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Informational Efficiency and the Reaction to Terrorism: A Financial Perspective

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INFORMATIONAL EFFICIENCY AND THE REACTION TO TERRORISM: A FINANCIAL PERSPECTIVE

by

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Abstract

The purpose of this study is to measure the message terror organizations hope to convey using the financial markets as a proxy of measurement to determine patterns within the marketplace and the effects on the terrorists' ability to deliver a desired message due to the increased use of digital devices and access to instantaneous news, seen over the past decade. Using death count, geographic location, and event type, this study identified 109 attacks between 1985 and 2015 to be analyzed against 5 market indices and 5 securities. Measuring the effects within a 10-day sample window from the time of the attack (+ or - 5 days) using average abnormal returns, standard deviation, Sharpe Ratio and the initial reactions in the market place as a percentage of total attacks, the effects on average abnormal returns on the market proxies were measured on three levels; The entire sample period from 1985 to 2015; the first half of the sample period 1985-1999; and the second half of the sample period 2000-2015. Analyzing trends in abnormal returns and standard deviation, the results of the study were inconclusive.

Dedication

Dedicated to the memory of my Father, Thomas Michael Roland, Jr. “Be Bold!”

Acknowledgements

I would like to thank my thesis chair, Dr. Ray Sturm, and my two committee members for helping me through this once in a life time opportunity.

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Introduction

Throughout history, the speed and accuracy of information exchanged between individuals have steadily improved. In fact, information sharing has continued to evolve and rapidly expand to the now interconnected society that allows individuals from all corners of the globe to share information. The digital era clearly has reshaped the world in which we live, but this reshaping can also be viewed as a double-edged sword.

There is no doubt that the emergence of the digital era and the evolution of technology have been advantageous for many societies around the world. However, there are always two sides to a coin. Benefits and costs of the digital era and technological innovation have emerged at a pace correlated with our rapidly changing society. One of the main catalysts in the spawning of a global economy, this interconnectedness has created an intricate "domino" system comprised of many countries around the world. The success (failure) of one affects the success (failure) of all. In addition, technology has become a new weapon for malicious intent and terrorists, domestic and abroad, take advantage of these advances in technology.

For example, identity theft has evolved from what was once simply rancorous individuals rummaging through old mail and pillaging mailboxes for personal information, to a prodigious network of cyber criminals operating beyond the reach of law enforcement agencies. The emergence of cyber terrorism, both domestic and abroad, forces the world to sit and wonder if their personal information and livelihood are in jeopardy. However, probably the most malevolent use of the advances in technology and communication mediums is by terrorist organizations that use these tools as a way to spread fear and propaganda while also luring more

to their cause. The question then becomes, have these advances increased the effectiveness of terrorist communications? This study seeks to answer that question.

It is important to note that the study of terrorism and communication has been a widely discussed topic on a conceptual level. This study adds to the discussion by using the financial markets as a tool to gauge the strength of the communication contained in terrorist attacks. More specifically, this paper will measure the strength of the message terror groups hope to convey in order to answer the following questions:

1) Do terrorist attacks lead to a distinguishable pattern in the financial marketplace?

2) Have increases in the use of digital devices and access to instantaneous news, seen over the past decade, had an effect on terrorists' ability to deliver the desired message?

To answer these questions, the time-period 1985 through 2015 will be examined to observe the effect on market prices of the major terrorist attacks. Because terrorist attacks occur globally, stock market indices from the United States, Europe and Asia will be examined using event-study methodology.

I hypothesize that the attacks over the sample period will cause consistent patterns of fluctuation in the financial marketplace to a certain measurable degree. These fluctuations will be seen in variables discussed in further detail within the methodology section. While I expect to see small, if any, decreases in daily returns following the terrorist attack being analyzed, this paper is concerned with the measurement of the communicative effect of terrorist attacks. These patterns of fluctuation (degree of variance: -5 days before the attacks and + 5 days following the

attack), in theory, will produce, to a certain degree of measurement, the level of impact the communicative efforts of terror attacks have on its intended audience. These findings would imply that the underlying message in terror attacks is accurately received, and understood within the target audience, to a certain measurable degree, and in turn affects their behavioral investment decisions to a certain measurable level.

In the sections that follow, I will detail the following topics leading up to the empirical testing of the hypothesis: Section 1) Brief History of Terrorism Section; Section 2) The Ages of Mass Communication & Technology; Section 3) Terrorism and Mass Communication; Section 4) The Financial Markets-Tool for Measurement.

I. Terrorism-A Brief History

Coming from the French word terrorisme which in turn was derived from the Latin verb terrere, meaning to "frighten" (Laqueur, 2001), terrorism has been a widely discussed topic for many years; much to do with the sheer fascination of the subject, but at a distance. The political ramifications of terrorism have been depicted clearly throughout history, as systematic assassinations of political leaders are a well-known topic to all: Julius Caesar, Abraham Lincoln, JFK. However, it also serves as one of the least understood issues of this time.

The fascination it exerts and the difficulty of interpreting it have the same roots: it is unexpected, shocking and involves outrageous behavior (Laqueur, 2001). The chaos and fear that permeates through society (because of terror attacks) in modern times often overshadow the true nature of said attack. However, in truly understanding the truth of identity, a glimpse into the past and the emergence of terrorism is necessary.

It is important to note that terrorism comes in many shapes and forms throughout history, making it impossible for one definition of terrorism to cover all varieties: peasant wars and labor disputes, general wars, civil wars, revolutionary wars, wars of national liberation, and resistance movements against foreign oppressors (Laqueur, 2001). This section will give a brief history of the use of methodical terrorism as a main weapon. Furthermore, while the psychological and sociological effects of terrorism have been the basis for most studies into terrorism, the history of terrorism and the connections to the birth of modern day terrorism, is often overlooked.

The history of terrorism dates back long before the word "terrorism" was first invented during the French Revolution Reign of Terror (1793-94), and confirmed by the discovery of artifacts fifty miles south of Mosul in Iraq depicting the conqueror Assurnasirpal of Assyria's

enforcement of rule over his conquered territories by erecting stone monuments (884-860 BCE), (Matusitz, 2013). Written on the monuments Assurnasirpal states how he "flayed all the chiefs who have revolted, and I covered the pillar with their skin. Some I walled up within the pillar, some I impaled upon the pillar on stakes" (Matusitz, 2013).

Another early terrorist operation in history, the Sicarii, was active during the Zealot struggle in Palestine (A.D. 66-73), and was a highly organized religious sect of men of lower orders known as the extremis nationalist, anti-Roman party whose victims were the moderate, Jewish peace party. They are known to have used unorthodox tactics such as attacking their enemies by daylight, preferably on holidays when crowds congregated in Jerusalem (Laqueur, 2001), and are mentioned to have burned granaries and sabotaged Jerusalem's water supply. Believing God alone was considered the Lord, they refused any political allegiances and rejected priests seeing them as intermediaries. Some viewed them as social protestors who aimed to inspre the poor to fight against the rich.

One of the most well-known terror organizations in history, The Assassins, have been a incredibly popular topic of study among academics and have even been featured in many forms of popular culture. Always operating in secrecy, the Assassins were based in Persia, but quickly spread to Syria killing many people along the way, believing murder to be a sacramental act, Laqueur (2001). The Assassins were so feared that many Crusader leaders paid tribute to them in exchange for not being attacked, Matusitz (2013), and their assassination of Nizam al-Mulk, a Persian grand vizier of the Turkish Seljuq sultans, is considered one of the predominant terror attacks in history, Chaliand and Blin (2007).

Another terror organization in history acting in secrecy is the Thugs, or Thuggees, of Central India. Active for over four hundred years all across South Asia from the mid 1300's to the late 1800's, the Thugs would murder innocent travelers and steal all of their processions in the name of their God of worship Kali, (Woerkens, 2002). In the words of a captured Thug, "Let any man taste of that goor (sugar) of the sacrifice, and he will be a Thug, though he knows all the trades and has all the wealth in the world…I have been in high office myself and became so great a favorite wherever I went that I was sure of promotion. Yet I was always miserable when away from my gang and obliged to return to Thuggee.," (Laqueur, 2001, p. 9). While the Thuggee's did not want to terrorize the government or have any political aims, their victims numbered into the hundreds of thousands over the course of their activity.

The move toward modern, more systematic terrorism would begin in the late nineteenth century. Some examples of early systematic terrorism would be:

1) the Russian revolution against tyrannical leadership from 1878-81 and again in the early twentieth century (Laqueur, 2001);

2) the Irish, Macedonians, Serbs and Armenians who fought for independence (Laqueur, 2001);

3) the "propaganda by the deed" which was political action against left terrorism during the 1890's in France, Italy, Spain in the U.S (Laqueur, 2001);

4) in the U.S. there was working-class terrorism such as the Molly Maguires and the Western Union of Mineworkers (Laqueur, 2001);

5) the Fascist movements in Germany and Hungary during the 1920's (Laqueur, 2001).

Following the political assassinations of King Alexander of Yugoslavia and Barthou in Marseilles in 1934, the League of Nations would finally intervene and produce the first attempts to combat terrorism by making terrorist acts illegal and punishable (Laqueur, 2001). Nevertheless, new forms of terrorism continued to emerge over the years.

A. Weapons and Tactics throughout History

As technology has continued to innovate and evolve over time, the weapons, technology, and tactics terrorist organizations utilize have seen similar shifts. This section will provide a brief overview of the history of such weapons and tactics, leading up to the emergence of terrorism through mass communication.

Early terrorist organizations often used crude forms of weaponry and tactics, often due to the lack of better options. However, it is important to note that modern terrorist organizations continue to use these weapons and tactics by choice because of certain advantages their utilization provides over more sophisticated forms of attack, (Dolnik, 2007). The following are examples of the weapons and tactics utilized by the early terrorist organizations mentioned in the previous section. The Sicarii would attack their enemies in broad daylight, utilizing their weapon of choice, the sica or dagger. The Assassins, operating in the shadows, would also utilize daggers during their missions. However, the Assassins were known more for their ability of infiltration and operated under high levels of secrecy, which resulted in the creation of a far more powerful weapon. Superstition and fear. Lastly, The Thugs of India would often use a noose and strangle their victims whom were often unsuspecting travelers, all in the name of their God Kali. Another primitive and often overlooked weapon of both early and modern terror organizations is arson,

which accounts for roughly a quarter of all terrorist violence, and provides many advantages for terror organizations such as deniability and the ability to cause material damage without causing casualties, Dolnik (2007).

The firearm as a weapon for terrorism first emerged in 1584 with the first political assassination by use of firearm, William of Nassau, the Prince of Orange. However, the firearm was not used again in an assassination until Gustav III Adolf, the King of Sweden, in 1792, (Dolnik, 2007), most likely due to the unreliability of sixteenth century firearms. Nevertheless, the through the innovations in weapons technology, the firearms today are much more accurate and reliable, and following World War II terrorist organizations easily found infantry firearms to fill their armories. Despite the technological innovations in firearms from the sixteenth century to the beginning of the twentieth century, innovations in firearms have been relatively stagnant over the past 50 years. The smaller size of firearms is the most prolific change seen during that time. Nevertheless, shooting account for 13% of all terrorist violence, are often used it highly publicized political assassinations, and sniping attacks against soldiers and civilians, Dolnik (2007). A number of terrorist groups often use homemade firearms and stand-off weaponry such as rockets, anti-tank weapons, mortars, and surface to air missiles. In 1964 one of the fist uses of standoff weaponry occurred when a rocket shell was triggered by an automatic timing device in New York City by anti-Castro Cubans. Innovation in these weapons has been heavily focused on increasing the range, accuracy, and overall destruction resulting from their use. In doing so it has provided governments and terror organizations a like the strategic advantage of reaching an enemy territory from afar.

Hostage incidents account for roughly 20% of terror incidents and throughout history has been characterized into three subgroups of hostage attacks: barricade attacks, kidnappings and air/land/sea hijackings, Dolnik (2007), dating back to biblical times. It is estimated that over 10,000 kidnappings occur worldwide a year, mostly occurring in Latin America and not political in nature (Dolnik, 2007), while 9/11 showed the world the lengths terror organizations are willing to take their hijacking tactics.

Sabotage is another tactic used by terror organizations, but while it garners the ability to inflict incredible damage, more violent tactics are commonly preferred and utilized by most terrorist organization, Dolnik (2007). The primary advantage of using sabotage is causing an enemy harm while bring a certain level of attention to the unknowing public, and provides a way for groups dedicated to specific issues to target their enemy more accurately. With the increased use of the internet and the emergence of cyberterrorism, sabotage has become a highly utilized form of destruction within the past decade and continues to spread fear, propaganda, and worry about the individual security in the future.

Bombings have become the most frequently used attack in recent history, accounting for over half of all terrorist related violence in the world. When looking at the advantages of using bombings as the main weapon and tactic, it is easy to see why it is the most frequently utilized. One advantage is it allows the attackers to inflict damage without necessarily being there, which provides a level of physical safety and safety from capture. Furthermore, is it has the incredible power to induce fear, not only in the eyes of the region in which the bomb is detonated, but due to the innovations in mass communications, the world. Bombings are also cost-effective and can

be made from house-hold items, accounting for one of the most important strategic advantages of using bombing's as a main tactic.

The primary bombing tactic utilized in the past decade and spreading exponentially across the world has been suicide bombings, and represents the deadliest of all terror attacks, Dolnik (2007). From the samurai to kamikazes, ideologically and religiously motivated suicide has been occurring throughout history. The destructive capabilities are unparalleled and it allows an organization to deliver massive amounts of destruction to areas where other forms of weaponry and tactics would not produce the same level of physical and psychological harm. Being extremely hard to defend against and the relatively low cost of producing an effective device, suicide bombing offers terrorist organizations the ultimate weapon in spreading their message in reaching their overarching goals. Nevertheless, suicide bombing can also have adverse effects on the terror groups that utilize such a destructive tactic, commonly acting as a way to galvanize the public and increase the support against the war against terrorism.

In summary, while the main goal of terrorism remains constant, the weapons used have evolved over time. Beginning with crude weapons, terrorism, much like warfare, has evolved with the innovations in weaponry. Nevertheless, terrorist organizations, both in history and in modern times, continue to use weapons as a tool, while the message and underlying reasoning behind these violent attacks have stayed relatively consistent over time.

The development of the personal computer, the internet, and especially social media has ushered in a new era of terrorism. They are now able to communicate their message reaching a greater audience more cost effectively than ever before. This age of mass communication and technology has been a game-changer. In this day and age, much of the world's population now

holds a personal video camera in the palm of their hands. This, coupled with the power of the internet, has turned terrorism into a media extravaganza, allowing terrorist organizations to spread their message on a global scale. Furthermore, with society being continuously fed information and news to the point of oversaturation, publicized terrorist organizations and the attacks they commit take center stage on almost all news outlets. Violence, corruption, and dramatic events that appeal to the emotions of society, regardless of geographic location, are sadly the news that people "want" to hear.

