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FACULTY OF ECONOMICS AND MANAGEMENT

Postgraduate (Master's) Programme of *Master in Business Administration (MBA)*

Postgraduate (Master's) Dissertation

Terrorist Attacks: The Impact on the European Hotel Sector

Antroula Dyspyrou

Supervisor
Konstantinos Chatzimichael

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The present Postgraduate (Master's) Dissertation was submitted in partial fulfillment of the requirements for the postgraduate degree in Business Administration (MBA) , Faculty of Economics and Management of the Open University of Cyprus.

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Abstract

Incidents of terrorism have been radically increased in Europe over the last decade. Beside their social costs, terrorism attacks may also entail significant economic costs for many sectors of the economy. Among the various economic sectors, the tourism industry is likely to bear the highest portion of these economic costs since the link between terrorism attacks and demand might be stronger for tourism products and services. Theoretical work but also common sense suggest that as terrorism attacks increase in a country, the preferences of potential tourists alter resulting in a lower demand for tourism products in a country. However, despite the theoretical negative link between terrorism and tourism performance, existing empirical work in the field provides rather mixed results. Along these lines, this study aims to investigate whether terrorism attacks have indeed a significant negative impact on the performance of the hotel-sector in Europe and further provide measures directed to lessen the adverse effects of terrorism on hotel performance at the micro-level. Using a balanced panel dataset of 22 European countries for the period from 2008 to 2018 drawn from Eurostat and the Global Terrorism Database (GTD), this study employs a fixed effects regression model to examine whether terrorism has a negative effect on the performance of the hotel sector in Europe. Estimation results conclude that terrorism attacks are having a negative impact on the number of nights spent at hotel and similar establishments in the 22 European countries. Despite the fact that the hotel industry has grown significantly, terrorism will always represent a major challenge and threat to the industry.

Περίληψη

Τα περιστατικά τρομοκρατίας έχουν αυξηθεί σε μεγάλο βαθμό στην Ευρώπη κατά την τελευταία δεκαετία. Εκτός από το κοινωνικό τους κόστος, οι τρομοκρατικές επιθέσεις μπορεί επίσης να επιφέρουν σημαντικό οικονομικό κόστος σε πολλούς τομείς της οικονομίας. Μεταξύ των διαφόρων οικονομικών τομέων, η τουριστική βιομηχανία είναι πιθανό να υποστεί το μεγαλύτερο μέρος του οικονομικού κόστους, καθώς η σχέση μεταξύ τρομοκρατικών επιθέσεων και ζήτησης ενδέχεται να είναι ισχυρότερη για τα προϊόντα και τις υπηρεσίες του τουρισμού. Η σχετική βιβλιογραφία αλλά και η κοινή λογική υποδηλώνουν ότι, καθώς οι τρομοκρατικές επιθέσεις αυξάνονται σε μια χώρα, οι προτιμήσεις των τουριστών αλλάζουν, οδηγώντας σε χαμηλότερη ζήτηση για τουριστικά προϊόντα σε μια χώρα. Ωστόσο, παρά τη αρνητική σχέση μεταξύ της τρομοκρατίας και των επιδόσεων του τουρισμού, η υπάρχουσα εμπειρική εργασία στον τομέα παρέχει αρκετά μικτά αποτελέσματα. Η παρόν μεταπτυχιακή διατριβή στοχεύει να διερευνήσει κατά πόσο οι τρομοκρατικές επιθέσεις έχουν πράγματι αρνητική επίπτωση στην απόδοση του ξενοδοχειακού τομέα στην Ευρώπη. Χρησιμοποιώντας ένα σύνολο δεδομένων 22 ευρωπαϊκών χωρών για την περίοδο 2008-2018 που αντλήθηκαν από την Eurostat και την Παγκόσμια Βάση Δεδομένων για την Τρομοκρατία (GTD), η μελέτη αυτή χρησιμοποιεί μοντέλο παλινδρόμησης σταθερών επιδράσεων για να εξετάσει κατά πόσον η τρομοκρατία έχει αρνητικές επιπτώσεις στην απόδοση του ξενοδοχειακού τομέα στην Ευρώπη. Τα αποτελέσματα της εκτίμησης καταλήγουν στο συμπέρασμα ότι οι τρομοκρατικές επιθέσεις επηρεάζουν αρνητικά τον αριθμό των διανυκτερεύσεων σε ξενοδοχεία και παρόμοιες εγκαταστάσεις στις 22 ευρωπαϊκές χώρες. Παρά το γεγονός ότι η ξενοδοχειακή βιομηχανία έχει αναπτυχθεί σημαντικά, η τρομοκρατία θα αποτελεί πάντα μια μεγάλη πρόκληση και απειλή για τη βιομηχανία.

Acknowledgment

The completion of the present study leads a new beginning and takes a step forward toward achieving my future goals.

First of all, I would like to thank my supervisor Mr. Konstantinos Chatzimichael for all of his help, support and guidance throughout the completion of this master's dissertation.

I would like to express my sincere appreciation to my family and friends. Being loved and supported by them makes me believe that I can accomplish all my goals and future plans.

Sincerely,
Antroula Dyspyrou
December 2019

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Chapter 1

Introduction

Tourism is one of the central pillars of the economy for many countries in Europe and has become a major economic activity in the 20th century. Travelling was once a luxury affordable only by the wealthy; due to the continuous technological progress and the appearance of low cost airlines travelling has become affordable to the masses and a lifestyle. Tourism industry can benefit a destination's economy in numerous ways; it does not only support economies by creating revenues it also creates job opportunities. The travel and tourism sector not only creates added value throughout the European Union by making Europe the leading region in the global tourism market and number one tourism destination, it is also considered one of the major job creators in Europe. The economic significance of tourism is evident; member States of European Union together reported 538 million international tourist arrivals last year, accounting for 40% of the world's total. Furthermore in the European Union, tourism contributes 10% to EU GDP and creates jobs for 26 million people (World Tourism Organization).

Tourism industry it is a wide-range industry and includes various sectors; the hospitality sector, the transport sector, the food and beverage sector, the entertainment sector and some other related sectors that are either directly or indirectly connected to the tourism industry (these can be businesses that arrange transport and activities for traveler). Focusing on the hospitality sector its worth mentioning that is the 3rd largest socio-economic activity in the European Union. The hospitality sector deals with providing tourists with a place to stay during their trip; the type of accommodation provided can vary from a luxury bed in a five star hotel to a bed in shared dormitory of a hostel or a serviced apartment in the city center. According to PwC's publication European hotel transaction

volume reached €20.9 billion in 2017. This was an 11% increase compared to 2016 deal volume and surpassed the record level achieved in 2015. (PWC, 2019)

As known, tourism and the hospitality industry are considered vulnerable to a variety of influences. Such influences could be an economic crisis, a natural disaster or a human caused disaster. Despite the fact that tourism industry has grown significantly, terrorism will always represent a major challenge and threat to the industry. Nowadays terrorism is known by its own name and it's always accompanied by images of terror, fear, destruction and chaos. The number of terrorist attacks occurred in the past few years has risen dramatically in European countries. According to (Weimann & Winn, 1994) terrorist activities have a major impact on international tourism of a destination country and they are the largest economic factor in the equation between terror and foreign tourism.

The causes and economic consequences of terrorism have become worthy of the attention of scholars since the early years. A substantial amount of research has analyzed the effect of terrorism on tourism. Several empirical studies (Enders & Sandler, 1991); (Enders, et al., 1992); (Drakos & Kutan, 2003); (Greenbaum & Hultquist, 2006); (Yechiam, et al., 2005) find a significant negative impact of terrorism on tourism arrivals and tourism revenue.

Given the increase and intensity of terrorist attacks around Europe in the recent years, examining the impact of terrorism on hotel performance in Europe seems of great relevance. To measure the impact of terrorism on the hotel sector a fixed effect regression analysis was implemented. Four different regression models were developed for the study. Along these lines, the main objective of this study is to examine whether and to what extent terrorist attacks have a significant negative effect on the hotel-sector in Europe.

The data source for the terrorist incidents comes from the GTD (Global Terrorism Database) and covers the period from 2008-2017. The data used for the study are: total, domestic and international terrorism incidents resulting in injuries and fatalities that have occurred in each European destination country over the period 2008-2017. Data collected and used in the study regarding tourism were collected from Eurostat and cover the period 2008-2018. The yearly number of nights spent at hotels and similar establishments, the

yearly number of bed places and the yearly number of employed persons in hotel and similar establishments for each country was included in the dataset. In summary the total dataset consisted of 22 European countries that suffered from terrorist incidents during period 2008-2018.

The dissertation study is structured as follows. In Section 2 we give a definition of tourism and terrorism and then we present the link and relationship between the two. Additionally in section 2 the literature review is included with references of previous studies and researches associated with the research question presented. Section 3 discussed the research design of the study and provides a thorough explanation of the data that were used in the analysis and the data selection process. Section 3 also includes a brief description of the methodology and presents the four regression models. Section 4 outlines the findings and the analysis results obtained from the regression analysis. Finally in section 5 conclusion, limitations and suggestions are presented.

Chapter 2

Theoretical Considerations

In the first and second subsection of this chapter the general description of tourism and terrorism is included and at the same time the link between the two is identified. Then the third subsection refers to the literature review and includes a summary of previous studies examining the same research problem.

2.1 Tourism

Lelper in 1979 proposed a definition of tourism. He defined tourism as a system which involves the discretionary travel and temporary stay of persons away from their usual place of residence for one or more nights, with the exception of tours made for the primary purpose of earning remuneration from points en route. The system consists of five elements which are arranged in spatial and functional connections; the five elements of the system are tourists, generating regions, transit routes, destination regions and a tourist industry. Having the characteristics of an open system, the organization of five elements operates within broader environments with which it interacts: physical, cultural, social, economic, political, technological with which it interacts.

Tourists are rational consumers who must allocate their income between commodities which include tourist trips (Enders & Sandler, 1991). Travelling was once a luxury affordable only by the wealthy but nowadays travelling became affordable to the masses. As technological advantages made the airline industry more competitive, the cost of travelling was decreased and the growth of the tourism industry begun.

Tourism is one of the world's largest industries. Revenues deriving from the tourism industry contribute in the economic growth and economic structure for many European countries. Tourism and the hospitality industry provide not only economic growth but also employment opportunities. Economic activities related to tourism employ over 13 million people in the European Union. Nearly 8 million of these people work in the food and beverage industry, while 2 million are employed in transport (industry sectors that are related to tourism but do not rely on tourism). The accommodation sector accounts for 2.7 million jobs in the EU; travel agencies and tour operators account for just over half a million. The three industries that rely almost entirely on tourism (accommodation, travel agencies/tour operators, and air transport) employ 3.6 million people in the EU. According to Euro Stat the tourism industry gives job opportunities to different groups of people. Tourism industry is a major employer of women, part time workers, young workers, lower educated workers (those who haven't finished upper secondary schooling) and foreign citizens.

