

Impact of Governance Structure, Infrastructure, and Terrorism on Tourism

Malik Fahim Bashir, Syeda Qurat Ul Ain, Yasir Bin Tariq* and Naveed Iqbal

Department of Management Sciences, COMSATS University Islamabad, Abbottabad Campus, University Road, Abbottabad-22060, Pakistan

ABSTRACT

This study explores the effect of governance structure, ICT infrastructure, physical infrastructure, and terrorism on tourism receipts for 102 countries. The study uses 18-year data ranging from 2002–2019. To test the relationship among variables in the short and long run, Panel ARDL is employed. Furthermore, this study extended the analysis by dividing the overall sample into five regions and four income groups. Results revealed that all variables are cointegrated. Pooled Mean Group model's results show that physical and ICT infrastructure significantly impact tourism. Governance structure matters in high-income countries only. However, surprisingly terrorism incidents were not negatively affecting tourism receipts in the low and lower-middle-income countries. Terrorism was negatively impacting tourism in upper-middle-income countries only. Furthermore, ICT, physical infrastructure, and governance significantly affect tourism in different regions of the world. The causality test suggested unidirectional causation from tourism to terrorism and bidirectional causality for physical infrastructure and tourism. This study has important policy implications for all tourism and travel industry stakeholders.

Keywords: Governance structure, infrastructures, panel ARDL, terrorism, tourism

ARTICLE INFO

Article history:

Received: 11 November 2021

Accepted: 14 September 2022

Published: 03 November 2022

DOI: <https://doi.org/10.47836/pjssh.30.4.08>

E-mail addresses:

malik.fah@gmail.com (Malik Fahim Bashir)

syedaquratulain356@gmail.com (Syeda Qurat Ul Ain)

yasirtariq@cuiatd.edu.pk (Yasir Bin Tariq)

naveed@cuiatd.edu.pk (Naveed Iqbal)

* Corresponding author

INTRODUCTION

Tourism is one of the largest global economic sectors comprising multiple industries playing an increasingly important role in the economic and social development of countries and communities. Tourism activities contribute to economic growth by creating jobs, developing marginalized places and communities, and improving

foreign currency reserves (Ishikawa & Fukushige, 2007; McElroy, 2006). Tourism's role in elevating an economy is more pronounced for developing than developed economies (A. Liu & Wall, 2006).

The scale and scope of tourism's economic impact¹ are evident in the following statistics shared by World Economic Forum (2019, 2022) and World Travel and Tourism Council (2021). The number of worldwide international tourist arrivals reached 1.4 billion in 2018, two years earlier than the prediction (World Economic Forum, 2019), and it may reach the 1.8 billion mark well before the year 2030. The share of the tourism and travel industry's GDP in global GDP is 10.4% in 2019, and it is predicted to increase to 11.5% of global GDP by 2029². Approximately 11% of the total employment in 2019 was generated by the tourism sector alone, translating into 319 million jobs. Despite the 62 million jobs lost due to the COVID-19 pandemic, the travel and tourism sector still provides 8.9% of all the jobs. Finally, tourists spent approximately 1,691 Billion USD on foreign destinations in 2019 (World Travel and Tourism Council, 2021). These numbers suggest an increasingly important role of tourism in economic and social development. Therefore, this topic warrants additional attention from all quarters, i.e.,

¹ This study used tourism and related variables data till 2019. Therefore, the empirical discussion does not address the pandemic starting in 2020

² This forecast was before the world experienced the COVID pandemic. However, the travel and tourism GDP declined by 49.1% due to the pandemic, i.e., a \$4.5 trillion GDP loss.

academics, policymakers, and industry, and motivates our study.

The extant literature investigated critical factors affecting tourism, such as terrorism, governance, physical infrastructure, and information and communication technology (ICT) infrastructure. Due to the global nature of tourism and its intensive economic impact, terrorism poses a serious threat to the tourism industry (Saha & Yap, 2014). In addition, a sense of uncertainty and insecurity may force a tourist to pick a less famous but safer destination (Lutz & Lutz, 2020), thus affecting entire regions. Among studies that have investigated different aspects of terrorism and its impact on tourism include Alvarez and Campo (2014), Isaac (2021), Karamelikli et al. (2020), and Muthoni (2021).