II. The Age of Mass Communication & Technology

While many believe that the Age of Information has no beginning, and "has as many definitions as information does" (Aspray, 2015, p. 1), history shows there have been periods of drastic acceleration in the volume of information available and in the creation of information systems, (Boyd, 2014). The importance of media has been apparent dating back to ancient Greece and Rome. With their prevalence on the art of oral and written communication, it has become clear that ancient Greek culture was shaped by the dominance of oral communication, (Briggs and Burke, 2009). In ancient Persia, human figures, along with birds and animals, were prominent in illuminated manuscripts, which went on to flourish in the Ottoman Empire and Mogul India, whom of which recorded their history in similar fashion. According to the French art historian Emile Male (1862-1954), "art was didactic," Briggs and Burke (2009). Cathedrals in medieval times were abounding with carved imagery of historical representations, coupled with intricate stained-glass windows, which formed a comprehensive system of communication. Nevertheless, it was not until 1450, following the invention of the printing press by Johann Gutenberg, that communicative efforts took a giant leap forward.

The printing press constitutes the elemental shift from script to print. It altered methods of data collection, storage and retrieval systems, communication networks used throughout Europe, (Einstein, 1979), and arguably a main cause of the Protestant Reformation that occurred during the next generation following the introduction of the printing press, (Parrott, 2012). In addition, the rise of humanism and the development of science can be traced to Gutenberg's printing technology. Cities that adopted print media benefited from localized spillovers in human capital accumulation, technological change and forward and backward linkages. In addition,

print media played a key role in the acquisition and development of skills valuable to merchants such as the ability to calculate interest rates, profit shares and exchange rates following the first printed mathematical textbooks designed for students preparing for careers in business, Dittmar (2011).

In the 1830's, the telegraph came into being and revolutionized the arena of mass communication. It enabled print mediums to have a constant stream of information from different regions, and in 1863, the globe. Following the invention of the telegraph, in 1877 the phonograph began to replace the traditional hand-cranked, models due to the developments in electricity. Radio gained widespread popularity in the 1920's when music genres were integrated into its use. Television emerged in the 1950's as the next step in mass communication and transfer of information. However, it was not until 1962 that the availability of information took a leap forward following the launch of communication satellites, paving the way for the modern communication systems now seen today. While the computer emerged in the 1980's it was not until the early 1990's and the development of the Internet, that mass communication and the birth of the digital era would change the world forever.

The emergence of the digital era, connecting cultures and economies, knowledge and expertise, has unequivocally played a part in the nascence of globalism. "The growth of a worldwide network of fast cables and telegraph systems, in tandem with developments in railways and steamships, eroded some of the obstacles of geography and made it easier to organize transcontinental business. These networks supported huge flows of capital, technology, people, news, and ideas which, in turn, led to a high degree of convergence among markets, merchants, and bankers" (Winseck and Pike, 2007, p. 1,2). While the theory of globalism is a

recent discovery, one could argue that globalism came to fruition with the birth of the digital era. We are connected in our societies, our economies, our way of life, and reliance upon continuously flowing information reaches far beyond that of just the average consumer. The digital era has reshaped not only the sociological and psychological structure of our world, it has also imposingly impacted economies around the world.

The revolution in technology and globalization has led to a global economy that is based on knowledge and high-tech industries in areas such as biotechnology, health, environmental products and services, tourism and hospitality, telecommunication, computer hardware and software applications, financial services, and entertainment (film, television, games) will be highly competitive global industries, Prasad (2011). It is now prehistoric to think, from an economic standpoint, only within the boundaries of our own country. Governments have become increasingly dependent on the immediate access to capacious amounts of information at the click of a button. Every aspect of the U.S. economy and infrastructure depends on digital interconnections, Opderbeck (2012), and at the heart of the digital era, the Internet.

If there was any doubt surrounding a global economy, the crash of 2008 and the Brexit vote of 2016 reminded all of us, that this is now a global economy. In addition, tables (1-3) below, show the correlation between 3 indices from the United States, Europe and Japan which further illustrates the movement towards a global economy. Table 1 shows the correlations over the entire sample period and Tables 2 and 3 show the correlations for the first half and the second half of the sample period respectively. The most compelling result is that all of the correlations have increased over the sample period clearly indicating increased globalization.

Table 1

Table 1: Correlations. This table presents the correlation between monthly returns of the S&P 500, FTSE, and Nikkei.

Panel A. Entire sample period (1985-2015).

	SPX	FTSE	NIKKEI
SPX	1.00	0.79	0.50
FTSE	0.79	1.00	0.45
NIKKEI	0.50	0.45	1.00

Panel B. First half of the sample period (1985-1999).

	SPX	FTSE	NIKKEI
SPX	1.00	0.72	0.39
FTSE	0.72	1.00	0.36
NIKKEI	0.39	0.36	1.00

Panel C. Second half of the sample period (2000-2015).

	SPX	FTSE	NIKKEI
SPX	1.00	0.86	0.62
FTSE	0.86	1.00	0.56
NIKKEI	0.62	0.56	1.00

There is no denying that the emergence of the digital era has been advantageous to many countries and economies around the world, forcing countries to continually innovate and increase their knowledge base, connectivity, and quality of life. Free economy was never so prevalent until the theory of globalism became a dominant force in modern day economics. Beyond connecting readers to gigantic stores of information, the Internet has created a forum by which new classes of experts can contribute their knowledge to the world, Pierpoint (2011). Nevertheless, like many things in life, there is always a cost and while the digital era has reshaped the world in which we live in, this reshaping can also be viewed as a double-edged sword.

Life in media and the communication jungle seems to have become increasingly dangerous. The experts in digital world say that the telephone, the emails, the blogs, and even Facebook are speeding us up to the grave as we speak (Lohar, 2010). In addition to the heightened concern stemming from younger generations embracing and incorporating digital devices more quickly into their daily routine, Vandewater and Lee (2009), innovation in online platforms and communication mediums has contributed to the growth of modern societies, providing opportunities for those with dubious intent in the process. While there is a sufficient amount of research and rhetoric pertaining to the adverse effects Internet has on our society Davidow (2011); Bell (2011); Fuller (2010); Etling, Faris and Palfrey (2010); Cunningham, (2012); Opderbeck (2012); there continues to be a recurring theme. We need it, and more so, our governments have become too reliant upon it to change it.

The emergence of the global economy, the digital era and the instantaneous transfer of information has reshaped our world. While many positive outcomes have manifested due to these emergences, it would be naïve to think that malicious forces ranging from all corners of the globe have not taken advantage of these advances to fuel and recreate their terror efforts. Terrorist organizations continue to operate as global enterprises, using any and all weapons in their arsenal to further their causes. However, with societies being more interconnected by the day, the most powerful, and most frequently used weapon of all in a terror organizations arsenal comes in the form of mass communications.

III. Terrorism & Mass Communication

A. Terrorism and The Communication Process

H. Dan O'Hair and Robert L. Heath (2005, p. 4) stated, "Terrorism is an inherently communicative process." Jonathan Matsuitz (2013, p. 35) goes on to explain, "Terrorism is a communicative process because it is aimed at a very large audience beyond the direct targets," and implores the same components of the model described in the previous section. It is important to note that in no way, shape, or form does the author condone any form of terrorism, domestic or international. The underlying reasoning behind terror attacks is to illicit a response, most often achieved through extreme acts of violence. However, in order to fully understand the reasoning behind terror attacks and the concept of terrorism as a communication process, it is important to understand two necessary elements of terrorism. First, it is a form of communication and second, the conditions necessary for terrorism to exist.

Since terrorism is a form of communication, it is necessary to understand the communicative process. Harold Lasswell (1948) described a number of elements essential to communication: a sender, a message, a medium, a receiver, and the reason. This model depicts the purpose of communication and the impact it is meant to have on the audience, Matusitz (2013). This section will provide a brief overview of the communication process, which is followed by the concept of terrorism as a communication process in and of itself. The process will be detailed using David Berlo's (1960) Model of Communication, and further analyzed by Jonathan Matusitz (2013) in his study of terrorism and communication.

Berlo's model expands on elements previously mentioned by Laswell (1948), and includes ten components of communication:

1) The Source: person with an idea and an intention to communicate;

2) Encoding: turning the idea into a symbol sent both verbally and nonverbally;

3) The Message: resulting creation following the encoding process;

4) The Medium: ways the message is sent (TV, radio, print media, etc.);

5) Noise: ways in which the message is distorted either by external, internal, sematic, or cultural means;

6) The Receiver: person (s) who is the intended audience;

7) Decoding: interpretation of the message received;

8) Reaction: response following the decoding of the message;

9) Feedback: source derives meaning from the receiver's response;

10) Context: environment that the communication takes place in (culture, setting, or background).

In order for terrorism to exist in the first place, several conditions must be in place. John Hogan (2005) in The Psychology of Terrorism, conveyed the main reasons that result in the emergence of terrorism. Some of these reasons are as followed:

1) Lack of democracy
2) Rapid modernization
3) Extremist ideologies
4) Triggering events
5) Corrupt governments
6) Repression

7) Failed or weak state.

While there are many reasons, known and unknown, behind the emergence of terrorist organizations, their use of communication has become a powerful weapon to strike fear into the masses just as the sword or evolution in small arms weaponry did before.

The communication process spreads far beyond that of traditional practices we see in marketing, communication, advertising, etc. It stretches to the violence and fear generated by various terrorist organizations all over the world. This process begins to unravel the inner psyche of terror organization's and their efforts to strike fear into societies around the world and bring more to their cause. The "weapon of choice" now being the different mediums used by these organizations.

B. Terrorism in The Media

Weimann (2008) studied terrorists' use of media by analyzing pamphlets, personal diaries, and press interviews, in addition to conducting interviews with terrorists, both jailed and free. This study found that terrorists see the media as a powerful tool in psychological warfare and target various audiences as they create awareness on a global scale, Weimann (2008). These findings form the motivation for this study, but this is not a new idea. Terrorists have always used the media to communicate their message. However, the current speed and accuracy of informational flow is unparalleled in history providing these terrorist organizations the same opportunities that many nations around the world consider an asset, mass communication.

Following the Boston Marathon attack on April 15, 2013, killing 3 and injuring 264, a political commentator by the name of Chemi Salev wrote a column in the Israeli Haaretz newspaper. In his column, Salev writes, "This was terrorism's great victory, its spectacular

triumph, and its abhorrently glorious day in the sun. Never, in the history of violence aimed at innocent civilians, have the lives of so many been disrupted so much by the relatively amateurish actions of so few." A "victory" for terrorism when taken out of context could be deemed a controversial remark. However, Salev, is referring to the number of people the news reached in a very short time due to social media and online news outlets. 750,000 mentions were posted and shared via social media outlets just 10 minutes after the first bomb exploded and 3.5 million tweets were posted within the first 24 hours following the attack.

Terrorism in the media has seen an evolutionary response to the birth of the Digital Era. Many scholars believe that without the media, modern terrorism would not be as prevalent in our societies as it is today. It is no secret that news media feeds off enterprise, and often times, dissension. Aggrandizing is a familiar topic that is debated among societies. Catching the attention of the public is of upmost importance and, unfortunately, death and violence catches the attention of the public immediately. Again, there are two sides to the coin. While news outlets scrape and scourge through the mud to find the next "big story," has allowed these terrorist organizations and executors of death and violence, use the increase media outlets to reach the public's eye on a global scale. While it can be argued that the media and terrorism have existed symbiotically since the introduction of the printing press, it is important to acknowledge the growing strength of this relationship due to modern development of mass media and communication technologies, Eid (2013).

While the meaning of terrorism is often difficult to define, Cindy C. Combs (2012) who of which penned Terrorism in the Twenty-First Century, proposed that terrorism is a combination of theater and war. Terrorism in modern days has shifted to a mass media front of

creating drama that will attract the most readers or viewers. This shift can be drawn to the impacts of 9/11, the pivotal point in the development of terrorism, Eid (2013) with the emergence of the "Global War on Terror." However, the importance of communication mediums within terrorist organizations has been prevalent since the explosion in popularity of television.

Following the attack of the 1972 Munich Olympic Games, one of the orchestrators had stated while testifying, "we recognized that sport is the modern religion of the Western world. We knew that the people in England and America would switch their television sets from any program about the plight of the Palestinians if there was a sporting event on another channel. So, we decided to use their Olympics, the most sacred ceremony of this religion, to make the world pay attention to us. We offered up human sacrifices to your gods of sport and television. And they answered our prayers. From Munich onwards, nobody could ignore the Palestinians or their cause," Dobson & Paine (1977, p. 15).

It has become increasingly evident that the use and manipulation of media have become a powerful, strategic tool for influence and psychological warfare with which terrorist organizations have become dependent. Alex P. Schmid, a member of the Terrorism Prevention, UNODC, determined a number of factors in accessing the effectiveness of a terrorist attack, including the degree of publicity it obtains, Schmid (2005). While terrorism in the media has been widely viewed as psychological warfare against a target population, aiming to intimidate, threaten, and spread fear, a common target of terror attacks is a nation's political and economic infrastructure.

C. Terrorism and the Economy

The economic impacts of terrorism have been a widely discussed topic since the late 1960's, and becoming increasingly popular following the events of 9/11. In 2004, Andrew Chen and Thomas Siems examined the response in U.S. capital markets to terrorist and military attacks dating back to 1915 and global capital markets response to two events-one pre 9/11 and the 9/11 attack. In their findings they suggest, due to capital markets today being tightly inter-linked on a global scale, in regards to news spreading rapidly, and with quick spillover, they are more resilient than in the past and recover sooner from attacks, Chen and Siems (2004). These findings tie directly into the hypothesis that the increased amount of information available in the market place has in fact decreased the impact of certain news events, particularly terrorist attacks. Alberto Abadie and Javier Gardeazabal in 2008 used a macroeconomic model of the world economy and international data on terrorism and the FDI assets and liabilities to study the economic effects of terrorism in an integrated world economy. In their findings, it is suggested that a one standard deviation increase in the intensity of terrorism results in a 5% fall in the net FDI position of the county, Abadie and Gardeazabal (2008). Nevertheless, while many scholars study the linkages of terror attacks to their effects in the financial and economical arena, this study intends to turn their methods in the opposite direction by using market trends as a proxy to measure the effectiveness terror organization's communicative efforts.

IV. Financial Markets-Tool for Measurement

The study of terrorism and its effect on an economic level have been done using a variety of tools for measurement. In the coming sections the various implications that terrorism has on the economies of countries around the world. Theoretical tools such as game theory and utility maximizing models, and empirical tools such as time series and spectral analysis, have been utilized in studying the economic effects of modern-day terrorism. While financial markets have been used to measure the effects of terror attacks, (Berger and Sturm, 2005), this study will examine patterns following an attack and measure such patterns to determine the effectiveness of a terror organizations underlying message.