As a labor-intensive sector, the hospitality sector holds a specific responsibility to provide good working conditions for its employees. The hospitality industry provides many jobs for the younger ones usually for the ages below 25 and is seen as an important sector for young people, having their first jobs. Furthermore, (Hotrec, 2019)states that the hospitality and tourism sector also provides opportunities to unskilled people (lower secondary education) and to women (gender equality – around 54% people working in this industry are women).

According to the United Nations World Tourism Organization's (2019) publication "Tourism highlights", the European Union is a major tourist destination, with five of its Member States among the world's top 10 destinations in 2017; France, Spain, Italy, United Kingdom and Germany. Europe was the most frequently visited region in the world in 2017, accounting for just over half (51 %) of the 1.32 billion international tourist arrivals. The European Union's tourism industry is made up of 2.3 million businesses, primarily small and medium-sized enterprises (SMEs). In 2018, the 'travel & tourism' sector directly contributed 3.9% to EU GDP and accounted for 5.1% of the total labor force (which equates to some 11.9 million jobs) (Organization, 2019). It's worth mentioning that according to (Hotrec, 2019)90% of the 2 million hospitality businesses in Europe are micro-enterprises.

According to Huang, et al., (2019) hotel performance hence the hotel sector is affected by both internal management factors and external environmental factors. Major internal management factors affecting hotel performance include hotel construction investment, marketing, hotel service quality, facility quality, reputation and operational innovation. Major external environmental factors that affect hotel performance include the attractiveness of a travel destination, safety and political stability, national image and openness, and highly developed tourism infrastructure. Therefore the influence of external environmental factors on hotel performance is significant.

Unfortunately the tourism industry is highly vulnerable to natural and human caused disasters and any downturn in the industry can create major problems for many governments and countries. For a tourist destination, this period can represent a tourism crisis (Sönmez, et al., 1999). During a tourism crisis a destination can lose its attractiveness and a rather negative image can be created pushing tourists away in safer destinations. This situation can cause a downturn in the travel and tourism economy by creating problems in the operation of many hospitality businesses and reducing tourist arrivals in effected countries. The longer a crisis lasts, the higher is it's the risk for a negative impact.

Sönmez & Graefe (1998) in their study examined international touristic decisions made within the context of terrorism risk. Their results showed that decisions involving risk in general or terrorism risk in particular, involve a complicated process. Whether real or perceived, risks associated with international tourism place serious constraints on tourist behavior. Unlike business travelers, those on vacation enjoy the element of choice; tourists are free to choose which country to visit and which to avoid. Therefore, regardless the causes of a tourism crisis, natural or human, tourists will always choose for the safest destination. According to Enders & Sandler (1991), if a tourist has to choose between two trips which both provide identical benefits the tourist would choose the trip with the lower price; but in the case of an increased threat associated with one of the two destinations the tourist would choose to substitute the destination with a less attractive and safe image with another destination.

2.2 Terrorism

Terrorism is a global phenomenon which is easy to recognize but difficult to define. A review of the literature addressing the definition of terrorism reveals that defining terrorism is not easy. Numerous studies and scholars entangle in the definition of terrorism, each one expressing a different point of view based on different situations and at different times. Some of the most widely acceptable definitions define terrorism as:

"*the premeditated use or threat to use violence by individuals or subnational groups against noncombatants in order to obtain a political or social objective through the intimidation of a large audience beyond that of the immediate victims.*" (Sandler & Enders, 2004)

 "*an act of or threat of an act of tactical violence by a group of trained individuals , having international linkage, to achieve political objectives.*" (Prabha, 2000)

"*the use of violence against random civilian targets in order to intimidate or to create generalized pervasive fear for the purpose of achieving political goals*" (Alexander, 1976)

"*Terrorism is an anxiety-inspiring method of repeated violent action, employed by clandestine individual groups or state actors, for idiosyncratic, criminal or political reasons, whereby—in contrast to assassination—the direct targets of violence are not the main targets. The immediate human targets of violence are generally chosen randomly or selectively from a target population, and serve as message generators. Threat and violence based communication processes between terrorists' victims, and main targets are used to manipulate the main target, turning it into a targeting of terror, a target of demands, or a target of attention, depending on whether intimidation, coercion or propaganda is primarily sought.*"
(Schmid & Jongman, 1988)

Terrorism, *"as a symbolic act",* according to Karber (1971), *"can be analyzed much like other mediums of communication ».* This conceptualization is accompanied by four basic components of the communication process within the context of terrorism: transmitter of message (terrorist); intended recipient of message (target of terrorist's message); message (terrorist act involving individual or institutional victims); and feedback (reaction of the recipient). Karber's explanation supports a familiar scenario: terrorists initiate communication when they hijack a passenger airline; the target of their message is likely to be a large and usually removed audience (i.e., the government being protested); travelers on the plane and the hijacking itself represent the message (which may involve certain demands); and governmental compliance with terrorist demands represent the feedback required by the terrorists to confirm successful communication. (Karber, 1971)

Terrorism in most cases is defined as a political phenomenon with the sole objective to obtain political power. Terrorist's ultimate goal is to acquire political power over a territory or a country and implicate their rules and believes. Social and economic problems are not primary to terrorists but they are vital for their growth. Terrorist groups are organized and emerge as a political party aspiring for political recognition but along the way they fail to make a dent in active politics through political means and their agenda shifts from politics to tactical violence. Random terrorism may be targeted at the innocent and vulnerable, for two reasons. The first is that killing the innocent graphically demonstrates the state's failure to protect its citizens. Second, it helps to create revulsion, fear and panic. The combination of anger, revulsion, fear and despair eventually obliges the State to concede some or all of the demands of the terrorists. Tourists are usually both innocent and vulnerable. (Korstanje & Clayton, 2012)

Although the international environment plays an important role in constraining or enabling the growth of terrorist activity, threats to human security are directly related to the development and growth of terrorism. The violation of three types of human rights can create an environment that is conducive to the development of terrorism. These three types of rights: political rights, personal security rights and basic human rights collectively constitute human security. (Callaway & Harrelson-Stephens, 2006)

According to Johnston & Nedelescu (2005) the economic consequences of terrorist attacks can be largely broken down into short-term direct effects; medium-term confidence effects and longer term productivity effects. The direct economic costs of terrorism ,including the destruction of life and property, responses to the emergency, restoration of the systems and the infrastructure affected, and the provision of temporary living assistance, are most pronounced in the immediate aftermath of the attacks and thus matter more in the short run. The indirect costs of terrorism can be significant and have the potential to affect the economy in the medium term by undermining consumer and investor confidence. A deterioration of confidence associated with an attack can reduce the incentive to spend as opposed to save, a process that can spread through the economy and the rest of the world through normal business cycle and trade channels. Finally, over the longer term, there is a question of whether the attacks can have a negative impact on productivity by raising the costs of transactions through increased security measures, higher insurance premiums, and the increased costs of financial and other counterterrorism regulations.

Terrorist attacks have become very frequent and more severe over the last decade. Most of the terrorist attacks nowadays result in devastating numbers of lost lives and injuries. Terrorists often unleash their attacks at targets, not directly involved in the decision-making process that terrorists seek to influence (Enders, et al., 1992). Terrorist attacks may harm pedestrians along a crowded road (Nice 2016 with 87 fatalities), passengers waiting at a check in counter in an international airport (Brussels airport in Zaventem 18), passengers waiting in metro station (Brussels Maalbeek Metro Station 2016 with 17 fatalities) or music fans attending a concert (Bataclan Concert Hall 2015 with 93 fatalities). According to the Global Terrorism Index 2017 terrorism has dramatically increased since 2014 due to ISIL and ISIL inspired attacks. Between 2014 and 2016 there was a 67 per cent increase in attacks and a nearly 600 per cent increase in death from terrorism. Terrorism does not only create terror and tension in target countries but also creates fear and insecurity in the rest of the world.

2.3 Link between terrorism and tourism

There is a big correlation between international terrorism and tourism according to Edkins, et al , (2004). International terrorism and tourism are paradoxically connected via their mutual characteristics such as both crossing national boarders, both involve citizens of different countries, and they both utilize travel and communication technologies. (Schlagheck, 1988)

Terrorists use the tourist system to attract global media attention through spectacular attacks on tourists or the tourist infrastructure (Baker, 2014). Richter & Waugh, 1986 suggests that travelers might be targeted for violent attacks because they are perceived as ambassadors of their countries. Based on this suggestion, tourists are viewed as strategic objectives and used as a political tool. When tourists are victimized in a terrorist attack simultaneously more countries are involved; engaging international media attention and news coverage on a global network. According to Sönmez (1998) negative media coverage can impact attitude formation quite easily and because of the intangible nature of the tourism experience, destinations depend heavily on positive images. Media coverage of terrorism can tarnish a destination's image and has the potential to shape individuals' opinions of a destination. Sonmez (1998) warned that persistent terrorism will jeopardize a country's reputation as a safe destination, particularly when the public has long lasting memories of terrorist attacks in the country. Being safe on vacation is an expected requirement for any visitor in a tourist destination or a city. Acts of terrorism performed against the tourism industry can easily damage the destination's image and instill fear in potential tourists. This negatively affects the tourist industry and can cause a decline in tourist arrivals. Through mass media coverage and especially television, terrorism has gained power and terrorists achieve their goal of publicity by spreading images of fear and death for the whole word to witness at a fast rate. However in many situations, the media exaggerates the severity of the terrorist incident.

Furthermore according to Richter & Waugh (1986), large groups of foreign-speaking and - looking tourists provide camouflage and safety while offering various opportunities and

choice of targets. Terrorists can circulate among tourists and carry out financial transactions in foreign currencies without arousing suspicion. Even though the likelihood of a tourist to be harmed by a terrorist attack is negligible, the fear created by terrorism and terrorist attacks has a huge impact on human behavior and on individual decisions. Terrorism usually discourages tourists from visiting affected destinations (Liu & Pratt, 2017). Potential tourists either defer their travel or choose safer destinations. According to Baker (2014) the greatest impact on tourist demand comes from terrorist attacks where tourists and locals are the direct target or victims of the attack.

The literature examining the impact of terrorism on tourism industry and the hotel sector is limited. There are a number of studies measuring the impact of terrorism on tourism, more of them resulting in the negative impact of terrorist incidents on tourism revenues and tourist arrivals in countries. Most of the studies are more general and focus only on the effects of terrorism on tourism; our study will focus on the impact of terrorism on hotel sector in Europe.

