

# THE IMPACT OF TERRORISM ON FDI INFLOWS: A META-ANALYSIS

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**ABSTRACT**

The determinants of foreign direct investment (FDI) inflows have been a subject of several empirical and theoretical studies. However, previous researchers reached to vague or contrasting results as for the role of terrorism on attracting FDI inflows in developing countries. The purpose of the present study is to conduct a meta – analysis on published papers that focused on the empirical investigation of terrorism as a determinant factor of FDI inflows in developing countries. Papers are selected under specific criteria, while publication biases and models' specifications are discussed. The contribution of the essay is proven by the fact that it is the first paper to conduct a meta-analysis on the relation between FDI and terrorism, considering that there is an increasing research interest towards terrorism, mostly in the post-9/11 period. The study concludes that the impact of terrorism on FDI inflows in developing countries depends on the estimation techniques, the sample of countries and the research design of previous empirical papers. Limitations of the study and suggestions for future research are included.

**KEY WORDS:** foreign direct investment, terrorism, meta-analysis, empirical studies

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**1. INTRODUCTION**

Trade relationships developed during international flow transfer have a significant impact on the modern economic system. Multinational enterprises (MNEs) and foreign investors consider several factors when investing their capitals in developed and developing countries. In particular, Foreign Direct Investment (FDI) inflows in developing economies are determined by the political conditions of the recipient countries, among which the terrorist incidents. Therefore, developed and developing economies proceed to reforms in order to attract more FDI by MNEs and to improve the determinant factors, which have been investigated by several researchers.

The interaction between FDI inflows and terrorism attracts increasing research interest over the past years. Nevertheless, empirical studies reached to vague or contrasting findings. It is noted that these studies focused on different groups of countries, different case studies, used different estimation methods and examined different periods of time. Therefore, a meta-analysis review is conducted in order to combine and discuss findings of previous studies on FDI and terrorism in developing countries.

The paper is structured as following: the theoretical framework of the research is presented in section 2, in order to discuss definitions and to define the literature gap. Section 3 includes the methodological approach and the findings of the meta-analysis, while section 4 includes the discussion of the findings, the limitations and suggestions for future research. Additionally, tables and figures related to the meta-analysis are presented in order to justify and explain the included studies.

**2. THEORETICAL FRAMEWORK****2.1. Definitions and literature review**

The role of FDI inflows in developing economies has been a subject of several theoretical and empirical studies. When regarding to foreign capital, several definitions of FDI have been presented until present. According to the IMF (1993) FDI are defined as a form of investment performed in order to acquire long-term interest in a company operating in a different country from the investor. The foreign investors perform FDI so as to actively participate in the decision-making process of the company. Similarly, OECD (2008) defines FDI as the acquisition of a long-term interest of a foreign investor

to a company located in a different country than the investors. Finally, WTO (1996) defines FDI as the acquisition of capital or share by an investor based in a different country in order to control that capital.

The present study focuses on the impact of terrorist attacks on FDI inflows. Therefore, it is noted that terrorism refers to the intended use or threat of violence by an individual or a group in order to obtain social or political benefits (Sandler & Enders, 2008; Schmid, 2010). Terrorist attacks include bombings, suicide attacks, hijackings, abductions, murders, threats and other related offensive activities (Sandler & Enders, 2008). Schmid (2010) argued that terrorism can take several forms, such as crime, politics, wars, propaganda and religion.

According to the Global Terrorism Database (2017) a terrorist attack fulfils the following criteria:

1. The incident takes place for a specific purpose, which derives as a conscious choice of the perpetrator.
2. The incident involves some form of violence or immediate threat of violence, including violence against both people and property.
3. The perpetrators may be either resident in the country where the attack occurs or in a different country.

In particular, several studies reached to the conclusion that terrorism is a deterrent factor of FDI inflows in developing countries (e.g. Bisson, 2012; Bandyopadhyay et al., 2014; Kinyanjui, 2014; Opocu, 2015; Gammoudi & Cherif, 2016; Morrison et al., 2016; Asongu et al., 2018). Nevertheless, other studies reached to vague findings (e.g. Efobi et al., 2015; Quyang & Rajan, 2016; Zebua, 2016; Kurul & Yalta, 2017; Koko et al., 2017). Finally, some researchers concluded that there is no association between terrorism and FDI inflows (e.g. Younas, 2009; Luca & Spatafora, 2012; Ullah & Inaba, 2014; Erkekoglu & Kilicarslan, 2016). Therefore, it is concluded that previous researches that focused on the impact of terrorism on FDI inflows in developing countries reached to mixed or contrasting results.

