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Causality between Terrorism and FDI in Tourism: Evidence from Panel Data

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Abstract: The aim of this research was to examine the causal link between terrorism and FDI in tourism on the example of a panel of 50 countries for the period from 2000 to 2016. Other control variables were included in order to ensure the validity of the results—number of international tourist arrivals per capita, the KAOPEN index, the KOF Globalisation Index and GDP per capita. The main goal was to look at this issue from the perspective that terrorism does not affect FDI in tourism. The research employed the Granger causality test in a vector autoregressive model (VAR model), the analysis of variance decomposition and the impulse response function within the panel setting. Based on research results, it was found that terrorism does not Granger cause FDI in tourism. The results are in line with recent research related to the subject matter which indicated that the negative effect of terrorism on FDI in tourism was questionable.

Keywords: FDI in tourism; terrorism; panel Granger causality test; panel VAR analysis

JEL Classification: C33; F21; Z32

1. Introduction

The global economy has faced a sequence of serious challenges in the 21st century. Even though globalisation brought benefits to most stakeholders, the increased interconnectedness of the global economy correspondingly caused several issues. Some of these problems are of a short-term nature (such as the global financial crisis from 2008), while some have long-term features (such as global inequality, sustainable development or terrorism). At the same time, the global economy is predominantly driven by two phenomena, tourism and FDI. The recent decades have seen a powerful boom in touristic development and tourism has been recognised as a global economic driver and one of the fastest growing sectors of the global economy (UNWTO 2017). FDI has also experienced strong growth and is one of the drivers of economic growth as well and also one of the most salient aspects of globalization (Li 2008). In addition, the globalization of tourism is occurring simultaneously with the globalization of the world economy predominantly characterised by international capital movements, most notably in the dimension of its external flow and activity. According to the UNWTO (2018) World Tourism Barometer, arrivals grew by 7% in 2017 and reached a total of 1.322 billion. This number is expected to reach 1.8 billion by 2030. Tourism accounts for 10.4% of the global GDP and 313 million jobs, i.e., 9.9% total employment in 2017 (WTTC 2018). Regarding FDI in tourism from 2003 to 2016, $325 billion in capital expenditure was spent on tourism, and out of 39 sectors, tourism is in tenth place (Shehadi 2017). However, since 2008 greenfield FDI in tourism has constantly been in decline. From

2003 to 2008 the average greenfield FDI in tourism was $33.3 million, and since then it has dropped to $18.9 million (Shehadi 2017). The brand value of all top ten hotel chains dropped significantly during 2016, and this has been attributed to the rise of the sharing economy (Atherton 2016). Companies such as Airbnb have made tourism cheaper and easier, but probably at the cost of FDI in tourism (Shehadi 2017) so they are a threat to the global hospitality industry. Regarding M&A in tourism, the average number of deals in the period from 2012 to 2017 was 327, while the average value was $78.15 billion (Haddad 2018). The peak was reached in 2015 with 385 deals and a value of $200.3 billion (Haddad 2018). In the context of this paper, it is important to emphasize that the total FDI is more than double in very peaceful countries (IEP 2018).

The last decade has seen a mild but steady decline in global peace. The number of terrorist incidents has risen nearly 200% since 2011, while casualties resulting from terrorist activities, and casualties caused by terrorism in OECD member states, have increased by 900% since 2007 (IEP 2018). According to the Global Peace Index (IEP 2018), the global economic impact of violence increased by 2.1% from 2016 to 2017, equivalent to 12.4% of the global GDP, or $1988 per person.

Given the strength that tourism has in economic terms at local and global level, the prospect of it being a generator of peace in the world and the fact that tourism development is often associated with the struggle against poverty (Holden 2013), it is essential to ensure the development of its key elements. This primarily pertains to capital, infrastructure, knowledge and disposal of international marketing and distribution networks whose most efficient developmental driver is FDI in tourism (Barrowclough et al. 2007). FDI in tourism is especially important for less developed destinations, especially when it comes to investing in human resources and skills (Shehadi 2017). FDI in tourism has an effect on international tourist arrivals (Bezić et al. 2010; Perić and Nikšić Radić 2016; Selvanathan et al. 2012; Tang et al. 2007; Zhang et al. 2011) and thus significantly affects economic growth. Even though FDI in tourism has not until recently been emphasized as a key sector of investment promotional agencies of particular countries, today it plays a key role in their plans and is one of the pillars of sustainable development of the global economy (Fingar 2017).

FDI, tourism and terrorism have some dominant common features. They surpass national borders, involve stakeholders of different nationalities and are mutually intertwined. FDI and tourism are strongly linked to terrorism because terrorism affects both the movement of tourists and the movement of FDI. Because of its significant role in job creation, tax revenue contribution, and overall impact on economic growth, FDI is a logical choice for attacks (Lutz and Lutz 2017). International hotels are symbolic targets of western wealth and influence which attract exactly the type of militants who aim to remove foreigners, business travellers, tourists and local elites (Bharwani and Mathews 2012). Tourists also often become targets of terrorism as they are in a way considered as ambassadors of their countries and easy targets, as well as symbolic indirect representatives of enemy governments. Attacks on foreign tourists and international businesses, i.e., citizens of other countries, guarantees greater media attention to terrorists.

Despite the importance FDI plays in tourism, the subject research is very scarce and insufficiently explored (Dwyer et al. 2010; Kundu and Contractor 1999; Perić and Nikšić Radić 2016; Sinclair and Stabler 1991). Nevertheless, it is also possible to conclude that the amount of subject research is continuously growing (Bezić et al. 2010; Craigwell and Moore 2008; Dunning 1981; Endo 2006; Fereidouni and Al-mulali 2014; Katircioglu 2011; Othman et al. 2012; Perić and Nikšić Radić 2016; Salleh et al. 2011; Samimi et al. 2013; Sanford Jr and Dong 2000; Selvanathan et al. 2012; Tang et al. 2007; Zhang et al. 2011). What is surprising is the virtual ignorance of empirical research on the link between terrorism and FDI in tourism. In 1975, Matthews pointed out that literature related to tourism generally lacks the political components of research (Mathews 1975). This issue was somewhat tense in Formica (1996), who pointed out there is no analytical or theoretical research that deals with the link between political risk and FDI in a specific area of hospitality. Fourteen years later Steiner (2010) stated that there has been no significant progress on the matter and researched the link between terrorism and FDI in Egypt, concluding that the negative effect of terrorism on FDI in tourism is overestimated. Once more, with a shorter pause of 8 years, Nikšić Radić and Barišić (2018) pointed out the scarcity of existing research on FDI in tourism and terrorism and concluded that the

subject matter is highly complex and that the effect of terrorism on FDI in tourism cannot be generalized. Finally, Nikšić Radić (2018) provided evidence against terrorism as a significant predictor of FDI in tourism.

