

THE NEGATIVE IMPACT OF TERRORISM ON TOURISM: NOT JUST A PROBLEM FOR DEVELOPING COUNTRIES?

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Abstract

The negative impact of terrorist activity on international tourism has been repeatedly reported on from many studies in the past. However, the results of these studies are consistent only for developing countries with low political stability. In the case of developed countries with a stable political regime, the findings are contradictory, varying from studies that have registered a significant negative impact of terrorism on tourism to studies reporting no significant relationship between these variables. The aim of this paper is to present new information about the relationship between terrorism and tourism in developed countries. For this reason, monthly statistics of tourist arrivals and terrorist attacks in European Union member countries were utilized. The results indicate that terrorist attacks may damage tourism even in developed countries. This potential, however, concerns only the most serious terrorist attacks. Moreover, even in this case, the effect was only short-term, lasting two months after the attack. Crisis management procedures such as enforcement of security measures, government subsidies for the tourism sector during the recovery phase after the terrorist attacks or crisis signal detection are recommended to reduce the risk of a terrorist attack and its negative impact on tourism.

Keywords: sustainability, terrorism, tourism, economic growth, regional development, security, crisis management

INTRODUCTION

Over the last few decades, the tourism industry has had to cope with rapid changes associated with globalization. These changes include the increase of dependence for developing countries on limited overseas markets, growth of transnational corporations in the tourism industry, the process of de-industrialization for popular international tourist destinations, the enhancement of labour mobility, the facilitation of the exchange of information, the emergence of new tourism markets, the increase of migration levels, the increase of the availability of air transport or easier access across borders (for details see Dwyer, 2015), the growing demands for tourist destinations resilience to natural and anthropogenic threats (e.g. Kincl & Oulehlová, 2018; Beňová, Hošková-Mayerová, & Navrátil, 2019), increased demands on logistics infrastructure (e.g. Foltin, Brunclik, Ondryhal, & Vogal, 2018), as well as the growing importance of

ecological sustainability issues (e.g. Houdek & Škodová-Parmová, 2006). These changes have a direct impact not only on the current level of tourism services worldwide, the social structure in target countries or the global environment. They also significantly determine the economic environment on both the side of supply and demand. As suggested by Dwyer (2015), tourists increasingly demand short holidays, unusual experiences and a high quality of services. Another important factor influencing tourists' decision is the tourists' perception of the risks associated with target destinations, even though the perception of risk by tourists is not uniform and significantly associated with their personality characteristics and benefits sought (Karl, 2018; Morakabati & Kapuscinski, 2016).

The beneficial effect of international tourism on the economic growth of target countries has been discussed extensively in previous years. The relationship between tourism and economic growth has been reliably evidenced by many studies, although there is no consensus on whether this relationship is unidirectional or bidirectional, for a comprehensive review see Gwenthure and Odhiambo (2017). Unfortunately, international tourism is highly vulnerable to the deterioration of the security situation in the target destination country. This may be caused by a variety of security threats, particularly natural disasters (Liu, 2014; Machado, 2012; Wu & Hayashi, 2014), epidemic (Kuo, Chang, Huang, Chen, & McAleer, 2009; Mao, Ding, & Lee, 2010; Rosselló, Santana-Gallego, & Awan, 2017), or political instability and wars (Al-Hamarneh, 2013; Alvarez & Campo, 2014; Causevic & Lynch, 2013; Saha & Yap, 2014; Vallejo, Hoskova-Mayerova, Krahulec, & Sarasola, 2017). As reported by many studies (Afonso-Rodríguez, 2017; Araña & León, 2008; Buigut, Braendle, & Sajeewani, 2017; Drakos & Kutun, 2003; Liu & Pratt, 2017; Llorca-Vivero, 2008; Raza & Jawaid, 2013), terrorism is one of the most serious security threats that is able to significantly harm international tourism.

