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**THE IMPACT OF TERRORIST BOMBINGS ON THE MARKET VALUES OF  
HOSPITALITY AND TOURISM ENTERPRISES: GLOBAL EVIDENCE FROM  
TURKEY, SPAIN AND INDONESIA**

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# **THE IMPACT OF TERRORIST BOMBINGS ON THE MARKET VALUES OF HOSPITALITY AND TOURISM ENTERPRISES: GLOBAL EVIDENCE FROM TURKEY, SPAIN AND INDONESIA**

## **ABSTRACT**

The last two decades witnessed numerous international terrorism incidents, some of which were specifically aimed at tourists or were at least intended to hamper visitor inflows. However, there is no empirical evidence explaining and measuring the effect of terrorist attacks on the market value of tourism enterprises. This study looked at the effect of the recent terrorist bombings in Bali (Indonesia), Istanbul (Turkey), and Madrid (Spain) on the market values of publicly traded hospitality and tourism firms in these countries. The findings indicate that, overall, markets reacted negatively to these tragic events but reaction in Turkey was milder than in Spain.

**Key Words:** Terrorist bombings, event study, abnormal returns, shareholder wealth.

## INTRODUCTION

The last two decades witnessed numerous international terrorism incidents, some of which were specifically aimed at tourists. The terrorist attacks against international tourists in Egypt and TWA hijacking incident in 1992, the nightclub bombing of Bali, Indonesia in October 2002, terrorist bombings in Casablanca, Morocco in May 2003, are some of the examples. Even the terrorist events of September 11, 2001 affected the tourism industry since commercial airplanes were involved in the incidents. These tragic events resulted in the loss of billions of dollars in lost revenues to the global hospitality industry.

Wall (1996) claimed that tourism is an effective target for terrorists who wish to proclaim their goals worldwide. Their effectiveness can be attributed to the fact that tourist destinations are visited by people from multiple nations and thus targeting tourists ensures global media coverage (Pizam & Mansfield, 1996). Wall (1996) believed that with such attacks, the terrorist not only achieves global coverage but also causes a direct negative impact on the economic base of the target country, as tourists immediately react to these events and cancel their reservations and choose alternative destinations. Therefore, one way to assess the economic impact of a terrorist attack (at the macro level) has been to compare tourist arrival data in the event year to the previous years' data. Although several equity analysts conjecture that industries such as tourism, transportation and insurance are more vulnerable to terrorist attacks, the empirical evidence of these events on stocks of these industries in developing countries is not known.

### *Purpose*

This study attempts to fill the void in the literature by assessing the effect of terrorist bombings on the market value of hospitality and tourism enterprises. Thus, the purpose of this study is to investigate the effect of the recent terrorist bombings in Bali (Indonesia), Istanbul

(Turkey), and Madrid (Spain) on the market values of publicly-traded hospitality and tourism establishments in these countries. This study investigates whether investors reacted negatively to the terrorist attacks in these countries and if they did, to what extent. To achieve this objective this paper uses event study analysis to determine whether there was an "abnormal" stock price effect associated with the terrorist bombings.

## **TOURISM AND TERRORISM**

In the recent years the world has seen an abundance of terrorist events that ranged from plane hijackings to bombing of buildings, facilities and transportation networks. International terrorist attacks increased from an average of about 342 a year between 1995 and 1999 to 387 a year between 2000 and 2001 (Gupta, Clements, Bhattacharya, & Chakravarti, 2004; U.S. Department of State, 2002). The literature documented that some of these events have considerable economic effects not only on the local economy but also on the other countries across the globe. Terrorist attacks of September 11, 2001 are arguably the best example of a global impact of such an event.

