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Description of document: Office of the Director of National Intelligence (ODNI)
Inside the Loop: Terrorist Insider Trading as Attack Indicator (July 2005) - Thesis

Requested date: 01-June-2022

Release date: 14-November-2024

Posted date: 25-November-2024

Source of document: FOIA Request
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OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE
WASHINGTON, DC

November 14, 2024

Reference: ODNI Case No. DF-2022-00303

This letter provides an interim response to your Freedom of Information Act (FOIA) request to the Office of the Director of National Intelligence (ODNI), received June 1, 2022, requesting 22 specific theses written by students at the National Intelligence University.

Attached to this response are four theses, which were processed under the FOIA, 5 U.S.C. § 552, as amended. During the review process, the foreseeable harm standard was considered and it was determined that the documents may be released in part, with certain information withheld pursuant to the following FOIA exemption:

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Sincerely,



Erin Morrison
Chief, Information Review and Release Group
Information Management Office

**INSIDE THE LOOP:
TERRORIST INSIDER TRADING AS ATTACK INDICATOR**

by

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Unclassified thesis submitted to the Faculty
of the Joint Military Intelligence College
in partial fulfillment of the requirements for the degree of
Master of Science of Strategic Intelligence.

July 2005

The views expressed in this paper are those of the author and
do not reflect the official policy of the
Federal Bureau of Investigation or the U.S. Government.

ABSTRACT

TITLE OF THESIS: Inside the Loop: Terrorist Insider Trading As Attack Indicator

STUDENT: (b) (6)

CLASS NO. PGIP 9902

DATE: July 2005

THESIS COMMITTEE CHAIR: (b) (6)

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If terrorists are exploiting financial markets using insider trading methods, can a model be devised to detect irregular trading activity prior to the an attack? This thesis develops a model that attempts to identify that irregular trading activity by focusing on the financial sectors that are most likely to be affected by an attack, and analyzing the futures trading activity pertaining to those sectors. If those sectors could be monitored in real (or near real) time, trading irregularities could provide indications and warning of a pending attack. The thesis concludes that, while this model identifies trends toward market expectations, the model was not sophisticated enough to positively identify whether or not terrorists were exploiting the financial markets during the selected timeframe. In spite of these findings, this model can be utilized as a starting point for further research as the market data, if processed in greater detail and processing all of the available data, should reveal specific trading irregularities.

The model, based on insider trading, identified the most likely investment strategies and used six broad indices that would be affected by a terrorist attack. These indices represent both related and unrelated commodities in order to eliminate the chance that other factors, such as interest rate fluctuation, could randomly affect the model and generate false positives. For each index, data on futures options was collected and

analyzed for a period of time, and from that data, a “normal” trading pattern was established. Any trades that were more than two standard deviations outside of the normal pattern were identified and the dates of those anomalies were noted. Finally, all of the data was graphed together in order to identify coincidental anomalies. The model identified one set of dates that did appear anomalous, and when checked against a calendar of events, the anomaly appeared just prior to Ronald Reagan’s state funeral.

The results of this model revealed that it was able to identify anomalies to a point, but that the data the study had access to was not sufficient to provide specific evidence of insider trading. Given the volumes of financial data that stream through the markets every day, a more sophisticated model coupled with detailed “to the second” data would provide a clearer picture of irregular trading practices. In spite of the model’s shortcomings, it demonstrates the utility of exploiting focused financial market analysis in the counter-terrorism effort.

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CHAPTER 1

THE PROBLEM

Money is the lifeblood of the terrorist. Without it, networks crumble, weapons are unavailable, and communications are non-existent. Following the 11 September 2001 attack, President George W. Bush ordered the blocking of property, and prohibited transactions with persons who commit, threaten to commit, or support terrorism through Executive Order 13224. This order provided sweeping powers to freeze assets and opened doors among U.S. Government agencies to work together to prevent terrorists from using U.S. institutions or citizens to provide financial underpinnings for terror networks. As terrorists' abilities to raise funds are squeezed by the international community, this type of activity, even if it can not be proven to have happened in the past, would provide the opportunity for terrorist organizations to not only raise vast sums of money, but also to undermine the United States' financial system altogether.

In the aftermath of the 11 September 2001 attack, rumor and speculation ran rampant that terrorists had utilized an investment mechanism called options to make sizeable amounts of money in U.S. financial markets when the shares of United Airlines, American Airlines, and several other stock indexes declined. The Federal Bureau of Investigation, the lead agency in the 11 September 2001 investigation, came to the conclusion that there was no suspicious trading surrounding the attacks on the Pentagon

and the World Trade Towers.¹ Given the perishable nature of financial data, the byzantine nature of shell companies, and the complex nature of international finance, it may be impossible to trace all of the trades surrounding 11 September 2001 to their original source. While public debate surrounds that conclusion, the valid question to ask now is, “What would prevent terrorists from exploiting financial markets in the future?”

Whether or not it happened then, how do we prevent insider trading of this type to occur in the future? If it is not possible to actually prevent this activity, then how can the intelligence and financial communities analyze financial data and use their results as indicators of future attack? If terrorists are exploiting financial markets prior to an attack, a model should be able to discover irregular trading activity prior to an attack.

AUDIENCE FOR THESIS

Every U.S. Government agency that has any relation to money has investigative or intelligence divisions – the Federal Bureau of Investigation, the Securities and Exchange Commission (SEC), Treasury, the Commodity Futures Trading Commission, and the Central Intelligence Agency – is responding to the need for increased scrutiny of terrorist finances. The model developed and tested in this thesis will be another tool for use in the fight against terrorism. It selects a limited number of indicators drawn from the financial sector, evaluates the futures trading of each indicator, and highlights statistical anomalies for further investigation. Terrorism is not solely a problem for the United States; since financial markets are spread across the world, this tool will be of use

¹ David Roeder, “No profiteering on terror attacks,” *Chicago Sun-Times*, 19 September 2003, 66.

for any organization, government or private, in any nation that is engaged in the fight against terrorism.

As this tool may augment market surveillance systems already in use, such as the one currently in use by the Chicago Board Options Exchange, it is critical that the model remain unclassified. Classification would exclude those private sector entities throughout the world that are on the front lines in the area of financial investigations and who are among the best equipped to detect instances of suspicious trading.

HYPOTHESIS AND KEY QUESTIONS

This study proposes that if terrorists are sophisticated enough to engage in insider trading prior to an attack, then a model should be able to discover irregular trading activity before the attack takes place. Any attack on a large enough scale to disrupt financial markets and the population's confidence in the market system's integrity, as in the case of the Madrid train bombings of March 2004, could be exploited through insider trading. This model, by identifying unusual futures and options activity in the worldwide financial markets, will add credence to any number of other indicators that exist in the Intelligence Community.

KEY TERMS

This study examines the role of options as the primary indicator of illegal insider trading. The world of financial trading has its own language. Specifically, several terms

are key to further discussion of this thesis. While this thesis has terrorism as its ultimate focus, the activity which is targeted is financial in nature and not specific to terrorists. Each of the following terms pertains to financial activity in general, investment vehicles, and specific investments.

Insider Trading

Legal Insider Trading. While the trading that makes the headlines as “insider trading” is of the illegal sort, there is a category of insider trading that is perfectly legal. Legal insider trading consists of the “buying or selling shares of a company’s stock by that company’s management, board of directors, or by a holder of more than 10% of the company’s shares.”² There are reporting requirements that must be adhered to and, most importantly, the decision by those listed to buy or sell shares cannot be based on corporate developments that have not been announced publicly and could affect the company’s stock positively or negatively. This is not the type of trading this study is targeting.

Illegal Insider Trading. Illegal insider trading is defined as follows by the Securities and Exchange Commission:

It is the trading that takes place when those privileged with confidential information about important events use the special advantage of that knowledge to reap profits or avoid losses on the stock market, to the detriment of the source of the information and to the typical investors who buy or sell their stock without the advantage of “inside” information.³

² John Downes and Jordan Elliot Goodman, *Barron’s Finance and Investment Handbook*, 6th ed., (New York: Barron’s, 2003), 498.

³ U.S. Securities and Exchange Commission, *Insider Trading*, URL: <<http://www.sec.gov/divisions/enforce/insider.htm>>, accessed 4 June 2004.

The knowledge and market exploitation that a shock is about to be applied to the financial system and to individual companies makes trading in this manner illegal. Any trading that takes place prior to a terrorist event, with the knowledge that the event is to take place and that it will either negatively (e.g. the stock market) or positively (e.g. gold) affect a particular financial commodity, would be considered illegal insider trading.

There are inherent difficulties in investigating and proving illegal insider trading is occurring. Experts believe that significant amounts of illegal activity go undetected or unpunished and would be ideal methods of terrorist financing. As SEC Chairman Levitt recently observed, “It's not as if insider traders wander innocently into the gray areas near the boundaries of legality. They willfully stride across the bright line of the law.”⁴

Options. An option is a contract purchased that gives the buyer the right to buy or sell a quantity of stock prior to the expiration date at a price that is determined today. This amounts to a belief, backed by currency, that the value of the stock will increase or decrease in the future. Translated into this study, an option may be purchased by the terrorist trader knowing that the impact of the terrorist event will drive the value of the stock or commodity up or down.

Puts and Calls. For the investor, options may be divided into two types, put and call options. “Put options” are essentially a bet, or hedge, that the value of the stock that is underlying the option contract will go down. In other words, a put option gives the option holder the right to sell at a future date at a predetermined price. If the market value of the underlying commodity falls below the option price, then the option holder can sell his option at the higher price and profit by the margin between the option price

⁴ Testimony of Arthur Levitt concerning Appropriations for Fiscal Year 1999 before the Subcommittee on Commerce, Justice, State and Judiciary of the Senate Appropriations Committee, March 19, 1998.

and the actual market price. Conversely, a “call option” enables the option holder to buy the underlying at a predetermined price. If the value of the underlying commodity increases beyond the price of the option, the option holder can buy the underlying commodity for the option price, then resell at the higher price, again profiting by the difference between the option price and the market price.