Among the first studies conducted to examine the impact of terrorist events on tourism industry was one by Enders and Sanders in 1991. Their basic methodology involved a vector auto regression framework (VAR) using data for Spain between years 1970-1988. The study has demonstrated that transnational terrorist events can significantly curtail foreign tourists. According to the results during the period 1970-1988 transnational terrorist attacks reduced Spanish tourist visits by 140.847 people. This study suggested that transnational terrorism can severely cripple economies that rely heavily on foreign tourism. (Enders & Sandler, 1991)

In 1992 Enders, et al. conducted a research study to investigate whether terrorism can have an impact on tourism. To accomplish their task they estimated a forecasting equation for a country's (or a region's) share of tourism using an ARIMA model with a transfer function based on the time series of terrorist attacks in that country (or region). Data on terrorist incidents were obtained for years 1968-1988 and data on tourist receipts were obtained from 1970 to 1988 for twelve countries. The technique was applied to Greece, Italy, Austria and continental Europe. The estimated transfer functions showed that tourism begins to

respond to terrorist incidents after six to nine months in the case of Greece and Italy and a surprising twenty-one months delay in tourism reaction in the case of Austria. In estimating the revenue losses from terrorism the study showed a loss of 427 million of SDRs for Greece , a loss of 615 million for Italy , a 2.582 billion loss for Austria and a loss of over 12.6 billion for continental Europe since 1974. (Enders, et al., 1992)

A quantitative analysis of the major terrorism events around the world during 1985- 1998, the magnitude of their impact on host destinations and the tourism industry was published by A. Pizam and G. Smith (2000). The data collected were inserted into a matrix and based on the results terrorist acts occurring at tourist destinations have been numerous and frequent. The authors found that a large portion of terrorist acts that resulted in bodily harm or death caused a significant decline in tourism demand that lasted from one to six months, with recovery in approximately 50% of the cases within three months or less. (Pizam & Smith, 2000)

Pizam and Fleischer (2002) conducted a study on the impact of acts of terrorism on tourism demand in Israel during the period May 1991 to May 2001; their results confirmed that the frequency of attacks rather than their severity caused a larger decline in international tourist arrivals. The implication is that a destination will recover from nonrecurring attacks, whereas frequent attacks cause tourism demand to decrease. (Pizam & Fleischer, 2002)

K. Drakos and A. Kutan in 2003 used the hypothesis testing and the SURE method to indicate whether terrorism had an impact on tourism in three major Mediterranean tourist destinations; Greece, Israel and Turkey. Terrorist incidents were divided in three levels of intensity: low, medium, high. Data on the number of tourist visits and on terrorist incidents were collected for the period January 1991 to December 2000. In their study Drakos & Kutan, 2003 examined the effects of each country's own terrorist attacks and the effect of cross country terrorism. Their empirical findings indicate that terrorist incidents significantly reduce tourist arrivals and have significant own and cross county effects on the market shares of the involved countries. And although neighboring countries may be considered as immediate destination substitutes, results showed that there is a negative impact on tourism demand for the entire region. (Drakos & Kutan, 2003)

R. Greenbaum and A. Hultquist in 2006 measured the effect of terrorism incidents on lodging-use rates in Italian cities using an ordinary least squares (OLS) regression model. The study focused on measuring the impact of domestic and transnational incidents of terrorism in Italian cities rather than entire countries. The results showed that lodgings used by foreign visitors are most sensitive to terrorist attacks and that the incidents have the largest impact during the year of attack and not after one year. Also negative impacts of incidents are significant in small cities for hotels and foreign lodgings and for foreign lodgings in large cities. (Greenbaum & Hultquist, 2006)

Despite the fact that many studies resulted in a negative impact of terrorism on the tourism industry there are findings indicating that local tourists are not easily affected by terrorist incidents. Becker and Rubinstein (2011) in their study on estimating the impact of terrorist attacks during Al-Aqsa Intifada on the usage of public busses and visits to cafes by frequent and occasional users came to the conclusion that each type of user reacts differently. They found no impact on the demand by frequent users while the reactions of occasional users affected the use of the services. (Becker & Rubinstein, 2011)

Yechian et al. (2005) examined the effect of a wave of terrorist attacks called the Al-Aqsa Intifada on tourism and Israeli hotels. Their results showed that during the terrorist activities in October 2000, hotel stays by inbound tourists decreased by 60% and stays by domestic tourists by 10%. While a comparison of October 2000 and October 2001 showed that stays by inbound tourists decreased by 80% and stays by domestic tourists increased by 20%. Through a laboratory experiment Yechian et al (2005) suggested that local residents that are constantly exposed to the risk of terrorist attacks have low sensitivity to the risk of an attack. (Yechiam, et al., 2005)

Llorca-Vivero (2008) carried out an empirical study on the effects of different measures of terrorism activity on international tourist flows from the G-7 countries to a sample of 134 destinations. The analysis was based on a cross-sectional augmented gravity equation for tourism over the period 2001–2003. The results obtained suggest that both domestic and international terrorism have a moderate but significant negative influence on tourist flows.

Moreover, in developing countries, the cost of terrorist actions in terms of tourist arrivals is noticeably higher.

Feridun (2011) examined the causal impact of terrorist attacks on tourism in the case of Turkey by employing an autoregressive distributed lag bounds testing procedure to investigate the effect of terrorism for the period between 1986 and 2006 on the Turkish tourism sector. The findings indicate a negative causal effect of terrorism on tourism and that tourism is in a long-run equilibrium level relationship with terrorism. (Feridun, 2011)

Buigut & Amendah (2016) measured the effect of terrorism on tourism demand in Kenya. Their objective was motivated by the importance of tourism sector in the national economy. The authors implemented a dynamic panel data model on annual data from 2010 to from a set of 124 countries covering all the geographical regions of the world. Unsurprisingly, the results showed that that terrorism, proxied by the number of fatalities, negatively and significantly affects the number of visitors to Kenya. A 1% increase in fatalities decreases the arrivals by about 0.132% which translates into a reduction in annual tourist earnings of about $1.82 million.

Charbel (2014) in his study used a seemingly unrelated regression model (SUR) to test the individual effects of domestic and transnational terrorism on tourism demand to Lebanon, Turkey and Israel over the period 1995–2007. Tourism demand is measured by the logarithm of the number of arrivals to each country. Moreover Charbel, 2014 tested whether tourism depends on the magnitude of the terrorist attacks by disaggregating terrorism into three levels of intensity – low, medium and high. The results showed significant own and spillover effects for domestic and transnational terrorism on tourism demand to each of the three selected countries. In addition, the results showed that the effect of terrorism on tourism depends on the intensities of the terrorist attacks. (Charbel, 2014)

A recent study published by Vanneste, et al., (2017) measured the impact of the 2016 terrorist attacks in Brussels on tourism. The effects are explored on two levels; the first level is a desk research, were monthly numbers of different indicators are compared for

2015 and 2016. While the second level of the study is a survey on the interpretation and attitude of tourist towards the terrorist event. The survey took place not only in Brussels which was the destination country but also in Antwerp and Bruges which were used as a benchmark. The results showed that the terrorist attacks had an effect on the visitor's behavior for several months and in fact it took Brussels more than six months to recover. According to the results the effects of the terrorist attacks are felt far beyond the place that suffered from the attacks, particularly if this place is a brand for the region or for the country. The study showed also good news; the good news is that tourists seem to feel safe again after approximately six months. (Vanneste, et al., 2017)

Chapter 3

Methodology

In the first subsection of chapter 3 we have included a brief reference on the research design implemented for the study. Then in the second subsection the dependent, independent variables and dummy variables used in the study are explained in detail. In addition the second subsection describes the selection process of the data and how the final dataset was formulated. While in the last subsection of this chapter the methodology and the four regression models used in the study are analyzed.

3.1 Research Design

For the completion of this study we implemented a quantitative research design using secondary data. The secondary quantitative research design involves the collection of quantitative data from existing data sources like the internet, government resources, libraries, research reports etc. Existing data is summarized and collated to increase the overall effectiveness of research. Usually quantitative data is represented by tables, charts, graphs or any other non numerical form; this makes it easy to understand the data that has been collected. When implementing the quantitative research design we have the advantage of collecting reliable and accurate data in less time. It also provides a wide scope of data collection and the results obtained are numerical and offer no scope for personal comments or biasing.

3.2 Data Description

As mention in the research design subsection the study uses secondary data collected from the internet. The data selection process for the completion of this study was completed in two stages. For the first stage, data regarding the hospitality industry were drawn from Eurostat; for the second stage data regarding terrorism were drawn for Global Terrorism Database.

On Eurostat's website there is a large number of annual data available regarding tourism and accommodation industry for all European countries. For our regression model we choose to use the following data; the number of nights spent at tourist accommodation establishments for hotels and similar accommodation (Y), the number of bed places for hotel and similar accommodation (K) and the number of employed persons fulltime and part time for accommodation activities (L).

Information on the hotel sector physical outputs and inputs was available for 36 European countries for the time period of 2008-2018. After excluding eight countries due to incomplete data availability at different points of time, the final sample is limited to 28 European countries for the period 2008-2018. It's worth mentioning that the countries excluded from our sample were Ireland, Kosovo, Lithuania, Liechtenstein, Montenegro, North Macedonia, Serbia, and UK.

Focusing on our depended variable (Y), we had two options available on Eurostat's database; the number of nights spent at tourist accommodation establishments for hotels and similar accommodation and the number of arrivals at hotels and similar accommodation. Considering the fact that the number of nights spent at hotels and similar accommodation might represent more reliable indicators and that the number of arrivals at hotels does not give the actual size of a hotels occupancy we decided to eliminate the second option and use the number of nights spent at hotels as our depended variable.

For the first independent variable three figures were available; the number of bed places at hotels and similar accommodation, the number of bedrooms at hotels and similar accommodation and the number of establishments. We preferred to use the number of bed places for our variable as the number of bedrooms does not show the actual size of a hotel and the number of establishments does not show the actual size of the hospitality industry in a country. The second variable (L) we use in this study is the total number of employed persons both fulltime and part time in accommodation activities. It could be better to use the total number of working hours in the hospitality industry instead of the number of persons but unfortunately this information is not available from Eurostat.

Of course, one has to take into consideration that a number of tourists stay at friends or family homes during their vacation; Eurostat's figures do not include the number of nights spent with friends or family. It's worth mentioning that an important figure we could use in our estimation is the total revenues for the hospitality industry. However this information is not available.

In Figure1, the numbers represent the nights spent in hotel and similar accommodations by country (the 22 countries of the final dataset) for the period 2008-2018. From Figure 1 we know that the 4 countries with the bigger numbers in nights spent at hotel and similar accommodations are Spain, Italy, Germany and France. The country with the largest number of nights spent at tourist accommodation establishments is Spain. Italy and Germany follow with a very small difference between them, while France ranks position number four. In contrast, Estonia is the country with the smallest number of nights spent at hotel and similar accommodation from our dataset.

Figure 2 shows the total annual number of nights spent at hotels and similar accommodations for all the countries per year for the period 2008-2018. From figure 2 we can observe that apart from year 2009 which shows a decrease when compared to 2008, all years from 2009-2018 represent a yearly increase in the total number of nights spent at hotel and similar accommodation. In Table 1 the percentage of yearly increase or decrease in the total number of nights spent in hotel and similar accommodation is shown. The only decrease recorded in the total number of nights spent at hotels and similar accommodation

is when comparing 2009 and 2008 with a percentage of 4.17. When comparing the years 2010-2009 and 2011-2010 we get the higher percentages of increase in nights spent, 3.97% and 4.83% respectively. For the last two years 2018 and 2017 the percentages of increase shown on Table 1 are surprisingly lower from previous years.