## 2.2. Contribution to the existing literature

The literature review on relative empirical studies led to the conclusion that previous researchers have been unable to agree on whether terrorism averts FDI inflows in developing economies. The empirical evidence is led to contrasting results because of different samples, data sets and methodologies used in these studies. Despite the fact that meta-analyses have been widely used over the past years in economic studies (Stanley et al., 2013) there are limited meta-analyses on FDI inflows.

When regarding meta-analyses of FDI studies, Iršová & Havránek (2013) focused on the horizontal spillovers from the inflows, Gunby et al. (2017) focused on economic growth in China, Demena & van Bergeijk (2017) focused on spillovers effects, while Rezza (2015) on environmental regulations. Similarly, Ljungwall & Tingvall (2010) performed a meta-analysis on the effect of FDI on domestic firms and Mebratie & van Bergeijk (2013) also conducted a meta-analysis on productivity spillovers.

Nevertheless, none of the already conducted meta-analyses focused on terrorism, despite the fact that terrorist attacks have direct impact on the operation of multinational companies, causing fear, mortality, injuries etc (Shah & Faiz, 2015). It is noted that Bailey (2018) performed a meta-analysis on institutional factors and FDI, including terrorism, but the study examined both developed and developing economies. Kollias et al. (2011) argued that terrorism is related to economic instability and Blomberg et al. (2011) concluded that terrorism is a global phenomenon which does not seem to be reduced. Therefore, the contribution of the present research is proven by the fact that it is the first effort to conduct a meta-analysis on studies that focused on the association between FDI inflows and terrorist attacks.

## 3. METHODOLOGY AND EMPIRICAL FINDINGS

### 3.1. Methodological approach

A meta-analysis review is conducted in order to combine and discuss findings of previous studies on FDI and terrorism in developing countries. The steps of the meta-analysis were the following ones:

1. The purpose of the research has been defined.
2. The inclusion criteria were defined.
3. The selected studies are included using certain keywords and combinations of them.
4. Certain statistical programs have been used to analyze the findings of the selected studies.

Moreover, several search engines are used, including Google Scholar, ScienceDirect, Scopus, EBSCO and JSTOR. The purpose of the present research is to meta-analyze empirical studies that focused on the impact of terrorism on FDI inflows in case-studies of developing countries. Additionally, Excel and Stata have been used in order to conduct the meta-analysis of the studies. The general form of the regression is given by equation 1 and it is noted that  $z_j$  represents various control variables used in the original studies.

$$\text{Eq. 1.: } Y = \beta_0 + \beta_1 \text{Terrorism} + \sum_{j=2}^i \beta_j Z_j + \text{error}$$

### 3.2. Selection criteria

Certain criteria are used in order to minimize unobserved heterogeneity and to focus on the “true effect” of terrorism on FDI inflows in developing economies. These are the following ones:

1. Studies published in English and in international journals are included.
2. FDI inflows as dependent variable.
3. Analysis focused solely on developing economies.
4. Solely empirical studies used annual data.
5. Solely country – specific (case-studies) studies were included.
6. Solely articles to which the researcher had access to full text were chosen.
7. Keywords such as “FDI inflows”, “terrorism”, “developing countries”, “developing economies”, as well as Boolean operators were used.

It is noted that access is provided by the University of Thessaly (Greece).

### 3.3. Meta-analysis findings

The literature review on previous studies, using the above presented criteria, led to the below presented number of studies screened Table 1.