Short and Long. Briefly defined, if an investor buys an option (pays a premium to purchase either a put or call option), he is said to be “long” in that option. That investor has a risk potential that is limited to the premium paid to purchase those options, and an unlimited profit potential. In a worst-case scenario, the purchased options are worthless when they expire, and the investor loses only the money spent on the premiums charged to buy the options. On the other hand, if the investor sells an option (collects a premium by selling a long option to another investor), the investor’s profit is limited to the premiums collected and the risk incurred is unlimited; since most options expire worthless, this is can be profitable for investors but there are well defined limits to the gains that can be made.

Expiration Date. All options expire after a predetermined amount of time. Between the purchase (long) or sale (short) time and the expiration month, the holder of the put or call option can exercise those options.

Commodities. Commodities, unlike stocks, are shares of an actual product. Commodities range from metals to agricultural products to foreign currencies. Commodity markets were initially established in order to make the process of delivering products to market more efficient and prices less volatile. Futures markets, as the commodity markets came to be known, enabled the commodity buyers and sellers to be

guaranteed that the contracts they entered into would be fulfilled at the agreed time. As futures markets matured, speculators entered the market and invested based on whether or not they believed that the prices would increase or decrease. Speculators are not interested in the underlying product, only in the value of the product over time as it relates to their investment strategy.

Index Funds. Index funds are based on the performance of market indices such as the Dow Jones Industrial Average, the Standard and Poor's 500, and the Japanese Nikkei 225. One advantage of trading on an entire market rather than individual stocks or commodities is that it is easier to predict broad trends and how events will affect a market than it is to predict the impact on a specific stock or commodity. Index funds also generally carry the opportunity to trade in options. Index options provide another advantage over options on individual stocks in that there is a higher element of leverage than for option on individual stocks. The market does not have to move as much to yield the same percentage as movement on individual stocks.⁵

For example, it is easier to predict that the Dow Jones Industrial Average will go down than it is to predict that General Electric will decline. There are also several specific index funds that cover narrow interests, such as the American Mercantile Exchange's Airline Index. There are any number of factors that could deal the airline industry as a whole another significant blow, regardless of how it affects either individual airlines or the major markets overall.

Treasury Bills, Notes and Bonds. Treasuries are negotiable debt obligations of a government; as such, they are backed by the full faith and credit of a nation's Treasury. U.S. bills, notes and bonds are essentially only differentiated by the term of their maturity

⁵ James B. Bittman, *Trading Index Options* (New York: McGraw-Hill, 1998), xv.

– bills are short term securities that mature in less than a year, notes between 1 and 10 years, and bonds are for 10 years or longer. This makes treasuries of all sorts (bills, notes, and bonds) some of the most secure places to invest money. The return on treasuries is typically much lower than can be realized in the stock market, but people invest in treasuries in order to offset the risk in other areas of their investment portfolios or as another vehicle to save money. The security treasuries offer make them highly desirable in times of crisis, especially when stock market volatility causes investors to pull money out of the market and move them to treasuries and commodities in a “flight to quality.”

The U.S. Treasury market is the most liquid fixed-income market in the world.⁶ Because there is such a high volume in the Treasuries market (the average is over 200 billion dollars per business day), buyers and sellers of Treasuries are almost always able to transact business in any quantities at fair prices. This makes the disposal of Treasuries particularly easy for any trader.

Federal Futures Rate. The futures contracts on all U.S. Treasuries are governed by the Federal Funds Futures Rate. This rate fluctuates daily and determines the yield on futures contracts each day. Since the cost of futures is determined by supply and demand, this rate reflects the current demand for each Treasury; this implies that volatility in the markets has the potential to greatly affect the futures rate.

For example, if the terrorist trader knew about an attack sure to affect the stability of the financial markets, it can be expected that investors will remove some percentage of their investment capital from financial markets and invest in a commodity that is readily

⁶ Stuart R. Veale, *Stocks, Bonds, Options, Futures* (New York: New York Institute of Finance, 2001), 142.

tradable without dependence on the continued function of the financial markets, such as gold. Anticipating a blow to the financial sector, the terrorist trader might buy options that enable him to purchase gold at a low price (say \$100 per contract) at a fixed time in the future; this would be called “initiating a long call position” on gold. The contract expiration date would lie after the terrorist attack, and after the attack, the value of gold would radically increase. Owning the option on gold contracts would enable the terrorist investor to buy the predetermined number of gold contracts at a low price (\$100) then immediately resell at the market value which should have increased due to the attack (say to \$200), earning the trader \$100 per option contract.

ASSUMPTIONS

The knowledge that an attack is to take place provides too lucrative of an opportunity for profit for terrorist investors to pass up. Given the need for operating funds, and the means to profit that, with sophistication, could be almost untraceable, it would be unconscionable to assume that terrorists would pass up the opportunity to make windfall profits by exploiting U.S. and International financial markets.

Given that there is a vast amount of financial data available, this study makes the following general assumptions about terrorist organizations and the financial systems. While there are differences between terror groups or cells, these broad assumptions are applicable to most of the known groups.

First, terrorist organizations require significant amounts of money in order to recruit, train, equip, and operate. While the costs for executing a car bomb attack, for

example, may seem to encompass only the cost of a car, explosive and detonators, the real costs must include the training of terrorist cells in demolitions, surveillance and reconnaissance, communications, housing and food.

Second, terrorist organizations have shown a willingness to utilize a range of illegal activities to fund their operations. There are reports in the open press that these groups have engaged in selling drugs, smuggling, credit card scams, and even diverting charity funds.⁷ In a disturbing turn of events, terrorist groups have allied themselves with some of the drug cartels in South America and are providing protection and training in return for cash.⁸

Third, the financiers that have been fueling terrorist organizations are sophisticated when it comes to international financial systems. They would not hesitate to exploit any regulatory gaps in international investing and would be in a position to take advantage of illicit trading to maximize profits. If those financiers were not aware of the profit potential insider trading represents, the attention given to this subject in regard to the 11 September 2001 attack almost guarantees that they are now.

Fourth, since financial data on the minute-to-minute scale is generally held for one year, it will be impossible within the scope of this research project to determine whether or not insider trading took place prior to 11 September 2001 based solely on options research.

Fifth, the absence of evidence does not mean that an activity has not occurred.

Sixth, insider trading is difficult to prove under the best of circumstances.

⁷ Sari Horowitz, "Cigarette Smuggling Linked to Terrorism," *Washington Post*, 8 June 2004, A01.

⁸ Rachel Ehrenfeld, speech presented at the Heritage Foundation, Washington, DC, 2 December 2003.

Seventh, terrorist investors, instead of maximizing their return on investment and potentially destroying this income pipeline and risking identification, would adopt a relatively conservative trading plan and invest across the financial board to avoid detection.

CHAPTER OVERVIEW

Chapter One introduces the reader to the relevance of terrorist financing, identifies the potential audiences, and defines some key financial terms. In addition to the identification of a potential reporting gap - financial investment activity - Chapter One introduces the concept that a model can be constructed to help identify whether suspicious options trading activity is occurring.

Chapter Two sets the parameters for the model. Each element of the model is discussed, including the reasons for choosing specific types of indicators, the methods to be used in evaluating the performance of each indicator, and what the activity of each indicator may mean. Chapter Two also sets the parameters for the timeframe for data collection as well as the statistical analysis to be performed on the data. While there may be valid multiple reasons for individual performance, the combination of all of the indicators, taken as a group, points to a coming shock to the markets that could indicate a terrorist attack.

Chapter Three develops the specific indicators that are applicable to the model developed here. These indicators include options on the Gold Index, the Five Year Treasury Note Index, the Dow Jones Transportation Index, the iShares Energy Index, the iShares Healthcare Index Fund, and the S&P 500 Index. These six indices are diverse

and represent sectors most likely to be affected by any terrorist attacks. The different indexes are analyzed to suggest the probable direction each would take in an attack or non-attack scenario. Comparing the volume of the options over time allows for the graphic depiction of any trading anomalies.

The model is tested in Chapter Four using market data from 24 May 2004 to 9 July 2004. The results and analysis of the validity of the model are reported in Chapter Five. This chapter seeks to answer the question as to whether monitoring the options markets could provide a reliable indicator of an impending terrorist attack.

In Chapter Six, the applicability of the model as well as opportunities for further research are discussed. Recommendations for further refinements to the model resulting from this analysis are proposed.

CHAPTER 2

THE MODEL

If terrorists are conducting insider trading on the market, that activity should be detectable. This model provides indications and warning for a terrorist attack through analysis of financial market data. Indicators, in the form of financial instruments, must be directly or indirectly affected in a predictable manner in the event of a terrorist attack. In order to make this model manageable, the number of indicators is set at six. Indicators are evaluated over time using the model to determine their “normal” pattern of activity. A statistical analysis consisting of a mean determination and standard deviation is performed to identify any trading patterns that fall outside of expected patterns; a special notice is made of any irregularities and their implications. All trading activity is charted graphically, with special attention paid to coincidence of trading anomalies across indicators. If there are any trading anomalies, even if anomalies are not reflected in all six of the indicators, those dates should be compared to any significant events that might serve as significant terrorist targets.

INSIDER TRADING INVESTMENT CRITERIA

If one purpose of terrorism is to instill fear, financiers seeking to gain profit in the financial markets from a terrorist attack have to anticipate reaction to the attack in the

marketplace. If the terrorist financiers can determine what the market movements are likely to be, investing ahead of the curve should not only be easy, but also lucrative.

Given the potential for massive profit, this model takes into account several investment vehicles that, through monitoring, could indicate potential attack. Each of these investments should offer the opportunity to maximize profit, maintain the investor's anonymity, and ensure the profits are obtainable. In addition, the front-end financial risk should be low to optimize profits.

Opportunity for Profit. The number of channels available for investors to make or lose money in financial markets is almost limitless. However, futures contracts and options yield the highest percentage of profit. Futures and options make use of leveraged money and therefore can deliver exponential returns without a large investment.

Anonymity. The use of shell companies and fraudulent representation make it nearly impossible to track individual trades to their source and establish a direct link between terrorist organizations and trading activity. To this end, the Securities and Exchange Commission and the Commodity Futures Trading Corporation (CFTC) have instituted "know-your-customer" rules that require banks and financial brokerages to make an effort to know who is investing in U.S. markets. In addition, the regulatory bodies have watch lists of investors, companies, and banks with whom they are forbidden to transact business. Unfortunately, the entire banking world is not held to the same standards. In the case of at least one of the suspicious trades surrounding 11 September 2001, a put option order for 2,500 contracts was sent to the Chicago Board of Options from Deutsche Bank.⁹

⁹ Arvedlund, "Follow the Money," 22.