The previous sections have detailed the goals of terrorism, the weapons of terrorism, the conditions necessary for terrorism to exist and the communicative vehicles terrorists use. While it is clear that terrorism is ultimately about communication, quantifying the impact of that communication is much more problematic. Yet, one constant through all of modern terrorism is the existence of freely traded financial markets. In particular, stock markets. Accordingly, they provide perhaps the most objective measure available. Moreover, the Efficient Market Hypothesis, (Fama, 1970) predicts that all information about a stock is reflected in that stock's price. So an understanding of the Efficient Market Hypothesis is necessary, as well as a theory as to why we would expect the markets to react to a terrorist attack. The Efficient Market Hypothesis is well documented in the academic literature and elsewhere. The "Terrorist Attack Expectations Theory" is the result of this study.

A. The Efficient Market Hypothesis

The "efficient market hypothesis" (EMH), introduced by Eugene Fama in the 1970's for which he won a Nobel Prize in 2013 has been a largely popular research topic well before Fama's famed research on the EMH. However, Fama tested the adjustment of security prices against three relevant information subsets, culminating the most specific empirical testing of the EMH up until that time. Fama concluded that, with a few exceptions, the EMH model "stood up well Fama (1970)."

The three information subsets previously mentioned are as follows:

1. Weak Form: Historical price information.
2. Semi-Strong Form: All publicly available information.
3. Strong Form: Investors/Groups have monopolistic access to relevant pricing information.

By definition, if a market is considered efficient, all information pertinent to rational decision-making in market participants is immediately available and the future path of the price level of a security is independent and identically distributed (Fama, 1965). As it pertains to this study, all prices should accurately reflect all information readily available, and pertinent to the investment decision making process. As such, prices before an attack (day -5 to day 0 in the next section) should not be affected and remain random. However, if prices before an attack are shown to be affected on a consistent basis, then this brings us back to one of the three subsets of information tested by Fama. In strong form information subsets, it is theorized that investors or groups of investors have access to relevant pricing information regarding a given stock, or simply insider trading. If a consistent fluctuation of prices in days leading up to an attack is

apparent, this would lead to the implication that particular terrorist organizations attempt to directly affect particular markets in an attempt to profit from the reaction an attack creates in market prices. For example, it was theorized that the terror organization behind the 9/11 attacks used their insider information regarding the future attack on the World Trade Center to profit from the reaction in prices for particular airline stocks.

The availability of news has exponentially increased with the continued expansion of online news sources. The ability to receive information almost immediately has changed the social structure of society. For example, the increased speed and accuracy of information exchange has created a more efficient financial marketplace and since the speed and accuracy of information has increased over time, less of a reaction should be seen in the second half of the sample being tested (next section). Nevertheless, the availability of news pertinent to investment decision-making is undoubtedly the most important factor in measuring market efficiency, and has the ability to influence and solicit psychological responses that in turn influence investing decisions.

The effect of news on investment decisions has been a long and popular studied topic. It goes without saying that behavioral studies into the effects that a range of variables has on investment decisions contains a certain draw, due to the hope of gaining a more predictable model to take advantage of. Nevertheless, throughout this study, one common conclusion remains intact. Investment behavior is, and will remain, unpredictable. However, market trends, stemming from the behavioral implications of certain news events, convey the effectiveness of news events on influencing investment decisions.

B. Information Availability

When comparing the mid to late 80's and present times, in terms of the immediate availability of information, which is important when evaluating financial markets, a clear discrepancy in news sources is apparent. While many of the large news outlets that provide a majority of the global population's access to news have continued to operate within this timeframe, the online and digital presence of news source has increased the amount of information available. In addition to the quantity and availability of important news topics to market investors, the speed in which they receive the news has changed dramatically.

When talking about the level of news in the market, there has been research about the effects on financial markets given the level of news being circulated. Feuerriegel, Heitzmann and Neumann (2015) suggested that investors read too much news and as a result, cause price formation. Veldkamp (2006) predicted that information-based herding creates a situation where high-value markets will generate news and the news will generate a price premium resulting in high price dispersion in times when news is abundant. In 2014, a study investigated the medias influence on stock returns, finding its effect depends on the ability to disseminate information broadly and shape opinions or form consensus, Azuma, Okada and Hamuro (2014). In 2013 a study found that trading activity is highly correlated with both the flux of news and the volatility, Lillo, Micciche, Tumminello, Piilo and Mantegna (2013).

C. The "Terrorist Attack Expectations Theory"

One method to determine the strength of a firm is to determine the present value all of future cash flows that company may generate. This is done by using the discounted cash flow

method (DCF), most often using the weighted average cost of capital (WACC) as the discounting metric. The present value of cash flows using DCF is as follows:

$$PV = \sum_{t=0}^{n} \frac{FV}{(1+r)^t}$$

where: PV=Present value; FV= Future Value; R=Interest Rate or Discount Rate; N=Time.

The determination of a firm's value using the present value of future cash flows is the determinant on the expectant growth of the firm and the duration of the growth. Unfortunately, even small fluctuations in key metrics used to determine the growth of a firm could have enormous impacts on firm value when using this discounting method. When determining the growth of a firm it is necessary to evaluate such growth on metrics such as interest rates, currency exchange rates, and a number of other economic metrics that determine the overall health of the economy in which a firm operates. The growth of a firm is also dependent on the growth of the industry in which it operates. These factors could theoretically lead to a terrorist attack adversely affecting the growth of a firm. This would, in turn, lead to the discounting of cash flows being adversely affected as well. In times of economic distress, the amount of attacks increases due to the instability in government and their inability to effectively manage a nation. The resulting increase in attacks compounds the issues of a nation's economy and government, leading to the continued negative outlook of growth within a specific industry.

For example, the airline industry. Upon determining the present value of future cash flows for a particular airline in Europe, the growth and length of such growth of future operating cash flows, would be enormously affected by the hijacking or bombing of a plane or airport. This

could in turn result in a firm's financial performance being negatively affected by a large number of consumers determined to keep out of airports or refuse to fly certain airlines.

V. Measuring the Communication Effect of Terrorism

A. Methodology

I. Defining the Events and Sample

In testing the hypotheses, I will first identify attacks based on specific variables to ensure that the comparative analysis is fundamentally identical spanning the life of the time series and accurately measures the effects of the terror attacks. For example, comparing the 9/11 attacks to the bombing against the Tati store on rue de Rennes in Paris would most certainly result in information bias and produce immeasurable results when using the financial markets as a proxy of measurement.

This study identifies 109 attacks (Table 3-Column 1) to use in the sample using the following methods. First, this study categorizes terror attacks based on the level of media exposure likely to be obtained in the sample period using three variables: 1) death count (level of violence) (Table 3-Column 4); 2) geographic location (Table 3- Column 3); and 3) the type of terror attack (Table 3-Column 2). An attack generating 100 or more causalities is the first measurement used to build the dataset for the study. In addition, a small number of attacks generating less than 100 deaths are included in the sample due to their historical and cultural significance. Death counts will then be split into three subsections (0-149; 150-299; 300+) (Table 2).

Table 2

Number of Deaths (By Quantity per Sample Period): This panel splits the death count of each event into 3 subsections and provides the number of events that occurred for each. The last 2 rows are the calculated mean and median death count for each sample period (Columns 2-3). This panel represents the death count analysis for all subsequent studies that follow.			
Number of Deaths (per Event)	First Half of Sample Period (1985-1999)	Second Half of Sample Period (2000-2015)	Total-Entire Sample Period (1985-2015)
0-149	23	49	72
150-299	9	20	29
300+	3	5	8
Mean (# of deaths per sample period)	134	154	148
Median (# of deaths per sample period)	127	126	127

Finally, this study measures the sample window on three levels for comparative analysis: 1) The first half of the time period being studied (1985-1999). 2) The second half of the time period being studied (2000-2015), and 3) The entire time period being studied (1989-2015). Comparing the effects of terror attacks before (first half of the sample) and after (second half of the sample) the emergence of large scale communications will answer 1 of the 2 main questions of this study:

1. Have increases in the use of digital devices and access to instantaneous news, seen over the past decade, had an effect on terrorist's ability to deliver the desired message?

While analyzing the entire sample period (1985-2015) will answer the 2nd question of this study:

2. Do terror attacks lead to a distinguishable pattern in the financial marketplace?

This study will analyze the effects from an attack on two financial levels. The first level will focus on analyzing the effects from an attack on 5 separate indices in the United States, Europe, and Eastern Asia to evaluate the level of effectiveness in the terror attacks message: The

S&P 500 (SPX); The German Stock Index (DAX); The Tokyo Stock Index (NIKKEI); The London Stock Exchange Index (FTSE); and the Amsterdam Stock Exchange Index (AEX). The calculation for average abnormal returns is as follows:

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

Where:
AAR_t= average abnormal return for time t
AR_{it}=abnormal return for event i at time t
N=sample size

The second level will focus on securities from different sectors around the world including Consumer Discretionary, Consumer Staples, Energy, and Industrial, which will theoretically see the greatest impact from terror attacks due to the nature of the products and services companies within these sectors produce and distribute.

The motivation behind this study stems back to the early 80's as interest in the impact of macro indicators and their effect on financial market variables started to gain momentum within the academic community. Pearce and Roley (1985), Hardouvelis (1986) and Jain (1988) primarily studied news in the United States and its impact on asset pricing. Mcqueen and Roley (1993) found a strong correlation between news, stock prices, and the state of the economy. Funke and Matsuda (2006) formed datasets based on Bloomberg information to study the impacts of news originating in the US on both US and German stocks. However, the study of reactions in market prices due to terror attacks, and measuring the "effectiveness" of terror group's communicative efforts at a quantitative level, has seldom been researched. The relevancy

of this study in modern times goes without question. The theater of terrorism has evolved with the evolution of the digital era. Terrorism can best be understood as a violent communication strategy, Graff (1982), with an aim to strike fear, spark chaos, and persuade the intended receiver or victim.

Table 3

List of Events. This table presents this list of terrorist events examined in this study. The first column presents the event number in chronological order, the second column gives a brief description of the event, the third column lists the location, the fourth column lists the number of deaths and the last column identifies the event's date.

Number	Event	Location	Deaths	Date
1	Bombing	Spain	18	4/12/85
2	Small Arms	Sri Lanka	150	5/14/85
3	Plane Bombing (Air India)	Ireland	331	6/23/1985
4	Hostage	Columbia	100	11/6/1985
5	Small arms	Italy	23	12/27/1985
6	Bombing	France	7	9/17/1986
7	Kidnapping	Sri Lanka	127	4/18/1987
8	Bombing	Sri Lanka	106	4/21/1987
9	Plane Bombing (Korean Air)	Burma	115	11/29/1987
10	Plane Bombing (Pan Am)	Scotland	270	12/21/1988
11	Plane Bombing (French UTA)	Niger	171	9/19/1989
12	Plane Bombing (Avianca)	Columbia	110	11/27/1989
13	Small arms	Sri Lanka	140	8/3/1990
14	Small arms	Sri Lanka	122	8/13/1990
15	Plane Hijacking (PRC airliner)	PRC	132	10/2/1990
16	Bombing	USA	6	2/26/1993
17	Bombing	India	317	3/12/1993
18	Plane crash	Georgia	106	9/22/1993
19	Bombing	USA	169	4/19/1995
20	Bombing	France	8	7/25/1995
21	Bombing	France	0	8/17/1995
22	Bombing	France	0	9/3/1995
23	Bombing	France	0	9/7/1995
24	Hostage	Russia	143	6/14-19/1996
25	Bombing	Saudi Arabia	20	6/25/1996

26	Plane Hijacking (Ethiopian Air)	Comoros	127	11/23/1996
27	Small arms	Algeria	238	8/29/1997
28	Small arms	Algeria	277	9/22/1997
29	Small arms	Algeria	272	12/30/1997
30	Small arms	Algeria	182	1/4/1998
31	Small arms	Algeria	103	1/11/1998
32	Bombing	Tanzania	303	8/8/1998
33	Small arms	Columbia	138	11/3/1998
34	Bombing	Russia	130	9/13/1999
35	Plane Hijacking (Egypt Air)	USA	217	10/31/1999
36	Ship Bombing	Yemen	17	10/12/2000
37	Small arms	Angola	152	8/10/2001
38	Small arms	Columbia	119	5/2/2002
39	Helicopter Crash	Russia	127	8/19/2002
40	Car Bombing	Indonesia	202	10/12/2002
41	Hostage	Russia	170	10/26/2002
42	Car Bombing	Iraq	125	8/29/2003
43	Suicide Bombing	Iraq	109	2/1/2004
44	Small arms	Uganda	239	2/21/2004
45	Ferry Bombing	Philippines	118	2/27/2004
46	Suicide Bombing	Iraq	188	3/2/2004
47	Train Bombing	Spain	191	3/11/2004
48	Bombings & Small arms	Iraq	103	6/24/2004
49	Hostage	Russia	372	9/1-3/04
50	Car Bombing	Iraq	135	2/28/2005
51	Bombing	England	56	7/7/2005
52	Suicide Bombing	Iraq	100	7/16/2005
53	Suicide Bombing	Iraq	182	9/14/2005
54	Bombing	Iraq	124	1/5/2006
55	Train Bombing	India	209	7/11/2006
56	Car Bombing	Sri Lanka	103	10/16/2006
57	Car Bombing	Iraq	202	11/23/2006
58	Bombing	Iraq	101	1/22/2007
59	Car Bombing	Iraq	137	2/3/2007
60	Bombing	Iraq	137	3/6/2007
61	Car Bombing	Iraq	153	3/27/2007
62	Bombing	Iraq	137	3/29/2007

63	Bombing	Iraq	193	4/18/2007
64	Hostage	Pakistan	102	7/3-10/07
65	Bombing	Iraq	182	7/7/2007
66	Car Bombing	Iraq	520	8/14/2007
67	Bombing (Car)	Pakistan	141	10/18/2007
68	Bombing	Afghanistan	105	2/17/2008
69	Car Bombing	Pakistan	110	10/10/2008
70	Small arms & hostage	India	174	11/26-29/08
71	Small arms	Congo	189	12/24/2008
72	Small arms	Nigeria	780	7/26/2009
73	Bombing	Iraq	104	8/19/2009
74	Car Bombing	Iraq	155	10/25/2009
75	Bombing	Pakistan	119	10/28/2009
76	Shooting	USA	13	11/5/2009
77	Car Bombing	Iraq	127	12/8/2009
78	Bombing	Iraq	111	5/10/2010
79	Train Crash	India	148	5/28/2010
80	Suicide Bombing	Pakistan	106	7/10/2010
81	Small arms	Nigeria	100	11/4/2011
82	Bombing	Nigeria	178	1/20/2012
83	Bombing	Iraq	116	7/23/2012
84	Bombing	Iraq	106	8/16/2012
85	Bombing	Iraq	106	9/9/2012
86	Small arms	Libya	4	9/11/2012
87	Bombing	Pakistan	120	1/10/2013
88	Bombing	USA	5	4/15/2013
89	Small arms	Nigeria	187	4/22/2013
90	Bombing	Iraq	113	5/20/2013
91	Small arms	Nigeria	143	9/17/2013
92	Bombing	Afghanistan	100	9/21/2013
93	Small arms	Nigeria	219	3/16/2014
94	Small arms	Nigeria	310	5/7/2014
95	Bombing	Nigeria	118	5/20/2014
96	Suicide Bombing	Nigeria	121	11/28/2014
97	Small arms & Bombing	Pakistan	148	12/16/2015
98	Small arms	Nigeria	700	1/3/2015
99	Small arms	France	13	1/7/2015

100	Small arms	France	1	1/8/2015
101	Hostage	France	4	1/9/2015
102	Small arms	Kenya	152	4/2/2015
103	Bombing	Yemen	142	5/20/2015
104	Small arms & Bombing	Syria	146	6/25/2015
105	Small arms	Nigeria	118	7/1/2015
106	Car Bombing	Iraq	115	7/17/2015
107	Bombing	Nigeria	108	9/20/2015
108	Suicide Bombing	Turkey	102	10/10/2015
109	Plane Bombing (Russian Airline)	Egypt	224	10/31/2015

B. Results

In this section I will briefly describe the results generated from the studies performed. I will first categorize the results into 2 sections: B1) the entire sample (1985-2015), and B2) the first and second half of the sample (1985-1999; 2000-2015). Within each section I will first describe the results generated by the indices, followed by the results generated by the individual securities. Following the results section will be a discussion detailing the implications these results have in regards to the overarching purpose of this study.

