



## Terrorist incidents and tourism demand: Evidence from Greece



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### ABSTRACT

The purpose of this paper is to examine the impact of terrorism on tourism demand in Greece using monthly data from 1977 to 2012. We investigate whether this relationship is bidirectional and whether it exhibits long run persistence. Thus, we employ a large dataset of terrorist incidents and perform cointegration and long-run causality tests, correcting our data for cyclical seasonality and applying PCA to construct a terrorism proxy according to the severity of the incident. Our findings concur that terrorism has a significant negative impact on tourist arrivals to Greece and that causality is noted from terrorism to tourism only. The results suggest that authorities should establish firm measures against terrorism and that further actions should be taken to promote tourism, safety and security, as a response to terrorist incidents. Our study is, to the best of our knowledge, the first to approach terrorism using a three-factor proxy with qualitative features.

### 1. Introduction

The past few years have seen a significant rise of terrorist incidents worldwide. These incidents usually relate to domestic political problems, even though we have recently experienced incidents relating to international geopolitical differences. Greece has been dealing with terrorist incidents from as far back as 1974, despite its relative political stability during this time. Being a top tourist destination, with 18.5% of GDP being attributed to the tourist industry (WTTC, 2017), Greece is an interesting case study on how terrorist events can affect tourist arrivals, since tourism is one of the most highly vulnerable industries resulting in huge losses for the economy. Bearing in mind the latest tourist attacks worldwide, this study aims to examine the existence and the direction of the link between terrorism and tourism.

As stated earlier, the total contribution of tourism earnings in Greece was 32.8 bn Euros (18.5% of GDP) in 2016 and is expected to rise by 4.6% per annum to reach 23.8% of GDP by 2027 (WTTC, 2017). In the recent WTTC 2016 report, Greece is ranked 29th worldwide, in terms of absolute earnings, with its tourism industry contribution to GDP being much higher than the EU average of 10.2%. While there are a number of determinants that influence the decision to travel to a particular destination, terrorist acts have a clear negative impact, because, unlike other factors, they are outside the tourists' control. Subsequently, tourist preferences for a safe travel destination can affect countries vulnerable to terrorist attacks. Greece has suffered a number

of terrorist incidents perpetrated by certain terrorist organisations such as 1st May, Revolutionary People's Struggle (ELA) and November 17 Revolutionary Organisation (N17RO). While the Greek economy relies heavily on its burgeoning and sizeable tourism sector, the latter is highly vulnerable to terrorism activities, resulting in huge economic losses. Finally, Greece presents particular interest as a case study on terrorism since it is currently one of the top destinations for international tourists, while tourism is the only "heavy industry" of the Greek economy. Also, Greece is the only country which has experienced massive terrorist attacks for an extended period of time and is thus ideal for a time series study.

Terrorist acts are not only aimed at direct and immediate casualties, but are targeted at a larger audience in order to succeed in a political or social cause through violence or the threat of violence. The existence of a political or social objective is important because it is the differentiating element between terrorism and criminal acts. Terrorism can be domestic or transnational, with a clear distinction proposed by Enders, Sandler, and Gaibulloev (2011). Consequently, terrorist incidents affect more than the immediate victims. Schmid and Muldoon (2015) showed that a perceived threat negatively affects public well-being, even though Rubin and Wessely (2013) suggested that the psychological effect for most individuals will fade in the long run.

Almost every survey on the views of prospective tourists following terrorist incidents suggests that terrorism affects tourism. However, while informative, these surveys do not account for the fact that the

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memory of such incidents may fade or that the surveyed potential tourists can be tempted by low prices and special offers. Hence, historical data analysis with appropriate methods provides a clearer and better understanding of the effects of terrorism on tourism demand (Enders & Sandler, 1991). However, noting the dearth of empirical evidence for Greece, this paper explores this relationship with the use of cointegration and causality tests, utilising a relatively large sample of monthly data on terrorism incidents and visitor arrivals over the period 1977–2012. Furthermore, the cyclical seasonality is purged from the tourist arrivals series and from the three proxies of terrorism (terrorist incidents with casualties only, terrorist incidents with no casualties and terrorist incidents) and a common factor is selected using the Principal Components Analysis (PCA) in order to avoid multicollinearity problems. Finally, our work also demonstrates the long-run persistence of the negative effect of terrorist incidents on tourist demand, a finding with important policy implications.

This paper contributes to four aspects of the current literature. First, it establishes the relationship between terrorism and tourism, in a country with a heavy tourism industry, such as Greece. Second, it shows that this relationship is unidirectional, from terrorism to tourism only, even though our results relate mainly to domestic terrorism. Third, it demonstrates that the negative impact of terrorist incidents in Greece is persistent in the long run and is not limited to a short run drop in demand. Lastly, it complements existing studies on tourism and terrorism using a different methodology to proxy terrorist incidents according to the severity of the incident and an extensive dataset of terrorist incidents, corrected for seasonality.

The rest of this paper is structured as follows: Section 2 presents the relevant literature linking tourism and terrorist incidents, Section 3 presents the methodology and the data set used, Section 4 presents our empirical findings and Section 5 concludes.

