave similarly in case of the natural disasters and financial crashes. They show how the results of this approach can be used for investors' portfolio diversification strategies against terrorism risk.

Abadie & Gardeazabal (2008) analyzed the effects of terrorism in an integrated world economy. They use a simple economic model to show that terrorism may have a large impact on the allocation of productive capital across countries, even if it represents a small fraction of the overall economic risk. The model emphasizes that, in addition to increasing uncertainty, terrorism reduces the expected return to investment. As a result, changes in the intensity of terrorism may cause large movements of capital across countries if the world economy is sufficiently open, so international investors are able to diversify other types of country risks. Using a unique data set on terrorism and other country risks, they find that, in accordance with the predictions of the model, higher levels of terrorist risks are associated with lower levels of net foreign direct investment positions, even after controlling for other types of country risks. On average, a standard deviation increase in the terrorist risk is associated with a fall in the net foreign direct investment position of about 5% of GDP. The magnitude of the estimated effect is large, which suggests that the ''open-economy channel'' impact of terrorism may be substantial.

2.4.1 Terrorism and the stock market in Kenya

The effect of terrorism on the stock market is a recent area of study that has received attention in advanced economies. However, there are no studies in Kenya on the effect of terrorism on the stock market.

Although Kenya's Operation Linda Nchi was in response to a provocation by Al Shabaab, Kenya is acting broadly in the collective interest of advancing international peace and security and fighting terror. It, therefore, requires the support of the international community in order to meet its objectives.

Owing to terrorist events, investors may anticipate that future profits of companies within the nation will suffer due to either a drop in exports or due to a drop in domestic demand due to uncertainty about Kenya's future given the possibility of repercussions against Kenya from other countries. The likely result will be a drop in stock prices. The greater the impact of terrorist strike and the anticipated repercussions, the larger the drop in stock prices. Correlations between acts of terrorism and stock market reactions have been empirically proven. Ahmed and Farooq (2008) examined the effect of 9/11 on the Karachi stock market and found a significant change in volatility during the post 9/11 period.

Due to the interconnectedness of the financial markets, it is reasonable to further assume that other stock exchanges have been affected. Such spillover effects have been noted by Floros (2008) between the Egyptian and Israeli stock exchanges and by Chan and Hooy (2003) between the US, Japan, Hong Kong, Singapore, South Korea, Taiwan, Indonesia, Malaysia, the Philippines and Thailand.

2.4.2 Causes of terrorism

Kenya is a good target of global terrorism because of a combination of geographic, regional, historical, political, economic and socio-cultural factors. Some of these factors are direct justifications of attacks while others facilitate the attacks. Direct motivations of terrorism in Kenya include (1) the country's close ties with Israel and western countries, especially the US, (2) its vibrant coastal beach tourism industry that is at odds with the locally dominant Islamic religion and culture and, (3) the perception that the country's predominantly Christian population is an obstacle to the Islamization of Eastern Africa. Factors facilitating terrorist attacks in Kenya include the country's (1)

coastal geographic situation and strategic location relative to Europe, Asia, and neighboring African countries, (2) porous borders, (3) unstable neighboring countries, especially Somalia and Sudan, (4) relatively open and multicultural society, (5) relatively good transport and communications infrastructure, (6) relatively advanced regional economy, (7) relatively large Muslim population and, (8) the political and socioeconomic deprivation of the coastal population relative to the rest of the country (Otiso, K.,2009).

Moreover, poor security and high levels of corruption have compromised Kenya's
Security. Crucial services related to security such as the police, immigration and border security (customs) were commercialized to the extent that they became goldmines for the civil servants who worked in those departments. Hence one is able to slip into the country and do whatever he wants to do provided he has the money to pay bribes to relevant persons (Soke, 2003). Corrupt civil servants such as customs and security officers provide false identity documents to terrorists who move freely, thus threatening lives and property.

Frustration and poverty with the slow pace of social reforms, coupled with poor governance and lack of social services, facilitates the proliferation of terrorist groups that purport to offer solutions to the poor living conditions (Cronin 2002:38). People who live on less than a dollar a day tend to lose hope and engage in acts of terrorism.

Some people in the society have the tendency to dominate over others. In order to realize their wishes, they resort to any kind of activity including terrorism activities to prove their supremacy in society.

2.4.3 Preventing the effects of terrorism on the stock market in Kenya

Terrorist attacks are facilitated by money laundering. Therefore, banks need to implement the principle of at least knowing your customers (KYC). Banks need to conduct due diligence on their customers so as to identify terrorist financing activities. Essentially, all financial institutions should be extra vigilant so as not to be used to channel terrorist funds.

Financial infrastructure services which are becoming increasingly susceptible to electronic attacks from cyber space should be considered to be infrastructures of national interest and be protected by continuous checks and regulatory oversights.

There is need to get asset clauses in to the UN convention against international corruption. This would facilitate the recovery of assets acquired in corrupt deals which could expose the society to acts of terrorism.

Kenya needs to employ effective and appropriate monetary policies which strengthen banking and the entire financial sector. Consequently, financial institutions would be able to provide liquidity to a shaky and panicky market which in turn stabilizes the market and facilitates its recovery from the effects of terrorist and military attacks.

There is need for teamwork among all the stakeholders as well as a very competent and effective civil society. Terrorism has to be combated by a combination of government, governance, stringent laws, quick and firm system of justice that delivers harsh punishments to the perpetrators. The government, the opposition and other political parties including the people should work in harmony to prevent terrorism. There is need to eradicate the politics of conflict among political parties.

Poverty breeds criminals and terrorists. Poor people tend to engage in acts of desperation, hopelessness and conflict with other people or regions. As such, the government with assistance from the donors and donor countries should take concerted efforts to eradicate poverty in society.

Kenya needs to implement a good governance strategy which includes the reduction of fraud, inefficiencies, inequities and dignified life. If people are sure about their rights and privileges, this will change their mindset towards a positive attitude. The government has to ensure rule of law so that nobody is denied of his just rights. Besides, discrimination against anyone should be stopped.

The government and the private sector should put importance to development plans that will create more jobs for the citizens. Once unemployment is reduced, it will create an environment which will automatically reduce terrorism since citizens will be actively engaged in productive activities.

2.5 Summary

From the above literature review, terrorism generally has an adverse effect on the stock market. This study is different from prior studies in several respects. First, most prior studies examine only one or two terrorist events .I examine three major terrorist events in Kenya and provide substantial evidence of the impact of terrorism.

Second, prior studies are mainly US based and examine impact on the US financial
Market. This study focuses on the Kenyan financial market. Karolyi (2006) states that most studies in this area are 'limited in scope and are hampered by the limits of the
databases used…most of them have focused on events surrounding the Sept 11... .'.