Given the scarcity of existing research and the absence of research involving a causal link between the subject variables, the current study aims to address this research gap. The aim of this paper is to research the causal relationship between terrorism and FDI in tourism on a panel of 50 countries for the period from 2000 to 2016 modelled on research of Nikšić Radić (2018). Additionally, in order to ensure the reliability of the research results, certain specific control variables will be included in the testing of causality between the mentioned variables. The authors' starting point is that terrorism does not affect FDI in tourism. There are several arguments in favour of this. Firstly, the last decade has seen a change in consumer and corporation mentality as they started to behave 'normally' as a response to terrorism (Oaten et al. 2015). One example of the broadening of the global portfolio in times of growing terrorist threats is the Hongkong and Shanghai Hotels (2016), which point out that 'It is an unfortunate reality in today's world that one can never be 100% protected against terrorists in a free and open society'. Smith Travel Research (STR) data suggested that hotel performances in affected destinations typically started to return to normal three months after an attack, as long as there were no further attacks (Doggrell 2017). According to Harper (2017) head of property services for Hotel Partners Africa, the impact of terror attacks across the world is lessening and, in general, international tourism is resilient to terrorism, recovery times for all types of locations are improving and have shortened significantly over the last 15 years (Oaten et al. 2015).

The main contribution of this paper is that, for the first time, to the best of the authors' knowledge, a causality analysis is used to examine the relationship between FDI in tourism and terrorism on a panel of countries. Another contribution of this paper is that it is not based on the premise that terrorism affects FDI in tourism. The third contribution, and the most important one in the authors' opinion, is that the results of the research point to the fact that, despite the rising nationalist and populistic excesses around the world promoting closing borders because of the fear of spreading terrorism via migration channels, terrorism does not affect FDI in tourism. Terrorism has become one of today's threats with which life is still normal, either in terms of tourism or in terms of tourism investment and should be treated like this. Like any other threat to global development, it is necessary to approach it with preventive measures to keep it under control in the long term. This article is composed of five sections. After the introduction, Section 2 presents an overview of the most recent theory on the subject matter. Section 3 describes the data and methodological framework, whereas Section 4 focused on the analysis of the results. As a final point, the conclusions and implications for policies are presented in Section 4.

2. Overview

At the start of the 21st century terrorism became a burning international political problem and it is likely to remain a potential threat to global business (ATKearney 2015; EIU 2008). Terrorism asserts insecurity on individuals and governments. Terror attacks have severe consequences on economic activity (gross domestic product, fixed capital formation, export, consumption expenditure) (Eckstein and Tsiddon 2004), and also on life. The incidence of terrorism appears to be associated with a change in spending from investment towards government expenditures (Blomberg et al. 2004). In addition, larger economies appear to be less likely to suffer from terrorism attacks (Kumar and Liu 2015).

Due to the globalisation process, global companies have at least one common feature with terrorism—they are present everywhere (Krug and Reinmoeller 2003). According to Mazzarella (2005), a decline in investment and operations in high-risk regions is the cost of terrorism which companies face. There are also corporations targeting terroristically high-risk countries, i.e., some investment choices may even be motivated by higher yields because of the higher risk the investments are based on (Asongu et al. 2015).

By analysing the characteristics of terrorism and tourism, it is easy to conclude that the two are essentially complete opposites and do not fit together in the same sentence (Nikšić Radić and Barišić 2018). The touristic demand is sensitive to the impact of terrorist attacks because tourists value peace

and enjoying what a tourist destination has to offer (Bassil 2014; Enders et al. 1992; Goldman and Neubauer-Shani 2017; Nikšić Radić et al. 2018). The tourist destination must meet the individual safety of tourists' criteria (Maslow 1970; Pearce 2005). As Gilham stated, 'Tourists vote with their feet in cases where there is a perceived threat to their safety' (O'Connor et al. 2008). In addition, in the case of tourism, one study discovered that campaigns of attacks have more negative effects than a smaller number of major attacks (Pizam and Fleischer 2002).

The relationship between FDI and the political environment is very complex. Political risk affects pre-investment activities of foreign investors and existing FDI (Feinberg and Gupta 2009). According to Vargas and Sommer (2015), political instability occurs through the interaction between three dimensions of political risk—economic instability, institutional instability and ethnic/religious diversity.

Political risk has mostly been equated with political instability and radical political changes in the host country (Green 1974; Thunell 1977). Every country showing unequal characteristics presents political risk and potential instability (Jarvis and Griffiths 2007). The two terms are, however, different. Instability is a characteristic of the general environment, while risk has a somewhat narrower focus that directly affects a foreign corporation or specific project (Kobrin 1979, 1980). There, the event itself is not important, the event's effect on business is important (Chermak 1992). Political stability is not in itself a guarantee for tourism or any other type of industry, especially when there is a lack of favourable economic conditions (Levis 1979).

When political risk is considered in the context of FDI it can be defined as 'the probability that political decisions, events or conditions will significantly affect the profitability of a business actor or the expected value of given economic action' (Matthee 2011, pp. 2010–11). Contemporary FDI theories treat political risk as the most significant political force affecting patterns in international capital flows, especially in developing countries (Barry and DiGiuseppe 2018). The term political risk was created within the scope of country risk with the aim of considering the type of insolvency in the country, and it is not directly related to financial or economic factors (Sottilotta 2017). The effect of political risk varies depending on the industry FDI is oriented towards (Barry and DiGiuseppe 2018). Research aimed at differences between sectors is scarce and points to the specificities of particular industries (Blanton and Blanton 2012; Dunning 1981).