In terms of regional or local level impact, Abadie and Gardeazabal (2003) studied the Basque Country region of Spain. The authors of that study faced a challenge of isolating the effects of terrorism by comparing a Basque Country region (a region affected by terrorism) to another region that matched its economic conditions ("synthetic region") and was not affected by terrorist attacks. Abadie and Gardeazabal reported that the Basque Country and the synthetic region behave similarly until 1975. However, starting in 1975, when Euskadi Ta Askatasuna's (ETA) terrorist activity became a large-scale phenomenon, they diverge. The authors further stated that after the outbreak of terrorism in the 1970s, per capita GDP in the Basque region of

Spain declined by about 10% relative to a "synthetic" control region, and that this gap widened in response to increase in terrorist activity.

Some other studies have empirically assessed the impact of terrorism on tourism, both domestic and regional, and have found the expected negative effect (Drakos & Kutan, 2001; Enders & Sandler, 1991; Enders & Parise, 1992). In 2001, Drakos and Kutan conducted study that encompassed Greece, Israel, and Turkey, and used Italy as a "control variable." The authors found that the intensity (measured by number of casualties) of terrorist incidents had significant domestic and cross-country effects on the market shares of the affected countries, and that there are significant contagion effects from terrorism within the region.

There are numerous ways of categorizing terrorism events which can be based on geographic location, target type, and by the attack type (e.g. killing oneself, killing others (suicide), cold weapon, armed assault, bombing, kidnapping and other; by the total number of people injured and killed (Eldor & Melnick, 2004). Drakos and Kutan (2001) stated that their findings indicate the importance of decomposing terrorist incidents into different categories to truly identify the impact of effects on the tourism market shares of involved countries. Using their argument as a starting point this study aims to look at the terrorist attacks where damage was caused by "bombing" buildings, facilities or public transportation. Although there may be several events that may fall into this category, three of them emerge as the most important and the most recent: namely, night club bombings in Bali (Indonesia), bombings of a British bank branch (HSBC) in Istanbul (Turkey), and the train bombing in Madrid (Spain). It is important to note that all these events occurred in a post-September 11 environment and they are expected to have more severe impact than the terrorist attacks prior to September 11, 2001, *ceteris paribus*. In addition, a report published by the Organisation for Economic Co-operation and Development

(OECD) advocates that close attention needs to be paid to the medium-term consequences of terrorism. The report contends that measures to reduce the risk and the economic consequences of further attacks should be both security-effective and growth-friendly for the economy (Lenain, Bonturi & Koen, 2002).

## **DESCRIPTION OF EVENT STUDY AND ITS APPLICATIONS**

Pioneered by Ball and Brown (1968) and Fama, Fisher, Jensen and Roll (1969), event studies have been used as a powerful tool in assessing the effect of an event on price of common stocks and thus on firms' market values (Seiler, 2000). MacKinlay (1997) states that the usefulness of the event studies comes from the fact that given the rationality in the equity markets, the effects of an event will be reflected immediately in security prices. Thus, using a relatively short period of time covering security prices one can construct a measure of the event's economic impact.

Essentially the event study method identifies an event that has occurred in a firm's life, isolates the event from all others, and measures its impact on share price. This is accomplished by first predicting what would ordinarily have happened to share price in the absence of the event. This value represents the "normal" return to the stock and it is compared to what actually happens to the share price during the period when the event is unfolding. The difference between these two values constitutes the "abnormal" return or the additional wealth created (or destroyed) for the shareholder as a result of the event (Kwansa, 1994).

The basis of studies relating to the behavior of stock returns is the proposition that the distribution of stock returns follows a normal distribution. That is, given a specific interval (a day, a week, or a month) if the number of transactions involving a particular stock is large, then

the price changes which occur during the interval will reflect many independent, identically distributed drawings. Thus, using the central limit theorem, the distribution of a sum of independent, identically distributed intermediate price changes will generally reflect a normal distribution as the number of items in the sum increases.