**Table 1.** Keywords and number of studies screened

Subject	Keywords	Number of studies screened	
Foreign capital	1. FDI inflows	Google Scholar	n=18.400
		ScienceDirect	n=4.215
		Scopus	n=1.379
		EBSCO	n=1.461
		JSTOR	n=57
	2. Foreign capital inflows	Google Scholar	n=18.400
		ScienceDirect	n=4.215
		Scopus	n=1.379
		EBSCO	n=1.461
		JSTOR	n=57
3. #1 OR #2	Google Scholar	n=16.900	
	ScienceDirect	n=2.867	
	Scopus	n=1.704	
	EBSCO	n=1.766	
	JSTOR	n=76	

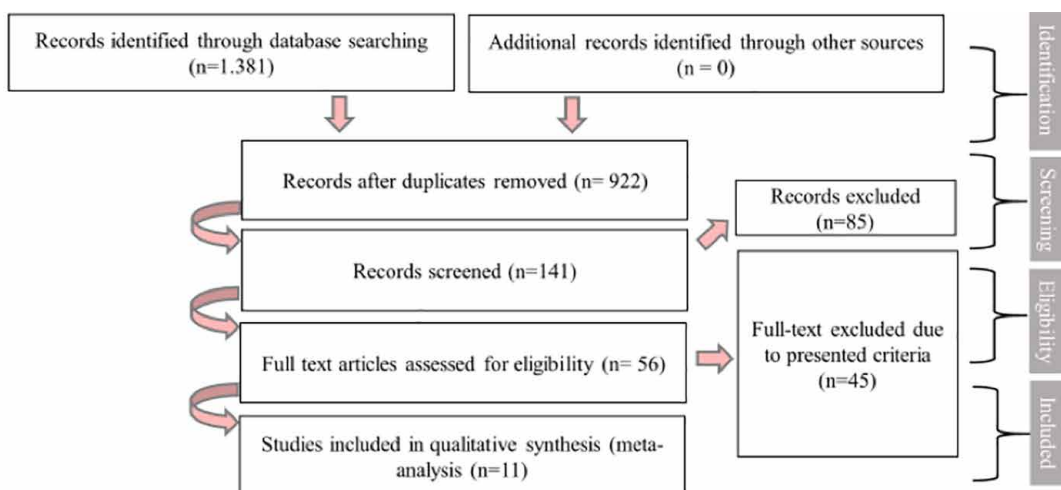
Terrorism	4. Terrorism	Google Scholar	n=522.000
		ScienceDirect	n=22.950
		Scopus	n=38.791
		EBSCO	n=147.496
		JSTOR	n=7.937
	5. Terrorist attacks	Google Scholar	n=79.900
		ScienceDirect	n=13.604
		Scopus	n=10.466
		EBSCO	n=93.426
		JSTOR	n=2.371
	6. Terrorist incidents	Google Scholar	n=12.000
		ScienceDirect	n=905
		Scopus	n=495
		EBSCO	n=623
		JSTOR	n=355
	7. Terrorist activity	Google Scholar	n=18.300
		ScienceDirect	n=2.412
		Scopus	n=1.381
		EBSCO	n=1.031
		JSTOR	n=388
8. #4 OR #5 OR #6 OR #7	Google Scholar	n=155.000	
	ScienceDirect	n=24.369	
	Scopus	n=44.859	
	EBSCO	n=161.877	
	JSTOR	n=8.448	
Sample	9. Developing countries	Google Scholar	n=3.610.000
		ScienceDirect	n=355.363
		Scopus	n=251.415
		EBSCO	n=278.433
		JSTOR	n=4.332
	10. Developing economies	Google Scholar	n=525.000
		ScienceDirect	n=24.914
		Scopus	n=7.058
		EBSCO	n=6.676
		JSTOR	n=368

11. #9 OR #10	Google Scholar	n=17.800
	ScienceDirect	n=364.487
	Scopus	n=256.645
	EBSCO	n=281.391
	JSTOR	n=4.483
Research design	12. Country specific	
	Google Scholar	n=682.000
	ScienceDirect	n=31.368
	Scopus	n=8.461
	EBSCO	n=11.329
	JSTOR	n=579
	13. Case study	
	Google Scholar	n=2.440.000
	ScienceDirect	n=539.687
	Scopus	n=763.263
EBSCO	n=560.735	
JSTOR	n=10.394	
14. #12 OR #13	Google Scholar	n=17.800
	ScienceDirect	n=565.985
	Scopus	n=771.324
	EBSCO	n=571.806
	JSTOR	n=10.870
15.#3 AND #8 AND #11 AND #14	Google Scholar	n=950
	ScienceDirect	n=397
	Scopus	n=2
	EBSCO	n=29
	JSTOR	n=3

Source: Created by authors

Similarly, the flow chart of the meta-analysis is developed as following (Figure 1).