The governance structure of a country is one of the crucial elements in improving tourism development. The presence of good governance means less political instability and corruption (Haider et al., 2011) and, therefore, might signal a significant level of security which improves incoming demand for tourism (Nadeem et al., 2020). Similarly, a developed ICT and physical infrastructure are critical for developing and elevating the travel and tourism industry (Bethapudi, 2013; Catudan, 2016; Guemide et al., 2019; Kumar & Sharma, 2017; Maltese & Zamparini, 2021).

Governance structure, physical & ICT infrastructure, and terrorism are the essential determinants of tourism. Existing literature studied the role of either one or two of these determinants on tourism for an

individual country or a panel of countries (for example, Bayram, 2020; Detotto et al., 2021; Maltese & Zamparini, 2021; Nadeem et al., 2020; Sun & Luo, 2021). However, to our knowledge, no study has analyzed the impact of all these variables on tourism in a simultaneous econometric framework. This study investigates the impact of governance structure, ICT infrastructure, physical infrastructure, and terrorism on tourism, considering this gap in the literature. Therefore, the current study adds to the empirical literature on tourism by investigating the simultaneous impact of these four independent variables on tourism in a multivariate framework and for countries included in the travel and tourism competition index. In addition, the current study also analyses these variables' impact on tourism in different world regions. This analysis is essential because the overall analysis does not highlight the underlying difference in governance structure, physical infrastructure, and terrorism across the region. Therefore, this study also contributes to the empirical literature by comparing the influence of these variables across different regions.

Furthermore, variation in the level of economic development across countries also influences the ability of a country to establish physical and ICT infrastructure in the country and provide funds for better governance. Different levels of development across nations lead to varying infrastructure and governance structures and influence tourism. Therefore, the current study contributes to the empirical literature by

analyzing the impact of terrorism, physical and ICT infrastructure, and governance structure on tourism across different income groups.

The rest of the paper is organized as follows. Section 2 focused on the literature review regarding governance structure, infrastructure, and terrorism's impact on Tourism. Section 3 elaborates on the estimation technique, variable description, and data sources. Finally, section 4 consists of the results and discussion, while section 5 consists of the conclusion and the recommendations.

LITERATURE REVIEW

Existing literature has analyzed the role of governance structure, infrastructure, and terrorism in attracting tourist arrivals separately. This study aims to contribute to the tourism literature by jointly considering terrorism, ICT and physical infrastructure, and governance structures' effect on tourism receipts. Therefore, we divided our literature review into three sections to demonstrate the clear nexus between the variables.

Governance and Tourism

The governance structure is vital in establishing an environment conducive to economic development and growth. Such an environment not only boosts investors' confidence but also attracts the attention of tourists. However, tourism is a fragile sector (Detotto et al., 2021), and any instabilities, e.g., poor governance through political instability or low-quality institutions, terrorism, and regional conflicts, could

severely affect tourism. Therefore, good governance, both at the national and industrial levels, is a primary requirement for the sustainable progress of tourism (Detotto et al., 2021; Dritsakis, 2004; Fayissa et al., 2008). Moreover, tourism can obtain political and economic power to build an optimistic image of one's country (Vujko & Gajic, 2014).

Many country-specific studies have linked governance (political (in)stability) and terrorism's impact on tourist arrival and demand (Causevic & Lynch, 2013; O'Brien, 2012). The quality of institutions and lack of crime, corruption, and violence are the key factors determining the tourist inflow to a destination (Choudhary et al., 2020; Santana-Gallego & Fourie, 2020). Therefore, tourists are usually more concerned about the state of political stability in a destination country (Tang, 2018). Similarly, political instability is more detrimental to tourism than an isolated terrorism incident (Saha & Yap, 2014). Interestingly, in politically stable countries, terrorism incidents could increase tourism demand.

Infrastructure (ICT, Physical) and Tourism

The development of the tourism sector is closely linked to physical and information & communication technology (ICT) infrastructure in the host destinations (Adeola & Evans, 2020). The physical infrastructure includes air travel facilities, highways and motorways, access roads and routes, rail and other transport infrastructure, accommodation, and recreational venues.

Masson and Petiot (2009) and Y. Liu and Shi (2019) looked into the role of high-speed railways in attracting and promoting tourism.