To the best of my knowledge, this is the first time an investigation of the impact of terrorist attacks within the East African region on the Kenyan stock market is being conducted. Terrorist attacks have been on the increase over time, particularly due to the instability in our neighbouring countries such as Somalia as well as the close ties with Western countries such as the US.

In conclusion, a deep understanding of terrorism and its effects on the NSE is a prerequisite for designing successful policies to prevent terror, to alleviate the costs of terrorism or to reduce an economy's vulnerability to attacks.

PART III: METHODOLOGY

3.1 Introduction

This chapter outlines the methodology to be used to conduct the study. It consists of the research design, population of interest, data collection methods as well as data analysis techniques. For the purposes of this study, event study methodology is used.

3.2 Research Design

A Research design refers to the way in which the study is designed, that is, the method used to carry out a research. Since the study focuses on the effect of events being terrorism on the stock market, the event study methodology has been used as applied by Fama, Fisher and Jensen(1969), Brown and Warner (1980), Brown and Warner (1985) ,Lyon, Barber and Tsai (1999), Chen and Siems (2004) and Abadie and Gardeazabal (2003).

When implementing this methodology, a test is conducted on the hypothesis regarding the abnormality of market's returns due to specific events. This methodology is based on the efficient market hypothesis which states that stock prices adjust to new information according to previous studies by Fama, Fisher and Jensen (1969) and MacKinlay (1997).

3.3 Population of interest

Kisulu and Tromp (2006) define a population as a group of objects which provide the sample that is being studied. The objects usually have similar characteristics. The population of the study was all the listed companies at the Nairobi Securities Exchange for the period 1998 to 2012 as represented by the NSE 20 share index. There were fifty four (54) listed companies. Those that joined the NSE later than 1998 and those that had since been suspended were not included in the study.

3.4 Data Collection Methods

Secondary data was used for this study. Data was obtained from the NSE. Daily individual stock prices as well as the NSE 20 share index are tabulated and stored by the NSE. For testing purposes, the event period consists of sixty one (61) days (days -30…., 0 day of terrorist attack, ….+30) around each terrorist attack date.

The author visited the NSE head office located on 1st Floor of Nation Centre, Kimathi Street in Nairobi and upon request, was granted access to data on the daily NSE 20 share index for a period of sixty one (61) days for each of

the three terrorist events. The data was compiled in excel format and analyzed using means and variances to derive abnormal returns(AR) and cumulative abnormal returns(CAR) as shown in appendices I, II and III. The data was then transferred to Statistical Package for Social Sciences (SPSS) for further statistical data analysis.

3.5 Data Analysis

This study examines the effects of terrorism events on the Nairobi securities exchange. For this purpose, the study focused on three main terrorist events namely, the 1998 bombing of the US embassy in Nairobi, the 2002 bombing of Paradise hotel in Kikambala and the 2011 kidnapping of tourists and aid workers prompting the Kenya Government to respond and send Kenya defense forces to Somalia under "Operation Linda Nchi."

Event-study methodology was used to measure the magnitude of the effect of considered extreme events on the behavior of stock, bond and commodity markets. To examine whether an event has any impact on the market, the event-day abnormal returns (ARs) and the cumulative abnormal returns (CARs) are measured and their statistical significance tested accordingly. An abnormal return (AR) is defined as the actual return (determined using arithmetic percentages) less the return predicted by the bank's beta, given the market return. The abnormal return represents the part of the return that is not predicted and is, therefore, an estimate of the change in bank value on a day, which is caused by the terrorist event. An investigation was conducted on whether there were abnormal returns around each terrorist attack date. Terrorism effect exists only if the abnormal returns are significant.

Abnormal returns on the indices were computed using a mean-adjusted return approach as described by Brown and Warner (1985). Daily excess returns were measured by the mean-adjusted returns approach, that is, for each day at and following the event, the abnormal or excess return from the stock index were calculated by the following equation.

$$\mathbf{AR_t = R_t - R}$$

Where
$\boldsymbol{AR_t}$ is the excess of the expected return for index at time *t*,
$\boldsymbol{R_t}$ is the return on index at the time of event *t*,
$\boldsymbol{R}$ is the average return on the index taken over the interval of 30 days in the estimation window.

$$\mathbf{R = \sum R_t}$$

When implementing this methodology, a test is conducted on the hypothesis regarding the abnormality of markets' returns due to specific events. This methodology is based on the efficient market hypothesis, which states that stock prices adjust to new information (Fama, Fisher, and Jensen (1969), MacKinlay (1997)).

Cumulative abnormal returns (CARs) are also analyzed over the interval of 31 days in the post-event window. The CAR corresponding to an event that is happening at time t (j=0) is computed as

$$\boldsymbol{CAR_t = \sum AR_t}$$

In contrast to event-day abnormal returns, which show the immediate investors' reaction on the terrorist event, the 31-day CARs provide an indication of the market response to the event 31 days following the attack. Usually, in event studies, the values of CARs are of more interest than the values of ARs. This is because significant negative CARs would reveal that an event had a strong impact on the markets, and insignificant negative CARs would indicate the markets' resilience to this event and their ability to recover quickly. The statistical significance of abnormal and cumulative abnormal returns were tested using the t-test statistics described by Brown and Warner (1985).

PART IV: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter presents the results of the analysis and findings of the study with reference to the study objectives. The first section gives a summary of the data analysis method used. The second part gives the findings of the study and it

includes relevant tables and figures that help to explain the results of the data analysis. The last part gives a summary of findings and interpretation of the results.

4.2 Data analysis

The objective of the research study was to establish the effect of terrorism on the Nairobi Securities Exchange (NSE). To achieve this objective, event study methodology was used for the three terrorist events. The study analyzes the performance of the securities market before and after the terrorist events.

Secondary data obtained from the NSE was compiled and analyzed in Excel format and then transferred to Statistical Package for Social Sciences (SPSS) for further statistical data analysis. Parametric t-test was used to establish the statistical significance of the abnormal returns (AR) and the cumulative abnormal returns (CAR) over the event window period.

The event period was determined relative to the date of the terrorist event and covered 61 days consisting of 30 days before the event and day 0 being the event day and 30 days after the event. The event period is considered reasonable for the purposes of examining the effect of terrorist events on the Nairobi Securities Exchange (NSE).

4.3.1 Abnormal returns (AR) and Cumulative abnormal returns (CAR)

In this study, event study methodology is used to measure the magnitude of the effect of terrorism on the NSE. Measurement was done for event-day abnormal returns (AR) and cumulative abnormal returns (CAR) for each of the three terrorist events as per appendices I, II and III and statistical significance tests done for each of the three terrorist events.

The hypothesis test was conducted as follows:
Null Hypothesis: Terrorism has no effect on the Nairobi Securities Exchange
Alternate Hypothesis: Terrorism has an effect on the Nairobi Securities Exchange.