The hypothesized behavior of a stock's return is made in the context of the market return. That is, the relationship between an individual stock's return and the return of a market portfolio is assumed to be bivariate normal. The expected return of the stock is given by:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt}$$

where,  $E(R_{it})$  is the expected return of stock  $i$ ,  $\alpha_i$  is the intercept,  $\beta_i = \text{cov}(R_{it}, R_{mt}) / \text{var}(R_{mt})$  is the relative risk, and  $R_{mt}$  is the market return. If the stock returns are normally distributed, the deviation of a return from its expected value (the residual) is also expected to be normally distributed with a mean of zero and variance  $\sigma^2(\varepsilon_{it})$ . The deviation is represented as:

$$\varepsilon_{it} = (R_{it}) - (\alpha_i + \beta_i R_{mt}),$$

where,  $\varepsilon_{it}$  represents the residual or error term. Thus, assuming that the joint distribution of a stock return and the market return is bivariate normal, then the relationship between the two returns is:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where, the residual term is normally distributed with a mean zero. This equation is referred to as the market model (Kwansa, 1994) and was used in this study. Hence, the abnormal return (AR) can be computed as:

$$AR = R_{it} - (\alpha_i + \beta_i R_m)$$

where,  $\alpha_i$  and  $\beta_i$  are the estimates obtained from the regression of  $R_{it}$  over  $R_{mt}$  over an estimation period preceding the event window. As a last step, the ARs are cumulated in order to obtain the Cumulative Abnormal Return (CAR) for the event period.

MacKinlay (1997) points out that the use of other models is dictated by data availability. Thus, he proposes that in cases when data are limited, market-adjusted model return can be used as a normal performance return model. In essence, the market adjusted return model can be viewed as a restricted market model with  $\alpha_i$  constrained to be zero and  $\beta_i$  constrained to be one. Since model coefficients are pre-specified, an estimation period is not required to obtain parameter estimates.

Event study has found numerous applications in the finance and accounting fields. Some examples include earnings announcements, issuance of new equity, CEO changes, corporate spin-offs, and merger and acquisitions. In the hospitality and tourism fields this method has been used by several researchers including: mergers and acquisitions (Andrew, 1988; Kwansa, 1994; Sheel & Nagpal, 2000), dividend announcements (Borde, Byrd, & Atkinson, 1999), spin-offs (Canina & Klein, 1998), hotel openings (Nicolau, 2002), earthquakes (Mazocchi & Montini, 2001) and casino-hotel fires (Sprecher & Pertl, 1988).

### ***Event Types***

There are two important dimensions that describe the events that affect the corporate firms. The first dimension is negative-positive dimension in which the event can be solely negative, solely positive, or an event that can be either positive or negative. The examples for the positive-negative dimension are: events that can be either positive or negative (dividend announcements, earnings announcements), solely positive events (introduction of a new product,

capital investment announcement) and solely negative events (plane crash, plant explosion, hotel fires, and earthquakes) (Brooks, Patel, & Su, 2003).

The other dimension of events can be called anticipated-unanticipated. Some of the examples for the anticipated-unanticipated dimension are: anticipated events (macroeconomic announcements e.g. inflation, consumer confidence, interest rate) and unanticipated events (e.g. death of a CEO, plane crash, plant fire). Since the events analyzed in the present article are unanticipated it is expected that the market will overreact to the negative news (Brown, Harlow, & Tinic, 1988; De Bondt & Thaler, 1985, 1987) and later there may be some correction or adjustment in the stock prices.

To date, there are two studies that focused on unanticipated negative events in the hospitality industry. Those are the MGM Grand casino-hotel fire in 1980 in Las Vegas, Nevada (Sprecher & Pertl, 1988) and the earthquake of that occurred in Umbria, Central Italy on September 26, 1997 (Mazocchi & Montini, 2001). The study related to the MGM looked at the intra-industry effects of this fire that caused several hundred million dollars in damage. Yet, the findings demonstrated that the investors did not perceive this as an event that will affect the future cash flows of casino hotels. Put in other words, the costs borne by the additional insurance costs and preventive measures were believed to have a minor impact on the casino-hotel firms.

