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Radical Islamic Terrorism in the Middle East and its Direct Costs on Western Financial Markets
Martin Mullins and John Garvey

Close examination of the behaviour of participants in financial markets in the aftermath of terrorist attacks is a valuable line of enquiry. In this paper, we bring together insights from field of finance and politics. Specifically, we examine trading patterns on highly liquid insurance-type financial instruments around a specific terrorist event. This approach provides an insight into risk perception around political violence and allows us to answer a number of key questions on the impact of terrorist attacks on economies and societies. When examined and processed, intraday financial trade data yields valuable empirical evidence on immediate reactions to the threat posed by terrorist groups. The methodology applied in this paper also tells us much about the geographical resonance of terrorist events. We clearly show that fear of economic disruption can be activated in Western markets by events that are often geographically remote. Importantly, these datasets allow us to judge the vulnerability of financial markets to terrorist attack. This potentially allows public authorities to safeguard our interests more effectively. Financial markets are one important element of a "neglected home front" and the risks posed by disruption to those markets are such as to merit our urgent attention.[1]

The Markets: 9/11 and its Aftermath

In their analysis of the economic impact of terrorism, Lenain, Bonturi and Koen (2002), argue that the financial markets recovered relatively quickly after the WTC attacks. By the end of 2001 equity prices had largely bounced back to levels seen on September 10th of that year. Similarly, other financial indicators associated with increased volatility in financial market such as interest rates spreads returned to those levels seen before the attack. They conclude by stating, "on the whole, the shock to the financial markets thus seems to have been largely transitory."[2] Thus, the long term resonance of the September 11th attacks in both the social and political arena does not appear to be reflected in the behaviour of Western market participants. In this paper we show that contrary to the evidence provided by stock market levels, security fears persisted long after the events of September 11th and these fears were amplified by terrorist activities located in the Middle East.

The psychological impact of the September 11th attack was clearly reflected in asset price volatility during the period immediately following the attack. The `flight to safety' which occurred saw a significant movement of assets from the risky end of the investment spectrum (the stock market) towards safer investment vehicles such as cash and the bond market. This observation however must be placed in the context of a general stock market decline that had begun the previous year. The well-documented TMT (telecom, media and technology) stock market bubble had developed over the latter part of the previous decade and the awareness of unjustified asset prices had led to a shift in investor sentiment so that by March 2000 investors were reducing their holdings in these companies. The FTSE100 Index was not immune from this unwinding since the stock values of some of its top ranked member companies, such as Vodafone, suffered severe declines. Stock market prices are often underpinned by sentiment and this phenomena is vulnerable and subject to rapid change. Political violence represents a threat to confidence and to the stability of financial markets.

Financial Markets as a Target

Financial markets are of crucial importance to the functioning of Western society. For those seeking to disrupt the operation of wider society, economic targets have long been part of the overall strategy.[3] The repeated ETA (Euskadi Ta Askatasuna) attacks on Spain's tourist infrastructure in the early 1990s is an example of such a tactic. Historically, terrorist groups (non state military actors) have sought to exert leverage through putting pressure on actors in the economic/financial sphere. The logic is that by imposing a high cost on particular parts of a society that this would weaken the resolve of the State in resisting demands of such groups. Radical Islamic groups understand that if they impose sufficient pressure, they may force policy changes on the part of Western governments.

There is much debate over the motivation for Al Qaeda's actions. Abrams (2006) outlines the four most common sets of interpretations; 1. Al Qaeda hates freedom and seeks to impose its view of the word. 2. The desire to kill Americans is seen as end in itself. 3. Al Qaeda wish to provoke the US into a waging wars in the Middle East. 4. Al Qaeda wants to change US foreign policy, particularly as it pertains to the Middle East.[4] The fact that there is no consensus on their ultimate goals and a high degree of uncertainty about their capabilities ensures that financial markets are even more vulnerable as a target for such groups. It is this feature, namely the difficulty in assigning clear goals to this movement, which makes Al Qaeda so threatening to financial markets. In the financial literature, experimental research has demonstrated the reluctance of individuals to engage in investment in the presence of ambiguity. In this instance, ambiguity can be defined as a state where there are a number of potential outcomes and each of these outcomes cannot be assigned a probability. Market participants will always prefer to invest in an environment where they feel they can assign a numerical probability of future outcomes occurring.[5] Empirical studies that have demonstrated greater market engagement following company announcements thus demonstrating a preference in markets for information flows that conform to a well understood system. [6]