4.3.2: Statistical Test at 5% Level of significance

(i) T-Test for the abnormal returns (AR)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
AR98	42	-.3300	.79242	.12227
AR02	39	4.8536	4.88018	.78145
AR11	43	.3158	2.61044	.39809

The descriptive statistics for the variables have been provided as the number of observations (N), the mean and the standard deviation for the 1998, 2002 and 2011 terrorist events abnormal returns (AR). The standard error is the estimated deviation of the mean of the sample used for the statistical test. For the 1998 terrorist event abnormal returns (AR), the standard error of the sample mean is merely 0.122 which is relatively small. Therefore, there is a high likelihood that the sample mean is close to the population mean. Equally, the standard error of the sample mean for the 2011 terrorist event abnormal returns (AR) is 0.398 which is relatively small meaning that it too adequately represents the population mean. However, the standard error for 2002 is relatively very high at 0.781 which indicates that it is not adequately representative of the population mean.

	Test Value = 0.05					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
AR98	-3.108	41	.003	-.3800	-.6269	-.1331
AR02	6.147	38	.000	4.8036	3.2216	6.3856
AR11	.668	42	.508	.2658	-.5376	1.0692

This output gives the t-test value, the degrees of freedom and the two-tailed significance. Since the p values for 1998 and 2002 abnormal returns are 0.003 and 0.000 respectively which are less than 0.05, the null hypothesis is rejected. However, for 2011 abnormal returns (AR), the p value of 0.508 is greater than 0.05 and therefore, the null hypothesis cannot be rejected. The t-statistical test at 5% level of significance indicates that event -day abnormal returns (AR) were significant for 1998 and 2002 terrorist events and insignificant for the 2011terrorist event during the event window period.

(ii) T-Test for the Cumulative Abnormal returns (CAR)

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
CAR98	42	-7.7557	5.15894	.79604
CAR02	39	63.1885	55.35185	8.86339
CAR11	43	-.9947	14.06274	2.14455

The descriptive statistics for the variables have been provided as the number of observations (N), the mean and the standard deviation for the 1998, 2002 and 2011 terrorist events cumulative abnormal returns (CAR). The standard errors of the samples for the 1998, 2002 and 2011 terrorist events cumulative abnormal returns (CAR) are 0.79604, 8.86339 and 2.14455 respectively.

	Test Value = 0.05					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CAR98	-9.806	41	.000	-7.8057	-9.4134	-6.1981
CAR02	7.124	38	.000	63.1385	45.1955	81.0815
CAR11	-.487	42	.629	-1.0447	-5.3725	3.2832

The t test values for the 1998, 2002 and 2011 terrorist events cumulative abnormal returns (CAR) are calculated as -9.806 7.124 and -0.487 respectively. Since the p values for 1998 and 2002 cumulative abnormal returns are 0.000 and 0.000 respectively which are less than 0.05, the null hypothesis is rejected. However, for 2011 cumulative abnormal returns (CAR), the p value of 0.629 is greater than 0.05 and therefore, the null hypothesis cannot be rejected.

As per the t-statistical test for the cumulative abnormal returns (CAR), only the 2011 terrorist event was found to be insignificant while the 1998 and 2002 terrorist events were found to be significant at 5% level of significance. This means that the NSE 20 share index as well as the

individual stock returns for the 1998 and 2002 terrorist events deviated significantly from their means while those for the 2011 terrorist event showed no significant deviation from their means meaning the stock market may have viewed the event as inconsequential.

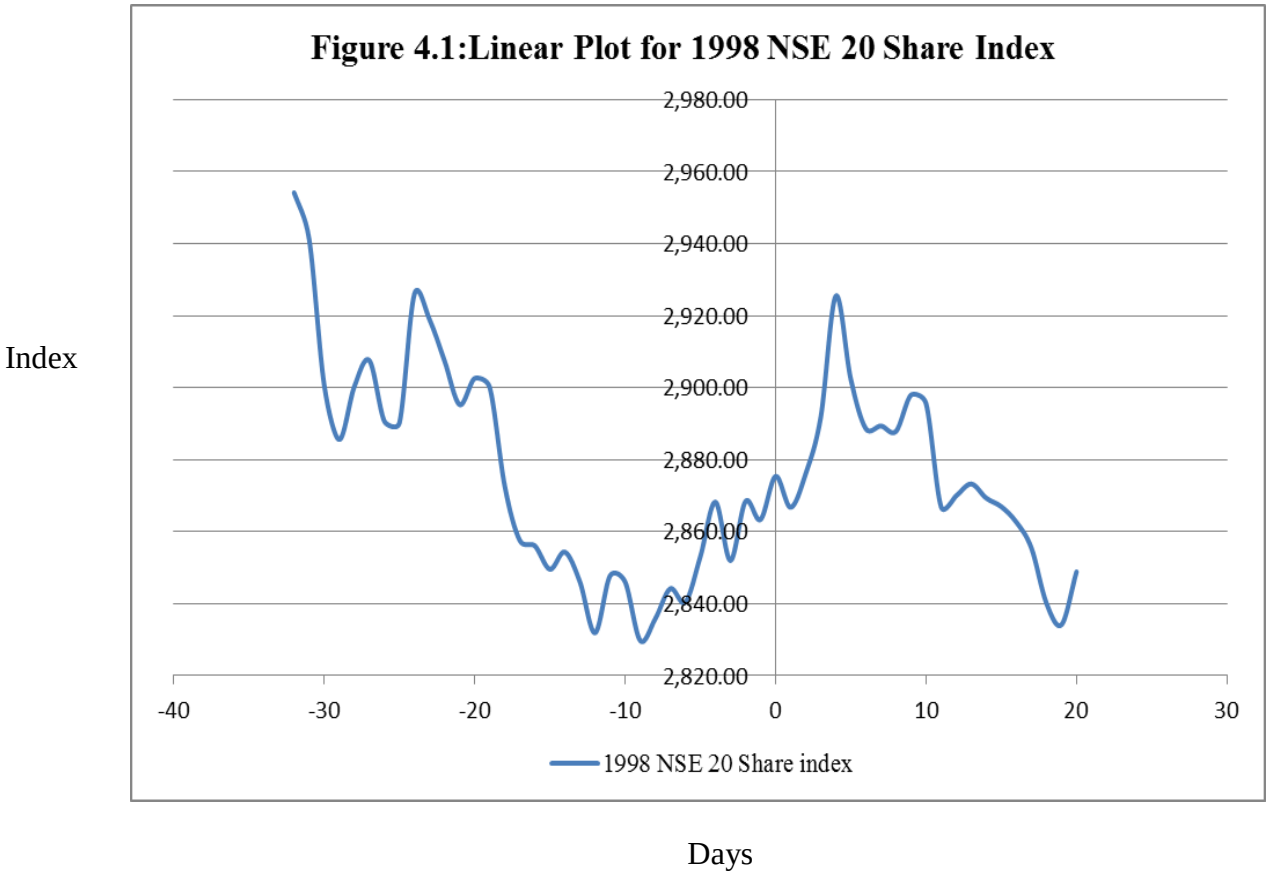


Figure 4.1 demonstrates that the NSE 20 share index started decreasing from a high index of 2,954.19 on the 32nd day before the 7th August, 1998 terrorist event and achieved the lowest index of 2,829.80 on the 9th day before the event, meaning a drop of 124.39 points . Thereafter, there was a gradual increase in the NSE 20 share index up to the 9th day after the terrorist event when a high index of 2,925.49 was recorded implying an increase of 95.70 points. This was followed by a gradual decline up to the 19th day after the terrorist event when a low index of 2,834.17 was recorded meaning a decline of 91.3 points. This can be interpreted to mean that there was a significant drop in the NSE 20 share index around the 1998 terrorist

event date.