The second study, which assessed the impacts of the earthquake on the tourism inflows, used tourism arrival data instead of capital markets data. Mazocchi and Montini (2001) looked at the residuals between forecasted and realized tourist arrivals of 12 districts in Umbria, Central Italy. The authors called the residuals “missing arrivals” that occurred due to the earthquake of 1997. Gubbio, Assisi, and Foligno were closest to the epicenter of the earthquake and were

affected most severely by this event. Additional factors that contributed to the drop in tourist visits were the availability of the historical monuments and the increased media coverage in these districts.

## METHODOLOGY

This paper uses event study guidelines suggested by MacKinlay (1997). The research uses a three-step approach provided below:

### 1. Event Definition

McWilliams and Siegel (1998) pointed out that event definition is probably the most critical stage in conducting an event analysis. The researchers stated that the following requirements should be met in order to assess the viability of the event study:

a) First, define the event of interest and verify the event date(s) in the published press. In this study three independent events are defined and verified using written media sources:

*Event 1:* A bomb on the Indonesian holiday island of Bali has killed at least 58 people in a crowded nightclub in the resort of Kuta (October 12, 2002) (BBC News, 2002).

*Event 2a:*“Car bombs exploded at 10’o clock in the morning on November 15, 2003 in Istanbul and killed at least 20 and wounded 257 people” (BBC News, 2003a).

*Event 2b:* Bomb attacks on the British consulate and the HSBC bank headquarters in Istanbul have left at least 27 dead and up to 400 injured (November, 20, 2003) (BBC News, 2003b).

*Event 3:* One hundred and ninety-eight people died and a further 1,400 were injured on Thursday (March 11, 2004) when bombs exploded in quick succession on packed commuter trains during Madrid's morning rush hour” (BBC News, 2004a).

b) Second, the researcher needs to ascertain that there are no other confounding effects from other events such as dividend declarations, signing of a major government contract, and changes

in the executive board that may explain the changes in market value. The present study did not detect any other confounding events.

c) Third, define the length of the event window. In this study, the events for Spain and Indonesia lasted three days (0, +2) and five days for Turkey (+1,+4) (due to the occurrence of the second bombing) where day 4 (+4) is the day of that event.

## 2. Selection Criteria

The publicly traded hospitality (hotel and restaurant), tourism, transportation, and real estate companies (that own hotels) listed on one of the following stock exchanges: Istanbul Stock Exchange (IMKB), Jakarta Stock Exchange (JSE) and Madrid Stock Exchange (IBEX) and have market data for at least 151 days before the event and 30 days after the event were selected for the analysis. Thus, 10 Indonesian, 11 Turkish, and 9 Spanish companies were selected for the analysis.

## 3. Normal and Abnormal Returns

Estimation period for normal returns was defined as 120 days before the beginning of the pre-event period (-30, -1), (MacKinlay, 1997). This study uses the market model to calculate the size of the abnormal returns. Market model denotes that the return on a security depends on the return on the market portfolio and the extent of the security's responsiveness as measured by beta. For all stocks, day 0 represented the event day (in this case, the terrorist bombing(s)) and day +1 was the day after the event day and so on.

It should be noted that, during the process of the study, the researchers faced two critical challenges. In the case of Indonesian stocks, the severe asynchronous trading prevented the authors from conducting an event study analysis for this terrorism event. On the other hand, the estimation period for Turkish stocks (-151 through -31) demonstrated that stock returns in that

period were not normal. As a result, market-adjusted return was used in lieu of market model to remedy this problem as suggested by MacKinlay (1997) and Ritter (1991).

## **FINDINGS**

The results indicated that the Spanish hospitality and tourism stocks recorded negative abnormal returns for all of the three observed days (0, 1, and 2) (see Table 1). The largest abnormal return occurred during day 2 (-3.06%). The t-values for all event days were significant at .05 level which indicated that hospitality and tourism investors reacted negatively to the bombing events in Madrid. The terrorism event resulted in a negative Cumulative Abnormal Return (CAR) of -5.74% ( $p < .05$ ) for the portfolio of publicly-traded tourism and hospitality firms in Spain.