Non-detection. For a trader utilizing insider information to exploit financial markets, a significant part of the operation involves not being caught. A more sophisticated investor might buy futures and options in related markets instead of investing in a market directly affected by inside knowledge. For example, if a trader knew that there was going to be an event that negatively impacted the railroads, he might invest in the trucking industry, as it could be reasonably expected to benefit from the misfortune suffered by the railroads. By adding a layer between the event and the investment strategy, the inside trader insulates his investments from obvious scrutiny.

Liquidity. This is the ability to buy or sell an asset quickly and in large volume without substantially affecting the asset's price. It also refers to the ability to convert investments to cash quickly.¹⁰ Anyone that anticipates taking advantage of financial markets surrounding a terrorist event would be prudent to have those funds immediately available so as to avoid having the accounts frozen.

Leverage. Both futures and options offer the opportunity to control large amounts of a commodity with little or no investment. With futures contracts, it is only necessary to post a small percentage on the margin in order to control a large amount of the commodity. This percentage, called the "margin requirement," is determined on the basis of market risk and usually set between 4 and 18 percent of the underlying futures contract. To use gold futures as an example, as of 30 June 2004, the initial margin required to "purchase" one contract of 100 ounces of troy gold was only \$2,025.00. Because gold was valued on that date at \$392.60 per ounce, an investment of \$2025.00 enabled an investor to control \$39,260.00 worth of gold. For every upward movement in

¹⁰ John Downes and Jordan Elliot Goodman, *Barron's Finance and Investment Handbook*, 6th ed., (New York: Barron's, 2003), 550.

price from \$392.60, the investor would profit one hundred times the initial investment (amount of upward movement X 100 ounces of gold).

Futures. Futures markets enable investors to bet that whatever they are investing in will either lose or gain value. A long futures trade is a bet that the value of the investment will increase. A short futures trade is the opposite – a bet that the value will decrease. Since inside traders know what event is to take place, it stands to reason that they would be in a strong position to make accurate decisions as to which investments would yield the maximum profits. Futures positions are among the most liquid of all investment vehicles, as they are settled at the end of each trading day. Any profits made, or losses incurred, are immediately posted to the investor's account, and no further action is required of the investor to gain access to that money.

Options. The buyer of an option acquires the right – but not the obligation – to buy or sell a futures contract under specific conditions in exchange for payment for that right (called a premium).¹¹ The premium is based on the volatility of the futures contract that is being purchased and the timeframe in which the option can be exercised. If the value of a futures contract is likely to change substantially in the timeframe chosen, then the option premium will be high; if no significant volatility is either expected or is inherent in that particular market, then the option premium is be low.

The option gives the holder of the option the ability to buy (call) or sell (put) that futures contract at a predetermined rate and at a predetermined time. For example, if the price of gold is \$375.00 per ounce today, an investor could purchase an option to sell (a put option) that gold futures contract in one month at \$380.00 per ounce. If the price of gold increases beyond \$380.00 per ounce by that time, the options contract is worthless.

¹¹ Scott Barrie, *The Idiot's Guide to Options and Futures* (New York, Alpha, 2002), 104.

However, if the price of gold does not reach \$380.00 per ounce, then the investor has the option to sell the gold at \$380.00 per ounce regardless of the actual price at which gold is being traded. Conversely, if the investor believes that the price of gold will increase, he can purchase an option to buy (a call) that entitles the investor to purchase a number of contracts of gold at the pre-determined price. If gold today is \$375.00 per ounce, an investor can purchase a call option that entitles him to purchase it at \$370.00 per ounce. If the price of gold rises, the investor can exercise those options and acquire the gold at a profit of at least \$5.00 per ounce.

Each of these factors plays a role in the choice of investment strategy. None of the factors offer everything: the highest returns, no suspicious activity reports, and immediate liquidity. There are several, however, that would offer the savvy investor the ability to maximize his investment. Depending on the scenario, terrorist financiers could combine several or all of these investment strategies in order to maximize their profits. If a terrorist organization knows that an event will adversely or favorably alter a futures contract value then the purchase of options would guarantee significant returns. For example, if the perpetrators of the 11 September 2001 attacks had purchased put options allowing them to sell United Airlines or American Airlines stocks in late September or October at \$50.00, then, for a minimal investment, they could guarantee their ability to sell those stocks even if the stock values plummeted to \$25.00; each share would yield a \$25.00 profit. Risks ordinarily associated with these investment options would be obviated by insider knowledge of impending terrorist attack.

Choices, Choices, Choices.

There seem to be an infinite number of stocks, commodities, funds, and strategies that are available to any investor in the market. Terrorists investing in the market are armed with the knowledge that an attack is to take place or, as far as they know, that an attack will not take place. Given either scenario, this study selects and explores six highly likely places the terrorist trader would place his investments for maximum return, even if the return on their investment is “only” in the millions of dollars.

CHAPTER 3

THE MODEL APPLIED

This study examined options for potential investment. It addressed those areas that are likely to react to a terrorist attack regardless of the target. This includes the Gold Index, the Five Year U.S. Treasury Note Index, the Dow Jones Transportation Index, the iShares Energy Index, the iShares Healthcare Index, and the Standard and Poor's 500 Index. The use of the index format allows the model to examine a broader section of the financial market than if individual stocks or commodities were chosen. For example, the Dow Jones Transportation Stock Average Index is comprised of stocks from air, rail, and ground transportation modes. Each is either a hedge against the decline of the value of the dollar, represents a "safe" place to invest until the reverberations of the attack have stopped, or represent industry wide areas that will be definitively affected. Across the board, choosing to invest in each would ensure large profits. In the event of an attack each of these will follow a predictable shift in value that can be anticipated by any savvy investor that takes the time to conduct a small amount of research and apply common sense.

The terrorist trader could also be faced with two investment scenarios. In one, he knows that an attack is to take place, and assumes that the terrorists retain the element of surprise. In that case, markets will respond to the attack, either positively or negatively depending on the market sector affected. A complimentary investment strategy could center around an anticipated attack, but with no attack planned. The government and public may be led to believe that an attack was to take place, but when that attack fails to

materialize, the markets rebound as investor confidence returns to sectors that would be affected by those attacks. Either way, the inside terrorist trader makes significant amounts of money.

Attack Scenario. Another attack on an 11 September 2001 scale is planned and executed. In this case, markets should respond by falling significantly as investors move their money into more risk adverse investments – valued investments that are almost guaranteed to provide returns whatever the condition of the U.S. economy. The terrorist investor could expect all of the major stock markets to fall, especially the transportation indices. They could also expect the value of gold and treasuries to go up as investors moved their money out of the stock markets.

In this scenario, terrorists invest directly in the most affected markets, especially through the use futures and options. Depending on the greed level and wish to keep this particular investment strategy viable in the future, even the blatant investor would have to restrict his profit taking or risk having all accounts identified and frozen.

Non-Attack Scenario. An intrepid terrorist trader may also invest in the opposite direction. He may read public opinion regarding attack expectations and decide against an attack. In this case, the trader would invest with the expectation that the markets are expecting an attack and profit from doing nothing. This strategy entails a short window of opportunity, as the markets should quickly correct, but if the S&P 500 is down in the expectation of a 4 July attack and nothing happens, then it should rebound as soon as trading reopens. While there are much greater financial risks in this effort than with the attack scenario, the premiums may be worth their value if no attack does occur and the markets move as expected.

Investment	Attack (Y/N)	Attack Impact	Expected Market/ Value Effect	Expected Terrorist Investments			
				Long Options		Futures	
				Call	Put	Long	Short
Gold Index	Y	Direct	Up	X		X	
	N		None or Down		X		X
Five Year Treasury Note	Y	Direct	Up	X		X	
	N		None or Down		X		X
S&P 500 Index	Y	Direct	Down		X		X
	N		None		X		X
Dow Jones Transportation Average Index	Y	Direct	Down		X		X
	N		None or Up	X		X	
iShares U.S. Energy Index	Y	Direct	Up	X		X	
	N		Up	X		X	
iShares U.S. Healthcare Index	Y	Indirect	Up	X		X	
	N		None				

Figure 1: Expectations of market performance in the event of attack or non-attack

Source: Developed by Author

Timeframe.

The timeframe examined was from 24 May 2004 through 9 July 2004.

Specific Indicators.

1) **Gold.** Gold is considered a classic crisis hedge. Its value does not rely on the dollar and is readily convertible into any currency. In response to the 11 September 2001 attack and the 11 March 2004 attack, the value of gold rose significantly. On 10 September 2001 gold was trading at \$274.10 per ounce; this jumped to \$291.60 per ounce on 17 September 2001 when markets reopened. This did not fall below \$290.00 per

ounce until 9 October 2001, when the price was \$289.80 per ounce.¹² In terms of the Madrid attack of 11 March 2004, gold went from \$400.80 on 8 March up to \$422.10 by 26 March. In either of these cases, given that each futures contract controls 100 ounces of gold, the profit potential ranges from \$1750.00 per contract in September of 2001 to \$2130.00 per contract in March of 2004.

The Gold Index is an index that is made up of 10 large gold mining and production companies. In the event of an attack, with the value of gold rising sharply, this index should also rise. On Monday, 10 September 2001, this index closed at a value of \$40.16. It opened again on Monday, 17 September 2001, then closed at a price of \$41.73 and during this trading session the volume for call options was 65. Just assuming that the original call was for \$40.16 and the volume reflects long call options exercised, the profit for this small rise in price is over \$10,000.00.

2) Five-Year Treasury Index (FVX). The value of Treasuries of all denominations rises with political and economic instability, making this an easy investment choice for those who know that severe political and economic instability will ensue. While the overall interest rate of return on these investments do not change often, the Federal Futures Rate does fluctuate within the futures market. These rates depend on the nature of supply and demand. As investors move their money from the volatile stock markets to more stable, fixed-income investments, the Futures Rate escalates. The Federal Futures Rate increased after 11 September 2001 on all of the futures markets for Treasuries, from 13 Week Treasury Bills to the 30 Year Treasury Bonds, but the Treasuries futures with shorter times to maturity were affected the most.