B.1 Entire Sample Period (1985-2000)

S&P 500

Table 4

S&P 500: This index is comprised of the top 500 large cap stocks in the U.S. and will provide insight into the effects of the message terrorists hope to convey on U.S. large cap stocks.

This table presents the average daily abnormal returns of the S&P 500 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero.

Panel A. Entire Sample Period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.24	-0.17	0.16	0.15	0.04	0.01	0.04	0.18	0.11	0.32	0.25
	3.00	2.90	2.66	2.02	1.23	0.91	1.74	1.86	1.54	2.00	2.25
	-0.08	-0.06	0.06	0.07	0.03	0.02	0.02	0.10	0.07	0.16	0.13
%Positive	53%	53%	58%	58%	59%	36%	54%	53%	56%	57%	59%
%Negative	47%	47%	42%	42%	41%	64%	46%	47%	44%	43%	41%

Panel B. First Half of Sample Period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.06	0.19	0.60	0.51	0.12	0.10	-0.15	0.04	0.12	0.36	0.12
	2.49	2.34	1.85	1.69	1.04	0.73	1.16	1.41	1.62	2.30	2.58
	0.02	0.08	0.32	0.30	0.12	0.13	-0.13	0.03	0.08	0.16	0.04
%Positive	54%	57%	69%	69%	60%	34%	49%	60%	60%	63%	63%
%Negative	46%	43%	31%	31%	40%	66%	51%	40%	40%	37%	37%

Panel C. Second Half of Sample Period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.39	-0.34	-0.05	-0.03	0.00	-0.02	0.12	0.25	0.11	0.29	0.32
	3.22	3.13	2.95	2.15	1.32	0.99	1.96	2.04	1.51	1.86	2.09
	-0.12	-0.11	-0.02	-0.01	0.00	-0.03	0.06	0.12	0.07	0.16	0.15
%Positive	53%	51%	53%	53%	58%	36%	57%	50%	54%	54%	57%
%Negative	47%	49%	47%	47%	42%	64%	43%	50%	46%	46%	43%

At day t (0) average abnormal return (AAR) was found to be 0.01 with a standard deviation of 0.91 and a Sharpe Ratio of 0.02 (Table 4-Panel A). Standard deviation decreased from 1.23 the previous day, t (-1), to 0.91 on the day of an attack. However, AAR continued to

an upward trend on day t (+1) into day t (+2) to 0.18 while both standard deviation and the Sharpe Ratio continued an upward trend well. On day t (+3), (Table 4-Panel A) AAR was found to decrease to 0.11 on decreasing volatility (1.86 to 1.54) and a decreasing Sharpe Ratio (0.10 to 0.07) before continuing an upward trend in AAR found in the days leading up to day t (0). In addition, on day t (0), 64 % of the attacks used in the sample had a negative AAR on day of the attack (Table 4-Panel A).

Russel 2000

Table 5

Russel 2000 index: Representing the 2000 small cap stocks, the Russel's 200 Index was chosen to analyze the effects of terrorist events on smaller companies as opposed to the S&P 500 which is comprised of mainly large cap stocks.

This table presents the average daily abnormal returns of the Russel's 2000 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction.

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-.34 3.46 -.10	-.24 3.27 -.07	.12 3.04 .04	.16 2.37 .07	.07 1.43 .05	.02 1.19 .02	0.00 1.87 0.00	.19 1.83 .10	.19 1.86 .10	.32 2.13 .15	.21 2.552 .08
% Positive	54%	58%	58%	55%	60%	42%	51%	57%	60%	64%	60%
% Negative	46%	42%	42%	45%	40%	58%	49%	43%	40%	36%	40%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.24 2.23 -.11	.09 2.05 .04	.37 1.66 .22	.46 1.45 .32	.20 .99 .20	.01 .70 .01	-.14 .99 -.14	0.00 1.34 0.00	.19 1.49 .13	.12 1.91 .06	-.14 2.58 -.05
%Positive	54%	63%	66%	66%	66%	43%	57%	63%	63%	63%	63%
%Negative	46%	37%	34%	34%	34%	57%	43%	37%	37%	37%	37%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.38 3.93 -.10	-0.40 3.71 -.11	0.00 3.51 0.00	0.02 2.70 .01	0.01 1.60 0.00	0.03 1.37 0.02	0.07 2.17 .03	0.28 2.03 .14	0.19 2.02 .09	0.41 2.23 .18	0.37 2.50 .15
%Positive	54%	55%	54%	50%	57%	42%	49%	54%	58%	65%	58%
%Negative	46%	45%	46%	50%	43%	58%	51%	46%	42%	35%	42%

Day t (0) found AAR to be 0.02, volatility at 1.19 and the Sharpe Ratio at 0.02 (Table 5-Panel A). The standard deviation decreased from 1.43 on the previous day, t (-1). On day t (+1),

AAR decreased to 0.00. However, standard increased to 1.87. Following the decrease in AAR at day t (+1), AAR increased on day t (+2) and day t (+3) to 0.19, as standard deviation remained similar and continued on the upward trend found in both the days leading up to t (0) (Table 5 - Panel A). Furthermore, on day t (0), 58% of the attacks used in the sample were found to have a negative AAR on the day of the attack (Table 5-Panel A).

Financial Times Stock Exchange

Table 6

Financial Times Stock Exchange 100 (FTSE): An index representing 100 companies on London's' Stock Exchange with the largest market capitalization, this index was chosen due to the recent terrorist events aimed at European countries and to analyze the patterns and message effectiveness.

This table presents the average daily abnormal returns of the FTSE 100 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-.13 2.60 -.05	-.13 2.51 -.05	-.04 1.97 -.02	.18 1.92 .09	.08 1.11 .07	-.12 1.25 -.09	.16 1.37 .11	.20 1.93 .10	.23 1.72 .13	.29 2.03 .14	.30 2.06 .15
%Positive	50%	49%	51%	55%	52%	34%	60%	57%	61%	58%	60%
%Negative	50%	51%	49%	45%	48%	66%	40%	43%	39%	42%	40%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.08 2.08 .04	.23 1.91 .12	.13 1.52 .08	.30 1.15 .26	.13 1.06 .12	-.05 .61 -.08	.10 1.24 .08	.02 1.49 .01	.24 1.78 .14	.44 2.24 .20	.43 2.14 .20
%Positive	43%	57%	51%	63%	51%	34%	69%	57%	63%	66%	63%
%Negative	57%	43%	49%	37%	49%	66%	31%	43%	37%	34%	37%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-.24 2.82 -.08	-.29 2.75 -.11	-.12 2.15 -.06	.12 2.19 .05	.05 1.13 .05	-.15 1.47 -.10	.18 1.43 .13	.28 2.11 .13	.22 1.70 .13	.22 1.93 .11	.25 2.04 .12
%Positive	54%	45%	51%	51%	53%	34%	55%	57%	59%	54%	58%
%Negative	46%	55%	49%	49%	47%	66%	45%	43%	41%	46%	42%

Day t (0) found AAR to be -0.12, with a standard deviation of 1.25 and a negative Sharpe Ratio of -0.09 (Table 6-Panel A). Standard deviation also increased from 1.11 to 1.25 on the

previous day, t (-1). This was followed by an increase in AAR and volatility on day t (+1) and day t (+2) to 0.20 and 1.93 respectfully (Table 6-Panel A). On day t (+3), a decrease in volatility, AAR and the Sharpe Ratio were found while AAR and standard deviation continued the upward trend into day t (+5). In addition, and consistent with the previous indices, 66% of the attacks used in the sample were found to have negative AAR on the day of the attack (Table 6-Panel A).

NIKKEI 225

Table 7

NIKKEI 225 Index: The price-weighted index for the Tokyo Stock Exchange, calculated daily by the NIKKEI Newspaper, this Index provides insight into the strength of the message in terrorist attacks in the most Eastern part of the globe and is the most widely quoted average of Japanese equities.

This table presents the average daily abnormal returns of the NIKKEI Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.50	-.23	-.17	-.11	.03	.07	.06	0.00	.07	.10	.29
	3.95	3.52	2.79	2.58	1.48	1.91	1.86	2.58	2.37	2.79	3.15
	-.13	-.07	-.06	-.04	.02	.04	.03	0.00	.03	.04	.09
%Positive	48%	53%	50%	55%	51%	40%	47%	48%	53%	53%	57%
%Negative	52%	47%	50%	45%	49%	60%	53%	52%	47%	47%	43%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.47	.13	.01	.07	.16	.26	-.15	-.33	.09	.09	.19
	4.21	3.79	2.80	2.80	1.60	2.56	1.37	2.49	2.14	2.87	3.00
	-.11	.03	0.00	.02	.10	.10	-.11	-.13	.04	.03	.06
%Positive	46%	57%	51%	63%	51%	34%	46%	37%	51%	49%	54%
%Negative	54%	43%	49%	37%	49%	66%	54%	63%	49%	51%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-.51	-.40	.25	-.19	-.03	-.02	.16	.15	.05	.10	.34
	3.85	3.40	2.80	2.48	1.43	1.52	2.05	2.62	2.49	2.78	3.24
	-.13	-.12	-.09	-.08	-.02	-.01	.08	.06	.02	.04	.11
%Positive	49%	51%	49%	51%	51%	43%	47%	53%	54%	55%	58%
%Negative	51%	49%	51%	49%	49%	57%	53%	47%	46%	45%	42%

Day t (0) AAR was found to be 0.07, with a standard deviation of 1.91 (up from 1.48 the previous day, t (-1)) and a Sharpe Ratio of 0.04 (Table 7-Panel A). On day t (+1), AAR decreased to 0.06 on a lower degree of standard deviation (1.86). This was followed by another

decrease in AAR on day t (+2) to 0.00 and a large increase in standard deviation (1.86 to 2.58). In addition, and consistent with the previous indices, 60% of the attacks used in the sample were found to have negative AAR on the day of the attack (Table 7-Panel A). However, the entire length of the sample window, day t (-5) to day t (+5), follows an upward trending pattern of AAR, volatility and Sharpe Ratio with the only measurable decrease in AAR and an increase in standard deviation occurring on day t (+3).

Amsterdam Exchange Index

Table 8

Amsterdam Exchange Index (AEX): Comprised of 25 of the most actively traded Dutch companies, the AEX provides another opportunity to analyze the effectiveness of the message terrorist organizations hope to convey when considering the aim terrorist organizations have taken towards European countries as of recent. This table presents the average daily abnormal returns of AEX within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.16	-0.13	0.00	0.20	0.09	-0.09	0.08	0.20	0.19	0.33	0.29
	3.27	3.15	2.64	2.44	1.34	1.50	1.78	2.10	2.10	2.34	2.70
	-0.05	-0.04	0.00	0.08	0.07	-0.06	0.05	0.10	0.09	0.14	0.11
Positive	51%	52%	57%	61%	53%	32%	52%	57%	60%	57%	58%
Negative	49%	48%	43%	39%	47%	68%	48%	43%	40%	43%	42%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	0.16	0.44	0.36	0.54	0.18	-0.12	-0.11	0.01	0.18	0.21	0.12
	3.03	2.34	2.42	1.75	1.36	1.01	1.72	1.86	2.35	2.19	2.67
	0.05	0.19	0.15	0.31	0.13	-0.12	-0.07	0.01	0.07	0.10	0.04
Positive	51%	60%	69%	69%	60%	29%	57%	54%	60%	60%	63%
Negative	49%	40%	31%	31%	40%	71%	43%	46%	40%	40%	37%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.31	-0.40	-0.17	0.04	0.05	-0.07	0.18	0.29	0.20	0.39	0.37
	3.39	3.45	2.74	2.71	1.34	1.68	1.81	2.21	1.99	2.41	2.73
	-0.09	-0.12	-0.06	0.01	0.04	-0.04	0.10	0.13	0.10	0.16	0.14
Positive	51%	49%	51%	57%	50%	34%	50%	58%	59%	55%	55%
Negative	49%	51%	49%	43%	50%	66%	50%	42%	41%	45%	45%

On Day t (0) AAR was found to be -0.09, with a standard deviation of 1.50 (up from 1.34 on the previous day, t (-1)) and a Sharpe Ratio of 0.04 (Table 8-Panel A). Day t (+1) would see the trend in increasing standard deviation continue measuring 1.78 and an AAR of 0.08. This

trend would continue for the life of the sample window ending on day t (+5) with a standard deviation of 2.70 and an AAR of 0.29. An AAR found on day t (-2) is 0.20 (increase from t (-3)), while standard deviation decreased from 2.64 to 2.44 (Table 8-Panel A). In addition, 61% of the attacks used in the sample were found to have a positive AAR. Furthermore, and consistent with the previous findings 68% of the events used in the sample had a negative AAR on the day the attack occurred on, t (0).

German Stock Index

Table 9

German Stock Index (DAX): Measuring the performance of the 30 largest German companies in terms of order book volume and market civilization, this is the last broad index analyzed to provide further analysis into measuring terror organizations communicative efforts.