There is a wide stream of research that has highlighted the role of all these different types of infrastructures and their role in enhancing tourism in a single country and multi-country settings (Catudan, 2016; Kanwal et al., 2020; Maltese & Zamparini, 2021; Saayman & Saayman, 2008).

Tourism is an information-intensive industry (Anwar et al., 2014); thus, a developed and working ICT infrastructure is a prerequisite for proper functioning and growth. From Web 1.0 to smartphone apps, the internet has become an integral part of tourism. Adeola and Evans (2020) reported a statistically significant and positive relationship between ICT and infrastructure on tourism development for an African sample of countries. In addition, the use of the internet for information access, travel planning and booking tickets has been studied in tourism (Karanasios & Burgess, 2008; Wang & Cheung, 2004). As of April 2021, there are a total of 4.72 billion active users, growing at a rate of 7.6% per annum (<https://datareportal.com/global-digital-overview>). This mammoth number of internet users suggests the critical role of ICT in promoting and developing tourism. Also, the availability and access to ICT-related services and products made tourism-related service providers efficient and competitive (Alford & Clarke, 2009), which ultimately benefits tourists, which means growth of the tourism sector.

The empirical literature on the role of ICT in impacting tourism has been multi-dimensional. Studies such as Buhalis (2004) and Wang and Cheung (2004) looked at the role of the internet in promoting tourism activities from an e-commerce perspective. A major chunk of studies (Adeola & Evans, 2020; Choudhary et al., 2020; Kumar & Sharma, 2017) investigated the link between the state of ICT infrastructure and tourism income, demand, and growth. An emerging stream of studies also has focused on the role of ICT in tourist satisfaction and experience sharing (Buhalis, 2020; Tussyadiah & Zach, 2012), information access and trip planning (Doric et al., 2019; Maltese & Zamparini, 2021), smart tourism (Gretzel et al., 2015), tourism promotion and marketing (Bayram, 2020), and medical tourism (Ayuningtyas & Ariwibowo, 2020).

Terrorism and Tourism

During the last decade, apart from countries that are already suffering from political turmoil and terrorism incidents, developed and stable countries also have witnessed many terrorist attacks (Lanouar & Goaid, 2019). The most significant impact of terrorism is its capacity to divert travelers' preferences from one destination to another (Dlugosz et al., 2022; Neumayer & Plümper, 2016; Stankova et al., 2019). Fernando et al. (2013) reported the varying effect of civil war in Sri Lanka and how it was reported in print and electronic media on tourist arrivals. Buigut et al. (2021) reported a decrease in inward international travelers in Malaysia after terrorism incidents. Similarly,

Isaac (2021) pointed out the reluctance of Dutch tourists, especially if accompanying children in traveling towards Egypt, because of the risk perception. Furthermore, tourism can be a leading source of earnings for an industrialized economy, and terrorism poses a significant threat to tourism, thus negatively affecting the economy (Saha & Yap, 2014).

Many studies have investigated the spillover effects of terrorism and reported its existence, suggesting that the effect of terrorism incidents has a cross-boundary impact (Bassil et al., 2019; Buigut et al., 2021; Neumayer & Plümper, 2016; Seabra et al., 2020).

Maslow's (1943) theory of motivation suggested that safety is one of the basic needs of humans. Thus, while planning for a vacation, the destination's safety image and risk perception play a vital role in destination selection (Roehl & Fesenmaier, 1992). The possibility of terrorism (incident news, threats, perception) negatively influences tourists' decision to visit a chosen destination (Ziółkowska-Weiss & Pieron, 2021). An overwhelming majority, i.e., 91% of the respondents in Ziółkowska-Weiss and Pieron's study, checked the political news and conditions before traveling to the chosen destination. Thus, travelers' political stability and safety are critical factors for the success of the travel industry (Almuhri et al., 2017; Araña & León, 2008; Bhattarai et al., 2005). Tourists from safe countries favor traveling to countries with a comparable level of security.