¹² “New York Mercantile Exchange Historical Data for Gold Futures,” *New York Mercantile Exchange*, URL: < http://www.nymex.com/jsp/markets/gol_fut_histor.jsp?>, accessed 5 July 2004.

3) Dow Jones Transportation Average Index (DTX). This index is made up of 20 large companies in the transportation business, which includes airlines, railroads, and trucking.¹³ As of 10 September 2001, the risk/return statistic cited the annual return as of the price close was -.55%, and for the total return was at +.71% for the year; seven days later, when the markets reopened, those figures took a major slide – the annual return on the daily price at the close of trading was down 13.3% and the yearly annual return was down 12.2%.¹⁴

4) iShares U.S. Energy Index Fund (IYE). The iShares Dow Jones U.S. Energy Sector Index Fund seeks investment results that correspond to the performance of U.S. energy stocks, as represented by the Dow Jones U.S. Energy Sector Index. Companies in this index include coal producers, oil drillers, oil repository/production manufacturers and service providers, major oil companies, secondary oil companies, and pipeline companies (see Appendix A for complete company listings).¹⁵ In the event of any attack, this study assumes that the prices for the energy sector will increase as volatility in delivery, production, and other factors influence price. Due to its specialization, this fund is classified as “non-diversified.” This means that there is more risk for the investor because there are a smaller number of companies in the portfolio than in a diversified fund. Since the companies are all in the same market sector the risk/benefit factors should affect all of the companies in this sector in the same direction.

5) iShares U.S. Healthcare Index Fund (IYH). The iShares Dow Jones U.S. Healthcare Sector Index Fund seeks investment results that correspond to the

¹³ See Appendix A for complete listing of companies in the DJTA.

¹⁴ Dow Jones Indexes Web Site, URL: <<http://www.djindexes.com/jsp/uiReturnRiskRep.jsp>>, accessed 8 July 2004.

¹⁵ iShares Website, URL: <http://www.ishares.com/fund_info/detail.jhtml?symbol=IYE>, accessed 4 July 2004.

performance of U.S. healthcare stocks, as represented by the Dow Jones U.S. Healthcare Sector Index. Companies in this sector include healthcare providers; biotechnology companies; and manufacturers of medical supplies, advanced medical devices, and pharmaceuticals¹⁶ (see Appendix A for complete company listings). An attack on the U.S. would drive prices up for this sector as well. Following a large attack, the demand for medicine, vaccines, and medical supplies should increase. This sector is critical to this study because it is unrelated to the others. A marked increase in the number of call options in this category combined with similarly large call numbers in Treasuries, gold, and energy, would markedly advance the weight of this indicator.

As with the Energy Sector Index, this is a “non-diversified” fund. That it is narrowly focused allows both the terrorist and the analyst to focus on a sector rather than the market as a whole or on companies individually.

6) Standard and Poor’s 500 Index Fund (SPX). This fund is a market value weighted fund that consists of the S&P 400 Industrials, S&P 20 Transportations, the S&P 40 Financials and the S&P 40 Utilities. With such a composition, this fund represents approximately 80% of the market value of all of the stocks traded on the New York Stock Exchange, making it one of the most reliable measures of market activity in the investment sector.¹⁷ As a measure of investor sentiment in the market, the S&P 500 reflects consumer confidence in the markets in general. By virtue of trading on the index as a whole, the risk of losing on individual stocks is minimized and should make market

¹⁶ iShares Website, URL: < http://www.ishares.com/fund_info/detail.jhtml?symbol=IYH>, accessed 4 July 2004.

¹⁷ Standard and Poor’s Website, URL: <www.standardandpoors.com>, accessed 2 July 2004.

prediction for the insider relatively easy. On 11 September 2001, the S&P 500 Index dropped by 75 points or 20% of the total fund's average.¹⁸

Output Data. The following tables show the put and call volumes for options on the model's indicator set. For each indicator, the standard deviation for the population has been indicated by "SDEVP" and the mean and range have also been indicated. Since the model is looking for an unusual increase in volume, the range only indicates the number over which is either one or two standard deviations from the mean. Dates will be noted for any volumes that fall both one and two standard deviations from the mean and those dates will be compared across indicators.

¹⁸ Chicago Board of Options Exchange website, URL:
<<http://www.cboe.com/LearnCenter/pricehistory.xls>>, accessed 8 July 2004.

GOX Date	Calls	Puts	Close	Attack Expectation: in attack, price rise - check call volume No-Attack Expectation: price fall - check put volume
7/9/2004	7	0	82.64	
7/8/2004	4	0	82.27	
7/7/2004	4	5	80.86	
7/6/2004	0	10	78.16	Calls
7/2/2004	18	0	78.69	
7/1/2004	5	0	76.87	
6/30/2004	45	0	77.75	SDEVP 23.25
6/29/2004	0	3	75.91	Mean 21.44
6/28/2004	32	2	77.53	Range 44.69
6/25/2004	29	0	79.49	2SDEVP 46.50
6/24/2004	52	12	79.45	Range 67.94
6/23/2004	0	5	77.64	
6/22/2004	21	0	77.26	Puts
6/21/2004	35	41	76.25	
6/18/2004	40	2	76.78	SDEVP 20.71
6/17/2004	11	5	75.30	Mean 11.25
6/16/2004	6	12	74.65	Range 31.96
6/15/2004	10	7	74.32	2SDEVP 41.43
6/14/2004	63	62	72.41	Range 52.68
6/10/2004	0	100	74.86	
6/9/2004	31	15	73.88	
6/8/2004	3	1	77.69	
6/7/2004	4	2	78.85	
6/4/2004	4	0	77.80	
6/3/2004	22	27	76.43	
6/2/2004	0	0	78.40	
6/1/2004	40	0	78.83	
5/28/2004	0	3	79.93	
5/27/2004	13	21	80.39	
5/26/2004	49	11	79.38	
5/25/2004	35	14	78.59	
5/24/2004	103	0	77.48	

Figure 2: Gold Index (GOX) History

Source: Data compiled by Author from Chicago Board Options Exchange, www.cboe.com. Accessed 10 July 2004.

If an attack were to take place, the value of the index should rise, and call options should increase. The only date that falls more than two standard deviations outside of the mean is 24 May, although 26 May and 24 June are both very close. For the non-attack scenario, the only dates that exceed two standard deviations are 10 June and 14 June.

FVX Date	Calls	Puts	Close	Attack Expectation: in attack, price rise - check call volume No-Attack Expectation: price fall - check put volume		
7/9/2004	15	0	36.39			
7/8/2004	0	0	36.46			
7/7/2004	0	0	36.29			
7/6/2004	15	0	36.32	Calls		
7/2/2004	7	150	35.99		SDEVP	16.19
7/1/2004	9	0	37.26		Mean	9.03
6/30/2004	10	30	38.08		Range	25.22
6/29/2004	41	2	39.08			
6/28/2004	0	0	39.54		2SDEVP	32.37
6/25/2004	0	0	38.40		Range	41.41
6/24/2004	0	0	38.41			
6/23/2004	5	0	39.02			
6/22/2004	4	0	39.19	Puts		
6/21/2004	0	0	39.06		SDEVP	27.21
6/18/2004	14	0	39.35		Mean	6.43
6/17/2004	8	0	39.22		Range	33.65
6/14/2004	9	0	40.96			
6/10/2004	0	0	39.97		2SDEVP	54.43
6/9/2004	0	2	39.81		Range	60.86
6/8/2004	5	0	39.32			
6/7/2004	0	0	39.23			
6/4/2004	1	0	39.53			
6/3/2004	1	0	38.72			
6/2/2004	0	2	38.82			
6/1/2004	80	0	38.38			
5/28/2004	3	0	38.00			
5/27/2004	31	0	37.17			
5/26/2004	13	0	38.04			
5/25/2004	0	0	38.78			
5/24/2004	0	7	38.85			

Figure 3: Five-Year Treasury Index (FVX) History

Source: Data compiled by Author from Chicago Board Options Exchange, www.cboe.com. Accessed 10 July 2004.

Only two dates for either the attack or non-attack scenarios exceed the two standard deviations. For the expected attack, 1 June is the only date, and for the non-attack scenario, only 2 July meets the two standard deviation criteria.

DTX Date	Calls	Puts	Close	Attack Expectation: price fall - check puts No Attack Expectation: price rise - check calls
7/9/2004	23	16	308.80	
7/8/2004	0	0	307.13	
7/7/2004	0	0	315.01	
7/6/2004	0	40	311.65	Calls
7/2/2004	16	0	314.62	SDEVP 11.55
7/1/2004	30	1	317.20	Mean 8.88
6/30/2004	31	2	320.43	Range 20.42
6/29/2004	0	1	318.47	
6/28/2004	10	10	317.80	2SDEVP 23.09
6/25/2004	30	41	316.42	Range 31.97
6/24/2004	20	11	312.73	
6/23/2004	32	10	313.93	
6/22/2004	7	0	307.78	Puts
6/21/2004	0	0	306.52	SDEVP 297.59
6/18/2004	27	700	306.87	Mean 100.13
6/17/2004	0	6	306.00	Range 397.71
6/16/2004	0	0	305.92	
6/15/2004	0	2	303.98	2SDEVP 595.17
6/14/2004	5	0	299.40	Range 695.30
6/10/2004	6	590	302.47	
6/9/2004	21	250	302.82	
6/8/2004	0	2	307.24	
6/7/2004	6	5	304.01	
6/4/2004	0	0	299.23	
6/3/2004	0	0	296.30	
6/2/2004	0	1500	300.19	
6/1/2004	0	0	296.35	
5/28/2004	0	0	294.80	
5/27/2004	0	7	295.19	
5/26/2004	0	6	293.99	
5/25/2004	20	4	293.20	
5/24/2004	0	0	286.54	

Figure 4: Dow Jones Transportation Average Index (DJTA) History

Source: Data compiled by Author from Chicago Board Options Exchange, www.cboe.com. Accessed 10 July 2004.

For the DJTA, in the event of an attack the value should fall. Put options for 2 June and 18 June reflect values exceeding two standard deviations from the mean. There are no call option values that exceed two standard deviations.