Four types of terrorism-tourism relationship studies may be delimited:

- 1) Case or survey studies assessing most frequently impacts of individual terrorist attacks such as the September 11, 2001 attacks in the US (Araña & León, 2008; Goodrich, 2002; Korstanje & Clayton, 2012) or the attacks in Norway on July 22, 2011 (Wolff & Larsen, 2014). Korstanje & Clayton (Korstanje & Clayton, 2012) reported a 13.5 % decline in the number of US tourists to the Caribbean after September 11, 2001. A similar impact of these terrorist attacks on the tourism industry in the US was reported by Goodrich (2002). Araña and León (2008) compared the results of two separate surveys on tourist preferences, conducted before and after September 11, 2001 in Germany. They reported an overall decrease in willingness to pay for six destinations in surveys (Tunisia, Canary Islands, the Balearic Islands, Cyprus, Turkey and the Greek Islands) after September 11, 2001. Also interesting to note is that the

impact on individual destinations was markedly asymmetrical. Such destinations, where the Muslim population is the majority (Tunisia and Turkey), suffered a more severe negative impact on their attractiveness for tourists compared to the other destinations.

2) Cross-sectional studies comparing tourism and terrorism data from more countries, however, without considering time (Llorca-Vivero, 2008; Thompson, 2011). Llorca-Vivero in 2008 (Llorca-Vivero, 2008) used the average data of tourist arrivals from G-7 countries to 134 destination across the world for the period from 2001 to 2003. They reported that both domestic and international terrorism have a significant negative effect on the flow of tourists. This type of study has, however, a significant limitation. As was highlighted by Samitas, Asteriou, Polyzos, and Kenourgios (2018), the impact of a single terrorist act on tourism preferences does not last forever and may fade over time. This type of information, however, cannot be obtained using a simple cross-sectional study.

3) Longitudinal country-specific studies assessing the impact of terrorism on tourism based on time series data (Afonso-Rodríguez, 2017; Gut & Jarrell, 2007; Pizam & Fleischer, 2002; Raza & Jawaaid, 2013; Samitas et al., 2018). Raza and Jawaaid (2013) reported a negative impact of terrorism on tourism based on annual data for Pakistan from the period from 1980 to 2010. A similar framework was used recently by Afonso-Rodríguez (2017), or Samitas et al. (2018). Afonso-Rodríguez (2017) analysed quarterly data for Turkey in the period between 1977 and 2014. They reported a negative impact of terrorist attacks on real GDP caused by the reduction of the contribution of tourism on economic growth. This effect could be further exacerbated by potential disruption of economic networks (Foltin, Gontarczyk, Świdorski, & Zelkowski, 2015). Samitas et al. (2018) analysed the monthly data for Greece in the period from 1977 to 2012. They reported that terrorism had a negative impact on tourism in any given period and this relationship is unidirectional, from terrorism to tourism only. On the other hand, Goldman and Neubauer-Shani (2017) suggested that the relationship between terrorism and tourism is reciprocal in a certain way. In their study, they reported a positive correlation between arrivals to a country and the number of terrorist attacks committed by foreigners in the country. The main limitation of longitudinal studies based on data from one country is, nevertheless, the impossibility of assessing compensation mechanisms. As suggested by Araña and León (2008), the reduction of tourism in one destination could be partially compensated by an increase of tourism in other countries which are perceived by tourists as being less dangerous.

4) Panel studies shared the advantages of both longitudinal and cross-sectional studies (Buigut et al., 2017; Drakos & Kutan, 2003; Liu & Pratt, 2017; Saha & Yap, 2014). Panel data contains longitudinal data for multiple countries. One of the first panel studies of relationship

between tourism and terrorism was performed by Drakos and Kutan (2003) who utilized the monthly data for 3 countries (Turkey, Greece and Israel) in the period from 1991 to 2000. They recorded a negative impact of terrorism on tourism. Interestingly enough, the reduction of one country's market share due to the low intensity of terrorist activity (i.e. terrorist attacks without fatalities) led to a significant increase of market shares of the other two countries. This substitution effect, however, was not observed for high intensity terrorist activity (i.e. terrorist attacks with fatalities). More recently, a panel study by Buigut et al. (2017) showed that casualties from terrorism have a significant negative impact on tourism demands based on the panel analysis of 49 destinations and 15 countries of origin for the period from 2010 to 2014. This effect was even stronger when casualties from terrorism are accompanied by a travel warning against visiting the country issued by tourists' home countries. Saha and Yap (2014) used panel data from 139 countries for the period from 1999 to 2009 assessing the influence of terrorism and political instability on tourism. Interestingly enough, they reported political instability as a more important cause of tourism demand reduction. Terrorism in political instable countries, however, led to an additional decrease in tourism. On the other hand, terrorism had no significant negative impact on tourism in countries with low political instability. Liu and Pratt (2017) analysed panel data from 95 destinations in the period from 1995 to 2012. They reported a negative impact of terrorism on tourism, however, only in the short term. In contrast, no significant long term relationship between terrorism and tourism was found. Based on this result, the authors suggested that the demand for international tourism is resilient to terrorism.