After the 2001 terrorist attack in the USA terrorism became a source of concern for international investors and entered the scene as a type of political risk (Berry 2007; Lee 2017). Furthermore, terrorism can be viewed as a category of political violence (Latif et al. 2017). Political violence is not a homogenous category. According to Witte et al. (2017), terrorism represents a discontinuous risk with a high level of impact. Similarly, Steiner (2010) views terrorism as violent political unrest when conceptualising dimensions of political risk. There is a well-established strong link between political instability and terrorism (Sonmez and Graefe 1998). Political stability is one of the key factors in attracting FDI while economic and political shocks are a deterrent (Metaxas and Kechagia 2017). Latif et al. (2017) argue that continuous terrorist attacks probably increase political instability and decrease investments. Terrorist incidents increase risks associated with political instability and through this channel deter FDI (Bandyopadhyay et al. 2014).

It has already been emphasized that this research does not take as a postulate the necessity of a negative influence of terrorism on FDI in tourism. There are several reasons the authors assumed this stance. Firstly, in an earlier overview of research on political risk, Kobrin (1979) concluded that the empirical evidence is inconsistent and presents mixed results regarding the effect of political instability on FDI stocks or flow. Secondly, already in 1983, it was indicated that terrorism in general does not significantly affect FDI, even though it had significant localised effects in places such as the Basque region in Spain or in Northern Ireland (Crenshaw 1983, p. 6). Ultimately, all subsequent research casts doubt on such a postulate, as displayed in the table below.

As can be seen from Table 1, available empirical studies have recognized different results considering the relationship between political instability, political risk or just terrorism and FDI. Schneider and Frey (1985), Nigh (1985), Globerman and Shapiro (2003), Enders et al. (2006), Abadie and Gardeazabal (2008) and Powers and Choi (2012) argued that political instability, political risk or

terrorism negatively influenced the FDI inflows. Interestingly, certain researches such as Fatehi-Sedeh and Safizadeh (1989), Olibe and Crumbley (1997), Li and Resnick (2003), Sethi et al. (2003), Li (2006), Kolstad and Villanger (2008), Steiner (2010), Blonigen and Piger (2014) and Nikšić Radić (2018) provided evidence that observed variables did not have a significant impact on FDI. Most interesting of all, certain researches such as Loree and Guisinger (1995), Mihalache (2010), Tosun et al. (2014) and Lutz and Lutz (2017) provided evidence that observed variables could even contribute to FDI. Research closely related to the impact of terrorism on FDI in tourism is very scarce. Steiner (2010) is the only one which links terrorism and FDI in tourism and concludes that a clear link between the observed variables cannot be determined, and Nikšić Radić (2018) is the only one which found that terrorism is not significant for attracting FDI in tourism. Bearing in mind the diverse results of research related to the impact of observed variables on the total FDI inflows into the economy, and focusing narrowly on the scarcity of research related to the impact of terrorism on FDI in tourism, it is justified not to start from the premise that terrorism necessarily affects FDI in tourism.

Table 1. Effect of political instability, political risk and terrorism on FDI flow.

Authors	Sample and Period	Methodology	Results
Schneider and Frey (1985)	54 developing countries, 1976–1980	Multiple regression analysis	Political instability has a negative influence on FDI inflow
Nigh (1985)	24 countries, 1954–1975	The pooled time-series cross-section design	Conflict has a negative influence on FDI flows by US firms
Fatehi-Sedeh and Safizadeh (1989)	15 countries, 1950–1982	Multiple regression analysis	There is no evidence of statistical connotation among political stability and FDI inflow
Loree and Guisinger (1995)	36 countries, 1977 and 1982	Multiple regression analysis	Political stability promotes FDI in 1982 but not in 1977
Olibe and Crumbley (1997)	OPEC countries, 1989–1994	Multiple regression analysis	Without evidence that political risk influences U.S. FDI flows to 10 out of 13 countries
Li and Resnick (2003)	53 countries, 1982–1995	The pooled time-series cross-section design	Political instability does not have any statistically significant effect on FDI inflows (but regime durability encourages FDI inflows)
Sethi et al. (2003)	28 countries, 1981–2000	Multiple regression analysis, factor analysis	Political instability does not affect U.S. FDI flows
Globerman and Shapiro (2003)	143 countries, 1994–1997	Probit estimates, regression	Index of political stability and violence reduce the amount of FDI inflow a country receives
Li and Schaub (2004)	112 countries, 1975–1997	Negative binomial regression	FDI inflows have a stabilising indirect effect on transnational terrorist attacks by promoting economic development
Hitchcock and Darma Putra (2005)	Bali	Case study	Although the Bali bombings had a huge impact on international tourism, foreign-owned resorts with strong marketing helped restore confidence in Bali after the terrorist attack
Enders et al. (2006)	69 countries, 1989–1999	Time-series intervention analysis	Terrorism has a significant effect on US FDI in OECD countries, but the effect disappears in non-OECD countries
Li (2006)	129 countries, 1976–1996	The pooled time-series cross-section design	Transnational terrorism in a country does not affect its chances of being chosen as an investment destination or the amount it receives once being chosen
Lutz and Lutz (2006)		Theoretical discussion	Short-term investments are more sensitive to terrorist attacks since long-term investments have higher sunk costs
Abadie and Gardeazabal (2008)	186-country full sample and the 110 countries regression sample, 2003	The pooled time-series cross-section design	Negative correlation between terrorism and FDI
Kolstad and Villanger (2008)	57 countries, 1989–2000	Panel fixed effects estimation vs random effects estimation	Institutional quality and democracy appear more important for FDI in services than general investment risk or political stability