The development of terrorist groups such as Al Qaeda who are active across borders and regions represents a new dynamic for those in the financial markets. Mullins and Garvey (2008) refer to Al Qaeda as de-territorialized, such groups are potentially more dangerous and certainly more unpredictable than State sponsored groups and those organisations with a geographic base.[7] For terrorist groups with a geographical base, it is important for them to retain support in their communities and this limits the military options available to them. Targets are often presented as being legitimate targets and can be restricted to political/military targets. The imperative not to damage their support base ensures their actions are more predictable. "New" terrorist actors are not constrained in this way and they are less beholden to a specific constituency, hence often no real distinction is made between civilian and military targets. As the operational capacity of such groups improves, the political/security environment may deteriorate very quickly. Financial markets have had to deal with terrorism in the past. In the UK the Provisional Irish Republican Army (IRA) directly targeted the financial community in London.[8] However in this instance the terrorist group was perceived to operating in a well understood system, controlled by a politically aware Army Council with well discipline operatives.[9] Al Qaeda is different in that the goals of the organisation is not well understood, nor indeed is the nature of the organisation itself. Moreover, there is no clear understanding of the upper limit of violence this group in capable of. This creates a dread factor not only for the population in general but also for the markets. Hence Slovic (2002) argues that with 9/11 we entered a new era of terrorist risk. [10]

Al Qaeda is not well understood by its enemies and indeed Al Qaeda, in its communiqués, bemoans that fact.[11] That Al Qaeda is not well understood does not mean that there is an absence of rationality in the organisation. There is an acceptance that the in terms of targeting there is rationality at work.[12] Given the pressure on its resources Al Qaeda needs to manage it target selection with some care. Improved security has seen them turn towards softer targets. Bergen (2005) states, "they now care about economic targets because they understand that this is the best way, in a sense, to attack the West."[13] In a audio tape released in 2004 Bin Laden stated that Al Qaeda were committed "to continuing this policy in bleeding American to the point of bankruptcy." He went on to say that whilst the September 11 attacks had cost his organisation US$500,000 they had cost the United States some US$500 billion.[14]

A striking aspect of the coverage of the World Trade Centre attack was the subsequent attention that focused on the financial markets. Similarly, many of those commenting in the aftermath of the July 2005 bombings in London stressed the resilience of markets in the face of the attacks.[15] There is often an explicit, sometimes implicit acceptance that the markets are an important element of this "war". In security terms the behaviour of the markets are crucial. *Jihadi* terrorist networks may not be able to mount sustained campaigns but the responsiveness of the markets still means that they can impose a heavy cost on the West. In effect, financial markets provide substantial leverage to these networks.

High levels of liquidity and the role of information and the media mean that these markets are extremely responsive to events. Financial markets are both strategically vital and vulnerable to precisely what Al Qaeda is able to produce, fear and negative emotion. In societies that pride themselves on their rationality financial markets, paradoxically, are both vital and prone to emotionality. Institutions such as stock markets render visible the co-existence of the modern and the pre-modern in our society. In other public institutions irrationality and emotionality have tended to be excluded from the mainstream of the discourse. In financial markets, there is an acceptance of the saliency of emotional factors in the markets.[16] It is this combination of strategic importance and vulnerability that makes the relationship between terrorism and financial markets such a fascinating area of study. Technology enabled velocity and the global nature of these markets allows fear and panic to spread with extreme rapidity. The phenomenon of 24-hour news coverage means that events are fed instantaneously into the large financial centres.

Another important aspect of the markets is that their sheer size precludes government from exercising any more than a degree of influence. Taking the example of the *forex* markets, the average daily trade in 2007 stood at around US$3.2 trillion.[17] The phenomenon of financialization has raised the stakes in that financial markets have become progressively more central to our economic security. The combination of strategic importance and vulnerability ensures that understanding the response of financial markets to terrorism is vital to protecting States around the world. There is often an explicit, sometime implicit acceptance that the markets are an important element of this "war".[18] In security terms, the behaviour of the markets are crucial. *Jihadi* terrorist networks may not be mount sustained campaigns but the responsiveness of the markets still means that they can impose a heavy cost on the West.

