International Review of Economics and Finance 20 (2011) 532–541

Contents lists available at ScienceDirect

International Review of Economics and Finance

journal homepage: www.elsevier.com/locate/iref

Terrorism and capital markets: The effects of the Madrid and London bomb attacks

Christos Kollias, Stephanos Papadamou *, Apostolos Stagiannis

Department of Economics, University of Thessaly, Korai 43, Volos, Greece

ARTICLE INFO

Article history:
Received 23 February 2009
Received in revised form 23 September 2010
Accepted 23 September 2010
Available online 7 October 2010

JEL classification:
G14
G21
C22

Keywords:
Terrorism
Capital markets
Event study
Conditional volatility
GARCH

ABSTRACT

Using event study methodology and GARCH family models, the paper investigates the effects of two terrorist incidents – the bomb attacks of 11th March 2004 in Madrid and 7th July 2005 in London – on equity sectors. Significant negative abnormal returns are widespread across the majority of sectors in the Spanish markets but not so in the case of London. Furthermore, the market rebound is much quicker in London compared to the Spanish markets where the attackers were not suicide bombers. Nevertheless, the overall findings point to only a transitory impact on return and volatility that does not last for a long period.

1. Introduction

The economic analysis and effects of terrorism are issues that have attracted a considerable and growing body of literature (*inter allia*: G, Bird, Blomberg, & Hess, 2008; Bruck, 2005, 2007; Enders & Sandler, 2006; Bruck & Wickstrom, 2004; Sandler & Enders, 2004; Sandler, 2003). Beyond the loss of life and personal injuries that the victims of terrorist actions suffer and the atmosphere of fear terrorists seek to create with their premeditated use of brutal violence, terror also has real economic costs. These costs are not limited to the often very large amount of resources required to provide protection against terrorism or to the immediate damages and loss of property and stock of capital a terrorist attack causes. Terrorist actions can have a multitude of economic consequences that may adversely affect a number of economic indices, sectors and activities including growth and investment; fiscal consequences; FDI flows and the allocation of productive capital across open economies; the tourist industry; increased economic uncertainty; investor's decision making process; the stock markets via a reduction to firms' expected profits; the foreign exchange markets, etc. (*inter allia*: Drakos, 2009; Abadie & Gardeazabal, 2008; Enders, Sachsida, & Sandler, 2006; Gupta, Clements, Bhattacharya, & Chakravarti, 2004; Chen & Siems, 2004; Llorca-Vivero, 2008; Blomberg, Hess, & Jackson, 2009;Blomberg, Hess, & Orphanides, 2004; Levy & Gallili, 2006; Drakos & Kutan, 2003; Enders & Sandler, 1996; Enders, Sandler, & Parise, 1992; Eckstein and Tsiddon, 2004). Of course, as Bruck and Wickstrom (2004) note, such economic consequences and costs of terrorist attacks vary in their distribution across economic activities, sectors, countries and time. Nevertheless, they constitute an important economic impact and hence they should be accounted for and measured.

* Corresponding author. Korai 43, Volos, 38333, Greece. Tel.: +30 24210 74963.
E-mail address: stpapada@uth.gr (S. Papadamou).

1059-0560/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.iref.2010.09.004

In line with a number of previous studies such as for example Barros and Gil-Alana (2008), Nikkinen, Omran, Sahlstrom, and Aijo (2008), Eldor and Melnick (2004), Drakos (2004, 2009), Hon, Strauss, and Yong (2004); this paper sets out to examine the impact of terrorist attacks on financial markets. It focuses its empirical investigation on two specific major terrorist incidents in Europe: the 11th March 2004 in Madrid and 7th July 2005 in London attacks and attempts to evaluate and assess their effects on capital markets. The two terrorist bomb attacks are in many respects regarded as the European equivalents of 9/11 albeit on a much lower scale if the number of fatalities and injuries is considered. In particular, using event study methodology, the paper examines how the stock markets in Barcelona, Madrid, Valencia and London reacted to the terrorist attacks in the two capital cities of Spain and the UK. Additionally, EGARCH models are employed to investigate the effect of these events on conditional volatility. The analysis that follows focuses not only on the general index of the aforementioned stock markets but also on the possible impact the terrorist incidents had on sectoral indices. Given these introductory remarks, the paper is structured as follows. The next section contains a brief review of the relevant literature followed by a description of the data and the methodology employed herein. It then turns to analyse the reaction for the four stock markets in Spain and the UK using, as already mentioned, both the general as well as the sectoral indices. Following this, the paper tries to provide plausible and tentative explanations for the different responses that it identifies. Finally Section 5 concludes the paper.