From Figure 3 we can learn that Italy, Spain, Germany and France are the top 4 countries in total bed places for period range 2008-2018. Italy is the country with the higher number of total bed places for the period 2008-2018. Spain is at the second position with 20305,37(thousands) bed places, while Germany and France follow with 19335,45(thousands) and 14025,62(thousands) bed places respectively. Figure 4 shows the total annual number of bed places for all the 22 countries from our sample. Each year there is a small increase in the total number of bed places which shows that the hospitality industry is growing larger year by year by additions of new accommodation establishments. When observing figures 3 and figure 4 we should take into consideration that data for year 2017 and 2018 for Norway and Switzerland were not available from Eurostat and not included in our study. The same is valid for Romania and data for 2018.

The data in figures 5 and figure 6 show the total number of employed person in the accommodation services by country and by year. In figure 5 we were surprised to see Germany, which is third in nights spent at hotels and similar accommodations and second in number of bed places available, ranks at the top of the list for employing the largest number persons in the hospitality industry. Spain, which was expected to employ the largest number of people due to the fact that has the large number of nights spent in hotels and similar accommodations, is at second place. Italy and France follow with a very small difference. In figure 6 we can notice a non steady line with some ups and downs in the number of employed persons during periods 2008-2012 while for the years later an increase is recorded until 2016. In 2017 there was a small decrease which was followed by an increase in 2018.

As mentioned in the beginning of the chapter all data on terrorist incidents were obtained through the Global Terrorism Database; Global Terrorism Database is an open-source database including information on domestic, transnational and international terrorist

events that have occurred around the world from 1970 through 2017. Initially we collected all the terrorist incidents for the period 2008-2017 for all the 28 European countries selected in stage one. Even though a large number of terrorist incidents occurred in 2018 the GTD does not have any available data after 2017. Global terrorist database reports all types of incidents related to domestic, transnational and international terrorism. In the sample of the 28 European countries a very large number of incidents occurred so we decided to narrow our data set by excluding all terrorist attacks with zero injuries and zero fatalities. Countries with zero injuries and zero fatalities from terrorist attacks are Cyprus, Portugal, Latvia and Iceland; these countries were excluded from the dataset. Luxemburg and Slovenia had none terrorist incidents reported on the Global Terrorism Database so they were also deleted from the dataset. Hence our final dataset narrows down to 22 European countries reporting 175 terrorist incidents for the period 2008-2017.

As can be seen in Figure 7 in the number of incidents per country for years 2008-2017 France ranks position number one with the higher number of terrorist attacks (55 in total), second is Germany with 22 attacks and third is Spain with 16, Greece Italy and Belgium follow with 15, 11, 10 terrorist attacks respectively.

As shown in Figure 8, incidents related to any type of terrorism spiked through the years and especially after 2014 GTD reports a sharp increase. The year with the largest number of attacks was 2016 with 43 terrorist incidents resulting in injuries and fatalities of civilians, 2017 and 2015 follow with 39 and 32 incidents respectively. In contrast for the period 2008-2014 we observed that the total number of attacks yearly is smaller, with the highest number of incidents during that period to be 13 in 2013 and the lowest 4 in 2010.

In table 2 we summarized the top ten terrorist incidents from our dataset. In 2015 Paris suffered one of the biggest terrorist incidents when three suicide bombers opened fire on Bataclan concert hall killing 93 and injuring 217 people. In 2015 France witnessed eight coordinated attacks carried out in Paris on the same day with the Islamic State of Iraq and the Levant (ISIL) claimed responsibility. One year later France experienced another big terrorism attack with a devastating number of 433 injuries and 87 deaths attributed to the Jihadi-inspired extremists where an assailant rammed a truck into a crowd celebrating

Bastille Day in Nice. Also in 2016 in Greece the EgyptAir Airbus A320 flying overnight from Paris to Cairo crashed into the eastern Mediterranean Sea on 19 May 2016. All 66 passengers and crew on board Flight MS804 died. No terrorist group has claimed responsibility for the crash.

The whole world was shocked in 2011 when a civilian dressed as a police officer entered a youth camp in the island of Utoya, Norway and opened fire killing 69 people and injuring at least 60 others, including teenagers. In Belgium 2016 two coordinated attacks took place targeting transportation infrastructure in Brussels on the same day. Two suicide bombers with explosives-laden suitcases detonated at a check-in counter at Brussels Airport in Zaventem, Flemish Brabant, Belgium and a suicide bomber detonated at the Maalbeek Metro Station in Brussels, Belgium. Unfortunately 270 people were injured and 35 died across both incidents. The Islamic State of Iraq and the Levant (ISIL) claimed responsibility and stated that the attacks were carried out in retaliation for Belgium's participation in a coalition against ISIL. Germany 2016, an assailant drove a truck into a Christmas market in Breitscheidplatz in Berlin; the casualties from the incident were 12 fatalities and 48 injuries. Spain experienced a terrible terrorist incident in 2017 when an assailant rammed a van into a crowd of pedestrians along Las Ramblas in Barcelona, Spain; 14 deaths and 101 injuries was the aftermath of the attack.

3.3 Regression Model

To measure the impact of terrorism on hotel performance in Europe this study utilizes a multiple regression analysis using fixed effects. Multiple regression analysis is an extension of simple regression analysis; the general purpose of multiple regressions is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. According to Mummolo & Peterson, 2018 the fixed effects regression model is commonly used to reduce selection bias in the estimation of causal effects in observational data by eliminating large portions of variation thought to contain confounding factors. For example, when units in a panel data set are thought to differ systematically from one another in unobserved ways that affect the outcome of interest,

unit fixed effects are often used since they eliminate all between-unit variation, producing an estimate of a variable's average effect within units over time .

To obtain results on the impact of terrorism on the hospitality industry in Europe we need first to specify the regression models used in our study. Following the relevant work in this field we rely on a simple Cobb-Douglas production function augmented to account for hicks neutral technical change:

$$Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + +u_{it} \quad (3.1)$$

Where:

- Subscripts i and t refer to countries and years, respectively. Therefore all variables (independent and dependent) had a double subscript indicating that their corresponding values vary across countries and over years.
- Y_{it} is the dependent variable and represents the nights spent at hotels and similar accommodation,
- Beta's (b) are parameters to be estimated,
- K_{it} is an independent variable and denotes the number of bed places,
- L_{it} is an independent variable and denotes the number of employed persons in the hospitality sector,
- u_{it}: disturbance term

From the above equation four different models were developed by introducing the terrorism variables. The four models used in the study are described below:

Model 1: $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_1 D_{it} + u_{it}$ (3.2)

Model 2: $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_2 D_{it+1} + u_{it}$ (3.3)

Model 3: $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_1 D_{it} + \beta_2 D_{it+1} + u_{it}$ (3.4)

Model 4 : $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_{TI} TI_{it} + u_{it}$ (3.5)

Where:

- – (D_{it}) represents the first dummy variable
- – (D_{it+1}) represents the second dummy variable
- – TI_{it} represents the total number of terrorist incidents occurred in the time period,

The dependent variable used is the number of nights spent at tourist accommodation establishments for hotels and similar accommodation (Y). We decided to use the same dependent variable for all our estimation models. We are measuring the relationship each independent variable has with the nights spent at hotels and similar establishment. We consider the number of nights spent at hotels and similar establishment as the output of the hotel sector and therefore we can calculate the impact each independent variable has on the hotel performance in Europe.

The first independent variable used in the regression models is the number of bed places for hotel and similar accommodation (K). By including this independent variable in the model we will measure the impact a 1% increase of the number of bed places will have on the number of nights spent.

In the same way we selected the second independent variable, the number of employed persons fulltime and part time for accommodation activities (L). The regression results will show the relationship between the two variables and how labor (the number of employed persons) impacts the performance of the hotel sector.

The introduction of dummy variables in our regression model was necessary. Dummy variables are a way of transforming qualitative variables into quantitative variables. A dummy variable is an artificial variable which usually takes on only two possible values, 0 and 1. Some of the variables we intended to use in our study were qualitative in nature and therefore not measurable in numerical terms; so we decided to create and add to our regression models the following dummy variables:

- (D_{it}) represents a dummy variable and it is equal to 0 when there is no terrorist incident in year t and its equal to 1 when there is a terrorist incident for year t.
- (D_{it+1}) represents the second dummy variable and it is equal to 0 when there is no terrorist incident in year t , equal to 1 in period t+1 when a terrorist incident is recorded in year t.

As described above the dummy variables represent a very important variable of the research study. We introduced the terrorism variable in the regression models with these two dummy variables. The two dummy variables are an important part of the regression analysis and the coefficients of these two will give the answer to the research question presented in the first section of the study.

A constant variable is also included in all four regression models representing the technological progress. Technological progress refers to the discovery of new and improved methods of producing goods. Changes in technology lead to an increase in productivity.

The last independent variable also represents the terrorism factor and is the number of total terrorist incident occurred in country i at time t; this independent variable is only used in the fourth model of the regression analysis. The results of the regression analysis show the effect of the total number of terrorism attacks on the number of nights spent at hotels and similar establishments.

For evaluating the significance of the coefficients, results for the t-statistics are examined using a hypothesis testing for each variable.

H_0 =0 , in the null hypothesis the variable examined is equal to zero and has no effect on the dependent variable

$H_1 \neq 0$, the alternative hypothesis is that the variable examined is different than zero and has an effect on the dependent variable.

Model 1: $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_1 D_{it} + u_{it}$ (3.2)

In Model 1 equation (3.2) coefficients β_i, β_t, β_K, β_L measure the impact when there is a unit increase of each independent variable (t,) (K_{it}), (L_{it}) on the number of nights spent at hotels and similar establishments. In this model we added the first dummy variable. As mention above (D_{it}) represents it is equal to 0 when there is no terrorist incident in year t and it's equal to 1 when there is a terrorist incident for year t.

Model 2: $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_2 D_{it+1} + u_{it}$ (3.3)

- In the same ways as model 1 coefficients β_i, β_t, β_K, β_L in model 2 equation (3.3) measure the impact when there is a unit increase of each independent variable (t,) (K_{it}), (L_{it}) on the number of nights spent at hotels and similar establishments. The only difference now is the replacement of the dummy variable with another one. (D_{it+1}) takes the value of 0 when there is no terrorist incident in year t, and it is equal to 1 in period t+1 when a terrorist incident is recorded in year t.

Model 3: $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_1 D_{it} + \beta_2 D_{it+1} + u_{it}$ (3.4)

Model 3 equation (3.4) is a merge of model 1 and 2. Again the main part of the equation is the same with coefficients β_i, β_t, β_K, β_L measuring the impact of each independent variable (t) (K_{it}), (L_{it}) on the number of nights spent at hotels and similar establishments. The new feature of this equation is that we decided to insert both dummy variables (D_{it}),(D_{it+1}).