Mihalache (2010)	50 developing countries, 1980–2004	The pooled time-series cross-section design	Positive impact of political violence on FDI in capital-intensive tertiary sector industries such as hotels and restaurants, transportation, communications, real estate, etc.
Steiner (2010)	Egypt	Case study	Impact of violent political turmoil on FDI in tourism cannot be confirmed by a clear link between the observed variables.
Powers and Choi (2012)	123 developing countries, 1980–2008	The pooled time-series cross-section design	Terrorism that targets TNC in developing countries negatively affects FDI inflow to those countries, but terrorist attacks that do not target businesses have no statistically significant effect on FDI
Blonigen and Piger (2014)	OECD countries	Bayesian statistical techniques—systematic investigation of the determinants of FDI	No robust evidence that policy variables have an effect on FDI
Bandyopadhyay et al. (2014)	78 developing countries, 1984–2008	Dynamic panel data framework	Wealthy, developed countries with a diversified economic structure are better off with the consequences of terrorist attacks than small, poor, more specialised countries
Tosun et al. (2014)	Turkey, 1992M01–2010M12	Cointegration and error correction methods	Political risk may contribute to FDI inflow
Lutz and Lutz (2017)			More terrorism led to more FDI in some of the regions and for the developing world as a whole, which suggested perversely that terrorism encouraged FDI, especially in the 1990s.
Nikšić Radić (2018)	50 countries, 2000–2016	System generalized method of moments	Terrorism is not a significant determinant that affects FDI in tourism

Source: Authors' research.

FDI holders take into account political instability when making investment decisions (Li 2006). When considering the relationship between FDI and terrorism, it should be borne in mind that a foreign investor has a long-term business horizon. Thus, FDI itself becomes a barrier to exit because if the investor decides to disinvest, they cannot do it at no extra cost (Rivoli and Salorio 1996). This implies that the exit barrier makes the investor anticipate the political and economic development of a potential country or region, including potential political violence and terrorism (Li 2006). The fact that investors take political instability into account when making investment decisions is further shown in research by Bass et al. (1977) and Porcano (1993). The level of terrorism risk may influence future business, i.e., expected profit and growth potential. This leads to the conclusion that the scope of the effect of a terrorist attack is not what matters, but the scope of the unexpected effects of that attack (Hallberg 2016). A large anticipated attack will ultimately become internalised and have less consequences, while a small unanticipated attack will have more severe consequences because it will not be internalised (Li 2006). FDI in tourism is mostly oriented towards large hotel complexes (Barrowclough et al. 2007), so it is likely that such investments take into account the long-term business horizon and that market risk analyses definitely consider potential political instability, including possible terrorist attacks in that country. Terrorist attacks are one of the external risks which particularly affect the hotel business (Bharwani and Mathews 2012).

3. Limitations, Data and Methodological Framework

3.1. Research Limitations

Before going further with explaining the dataset and the methodology used in this research, it is necessary to clearly state that the authors are aware of the limitations of the present study. The main limitation of this study refers to the number of countries included in the panel survey as well as the missing values for individual years of individual countries (insights into the missing data are located in the Appendix A, Table A2). However, this is a common feature of FDI-oriented research on a particular sector, as the industrial coverage of FDI reporting is limited (UNCTAD forthcoming). It

should also be pointed out that FDI in tourism is concentrated primarily in developed countries (Barrowclough et al. 2007).

3.2. Data

The data set, following Nikšić Radić (2018), comprises annual time series data from 2000 to 2016 in order to investigate the causal relationship between FDI in tourism and terrorism on a panel of 50 countries (the list of countries and summary statistics can be found in the Appendix A, Tables A1 and A2). The representativeness of the sample is supported by the fact that it includes 50 countries, which make up 72% of total international tourism receipts (Nikšić Radić 2018). The selection of this sample was made due to data availability of variable FDI inflows in tourism. The variable FDI in tourism (*fdi-t*) was obtained from OECD, UNCTAD and the Vienna Institute for International Economic Studies databases. The variable employed is in millions of US dollars.

Terrorism data are derived from The Global Terrorism Database (GTD) (START 2018). According to START (2017), for an incident to be categorised as terrorist, the following attributes must be present: The incident must be intentional, the incident must entail some level of violence or immediate threat of violence and the perpetrators of the incidents must be sub-national actors. In order for the results to be more valid, this article uses total international casualties (*intall*) and total international incidents (*intatt*) as the terrorism variables. Total casualties include both injuries and fatalities (killed). Additionally, for an incident to be included into the total casualties variable it must meet all three GTD criteria, including only successful attacks and excluding ambiguous cases. The GTD database does not provide a column distinguishing domestic and international terrorist incidents per se. Decomposition was done following an established methodology by Enders et al. (2011) and Kis-Katos et al. (2011).

In order to secure the validity of the research results, four control variables were included in the research. The variables international tourist arrivals (*INTARRpercapita*) and GDP per capita (*GDPpercapita*) were obtained from the World Bank database. The Chinn-Ito index (KAOPEN) is an index that measures a country's degree of capital account openness. The index runs from −1.85 to 2.5, and a higher value indicates a smaller number of restrictions on the capital account, i.e., a smaller number of national restrictions on the capital account. The KAOPEN index was obtained from http://web.pdx.edu/~ito/Chinn-Ito_website.htm. The KOF Globalisation Index (*KOFGI*) (Gygli et al. 2018) measures the economic, social and political dimensions of globalisation. It was introduced by Dreher (2006). The data was obtained from the KOF Swiss Economic Institute (Gygli et al. 2018).

All variables are in the logarithmic form.

3.3. Econometric Methodology

This research uses panel VAR approach. The VAR methodology is well suited to the set research goals since there is no a priori theory of causal relationships between variables of interest, namely terrorism and FDI in tourism. Panel Granger causality analysis allows for defining the direction of the link between terrorism and FDI in tourism. As a final point, impulse response functions (IRFs) help to determine the dynamic links between terrorism and FDI in tourism.

The analysis started by testing stationarity. The order of integration of the variables involved in the model are defined by using the Fischer Augmented Dickey–Fuller (Fischer -ADF.—) test. The unit root test is conducted against the null hypothesis of a unit root present and by an autoregressive procedure based on an appropriate number of lags. Selection of the optimal lag length is fundamental for the consistency of VAR models (Liu 2005).