### **TABLE 1 ABOUT HERE**

As it was stated in the previous finance research, the investors tend to overreact to negative unanticipated events. In order to evaluate whether this is the case for the terrorist bombings in Spain a graph showing the ARs was plotted (See Figure 1). As the results indicated, there was a considerable correction in the stock prices of the hospitality and tourism portfolio after day 10. However, even after 30 days the negative cumulative abnormal return remained around 2%. This implies that the decrease in the market values of the publicly-traded hospitality and tourism companies can not be justified on the grounds of overreaction.

### **FIGURE 1 ABOUT HERE**

The hospitality and tourism firms listed on the JSE (Indonesia) had asynchronous trading which confounded the event analysis method. The authors applied some filtering techniques to

improve the reliability of the results. However, event study analysis was not a viable option due to infrequency of trading of these stocks. The JSE index lost 11.2% on the first trading day after terrorist attacks and the hospitality and tourism portfolio stocks' value decreased by 2.67%.

In the case of hospitality and tourism stocks in Turkey, the analysis produced mixed results. The market did not react to the first bombing which occurred on November 15, 2003. Whereas, the reaction on the day of the second bombing (Day 4) was much more severe. Table 2 shows that only two of the event days (2 and 4) recorded negative abnormal returns (ARs). However, the AR for Day 4 was fairly large (-7.62%) and significant at .05 level which resulted in negative CAR for the whole event period. Yet, the CAR value for the event period was not significant at .05 level.

#### **TABLE 2 ABOUT HERE**

The researchers checked whether the decrease in the market values of the Turkish hospitality and tourism stocks was due to overreaction. As it can be seen in Figure 2, the return patterns of the CAR demonstrated some considerable swings in the post event period. For instance, on day 12 the holders of hospitality and tourism stocks recovered some of the losses they encountered. Then however, on day 17 the significant drop occurred (-2.46%,  $t=2.06$ , sig. 05) which brought the CAR to a negative 4.27%. Afterwards, the fluctuations in the abnormal returns continued; yet, the losses due to the terrorism bombings were never fully recovered. This can be seen in the CAR on day 31 which was a negative 3.71%. Thus, just like in the case of Spanish firms, the hospitality and tourism stocks were not subject to overreaction to the unanticipated event.

#### **FIGURE 1 ABOUT HERE**

## **LIMITATIONS**

The results of this study should be interpreted with caution because both Spain and Turkey have low number of publicly traded hospitality and tourism stocks which may affect the robustness of results of an event study. In addition, acknowledge the fact the occurrence of two back to back bombing events in Istanbul, Turkey may have confounded the analysis.

## **DISCUSSION AND CONCLUSION**

Based on the findings of this study there is evidence that investors perceived hospitality and tourism stocks to be more vulnerable than that of the market index during the periods of terrorist attacks. This provides a support to the long-standing view that the hospitality and tourism industry is sensitive to shocks of economic and non-economic nature. Although findings in Turkey were slightly confounded by the second terrorist bombing, it is evident that investors' reaction was more intense for the second bombing. The results of this study can be useful for policy makers, investors, and executives of hospitality firms in assessing their future investment strategies in these countries. However, one should keep in mind the difficulties of locating reliable data for the stock markets in emerging countries.

The next step in this line of research would be to look into the stock returns of hospitality firms in neighboring and competing countries during the bombing events. One may argue that investors in the competing countries (such as Greece, Italy and France) might also have reacted negatively on these bombings by being nervous about possible similar attacks on their own countries. This view is supported by the raw stock returns reported by BBC News (2004b) during the second bombing in Istanbul, for European hospitality and tourism stocks were negative. Indeed, the authors of this paper conducted a preliminary cross-country analysis for

Turkey and Spain to check for this argument. The findings revealed that in both of the cases – that is, for the bombing in Spain and the subsequent reaction of Turkish hospitality and tourism stocks, and vice versa – the abnormal returns were not significant. This provides a partial support to the perspective that investors focus on the country where the event has occurred rather than conjecturing about the spillover effect of the bombing in the neighboring/competing countries.