Model 4 : $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_{TI} TI_{it} + u_{it}$ (3.5)

In model 4 equation (3.5) we keep the main part of the equation with adding a new independent variable. The variable TI_{it} represents the total number of terrorist incidents occurred in country i in the time period t; therefore coefficient β_{TI} measures the impact of the total number of terrorist attacks on the number on nights spent at hotel and similar establishments.

Based on the conclusions and results from previous studies measuring the impact of terrorism on tourism mentioned in chapter 2 we expect the three coefficients representing terrorism in our regressions β_1, β_2, β_{TI} to have a negative direction. All other coefficients are expected to be positively related to the hotel performance.

Chapter 4

Results and Discussions

In the first subsection of this chapter a descriptive analysis of the variables is included. In the second subsection the results of the four regressions models are presented and analyzed.

4.1 Descriptive Analysis

Table 3 presents descriptive analysis of the three variables , the number of nights spent at tourist accommodation establishments for hotels and similar accommodation (Y), the number of bed places for hotel and similar accommodation (K) and the number of employed persons fulltime and part time for accommodation activities (L). The variable nights spent at hotel and similar accommodation has a mean of 69.738,38 , and a standard deviation of 91.730,70. The maximum value of number of nights spent at hotels and similar accommodation (Y) recorded is 340.577,82 while the minimum value is 3.498,96. For the second variable the number of bed places for hotel and similar accommodation (K) we get a mean of 521,00. A maximum value of 2.260,19 number of bed places is recorded and the minimum value available in our data is 29,76. The standard deviation of the number of bed places is 642,88. From the sample data collected for the number of employed persons fulltime and part time for accommodation activities (L) we get a mean of 95,42 with a standard deviation of 120,46. Minimum and maximum value of the number of employed persons in hospitality is 5,90 and 515,60.

4.2 Regression Results

To ascertain whether terrorism has an impact on the hotel sector in Europe, the effect on the number of nights spent at hotel and similar establishments was estimated across a group of 22 European countries. Each equation was estimated separately and the estimation results are presented in Table 4. Table 4 provides the coefficient estimates and the t-statistics.

First we estimate the equation (3.2): $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_1 D_{it} + u_{it}$. The results from the regression analysis are reported in the second column of table 4. The coefficients of the variables indicate how much the depended variable Y (number of nights spent at hotel and similar establishments) changes when each independent variable increases by one unit. When estimating the first equation we get positive coefficients for variables K, L and t; all three were found to be statistically significant at 10 per cent level. By interpreting the results we get that the number of nights spent at hotel and similar establishment's increases by 0.7807 for every unit increase on the number of bed places. The coefficient β_L equals to 0.1704 which means that for every extra unit of employed persons the number of nights spent at hotel and similar establishments is positively increased by that number. When calculating the coefficient β_T the results show an increase of 0.0182 on the number of nights spent at hotel and similar establishments due to the positive correlation with the technological progress. On the other hand when observing the results of the coefficient D_{it} we get a negative estimation at -0.0058. The D_{it} as mentioned earlier is dummy variable and its equal to 0 when there is no terrorist incident in year *i* and 1 when there is a terrorist incident for year *i*. Even thought the coefficient of D_{it} is negative the t statistic value is (-0.60) which is not statistically significant; the null hypothesis is accepted and the model explains that terrorism does not have any significant influence on the nights spent at hotel and similar establishments. If the t statistic value was closer or higher to ±1.645 for a 90 % confidence interval the results would have shown that terrorism has a negative impact on the nights spent at hotel and similar establishments. In overall the results from the fixed effects regression analysis for equation 1 suggest that the

number of bed places, the number of employed persons and the technological progress are positively correlated with the number of nights spent at hotels and similar establishments.

Results for the second model equation (3.3) $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_2 D_{it+1} + u_{it}$ are available on the third column of table 4. The results we get from the regression analysis of the second equation are similar to the first model. From the regression results we obtain positive coefficients for the number of bed places for hotel and similar accommodation (K), the number of employed persons fulltime and part time for accommodation activities (L) and the technological progress (t). However the results show a negative coefficient for the dummy variable D_{it+1}. The T statistic for the number of bed places (K) at 90 per cent confidence is (9.26) which means that the null hypothesis is rejected and for any increase in the number of bed places there is a positive impact on the number of nights spent by 0.7449. The impact of the number of persons employed on the number of nights spent at hotel and similar establishments is lower than the impact of the number of bed places; the coefficient is 0.1527 with a t statistic result of (1.89). The null hypothesis is rejected and we can say that the variable number of employed persons (L) has an influence on the number of nights spent (Y) by increasing it 0.1527 per each extra unit. The coefficient of D_{it+1} which represents the terrorism regressor in our equation is estimated at -0.0049 with a t statistic of (-0.54). Although the regression model for equation 2 results in a negative impact of terrorism variable D_{it+1} on the number of nights spent (Y), the t statist was lower than 1.645 and the null hypothesis was accepted ;the results indicate for the second time that D_{it+1} doesn't have any significant influence on our dependent variable. While the number of bed places, the number of employed persons and the technological progress are positively correlated with the number of nights spent at hotels and similar establishments.

The estimations of the third model equation (3.4): $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_1 D_{it} + \beta_2 D_{it+1} + u_{it}$ are included as well in table 4 in column 4. Notably the results of the coefficients for the number of bed places for hotel and similar accommodation (K), the number of employed persons fulltime and part time for accommodation activities (L) and the technological progress (t) are statistically significant and have a positive impact on the number of nights spent at hotels and similar establishments (Y). Coefficient of β_t was estimated at 0.0206 and the t statistic at (10.73); resulting in the rejection of the null

hypothesis and accepting a significant positive influence of 2.06% of (t) variable on the number of nights spent (Y). The coefficient with the largest impact on the number of nights spent (Y) included in the third equation was β_K ; the β_K coefficient was equal to 0.7456 and was statistically significant with an estimation of t statistic (9.23). The number of bed places for hotel and similar accommodation (K) increased the number of nights spent (Y) by 0.7456 per unit. When estimating the β_L coefficient we get that there is a positive impact between the two variables and the number of employed persons fulltime and part time for accommodation activities (L) has an impact of 0.1527 on Y the number of nights spent. As expected the two dummy variables representing terrorism in our regression equation 3 have resulted in a negative coefficient. For D_{it} the coefficient β_1 was estimated at -0.0017 , and for D_{it+1} the coefficient β_2 was estimated at -0.0039. By interpreting these results we could argue that the two variables have a negative impact on the hotel sector by decreasing the number of nights spent at hotel and similar establishments under the assumption that the estimations of t statistic are higher than 1.645. However the results of the t statistic are -0.14 for D_{it} and -0.34 for D_{it+1} , the null hypothesis is accepted and we can say that the two dummy variables have no effect on the number of nights spent as they are statistically insignificant. As in our previous regression models the number of bed places, the number of employed persons and the technological progress have a positive impact on the number of nights spent at hotels and similar establishments.

In the last column of Table 4 the regression results for the fourth equation (3.5): $Y_{it} = \beta_i + \beta_t t + \beta_K K_{it} + \beta_L L_{it} + \beta_{TI} TI_{it} + u_{it}$ are available. It is worth noting that the coefficients β_t, β_K, β_L for the variables bed places for hotel and similar accommodation (K), employed persons fulltime and part time for accommodation activities (L) and technological progress (t), are once more all positive and statistically significant. The coefficient β_T is equal to 0.0216 with t statistic value (11.06) which means the null hypothesis is rejected and technological progress (t), has an impact on the number of nights spent (Y) by increasing it 0.0216 for each additional unit. The results we get for coefficients β_K and β_L are also statistically significant and have a positive impact on the number of nights spent (Y); β_K was found to be equal to 0.7276 with t statistic (8.97) while β_L equals to 0.1519 with t statistic (1.88). Therefore the number of nights spent at hotels and similar establishments is increased by 0.7276 for each additional unit of bed places (K) and by 0.1519 for

technological progress. When measuring the terrorism coefficient β_{TI} the results show a negative value of -0.033 and a t statistic of (-1.88). The t statistic is in the rejection area ±1.645 and the null hypothesis is rejected; the results show that the number of terrorism incidents had a negative impact on the nights spent at hotel and similar establishments. The results show that the number of nights spent (Y) is negatively impacted by the total number of terrorist incidents (TI_{it}), which decreases it by -0.033. The largest the number of the terrorist attacks occurred in a country i at time t is , the higher the impact on the nights spent at hotel and similar establishments gets.

Several notable results are apparent. First, the signs of the coefficients $\beta_{TI,}$ $\beta_1,$ β_2 representing the terrorism effect in each equation, have the expected negative direction. However only in one out of the four equations the t statistic results regarding the terrorism coefficients were statistically significant at 10% level of significance. In the case where terrorism does have a statistically significant impact the null hypothesis is rejected and the number of terrorism incidents seems to have negative impact on the number of nights spent at hotel and similar establishments by reducing it by 0.33%. It's worth mentioning that the only statistically significant coefficient β_2 is also the coefficient with the smaller impact on hotel sector. If we assume that all terrorism coefficients were statistically significant the coefficient with the most significant impact would be β_1.

Secondly, coefficients β_K, β_L, β_t have all positive direction and are all statistically significant for all four equations. The results show that the number of bed places, the number of employed persons and the time progress have a positive significant impact on the nights spent at hotel and similar establishment. The parameter that has the largest impact on tourism is the number of bed places, followed by technological progress and then the number of employed persons. The positive results of the three variables suggest that as the number of bed places, the technological progress and the number of employed persons rise tourists tend to spent more nights in hotels and similar establishment and tourism is increased as would be expected.

Chapter 5

Conclusions and Recommendations

This paper aimed to measure the impact of terrorism on the European hotel sector using regression analysis. Four different models were used in the study; based on the result for the three models out of the four we were not able to detect any significant effects of terrorism incidents on hospitality sector. The hypothesis that terrorism has an impact on the hotel industry was valid based on the results from the last regression model; the terrorism variable used in model 4 represented the total number of terrorist attacks for each country *(i)* per year *(t)* and results showed a statistically significant negative coefficient.

The hospitality industry seems to be relatively resilient from the effects of terrorism. As seen from the results terrorism incidents do not have a large impact on the hotel industry in Europe. A negative impact is recorded when including the total number of terrorist attacks in country *(i)* per year *(t)* in the regression model. The more terrorist attacks in a country the higher is the impact they have on the total number of nights spent at hotel and similar establishments. As seen from the previous literature and from our study, terrorism still evokes fear in tourists and apparently it impacts negatively the tourism industry including the hospitality sector.

This study adds to the extend literature by providing evidence of the effect of terrorism on the hotel sector in European countries. Previous studies mainly examined the impact of

terrorism on the hospitality industry of different individual countries while we evaluate the impact of terrorism on the hospitality industry of a group of 22 European countries.