In contrast, tourists from unstable countries are less concerned with the

insecurity situation in the destination country (Fourie et al., 2020; Seabra et al., 2020). Adeloye and Brown (2018) asserted that terrorism causes fear and anxiety among potential tourists, and the media influences travel risk perception. Tourists could change their destination if considered unsafe due to terrorist threats to a safe one (Muthoni, 2021). The travel and terrorism advisories issued by different countries also influence tourists' preferences and choices (Walters et al., 2018). Baggio and Sainaghi (2011) argued about the memory effect, which shows that while tourist flow may affect in the short run due to terrorism, in the long run, tourists may return to the place of their choice.

In conclusion, the existing empirical literature (Alvarez & Campo, 2014, for Israel; Asongu & Acha-Anyi, 2020, for a panel of 163 countries; Bassil, 2014, for the Middle East; Dlugosz et al., 2022, for Egypt; Fletcher & Morakabati, 2008, for Fiji and Kenya; Kaya et al., 2022; Llorca-Vivero, 2008, for G-7 countries; Öcal & Yildirim, 2010, for Turkey; Raza & Jawaid, 2013, for Pakistan; Sloboda, 2003, for the USA; Stankova et al., 2019, for Europe and the USA) has established a damaging role of terrorism for tourism.

METHODS

Data and Model Specification

The travel and tourism competitiveness index measure the set of factors and policies that enable the sustainable development of the Travel and Tourism (T&T) sector, which in turn contributes to the development and

competitiveness of a country. The travel and tourism competitiveness index 2019 consists of 140 countries. However, the current study includes 102 countries (Appendix) in the travel and tourism competitiveness report and excludes those countries for which data of all variables are unavailable. Data for the study is collected from 2002 to 2019. The multivariate model expressed in equation 1 is used to measure the impacts of terrorism, governance structure, and physical and ICT infrastructure on tourism income.

$$TI_{it} = \alpha_i + \alpha_1 TSM_{it} + \alpha_2 GAVA_{it} + \alpha_3 INF_{it} + \alpha_4 ICT_{it} + \epsilon_{it} \quad (1)$$

Where TI, TSM, GAVA, INF, and ICT represent tourism income, terrorism, governance structure, physical infrastructure, and ICT infrastructure, respectively. α_i represent fixed effect while α_1 . α_4 denote the coefficient of each independent variable while ϵ_{it} is the error term.

Tourism is the dependent variable, and it is measured through income proceeds from tourism (current US\$) by a country, and the data is obtained from WDI. The governance structure is measured through an average of six governance indicators, i.e., voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, the rule of law and control of corruption. The data for this variable is obtained from Worldwide Governance Indicators (WGI). Physical infrastructure is the general term for the elementary physical systems of a commercial, region, or state. It is proxied

by gross fixed capital formation as a percent of GDP in line with Adeola and Evans (2020) and Nadeem et al. (2020), and data is gathered from WDI. ICT is the information and communications technology infrastructure and systems, including the internet, communication networks, software and mobile applications, and hardware. Following Adeola and Evans (2019) and Nadeem et al. (2020), ICT infrastructure is proxied through the number of people using the internet as a percent of the population, and the data is collected from WDI. Global Terrorism Database (National Consortium for the Study of Terrorism and Responses to Terrorism (2022) defines terrorism as “the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion or intimidation” (Data Collection and the Definition of Terrorism section). It consists of the total number of causalities in a terrorist attack. In the current study, we used the Global Terrorism Index (GTI) established by the Global Terrorism Database. It ranges from zero to 10, where zero represents no impact from terrorism and 10 represents the highest measurable impact of terrorism.

Methodology and Estimation Technique

The panel ARDL is applied to find whether long and short-run relations exist between the given variables for all the countries. However, the panel ARDL method is favored compared to cointegration because of its benefit of being more robust and executing well for a small sample size. The

traditional cointegration method required the integration of data on the same level, while ARDL can be used nevertheless of whether they are $I(0)$, $I(1)$, or both $I(0)$ and $I(1)$. Panel ARDL consists of three models, which include Mean Group (MG), Panel Mean Group (PMG), and Dynamic Fixed Effect (DFE). PMG and MG both depend on the maximum likelihood method. PMG is more suitable than MG as it is robust towards the outliers and lag orders. Another advantage of the PMG model is that it can account for the cross-sectional dependence estimator introduced by Pesaran et al. (1999) to estimate the short and long-run association between the variables. It allows short-run coefficients, including intercept, the speed of adjustment to the long-run equation values, and error variances to be heterogeneous across countries. In contrast, long-run slope coefficients are restricted to be homogenous across cross-sections.