As part of the evaluation of the VAR model, the following models are specified as the next step:

$$\begin{aligned} logintatt_{it} = {} & a_0 + a_1 logintatt_{it-1} + \cdots + a_p logintatt_{it-p} + b_1 logfdi\_t_{it-1} + \cdots \\ & + b_p logfdi\_t_{it-p} + c_1^1 CV_{it-1}^1 \quad + \cdots + c_p^1 CV_{it-p}^i \quad + c_1^k CV_{it-1}^k \quad + \cdots \\ & + c_p^k CV_{it-p}^k \quad + u_{it} \end{aligned} \tag{1}$$

$$logfdi\_t_{it} = d_0 + c_1 logfdi\_t_{it-1} + \cdots + d_p logfdi\_t_{it-p} + e_1 logintatt_{it-1} + \cdots + e_p logintatt_{it-p} + f_1^1 CV_{it-1}^1 \quad + \cdots + cf_p^1 CV_{it-p}^i \quad + f_1^k CV_{it-1}^k \quad + \cdots + f_p^k CV_{it-p}^k \quad + v_{it} \tag{2}$$

$$logintall_{it} = a_0 + a_1 logintall_{it-1} + \cdots + a_p logintall_{it-p} + b_1 logfdi\_t_{it-1} + \cdots + b_p logfdi\_t_{it-p} + c_1^1 CV_{it-1}^1 \quad + \cdots + c_p^1 CV_{it-p}^i \quad + c_1^k CV_{it-1}^k \quad + \cdots + c_p^k CV_{it-p}^k \quad + u_{it} \tag{3}$$

$$logfdi\_t_{it} = d_0 + c_1 logfdi\_t_{it-1} + \cdots + d_p logfdi\_t_{it-p} + e_1 logintall_{it-1} + \cdots + e_p logintall_{it-p} + f_1^1 CV_{it-1}^1 \quad + \cdots + cf_p^1 CV_{it-p}^i \quad + f_1^k CV_{it-1}^k \quad + \cdots + f_p^k CV_{it-p}^k \quad + v_{it} \tag{4}$$

where *logfdi_t* is logarithmic form of the FDI in tourism, *logintatt* is logarithmic form of international terrorist attack and *logintall* is logarithmic form of total international casualties; $CV^{1,\ldots k}$ are control variables and p is the optimal lag length.

This paper employs a Granger causality test and applies the VAR framework within the panel setting. The causality model is used to detect the direction of causality between the two observed variables. The Granger causality between variables X and Y is simply defined as 'Granger X causes Y if Y can be better predicted using data from both X and Y instead of using data from just Y'. The Granger causality test is grounded on a simple Wald test. The Wald test allows testing the significance of the lagged values of the second variable. The null hypothesis of no causality is rejected if the Wald test is significant:

H_0: $b_1 = b_2 = \ldots = b_p = 0$, *against* H_A: *'Not* H_0*'*, is a test that X does not Granger-cause Y (Equation (3)).

H_0: $e_1 = e_2 = \ldots = e_p = 0$, *against* H_A: *'Not* H_0*'*, is a test that Y does not Granger-cause X (Equation (4)).

The rejection of the H_0 implies there is Granger causality, i.e., it implies a statistically significant causal relationship.

Lastly, within the set VAR model, a variance decomposition analysis is carried out, as well as the impulse response function examination The impulse response functions (IRFs) use Monte Carlo (MC) simulations for the confidence intervals. The Choleski decomposition of variance–covariance matrix residuals is followed to compute the impulse-response functions (IRFs) and the variance decompositions.

Abrigo and Love (2015) published a package of .ado files for Stata that enables the use of panel vector auto regression (pVAR), including sub-routines to implement Granger (1969) causality tests analysis, the impulse response functions (IRFs) and variance decomposition in this research.

4. Research Results

In adherence with the earlier-described research methodology, a panel unit root test is employed to determine whether there is a unit root present. The only variable where a time trend and drift term were included was for the international arrival per capita variable. Stationarity of the variables was tested for all time series, and the results of the unit root test indicate that all series are stationary in level, which is evident from the Table 2 (the graphs of the observed time series averaged of main variables of interest, across countries, can be found in the Appendix A, Figure A1).

Thus, it is possible to conclude that all the observed series do not contain the unit root given that the null hypothesis for non-stationarity has been rejected.

Table 2. ADF-Fischer unit root test results.

Variable	ADF-Fischer Chi Square	Conclusion
logfdi_t	349.4491 ***	I(0)
logintatt	444.3383 ***	I(0)
logintall	354.6990 ***	I(0)
logint_arr_pop	145.2888 ***	I(0)

logkaopen	277.6628 ***	I(0)
loggdppercapita	143.7357 ***	I(0)
logKOFGI	195.4971 ***	I(0)

Note: *** denote rejection of the null hypothesis at 1% significance level. Lag length in the model is based on the Akaike information criteria (AIC), the Bayesian information criteria (BIC) and the Hannan-Quinn information criteria (HQIC). Source: Authors' calculations.

To ensure the reliability of the VAR model, the next step was to choose the optimal lag length of the VAR models. The panel VAR used the first four lags of FDI in tourism and international terrorist attack, FDI in tourism and total international casualties as instruments, respectively. The optimal number of lags was chosen with the help of the usual information criteria, such as Hansen J test, Akaike information criterion (MAIC), the modified Bayesian information criterion (MBIC) and the modified Hannan-Quinn information criterion (MQIC). Based on the above-mentioned criterion, as optimal lag length, 1 is selected.

As suggested by Abrigo and Love (2015) a first-order panel VAR model is fitted with the same specification of instruments as above using GMM estimation. Since the database comprises missing values this research further follows Holtz-Eakin et al. (1988). The "GMM-style" instruments are used to replace instrument lags with missing values with zeroes. The consequence of such an approach is a larger sample of estimates and estimates that are more reliable.

The next step was to test the Granger causality relationship. Classic Granger causality involves performing the Wald test for the first p parameters of other variables in the VAR model, and, if the Wald test was significant, rejecting the null hypothesis of no causality. The results of the test are shown in Table 3.

Table 3. Granger Causality Test.