Market Responses to Political Violence

The impact of violent conflict on the economy has long been a subject of debate. Discussion has often focused on increased production related to war and to the negative consequences of trade dislocation. More recently Schneider and Troeger (2006) point to the indifferent or positive market reactions to the recent wars.[19] Using the example of the first Gulf War, the conflict over Kosovo and the 2003 invasion of Iraq, they show some examples of increased stock market volatility but demonstrate that for the most part markets reacted fairly positively to these events. One feature of these violent conflicts is their asymmetrical nature. In general terms, there was little doubt about the likely winner in these inter-state conflicts. Terrorism too has its roots in power asymmetries but the consequences of this type of conflict are perceived as less predictable. This is in part due to an essential characteristic of terrorism, namely it is an attempt to strike at the psyche of the target population. The reaction of the host population to terrorism is difficult to predict. The multitude of studies in the aftermath of the WTC attacks point to the various and varied impacts on the US population.[20] The impact of terrorist attacks is not temporally bounded and their impact may linger and continue cause economic loss for some time after the initial event. It may not be easy to detect the continuing fear and unease in the markets. One of the main insights offered by this paper is that it is insufficient to review asset prices or indices of assets prices to detect the continuing impact of a large scale terrorist incidents. In order to gauge the behaviour of market participants in response to these incidents other more sensitive (forward looking) financial instrument need to be included in any analy.sis. Terrorism does create fear and uncertainty, this is clearly visible in the options markets

More generally, terrorism has tangible affects on the world's economy. Terrorism can also be seen to have particular impacts on national economies. These impacts are not principally related to the damage caused, though this can be severe.[21] The negative effects of terrorism are often related to secondary actions. The response of the State to attacks can cause severe economic disruption. That is to say that the reaction of public authorities can extremely costly. In the aftermath of the WTC attacks increased security resulted in tangible economic consequence. There is the displacement of resources to consider. In GDP terms, an increase in public military spending by 1 per cent and a 0.5 per cent rise in private security spending may result in a reduction in output of 0.7 per cent.[22] The attacks produced a number of effects in business geography, architecture of buildings and cross border trading patterns.[23] In certain sectors the impact was very serious indeed, in particular the airline industry and tourism. In the case of the latter, increased security may have caused a substantial drop in visitor numbers to the US. The ability of terrorist actors to damage the tourist industry in well documented and the experience of certain European countries and the Levant region is instructive in this regard.[24]

It is not plausible that an event of the magnitude of 9/11 did not have an effect on the mentality of those engaged in the financial markets.[25] We show in this paper that unease and nervousness remained in the markets years after this event. It adds evidentiary weight to arguments put forward by Slovic that we had entered a new era of political violence.[26] Events as spectacular as the WTC attacks inevitably have an effect on the worldview of human subjects In the social sciences and philosophy there is a general consensus that actors in the social realm (here the focus is one financial traders) are not merely rational actors operating in the present. They are influenced by the past, a sense of belonging and by the other human actors.[27] The actions of human subjects are always influenced by the position they occupy, this is true both in historical and societal terms.[28] The financial literature has identified characteristics of market participants that do not fit neatly with traditional theories on rationality. In particular, early studies in behavioural finance demonstrated that individuals very often behave in an irrational and emotional manner[29]. These so-called biases in human behaviour are a useful context in which to view the trading behaviours that result from terrorist activities.

Terrorism: Impacts on Financial Market

Chen and Siems (2004) interpreting terrorism in its broadest possible context use an event-study methodology to measure the impact of a number of events since 1915. The authors note that in the case of a low-probability, high consequence events investors will shift their investment policy into defensive assets.[30] Eldor and Melnick (2004) examined the impact of terrorism on Israeli financial markets finding that suicide bombing had a tangible and long-lasting effect on the Israeli stock market.[31] Maillet and Michel (2005) also examine the impact of terrorist events on stock markets. They look specifically at market reaction to the WTC attack. Using a particular measure of volatility they found that the WTC attack had significant repercussions in both the US and French stock markets.[32]

The attacks of September 11th 2001 had a profound impact on capital markets globally. The immediate aftermath saw sharp falls in equity prices, however financial markets were quick to recover and many of the indicators of perceived risk returned to normal by the first quarter of 2002.[33]

Table 1. S&P 500 - Stock price recoveries

	Reaction period	Reaction	One year later*
Pearl Harbor	7 to 29 Dec. 1941	-10.2	15.3
Korean War	23 June to 17 July 1950	-12.9	31.4
Cuban missile crisis	23 Aug to 26 Oct 1961	-8.8	36.6
Tet offensive, Vietnam War	31 Jan. To 5 Mar. 1968	-5.6	13.7
Iraqi invasion of Kuwait	2 Aug 1990 to 16 Jan. 1991	-11.1	32.3

11 September, 2001	11 to 19 Sept. 2001	-7.0	15.0

a) Six months later in the case of the September 11 attacks

b) The reaction period is defined as ending when the US military build-up starts.