2. Terrorism and capital markets: a literature overview

As pointed previously, recent years have seen a growing attention of financial literature to the impact socio-political events have on stock market behavior and, broadly speaking, it has been shown that major events such as war and terrorism influence capital markets and asset prices (*inter allia*: Choudhry, 1995; Frey & Kucher, 2000, 2001; Amihud & Wohl, 2004; Athanassiou, Kollias, & Syriopoulos, 2006; Schneider & Troeger, 2006). Essentially, unforeseen socio-political events may be viewed as external shocks to capital markets that can directly affect market risk premium highly increasing volatility and thus exert an adverse impact on asset valuation, investment decisions and portfolio allocation. Terrorist violence, especially large scale attacks such as the 9/11 New York attacks or indeed the March 2004 and July 2005 bombings in Madrid and London respectively, constitute major external shocks that can directly impact capital markets and also capital movements between countries as Abadie and Gardeazabal (2008) report. In particular, they find that through increased uncertainty, terrorism reduces the expected return to investment and thus changes in the intensity of terrorist incidents may cause significant movements of capital across countries. Bruck and Wickstrom (2004) note, terrorist actions can affect expected profitability and, since asset values respond to such changes, adversely affect stock markets and through them the economy.

Eldor and Melnick (2004) examine the impact of terror on Israel's foreign exchange market and the Tel Aviv Stock Exchange (TASE) given the frequent and continuous terrorist incidents Israel faces as compared to one-off events such as 9/11 or the ones examined here. Their findings indicate that the foreign exchange market was affected but the opposite was the case for TASE. They identify a negative impact apparently due to the fact that prices seemed to internalise expectations of reduced future profits. Barros and Gil-Alana (2008) reach similar conclusions. They investigate the effects that ETA terrorist actions had on the Basque country stock market. Their findings indicate an adverse effect through negative returns and that a reduction in terrorist violence would bring about an increase in Basque stock market returns.

Using event study methodology Chen and Siems (2004) examine the magnitude of the effects the 9/11 New York terrorist attacks had on global and US capital markets. They report a significant impact which, however, was not unique if put in a historical perspective and compared to other political, economic or natural shocks. Their findings indicate a relatively speedy recovery for US markets compared to other global capital markets. Furthermore, they note that the former seem to have grown more resilient to terrorist attacks than they used to be since in the case of more recent events they appear to recover sooner. Hon et al. (2004) approach the issue from a different perspective and examine how the cross-country correlation of assets was affected from the 9/11 events using stock prices from twenty five countries. Compared to the time before 9/11, their results, especially for European markets, indicate that international stock markets responded more closely to US stock market shocks in the three to six months that followed 9/11. The 9/11 effects on markets are also addressed by Drakos (2004) who focuses on shares of the airline industry. His findings indicate that the stock market valuation of such shares were adversely and significantly affected due to changed risk perceptions by consumers that led to lower demand for air travel and higher insurance premia due to the reassessment by insurance companies of the risks.

Given the findings of previous studies, one would intuitively expect that the two terrorist attacks under examination here would have also affected the UK and Spanish stock markets. The question is whether differences can be identified in their respective reaction both in terms of the general indices as well as the sectoral ones. This is particularly interesting since the two attacks shared some common characteristics. The bombings targeted the transport system of the respective capitals of Spain and the UK – perhaps because it represents a softer target since all transport systems are a target-rich environment for prospective terrorists – and they were the work of Islamic extremists albeit “*homegrown*” in the case of London. The 11th March 2004 Madrid train terrorist actions consisted of a series of coordinated bombings against the *Cercanías* (commuter train) system of Madrid. The attacks caused the death of 191 people while another 1755 suffered injuries. The direct costs were estimated to be around €212 millions to the regional economy of Madrid, equivalent to the 0.16% of the region's GDP. As Barros and Gil-Alana (2008) point out, the Spanish terrorist group ETA was initially held responsible but soon afterwards it became apparent that the bomb attacks were the work of Islamic extremists. The 7th July 2005 London attacks also were a series of coordinated bomb blasts that hit London's public transport system during the morning rush hour. Carried out by British Islamist extremists, the suicide bombings were motivated by Britain's involvement in the Iraq War and other conflicts. The bombings killed 52 commuters (as well as the four suicide bombers), injured 700, and caused a widespread disruption of the city's transport system and the country's mobile telecommunications infrastructure.