IYE	Calls	Puts	Close	Attack Expectation: short supply - check calls No-Attack Expectation: plenty of supply - check puts		
Date						
7/9/2004	2	3	56.75			
7/8/2004	11	0	56.45			
7/7/2004	11	105	56.17			
7/6/2004	16	0	56.36	Calls		
7/2/2004	18	0	56.25		SDEVP	30.98
7/1/2004	2	0	56.15		Mean	37.50
6/30/2004						
6/29/2004	4	32	0	56.00	Range	68.48
6/28/2004	4	4	0	55.53		
6/25/2004	4	65	0	55.14	2SDEVP	61.97
6/24/2004	4	29	40	55.59	Range	99.47
6/23/2004	4	14	46	56.69		
6/22/2004	4	28	2	56.81		
6/21/2004	4	46	4	55.89	Puts	
6/18/2004	4	53	10	55.51	SDEVP	26.32
6/17/2004	4	24	0	55.83	Mean	18.38
6/16/2004	4	25	10	55.66	Range	44.70
6/15/2004	4	50	33	55.10		
6/14/2004	4	126	4	54.25	2SDEVP	52.65
6/10/2004	4	119	0	53.36	Range	71.02
6/9/2004	4	61	12	53.87		
6/8/2004	10	15	53.02			
6/7/2004	45	4	53.45			
6/4/2004	50	5	53.73			
6/3/2004	33	0	59.55			
6/2/2004	47	0	53.10			
6/1/2004	56	75	53.64			
5/28/2004	94	24	53.65			
5/27/2004	4	1	23	52.90		
5/26/2004	4	60	71	52.62		
5/25/2004	4	33	10	53.50		
5/25/2004	28	32	53.91			

4			
5/24/200			
4	7	60	53.10

Figure 5: iShares U.S. Energy Index Fund (IYE) History

Source: Data compiled by Author from Chicago Board Options Exchange, www.cboe.com. Accessed 10 July 2004.

Only 14 and 15 June meet the attack scenario criteria of two standard deviations.

In the expectation of no attack, 2 June and 7 July exceed two deviations.

IYH Date	Calls	Puts	Close	Attack Expectation: price rise - check calls No Attack Expectation: price fall - check puts	
7/9/2004	2	0	57.06		
7/8/2004	25	14	57.18		
7/7/2004	10	0	57.54		
7/6/2004	110	0	57.62	Calls	
7/2/2004	0	0	58.17		SDEVP 49.52
7/1/2004	51	0	58.30		Mean 29.06
6/30/2004	90	0	58.67		Range 78.59
6/29/2004	32	5	58.34		
6/28/2004	0	0	57.95		2SDEVP 99.05
6/25/2004	109	0	58.37		Range 128.11
6/24/2004	100	4	58.91		
6/23/2004	5	7	58.95		
6/22/2004	1	0	58.49	Puts	
6/21/2004	0	20	58.65		SDEVP 9.13
6/18/2004	1	2	59.13		Mean 5.16
6/17/2004	2	0	59.01		Range 14.28
6/16/2004	1	0	59.18		
6/15/2004	0	0	59.14		2SDEVP 18.26
6/14/2004	2	4	58.85		Range 23.41
6/10/2004	0	0	59.09		
6/9/2004	3	19	59.24		
6/8/2004	0	0	60.10		
6/7/2004	0	5	59.92		
6/4/2004	4	5	59.55		
6/3/2004	10	10	59.26		
6/2/2004	0	0	59.67		
6/1/2004	0	0	60.61		
5/28/2004	11	0	59.05		
5/27/2004	116	15	59.10		
5/26/2004	6	5	58.45		
5/25/2004	211	5	58.20		
5/24/2004	28	45	57.45		

Figure 6: iShares U.S. Healthcare Index Fund (IYH) History

Source: Data compiled by Author from Chicago Board Options Exchange, www.cboe.com. Accessed 10 July 2004.

Only 24 and 25 May show volumes higher than two standard deviations.

SPX Date	Puts	Close	Calls	Expectation: price fall -- check puts. Puts/1000			
7/9/2004	71799	1112.81	51183	71.799			
7/8/2004	107833	1109.11	57400	107.833	Puts		
7/7/2004	105511	1118.33	51066	105.511		SDEVP	34348.18
7/6/2004	90033	1116.21	49824	90.033		Mean	106964.7
7/2/2004	63478	1125.38	35086	63.478		Range	141312.9
7/1/2004	172247	1128.94	66590	172.247			
6/30/2004	4 71672	1140.84	60235	71.672		2SDEVP	68696.36
6/29/2004	4 48574	1136.20	40384	48.574		Range	175661.1
6/28/2004	4 65352	1133.35	33349	65.352			
6/25/2004	4 57134	1134.43	33322	57.134	Puts/1000		
6/24/2004	4 155170	1140.65	67185	155.17		SDEVP	34.34818
6/23/2004	4 95561	1144.06	56403	95.561		Mean	106.9647
6/22/2004	4 97108	1134.41	55534	97.108		Range	141.3129
6/21/2004	4 155343	1130.30	37821	155.343			
6/18/2004	4 193391	1135.02	39643	193.391		2SDEVP	68.69636
6/17/2004	4 131502	1132.05	76422	131.502		Range	175.6611
6/16/2004	4 118327	1133.56	82276	118.327			
6/15/2004	4 121024	1132.01	110737	121.024	Calls		
6/14/2004	4 143205	1125.29	68210	143.205		SDEVP	19925.51
6/10/2004	4 107247	1136.47	57084	107.247		Mean	56075.91
6/9/2004	87588	1131.33	47862	87.588		Range	76001.42
6/8/2004	98760	1142.18	60733	98.76			
6/7/2004	143484	1140.42	111555	143.484		2SDEVP	39851.02
6/4/2004	115607	1122.50	70651	115.607		Range	95926.93
6/3/2004	90023	1116.64	58044	90.023			
6/2/2004	112601	1124.99	59627	112.601	Calls/1000		
6/1/2004	62974	1121.20	30636	62.974		SDEVP	19.92551
5/28/2004	4 107158	1120.68	24486	107.158		Mean	56.07591
5/27/2004	4 135882	1121.28	44863	135.882		Range	76.00142
5/26/2004	4 117842	1114.94	47110	117.842			
5/25/2004	4 111482	113.05	71146	111.482		2SDEVP	39.85102

5/24/2004	67959	1095.41	37962	67.959	Range	95.92693
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Figure 7: Standard and Poor's 500 Index (SPX) History

Source: Data compiled by Author from Chicago Board Options Exchange, www.cboe.com. Accessed 10 July 2004.

The S&P 500 put volume exceeded two standard deviations on 18 June only.

There were two instances where call volume was much higher than expected: 7 and 15 June.

CHAPTER 4

FINDINGS

In this study, each indicator was analyzed to establish the current trading levels, the current futures contracts activity, and current option holdings. These indicators provided a framework for comparing these numbers. Comparison of these numbers revealed how investors view the U.S. financial markets. The monitoring of expiration dates for each option suggests potential attack dates.

Analyzing Options. For each trading instrument above, what would be the best way to analyze the option activity? Optimally, there would be a database that listed the total number of puts or calls for each contract, organized by strike price, expiration, and the dates each call or put was purchased; this is not the case. The total number of puts or calls at any given strike price over time was graphed when that data was available. Then the study looked at where the bulk of the trading activity took place. Deep “out-of-the-money” (highest risk) puts and calls suggest that the investor has high confidence that the price will rise or fall beyond that level. To this end, the volume of options at each strike price was compared and any significant trading activity that falls outside of the “normal” trading activity should trigger some investigatory interest. Some random, uninformed trading may also fall into that pattern of activity. However, if there are high volumes that fall in the strike price range that is far outside the normal option trading pattern or are of such volume that it raises concerns, then that trade should be investigated. By then comparing the results of these analyses for each indicator, an overall indicator develops

by illuminating investment trends over different sectors that suggest someone may believe that the market stability will take a significant hit in the near future.

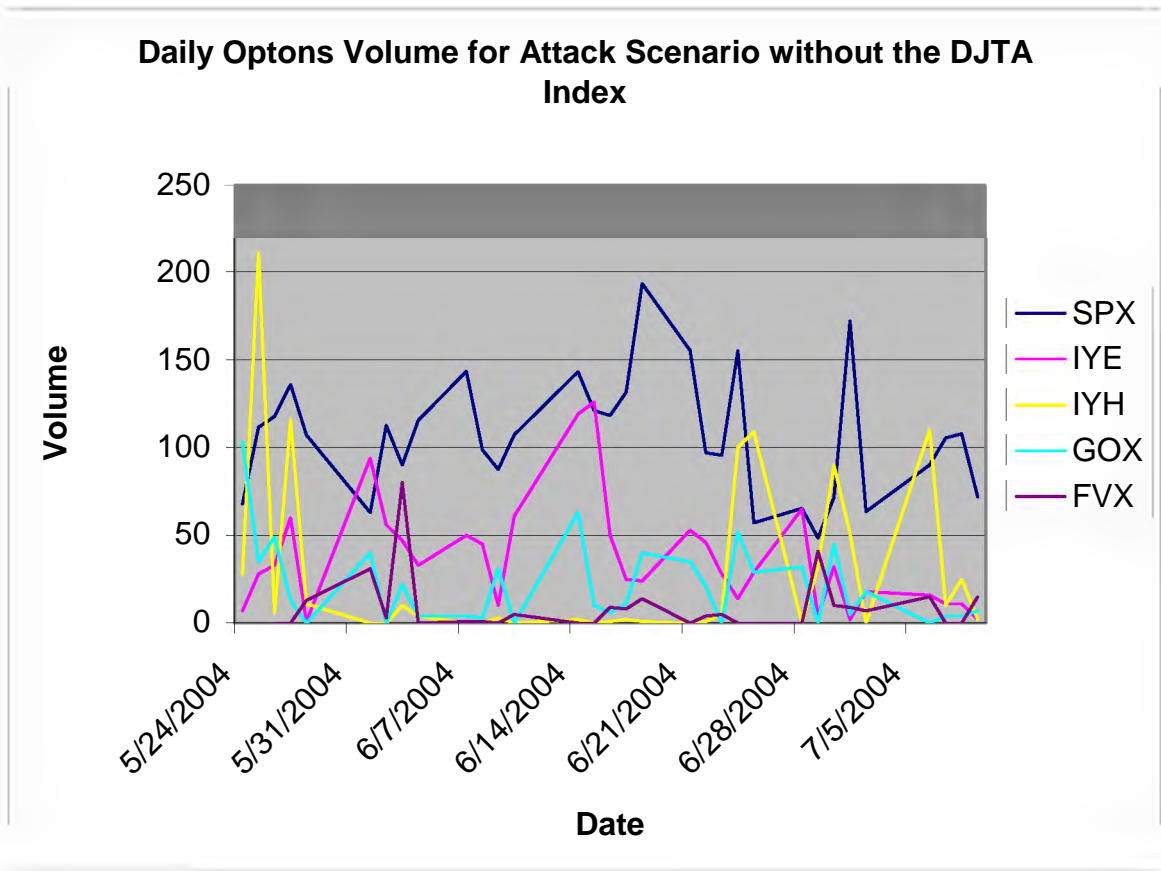


Figure 8: Put and Call Options Volume Summary for 5/24/2004-7/9/2004

Source: Compiled by author with data from the Chicago Board of Options Exchange Data, www.cboe.com/mktdata/mktstat.asp. Accessed 10 July 2004.