As mentioned previously, the negative impact of terrorism on international tourism could be considered a reliably proven fact. However, a few insufficiently resolved issues still remain:

First of all, as was suggested by some authors in the past (Araña & León, 2008; Drakos & Kutan, 2003), there could be a significant substitutional effect between tourist destinations. Gut and Jarrell (2007) later described a significant increase in attendance at Chimney Rock Park immediately after the terrorist attack on September 11, 2001. This increase lasted about 13 months, after which the attendance number decreased to its original level. Gut and Jarrell suggested that this was the result of changes in tourist preferences caused by the terrorist attack. Instead of urban destinations, they pursued rural destinations which they perceived to be safer. Unfortunately, we have practically no information about the exact mechanism of this substitution.

Secondly, not all terrorist attacks have the same effect on tourism. As reported by Drakos and Kutan (2003), the effect size of terrorist attacks significantly depended on the number of

caused fatalities. On the other hand, based on the monthly data of tourist arrivals in Israel from 1991 to 2001, Pizam & Fleischer (2002) suggested the frequency of terrorist attacks to be a better predictor of tourist arrivals than the severity of these attacks. Saha and Yap (2014) suggested that a reduction in tourism caused by terrorism depends on the political stability of the country. They did not observe any significant negative impact of terrorist attacks in destinations with low political instability. Similarly, Thompson (2011) reported that the negative affect of terrorist attacks on tourist arrivals is much stronger in developing countries than developed countries. Walters, Mair, and Lim (2016) noticed that the impact of a disastrous event on tourism demands may be substantially exaggerated by the way it is reported in the media, which tends to dramatize and sensationalize the real impact of the event.

Thirdly, although the negative influence of terrorism on tourism demands may be considered well-evidenced, there is only a limited amount of information about how much time is required so that the number of tourist arrivals returns to its original level. In the year 2000, Pizam and Smith analysed the recovery time after 70 major terrorist attacks that took place between 1985 and 1998 in 28 countries (Pizam & Smith, 2000). They reported the recovery time as less than 7 months in 92.4 % of valid cases.

The aim of our research was to bring new information about the last two from these issues utilizing the tourist arrivals data from Eurostat (2017a) and Global Terrorism Database (GTD) maintained by National Consortium for the Study of Terrorism and Responses to Terrorism (2016). For this reason, a statistical analysis of relative tourist arrivals increments in the months after a terrorist attack was performed.

METHODS

Monthly data from Eurostat (2017a) on the number of arrivals (NARR) of non-residents at hotels and similar accommodations in member countries of the European Union (EU) in the period from January 2003 to December 2016 were used as the measure of international tourism rate. According to the methods used by Eurostat (2017b), ‘a person is considered to be a resident in a country (place) if the person:

- has lived for most of the past year or 12 months in that country (place), or
- has lived in that country (place) for a shorter period and intends to return within 12 months to live in that country (place).’

Using tourist arrivals data as a measure of the tourism rate is usual practice in studies of tourism-terrorism relationships (Afonso-Rodríguez, 2017; Buigut et al., 2017; Liu & Pratt,

2017; Saha & Yap, 2014; Samitas et al., 2018). EU member countries (i.e. Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden and United Kingdom) were selected because in all cases, these countries have politically stable regimes. The reason for their selection was the effort to eliminate the effect of political instability on tourism as reported by Saha and Yap (2014). The period from 2003 to 2016 was chosen since we wanted to eliminate the short term effect of the terrorist attack on September 11, 2001 in the US. This attack was extraordinary in the number of casualties and media response throughout the world, which without any doubt, significantly influenced the global tourism market negatively as was repeatedly reported (Araña & León, 2008; Goodrich, 2002; Korstanje & Clayton, 2012).

The Global Terrorism Database (National Consortium for the Study of Terrorism and Responses to Terrorism, 2016) was used as a source of data for terrorism activities in EU member countries. As the results of Drakos and Kutan (2003) and Saha and Yap (2014) suggest, a terrorist attack with a higher degree of lethality has a more negative impact on tourism in developed countries. For this reason, only terrorist attacks leading to three or more fatalities were selected for statistical analysis. Subsequently, three overlapping groups of terrorist attacks were defined: 1) terrorist attacks causing three or more fatalities; 2) terrorist attacks causing five or more fatalities; 3) terrorist attacks causing ten or more fatalities.