However, it should be noted that Turkey and Spain are not neighboring countries and thus, the occurrence of an event in one country did not have an affect on stocks in the other country. Yet, a competing hypothesis may be that hospitality and tourism stocks in the neighboring countries may record positive abnormal returns when bombings occur in the target countries. In other words, it might be conjectured that bombings in Spain may result in positive gains in Italy and France because of the expectation that tourists canceling their trips to Spain may choose to visit other countries in the Mediterranean region that are in proximity to Spain. This can in turn increase the cash flows of the respective hospitality and tourism establishments in these countries (i.e. Italy and France). Heretofore, this paper paves the way for this kind of empirical research for the near future.

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**Table 1**

**Abnormal Return Statistics for Hospitality and Tourism Stocks (Spain)**

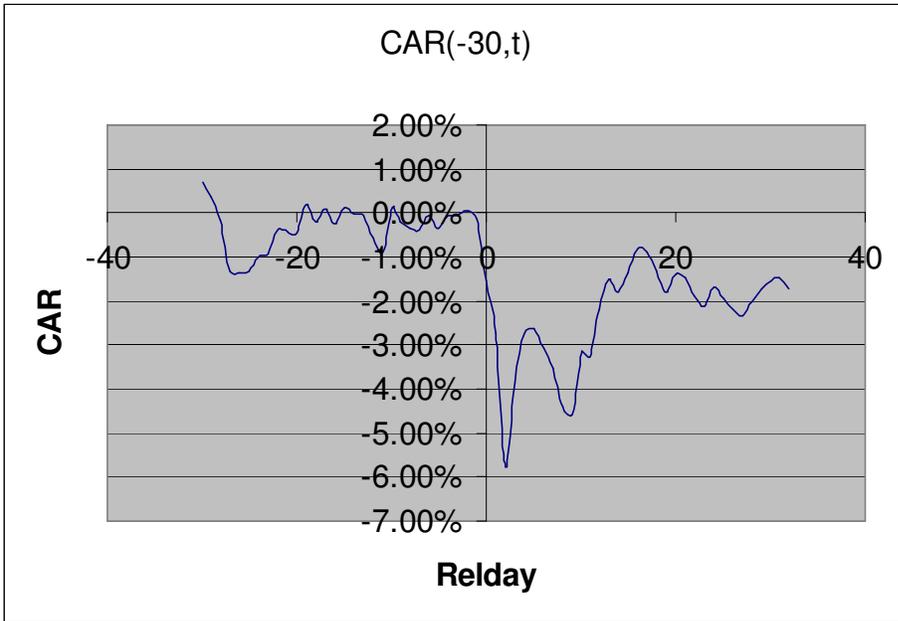
Day	AR	SE	t(AR)	CAR(0,t)	t(CAR(0,t))
0	-1.42%	0.5693%	-2.49*	-1.42%	-2.49*
1	-1.18%	0.5693%	-2.08*	-2.60%	-3.23*
2	-3.06%	0.5693%	-5.37*	-5.66%	-5.74*

Notes:

AR=Abnormal Return, SE=Standard Error, CAR= Cumulative Abnormal Return  
\*Significant at .05 level

**Figure 1**

**Cumulative Abnormal Returns for Spain**



**Table 2**

**Abnormal Return Statistics for Hospitality and Tourism Stocks (Turkey)**

Day	AR	SE	t(AR)	CAR(0,t)	t(CAR(0,t))
0	1.17%	1.67%	0.70	1.17%	0.70
1	0.27%	1.67%	0.16	1.44%	0.61
2	-0.27%	1.67%	-0.16	1.17%	0.41
3	2.30%	1.67%	1.38	3.47%	1.04
4	-7.62%	1.67%	-4.57 *	-4.15%	-1.11

Notes: AR=Abnormal Return, SE=Standard Error, CAR= Cumulative Abnormal Return

\*Significant at .05 level

**Figure 2**

**Cumulative Abnormal Returns for Turkey**