It is important to highlight some limitations of the results presented which mainly are related to the hotel sector variables. First limitation concerns the variable of nights spent at hotel and similar establishments. Various reasons can force a traveller to a cancel a holiday and according to our study one of these reasons can be the fear created by terrorism attacks. In the situation in which the decision is to cancel all travel arrangements, the hotel or similar accommodation reservation is also cancelled. However travel reservations are usually prepaid and often non refundable, this depends from the accommodation provider and the agreement or policy for cancellations. For example one can cancel the reservation at the hotel but has to pay the full amount of the booking; in this case the sale in nights spent at the hotel is completed even though the services were not provided. In another case the cancellation fee can be a partial payment of the number of nights booked, let's say the first 3 days of the reservation has to be paid by the customer. We also have the case where there is no cancellation fee and the reservation is fully deleted. The latter case of cancellation does not create any limitation on our data however we cannot say the same for the first two cases of a cancelation. When a cancellation fee is charged either partially or fully the number of nights is included in the number of nights spent at hotel and similar establishments. Therefore in the data collected from Eurostat cancelled reservations and bed nights are included.

Moreover due to limitations on the availability of data as mentioned in Chapter 3, United Kingdom was excluded for our dataset. United Kingdom generates a large number of nights spent at hotel and similar establishments each year and during the past few years have suffered from numerous terrorist attacks. Hence including United Kingdom in our regression analysis and data set results obtained might have been different.

A panel data study involving countries not in the same geographical area like in our study may explain better the impact of terrorism on the hotel performance. In case a traveller feels unsafe or threaten by a terrorist attack he would simply substitute a vacation in the attacked country with a safer neighbouring country. Let's presume that countries in the

same region can be considered an alternative travel destination, the revenues and all benefits generated stay within the same region. However if travellers decide to change geographical area all revenues and benefits are diverted in another region. As previous literature focuses mainly on measuring the impact of terrorism on tourism and hotel industry in individual countries; measuring the impact of terrorism on the hotel industry by more than one geographical area is an opportunity for future research.

Despite the various unexpected influences, the hotel industry has been experiencing a market development during the past years and appears to holding it steady for future years. By developing quick response strategies against terrorism the hotel industry can easily overcome any obstacles created by terrorist actions aimed to harm and destroy the image of a destination country. It must also be acknowledged that opportunities emerge from crisis, and the hotel industry must be quick to identify and exploit new conditions and trends, displaying flexibility and adaptability. Provided that the industry learns from past experiences, and that the academic research can make an essential contribution, the survival of the industry from the threat of terrorism is guaranteed.

Tables and Figures

Nigths Spent in hotel establishments

Country	Nights Spent in 000's(Y)
Switzerland	322101
Sweden	339537
Spain	3255219
Slovakia	88508
Romania	182712
Poland	360808
Norway	177601
Netherlands	431303
Malta	90397
Italy	2859906
Hungary	213757
Greece	803826
Germany	2809557
France	2244080
Finland	180882
Estonia	50578
Denmark	143710
Cech Republic	353721
Croatia	212161
Bulgaria	213896
Belgium	197993
Austria	945166

Nights Spent

■ Nigths Spent in 000's(Y)

Figure 1

Nigths Spent in 000's(Y)

Year

◆ Nigths Spent in 000's(Y)
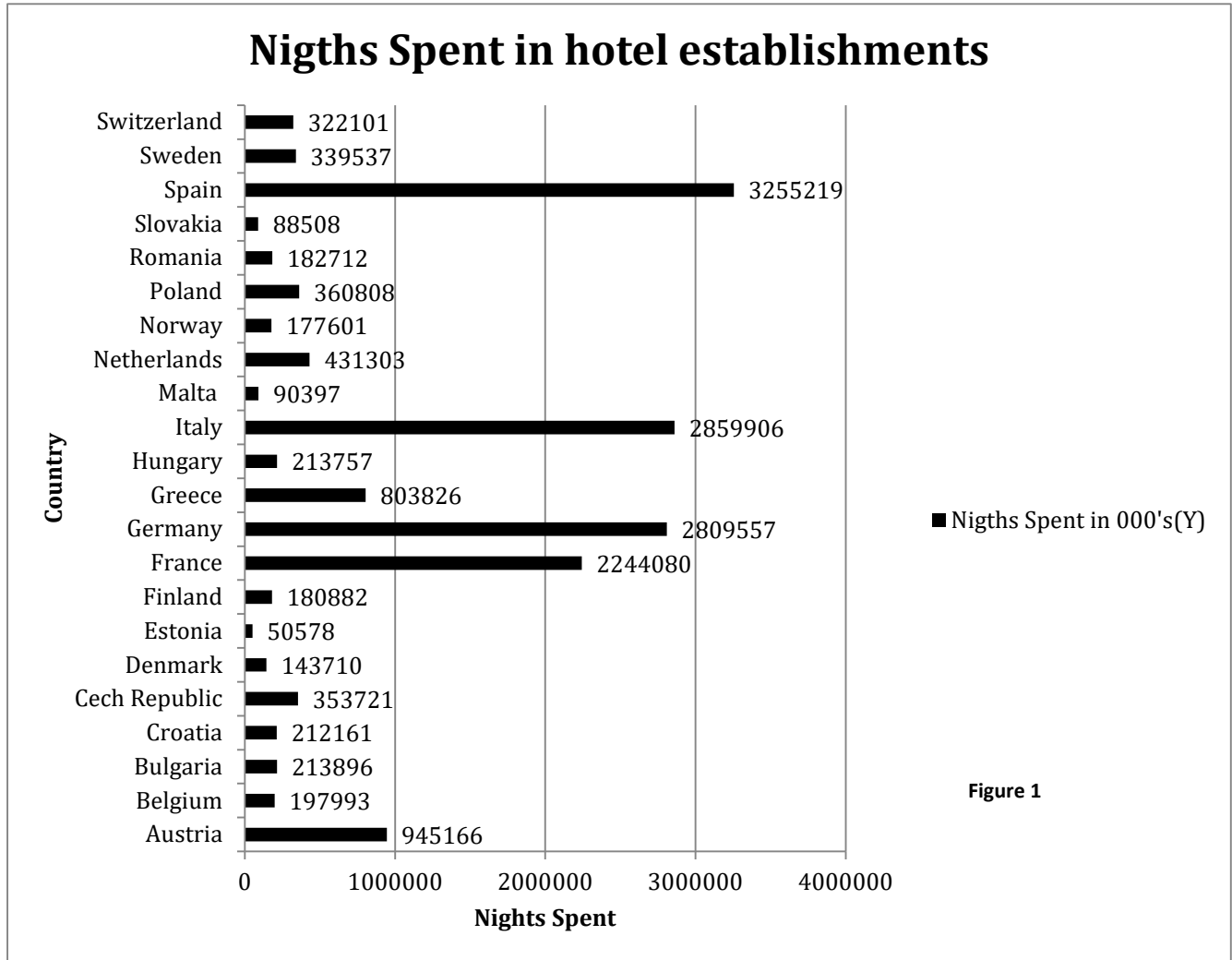
Figure 2

Total Number of bedplaces by country for period 2008-2018

Country	Number of bedplaces in 000's(k)
Switzerland	2453.94
Sweden	2568.00
Spain	20305.37
Slovakia	961.89
Romania	2295.66
Poland	2863.11
Norway	1611.39
Netherlands	2622.72
Malta	445.98
Italy	24660.36
Hungary	1872.98
Greece	8562.25
Germany	19335.45
France	14025.62
Finland	1442.70
Estonia	351.55
Denmark	955.33
Cech Republic	3257.45
Croatia	1599.19
Bulgaria	2911.56
Belgium	1420.36
Austria	6573.59

Bedplaces (x-axis: 0.00, 5000.00, 10000.00, 15000.00, 20000.00, 25000.00, 30000.00)

Legend: ■ Number of bedplaces in 000's(k)

Figure 3

Number of bedplaces in 000's(k)

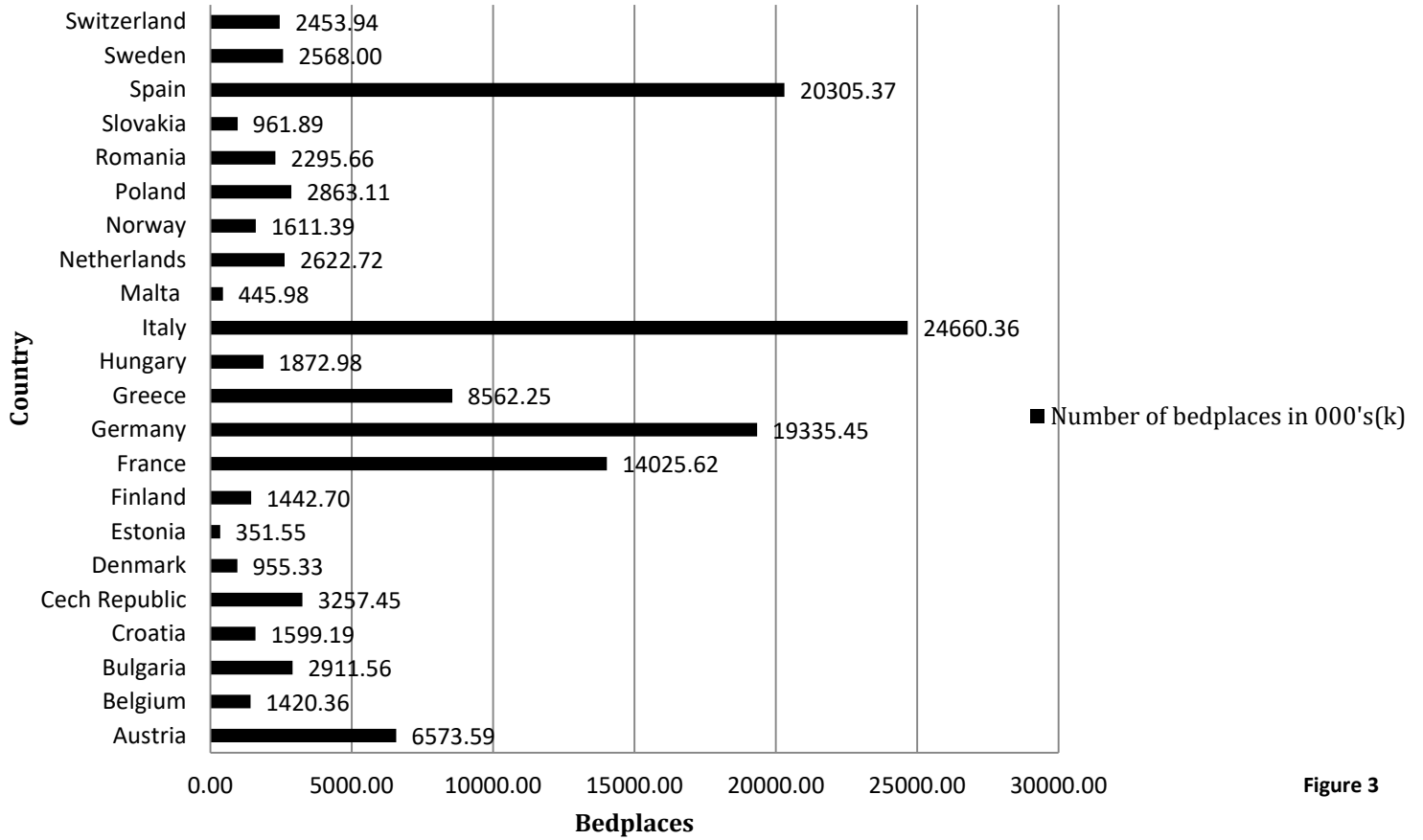| Year	Bedplaces
2008	10,682.15
2009	10,849.90
2010	11,035.30
2011	11,168.12
2012	11,288.28
2013	11,354.04
2014	11,443.98
2015	11,576.76
2016	11,613.47
2017	11,258.75
2018	11,205.32