The validity of data in the GTD about selected terrorist attacks was manually verified based on information published in open sources, particularly websites of news portals such as CNN (2018), BBC (2018) or France24 (2018). In all cases, the numbers of fatalities reported in the GTD and news reports were the same or slightly differed, however, in such a way that did not affect categorization of the terrorist attack. For each selected terrorist attack, the media impact of the attack was added. The media impact was assessed based on the number of search results in the Google search engine (Google, 2018) with region set to 'United Kingdom'. The keywords in the format 'country month year terrorist attack' were typed into the search engine for each terrorist attack, e.g. 'France November 2015 terrorist attack' for terrorist attacks committed in Paris in November 2015.

Subsequently, the monthly data in the selected period were indexed chronologically from January 2003 ($I = 1$) to December 2016 ($I = 168$) to obtain the time variable. For each terrorist attack, differences in relative tourist arrival increments (DIFINC) were calculated for the month when the attack was committed and eight successive months according to the equation

$$\text{DIFINC}_{a,t} = \text{RELARR}_{a,t} - \text{REF}_a, \quad (1)$$

where a in $A = \{1, 2, \dots, 168\}$ is the time in months when the terrorist attack was committed, t in $T = \{a+0, a+1, \dots, a+8\}$ the time in months for which DIFINC is calculated, $\text{RELARR}_{a,t}$ relative number of tourist arrivals for time t and terrorist attack committed in time a , and REF_a reference relative number of tourist arrivals for terrorist attack committed in time a . $\text{RELARR}_{a,t}$ was calculated using the equation

$$\text{RELARR}_{a,t} = \frac{\text{ARR}_t - \text{MARR}_{a,t}}{\text{IQR}_{a,t}}, \quad (2)$$

where ARR_t is the number of tourist arrivals in time t , $\text{MARR}_{a,t}$ the median of the number of tourist arrivals for time t and terrorist attack committed in time a and $\text{IQR}_{a,t}$ interquartile range for the number of tourist arrivals for time t and terrorist attack committed in time a . $\text{MARR}_{a,t}$ and $\text{IQR}_{a,t}$ were computed based on all values of the number of tourist arrivals for the period from January 2003 to December 2016 corresponding to the value of month in time t except for the ARR_t value, i.e.

$$\text{MARR}_{a,t} = \text{median} \left\{ \text{ARR}_i \mid \frac{t-i}{12} \in \mathbb{Z} \wedge i \in A \wedge i \neq t \right\}, \quad (3)$$

$$\text{IQR}_{a,t} = \text{IQR} \left\{ \text{ARR}_i \mid \frac{t-i}{12} \in \mathbb{Z} \wedge i \in A \wedge i \neq t \right\}. \quad (4)$$

Therefore, the values of $\text{MARR}_{a,t}$ and $\text{IQR}_{a,t}$ are independent of the value of ARR_t , because ARR_t is not included in $\text{MARR}_{a,t}$ and $\text{IQR}_{a,t}$ calculation. Finally, REF_a is the median of relative tourist arrivals in the three months prior to the terrorist attack committed in time a , i.e.

$$\text{REF}_a = \text{median} \left\{ \text{RELARR}_{a,i} \mid a-i \in \{1, 2, 3\} \right\}. \quad (5)$$

This method of REF calculation was chosen to prevent biasness of the results caused by an irregular increase of tourist arrivals associated with hosting some kind of extraordinary event, such as the FIFA World Cup in the country.

One-tailed Wilcoxon signed rank test was used to test null hypothesis

$$H_0: \text{DIFINC}_{a,t} \geq 0 \quad (6)$$

with the alternative

$$H_A: \text{DIFINC}_{a,t} < 0, \quad (7)$$

which corresponds to the decrease in relative tourist arrival increments. The differences in DIFINC values were assessed for the month when the terrorist attack were committed as well as for eight consecutive months. To be able to use this procedure, only terrorist attacks committed in the period from April 2003 to April 2016 were considered. Spearman's rank correlation coefficient was utilized to assess the relationship between the number of fatalities and media impact of the terrorist attack. All statistical calculations were performed in R software (R Core Team, 2017).