Sources: Bank of England, Financial Stability Review, December 2001 and OECD

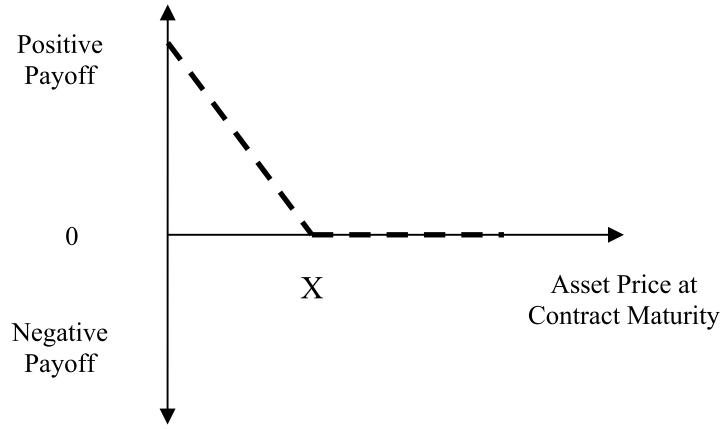
During times of increased flows of information on geopolitical/terrorist risk it is not unreasonable to conclude that there should be evidence of increased asset volatility. The causal relationship described here forms the basis for previous studies that have linked terrorist risk to financial markets. In the three year period following September 11, 2001, stock prices were relatively resilient in the face of non-catastrophic terrorist attacks. As one would expect, certain sectors were more responsive to terrorist events than others but overall market indices demonstrated a high degree of resilience. In the case of the FTSE index events such as the Bali bombing of 2002 are scarcely perceptible. This is explained by the fact that a number of other variables feed into the pricing of the assets contained within this index and so the effect of a terrorist incident may be drowned out by other data. The stability of asset prices may mask elevated level of fear in the market as transaction costs and the ability to hedge exposure mean that investor may choose to hold on vulnerable stock in the knowledge any losses will be limited.

Options Market, Index Options as a Terrorist Risk Indicator

In this paper a dynamic proxy for levels of security fear is provided by trading patterns in widely used financial instruments, known as put options. These contracts give the holder a financial payoff dependent on the value of some underlying asset. The structure of these contracts means that they are used by market practitioners to protect against or speculate on future asset price movements. Options market dynamics provide an insight into investor sentiment since option contract valuation is essentially forward-looking and reflects expectations of future asset price volatility. The focus of our study is on FTSE-100 Index Put Options whose traded price is dependent on the value of equity indices such as the FTSE-100.

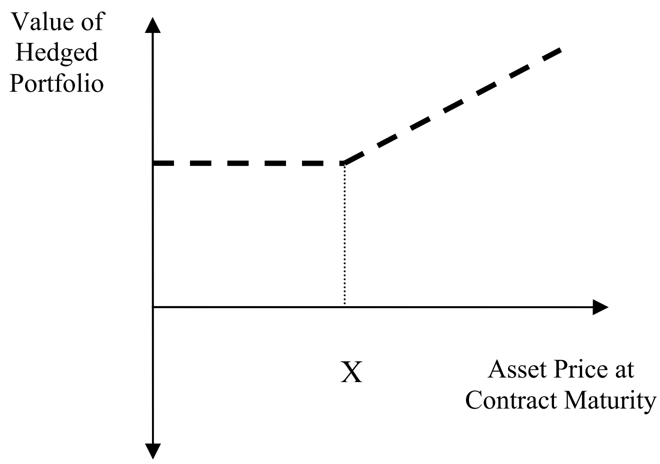
We proceed by briefly explaining the structure of a FTSE-100 Index Put Option through an example. For a fund manager who invests broadly in large UK firms that are members of the FTSE-100 index. (JG) Index put options can be used to protect against downward movement in the value of those stocks. As an illustration, let us say the FTSE-100 is trading at 4,000 and a 3-month put option is available with a strike price (X) of 3,800. If the value of the Index is trading at 3,500 by the end of the contract period, then the payoff for the put option is 300 (3,800 - 3,500). In general an economic value (£100) is associated with each point in the index, thus providing a payoff of £30,000 (300 points x £100) for each contract held. The payoff structure of holding a put option contract is shown in Figure 1a. (john can we start this with an overview of the function of put option)

Figure 1a Put Option Payoff



These instruments are widely applied as part of a strategy to protect the value of an equity portfolio from declining below a certain level. For a fund manager who has a current exposure to the stock market, purchasing put option contracts allows him or her to establish a floor portfolio value. The intrinsic value of index put option increases as the value of the index falls below the strike price (X). Applied effectively this almost exactly offsets the decline in the underlying asset, in this case, the equity index. The payoff structure of this strategy is illustrated in Figure 1b below.