This chart shows the volume of call or put options for five major indexes. For the S&P 500 Index (SPX) the volume is for put options as the index would likely fall in the event of an attack. For the Five Year Treasury Index (FVX), the US Energy Sector Index (IYE), the US Healthcare Index (IYH), and the Gold Index (GOX), the volumes are for call options as those indexes should rise in the event of an attack. In comparing the volumes, if they all are rising at the same time in a close vicinity to one another, then this

activity would suggest that the indexes will all respond to some event, terrorist or otherwise, in the same manner. While it is likely that any fall in the S&P 500 Index would be accompanied by a corresponding rise in the Gold Index, it would be unlikely for all of the indexes examined to respond in this predicted fashion as most do not enjoy direct linkage, e.g. Energy and Healthcare.

When the Dow Jones Transportation Average (DTX) graph is entered, there are several anomalous trading days that fall far outside of the norms. On 9 and 10 June, put options on the Transportation Average went from an average of 5.86 puts per day (minus the four major spikes), to 590 and 250 respectively. While there might be other mitigating information, one possible scenario is that since these two days preceded former President Reagan's state funeral, that there were investors who were hedging that the gathering of government officials would be too tempting of a target for terrorists to pass up. The other indicators, while not exhibiting as large of a spike as the one for the Transportation Average, do indicate increases in the options trading (either for or against based on the index) prior to the state funeral.

Another point on this chart that could indicate potential for activity is in the beginning of June. Again, the only indicator spike that falls well outside a normal range is the one for the Dow Jones Transportation Average, but the gold, Five Year Treasury, energy, and S&P 500 Indexes are all trending in the direction that would indicate that this might be cause for further investigation.

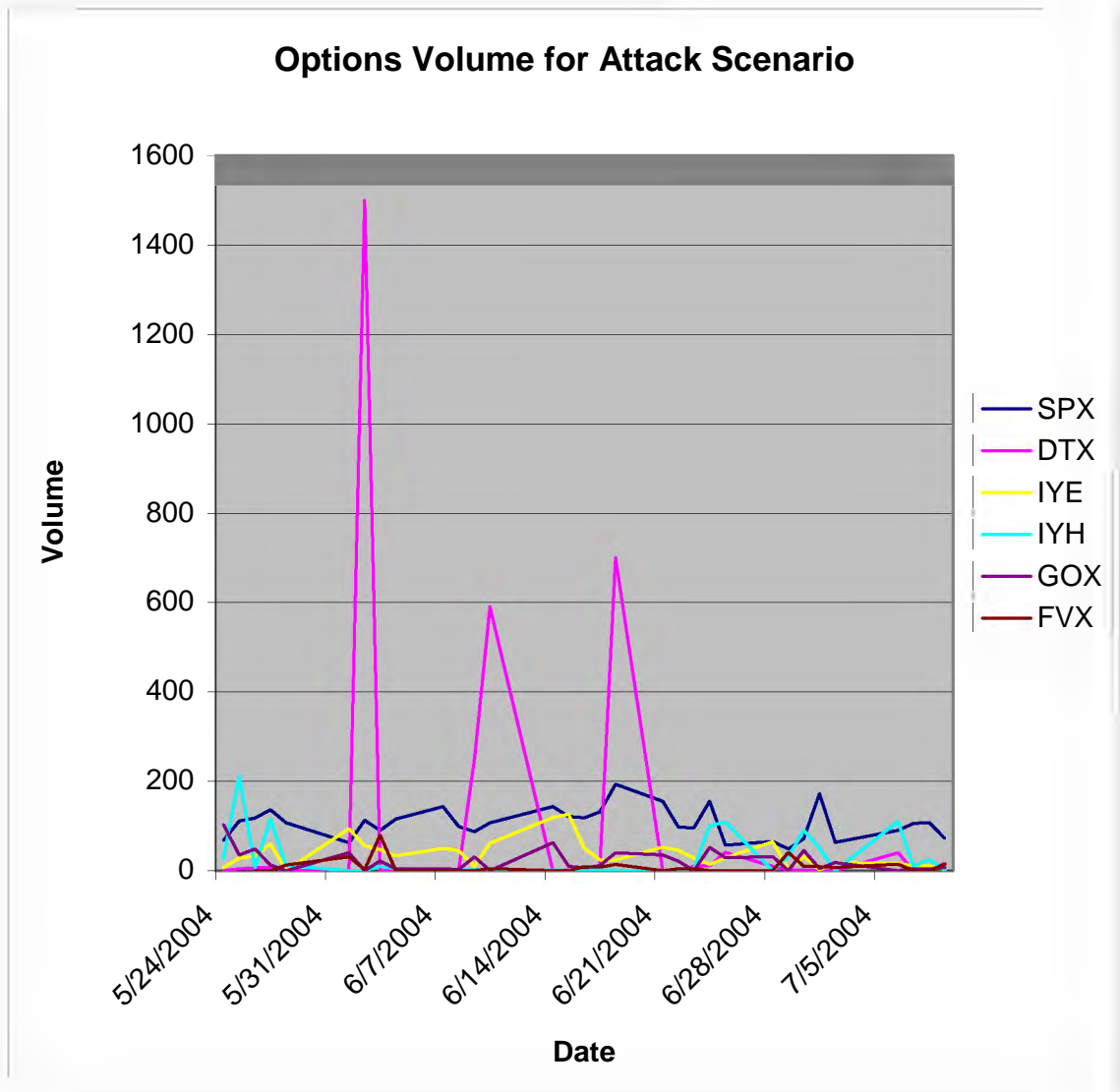


Figure 9: Options Volume for Attack Scenario

Source: Compiled by author with data from the Chicago Board of Options Exchange Data, www.cboe.com/mktdata/mktstat.asp. Accessed 10 July 2004.

Non-Attack Scenario.

Based on the matrix initially presented in Chapter Three (figure 1), the terrorist trader has the option to bet on likely attack dates with the knowledge that there will not be an attack. In the case of the indicators, all of the investment options would either change in the opposite direction or not change at all. Investing with the notion that

markets might anticipate an attack, and then not have an attack occur, is a more risky investment scenario, as one group of terrorists cannot control the actions of all of the other groups.

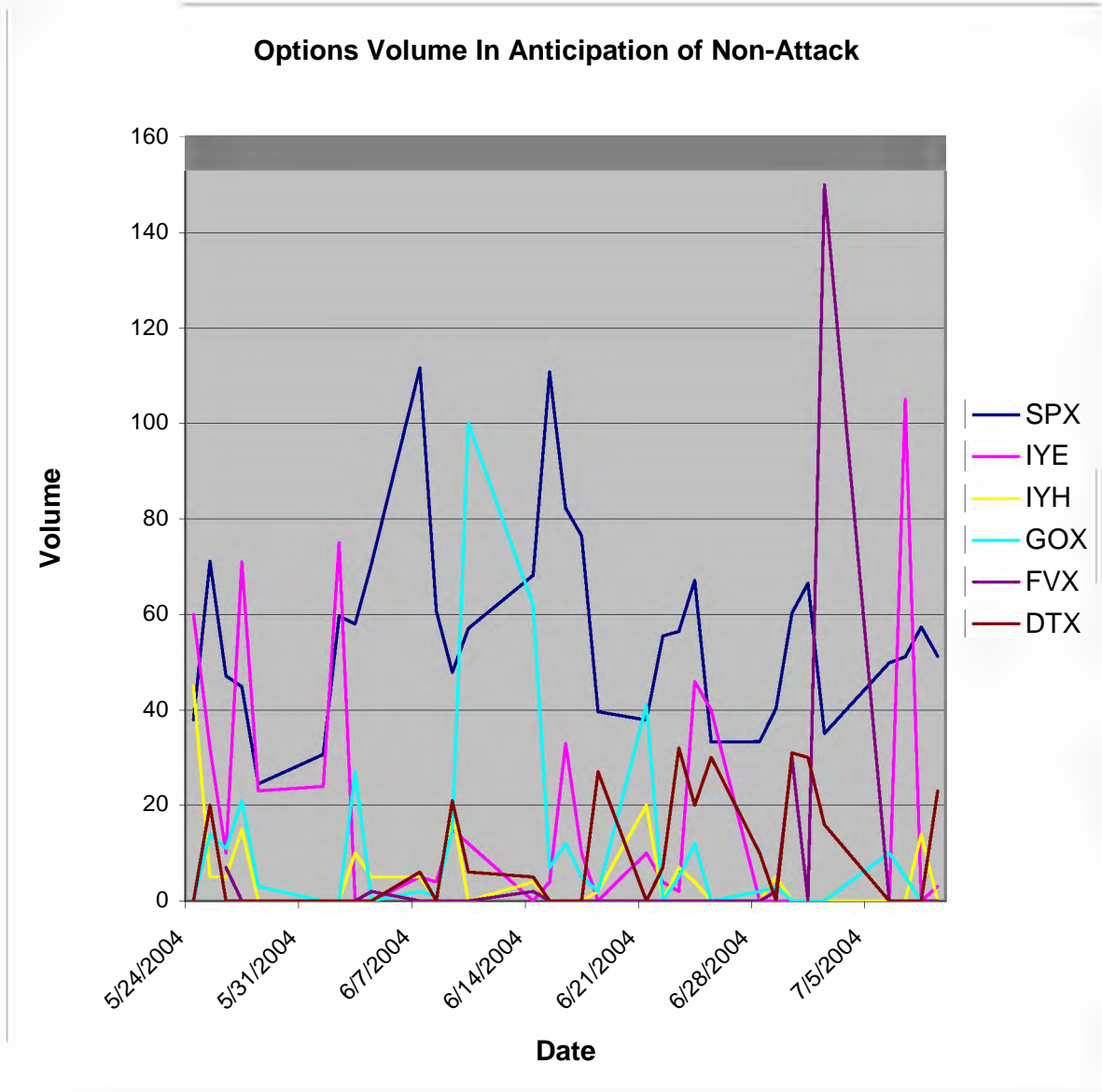


Figure 10: Options Volume In Anticipation of Non-Attack

Source: Compiled by author with data from the Chicago Board of Options Exchange Data, www.cboe.com/mktdata/mktstat.asp. Accessed 10 July 2004.