Three hypotheses were tested using the described methods:

H₁: Terrorist attack causing three or more fatalities has a negative impact on DIFINC values in the months after the attack.

H₂: Terrorist attack causing five or more fatalities has a negative impact on DIFINC values in the months after the attack.

H₃: Terrorist attack causing ten or more fatalities has a negative impact on DIFINC values in the months after the attack.

RESULTS AND DISCUSSION

A list of terrorist attacks committed in the EU in the period from April 2003 to April 2016, which caused three or more fatalities, is shown in Table 1. As can be seen, the media impact of the terrorist attacks was moderately correlated with the number of fatalities ($R_s = 0.511$, $p = 0.108$). This result indicates that the perception of the severity of terrorist attacks is to a certain extent determined by the real number of fatalities, however, other factors also have an impact, e.g. the country where the terrorist attack was committed, the time elapsed from the attack etc. In Table 2, medians of DIFINC values calculated separately for each category of terrorist attacks are given for each month when terrorist attacks were committed, as well as for eight successive months. As can be seen, any negative impact of terrorist attacks was not found in the first and second category, where all attacks causing at least three, resp. five fatalities were included. In contrast, the medians of DIFINC values for the third category, which includes only the terrorist attacks causing at least ten fatalities, were relatively high and negative for two months after the terrorist attack. In the second month after the attack, the decrease in the relative number of tourist arrivals was the highest (DIFINC = -0.73).

Although, the validity of any of the three hypotheses of the negative influence of the most severe terrorist attacks on relative tourist arrivals increments could not be proven statistically,

these results indicate that terrorist attacks with high lethality may have a negative impact on tourism even in developed countries. This finding corresponds with the findings of Drakos & Kutan (2003), who reported that terrorist attacks causing more fatalities had a greater impact on the market share on tourism in the cases of Greece, Turkey and Israel. On the other hand, this is in contrast with the suggestion made by Pizam and Fleischer (2002), who reported the frequency of terrorist attacks were the better predictor of tourist arrivals than the severity of these attacks in the case of Israel in the period from May 1991 to May 2001. However, this case is very specific in some ways: 1) The analysed period from 1991 to 2001 preceded the September 11, 2001 terrorist attack. The intensity, frequency, ideological frame, as well as the technique of the terrorist attack, however, changed significantly after September 11, 2001 as was documented by Hamm and Spaaij (2015) for lone wolf terrorists in the USA; 2) In contrast to many EU countries, Israel has been exposed to terrorism for a much longer time with a much greater intensity. This fact may significantly modulate the risk perception of terrorist attacks committed in Israel; 3) As noted by Drakos and Kutan, Israel is a very specific destination containing 'holy sites for three major religions (Judaism, Islam, and Christianity), and therefore tourism flows might be relatively inelastic because close substitutes do not really exist' (Drakos & Kutan, 2003, p. 634).

Similar research was performed by Thompson (2011) based on data from 60 countries. He also used a number of incidents as a measure of terrorist activity. He recorded a decrease of tourist arrivals due to terrorist intensity, which was very distinctive in developing countries. A decrease in the number of tourist arrivals was reported as well for developed countries, although it was substantially smaller and statistically insignificant in this case. This finding brought Thompson to suggest that 'tourism is affected more by terrorism in less developed countries' (Thompson, 2011, p. 698). This is expected because developed and politically stable countries have more instruments to lower the negative impact of terrorist activity on tourism. In our study, we used data from countries in the European Union, which may be considered as both developed and politically stable. The obtained results indicate that terrorist incidents affect tourism even in developed and politically stable countries. However, the frequency of terrorist attacks seems not to be a decisive factor, because only the most lethal terrorist attacks have the potential to negatively influence the tourism in these countries.