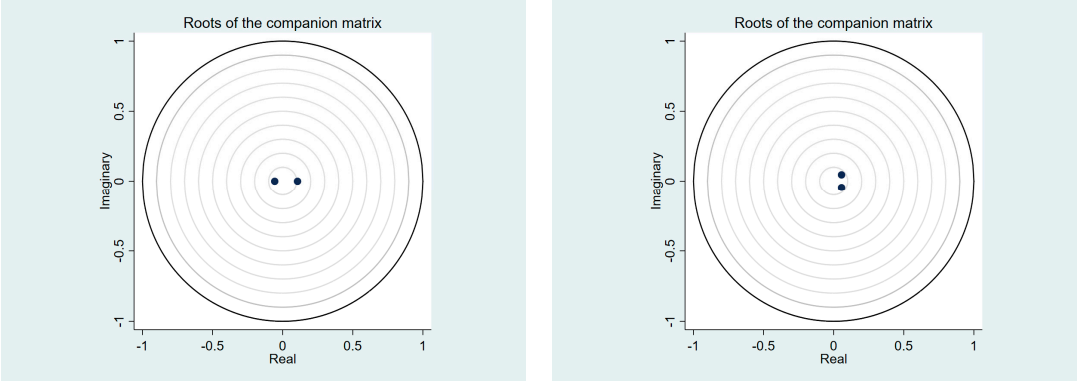
	Null Hypothesis	χ^2 **Test**	*p*-**Value**
No control variables	logintall does not Granger cause logfdit	2.413	0.120
	logfdit does not Granger cause logintall	0.195	0.658
Including control variables	logintall does not Granger cause logfdit	0.097	0.755
	logfdit does not Granger cause logintall	1.922	0.166
No control variables	logintatt does not Granger cause logfdit	0.225	0.635
	logfdit does not Granger cause logintatt	0.187	0.666
Including control variables	logintatt does not Granger cause logfdit	0.661	0.416
	logfdit does not Granger cause logintatt	0.720	0.396

Source: Authors' calculations.

The results of the Granger test indicate that the total casualties in international terrorist attacks and the number of international attacks do not affect FDI in tourism. The results remain the same when control variables are implemented in testing. It may be concluded that all the null hypotheses could not be rejected. The situation is the same the other way around. FDI in tourism does not affect international terrorist attacks or the total number of casualties from international terrorist attacks in any way.

Prior to estimation of impulse-response functions (IRFs) and variance decompositions (FEVD), the stability condition of the estimated panel was checked. The dynamic stability of the VAR models is shown in Figure 1.

According to Lutkepohl (2005) and Hamilton (1994), a VAR model is stable if all the roots are strictly less than one. None of the roots is outside of the circles so it is possible to conclude that the VAR models are stable. In other words, the outcomes and conclusions following from this analysis are not questionable.



(**a**) (**b**)

Figure 1. Stability of the VAR models: (**a**) logfdit and logintatt; (**b**) logfdit and logintall.

The variance decomposition of the first pair of variables, logfdit and logintatt, and the second pair of variables, logfdit and logintall, is shown in Appendix A (Table A3). The analysis was conducted for the prognostic period of the next 10 years. The variance decomposition shows the relative share of individual variables in the explanation of the variance of the second variable in the following periods. All the variables almost fully explain their prognostic errors as far as the prognostic period is concerned. Following Abrigo and Love (2015) the IRF confidence intervals are computed using 200 Monte Carlo simulations based on the estimated model.

Finally, impulse response functions are calculated as the reaction of each endogenous variable to unit shock in system variables. The analysis was conducted for the prognostic period of 10 years.

The results of the Impulse response function (IRF) from the Cholesky decomposition in Figure 2 concerning international terrorism attacks and FDI in tourism endorse the results obtained from the Granger causality test. The shock of a one standard deviation change in logintatt has a practically neutral influence on logfdit. In addition, the shock of one standard deviation in logfdit has a neutral influence on logintatt.

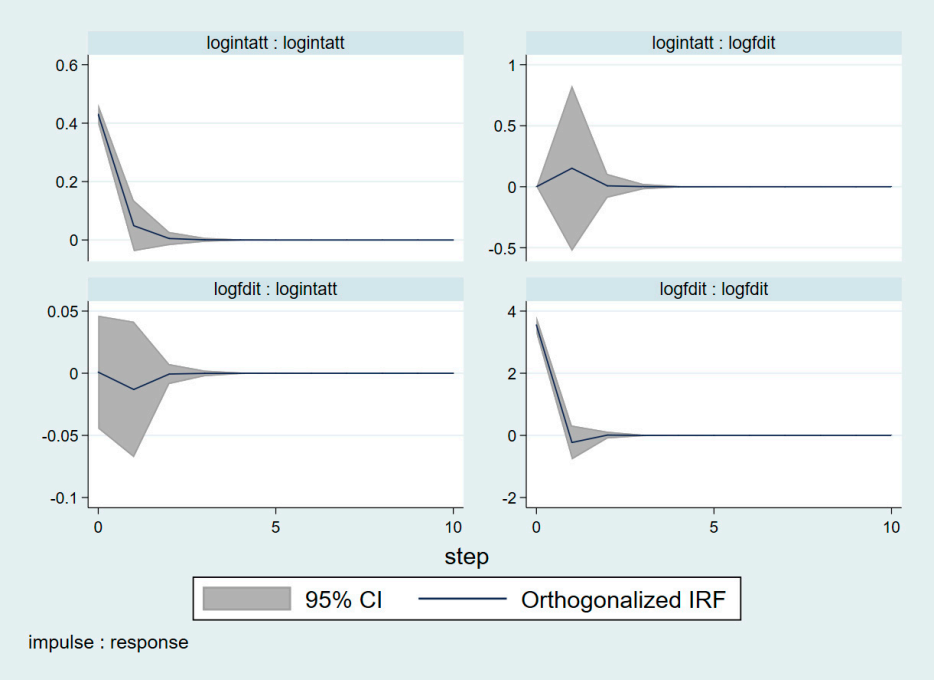


Figure 2. Impulse response of international terrorism attacks and FDI in tourism.

The situation is the same with the other pair of variables. The results from the impulse-response function in Figure 3 regarding international terrorism death and injures and FDI in tourism confirm the results obtained from the Granger causality test. The shock of a one standard deviation change in logintall has an almost neutral influence on logfdit. In addition, the shock of a one standard deviation in logfdit has a neutral influence on logintall.