**Figure 1.** Flow chart of the meta-analysis



Source: Created by authors

Nevertheless, certain studies have been excluded from the meta-analysis. The excluded studies and the reasons of exclusion are presented in Table 2.

**Table 2.** Excluded studies

Reason of exclusion	Author(s) and publication year
Use of quarterly data	Bano et al. (2019), Shahzad et al. (2016)
Use of monthly data	Anwar & Mughal (2016), Haider & Anwar (2014), Nazik et al. (2014), Omay et al. (2013), Ullah & Rahman (2014)
Panel data analysis	Gupta et al. (2004), Abadie & Gardeazabal (2008), Papaioannou (2009), Alomar & El Sakka (2011), Berrebi & Ostwald (2011), Powers & Choi (2012), Buchanan et al. (2012), Bandyopadhyay et al. (2014)
Developed economies	Gupta et al. (2004), Abadie & Gardeazabal (2008), Papaioannou (2009), Alomar & El Sakka (2011), Berrebi & Ostwald (2011), Powers & Choi (2012), Buchanan et al. (2012), Bandyopadhyay et al. (2014)
FDI inflows not as a dependent variable	Li & Schaub (2004), Enders et al. (2006), Daude & Stein (2007), Younas (2009), Berrebi & Ostwald (2011), Zeb et al. (2014), Hyder et al. (2015), Younas (2015), Mehmood & Mehmood (2016), Asongu & Amankwah – Amoah (2016), Anwar & Mughal (2016), Okafor & Piesse (2017)
Not published in scientific journals (master theses, dissertations etc)	Brevik (2014), Halllberg (2016), Vathsana (2016)

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Based on the above presented procedure, the meta-analysis includes 11 empirical studies, as presented in Table 3.

**Table 3.** Studies included in the meta-analysis

Author(s) and publication year	Country	Dependent variable	Type of FDI	Studied period
Alam et al. (2017)	Pakistan	FDI inflows	Net inflows of FDI	2000-2015
Ali et al. (2017)	Pakistan	FDI inflows	Total inflow of foreign direct investment	1980-2015
Kinyanjui (2014)	Kenya	FDI inflows	Net inflows of FDI	2010-2012
Najaf & Ashraf (2016)	Pakistan	FDI inflows	Total inflow of foreign direct investment	1981-2011
Rasheed & Tahir (2012)	Pakistan	FDI inflows	Total inflow of foreign direct investment	2003-2011
Rauf et al. (2016)	Pakistan	FDI inflows	Total inflow of foreign direct investment	1970-2013
Shahbaz et al. (2013)	Pakistan	FDI inflows	Net inflows of FDI	2000-2011
Talat & Zeshan (2014)	Pakistan	FDI inflows	Total inflow of foreign direct investment	1980-2010
Wami (2018)	Afghanistan	FDI inflows	Net inflows of FDI	2008-2017
Zakaria et al. (2019)	Pakistan	FDI inflows	Net inflow of FDI	1972-2014
Zulfiqar et al. (2014)	Pakistan	FDI inflows	Total inflow of foreign direct investment	2001-2013

Source: Created by authors

It is noted that the included studies focused on different case-studies, on different period spans and used different type of FDI as a dependent variable. The characteristics of the sample are presented in Table 4.