Table 1 Summary of included terrorist attacks

time	country	nkill ^a	media impact ^b	short summary ^a
03/2004	Spain	191	1 370 000	Coordinated bombing attacks against four commuter trains in Madrid, Spain on March 11, 2004. Abu Hafs al-Masri Brigades, a group said to be associated with Al-Qaida, claimed responsibility for the attack, stating that it was retribution for Spain's cooperation with the United States in the Iraq War.
07/2005	United Kingdom	52	2 030 000	Four bombers detonated themselves inside three trains and one double-decker bus on July 7, 2005. Abu Hafs al-Masri Brigades and the Secret Organization of al-Qaeda in Europe both claimed responsibility, although it is generally believed that the claim by Abu Hafs al-Masri Brigades was not credible.
11/2007	Finland	8	660 000	A student carried out a school shooting in Jokela, Finland on July 11, 2007. He killed seven students, a teacher, and himself with a handgun.
05/2009	Netherlands	6	1 080 000	Seven people were killed, including the driver and 12 people were injured when a man aimed his car into a crowd of civilians attending a festival for the royal family in Apeldoorn, Gelderland, Netherlands on May 1, 2009. The target of the attack was a bus carrying the Queen and her family, but the car was stopped 15 yards from the bus. The 38 year old male driver was identified as Karst Tate, and is said to have acted alone and his motive for the attack was unknown.
03/2012	France	8	1 530 000	Mohammed Merah, a French citizen of Algerian descent, shot three uniformed soldiers in Montauban, France on March 15, 2012 and four people, including children, were shot and killed outside a Jewish school in the city of Toulouse in France on March 19, 2012.
07/2012	Bulgaria	6	449 000	A suicide bomber detonated an explosive device on a bus of Israeli tourists in Burgas city, Bulgaria on July 18, 2012. At least six of the passengers died and 30 were injured in the attack. Hezbollah claimed responsibility for the incident.
05/2014	Belgium	4	1 560 000	Assailants opened fire on visitors of the Jewish Museum in Brussels, Belgium on May 24, 2014. At least four people, including two Israeli tourists, a French tourist, and a Belgian museum worker were killed in the assault. Mehdi Nemmouche, an Islamic State of Iraq and Levant (ISIL) member who had recently returned from Syria, claimed responsibility for the attack.
01/2015	France	17	3 760 000	Two assailants stormed the offices of Charlie Hebdo, a satirical magazine, in the 11th arrondissement of Paris, France on January 7, 2015. The attackers opened fire on journalists and building security. During the attack and subsequent events, 17 persons were killed. Al-Qaida in the Arabian Peninsula (AQAP) claimed responsibility for the incident, stating that the attack was in retaliation for the magazine's depiction of the Prophet Muhammad.
10/2015	Sweden	3	1 090 000	An assailant armed with a sword attacked students and teachers at the Kronan School in Trollhattan, Sweden on October 22. At least four people, including two teachers, one student, and the assailant, were killed and another student was wounded in the incident. The assailant, identified as Anton Lundin-Pettersson, claimed responsibility for the attack and stated that he was opposed to the immigration policies in Sweden.
11/2015	France	130	1 770 000	Eight coordinated attacks including the Bataclan shooting were carried out in Paris on November 13, 2015. The Islamic State of Iraq and the Levant (ISIL) claimed responsibility and stated that the attacks were carried out in retaliation for France's participation in the United States-led coalition that carried out airstrikes on ISIL targets in Iraq and Syria.
3/2016	Belgium	32	1 760 000	Two suicide bombers with explosives-laden suitcases detonated themselves at a check-in counter at Brussels Airport in Zaventem, Flemish Brabant, Belgium, and one suicide bomber detonated himself at the Maalbeek Metro Station in Brussels, Belgium.

Note. a – information taken from GTD (National Consortium for the Study of Terrorism and Responses to Terrorism, 2016), b – number of search results using Google Web Search (Google, 2018)

Table 2 Medians of differences in relative tourist arrivals increment (DIFINC) in the months after the terrorist attack was committed

time after attack (months)	TA _{F≥3} (n = 11)		TA _{F≥5} (n = 9)		TA _{F≥10} (n = 5)	
	DIFINC	P value	DIFINC	P value	DIFINC	P value
0	0.05	0.62	0.05	0.63	0.05	0.41
1	0.06	0.42	0.23	0.54	-0.33	0.16
2	0.08	0.48	0.08	0.5	-0.73	0.22
3	0.11	0.58	0.11	0.46	0.11	0.41
4	0.03	0.48	0.05	0.82	0.05	0.59
5	0.07	0.55	0.18	0.71	0.07	0.41
6	0.13	0.79	0.13	0.82	0.81	0.59
7	0.25	0.94	0.25	0.95	0.13	0.84
8	0.09	0.77	0.09	0.79	0.04	0.78

Note. P values based on one-tailed Wilcoxon signed rank test, TA_F – terrorist attacks with F fatalities, n – number of cases