In the current study, the PMG model is more appropriate because the short-run adjustment is always country-specific due to the widely diverse influence of political unrest and terrorism, different governance structures, and stabilization policies. In addition, PMG is considered more effective because of valid long-run restrictions, as it may be considered. PMG, MG, and DFE models are selected based on the Hausman test. If the P-value of the Hausman test is greater than 0.05, PMG is selected, but if the P-value is less than 0.05, then the MG or DFE model is selected.

ARDL cointegration technique is desirable if the variables are integrated

in diverse order. Thus Panel ARDL(p,q) equation is written as follows.

$$\begin{aligned} \Delta TI_{it} = & \gamma_i + \sum_{j=1}^p \alpha_{1,ij} \Delta TI_{i,t-j} \\ & \sum_{j=0}^q \alpha_{2,ij} \Delta TSM_{t-j} + \sum_{j=0}^q \alpha_{3,ij} \Delta GAVA_{t-j} \\ & + \sum_{j=0}^q \alpha_{4,ij} \Delta INF_{t-j} + \sum_{j=0}^q \alpha_{5,ij} \Delta ICT_{t-j} \\ & + \beta_{1,ij} TSM_{i,t-1} + \beta_{2,ij} GAVA_{i,t-1} + \\ & \beta_{3,ij} INF_{i,t-1} + \beta_{4,ij} ICT_{i,t-1} + \varepsilon_{it} \quad (2) \end{aligned}$$

Where p represents the lag of the dependent variable and q represents the lag of independent variables. $i = 1, 2, \dots, N$ and $t = 1, 2, \dots, T$, γ_i represent the fixed effects, $\alpha_1 - \alpha_5$ are the lagged coefficients of the independent variables, and ε_{it} is the white noise error term which varies across countries and time. Where Δ denotes the first difference while $\beta_1 - \beta_4$ are the long-run coefficients of the terrorism, governance structure, physical, and ICT infrastructure, once a long-run relationship is established between the dependent variable and the independent variables, the Panel ECM form can be written as follows.

$$\begin{aligned} \Delta TI_{it} = & \gamma_i + \sum_{j=1}^p \alpha_{1,ij} \Delta TI_{i,t-j} + \\ & \sum_{j=0}^q \alpha_{2,ij} \Delta TSM_{t-j} + \sum_{j=0}^q \alpha_{3,ij} \Delta GAVA_{t-j} \\ & \sum_{j=0}^q \alpha_{4,ij} \Delta INF_{t-j} + \sum_{j=0}^q \alpha_{5,ij} \Delta ICT_{t-j} \\ & + \beta_{1,ij} TSM_{i,t-1} + \beta_{2,ij} GAVA_{i,t-1} + \\ & \beta_{3,ij} INF_{i,t-1} + \beta_{4,ij} ICT_{i,t-1} + \theta_i ECM_{i,t-1} + \varepsilon_{it} \quad (3) \end{aligned}$$

Where θ_i represents the coefficient of the ECM, the speed of adjustment made every year towards long-run equilibrium.

RESULTS AND DISCUSSION

This study covered the 102 countries in the travel and tourism competitiveness report. Data for the study is collected from 2002 to 2019 to evaluate the effect of terrorism, governance structure, and infrastructure on tourism. Descriptive statistics presented in Table 1 describe the fundamental features of the data set in this study. The average tourism income is 9,230 million USD indicating an overall increase in tourism receipts. The average score of terrorism measured by the global terrorism index (GTI) in all countries is 2.384. GTI ranges from zero to 10, where zero represents no impact from terrorism and 10 represents the highest measurable impact of terrorism. The minimum value of terrorism is zero, while the maximum value is 8.931, which indicates that terrorism has a diverse effect on tourism in different countries. The minimum and maximum value of ICT infrastructure represent that in some countries share of the population using the internet is negligible, while in another hundred percent of the population has internet access. We also observe similar differences in nations in the sample in physical infrastructure and governance variables.