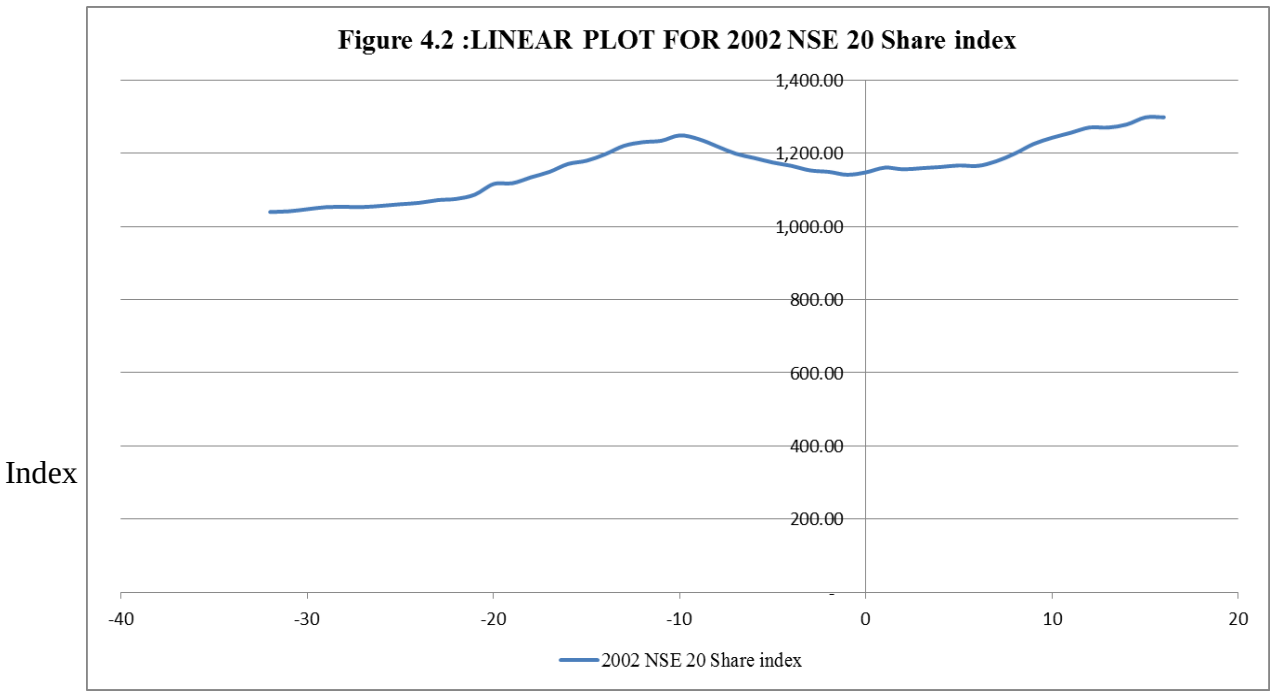
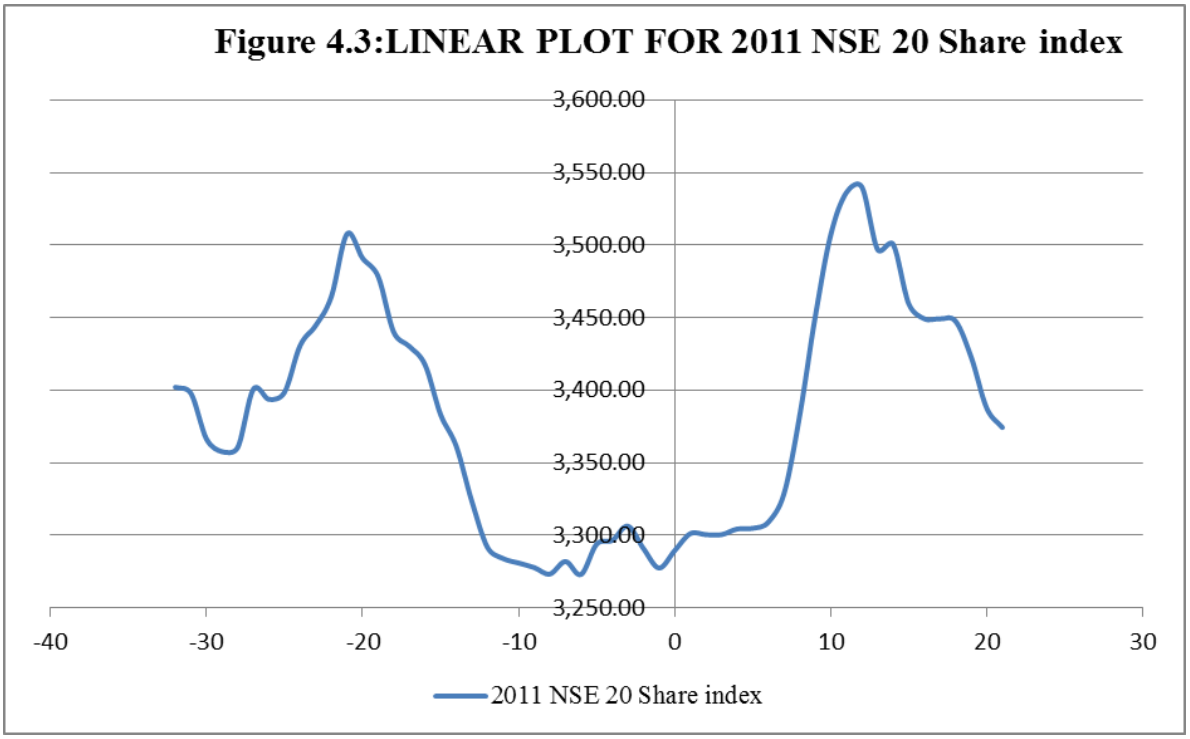


Figure 4.2 shows that there was a gradual increase in the NSE 20 share index from 1,039.82 on the 32nd day before the 28th November 2002 terrorist event up to 1,249.52 on the 10th day before the terrorist event, representing an increase of 209.43 points . This was followed by steady decline from a high index of 1,249.52 on the 10th day before the terrorist event to a low index of 1,141.62 on the last day before the terrorist event meaning a drop of 107.63 points. Thereafter, the NSE 20 share index started increasing gradually to reach a high index of 1,298.86 representing an increase of 157.24 points. This can be interpreted to mean that there was a significant

drop in the NSE 20 share index around the 2002 terrorist event date.