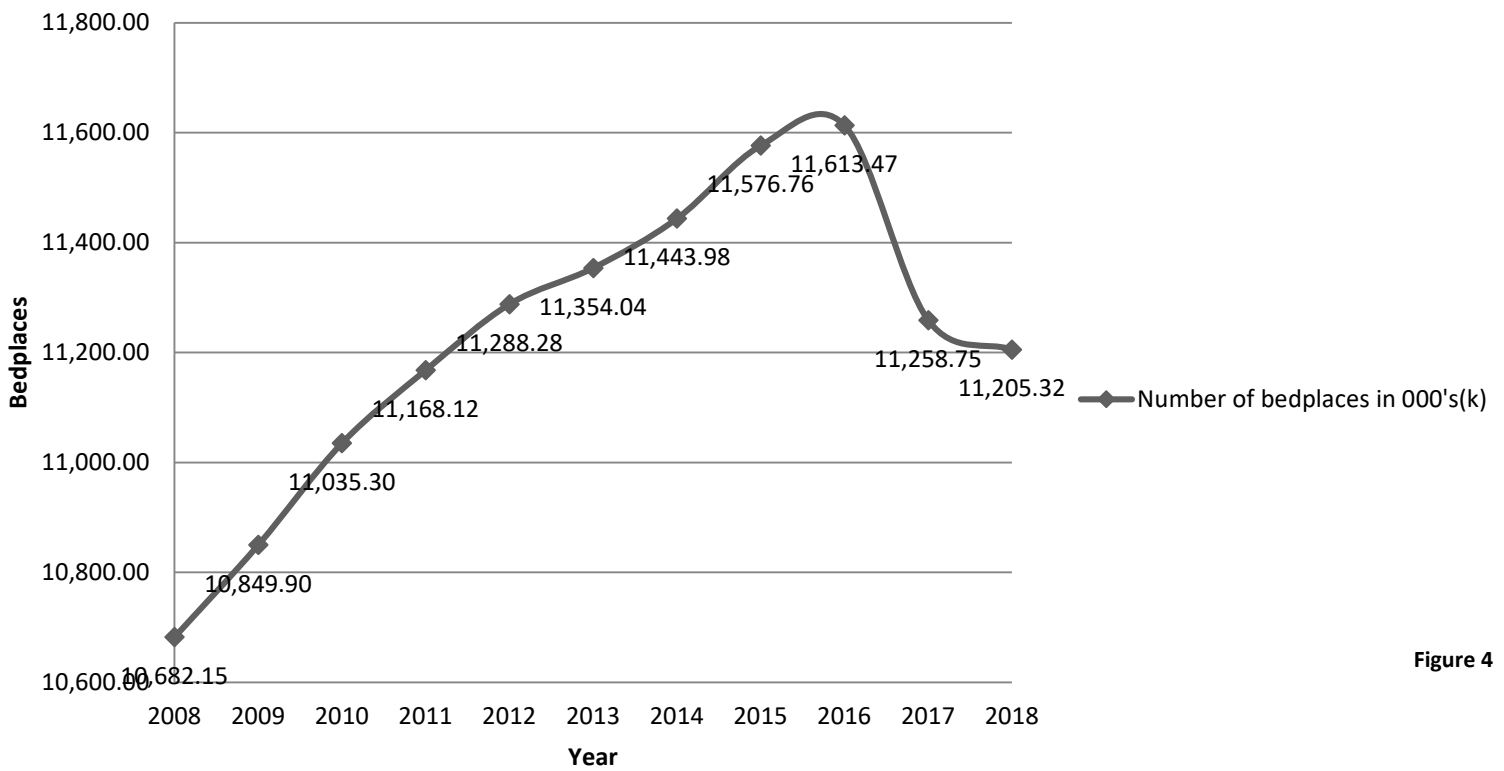Legend: ◆ Number of bedplaces in 000's(k)

Figure 4

Employed persons in accomodation by country
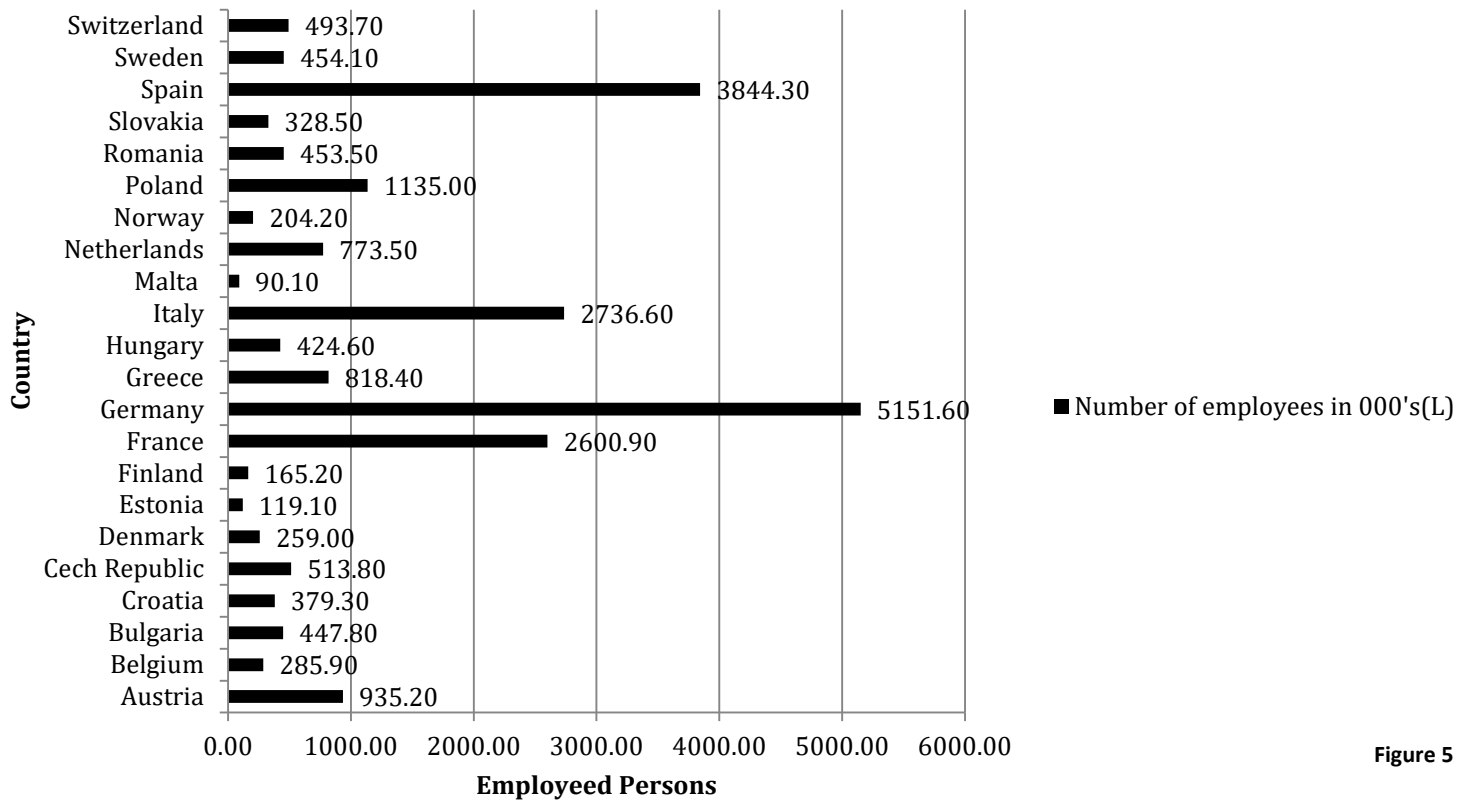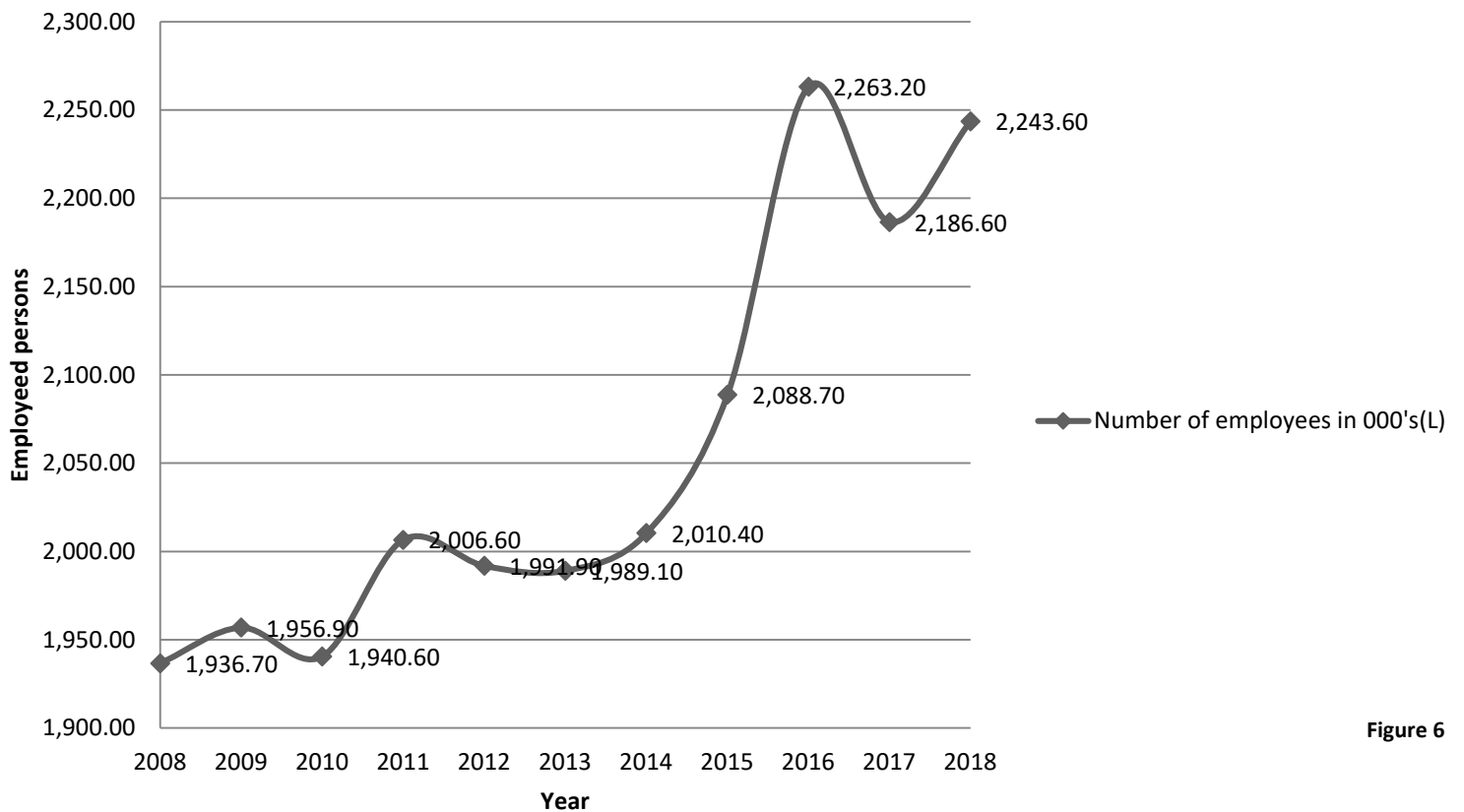