## 2. Literature review

A plethora of studies exist in the current literature that show a positive relationship between tourism and economic growth (Balaguer & Cantavella-Jorda, 2002; Dritsakis, 2012; Eeckels, Filis, & Leonard, 2012; Gunduz & Hatemi, 2005; Skerritt & Huybers, 2005). Skavronskaya et al. (2017) establish the “hedonic nature” of travel, using a series of cognitive psychology studies to examine what drives tourists to pick a particular destination. Buhalis (1999) also suggests that cultural and historical resources are often an important factor, price competitiveness notwithstanding. Saha and Yap (2014) examine 139 countries and show that political stability is an important factor for tourist arrivals, while Leung, Law, Van Hoof, and Buhalis (2013) examine the role of social media in the decision-making process. Reversing the causality, Causevic and Lynch (2013) and Webster and Ivanov (2014) show how a booming tourism industry can be used as a vehicle to promote political stability.

Studies pertaining to the influence of terrorism on tourism are mainly focused on examining the reduction in the number of tourists, the subsequent lost revenues in the industry and the temporal structure of the effects. While the methodologies employed vary, the conclusion remains that terrorism is decisively harmful and has severe negative repercussions on the hospitality sector and, thus, to GDP. Early literature notes evidence that international experience of tourists affects their reaction to terrorist incidents and the decision to travel to safer destinations which becomes economically damaging for countries where the frequency of terrorist incidents is high or growing (Araña & León, 2008; Cook & McCleary, 1983; D'Amore & Anuzza, 1986; Enders, Sandler, & Parise, 1992; Hartz, 1989; Martin & Gu, 1992; Seddighi, Nuttall, & Theocharous, 2001; Sonmez & Graefe, 1998). A few studies examine the causal relationship and confirm a unidirectional negative causality from terrorism to tourism. Among these, we note Enders and Sandler (1991) for Spain, Bhattacharya and Basu (2010) for India, Feridun (2010) for Turkey, Bassil, Hamadeh, and Samara (2015) for Lebanon and Raza and

Jawaid (2013) for Pakistan.

Further, Enders and Sandler (1991) note that the terrorist incidents time series appears to be autonomous, which is consistent with the fact that terrorist attacks are random, and that a typical transnational terrorist incident scares away approximately 140,000 foreign visitors. In another study, Enders et al. (1992) note that terrorism has an unfavourable effect on revenue gained from tourism in Greece, Italy, Austria and other Western European countries. The empirical results show that terrorism did not have a significant effect on tourism revenues of France, Denmark, Germany, the Netherlands, Norway, and Finland. On the other hand, tourism revenues in Greece, Italy and Austria were deteriorated by terrorist attacks and thus were sensitive to the adverse generalisation effects in the neighbouring countries (Enders et al., 1992; Sonmez, 1998).

The impact of terrorism on the local and foreign tourism market can be different. Fleischer and Buccola (2002) show that foreign demand is price elastic while local demand is responsive to regional terrorism, the latter reinforcing that price reductions aimed at compensating for the impact of terrorism and hence attract more local tourists cannot be used as an effective strategy. In a cross-country analysis, Drakos and Kutun (2003) investigate the impact of terrorism on Greece, Israel, and Turkey, using monthly data from 1991 to 2000 with Italy as a control country. They show that, in Greece, high intensity attacks have an immediate negative impact domestically. On the other hand, low intensity attacks in neighbouring countries like Israel and Turkey seem to result in tourist flows to Greece, while medium and high intensity attacks result in a shift of tourist demand to Italy. Aschauer (2010) builds a theoretical model including crisis-stable factors as well as behavioural characteristics to show that the effects of terrorism may differ according to gender or culture.

## 3. Methodology

### 3.1. The data set

Monthly data from January 1977 to December 2012 on tourist arrivals are sourced from the statistical databases of National Statistical Services of Greece (NSSG) and terrorist incidents are drawn from the Global Terrorism database (START, 2014). According to the NSSG, the principal reasons why tourists travel to Greece are summer vacations, visiting archaeological sites and other leisure purposes. All the above data is integrated in a single tourist arrival time series.

Regarding terrorist incidents, considering the period of interest and the fact that reliance on official terrorism statistics is often mistaken due to erroneous or concealed information, we processed the original complete database of 1056 terrorism incidents in Greece (1970–2012) as follows:

1. Cases where no terrorist group claimed responsibility for the attack or the government is not certain for the authentication of the terrorists' declaration were excluded (388 events). This was mainly due to the fact that these terrorist incidents were low scale incidents and therefore it was uncertain whether they were indeed for terrorist purposes.
2. Incidents that did not take place on Greek land or airspace were excluded (5 events).
3. Two incidents with reference to a bomb explosion in a civilian airplane flying over Greek airspace and a hijacking without any clear trace of perpetrators were excluded.
4. Three incidents claimed by the November 17 Revolutionary Organisation were added.

Following the above process, the final dataset includes 664 terrorist incidents, of which 39 caused a total of 112 deaths. A time series with 432 months of observations was assembled. Each observation includes the monthly number of all the incidents, the monthly number of

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