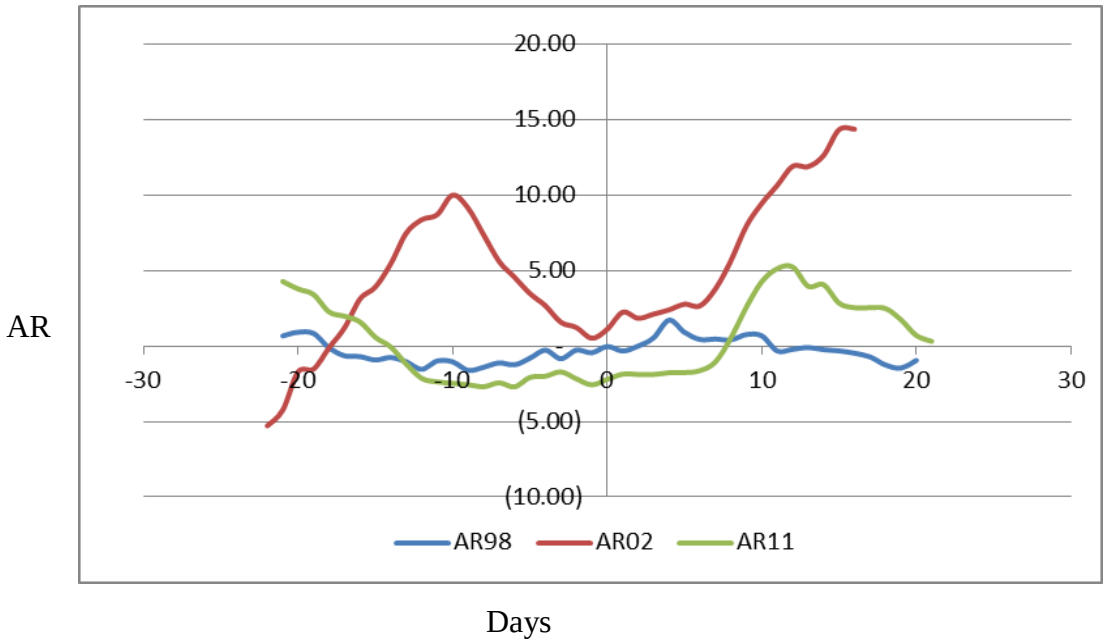


According to Figure 4.3, the NSE 20 share index started increasing from a low index of 3,357.66 on the 29th day before the 2011 terrorist event and attained a high index of 3,507.77 on the 21st day before the event, meaning an increase of 150.11 points. Thereafter, there was a sharp decline in the NSE 20 share index to a low of 3,273.05 on the 6th day before the terrorist representing a decrease of 234.72 points. The NSE 20 share index remained low up to the 6th day after the terrorist when the NSE 20 share index was 3,309.05 which was followed by a sharp increase to attain 3,540.03 points on the 12th day after the terrorist event, meaning an increase of 230.98

points. Thereafter, the NSE 20 share index dropped to a low of 3,374.37 on the 21st day after the terrorist event. This can be interpreted to mean that there was a significant drop in the NSE 20 share index around the 2011 terrorist event date.

From the above figures, it can be observed that there was a decline in the NSE 20 share index around the terrorist event dates, meaning that the terrorist events under study had a negative effect on the Kenyan stock market.

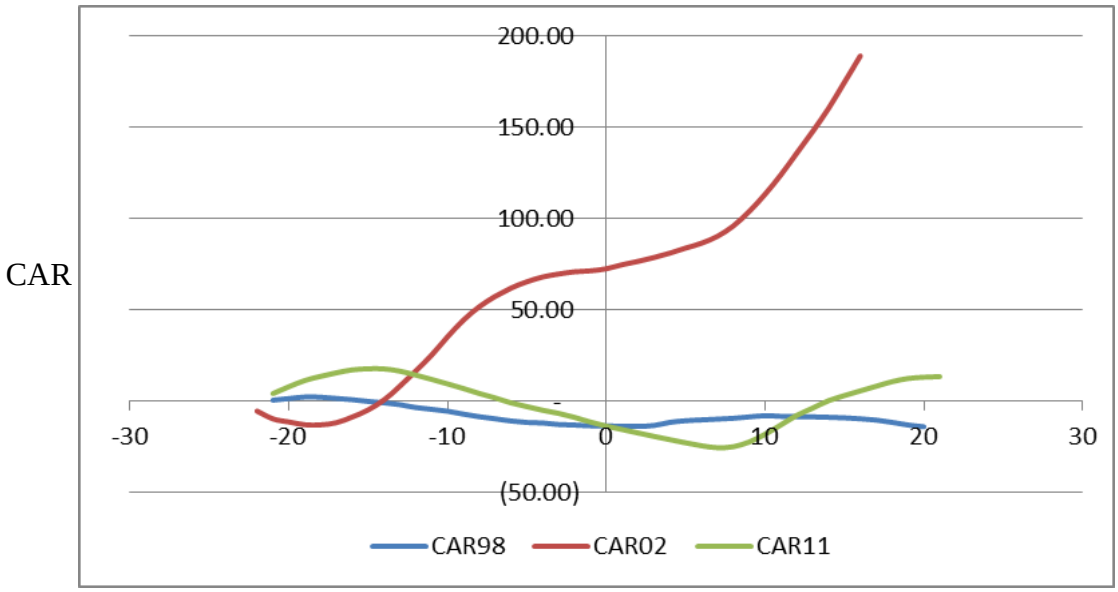
Figure 4.4: Linear Plot for the Abnormal Returns of NSE 20 Share Index: AR (%)



According to Figure 4.4, the abnormal returns (AR) dropped gradually from a high of 0.92% on the 20th day before the 1998 terrorist event to a low of -1.61% on the 9th day before the terrorist event. Thereafter, the 1998 abnormal returns (AR) increased to 0.03% and -0.33% on the terrorist event day and the following day respectively. As for the 2002 terrorist event, the abnormal returns (AR) dropped from a high of 10% on the 10th day before the 2002 terrorist event to a low of 0.52% on the last day before the terrorist event. Thereafter, the abnormal returns (AR) increased steadily to a high of 14.37% on the 16th day after the terrorist event. Similarly, the 2011 terrorist event abnormal returns (AR) dropped from a high of 4.28% on the 21st day before the terrorist event to a low of -2.7% on the 6th day before the terrorist event. The

abnormal returns (AR) remained negative around the terrorist event day until the 7th day after the terrorist event afterwhich the abnormal returns turned positive and a high abnormal return (AR) of 5.24% achieved on the 12th day after the terrorist event. This provides evidence of decline in abnormal returns (AR) around the terrorist event days.