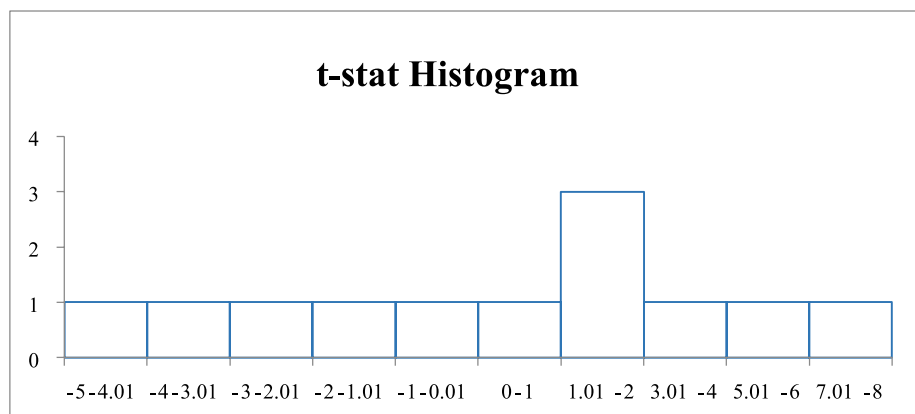
**Table 4.** Sample characteristics

Characteristics	Observations	Mean	Min	Max
T-stat	247	0,966	-4,467	7,833
Year of publication	247	2015,4	2012	2019
Mid-point of sample years	247	2002,09	1970	2017
Span of sample years	247	21,4	2	43
Multiple regression	12			
OLS	156			
GMM	43			
Linear regression	36			

Source: Created by authors

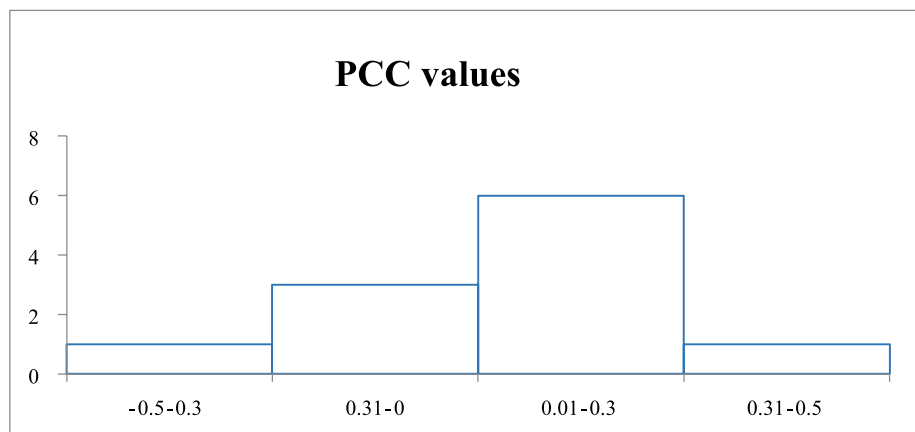
The histograms of the meta-analysis are presented in Figure 2 and in Figure 3. In particular, Figure 2 presents the t-statistics histogram, while Figure 3 depicts the histogram of the partial correlation coefficients (PCC).

**Figure 2.** T-stat histogram



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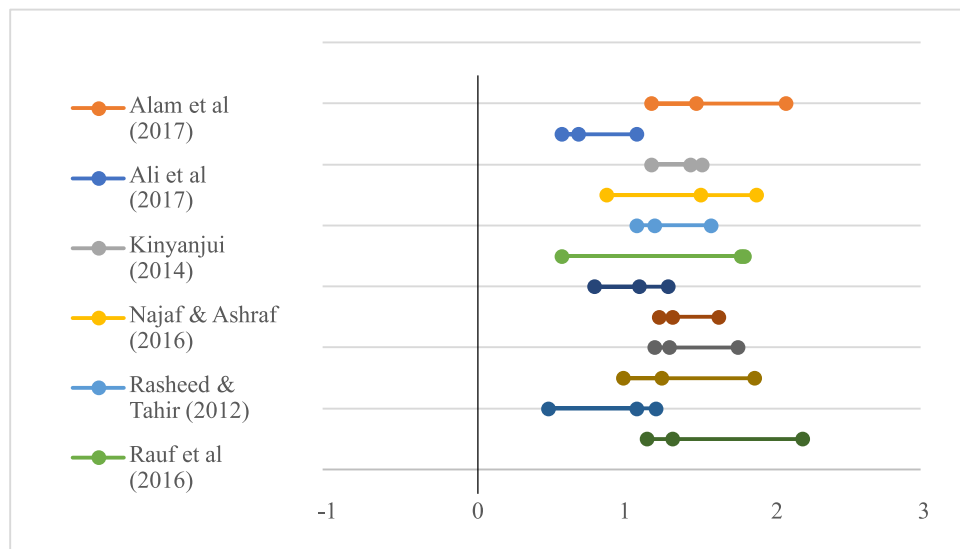
**Figure 3.** PCC values histogram



Source: Created by authors

It is observed that t-statistics of the original studies are characterized by wide range. Despite the outliers, it is observed that the weight of the distribution is mostly centered between t-values from 1,0 to 2. Similarly, it is observed that the distribution of PCC is well behaved and bounded between -1 and 1. Finally, Figure 4 presents the forest plot of the meta-analysis and it is observed there are differences on the effect size of the sample studies.