This table presents the average daily abnormal returns of DAX within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.04	0.01	0.14	0.30	0.15	-0.14	0.17	0.30	0.34	0.50	0.46
	3.27	3.21	2.72	2.67	1.53	1.42	1.78	2.24	2.20	2.41	2.71
	-0.01	0.00	0.05	0.11	0.10	-0.10	0.10	0.13	0.15	0.21	0.17
%Positive	57%	54%	53%	59%	58%	33%	60%	59%	63%	58%	57%
%Negative	43%	46%	47%	41%	42%	67%	40%	41%	37%	42%	43%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	0.40	0.91	0.71	0.81	0.49	-0.16	-0.05	-0.04	0.28	0.22	0.01
	2.80	2.53	2.24	1.98	1.44	1.01	1.64	1.85	2.09	2.15	2.59
	0.14	0.36	0.32	0.41	0.34	-0.16	-0.03	-0.02	0.13	0.10	0.00
%Positive	66%	69%	66%	69%	63%	34%	54%	54%	66%	57%	46%
%Negative	34%	31%	34%	31%	37%	66%	46%	46%	34%	43%	54%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.24	-0.41	-0.13	0.06	-0.01	-0.13	0.28	0.46	0.37	0.63	0.67
	3.47	3.42	2.90	2.92	1.55	1.59	1.85	2.40	2.27	2.53	2.75
	0.15	-0.16	-0.10	0.06	0.02	-0.05	0.18	0.12	-0.04	0.21	0.06
%Positive	53%	47%	47%	54%	55%	32%	62%	61%	62%	58%	62%
%Negative	47%	53%	53%	46%	45%	68%	38%	39%	38%	42%	38%

On day t (0) AAR, standard deviation, and the Sharpe Ratio were found to be -0.14, 1.42, and -0.10 respectfully (Table 9-Panel A). This would be followed by an increase in both standard deviation (1.78) and AAR (0.17) on day t (+1). 60% of attacks used in the sample were found to

have a positive AAR on the day of the attack (67% the previous day, t (0)). This upward trend would continue for the life of the sample window, with day t (+4) having the highest AAR of 0.50 and a Sharpe Ratio of 0.15 (Table 9-Panel A).

Hess

Table 10

HESS Corporation: Hess is a company that produces, transports, and refines oil and natural gas from areas all over the world including the middle east, Europe, and eastern Asia. Choosing a variety of companies within the energy sector whom operate in the middle east affords the ability to narrow the focus in measuring the message terror attacks hope to convey.

This table presents the average daily abnormal returns of Hess Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	.15	-.44	.20	.24	.08	.14	-.10	.13	.10	.30	.32
	2.09	2.80	3.00	2.68	2.54	1.91	2.87	1.97	2.76	2.11	1.83
	.07	-.16	.07	.09	.03	.07	-.04	.06	.04	.14	.17
%Positive	50%	50%	52%	51%	52%	41%	46%	49%	54%	59%	53%
%Negative	50%	50%	48%	49%	48%	59%	54%	51%	46%	41%	47%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.20	-.48	.08	.28	.46	.39	-.20	-.16	.34	.29	.26
	1.49	2.41	2.36	1.79	2.16	1.21	1.59	1.54	1.37	1.71	1.74
	-.14	-.20	.03	.16	.21	.33	-.12	-.10	.25	.17	.15
%Positive	51%	51%	54%	51%	57%	37%	40%	43%	51%	54%	54%
%Negative	49%	49%	46%	49%	43%	63%	60%	57%	49%	46%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	.12	.32	-.42	.26	.22	-.10	.02	-.06	.26	-.01	.31
	1.60	2.31	2.99	3.28	3.02	2.70	2.16	3.32	2.15	3.22	2.29
	.07	.14	-.14	.08	.07	-.04	.01	-.02	.12	0.00	.14
%Positive	50%	50%	51%	51%	50%	43%	49%	51%	55%	61%	53%
%Negative	50%	50%	49%	49%	50%	57%	51%	49%	45%	39%	47%

On day t (-4) AAR decreased from .15 on the previous day, t (-5), to -.44 (Table 10-Panel A). Measuring an increase in standard deviation from 2.09 to 2.80. Standard deviation increased again on day t (-3) to 3.00, while AAR increased to 0.20. The day prior to an attack, t (-1), AAR

measured 0.08 with standard deviation at 2.54 and a Sharpe Ratio of 0.03. On day t (0), AAR increased to 0.14 with standard deviation decreasing to 1.91 and the Sharpe Ratio decreasing to 0.07. In addition, 59% of attacks used in the sample were found to have a negative AAR on the day an attack (Table 10-Panel A). The day following an attack, t (+1), AAR decreased to -0.10 and standard deviation increased to 2.87, with 54% of the attacks used in the sample having a negative AAR on the day of an attack.

FedEx

Table 11

FEDEX Corp: FedEx is one of the world's largest companies in the courier industry, which makes it a reliable tool to measure the message contained within terror attacks.

This table presents the average daily abnormal returns of FedEx Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.05	0.03	0.42	0.31	0.02	0.11	-0.14	0.02	-0.17	0.01	-0.05
	4.29	3.91	3.87	3.02	1.85	1.48	2.22	2.57	3.15	3.65	3.95
	-0.01	0.01	0.11	0.10	0.01	0.08	-0.06	0.01	-0.06	0.00	-0.01
%Positive	51%	50%	53%	56%	53%	38%	46%	50%	49%	54%	54%
%Negative	49%	50%	47%	44%	47%	62%	54%	50%	51%	46%	46%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	1.59	1.43	1.62	1.06	0.08	0.16	-0.41	-0.01	-0.57	-0.45	-0.73
	5.29	4.42	3.79	3.19	2.08	1.75	2.49	3.28	4.33	5.05	5.11
	0.30	0.32	0.43	0.33	0.04	0.09	-0.17	0.00	-0.13	-0.09	-0.14
%Positive	69%	69%	71%	66%	49%	37%	49%	51%	46%	54%	54%
%Negative	31%	31%	29%	34%	51%	63%	51%	49%	54%	46%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.83	-0.64	-0.15	-0.05	-0.01	0.09	-0.01	0.04	0.01	0.23	0.27
	3.50	3.48	3.80	2.89	1.74	1.34	2.09	2.18	2.41	2.77	3.25
	-0.24	-0.18	-0.04	-0.02	-0.01	0.07	-0.01	0.02	0.01	0.08	0.08
%Positive	43%	41%	45%	51%	55%	38%	45%	50%	50%	54%	54%
%Negative	57%	59%	55%	49%	45%	62%	55%	50%	50%	46%	46%

On day t (-3) AAR was found to be 0.42, increasing from -0.05 on day t (-5) (Table 11-Panel A). In addition, standard deviation decreased from 4.29 on day t (-5) and 3.87 on day t (-3). AAR would continue to decrease until day t (0), which measured an AAR of 0.11 (up from

0.02 on day t (-1)) and volatility at 1.48 (down from 1.85 on day t (-1)) (Table 11-Panel A). Furthermore, 62% of attacks used in the sample had a negative AAR on the day of an event, t (0), which is up from 42% the day before (Table 11-Panel A). The day following the event, t (+1), AAR was found to decrease to -0.14, with a standard deviation of 2.22 (up from 1.48).

Southwest Airlines

Table 12

SOUTHWEST AIRLINES: While Southwest Airlines only operates within the United States, it is the only airline that has been publicly traded for the entire sample period being studied. Due to the airline industry being heavily involved in terrorist attacks over the past 30 years, Southwest Airlines will be a reliable tool to measure the communicative efforts not only in the airline industry, but the tourism industry as well.

This table presents the average daily abnormal returns of Southwest Airlines within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	0.23	-0.08	0.37	0.44	0.19	-0.24	-0.12	0.10	0.11	0.46	0.20
	4.40	3.77	3.67	3.27	1.88	2.26	2.56	3.67	3.98	4.71	5.08
	-0.05	-0.02	0.10	0.14	0.10	-0.10	-0.05	0.03	0.03	0.10	0.04
%Positive	46%	50%	57%	52%	51%	31%	47%	51%	48%	52%	52%
%Negative	54%	50%	43%	48%	49%	69%	53%	49%	52%	48%	48%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-0.08	0.10	1.24	0.77	-0.09	0.17	-0.17	0.23	0.34	0.47	0.33
	4.54	4.05	3.46	3.29	1.86	2.49	3.08	4.53	4.65	5.67	6.33
	-0.02	0.03	0.36	0.23	-0.05	0.07	-0.06	0.05	0.07	0.08	0.05
%Positive	49%	46%	63%	54%	46%	34%	46%	57%	54%	57%	57%
%Negative	51%	54%	37%	46%	54%	66%	54%	43%	46%	43%	43%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.30	-0.17	-0.04	0.29	0.32	-0.43	-0.10	0.04	0.01	0.46	0.14
	4.36	3.65	3.71	3.27	1.88	2.13	2.30	3.22	3.65	4.22	4.42
	-0.07	-0.05	-0.01	0.09	0.17	-0.20	-0.04	0.01	0.00	0.11	0.03
%Positive	45%	51%	54%	51%	54%	30%	47%	49%	45%	50%	50%
%Negative	55%	49%	46%	49%	46%	70%	53%	51%	55%	50%	50%

On the day of an event, t (0), standard deviation increased from 1.88 on day t (-1) to 2.26 on the day t (0), while AAR decreased from 0.19 to -0.24 (Table 12-Panel A). In addition, 69%

of attacks used in the sample had a negative AAR on the day of the event, up from 49% the previous day. The day following the event, t (+1), was found to have an increase in both standard deviation (2.56), AAR (-0.12) and the Sharpe Ratio (from -0.10 to -0.50). The following days, t (+1) to t (+5) would see increases in standard deviation up to 5.08 on day t (+5) with AAR trending up to 0.46 on day t (+4) (Table 12-Panel A).

Olin Corp

Table 13

OLIN Corporation: Olin Corp is a manufacturer and distributor of chemical products and ammunition. As terrorist organizations continue to use an array of weaponry to spread fear and bring more to their cause, the ability to measure the effects of the message contained within an attack on a weapons manufacturer and distributor is important in assessing the strength of the message terrorist organizations hope to convey,

This table presents the average daily abnormal returns of Olin Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.12	-0.04	0.15	0.28	0.12	-0.16	0.26	0.42	0.22	0.35	0.25
	5.02	4.68	4.12	3.21	1.98	1.58	3.15	3.49	3.14	4.11	4.51
	-0.02	-0.01	0.04	0.09	0.06	-0.10	0.08	0.12	0.07	0.08	0.06
%Positive	51%	54%	50%	50%	45%	33%	53%	54%	57%	53%	51%
%Negative	49%	46%	50%	50%	55%	67%	47%	46%	43%	47%	49%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-0.21	0.09	0.28	0.56	0.17	0.00	0.03	-0.05	-0.04	-0.07	-0.04
	4.33	3.89	2.95	2.83	1.59	0.88	1.57	2.18	2.71	3.44	4.39
	-0.05	0.02	0.10	0.20	0.11	0.00	0.02	-0.02	-0.01	-0.02	-0.01
%Positive	54%	63%	54%	51%	40%	31%	51%	43%	51%	49%	49%
%Negative	46%	37%	46%	49%	60%	69%	49%	57%	49%	51%	51%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.08	-0.10	0.08	0.14	0.09	-0.24	0.36	0.64	0.35	0.54	0.38
	5.34	5.04	4.58	3.39	2.16	1.82	3.67	3.95	3.33	4.39	4.59
	-0.01	-0.02	0.02	0.04	0.04	-0.13	0.10	0.16	0.10	0.12	0.08
%Positive	50%	50%	47%	49%	47%	34%	54%	59%	59%	55%	53%
%Negative	50%	50%	53%	51%	53%	66%	46%	41%	41%	45%	47%

Day t (-5) to day t (-1) would follow a similar trend of increasing AAR and decreasing standard deviation, similar to the index results listed above (Table 13-Panel A). On day t (0) an

AAR of -0.16 was found, down from 0.12 the previous day, t (-1). In addition, standard deviation measured 1.58 with a Sharpe Ratio of -0.10 and 67% of the attacks used in the sample having a negative AAR on the day of the attack, t (0) (Table 13-Panel A). Day t (+1) found an enormous jump in standard deviation to 3.15, and an AAR measure of 0.26.

Nippon Yusen Kaisha

Table 14

NIPPON YUSEN KAISHA (NYK): NYK operates as one of the largest shipping companies in the world and is a member of the Mitsubishi Zaibatsu.

This table presents the average daily abnormal returns of the Nippon Yusen Kaisha within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.95	-0.67	-0.57	-0.34	0.10	0.40	-0.16	-0.26	-0.32	-0.41	-0.49
	5.14	4.45	3.62	3.34	1.99	2.65	2.53	3.31	4.06	4.30	4.65
	-0.18	-0.15	-0.16	-0.10	0.05	0.15	-0.06	-0.08	-0.08	-0.10	-0.11
%Positive	50%	49%	44%	41%	46%	37%	40%	45%	45%	48%	45%
%Negative	50%	51%	56%	59%	54%	63%	60%	55%	55%	52%	55%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-1.62	-1.12	-1.39	-1.30	-0.20	0.82	-0.82	-1.16	-0.62	-1.03	-1.56
	4.97	3.92	3.47	2.92	1.98	3.00	2.41	3.78	4.15	4.70	4.93
	-0.33	-0.29	-0.40	-0.45	-0.10	0.27	-0.34	-0.31	-0.15	-0.22	-0.32
%Positive	40%	37%	34%	23%	40%	34%	29%	29%	37%	34%	29%
%Negative	60%	63%	66%	77%	60%	66%	71%	71%	63%	66%	71%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.62	-0.45	-0.18	0.12	0.25	0.20	0.16	0.17	-0.18	-0.12	0.01
	5.22	4.70	3.65	3.45	1.99	2.47	2.53	3.00	4.04	4.10	4.46
	-0.12	-0.10	-0.05	0.03	0.12	0.08	0.06	0.06	-0.05	-0.03	0.00
%Positive	54%	54%	49%	50%	49%	38%	46%	53%	49%	54%	53%
%Negative	46%	46%	51%	50%	51%	62%	54%	47%	51%	46%	47%

On day t (-1), AAR measured 0.10 (up from -0.34 the previous day) and standard deviation decreasing substantially from 3.34 on day t (-2) to 1.99 on day t (-1) (Table 14-Panel A). On the day of the event, AAR measured another increase in AAR (0.40 from 0.10) and

another increase in standard deviation (2.65 from 1.99). However, day t (+1) would register a large decrease in AAR in comparison to the day of the event (-0.16 from 0.40) with roughly the same standard deviation. The days that followed would see increases in standard deviation and a downtrend in AAR would ensue, moving from -0.26 on day t (+2) to -0.49 on day t (+5) (Table 14-Panel A).

B.2 First half of the sample (1985-1999) vs Second Half of the Sample (2000-2015)

S&P 500 (Table 4)

Table 4

S&P 500: This index is comprised of the top 500 large cap stocks in the U.S. and will provide insight into the effects of the message terrorists hope to convey on U.S. large cap stocks.

This table presents the average daily abnormal returns of the S&P 500 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero.