In comparing the activity levels, there appears to be a significant grouping of positive volumes just prior to the 4 July holiday. In spite of activity in the attack scenario, the number and volume of options purchased just prior to that holiday suggests that the market believes that there would be no attack during the 4th of July weekend. There is also activity early in June that suggests no attack was expected during former President Reagan's state funeral on 10 June. One explanation is that there are investors who believe that there may be an incident on either of these dates, and they are hedging their investments so that, in either event, the risk is limited.

CHAPTER 5

LIMITATIONS

Examining options activity as the primary indicator of terrorist insider trading and as an attack indicator provides a number of insights into market activity. With market volume being as large as it is, and with the wide selection of investment vehicles to choose from, each parameter selection in the model eliminated other potential areas for examination. To fully evaluate the effectiveness of any model, it is critical to understand not only what it can do, but also what gaps it contains.

Limited number of indicators. The indicators chosen for this study should apply regardless of the attack scenario. If there are indicators in the Intelligence Community that suggest specific targets, then other specific investments could also be investigated. For example, if the Intelligence Community had other indicators suggesting an attack against a major seaport, additional investment areas would be the shipping industry, the insurance/reinsurance industry, companies that would be most affected by the attacks, infrastructure that would suffer the most, and companies that specialize in marine salvage operations. Given the size of the market, it would also be an advantage to investigate trading on companies that would benefit from attacks (such as competitors) in addition to those who would be damaged.

Domestic markets only. This study only examined trading that occurred in the U.S. domestic markets. Given that investment is a global activity, and that the rules in other countries can be much less restrictive – read less risky for the terrorist investor – other major markets should be explored. Europe does not have the same reporting

requirements as the U.S., and while steps have been taken to tighten the loopholes in some of the financial systems, there are several where critical data is not even collected, let alone analyzed.¹⁹

Tracking companies is difficult even with “know-your-customer” rules. Even though exchanges are supposed to know their customers, the widespread occurrence of identity theft and fraud makes the discovery of who is actually behind specific trades difficult at best. Brokerages are required by the Patriot Act to know with whom they are transacting business. However, it is up to foreign banks that often submit trades to U.S. brokerages to know who their clients are. Since the banking regulations outside of the U.S. are often less strict, it is questionable how diligently foreign banks pursue their clients’ identities.

Information on individual trades not readily available. Hundreds of information sources are available for broad market data. It would be useful for any investigation to know the specific breakdown of the trades occurring. The aggregate data presented for the public impedes researchers and investigators outside of the financial community from monitoring numbers and volumes of specific enough detail to track individual, small volume trades. Given that trades could be made with as little as one contract, one method of avoiding detection for the terrorist would be to limit the number of contracts purchased at any one time in order to circumvent reporting requirements.

Financial Data. In evaluating the options volumes, there is not enough data to determine whether the puts and calls were exercised, purchased or written. Since options are traded on different exchanges and there does not appear to be a standardized format

¹⁹ Jesse Eisinger, “Investigators Fail to Find Evidence of Pre-Attack Market Manipulation, *Wall Street Journal*, 18 September 2001, C20.

for the collection and exploitation of this data, some of the volume data must be used with the knowledge that not enough specificity is available to form the most accurate representation of trading activity. One can garner a general sense of what the market is doing, but specifics are elusive.

It is also not clear that the volumes alone are the best indicator. It would be more informative to couple options volume with the strike price data. This combination would better show how many contracts are being written with high, unusual expectations. The author was unable to obtain this level of financial data.

Electronic Trading Anonymity. Even for those brokers who are tied into the electronic markets, the identity of the other brokers/investors making trades is not readily apparent. There are SEC reporting standards that require the reporting of certain position levels and all traders must be registered with the exchange they are working on, but unless criteria are established to identify each trader in real time, that information can be lost. There is also a mechanism called a “give up account” that brokerages use when they need to trade on an exchange they are not listed on. In that case, a brokerage would call another brokerage with whom it has a reciprocal agreement and who is a member of the exchange it wishes to trade on; the brokerage with the membership would allow the first brokerage to trade using one of its “house” accounts. The brokerage providing the “give up account” knows to whom it is giving the account, but the use of house accounts adds another layer to the difficulty in tracking specific trades and traders.

Within each brokerage, there may also be dedicated “house” accounts for use by traders who are not, themselves, members of the exchange. Their trading activity each day is only identified by the brokerage’s house account and has no ready indicator as to

the identity of the individual making the trade. It may be impractical for the exchanges to identify each and every trader, but regulations should be in place requiring brokerages to keep records of who exactly is making trades for them so any investigation can link the trader to specific trades.

Block Trading. Often traders and clearinghouses will take orders from individual investors and then consolidate those trades into one block trade that is presented to the exchange. This prevents those in the market exchange who are monitoring markets to determine where exactly the orders are coming from. This would also disguise those who are trying to place market orders or contracts by having them lumped in with other traders.

The model examined options activity that would be most affected by a terrorist attack in order to determine whether any pre-attack trading took place. A set number of indices were examined, and while they were the most likely to fluctuate given an attack, more or different indicators could also be chosen. The parameters of the model can be adjusted in order to account for specific threats, and even the investment vehicle can be changed if the analyst deems that it would better reflect activity in the area in which he is working.

CHAPTER 6

APPLICABILITY AND OPPORTUNITIES FOR FURTHER RESEARCH

APPLICABILITY

Terrorists require significant amounts of money to pursue their objectives. This money comes from as many sources as the terrorists can think of: narcotics trafficking, smuggling diamonds, charity funds, legal and illegal enterprises. With this all-encompassing effort to raise funds, it is unlikely that the astute terrorist financier would pass up the opportunity to profit in U.S. financial markets with foreknowledge of an attack's impact on these markets. In order to maximize the profit potential while minimizing financial risk, the use of "options" yields the lowest cost/benefit ratio. This begs the question, "How can the U.S. track options trading in order to identify suspicious trades that could be indicators of an impending attack?"

The study utilized six specific index funds, and then examined data for a 40-day period. These funds were non-diversified funds that would be most impacted by an attack, yet were for the most part unrelated to ensure objectivity. For each of the six indicators, the investment options were examined graphically based on how the index or commodity was expected to react to a large-scale terrorist attack. This data was charted in order to identify emerging trends in trading activity. In at least one instance, that of the time immediately prior to former President Ronald Reagan's state funeral, the trends across all of the indicators may have suggested an attack, but only one indicator was so far out of the normal data range to suggest investigation.

Can the study of options become an indicator to possible attack? The short answer is “a qualified yes.” The findings of this study suggest that in the current form, the data available for this model is not complete enough to isolate the trades and volumes that could lead to a reliable indicator. While there were some trends within the data that suggested potential for attack, without an attack actually occurring and the data being re-examined, it is difficult to know whether this model will hold for all scenarios. However, the study of options is a valid starting point in the quest predict/prevent further terrorist attacks and shut down avenues of terrorist finance. The ambiguity that was revealed by comparing the attack and non-attack scenario charts reflects the deficiency of not having specific enough information regarding the types of options activity. Puts and calls are both bought and sold – without specific data as to whether the options are bought or sold it is difficult to discern whether investors are calculating the market will swing up or down.

Furthermore, the best set of data was not available for this model. That, in and of itself, does not invalidate the model, it only suggests that the model would be much more accurate with the addition of more precise data. The optimal data set would include the following:

- 1) Total futures volumes for each specific index or commodity. This would enable the analyst to see the overall trend in investment patterns for the entire market.
- 2) Long and Short data for all futures contracts trades. It is critical to examine whether, in the total volume, investors are buying or selling futures contracts. In the research dedicated to this thesis, often neither was available.

- 3) The individual number and size of contracts traded. While this would offer no insight on block trading, the ability to analyze the volume on a trade-by-trade basis would be extremely helpful, as the size of trades does not necessarily have to be large to provide significant returns. The terrorist investor could use the overall volume to hide his transaction by being one of thousands of small trades.
- 4) Options data that reflected whether calls and puts were purchased or sold. The data available at the time of this writing provided the overall volumes for some of the indexes, but did not differentiate whether the call or put positions were purchased (long) or written (short).

AREAS FOR FURTHER STUDY

In order to make this study feasible, several areas were excluded that should be of interest to future analysts.

Specific Indicators. The indicators used for this study will apply to all attack scenarios regardless of the target. Future models could incorporate more specific indicators that could reveal more precise attack specifications. For example, if an analyst were interested in indicators surrounding a possible attack on Norfolk, Virginia, via a container ship, then futures and options that would be more directly impacted should be focused on. In that example, worldwide shipping companies have their U.S. headquarters there, and one of the largest imports through that harbor is crude oil. Marine salvage

companies would naturally be affected by any major attack, as would marine reconstruction and shipbuilding companies.

Hedge Funds. Hedge funds are undergoing increased regulation, but the strategy of hedge funds is to make money regardless of which direction the market is headed. This often entails high-risk investment strategies and there is a large degree of anonymity on the part of the investors. Hedge funds qualify as another highly desirable vehicle for investments due to the high returns and difficulty in identifying the investors behind the hedge funds.