Figure 1b Hedged Portfolio Payoff (Asset + Put Option)



The cost associated with this strategy is the premium paid for each put option purchased. In an environment where negative expectations dominate these instruments become more expensive, thus increasing the cost of protection.

Empirical Evidence of Security Fear

In our paper we examine the trading pattern of out of the money (OTM) index put options[34]. Increased demand for this type of option provides an insight into the level of security fear being experienced by market participants. By looking at the London options market during specific Middle East terrorist events we can evaluate the resonance of terrorist activities outside of the region in which they occur in a post September 11th environment.

This paper records the financial market reaction to a specific 'non-catastrophic' terrorist event. The bombing of the UN Headquarters in Baghdad on the 20th August 2003 occurred shortly after the fall of the Iraq government led by Saddam Hussein. From the perspective of market participants the event is both geographically remote and does not directly damage the financial infrastructure or the property of any member corporation of the FTSE-100 Index. Its impact on uncertainty and the heightened perception of political and/or terrorist risk is reflected in the trading patterns in the options market. Figure 2 shows the activity in out-of-the-money index options around the time of the Baghdad bombing. The volumes traded in these instruments are shown for the month prior to and the month following the attack. In each case 22 trading days are assumed. It can be seen from figure 2 below that traded volumes of these instruments spike on the day of the attack and the day following the attack. In fact the volumes hit a two-month peak on the day following the attack.

Figure 2 UN HQ Attack - Baghdad
OTM FTSE-100 Put Options (Volume Traded)

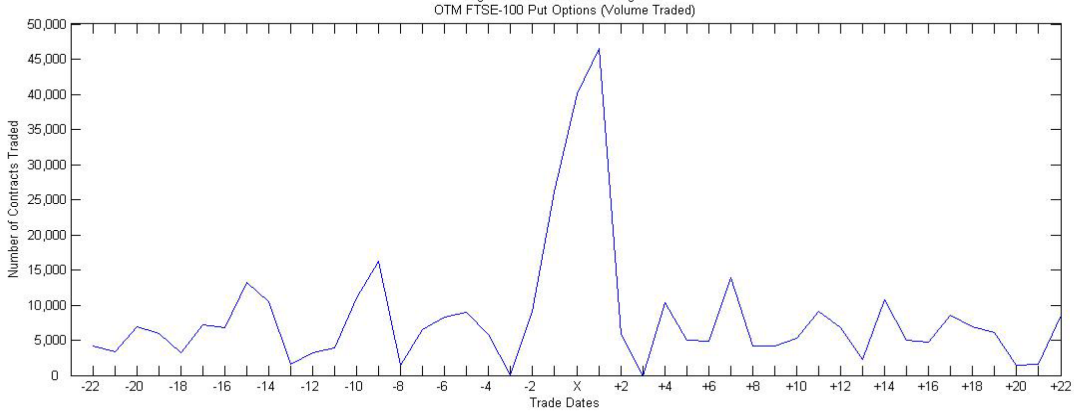
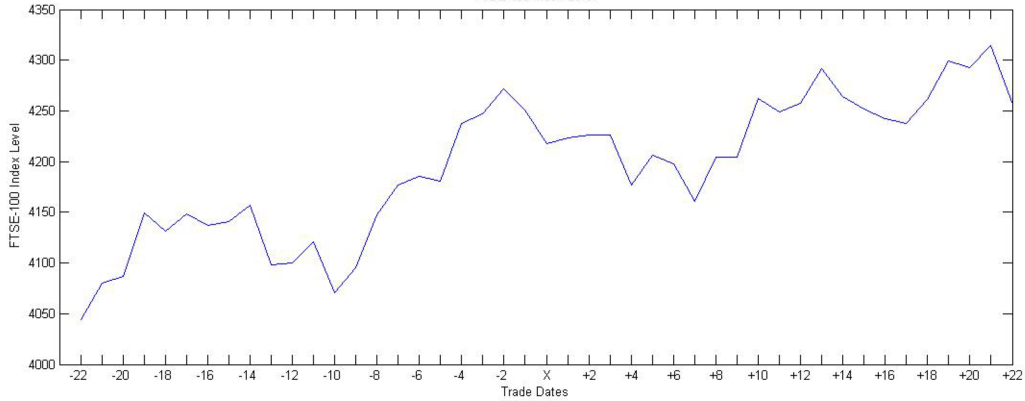


Figure 3 maps the level of the FTSE-100 Index for the 22 days prior to and post the bombing of the UN Headquarters.