Figure 4.5: Linear Plot for the Cumulative Abnormal Returns: CAR (%)



Source: Drawn by the author from the data collected from the NSE.

According to Figure 4.5, the cumulative abnormal returns (CAR) dropped gradually from 2.42% on the 19th day before the 1998 terrorist event to a low of -13.72% on the 2nd day after the terrorist event. This was followed by a gradual increase to achieve high of -7.82% on the 10th day after the terrorist event. The 2002 terrorist event cumulative abnormal returns (CAR) increased from a low of -12.86% on the 18th day before the terrorist event to a high of 72.66% on the terrorist event day. The cumulative abnormal returns (CAR) continued to increase steadily to a high of 189.25% on the 16th day after the terrorist event. For the 2011 terrorist event, the cumulative abnormal returns (CAR) dropped from a high of 17.87% on the 15th day before the terrorist event to a low of -13.52% on the terrorist event day. The cumulative abnormal returns

(CAR) dropped further to a low of -25.36% on the 7th day after the terrorist event. This shows that there was a decline in cumulative abnormal returns (AR) around the terrorist event days.

4.4 Summary of the findings

From the analysis, terrorism has a negative effect on the Nairobi Stock Exchange. Therefore, the null hypothesis is rejected and the alternate hypothesis accepted. The t-statistical test at 5% level of significance indicates that event -day abnormal returns (AR) were significantly negative for 1998 and 2002 terrorist events and insignificant for the 2011 terrorist event. As for the cumulative abnormal returns (CAR), only the 2011 terrorist event was found to be statistically insignificant while the 1998 and 2002 terrorist events were found to be statistically significant at 5% level of significance.

Figures 4.1, 4.2 and 4.3 clearly demonstrate that the NSE 20 share index declined around the terrorist event dates, meaning that the terrorist events under study had a negative effect on the Kenyan stock market.

According to the cumulative abnormal returns (CAR) linear plot (Figure 4.5), there was a significant decline in cumulative abnormal returns (CAR) of the market returns around the terrorist event dates. The abnormal returns (AR) linear plot (Figure 4.4) indicates that the 2011 terrorist event and military attack registered the largest drop in abnormal return (AR) followed by the 1998 terrorist event and finally the 2002 terrorist attack.

The three terrorist events are also deemed significant since they led to loss of human lives, serious injuries to individuals as well as destruction of property or infrastructure. For instance, the 1998 US Embassy bombing in Nairobi led to the death of over two hundred persons, foreigners included and thousands were injured while the 2002 terrorist attack led to the death of over ten people, foreigners included and dozens were injured.

PART V: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusion of the research study and the implications of the findings, limitations encountered in the course of the study as well as suggestions for further research. This research study sought to establish whether terrorism has an effect on the Nairobi Securities Exchange.

5.2 Conclusion

During the 1998 terrorist attack, the abnormal returns (AR) dropped by -0.33% on the following trading day while for the 2011 terrorist event, the abnormal returns(AR) dropped by -2.21% on the following trading day. On the 20th trading day after the 2011 terrorist event, the abnormal returns (AR) had dropped by -0.95% while the cumulative abnormal returns(CAR) had dropped by -13.87%. On the 5th trading day after the 2011 terrorist event, the abnormal returns (AR) had dropped by -1.76% while the cumulative abnormal returns(CAR) had dropped by -22.68% .These results suggest that terrorist activities indeed lead to significantly lower returns at the NSE.

The t-statistical test shows that out of the three terrorist events, two events (67%) namely the 1998 and 2002 terrorist events had negative abnormal returns (AR) that were significantly different from zero at 5% level of statistical significance while the 2011 terrorist event (33%) abnormal returns were noted to be statistically insignificant. Equally, the cumulative abnormal returns (CAR) for the 1998 and 2002 terrorist events were found to be statistically significant while those for the 2011 terrorist event were established to be statistically insignificant at 5% level of statistical significance. This may imply that Nairobi stock exchange market viewed the 2011 terrorist event as inconsequential and hence rebounded and stabilized immediately, hence the insignificance of cumulative abnormal returns (CAR) of the 2011 terrorist event. While the event-day abnormal returns (AR) are interesting in that they show immediate investors' reaction to terrorist and unexpected military attacks, the cumulative average abnormal returns (CARs) provide a stronger indication of the capital market's resilience and ability to bounce back from the attacks.

Furthermore, the data for the 2011 terrorist event may not have been accurately documented, hence the inconsistency of the results. The accuracy and the quality of the data collected from the NSE could not be independently confirmed and may have had errors. This may be responsible for the inconsistency of the study results.

In conclusion, terrorist activities indeed lead to significantly lower stock returns at the Nairobi Securities Exchange market on the day of terrorist attack occurrence. It is evident that there are significant short term negative stock returns around the terrorist event dates as evidenced by the decline in the NSE 20 share index, abnormal returns (AR) and the cumulative abnormal returns (CAR) around the terrorist event dates. In view of the above results, terrorism has a negative effect on Kenya's stock market.

5.3 Recommendations

From the study, it can be observed that terrorism affects the performance of the stock market and hence shareholders and other stakeholders should not overlook terrorism events. Terrorism negatively affects transactions processing in the market place and impedes the buying and selling of securities by instilling fear as well as destroying infrastructural facilities.

Retail and corporate investors are advised to diversify their portfolio as a strategy against terrorism risk. This would enable investors maximize returns while minimizing losses relating to terrorism. Certain sectors of the economy such as tourism, hospitality, airline and insurance are more susceptible to terrorist attacks than other sectors.

The government is advised to work towards preventing and combating any terrorist attacks since such attacks disrupt economic activities as well as scare away foreign investors and the much needed foreign direct investment. The government needs to invest in intelligence gathering mechanisms as well as security equipment and personnel for combating terrorism.

To faciliate market stability, policymakers and regulators are advised to be knowlegeable on the effect of terrorism and related military attacks and, thus, proactively share information in a timely and proactive manner so as to build a strong and resilient market better able to absorb shocks brought on by such events. Financial and banking

institutions should be strengthened to provide the necessary liquidity in the market should there be shortage or panic attributed to acts of terrorism.

5.4 Limitations to the study

Terrorism is a fairly recent phenomenon in Kenya which appears to have no readily available and adequate data which may have affected the results of the research study, particularly for the 1998 and 2002 terrorist events.