Figure 5

Employeed persons in accomodation per year

Figure 6

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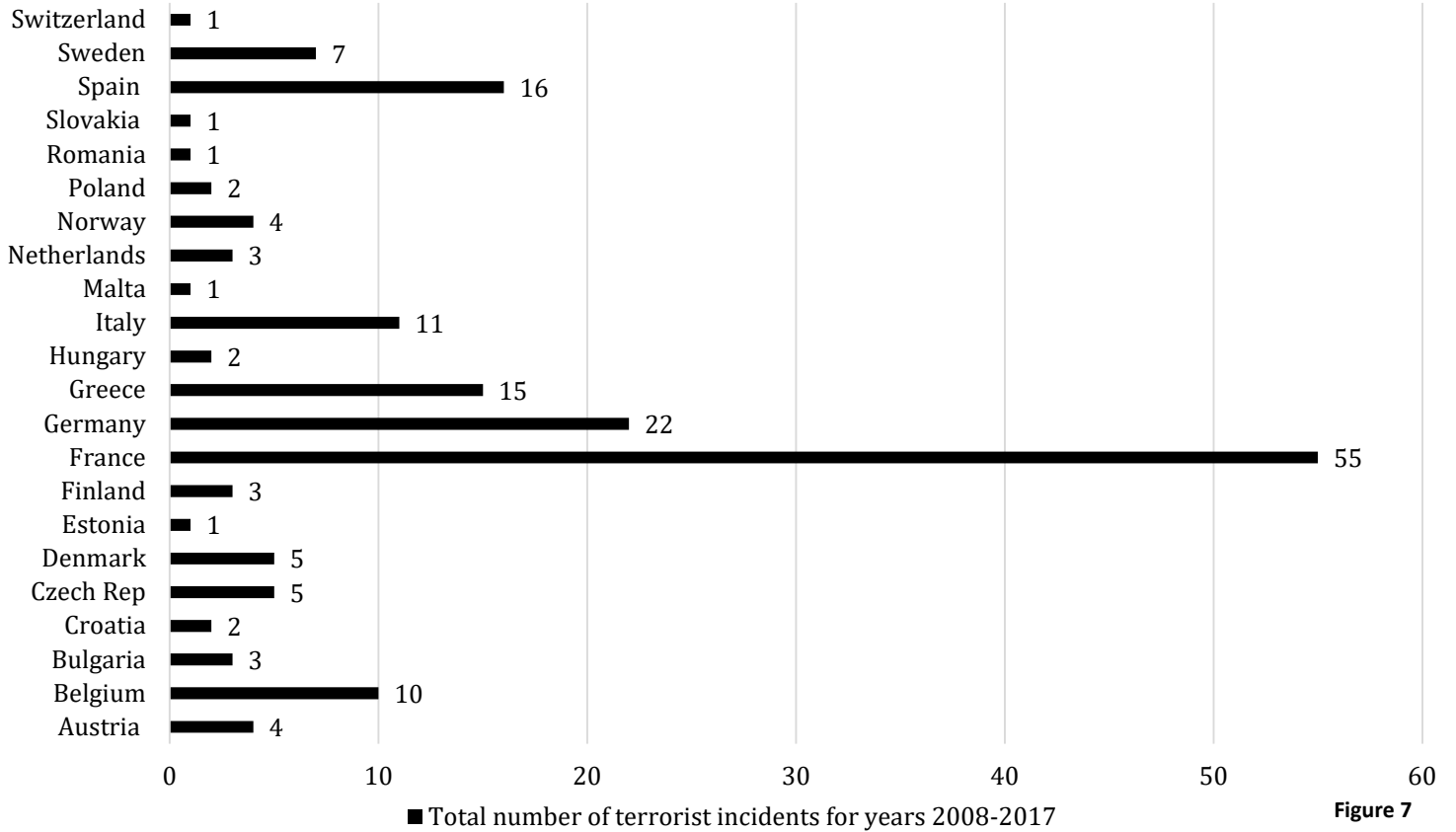# Total number of terrorist incidents for years 2008-2017

Country	Incidents
Switzerland	1
Sweden	7
Spain	16
Slovakia	1
Romania	1
Poland	2
Norway	4
Netherlands	3
Malta	1
Italy	11
Hungary	2
Greece	15
Germany	22
France	55
Finland	3
Estonia	1
Denmark	5
Czech Rep	5
Croatia	2
Bulgaria	3
Belgium	10
Austria	4

■ Total number of terrorist incidents for years 2008-2017

Figure 7

Total number of terrorist incidents for period 2008-2017

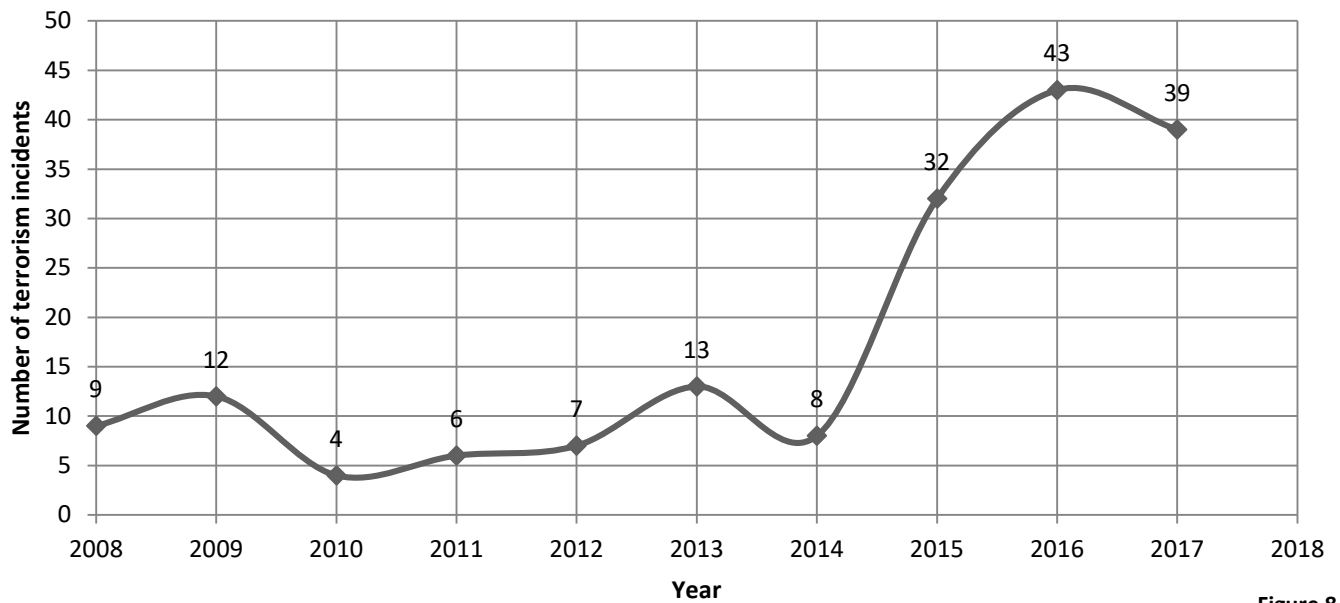| Year	Number of terrorism incidents
2008	9
2009	12
2010	4
2011	6
2012	7
2013	13
2014	8
2015	32
2016	43
2017	39

Figure 8

Table 1	Yearly % of increase or decrease in nights spent at hotel and similar accomodation									
Years Compared	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
%increase/decrease	-4,17	3,97	4,83	0,42	2,05	1,95	3,66	3,89	0,52	0,87

Table 2	**Top 10 terrorist incidents**			
DATE	**COUNTRY**	**FATALITIES**	**INJURED**	**PERPETRATOR GROUP**
13/11/2015	France	93	217	Islamic State of Iraq and the Levant (ISIL)
14/7/2016	France	87	433	Jihadi-inspired extremists
22/7/2011	Norway	69	60	Right-wing extremists
19/5/2016	Greece	66	0	Unknown
13/11/2015	France	19	26	Islamic State of Iraq and the Levant (ISIL)
22/3/2016	Belgium	18	135	Islamic State of Iraq and the Levant (ISIL)
22/3/2016	Belgium	17	135	Islamic State of Iraq and the Levant (ISIL)
13/11/2015	France	15	26	Islamic State of Iraq and the Levant (ISIL)
17/8/2017	Spain	14	101	Muslim extremists
19/12/2016	Germany	12	48	Jihadi-inspired extremists

Table 3	Summary Statistics of Variables			
Variable	**Mean**	**Min**	**Max**	**Std dev.**
Number of nights spent (Y)	69.738,38	3.498,96	340.577,82	91.730,70
Number of bed places (K)	521,00	29,76	2.260,19	642,88
Number of employees (L)	95,42	5,90	515,60	120,46

*All Variables are measured in 000's

Table 4   **Parameter estimates for the regression analysis**

Par	Model 1	Model 2	Model 3	Model 4
K	0.7807	0.7449	0.7456	0.7276
	(19.75)	(9.26)	(9.23)	(8.97)
L	0.1704	0.1527	0.1527	0.1519
	(2.65)	(1.89)	(1.88)	(1.88)
T	0.0182	0.0206	0.0206	0.0216
	(12.49)	(10.76)	(10.73)	(11.06)
D_{it}	-0.0058		-0.0017	
	(-0.60)		(-0.14)	
D_{it+1}		-0.0049	-0.0039	
		(-0.54)	(-0.34)	
TI				-0.0033
				(-1.88)

*t-statistics are reported in parenthesis.

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