The second significant finding of our study relates to the recovery time, which is necessary for returning the number of tourist arrivals to its original rate. Pizam and Smith (2000) analysed the recovery time after 70 major terrorist attacks and reported recovery time less than 7 months in 92.4 % of valid cases. As can be seen in Table 2, the negative impact of the terrorist attacks from the third group with at least ten fatalities is apparent only for two months after a terrorist attack, where the DIFINC values were negative. After then, the DIFINC values turned slightly positives. However, in the analysed period, there were only 5 terrorist attacks which fell into this group and in all cases the P values were higher than the selected significance level of 0.05. Therefore, the result cannot be considered conclusive. Moreover, on the basis of such a limited sample size, the mean duration of the negative impact of these attacks cannot be determined with sufficient precision.

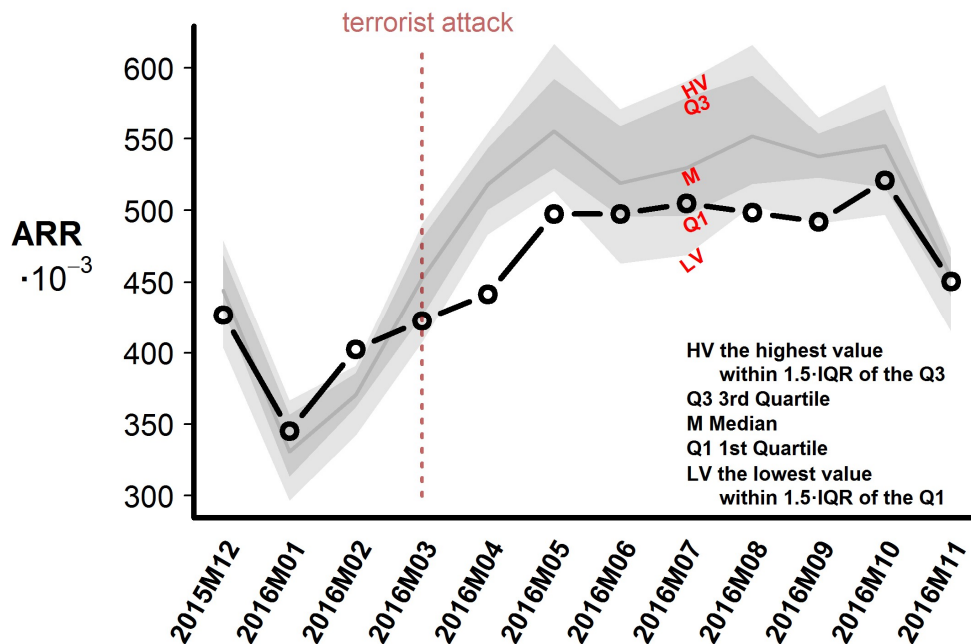
The effect of terrorist attacks with high lethality on tourism may be demonstrated in the case of the Brussels bombings attack that was committed on March 22, 2016 in Brussels, Belgium, which was aimed at Brussels airport in Zaventem and Maalbeek metro station. The terrorist attack resulted in 32 fatalities and more than 300 wounded persons. As can be seen in Figure 1, two months prior to the attack, the number of tourist arrivals was above the median. However, immediately after the terrorist attack, a visible decrease in tourist arrivals occurred. This decline resulted in a situation when the number of tourist arrivals in the two months after the attack (April and May) fell significantly below the long-term minimum for these months. The remainder of the tourism season was also below the long-term median, however, the values were in common variability.

Even though there are several publications dealing with the negative impact of terrorist activity on tourism, only a few studies discuss the measures that can be adopted to make the

tourism industry more resilient to terrorism. In 2001, Faulkner noticed that in spite of the high vulnerability of the tourism industry to disasters, very little research on the responses by the tourism industry and government agencies for coping with these disasters had been conducted (Faulkner, 2001). Until then, however, few instructive studies had been published.

As was demonstrated by several studies (Gurtner, 2016; Pizam & Smith, 2000), the negative effect of an terrorist attack on tourism demands is usually not permanent, but only temporary. As reported by Pizam and Smith (2000), the recovery time doesn't usually exceed six months. However, appropriate crisis management can significantly mitigate the impacts in at least three ways: 1) shorten recovery time; 2) reduce the immediate decline of tourist demands and 3) prevent the collapse of tourism and travel industry facilities. Two main approaches to crisis management in tourism can be distinguished: 1) a reactive approach aimed at mitigation of the disaster's impact and the rebuilding as quickly as possible of the destination image and 2) a proactive approach emphasizing the importance of prevention and preparedness for the disaster.