For the 2002 terrorist event, the sample mean may not be representative of the population mean which may have affected the results of the study. The event window period of sixty one (61) days may not have been sufficient to cover the terrorist event; hence the data collected and used in the study may not have been accurate leading to inconsistent results.

Other factors other than terrorism may have affected the performance of the stock market during the period of study and consequently the results of the study may have been affected. Such factors include inflation, climatic conditions, elections and technological advancement.

5.5 Suggestions for further research

There is need for more robust research studies to establish the effect of terrorism on the stock market, particularly in emerging stock markets such as the Nairobi Securities Exchange and be able to reach an ultimate conclusion.

Further research needs to be conducted to establish the effect of terrorism on other sectors of the economy such as financial institutions as well as the insurance and re-insurance sector. Such sectors play a critical role in the growth and development of a nation and require protection from harm, hence the need for a clear understanding of the effect of terrorism on the sectors.

There is need for robust research studies that would cover longer event window periods and clearly show the effect of terrorist attacks on the stock market and the overall economy. Terrorist events have both short term and long term effects on the securities market. Owing to Kenya's strategic location bordering Somalia and its cordial relationship with Western countries, it remains exposed to acts and threats of terrorism, thus necessitating further studies on the effects of terrorism.

In addition to event study methodology, it is suggested that other approaches be adopted such as the filtered GARCH-EVT approach and the non-parametric methodology for use in the study of the effect of terrorism on the stock market. GARCH-EVT approach enables one to study the event-day effect only, though it is computationally intensive.

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APPENDIX I:AR & CAR FOR THE 1998 TERRORIST EVENT

DATE	NSE 20 share index	AR	CAR	% AR	% CAR
23-Jun-98	2,954.19				
24-Jun-98	2,941.29				
25-Jun-98	2,900.78				
26-Jun-98	2,885.61				
29-Jun-98	2,900.27				
30-Jun-98	2,907.55				
01-Jul-98	2,890.66				
02-Jul-98	2,890.22				
03-Jul-98	2,926.07				
06-Jul-98	2,918.98				
07-Jul-98	2,907.48				
08-Jul-98	2,895.32	19.14	19.14	0.67	0.67
09-Jul-98	2,902.59	26.42	45.56	0.92	1.58
10-Jul-98	2,900.08	23.90	69.47	0.83	2.42
13-Jul-98	2,872.65	- 3.52	65.95	- 0.12	2.29
14-Jul-98	2,857.56	- 18.62	47.33	- 0.65	1.65
15-Jul-98	2,856.08	- 20.09	27.24	- 0.70	0.95

16-Jul-98	2,849.57	- 26.60	0.64	- 0.92	0.02
17-Jul-98	2,854.34	- 21.83	- 21.20	- 0.76	-0.74
20-Jul-98	2,846.04	- 30.13	- 51.33	- 1.05	-1.78
21-Jul-98	2,831.91	- 44.26	- 95.59	- 1.54	-3.32
22-Jul-98	2,847.78	- 28.40	- 123.99	- 0.99	-4.31
23-Jul-98	2,846.06	- 30.11	- 154.10	- 1.05	-5.36
24-Jul-98	2,829.80	- 46.38	- 200.48	- 1.61	-6.97
27-Jul-98	2,835.79	- 40.39	- 240.87	- 1.40	-8.37
28-Jul-98	2,844.17	- 32.01	- 272.88	- 1.11	-9.49
29-Jul-98	2,840.43	- 35.75	- 308.62	- 1.24	-10.73
30-Jul-98	2,853.07	- 23.10	- 331.72	- 0.80	-11.53
31-Jul-98	2,868.22	- 7.96	- 339.68	- 0.28	-11.81
3-Aug-98	2,852.01	- 24.17	- 363.85	- 0.84	-12.65
4-Aug-98	2,868.43	- 7.74	- 371.59	- 0.27	-12.92
5-Aug-98	2,863.39	- 12.78	- 384.37	- 0.44	-13.36
6-Aug-98	2,875.37	- 0.81	- 385.18	- 0.03	-13.39
10-Aug-98	2,866.78	- 9.40	- 394.57	- 0.33	-13.72
11-Aug-98	2,876.10	- 0.07	- 394.65	- 0.00	-13.72
12-Aug-98	2,891.81	15.63	- 379.01	0.54	-13.18
13-Aug-98	2,925.49	49.32	- 329.69	1.71	-11.46
14-Aug-98	2,902.36	26.19	- 303.50	0.91	-10.55
17-Aug-98	2,888.61	12.44	- 291.06	0.43	-10.12
18-Aug-98	2,889.41	13.23	- 277.83	0.46	-9.66
19-Aug-98	2,887.88	11.71	- 266.13	0.41	-9.25
20-Aug-98	2,897.98	21.81	- 244.32	0.76	-8.49
21-Aug-98	2,895.61	19.44	- 224.88	0.68	-7.82
24-Aug-98	2,866.90	- 9.28	- 234.16	- 0.32	-8.14
25-Aug-98	2,869.97	- 6.21	- 240.36	- 0.22	-8.36
26-Aug-98	2,873.27	- 2.91	- 243.27	- 0.10	-8.46
27-Aug-98	2,869.35	- 6.83	- 250.10	- 0.24	-8.70
28-Aug-98	2,866.98	- 9.20	- 259.30	- 0.32	-9.02
31-Aug-98	2,862.66	- 13.51	- 272.81	- 0.47	-9.49
01-Sep-98	2,855.50	- 20.67	- 293.48	- 0.72	-10.20
02-Sep-98	2,840.16	- 36.01	- 329.49	- 1.25	-11.46
03-Sep-98	2,834.17	- 42.01	- 371.50	- 1.46	-12.92
04-Sep-98	2,848.89	- 27.29	- 398.78	- 0.95	-13.87