**Figure 4.** Forest plot



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#### 4. CONCLUSION

The present paper focused on the meta-analysis of empirical findings regarding the role of terrorist attacks on FDI inflows in case studies of developing countries. The sample studies have been recently published, meaning from 2012 until present. This is in accordance with the findings of Fatima et al. (2014), Altay & Celebioglu (2015) and Drakos & Kallandranis (2015), who argued that 9/11 turned interest towards terrorism.

The initial analysis of the sample studies highlights the negative and statistically significant impact of terrorism on FDI inflows in case studies of developing economies. It is observed that the sample studies covered data from 1970 to 2017 and that the majority of the researches focused on the case of terrorism and FDI inflows in Pakistan, while only one study focused on Afghanistan and one in Kenya.

Additionally, publication bias is an important aspect of meta-analysis, as well as on FDI studies (Havrnek & Irsova, 2012; Doucouliagos & Stanley, 2013), considering that the sample selection could influence the observed estimated influence. The dependent variable is presented in several forms (Total FDI inflows, Net FDI inflows and FDI to GDP). Because of this heterogeneity on the measure of FDI, the use of partial correlation coefficient is suggested.

Nevertheless, it should be noted that the study is subjected in certain limitations. In particular, it is noted that the selected researches were published in international scientific journals. Therefore, future studies could expand the sample including doctoral dissertations, books, master theses etc. The sample of the selected studies could also be considered a limitation of research. Thus, the meta-analysis could be extended through including panel-data studies as well, considering that the present research is limited to case studies. Future studies could also include researches that focused not only on developing countries, but on developed economies as well. Moreover, the research could be expanded through including additional estimations, such as funnel plots, funnel asymmetry tests, General – to – Specific modelling etc.

Policy implications arise for the role of terrorism in attracting FDI inflows in developing economies. Therefore, in order to encourage foreign investors, it is crucial that anti-terrorism measures are applied, while the institutional and political framework should be encouraged. The migration flows from Asian countries have not been considered as an explanatory variable by any of the sample studies, despite the increased fear of spreading terrorism via migration channels (Nikšić Radić et al., 2019). Therefore, current social issues should also be considered. Finally, it is important to mention that none of the sample studies focused on countries that present high rates of terrorism, including Iraq and Syria. Studying the cases of the specific countries could provide additional information on the FDI determinants.



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## UTJECAJ TERORIZMA NA IZRAVNA STRANA ULAGANJA: META-ANALIZA

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### SAŽETAK

Faktori koji utječu na priljev izravnih stranih ulaganja predmet su nekolicine empirijskih i teorijskih studija. Međutim, prethodna istraživanja su prikazala nejasne ili oprečne rezultate što se tiče uloge terorizma u privlačenju izravnih stranih ulaganja u zemljama u razvoju. Svrha ovog rada je provesti meta - analizu objavljenih radova koji su se fokusirali na istraživanje terorizma kao glavnog čimbenika priljeva izravnih stranih ulaganja u zemlje u razvoju. Analizirani radovi su odabrani prema točno određenim kriterijima. Doprinos ovog rada je potvrđen činjenicom da je to prvi rad koji je primjenio meta-analizu odnosa između stranih ulaganja i terorizma, s obzirom na to da postoji sve veći istraživački interes za terorizam, većinom u periodu nakon 9/11. Zaključak analize je da utjecaj terorizma na izravna strana ulaganja u zemljama u razvoju ovisi o tehnikama procjene, uzorku zemalja i metodologiji istraživanja analiziranih empirijskih radova. Navedena su i ograničenja studije te prijedlozi za buduća istraživanja.

**KLJUČNE RIJEČI:** izravna strana ulaganja, terorizam, meta-analiza, empirijske studije