Figure 3 UN HQ Attack - Baghdad
FTSE-100 Index Level



The market in the underlying stock market does not exhibit the same sensitivity to this event. In fact the values of FTSE-100 companies remained relatively unaffected. The gradual increase in stock values up to the 20th August 2003 continued in the month following the attack. An explanation is thus required to reconcile the apparently different indications of certainty and fear that are provided by the options and the stock market respectively.

Given what we know about the function of OTM Index put options as hedging instruments, the gap between the option and underlying markets demonstrates that market participants interpreted this event as having a direct effect on the volatility of a broad based Western stock market. However, recognition of the importance of the event was coupled with an uncertainty regarding the political implications of the act. The sense of uncertainty meant that they were unwilling to immediately shift their resources from the relatively risky stock market. An asset allocation decision to move out of equities and into bonds or cash would impose direct financial costs in the form of transaction costs. It would also impose an indirect financial cost since fund managers may potentially lose out on a gain in stock value. Index options accurately capture the nervous uncertainty of the bombing of the UN headquarters in Baghdad. Traders recognised the potential internationalization of the conflict through a direct attack on this institution however the timing of future effects remain unclear and vague. Index Put Options allow them to protect their investments against large future falls, whilst maintaining an exposure to risky assets. In an environment where there are persistent fears and uncertainty index options provide us with the ideal gauge of how terrorist and political events affect the populace. The attack on the UN headquarter in Baghdad is not the only attack that registered clearly in the index options market. In the aftermath of the World Trade Centre attacks index option markets were clearly sensitive to radical Islamic inspired across the Middle-East and further afield.

Discussion on Security Implications

The open and dynamic characteristics of the financial markets allows terrorists groups such as Al Qaeda to leverage their attacks. There is a long history of terrorist groups using economic impact to gain such leverage. Both the PIRA and ETA used relatively discreet and limited actions in order to damage tourist interest and cause million of pounds/euros worth of damage for a relatively small investment on their part. Enders and Sandler (1991), using monthly data a VAR methodology, estimate that each incident cost the Spanish economy 140,000 tourists.[35] Given the pressure exerted on their resources by security agencies terrorist groups need to maximise the impact of their attacks. Financial markets offer an effective mechanism to gain maximum impact from attacks. The reaction of markets to attacks can in effect multiply the effect. This situation has been shown to be particularly acute in the aviation/tourist sector.[36] Terrorist incidents can damage infrastructure and have a tangible effect on future income streams, but the impact on share prices in the sector is also very significant. The ability to cause fear and uncertainty in populations means that financial markets represent ideal targets. Financial market participants are exposed to news coverage and any risk amplification effect feeds uncertainty in the financial markets. Liquidity means that traders are able to quickly offload those stocks perceived to be at higher risk due to terrorist actions and certain sectors may be badly effected as a result. Drakos (2004) show the impact on the share prices on airlines lasted well into the following year.[37] Whilst then the general stock markets may have bounced back relatively quickly, there was lasting damage in certain sectors. Through their actions Al Qaeda has severely directly effected one of the North America most important industries and one that has a critical role to play in terms of transport infrastructure. The ability of a terrorist attack, albeit in this instance a catastrophic event, to badly damage a key part of economic life is clear. Moreover what is also evident is the important role that the financial markets played in damaging the US airline industry. This is crucial and demonstrates the leverage effect of financial markets in the aftermath of terrorist attacks.

In the case of the overall index the impact of 9/11 is less striking and, as has been said, indices did recover fairly quickly. However, our analysis of the markets in index put options reveal that the continued ability of Al Qaeda to cause fear and uncertainly in Western markets. The purchase index put options indicate the fear of a general and sharp downward movement in stock market. The fact that a bomb attack in Bagdad resonated through the London options market show the sensitivity of the financial markets to these attacks. Spikes in OTM volumes show a continued state of anxiety among in market participants and a willingness to bear the considerable cost associated with the purchase of put options. The availability of hedging mechanisms such as index put options make underlying asset prices more stable in the face of terrorist attacks. This said, it worth noting that such options are costly (and would become much more so if we saw a series of successful attacks) and in the longer term there is the question of just how sustainable such investment strategies are.