Figure 1 Number of tourist arrivals (ARR) for three months before and eight months after the terrorist attack committed on March 22, 2016 in Brussels, Belgium



Source of data: Eurostat, 2017a)

The first reaction to a terrorist attack or a terrorist attack attempt is usually the enforcement of security measures. Goodrich (2002) analysed the security measures affecting tourism which was adopted in the USA after the terrorist attacks on September 11, 2001. These measures

included an increase in the number of security personnel at airports, intensification of personal and luggage checks at airports, investments in scanners able to detect explosives at airports, reinforcement of security personnel, and installation of more surveillance cameras in buildings such as hotels, bus stations or museums, strengthening border surveillance or investments in automatic face recognition technology. However, these measures are primarily focused on the increase of security. Although they may possibly lower the risk perception in tourists and thus mitigate the impact of crises and shorten recovery time, they cannot resolve immediate problems of organizations involved in the tourism sector, who lose a significant part of their income.

As suggested by Crawford (2012), a tourist's willingness to travel is determined not only by the perceived risk, but also by the perception of benefits. Based on this assumption, Crawford recommended to tourism stakeholders such as accommodation providers or transport providers, "to immediately cut prices during the recovery phase after a terrorist crisis in a host destination". Although this measure is capable of reducing the decline in tourism demands and shorten the recovery time, in the long run it would undoubtedly lead to the collapse of a large number of providers that are otherwise not supported by the government. Blake and Sinclair (2003) evidenced sector-specific targeted subsidies and tax reductions to be the most effective government measures for dealing with the downturn in the tourism and transport sectors in the US after September 11, 2001.

Regarding the pro-active approach, Paraskevas and Arendell (2007) and later Paraskevas and Altinay (2013) highlighted the role of crisis signals detection in the prevention of crises in the tourism sector. Paraskevas and Altinay (2013) distinguish three stages of the signal detection process: 1) scanning for signals; 2) signal capture and 3) signal transmission. The scanning phase should be performed by all stakeholders of the tourism sector. Its effectiveness is largely influenced by personal features such as education, experience or intuition especially by employers of organizations involved in the tourism sector, such as accommodation providers, tour operators or entertainment providers. Once the signal is scanned, the relevant signal must be recognized from noise. When the relevant signal is captured, it must be transmitted from organizations to 'those with the mandate of launching responsive measures' (Paraskevas & Altinay, 2013, p. 162). For successful transmission of a signal, the communication and cooperation between critical stakeholders of the tourism sector is required. The strategy for crisis signal detection is based on the assumption that many crises are preceded by some detectable signals. The question remains, however, how predictable terrorism-induced crises are. The crisis signal detection process should be accompanied by operational risk

assessment of terrorist attacks using standardized method (e.g. Štěpánek, Urban, & Urban, 2013).

CONCLUSIONS

The impact of terrorist activities on international tourism in developed countries with politically stable regimes is undoubtedly not as significant as was repeatedly reported for politically instable developing countries. Obtained results suggest, however, that even developed countries may be affected in a similar way when an extremely severe terrorist attack occurs, such as the terrorist attack committed in Brussels on March 22, 2016. Nevertheless, their effect on relative tourist arrival increments could not be statistically proven due to the limited number of these types of terrorist attacks in the European Union in the selected period from April 2003 to April 2016. This study may serve, however, as a basis for further research of the effect of terrorist attacks on international tourism in developed countries. Based on the obtained results, the research should focus on the deadliest terrorist attacks in the case of developed and politically stable countries. Additional data will be required for the final assessment of the impact of terrorism on tourism in these countries. Data from other developed countries with politically stable regimes outside the European Union such as United States, Canada or Australia may be utilized in order to obtain decisive evidence of the impact of terrorist attacks on tourism, and gain more details about its extent. Only on the basis of this information will it be possible to suggest an optimal strategy for coping with terrorist threats to international tourism in developed countries. In general, however, adoption of crisis management procedures for the reduction of risk of a major terrorist attack or its negative impact on tourism, such as enforcement of security measures, government subsidies for the tourism sector during the recovery phase after the terrorist attacks, crisis signal detection or operational risk assessment, may be recommended.

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