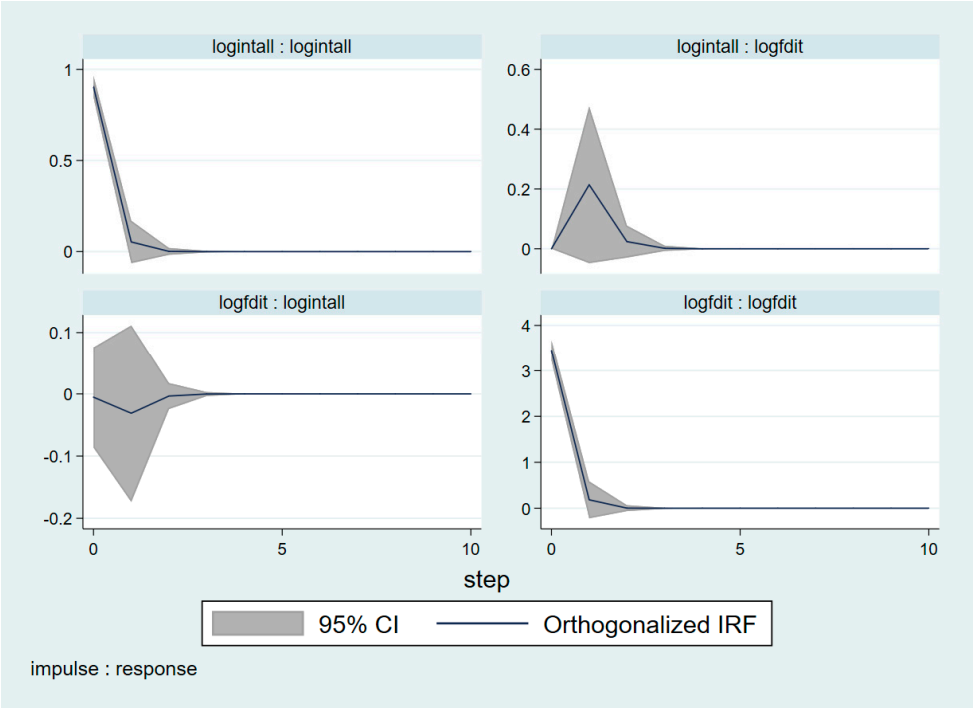


Figure 3. Impulse response of international terrorism deaths and injuries and FDI in tourism.

The implementation of Granger's causality test, variance decomposition analysis and impulse response functions lead to the same result. The example of the panel of countries proves that there is no causal relationship between terrorism and FDI in tourism. The variables of terrorism fully explain their prognostic mistakes and the increase in terrorism for one standard deviation does not lead to a decrease in FDI in tourism.

5. Concluding Remarks

The results of the conducted research have confirmed the justification of the established research ground. The example of a panel of countries has shown that there is no causality between terrorism and FDI in tourism in the Granger sense. Such a result was expected. Firstly, terrorism does not considerably influence the long-term behaviour of tourists. According to the WTTC study, it takes 13 months for tourism to make progress from a terrorist attack (Zillman 2015). Considering that tourist demand elicits tourist supply, it is logical to expect that investors in tourism will act in accordance with that trend. Secondly, global companies were conscious that terrorist threats raised business costs even in the 1980s. The risk of terrorism was then the second most substantial impediment to global business (Ryans Jr and Shanklin 1980). The risk of terrorism is one of the external risks that corporations take into count when making plans and expanding business to a selected investment location, and they operate in the long-term. The market data also indicate that hotel corporations are recovering faster from terrorist attacks (Oaten et al. 2015).

Such research results have significant political implications. The fact is that open borders make it easier for terrorists to move around and engage in terrorist activities. On the other hand, open borders also enable FDI to enter a country, as well as countries to get actively involved in

globalisation processes. Open borders also allow for tourists to travel more easily and enjoy the benefits of tourism in particular economies. On the one hand, FDI in tourism can attract terrorist attacks, but it can also have a beneficial effect on political instability in a country. Large foreign corporations act as a sort of magnet for terrorists as they symbolise western values, i.e., everything that terrorist attacks focus on. Such attacks on objects full of tourists also attract heavy media attention, which works in favour of causing terror, that being one of the goals of terrorist attacks. However, when taking market trends into account, it is more likely that FDI affects the political stability of a country. A large presence of foreign investors in a country is a symbol of the country's economic maturity and inclusion in globalisation processes. It seems appropriate to quote Friedman (1996), who pointed out in 1996 that 'No two countries that both have a McDonald's have ever fought a war against each other'. It may also be useful to bear in mind a research which proved that economic globalisation has an indirect negative effect on transnational terrorism, considering that FDI and international exchange affect economic development (Li and Schaub 2004).

In view of the various nationalist and populist appearances that are rapidly spreading around the world and calling for the closure of borders, such scientific research is needed. It points to the fact that terrorism has so many negative long-term consequences and that it has become one of the threats of today with which life is still normal. It is also important to emphasize that most terrorist attacks in the world do not actually cause deaths or injuries, as the violence involves property rather than people (Stohl 2003, p. 86). The further development of countries must be based on active participation in globalization processes, and that is only possible through open economies. Furthermore, the bearers of political authority are currently mostly busy putting out fires and enacting various security measures. However, political activities need to be oriented towards preventative antiterrorist measures, as they are the only thing which can secure long-term safety from terrorism (De Silva 2017). According to UNESCO (2017), appropriate, inclusive and unbiased quality education precludes youth from assembling violent fanatical groups.

The authors believe that the results presented in this research paper should be treated as a starting point for future research on the effects of terrorism on FDI in tourism. These results should be further validated on the level of each country, perhaps by using quarterly data, because each country has its own peculiarities.

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Appendix A

Table A1. Summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
logfdit	574	2.006643	3.790301	−8.149729	8.835171
logintatt	850	0.3685579	0.7320667	0	4.204693
logintall	850	0.4570625	1.317708	0	9.789254
logintarr_p	850	0.4626352	0.3558233	0	1.847234
logka_open	745	0.5320018	0.2047938	0	0.6931472
logkofgi	784	4.293395	0.1655348	3.667282	4.507197
loggdppc	850	9.616736	1.223536	5.547282	11.62597

Source: Authors' calculations.

Table A2. Missing observations for the FDI inflow in tourism.