Panel A. Entire Sample Period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.24	-0.17	0.16	0.15	0.04	0.01	0.04	0.18	0.11	0.32	0.25
	3.00	2.90	2.66	2.02	1.23	0.91	1.74	1.86	1.54	2.00	2.25
	-0.08	-0.06	0.06	0.07	0.03	0.02	0.02	0.10	0.07	0.16	0.13
%Positive	53%	53%	58%	58%	59%	36%	54%	53%	56%	57%	59%
%Negative	47%	47%	42%	42%	41%	64%	46%	47%	44%	43%	41%

Panel B. First Half of Sample Period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.06	0.19	0.60	0.51	0.12	0.10	-0.15	0.04	0.12	0.36	0.12
	2.49	2.34	1.85	1.69	1.04	0.73	1.16	1.41	1.62	2.30	2.58
	0.02	0.08	0.32	0.30	0.12	0.13	-0.13	0.03	0.08	0.16	0.04
%Positive	54%	57%	69%	69%	60%	34%	49%	60%	60%	63%	63%
%Negative	46%	43%	31%	31%	40%	66%	51%	40%	40%	37%	37%

Panel C. Second Half of Sample Period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.39	-0.34	-0.05	-0.03	0.00	-0.02	0.12	0.25	0.11	0.29	0.32
	3.22	3.13	2.95	2.15	1.32	0.99	1.96	2.04	1.51	1.86	2.09
	-0.12	-0.11	-0.02	-0.01	0.00	-0.03	0.06	0.12	0.07	0.16	0.15
%Positive	53%	51%	53%	53%	58%	36%	57%	50%	54%	54%	57%
%Negative	47%	49%	47%	47%	42%	64%	43%	50%	46%	46%	43%

From the days prior to an attack, t (-5) to t (-4), both halves of the sample period (Table 4-Panel B and C) follow a similar upward trend in AAR, standard deviation and Sharpe Ration. Table 4-Panel C shows AAR at t (-5) to be .06, standard deviation at 2.49 and a Sharpe Ratio of

0.02, which increases into t (-2) where AAR, standard deviation and Sharpe Ratio are 0.51, 1.69 and 0.30 respectfully. Prior to the day of an event, t (-1), AAR is found to decrease to 0.12, with a standard deviation of 1.04 and a Share Ratio of 0.12. The day following an attack, t (+1), in the first half of the sample, AAR was found to be -0.15, with a standard deviation of 1.16 and a Sharpe Ratio of -0.13. In the second half of the sample, (Table 4-Panel C) AAR was found to be 0.12, with a standard deviation of 1.96 and a Sharpe Ratio of 0.06. The negative reactions found on t (+1) in the first half of the sample (Table 4-Panel B) and on the day of the event, t (0), in the second half of the sample, (Table 4-Panel C), could indicate that prior to increases in the use of digital devices and access to instantaneous news, reactions to terror attacks in the market occur slower due to the limited access of news prior to 2010 directly leading into a main question of this study.

Russel's 2000 Index (Table 5)

Table 5

Russel 2000 index: Representing the 2000 small cap stocks, the Russel's 200 Index was chosen to analyze the effects of terrorist events on smaller companies as opposed to the S&P 500 which is comprised of mainly large cap stocks.

This table presents the average daily abnormal returns of the Russel's 2000 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction.

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-.34 3.46 -.10	-.24 3.27 -.07	.12 3.04 .04	.16 2.37 .07	.07 1.43 .05	.02 1.19 .02	0.00 1.87 0.00	.19 1.83 .10	.19 1.86 .10	.32 2.13 .15	.21 2.552 .08
% Positive	54%	58%	58%	55%	60%	42%	51%	57%	60%	64%	60%
% Negative	46%	42%	42%	45%	40%	58%	49%	43%	40%	36%	40%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.24 2.23 -.11	.09 2.05 .04	.37 1.66 .22	.46 1.45 .32	.20 .99 .20	.01 .70 .01	-.14 .99 -.14	0.00 1.34 0.00	.19 1.49 .13	.12 1.91 .06	-.14 2.58 -.05
%Positive	54%	63%	66%	66%	66%	43%	57%	63%	63%	63%	63%
%Negative	46%	37%	34%	34%	34%	57%	43%	37%	37%	37%	37%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.38 3.93 -.10	-0.40 3.71 -.11	0.00 3.51 0.00	0.02 2.70 .01	0.01 1.60 0.00	0.03 1.37 0.02	0.07 2.17 .03	0.28 2.03 .14	0.19 2.02 .09	0.41 2.23 .18	0.37 2.50 .15
%Positive	54%	55%	54%	50%	57%	42%	49%	54%	58%	65%	58%
%Negative	46%	45%	46%	50%	43%	58%	51%	46%	42%	35%	42%

On the day following an attack, t (+1), in the first half of the sample (Table 5-Panel B), AAR was found to be at -0.14 with an increase in standard deviation from 0.70 to 0.99 from the previous day t (0), consistent with the findings from the previous index. While the second half of

the sample experienced increased amounts in standard deviation on the days following an attack (Table 5-Panel C), AAR continued on an upward trend starting at t (-1) (AAR=0.01). This leads directly into one of the questions fueling this study: if the effects terror attacks have on the financial market place seen a considerable change from prior to the digital era until now?

FTSE (Table 6)

Table 6

Financial Times Stock Exchange 100 (FTSE): An index representing 100 companies on London's' Stock Exchange with the largest market capitalization, this index was chosen due to the recent terrorist events aimed at European countries and to analyze the patterns and message effectiveness.

This table presents the average daily abnormal returns of the FTSE 100 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-.13 2.60 -.05	-.13 2.51 -.05	-.04 1.97 -.02	.18 1.92 .09	.08 1.11 .07	-.12 1.25 -.09	.16 1.37 .11	.20 1.93 .10	.23 1.72 .13	.29 2.03 .14	.30 2.06 .15
%Positive	50%	49%	51%	55%	52%	34%	60%	57%	61%	58%	60%
%Negative	50%	51%	49%	45%	48%	66%	40%	43%	39%	42%	40%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.08 2.08 .04	.23 1.91 .12	.13 1.52 .08	.30 1.15 .26	.13 1.06 .12	-.05 .61 -.08	.10 1.24 .08	.02 1.49 .01	.24 1.78 .14	.44 2.24 .20	.43 2.14 .20
%Positive	43%	57%	51%	63%	51%	34%	69%	57%	63%	66%	63%
%Negative	57%	43%	49%	37%	49%	66%	31%	43%	37%	34%	37%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-.24 2.82 -.08	-.29 2.75 -.11	-.12 2.15 -.06	.12 2.19 .05	.05 1.13 .05	-.15 1.47 -.10	.18 1.43 .13	.28 2.11 .13	.22 1.70 .13	.22 1.93 .11	.25 2.04 .12
%Positive	54%	45%	51%	51%	53%	34%	55%	57%	59%	54%	58%
%Negative	46%	55%	49%	49%	47%	66%	45%	43%	41%	46%	42%

On the day of an attack, t (0), in the first half of the sample (Table 6-Panel B), AAR is -0.15 (down from 0.13 the previous day). However, standard deviation is 0.61. Conversely, on the

same day in the second half of the sample, (Table 6-Panel C), AAR was found to be -0.15 with a standard deviation of 1.47 (up from 1.13 the previous day) which could indicate that the increase in technology and news sources allows for a terror organizations message to be felt within the market sooner. In addition, in the second half of the sample (Table 6-Panel C), a trend consistent with the previous indices of the study is apparent. An increase in both standard deviation and AAR from day t (0) into day t (+2) is found, which is followed by a decrease in AAR and standard deviation on day t (+3).

Nikkei (Table 7)

Table 7

NIKKEI 225 Index: The price-weighted index for the Tokyo Stock Exchange, calculated daily by the NIKKEI Newspaper, this Index provides insight into the strength of the message in terrorist attacks in the most Eastern part of the globe and is the most widely quoted average of Japanese equities.

This table presents the average daily abnormal returns of the NIKKEI Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.50	-.23	-.17	-.11	.03	.07	.06	0.00	.07	.10	.29
	3.95	3.52	2.79	2.58	1.48	1.91	1.86	2.58	2.37	2.79	3.15
	-.13	-.07	-.06	-.04	.02	.04	.03	0.00	.03	.04	.09
%Positive	48%	53%	50%	55%	51%	40%	47%	48%	53%	53%	57%
%Negative	52%	47%	50%	45%	49%	60%	53%	52%	47%	47%	43%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.47	.13	.01	.07	.16	.26	-.15	-.33	.09	.09	.19
	4.21	3.79	2.80	2.80	1.60	2.56	1.37	2.49	2.14	2.87	3.00
	-.11	.03	0.00	.02	.10	.10	-.11	-.13	.04	.03	.06
%Positive	46%	57%	51%	63%	51%	34%	46%	37%	51%	49%	54%
%Negative	54%	43%	49%	37%	49%	66%	54%	63%	49%	51%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-.51	-.40	.25	-.19	-.03	-.02	.16	.15	.05	.10	.34
	3.85	3.40	2.80	2.48	1.43	1.52	2.05	2.62	2.49	2.78	3.24
	-.13	-.12	-.09	-.08	-.02	-.01	.08	.06	.02	.04	.11
%Positive	49%	51%	49%	51%	51%	43%	47%	53%	54%	55%	58%
%Negative	51%	49%	51%	49%	49%	57%	53%	47%	46%	45%	42%

On the day of an attack, t (0), in the first half of the sample (Table 7-Panel B), a considerable increase in both AAR and standard deviation is found. AAR increased from 0.16 on day t (-1), to 0.26, while standard deviation increases from 1.60 on t (-1) to 2.56. This is then

followed by a subsequent drop in AAR and standard deviation on day t (+1), consistent with previous findings. However, AAR on day t (+2) continues to decrease to -0.33 on a larger amount of standard deviation (2.49). The trend specified in the previous section is also apparent (Table 7-Panel C) from day t (0) to day t (+3) which can also be found in Table 6-Panel C below.

Financial Times Stock Exchange 100 (FTSE): An index representing 100 companies on London's' Stock Exchange with the largest market capitalization, this index was chosen due to the recent terrorist events aimed at European countries and to analyze the patterns and message effectiveness.

This table presents the average daily abnormal returns of the FTSE 100 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-.13 2.60 -.05	-.13 2.51 -.05	-.04 1.97 -.02	.18 1.92 .09	.08 1.11 .07	-.12 1.25 -.09	.16 1.37 .11	.20 1.93 .10	.23 1.72 .13	.29 2.03 .14	.30 2.06 .15
%Positive	50%	49%	51%	55%	52%	34%	60%	57%	61%	58%	60%
%Negative	50%	51%	49%	45%	48%	66%	40%	43%	39%	42%	40%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.08 2.08 .04	.23 1.91 .12	.13 1.52 .08	.30 1.15 .26	.13 1.06 .12	-.05 .61 -.08	.10 1.24 .08	.02 1.49 .01	.24 1.78 .14	.44 2.24 .20	.43 2.14 .20
%Positive	43%	57%	51%	63%	51%	34%	69%	57%	63%	66%	63%
%Negative	57%	43%	49%	37%	49%	66%	31%	43%	37%	34%	37%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-.24 2.82 -.08	-.29 2.75 -.11	-.12 2.15 -.06	.12 2.19 .05	.05 1.13 .05	-.15 1.47 -.10	.18 1.43 .13	.28 2.11 .13	.22 1.70 .13	.22 1.93 .11	.25 2.04 .12
%Positive	54%	45%	51%	51%	53%	34%	55%	57%	59%	54%	58%
%Negative	46%	55%	49%	49%	47%	66%	45%	43%	41%	46%	42%

Table 6

German Stock Index (Table 9)

Table 9

German Stock Index (DAX): Measuring the performance of the 30 largest German companies in terms of order book volume and market civilization, this is the last broad index analyzed to provide further analysis into measuring terror organizations communicative efforts.

This table presents the average daily abnormal returns of DAX within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.04	0.01	0.14	0.30	0.15	-0.14	0.17	0.30	0.34	0.50	0.46
	3.27	3.21	2.72	2.67	1.53	1.42	1.78	2.24	2.20	2.41	2.71
	-0.01	0.00	0.05	0.11	0.10	-0.10	0.10	0.13	0.15	0.21	0.17
%Positive	57%	54%	53%	59%	58%	33%	60%	59%	63%	58%	57%
%Negative	43%	46%	47%	41%	42%	67%	40%	41%	37%	42%	43%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	0.40	0.91	0.71	0.81	0.49	-0.16	-0.05	-0.04	0.28	0.22	0.01
	2.80	2.53	2.24	1.98	1.44	1.01	1.64	1.85	2.09	2.15	2.59
	0.14	0.36	0.32	0.41	0.34	-0.16	-0.03	-0.02	0.13	0.10	0.00
%Positive	66%	69%	66%	69%	63%	34%	54%	54%	66%	57%	46%
%Negative	34%	31%	34%	31%	37%	66%	46%	46%	34%	43%	54%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.24	-0.41	-0.13	0.06	-0.01	-0.13	0.28	0.46	0.37	0.63	0.67
	3.47	3.42	2.90	2.92	1.55	1.59	1.85	2.40	2.27	2.53	2.75
	0.15	-0.16	-0.10	0.06	0.02	-0.05	0.18	0.12	-0.04	0.21	0.06
%Positive	53%	47%	47%	54%	55%	32%	62%	61%	62%	58%	62%
%Negative	47%	53%	53%	46%	45%	68%	38%	39%	38%	42%	38%

On day t (-1), AAR and standard deviation (0.81; 1.98) in the first half of the sample (Table 9-Panel B) begin a downward trend which stops on the day of the event, t (0), with AAR and standard deviation measuring to be -0.16 and 1.01 respectfully. AAR and standard deviation

follow an upward trend which is consistent with the trend specified in the second half of the sample period (Table 9-Panel C). On the day of an attack, t (0), in the second half of the sample period (Table 9-Panel C), AAR is found to be -0.13 with a standard deviation of 1.59 (increase from the previous day t (-1)). This is consistent with findings in the previous index studies which ties back into the instantaneous availability of information in the second half of the sample period indicating that the effect of a terror organizations message is felt in the market sooner than the first half of the sample period (Table 9-Panel B).

Hess Corporation (Table 10)

Table 10

HESS Corporation: Hess is a company that produces, transports, and refines oil and natural gas from areas all over the world including the middle east, Europe, and eastern Asia. Choosing a variety of companies within the energy sector whom operate in the middle east affords the ability to narrow the focus in measuring the message terror attacks hope to convey.

This table presents the average daily abnormal returns of Hess Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	.15	-.44	.20	.24	.08	.14	-.10	.13	.10	.30	.32
	2.09	2.80	3.00	2.68	2.54	1.91	2.87	1.97	2.76	2.11	1.83
	.07	-.16	.07	.09	.03	.07	-.04	.06	.04	.14	.17
%Positive	50%	50%	52%	51%	52%	41%	46%	49%	54%	59%	53%
%Negative	50%	50%	48%	49%	48%	59%	54%	51%	46%	41%	47%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.20	-.48	.08	.28	.46	.39	-.20	-.16	.34	.29	.26
	1.49	2.41	2.36	1.79	2.16	1.21	1.59	1.54	1.37	1.71	1.74
	-.14	-.20	.03	.16	.21	.33	-.12	-.10	.25	.17	.15
%Positive	51%	51%	54%	51%	57%	37%	40%	43%	51%	54%	54%
%Negative	49%	49%	46%	49%	43%	63%	60%	57%	49%	46%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	.12	.32	-.42	.26	.22	-.10	.02	-.06	.26	-.01	.31
	1.60	2.31	2.99	3.28	3.02	2.70	2.16	3.32	2.15	3.22	2.29
	.07	.14	-.14	.08	.07	-.04	.01	-.02	.12	0.00	.14
%Positive	50%	50%	51%	51%	50%	43%	49%	51%	55%	61%	53%
%Negative	50%	50%	49%	49%	50%	57%	51%	49%	45%	39%	47%

AAR and standard deviation on day t (+1), in the first half of the sample (Table 10-Panel B), is found to be -0.20 and 1.59 respectfully. In comparison to the day of the terror attack, t (0), this remains consistent with the previous index studies and ties back into the previous indication

that prior to the wide spread availability of information, markets would react at a slower pace as news slowly circulated. In addition, standard deviation at t (-5) for both halves of the sample (Table 10-Panel B and C) are lower than all other samples studied. In the first half of the sample (Table 10-Panel B), standard deviation is 1.49 while in the second half of the sample (Table 10-Panel C), standard deviation is 1.60. Furthermore, standard deviations from the day of an attack, t (0), to the end of the sample window, t (+5), are all below 2.00 indicating a lower level of volatility over the second half of the sample window in comparison to the second half of the sample period (Table 10-Panel C).