Some Conclusions

In order to be successful, terrorists need to impose high cost on states and secure an audience for their actions. Financial markets offer an effective conduit to achieve these goals. The media feeds news of terrorist events to the markets and then go on to inform the general population on the reaction of those markets. In conjunction with the media, the nature of financial markets mean that Al Qaeda is able to affect the lives of and the sense of security millions of citizens in the North America and Europe. Citizens depend on the financial markets for their savings and pension. Furthermore, adverse movement in these markets can impact upon their job security. Much of the fear after the 9/11 attacks related to physical security, however, Al Qaeda has an ability to cause very pernicious and damaging forms of insecurity. In terms of the financial markets, some of the weaknesses of Al Qaeda do in fact constitute strengths. The lack of a disciplined organisation, the absence of a single geographical base and an unclear set of objectives all combine to produce a phenomenon that deeply troubles financial markets, namely uncertainty. For those engaged in protecting Western citizens from the terrorist groups the financial markets represent a serious challenge. Their global nature, size and dynamism put them largely beyond the control of the State and herein lies the opportunity for Al Qaeda and other radical terrorist groups. Our work on the options market should alert regulators and those charged with anti terrorist policy that the combination modern global financial markets and Al Qaeda is indeed a very potent mix.

Notes

[1] Stephen E. Flynn "The Neglected Home Front" *Foreign Affairs* (September/October 2004). In this article Flynn argues that the Bush administration has failed to defend the critical infrastructure of the United States included the financial markets. Flynn also notes that in an interview given to Al Jazeera

in October 2001 Bin Laden, an economic graduate, remarked on the losses the WTC attacks had caused on Wall Street

[2] Patrick Lenain & Marcos Bonturi & Vincent Koen,. "The Economic Consequences of Terrorism," *OECD Economics Department Working Papers* 334, OECD Economics Department, 2002, p11

[3] James M. Lutz and Brenda J. Lutz, "Terrorism as Economic Warfare," *Global Economy Journal* 6 (2) (2006)

[4] Max Abrams *Studies in Conflict and Terrorism* 29:5 (June 2006): 509-529

[5] Craig Fox and Amos Tversky, *Ambiguity Aversion and Comparative Ignorance*, The Quarterly Journal of Economics 110, 585-603.

[6] Oliver Kim and Robert Verrecchia, *Trading Volume and Price Reactions to Public Announcements,* Journal of Accounting Research 29 (2), 1991, pp. 302-321

[7] See Garvey & Mullins, Contemporary Terrorism: Risk Perception in the London Options Market. *Risk Analysis,* Volume 28, Number 1, February 2008 , pp. 151-160(10)

[8] In April 1992 the IRA exploded a large bomb in London' s financial district and again, this time in April 1993, the IRA detonated a massive truck bomb is the heart of the City of London.

[9] For a discussion on the factor that restrain terrorist groups including the attitudes of their political constituencies, See Jerrold Post, Keven G. Ruby, Eric D. Shaw "The Radical Group in Context: 1. An Integrated Framework for the Analysis of Group Risk for Terrorism *Studies in Conflict& Terrorism* 25 (73) (2002):, pp. 73-100.

[10] Paul Slovic, "Terrorism as Hazard: A New Species of Trouble" *Risk Analysis* 22 (3), (2002), pp. 425-426

[11] Abrams, "Al Qaeda's Scorecard: A progress Report on Al Qaeda's Objectives," p. 522

[12] See Dr. Gordon Woo, "Insuring Against Al Qaeda" *National Bureau of Economic Research Meeting 2003* see also Peter Bergen in Karen J. Greenberg's Al Qaeda Now Understanding Today's Terrorist (Cambridge, Cambridge University Press, 2005)

[13] Peter Berger, (James Fallow as Moderator)"Al Qaeda After 9/11: The New Face of Terrorism" in Greenberg's Al Qaeda Now Understanding Today's Terrorist, p 6.

[14] Don Van Natta Jr. "Sizing Up the New Toned-Down Bin Laden" New York Times 19th December 2004

[15] Jean Eaglesham and Scheherazade Daneshkhu, London Bomb Attacks: Economy likely to shrug off effect on sentiment, Financial Times, July 08, 2005

[16] See Jean Pierre Hassoun "Emotions on the Trading Floor. Social and Symbolic Expressions" in Karin Krorr Cetina & Alex Preda *Sociology of Financial Markets* (Oxford: Oxford University Press 2005)

[17] Bank for International Settlements, "Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in April 2007" September 2007.