Year	Missing Data Ratio	Country	Missing Data Ratio	Country	Missing Data Ratio	Country	Missing Data Ratio
2000	0.60	Australia	0.12	Iceland	0.00	Norway	0.65
2001	0.52	Austria	0.24	India	0.29	Poland	0.00
2002	0.46	Belgium	0.65	Ireland	0.53	Portugal	0.35
2003	0.46	Bosnia and Herzegovina	0.65	Israel	0.59	Russia	0.59
2004	0.42	Bulgaria	0.82	Italy	0.00	Serbia	0.65
2005	0.34	Chile	0.35	Kazakhstan	0.59	Slovak Republic	0.12
2006	0.28	China	0.88	Korea	0.00	Slovenia	0.35
2007	0.32	Croatia	0.00	Kosovo	0.71	Spain	0.06
2008	0.30	Czech Republic	0.06	Latvia	0.00	Sweden	0.71
2009	0.28	Denmark	0.18	Lithuania	0.24	Switzerland	0.88
2010	0.20	Estonia	0.00	Luxembourg	0.29	Thailand	0.29
2011	0.22	Finland	0.41	Macedonia	0.53	Tunisia	0.12
2012	0.18	France	0.00	Mauritius	0.11	Turkey	0.18
2013	0.24	Germany	0.06	Mexico	0.24	United Kingdom	0.24
2014	0.20	Greece	0.06	Morocco	0.59	United States	0.00
2015	0.24	Hong Kong	0.24	Mozambique	0.71	Vietnam	0.88
2016	0.26	Hungary	0.06	Netherland	0.00		

Source: Authors' calculations.

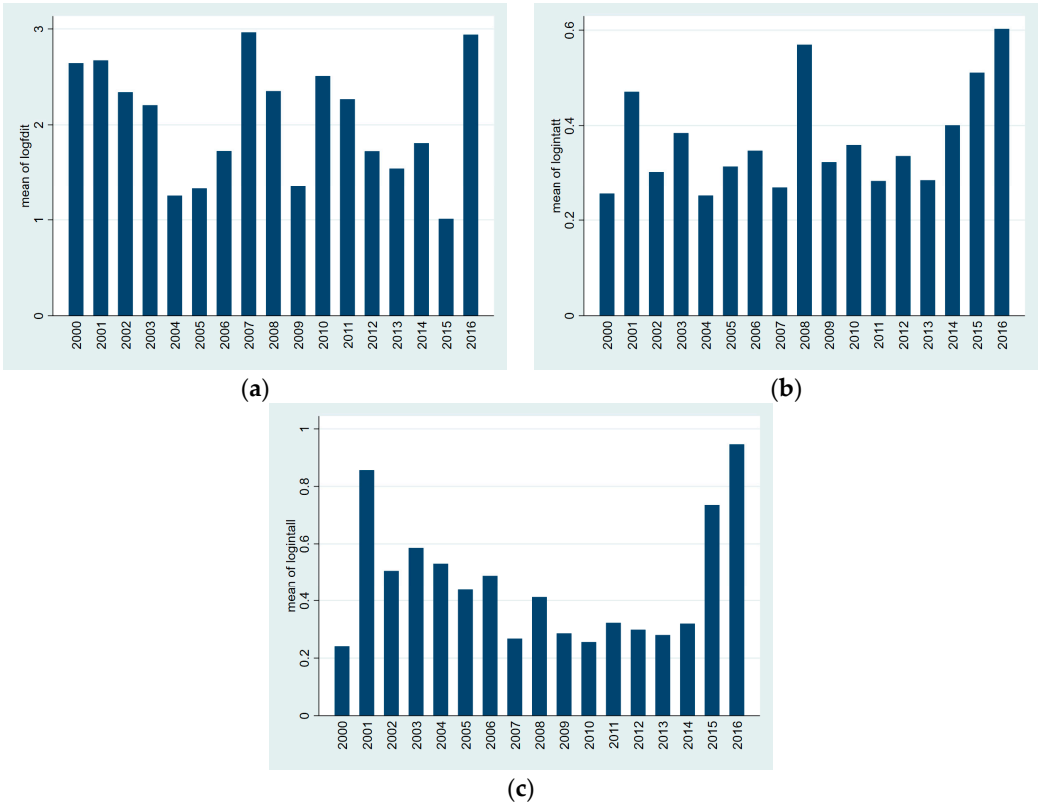

Figure A1. Observed time series averaged across countries: (**a**) logfdit; (**b**) logintatt; (**c**) logintall. Source: Authors' calculations.

Table A3. Variance decomposition.

Variance Period	Variance Decomposition of Logfdit		Variance Decomposition of Intatt	
	Logfdit	**Logintatt**	**Logfdit**	**Logintatt**
0	0	0	0	0
1	1	0	4.37×10^{-6}	0.9999956
2	0.9981868	0.0018131	0.0009129	0.9990872
3	0.9981825	0.0018175	0.0009149	0.9990851
4	0.9981824	0.0018176	0.000915	0.9990851
5	0.9981824	0.0018176	0.000915	0.9990851
6	0.9981824	0.0018176	0.000915	0.9990851
7	0.9981824	0.0018176	0.000915	0.9990851
8	0.9981824	0.0018176	0.000915	0.9990851
9	0.9981824	0.0018176	0.000915	0.9990851
10	0.9981824	0.0018176	0.000915	0.9990851
Variance Period	**Variance Decomposition of Logfdit**		**Variance Decomposition of Intall**	
	Logfdit	**Logintall**	**Logfdit**	**Logintall**
0	0	0	0	0
1	1	0	0.000034	0.999966
2	0.9961649	0.0038351	0.0012115	0.9987885
3	0.9961168	0.0038831	0.0012261	0.9987739
4	0.9961166	0.0038834	0.0012261	0.9987739
5	0.9961166	0.0038834	0.0012261	0.9987739
6	0.9961166	0.0038834	0.0012261	0.9987739
7	0.9961166	0.0038834	0.0012261	0.9987739
8	0.9961166	0.0038834	0.0012261	0.9987739
9	0.9961166	0.0038834	0.0012261	0.9987739
10	0.9961166	0.0038834	0.0012261	0.9987739

Source: Authors' calculations.

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