FedEx Corp (Table 11)

Table 11

FEDEX Corp: FedEx is one of the world's largest companies in the courier industry, which makes it a reliable tool to measure the message contained within terror attacks.

This table presents the average daily abnormal returns of FedEx Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.05	0.03	0.42	0.31	0.02	0.11	-0.14	0.02	-0.17	0.01	-0.05
	4.29	3.91	3.87	3.02	1.85	1.48	2.22	2.57	3.15	3.65	3.95
	-0.01	0.01	0.11	0.10	0.01	0.08	-0.06	0.01	-0.06	0.00	-0.01
%Positive	51%	50%	53%	56%	53%	38%	46%	50%	49%	54%	54%
%Negative	49%	50%	47%	44%	47%	62%	54%	50%	51%	46%	46%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	1.59	1.43	1.62	1.06	0.08	0.16	-0.41	-0.01	-0.57	-0.45	-0.73
	5.29	4.42	3.79	3.19	2.08	1.75	2.49	3.28	4.33	5.05	5.11
	0.30	0.32	0.43	0.33	0.04	0.09	-0.17	0.00	-0.13	-0.09	-0.14
%Positive	69%	69%	71%	66%	49%	37%	49%	51%	46%	54%	54%
%Negative	31%	31%	29%	34%	51%	63%	51%	49%	54%	46%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.83	-0.64	-0.15	-0.05	-0.01	0.09	-0.01	0.04	0.01	0.23	0.27
	3.50	3.48	3.80	2.89	1.74	1.34	2.09	2.18	2.41	2.77	3.25
	-0.24	-0.18	-0.04	-0.02	-0.01	0.07	-0.01	0.02	0.01	0.08	0.08
%Positive	43%	41%	45%	51%	55%	38%	45%	50%	50%	54%	54%
%Negative	57%	59%	55%	49%	45%	62%	55%	50%	50%	46%	46%

From the day of an attack, t (0), in the first half of the sample (Table 11-Panel B), to the end of the sample window, t (+5), standard deviation increases at a considerable rate from 1.75 at t (0) to 5.11 at t (+5). AAR during this time as a result is highly volatile (Table 11-Panel B).

However, less volatility can be seen in the same period in the second half of the sample (Table 11-Panel C) which ties into my expectation that the increased amounts of information within the markets would increase the efficiency of the markets, according to EMH.

Southwest Airlines (Table 12)

Table 12

SOUTHWEST AIRLINES: While Southwest Airlines only operates within the United States, it is the only airline that has been publicly traded for the entire sample period being studied. Due to the airline industry being heavily involved in terrorist attacks over the past 30 years, Southwest Airlines will be a reliable tool to measure the communicative efforts not only in the airline industry, but the tourism industry as well.

This table presents the average daily abnormal returns of Southwest Airlines within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	0.23	-0.08	0.37	0.44	0.19	-0.24	-0.12	0.10	0.11	0.46	0.20
	4.40	3.77	3.67	3.27	1.88	2.26	2.56	3.67	3.98	4.71	5.08
	-0.05	-0.02	0.10	0.14	0.10	-0.10	-0.05	0.03	0.03	0.10	0.04
%Positive	46%	50%	57%	52%	51%	31%	47%	51%	48%	52%	52%
%Negative	54%	50%	43%	48%	49%	69%	53%	49%	52%	48%	48%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-0.08	0.10	1.24	0.77	-0.09	0.17	-0.17	0.23	0.34	0.47	0.33
	4.54	4.05	3.46	3.29	1.86	2.49	3.08	4.53	4.65	5.67	6.33
	-0.02	0.03	0.36	0.23	-0.05	0.07	-0.06	0.05	0.07	0.08	0.05
%Positive	49%	46%	63%	54%	46%	34%	46%	57%	54%	57%	57%
%Negative	51%	54%	37%	46%	54%	66%	54%	43%	46%	43%	43%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.30	-0.17	-0.04	0.29	0.32	-0.43	-0.10	0.04	0.01	0.46	0.14
	4.36	3.65	3.71	3.27	1.88	2.13	2.30	3.22	3.65	4.22	4.42
	-0.07	-0.05	-0.01	0.09	0.17	-0.20	-0.04	0.01	0.00	0.11	0.03
%Positive	45%	51%	54%	51%	54%	30%	47%	49%	45%	50%	50%
%Negative	55%	49%	46%	49%	46%	70%	53%	51%	55%	50%	50%

The first half of the sample (Table 12-Panel B) contains a similar amount of volatility found in the previous study (Table 11-Panel B; below) with standard deviation on the day of an attack, t (0), being 2.49 and moving to 6.33 at the end of the sample window t (+5) (Table 12-Panel B).

FEDEX Corp: FedEx is one of the world's largest companies in the courier industry, which makes it a reliable tool to measure the message contained within terror attacks.

This table presents the average daily abnormal returns of FedEx Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.05	0.03	0.42	0.31	0.02	0.11	-0.14	0.02	-0.17	0.01	-0.05
	4.29	3.91	3.87	3.02	1.85	1.48	2.22	2.57	3.15	3.65	3.95
	-0.01	0.01	0.11	0.10	0.01	0.08	-0.06	0.01	-0.06	0.00	-0.01
%Positive	51%	50%	53%	56%	53%	38%	46%	50%	49%	54%	54%
%Negative	49%	50%	47%	44%	47%	62%	54%	50%	51%	46%	46%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	1.59	1.43	1.62	1.06	0.08	0.16	-0.41	-0.01	-0.57	-0.45	-0.73
	5.29	4.42	3.79	3.19	2.08	1.75	2.49	3.28	4.33	5.05	5.11
	0.30	0.32	0.43	0.33	0.04	0.09	-0.17	0.00	-0.13	-0.09	-0.14
%Positive	69%	69%	71%	66%	49%	37%	49%	51%	46%	54%	54%
%Negative	31%	31%	29%	34%	51%	63%	51%	49%	54%	46%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.83	-0.64	-0.15	-0.05	-0.01	0.09	-0.01	0.04	0.01	0.23	0.27
	3.50	3.48	3.80	2.89	1.74	1.34	2.09	2.18	2.41	2.77	3.25
	-0.24	-0.18	-0.04	-0.02	-0.01	0.07	-0.01	0.02	0.01	0.08	0.08
%Positive	43%	41%	45%	51%	55%	38%	45%	50%	50%	54%	54%
%Negative	57%	59%	55%	49%	45%	62%	55%	50%	50%	46%	46%

Table 11

In addition, in both halves of the sample period (Table 12-Panel B and C), standard deviation increases from the day prior to an attack, (t-1), to the day of an attack, t (0). In the second half of the sample (Table 12-panel C), the AAR on the day of an attack is -0.43 (from 0.32 the previous day).

Olin Corp (Table 13)

Table 13

OLIN Corporation: Olin Corp is a manufacturer and distributor of chemical products and ammunition. As terrorist organizations continue to use an array of weaponry to spread fear and bring more to their cause, the ability to measure the effects of the message contained within an attack on a weapons manufacturer and distributor is important in assessing the strength of the message terrorist organizations hope to convey,

This table presents the average daily abnormal returns of Olin Corp. within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.12	-0.04	0.15	0.28	0.12	-0.16	0.26	0.42	0.22	0.35	0.25
	5.02	4.68	4.12	3.21	1.98	1.58	3.15	3.49	3.14	4.11	4.51
	-0.02	-0.01	0.04	0.09	0.06	-0.10	0.08	0.12	0.07	0.08	0.06
%Positive	51%	54%	50%	50%	45%	33%	53%	54%	57%	53%	51%
%Negative	49%	46%	50%	50%	55%	67%	47%	46%	43%	47%	49%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-0.21	0.09	0.28	0.56	0.17	0.00	0.03	-0.05	-0.04	-0.07	-0.04
	4.33	3.89	2.95	2.83	1.59	0.88	1.57	2.18	2.71	3.44	4.39
	-0.05	0.02	0.10	0.20	0.11	0.00	0.02	-0.02	-0.01	-0.02	-0.01
%Positive	54%	63%	54%	51%	40%	31%	51%	43%	51%	49%	49%
%Negative	46%	37%	46%	49%	60%	69%	49%	57%	49%	51%	51%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.08	-0.10	0.08	0.14	0.09	-0.24	0.36	0.64	0.35	0.54	0.38
	5.34	5.04	4.58	3.39	2.16	1.82	3.67	3.95	3.33	4.39	4.59
	-0.01	-0.02	0.02	0.04	0.04	-0.13	0.10	0.16	0.10	0.12	0.08
%Positive	50%	50%	47%	49%	47%	34%	54%	59%	59%	55%	53%
%Negative	50%	50%	53%	51%	53%	66%	46%	41%	41%	45%	47%

Similar to previous studies, following the day of an attack, t (0), in the first half of the sample (Table 13-Panel B), a considerable amount of volatility is found with standard deviation

increasing from 1.58 on day t (0) and increasing to 4.51 at the end of the sample window, t (+5). In comparison to the same period within the sample window in the second half of the sample period (Table 13-Panel C), a smaller amount of volatility is found from t (0) to t (3), but increases to 4.39 by the end of the sample window t (-5). This ties into the studies initial expectation that with the increased amount of information flowing into the market in the second half of the sample period due to the advances in technology, market efficiency would increase.

Nippon Yusen Kaisha (Table 14)

Table 14

NIPPON YUSEN KAISHA (NYK): NYK operates as one of the largest shipping companies in the world and is a member of the Mitsubishi Zaibatsu.

This table presents the average daily abnormal returns of the Nippon Yusen Kaisha within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.95	-0.67	-0.57	-0.34	0.10	0.40	-0.16	-0.26	-0.32	-0.41	-0.49
	5.14	4.45	3.62	3.34	1.99	2.65	2.53	3.31	4.06	4.30	4.65
	-0.18	-0.15	-0.16	-0.10	0.05	0.15	-0.06	-0.08	-0.08	-0.10	-0.11
%Positive	50%	49%	44%	41%	46%	37%	40%	45%	45%	48%	45%
%Negative	50%	51%	56%	59%	54%	63%	60%	55%	55%	52%	55%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-1.62	-1.12	-1.39	-1.30	-0.20	0.82	-0.82	-1.16	-0.62	-1.03	-1.56
	4.97	3.92	3.47	2.92	1.98	3.00	2.41	3.78	4.15	4.70	4.93
	-0.33	-0.29	-0.40	-0.45	-0.10	0.27	-0.34	-0.31	-0.15	-0.22	-0.32
%Positive	40%	37%	34%	23%	40%	34%	29%	29%	37%	34%	29%
%Negative	60%	63%	66%	77%	60%	66%	71%	71%	63%	66%	71%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.62	-0.45	-0.18	0.12	0.25	0.20	0.16	0.17	-0.18	-0.12	0.01
	5.22	4.70	3.65	3.45	1.99	2.47	2.53	3.00	4.04	4.10	4.46
	-0.12	-0.10	-0.05	0.03	0.12	0.08	0.06	0.06	-0.05	-0.03	0.00
%Positive	54%	54%	49%	50%	49%	38%	46%	53%	49%	54%	53%
%Negative	46%	46%	51%	50%	51%	62%	54%	47%	51%	46%	47%

On the day of an event, t (0), in the second half of the sample (Table 14-Panel C), AAR is found to be -0.43 with a standard deviation of 2.13. Standard deviation from the previous day, t

(-1), to the day of the attack, t (0), increased from 1.88 to 2.13, while AAR decreased from 0.32 to -0.43. This could indicate a strong delivery in the desired message terror organizations hope to convey. In addition, AAR and standard deviation on the day following an attack, t (+1), in the first half of the sample was found to be -0.17 and 3.08 respectfully, and is consistent with findings from the previous study.

C. Discussion

The purpose behind this study was to measure the message terror organizations hope to convey in order to answer two questions. To answer these questions, I will first explain the methodology I used in order to accurately answer each question.

I based the methodology and framework of the studies on traditional event study formats similar in nature. I defined the sample of events in the following way. First, this study categorized terror attacks based on the level of media exposure likely to be obtained in the sample period using three variables: 1) death count (level of violence) (Table 3-Column 4); 2) geographic location (Table 3- Column 3); and 3) the type of terror attack (Table 3-Column 2). An attack generating 100 or more causalities was the first measurement used to build the dataset for the study. In addition, a small number of attacks generating less than 100 deaths were included in the sample due to their historical and cultural significance. Death counts will then be split into three subsections (0-149; 150-299; 300+) (Table 2).

Table 2

Number of Deaths (By Quantity per Sample Period): This panel splits the death count of each event into 3 subsections and provides the number of events that occurred for each. The last 2 rows are the calculated mean and median death count for each sample period (Columns 2-3). This panel represents the death count analysis for all subsequent studies that follow.			
Number of Deaths (per Event)	First Half of Sample Period (1985-1999)	Second Half of Sample Period (2000-2015)	Total-Entire Sample Period (1985-2015)
0-149	23	49	72
150-299	9	20	29
300+	3	5	8
Mean (# of deaths per sample period)	134	154	148
Median (# of deaths per sample period)	127	126	127

Finally, this study measured the sample window on three levels for comparative analysis: 1) The first half of the time period being studied (1985-1999). 2) The second half of the time period being studied (2000-2015), and 3) The entire time period being studied (1989-2015). To analyze the effects of the sampled terror attacks, I used the following framework. The first level focused on analyzing the effects from an attack on 5 separate indices in United States, Europe, and Eastern Asia to evaluate the level of effectiveness in the terror attacks message: the S&P 500 (SPX); the German Stock Index (DAX); the Tokyo Stock Index (NIKKEI); the London Stock Exchange Index (FTSE); and the Amsterdam Stock Exchange Index (AEX). This study calculated and analyzed the average daily abnormal returns, standard deviations and Sharpe Ratios to identify any consistent patterns of variance that may have occurred due to the terror attacks. The calculation for average abnormal returns is as follows:

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

Where:
AAR_t= average abnormal return for time t
AR_{it}=abnormal return for event i at time t
N=sample size

The second level focused on securities from different sectors around the world including Consumer Discretionary, Consumer Staples, Financials, Energy, and Industrial sectors.