APPENDIX II:AR & CAR FOR THE 2002 TERRORIST EVENT					
DATE	**NSE 20 share index**	**AR**	**CAR**	**% AR**	**% CAR**

15-Oct-02	1,039.82				
15-Oct-02	1,041.76				
16-Oct-02	1,047.53				
17-Oct-02	1,053.14				
18-Oct-02	1,053.78				
22-Oct-02	1,053.51				
23-Oct-02	1,056.80				
24-Oct-02	1,061.07				
25-Oct-02	1,064.86				
28-Oct-02	1,072.34				
29-Oct-02	1,075.66	- 60.05	- 60.05	- 5.29	-5.29
30-Oct-02	1,087.50	- 48.21	- 108.26	- 4.24	-9.53
31-Oct-02	1,116.36	- 19.35	- 127.61	- 1.70	-11.24
1-Nov-02	1,118.44	- 17.27	- 144.89	- 1.52	-12.76
4-Nov-02	1,134.49	- 1.22	- 146.11	- 0.11	-12.86
5-Nov-02	1,149.46	13.75	- 132.36	1.21	-11.65
6-Nov-02	1,171.12	35.41	- 96.95	3.12	-8.54
7-Nov-02	1,180.15	44.44	- 52.51	3.91	-4.62
8-Nov-02	1,197.86	62.15	9.64	5.47	0.85
11-Nov-02	1,220.79	85.08	94.72	7.49	8.34
12-Nov-02	1,230.73	95.02	189.74	8.37	16.71
13-Nov-02	1,234.60	98.89	288.63	8.71	25.41
14-Nov-02	1,249.25	113.54	402.17	10.00	35.41
15-Nov-02	1,239.36	103.65	505.82	9.13	44.54
18-Nov-02	1,219.38	83.67	589.49	7.37	51.91
19-Nov-02	1,199.45	63.74	653.23	5.61	57.52
20-Nov-02	1,187.46	51.75	704.98	4.56	62.07
21-Nov-02	1,175.19	39.48	744.47	3.48	65.55
22-Nov-02	1,166.01	30.30	774.77	2.67	68.22
25-Nov-02	1,153.61	17.90	792.67	1.58	69.79
26-Nov-02	1,149.67	13.96	806.62	1.23	71.02
27-Nov-02	1,141.62	5.91	812.53	0.52	71.54
28-Nov-02	1,148.33	12.62	825.15	1.11	72.66
29-Nov-02	1,161.12	25.41	850.57	2.24	74.89
2-Dec-02	1,156.59	20.88	871.45	1.84	76.73
3-Dec-02	1,159.71	24.00	895.45	2.11	78.84
4-Dec-02	1,162.93	27.22	922.67	2.40	81.24
5-Dec-02	1,167.18	31.47	954.13	2.77	84.01
9-Dec-02	1,165.92	30.21	984.35	2.66	86.67

10-Dec-02	1,178.70	42.99	1,027.34	3.79	90.46
11-Dec-02	1,199.87	64.16	1,091.50	5.65	96.11
13-Dec-02	1,225.95	90.24	1,181.74	7.95	104.05
16-Dec-02	1,242.98	107.27	1,289.01	9.45	113.50
17-Dec-02	1,256.53	120.82	1,409.83	10.64	124.14
18-Dec-02	1,270.95	135.24	1,545.07	11.91	136.04
19-Dec-02	1,270.67	134.96	1,680.03	11.88	147.93
20-Dec-02	1,279.09	143.38	1,823.40	12.62	160.55
23-Dec-02	1,298.50	162.79	1,986.19	14.33	174.89
24-Dec-02	1,298.86	163.15	2,149.34	14.37	189.25

APPENDIX III:AR & CAR FOR THE 2011 TERRORIST EVENT

DATE	NSE 20 share index	AR	CAR	% AR	% CAR
01-Sep-11	3,402.13				
02-Sep-11	3,397.83				
05-Sep-11	3,366.36				
06-Sep-11	3,357.66				
07-Sep-11	3,360.61				
08-Sep-11	3,400.68				
09-Sep-11	3,393.70				
12-Sep-11	3,398.66				
13-Sep-11	3,430.92				
14-Sep-11	3,444.70				
15-Sep-11	3,464.65				
16-Sep-11	3,507.77	143.88	143.88	4.28	4.28
19-Sep-11	3,491.07	127.18	271.06	3.78	8.06
20-Sep-11	3,478.35	114.46	385.52	3.40	11.46
21-Sep-11	3,439.86	75.97	461.49	2.26	13.72
22-Sep-11	3,430.27	66.38	527.87	1.97	15.69
23-Sep-11	3,417.60	53.71	581.59	1.60	17.29
26-Sep-11	3,383.27	19.38	600.97	0.58	17.87
27-Sep-11	3,361.51	- 2.38	598.59	- 0.07	17.79
28-Sep-11	3,323.44	- 40.45	558.14	- 1.20	16.59
29-Sep-11	3,291.79	- 72.10	486.04	- 2.14	14.45
30-Sep-11	3,284.06	- 79.83	406.21	- 2.37	12.08
3-Oct-11	3,280.96	- 82.93	323.28	- 2.47	9.61
4-Oct-11	3,277.79	- 86.10	237.18	- 2.56	7.05
5-Oct-11	3,273.33	- 90.56	146.62	- 2.69	4.36

6-Oct-11	3,281.96	- 81.93	64.69	- 2.44	1.92
7-Oct-11	3,273.05	- 90.84	- 26.14	- 2.70	- 0.78
10-Oct-11	3,293.95	- 69.94	- 96.08	- 2.08	- 2.86
11-Oct-11	3,296.55	- 67.34	- 163.42	- 2.00	- 4.86
12-Oct-11	3,306.34	- 57.55	- 220.97	- 1.71	- 6.57
13-Oct-11	3,290.90	- 72.99	- 293.96	- 2.17	- 8.74
14-Oct-11	3,277.50	- 86.39	- 380.35	- 2.57	- 11.31
17-Oct-11	3,289.51	- 74.38	- 454.73	- 2.21	- 13.52
18-Oct-11	3,301.18	- 62.71	- 517.44	- 1.86	- 15.38
19-Oct-11	3,300.48	- 63.41	- 580.85	- 1.88	- 17.27
20-Oct-11	3,300.48	- 63.41	- 644.26	- 1.88	- 19.15
21-Oct-11	3,304.39	- 59.50	- 703.75	- 1.77	- 20.92
24-Oct-11	3,304.85	- 59.04	- 762.79	- 1.76	- 22.68
25-Oct-11	3,309.05	- 54.84	- 817.63	- 1.63	- 24.31
26-Oct-11	3,328.57	- 35.32	- 852.95	- 1.05	- 25.36
27-Oct-11	3,381.90	18.01	- 834.94	0.54	- 24.82
28-Oct-11	3,450.33	86.44	- 748.50	2.57	- 22.25
31-Oct-11	3,507.34	143.45	- 605.05	4.26	- 17.99
01-Nov-11	3,536.25	172.36	- 432.69	5.12	- 12.86
02-Nov-11	3,540.03	176.14	- 256.55	5.24	- 7.63
03-Nov-11	3,497.10	133.21	- 123.34	3.96	- 3.67
04-Nov-11	3,500.55	136.66	13.32	4.06	0.40
07-Nov-11	3,459.51	95.62	108.95	2.84	3.24
08-Nov-11	3,449.31	85.42	194.37	2.54	5.78
09-Nov-11	3,449.24	85.35	279.72	2.54	8.32
10-Nov-11	3,447.66	83.77	363.49	2.49	10.81
11-Nov-11	3,422.82	58.93	422.42	1.75	12.56
14-Nov-11	3,387.51	23.62	446.04	0.70	13.26
15-Nov-11	3,374.37	10.48	456.52	0.31	13.57