[18] In the aftermath of bombings in London in July 2005, the Financial Time headlines from 9th March 2005 included "Shoppers return to the streets as analysts weigh up the costs" and "City in defiant mood on return to work TRADING FLOORS" writing under the latter headline Andrea Felsted, Andrew Hill, Peter Smith, Philip Stafford and Peter Thal Larsen write "The City of London went back to work in defiant mood as a surprising number of employees ignored advice to stay at home, and returned to their desks. As London's benchmark FTSE 100 index recovered Thursday's losses, most banks said they were operating with a reduced workforce but added that their trading floors were well staffed with other workers logging on from home. "It feels like a normal Friday in the summer," said one executive."

[19] Schneider and Troeger "War and the World Economy" *Journal of Conflict Resolution* 50 (5), (2006):,pp. 623-645.

[20] G Gigerenzer, Out of the Frying Pan into the Fire: Behavioral Reactions to Terrorist Attacks, Risk Analysis, 26 (2)(2006):, 347-351. J.S. Lerner, R.M. Gonzalez, D.A. Small and B. Fischoff, Effects of fear and anger on perceived risks of terrorism: a national field experiment. *Psychol Sci* **14** (2002), pp. 144–150.

[21] The property losses are reflected in US national accounts and an increase in the consumption of fixed capital and therefore a reduction in the net domestic product, but not in GDP, which measures the production of goods and services. Lenain, P, Bonturi, M, Koen, "*The Economic Costs of Terrorism"*, p. 6

[22] Ibid., p.6

[23] See Andreas, Peter. (2003). A Tale of Two Borders: the U.S.-Mexico and U.S.-Canada Lines After 9-11. UC San Diego: Center for U.S.-Mexican Studies. Retrieved from: http://www.escholarship.org/uc/item/63r8f039

[24] W Enders & W Sandler, "Causality Between Transnational Terrorism and Tourism: The Case of Spain" *Terrorism* Vol 14 (1). (1991) K Drakos & AM Kutan, "Regional Effects of Terrorism on Tourism in Three Mediterranean Countries" *Journal of Conflict Resolution*, 47 (5) (2003): pp. 621-41.

[25] It is worth noting the recovery of stock prices took place in the context of historically very low interest rates, as central bank on both sides of the Atlantic sought to ensure liquidity in the markets.

[26] Slovic (see note 10)

[27] Clifford Geertz, *Local Knowledge, Further Essays in Interpretative Anthropology* (New York: Basic Books, 1983), Martin Heidegger, *Being and Time* (Oxford: Basil Blackwell, 1962).Paul Ricoeur, *Hermeneutics and the Human Sciences* (Cambridge: Cambridge University Press, 1981).

[28] See Thomas Nagel, *The View from Nowhere*, (New York; Oxford: Oxford University Press (1986).

[29] Amos Tversky and David Kahnemann, *Judgement Under Uncertainty: Heuristics and Biases,* Science, New Series 185 (4157) 1124-1131.

[30] A.H Chen & T.F Siems, "The Effects of Terrorism on Global Capital Markets" *European Journal of Political Economy* Vol. 20, (2004); p.349-366. (more detail here about the specific nature of the event)

[31] R Eldor & R Melnick, Financial Markets and Terrorism European Journal of Political Economy Vol 20 (2) (2004): pp. 367-386.

[32] B Maillet, & T. L Michel, T.L., 2005, The Impact of the 9/11 Events on the American and French Stock Markets, 13(3) (2005):,pp.597-611.

[33] There is some historical evidence to suggest that asset pricing fails to take into account real levels of risk and there may be critical junctures at which the markets reacts suddenly and violently to one particular event. If we accept such an argument then the strategic risks are even more serious.

[34] Out-of-the-Money (OTM) means that the value of the underlying asset, in this case the FTSE-100 Index would have to decline from its current level if the option is to provide a positive payoff.

[35] Enders and Sandler (see note 23)

[36] We have lost more in one year than we have made in our entire history. This is an industry that is now in a deep hole. We must start looking for footholds and ways to climb quickly out of the financial abyss. (IATA Director General and CEO Pierre J. Jeanniot, on the opening day of the Airline Financial Summit, New York City, 8 April, 2002). Cited in Konstantinos Drakos, "Terrorism-induced structural shifts in financial risk: airline stocks in the aftermath of the September 11th terror attacks" *European Journal of Political Economy* 20 (2) (June 2004):, p435

[37] In the period from 8/11/2001 up to 26/6/2002 the stock price of American Airline fell by 41.24%, Continental fell by 59.86%, Delta fell by 46.36%, South West Airlines fell by 10.74% and United Airlines fell by 63.17&. The average stock price fall for US airlines was 44.27%. Drakos, "Terrorism-induced structural shifts in financial risk: airline stocks in the aftermath of the September 11th terror attacks" (2004), p 439.