The next portion of this discussion will outline the main questions this study aimed to answer, the answer to the question, and limitations of the study.

1. Do terror attacks lead to a distinguishable pattern in the financial marketplace?

After analyzing the results, this study did not find any distinguishable pattern in the financial marketplace based on inconclusive results. However, noteworthy findings of interest will be discussed. On the day of a terror attack, t (0), all indices and securities used in the study measured a larger quantity of negative average abnormal returns on day t (0), indicating that while no distinguishable pattern was identified, an individual attack would see negative abnormal returns on day t (0).

In addition, this study identified signs of price possible corrections in a number of market proxies used. For example, when the study was conducted against the S&P 500 Index (Table 4-Panel A) at day t (0), average abnormal return (AAR) was found to be 0.01 with a standard deviation of 0.91 and Sharpe Ratio of 0.02.

Table 4

S&P 500: This index is comprised of the top 500 large cap stocks in the U.S. and will provide insight into the effects of the message terrorists hope to convey on U.S. large cap stocks.

This table presents the average daily abnormal returns of the S&P 500 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero.

Panel A. Entire Sample Period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.24	-0.17	0.16	0.15	0.04	0.01	0.04	0.18	0.11	0.32	0.25
	3.00	2.90	2.66	2.02	1.23	0.91	1.74	1.86	1.54	2.00	2.25
	-0.08	-0.06	0.06	0.07	0.03	0.02	0.02	0.10	0.07	0.16	0.13
%Positive	53%	53%	58%	58%	59%	36%	54%	53%	56%	57%	59%
%Negative	47%	47%	42%	42%	41%	64%	46%	47%	44%	43%	41%

Panel B. First Half of Sample Period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.06	0.19	0.60	0.51	0.12	0.10	-0.15	0.04	0.12	0.36	0.12
	2.49	2.34	1.85	1.69	1.04	0.73	1.16	1.41	1.62	2.30	2.58
	0.02	0.08	0.32	0.30	0.12	0.13	-0.13	0.03	0.08	0.16	0.04
%Positive	54%	57%	69%	69%	60%	34%	49%	60%	60%	63%	63%
%Negative	46%	43%	31%	31%	40%	66%	51%	40%	40%	37%	37%

Panel C. Second Half of Sample Period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.39	-0.34	-0.05	-0.03	0.00	-0.02	0.12	0.25	0.11	0.29	0.32
	3.22	3.13	2.95	2.15	1.32	0.99	1.96	2.04	1.51	1.86	2.09
	-0.12	-0.11	-0.02	-0.01	0.00	-0.03	0.06	0.12	0.07	0.16	0.15
%Positive	53%	51%	53%	53%	58%	36%	57%	50%	54%	54%	57%
%Negative	47%	49%	47%	47%	42%	64%	43%	50%	46%	46%	43%

Standard deviation decreased from 1.23 the previous day, t (-1), to 0.91 on the day of an attack (Table 4-Panel A). However, AAR continued to increase on day t (+1) and day t (+2) to 0.18 as both standard deviation and the Sharpe Ratio continued to increase as well. On day t (+3) AAR was found to decrease to 0.11 on decreasing volatility (1.86 to 1.54) and a decreasing Sharpe Ratio (0.10 to 0.07) before continuing the upward trend in AAR found in the days leading

up to day t (0), indicating a correction at day (+3) (Table 4-Panel A). This phenomenon is also found using the Russell 2000 Index, the Financial Times Stock Exchange 100, the German Stock Index, and Olin Corporation.

2. Have increased in the use of digital devices and access to instantaneous news, seen over the past decade, had an effect on terrorist's ability to deliver the desired message?

After analyzing the results, the study did not find an effect on terrorist's ability to deliver the desired message based on increases in the use of digital devices and access to instantaneous news due to inconclusive results. However, noteworthy findings will be discussed and interpreted. For example, when conducting the study against the S&P 500 Index (Table 4), the following was found. Prior to the day of an event, t (-1), AAR is found to decrease to 0.12, with a standard deviation of 1.04 and a Share Ratio of 0.12 (Table 4-Panel B). The day following an attack, t (+1), in the first half of the sample (Table 4-Panel B), AAR was found to be -0.15, with a standard deviation of 1.16 and a Sharpe Ratio of -0.13. In the second half of the sample, (Table 4-Panel C), AAR was found to be 0.12, with a standard deviation of 1.96 and a Sharpe Ratio of 0.06. The negative reactions found on t (+1) in the first half of the sample, (Table 4-Panel B) and on the day of the event, t (0), in the second half of the sample, (Table 4-Panel C), could indicate that prior to increases in the use of digital devices and access to instantaneous news, reactions to terror attacks in the market occur slower due to the limited access of news prior to 2010 directly leading into a main question of this study.

Table 4

S&P 500: This index is comprised of the top 500 large cap stocks in the U.S. and will provide insight into the effects of the message terrorists hope to convey on U.S. large cap stocks.

This table presents the average daily abnormal returns of the S&P 500 Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero.

Panel A. Entire Sample Period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.24	-0.17	0.16	0.15	0.04	0.01	0.04	0.18	0.11	0.32	0.25
	3.00	2.90	2.66	2.02	1.23	0.91	1.74	1.86	1.54	2.00	2.25
	-0.08	-0.06	0.06	0.07	0.03	0.02	0.02	0.10	0.07	0.16	0.13
%Positive	53%	53%	58%	58%	59%	36%	54%	53%	56%	57%	59%
%Negative	47%	47%	42%	42%	41%	64%	46%	47%	44%	43%	41%

Panel B. First Half of Sample Period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	.06	0.19	0.60	0.51	0.12	0.10	-0.15	0.04	0.12	0.36	0.12
	2.49	2.34	1.85	1.69	1.04	0.73	1.16	1.41	1.62	2.30	2.58
	0.02	0.08	0.32	0.30	0.12	0.13	-0.13	0.03	0.08	0.16	0.04
%Positive	54%	57%	69%	69%	60%	34%	49%	60%	60%	63%	63%
%Negative	46%	43%	31%	31%	40%	66%	51%	40%	40%	37%	37%

Panel C. Second Half of Sample Period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.39	-0.34	-0.05	-0.03	0.00	-0.02	0.12	0.25	0.11	0.29	0.32
	3.22	3.13	2.95	2.15	1.32	0.99	1.96	2.04	1.51	1.86	2.09
	-0.12	-0.11	-0.02	-0.01	0.00	-0.03	0.06	0.12	0.07	0.16	0.15
%Positive	53%	51%	53%	53%	58%	36%	57%	50%	54%	54%	57%
%Negative	47%	49%	47%	47%	42%	64%	43%	50%	46%	46%	43%

In addition, when conducting the study against the German Stock Index (Table 9; below), the following was found. On day t (-1) AAR and standard deviation (0.81; 1.98) in the first half of the sample (Table 9-Panel B), begin a downward trend which stops on the day of the event, t (0), with AAR and standard deviation measuring -0.16 and 1.01 respectfully. AAR and standard

deviation follow an upward trend which is consistent with the trend specified in the second half of the sample period (Table 9-Panel B).

Table 9

German Stock Index (DAX): Measuring the performance of the 30 largest German companies in terms of order book volume and market civilization, this is the last broad index analyzed to provide further analysis into measuring terror organizations communicative efforts.

This table presents the average daily abnormal returns of DAX within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.04	0.01	0.14	0.30	0.15	-0.14	0.17	0.30	0.34	0.50	0.46
	3.27	3.21	2.72	2.67	1.53	1.42	1.78	2.24	2.20	2.41	2.71
	-0.01	0.00	0.05	0.11	0.10	-0.10	0.10	0.13	0.15	0.21	0.17
%Positive	57%	54%	53%	59%	58%	33%	60%	59%	63%	58%	57%
%Negative	43%	46%	47%	41%	42%	67%	40%	41%	37%	42%	43%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	0.40	0.91	0.71	0.81	0.49	-0.16	-0.05	-0.04	0.28	0.22	0.01
	2.80	2.53	2.24	1.98	1.44	1.01	1.64	1.85	2.09	2.15	2.59
	0.14	0.36	0.32	0.41	0.34	-0.16	-0.03	-0.02	0.13	0.10	0.00
%Positive	66%	69%	66%	69%	63%	34%	54%	54%	66%	57%	46%
%Negative	34%	31%	34%	31%	37%	66%	46%	46%	34%	43%	54%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-0.24	-0.41	-0.13	0.06	-0.01	-0.13	0.28	0.46	0.37	0.63	0.67
	3.47	3.42	2.90	2.92	1.55	1.59	1.85	2.40	2.27	2.53	2.75
	0.15	-0.16	-0.10	0.06	0.02	-0.05	0.18	0.12	-0.04	0.21	0.06
%Positive	53%	47%	47%	54%	55%	32%	62%	61%	62%	58%	62%
%Negative	47%	53%	53%	46%	45%	68%	38%	39%	38%	42%	38%

On the day of an attack, t (0), in the second half of the sample period (Table 9-Panel C), AAR is found to be -0.13 with a standard deviation of 1.59 (increase from the previous day t (-

1)). This is consistent with my findings in the previous index studies which ties back into the instantaneous availability of information in the second half of the sample period and indicates that the effect of a terror organizations message is felt in the market sooner than the first half of the sample period (Table 7-Panel B below and 9-Panel B above).

Table 7

NIKKEI 225 Index: The price-weighted index for the Tokyo Stock Exchange, calculated daily by the NIKKEI Newspaper, this Index provides insight into the strength of the message in terrorist attacks in the most Eastern part of the globe and is the most widely quoted average of Japanese equities.

This table presents the average daily abnormal returns of the NIKKEI Index within a 10-day window around the major terrorist events during the sample period 1985-2015 (Panel A), the first half of the sample period (Panel B) and the second half of the sample period (Panel C). The first column lists the event number from Table 3 and the percentage of events with an initial positive (≥0%) or negative (<0%) reaction beginning on the day of the event (Day 0). The remaining columns present the abnormal returns around the event day (Day 0) calculated as follows:

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

Where:

AAR_t= average abnormal return for time t

AR_{it}=abnormal return for event i at time t

N=sample size

For each group of events, the first row presents the average abnormal return in percentage, the second row presents the standard deviation of average abnormal returns and the third row presents the Sharpe Ratio where the risk-free rate is assumed to be zero. The following two rows present the percentage of events from each sample that resulted in either a positive or negative initial reaction

Panel A. Entire sample period (1985-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-109	-0.50 3.95 -.13	-.23 3.52 -.07	-.17 2.79 -.06	-.11 2.58 -.04	.03 1.48 .02	.07 1.91 .04	.06 1.86 .03	0.00 2.58 0.00	.07 2.37 .03	.10 2.79 .04	.29 3.15 .09
%Positive	48%	53%	50%	55%	51%	40%	47%	48%	53%	53%	57%
%Negative	52%	47%	50%	45%	49%	60%	53%	52%	47%	47%	43%

Panel B. First half of the sample period (1985-1999)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
1-35	-.47 4.21 -.11	.13 3.79 .03	.01 2.80 0.00	.07 2.80 .02	.16 1.60 .10	.26 2.56 .10	-.15 1.37 -.11	-.33 2.49 -.13	.09 2.14 .04	.09 2.87 .03	.19 3.00 .06
%Positive	46%	57%	51%	63%	51%	34%	46%	37%	51%	49%	54%
%Negative	54%	43%	49%	37%	49%	66%	54%	63%	49%	51%	46%

Panel C. Second half of the sample period (2000-2015)

Event	-5	-4	-3	-2	-1	0	1	2	3	4	5
36-109	-.51 3.85 -.13	-.40 3.40 -.12	.25 2.80 -.09	-.19 2.48 -.08	-.03 1.43 -.02	-.02 1.52 -.01	.16 2.05 .08	.15 2.62 .06	.05 2.49 .02	.10 2.78 .04	.34 3.24 .11
%Positive	49%	51%	49%	51%	51%	43%	47%	53%	54%	55%	58%
%Negative	51%	49%	51%	49%	49%	57%	53%	47%	46%	45%	42%

In addition to the two questions providing the overarching purpose behind this study, expectations about market efficiency were also included when analyzing the results. Specifically, that due to the EMH, days t (-5) to t (-1) should not see any considerable degree of fluctuation in prices. While there were instances of fluctuations of interest, the study concluded that the markets in question are efficient.

In the next section of the discussion I will provide the limitations in this study and future research. The first limitation of this study is based on the lack of statistical analysis performed on the variables to a certain degree of significance, resulting in the findings reported to be inconclusive. In addition, the framework and methodology of this study was also a limitation to answering the questions. While this study is similar to short term event studies, it lacks the necessary tests in order to accurately produce results to a certain degree of significance while controlling for certain variables within the macroeconomic environment. In addition, the sample of market proxy's used also proved to be a limitation. A larger sample size is needed for event study analysis, as well as a larger sample window period. The sample window period in this study proved to be a limitation, and analysis of the results could not be accurately identified due to the short time frame centered around t (0). Furthermore, one of the underlying purposes motivating this study was to determine the effect of news related to terrorism on the financial marketplace. However, while corporate specific news within a certain sample period is easy to collect, news events dating back 30 years based on terror attacks proved to be too broad of a scope.

Conclusion

This study has measured the strength of the message terror groups hope to convey when answering the following questions:

1. Do terrorist attacks lead to a distinguishable pattern of fluctuation in the financial marketplace?
2. Have increases in the use of digital device and access to instantaneous news, seen over the past decade, had an effect on terrorists' ability to deliver the desired message?

The motivation behind this study stems back to the early 80's as interest in the impact of macro indicators and their effect on financial market variables started to gain momentum within the academic community. Pearce and Roley (1985), Hardouvelis (1986) and Jain (1988) primarily studied news in the United States and its impact on asset pricing. Mcqueen and Roley (1993) found a strong correlation between news, stock prices, and the state of the economy. The relevancy of this study in modern times goes without question. The theater of terrorism has evolved with the evolution of the digital era. Terrorism can best be understood as a violent communication strategy, Graff (1982), with an aim to strike fear, spark chaos, and persuade the intended receiver or victim. As seen in the past 5 years, terrorism is becoming increasingly worrisome on a global basis and will continue to be a topic of interest for the foreseeable future.

While the results of this study are inconclusive, there still remains a considerable amount of future research opportunities. In the context of this study, applying a more specific event based study within a smaller sample period could generate a wealth of data that could be of great benefit to society. Specifying the mediums of communication terror organizations incorporate

into their communicative strategies and measuring the effectiveness of their message using financial markets as a proxy would serve as a unique research opportunity that offers more insight into the weapons terror organizations utilize. While my study aimed to compare the effects of terror communications prior to the technological boom, a focus on the last 10 years could provide insight into the communicative psyche of a terror organization. The prevalence of terrorism within the last 10 years has grown exponentially, and will continue to be a popular subject in society and the academic community.

"If you can't fly then run, if you can't run then walk, if you can't walk then crawl, but whatever you do you have to keep moving forward."-Martin Luther King Jr.

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