Futures. While this study focused on options on commodities, treasuries and Index Funds, futures contracts are an equally important vehicle for investment that are highly liquid, contain high levels of leverage, and enjoy a large trading volume. Further study could utilize the futures contracts intraday or daily volume over time. Futures contracts are subject to reporting requirements based on the number of contracts held. If the data is available, it would be useful to track individual trades and match the size of the individual trades to within a certain percentage of the reportable number (see Figure 11 below). As is the case with many criminals and money launderers who choose to make multiple deposits in the \$9,000.00 range in order to avoid the deposit reporting requirement of \$10,000.00, trades that fall into the 10-15% below the threshold number bear scrutiny, especially if it could be shown that the investment accounts were linked in any way. The Commodity Futures Trading Commission has established reporting requirements for commodities, an example of which is below.

Investment	CFTC Reporting Level Number of Contracts	Below Reporting Thresholds	
		10%	15%
Gold (GC)	200	180	170
U.S. Treasury Bill, 13 Week	150	135	128
U.S. Treasury Note, 2 Year	500	450	425
U.S. Treasury Note, 5 Year	800	720	680
U.S. Treasury Note, 10 Year	1000	900	850
U.S. Treasury Bond, 30 Year	1000	900	850
S&P 500 Index	1000	900	850
Dow Jones Transportation Average Index	100	90	85
Crude Oil, Sweet	350	315	297
Natural Gas	175	157	149

Figure 11: Futures Reporting Requirements and Potential Terrorist Trading Levels

Source: Compiled by author. Information is based on the Commodity Futures Trading Commission's Large-Trader Reporting Levels Document, CFTC Regulation 15.03(b), URL: <http://www.cftc.gov/dea/dearlevel2.htm>. Accessed 28 June 2004.

All of this information is publicly available, so it would be unreasonable to assume that terrorist traders might invest with these reporting levels in mind. Investigations into possible insider trading might examine not only trades exceeding the reporting thresholds, but also trades that fall within a certain small percentage of those reporting requirements.

On 7 July 2005, terrorists struck in London on the public transportation infrastructure. Instantly, the markets in the U.S. and the UK fell. Most of those losses did not last much longer than the day, but the financial downswing was there nonetheless. If terrorists are using the markets to further fund operations or to undermine the world financial system, that activity should be identifiable. This model serves as a step in that direction. While there are gaps this model does not account for, the concepts surrounding the investigation of terrorist insider trading

are sound. The selection of indices and timeframes are variable, but the use of the model, combined with the Intelligence Community's indications and warning effort, sheds light on potential terrorist attacks.

APPENDIX A

INDEX COMPOSITION

1. Dow Jones Transportation Averages Components Tuesday, July 6, 2004

Company	Price Exchange	Primary Group	Weighting
FedEx	NYSE	Air Freight	11.4287
United Parcel Service Inc.	NYSE	Air Freight	10.5293
Union Pacific Corp.	NYSE	Railroads	8.2539
Expeditors Intl of Washington, Inc	NASDAQ	Air Freight	6.7921
C.H. Robinson Worldwide Inc.	NASDAQ	Trucking	6.4809
CNF Inc.	NYSE	Trucking	5.8742
Ryder System Inc.	NYSE	Transportation Serv.	5.5416
Yellow Roadway Corp.	NASDAQ	Trucking	5.4759
J.B. Hunt Transport Services Inc.	NASDAQ	Trucking	5.4117
Burlington Northern Santa Fe Corp.	NYSE	Railroads	4.9006
USF Corp.	NASDAQ	Trucking	4.8621
Alexander & Baldwin Inc.	NASDAQ	Marine Transport	4.7351
CSX Corp.	NYSE	Railroads	4.5109
GATX Corp.	NYSE	Industrial Services	3.7472
Norfolk Southern Corp.	NYSE	Railroads	3.5745
Southwest Airlines Co.	NYSE	Airlines	2.2626
AMR Corp.	NYSE	Airlines	1.6345
Continental Airlines, Inc.	NYSE	Airlines	1.5588
Northwest Airlines Corp.	NASDAQ	Airlines	1.4846
Delta Airlines Inc.	NYSE	Airlines	0.9407

Source: the DowJones Indexes website, www.djindexes.com. Accessed 1 July 2004.

2. iShares U.S. Energy Index Composition:

Company	% Holdings
Exxon Mobile Corp.	24.03
ChevronTexaco Corp.	21.35
ConocoPhillips	5.00
Schlumberger Ltd.	4.43
Occidental Petroleum Corp.	4.41
Burlington Resources Inc.	3.01
Baker Hughes Inc.	2.46
Anadarko Petroleum Inc.	2.45
Devon Energy Corp.	2.42
Apache Corp.	2.41

Source: iShares website, www.iShares.com. Accessed 1 July 2004.

3. iShares U.S. Healthcare Index Composition:

Company	% Holdings
Pfizer Inc.	16.73
Johnson & Johnson	10.50
Merck & Co Inc.	6.59
Amgen Inc.	4.38
Lilly (Eli) & Co.	4.23
Abbott Laboratories	4.06
Medtronic Inc.	3.81
Wyeth	3.09
Bristol Myers Squibb Co.	2.99
United Health Group Inc.	2.40

Top Sectors/Industries	% Holdings
Pharmaceuticals	50.82
Medical Products	21.07
Biotechnology	15.33
Healthcare Providers	12.76

Source: iShares website, www.iShares.com. Accessed 1 July 2004.

4. Gold Index Components:

Company	% Holdings
Barrick Gold Corp.	10.00
Agnico-Eagle Mines	10.01
Anglogold Limited	9.99
Freeport McMoran Copper Gold	10.02
Gold Fields Limited	10.00
Glamis Gold Limited	9.99
Harmony Gold Mining Company	10.00
Placer Dome Inc.	9.99

Source: Information from the Chicago Board Options Exchange website, www.cboe.com. Accessed 1 July 2004.

APPENDIX B
FINANCIAL DATA

Index Fund Options Volume – Attack Scenario						
Date	S&P 500 Ind	Energy Ind	HealthCare Ind	Gold Ind	5 Yr Treasury	DJTA
	SPX	IYE	IYH	GOX	Yield Ind FVX	Ind DTX
	Puts/1000	Calls	Calls	Calls	Calls	Puts
7/9/2004	71.799	2	2	7	15	16
7/8/2004	107.833	11	25	4	0	0
7/7/2004	105.511	11	10	4	0	0
7/6/2004	90.033	16	110	0	15	40
7/2/2004	63.478	18	0	18	7	0
7/1/2004	172.247	2	51	5	9	1
6/30/2004	71.672	32	90	45	10	2
6/29/2004	48.574	4	32	0	41	1
6/28/2004	65.352	65	0	32	0	10
6/25/2004	57.134	29	109	29	0	41
6/24/2004	155.17	14	100	52	0	11
6/23/2004	95.561	28	5	0	5	10
6/22/2004	97.108	46	1	21	4	0
6/21/2004	155.343	53	0	35	0	0
6/18/2004	193.391	24	1	40	14	700
6/17/2004	131.502	25	2	11	8	6
6/16/2004	118.327	50	1	6	9	0
6/15/2004	121.024	126	0	10	0	2
6/14/2004	143.205	119	2	63	0	0
6/10/2004	107.247	61	0	0	5	590
6/9/2004	87.588	10	3	31	0	250
6/8/2004	98.76	45	0	3	1	2
6/7/2004	143.484	50	0	4	1	5
6/4/2004	115.607	33	4	4	0	0
6/3/2004	90.023	47	10	22	80	0
6/2/2004	112.601	56	0	0	3	1500
6/1/2004	62.974	94	0	40	31	0
5/28/2004	107.158	1	11	0	13	0
5/27/2004	135.882	60	116	13	0	7
5/26/2004	117.842	33	6	49	0	6
5/25/2004	111.482	28	211	35	0	4
5/24/2004	67.959	7	28	103	0	0

Source: Compiled by author. Data for this table came from the Chicago Board Options Exchange Website, www.cboe.com. Accessed 14 July 2004.

The values for the S&P 500 Index were divided by 1000 to facilitate graphing with the other indexes. The overall volume trend is unchanged.

Index Fund Options Volume - No Attack Scenario						
Date	S&P 500 Ind	Energy Ind	HealthCare Ind	Gold Ind	5 Yr Treasury	DJTA
	SPX	IYE	IYH	GOX	Yield Ind FVX	Ind DTX
	Calls/1000	Puts	Puts	Puts	Puts	Calls
7/9/2004	51.183	3	0	0	0	23
7/8/2004	57.4	0	14	0	0	0
7/7/2004	51.066	105	0	5	0	0
7/6/2004	49.824	0	0	10	0	0
7/2/2004	35.086	0	0	0	150	16
7/1/2004	66.59	0	0	0	0	30
6/30/2004	60.235	0	0	0	30	31
6/29/2004	40.384	0	5	3	2	0
6/28/2004	33.349	0	0	2	0	10
6/25/2004	33.322	40	0	0	0	30
6/24/2004	67.185	46	4	12	0	20
6/23/2004	56.403	2	7	5	0	32
6/22/2004	55.534	4	0	0	0	7
6/21/2004	37.821	10	20	41	0	0
6/18/2004	39.643	0	2	2	0	27
6/17/2004	76.422	10	0	5	0	0
6/16/2004	82.276	33	0	12	0	0
6/15/2004	110.737	4	0	7	0	0
6/14/2004	68.21	0	4	62	2	5
6/10/2004	57.084	12	0	100	0	6
6/9/2004	47.862	15	19	15	0	21
6/8/2004	60.733	4	0	1	0	0
6/7/2004	111.555	5	5	2	0	6
6/4/2004	70.651	0	5	0	2	0
6/3/2004	58.044	0	10	27	0	0
6/2/2004	59.627	75	0	0	0	0
6/1/2004	30.636	24	0	0	0	0
5/28/2004	24.486	23	0	3	0	0
5/27/2004	44.863	71	15	21	0	0
5/26/2004	47.11	10	5	11	7	0
5/25/2004	71.146	32	5	14	0	20
5/24/2004	37.962	60	45	0	0	0

Source: Compiled by author. Data for this table came from the Chicago Board Options Exchange Website, www.cboe.com. Accessed 14 July 2004.

The values for the S&P 500 Index were divided by 1000 to facilitate graphing with the other indexes. The overall volume trend is unchanged.

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