Table 2 shows descriptive statistics of each income group. Overall, the mean value of terrorism is lower in all income groups. However, the mean value is much lower in the high-income group than in the three other groups. Interestingly the mean value of terrorism is higher in upper-middle-income groups than in low-income or lower-middle-income groups. Overall average tourist

Table 1
Descriptive statistics (2002-2019)

Variable	Obs.	Mean	Std. Dev.	Min	Max
Tourism (\$M)	1836	9,230	22,200	1	256,000
Terrorism	1836	2.384	2.219	0	8.931
ICT Infrastructure	1836	38.311	30.554	0.055	100
Phy. Infrastructure	1836	24.088	7.456	1.525	58.151
Governance	1836	0.023	0.899	-1.784	1.969

Table 2
Descriptive statistics of different income groups

Variable	Low income					High income				
	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max
Terrorism	180	2.422	1.735	0	6.092	648	1.946	2.001	0	8.034
Tourism (\$M)	180	347	561	1	3,550	648	19,600	33,600	285	256,000
ICT Infrastructure	180	6.822	7.239	0.055	32.474	648	66.471	23.358	6.385	100
Phy. Infrastructure	180	21.076	9.810	3.949	53.988	648	24.018	5.522	10.217	48.869
Governance	180	-0.802	0.385	-1.587	0.024	648	1.037	0.595	-0.483	1.969

Variables	Lower middle income					Upper-middle income				
	Obs	Mean	Std. dev	Min	Max	Obs	Mean	Std. dev	Min	Max
Terrorism	522	2.627	2.625	0	8.931	486	2.693	2.089	0	7.519
Tourism (\$M)	522	1,970	3790	4	29100	486	6,570	10,700	63	65,200
ICT Infrastructure	522	17.218	17.091	0.140	76.124	486	35.083	23.547	0.390	82.642
Phy. Infrastructure	522	24.460	8.464	1.525	58.151	486	24.898	7.281	10.854	57.990
Governance	522	-0.624	0.357	-1.607	0.252	486	-0.326	0.438	-1.784	0.717

receipts are approximately nine billion USD in the overall sample. However, the average tourist receipts are much higher in the high-income group than in the other three income groups. The mean value of ICT is approximately 23 for high-income and upper-middle-income, which shows that almost one-fourth of the population has internet access.

In contrast, the mean values of ICT for lower-middle and low-income countries are 17.218 and 6.822, respectively, which shows that a fewer portion of the population

has internet access. A comparison of ICT infrastructure averages shows the increase in ICT infrastructure with an increase in income levels. In the case of physical infrastructure, the overall difference between high-income and other three groups is not that much. The mean governance values in the four income groups point toward the weak state of governance in low-income, lower-middle-income, and upper-middle-income countries. In contrast, the state of governance is much better in the high-income group.

Table 3 shows the correlation between tourism, terrorism, ICT, physical infrastructure, and governance in the overall sample (102 countries). Tourism receipts were found to be positively correlated with all the variables. Both ICT and governance are strongly correlated with tourism receipts. Similarly, ICT and governance are found to be strongly correlated as well.

Before applying the panel ARDL, we must check the stationarity properties of the variables. The CD test proposed by Pesaran (2004) is used to investigate whether cross-sectional reliance exists for the panel. Cross-sectional dependence can create complex issues while testing the unit root test null hypothesis.

CD test results in Table 4 demonstrate that the P-value is less than .05 for all variables, which means the variables are cross-sectionally dependent. Consequently, we can reject the null hypothesis of cross-sectional independence for tourism receipt, terrorism, ICT, physical infrastructure, and governance structure at a one percent significance level.

Table 5 shows the result of both CADF and CIPS. CADF results reveal that ICT is stationary at the level while the remaining

variables are stationary at the first difference. The CIPS panel unit root results show that tourism receipt, terrorism, and ICT are stationary at a one percent significance level. In comparison, the physical infrastructure and governance structure is stationary at first, with a one percent level of significance.

Panel ARDL Estimation

After the unit root analysis, Panel ARDL estimation is conducted. This study has taken different income categories because every country in the same region has different developmental status besides their difference in visiting places, climate conditions, and tourism industry competitiveness. Furthermore, every country in different regions has different facilities to accommodate tourists. Therefore, these factors are directly incorporated into the

Table 4
CD test results

Variable	CD-test	p-value
Tourism	207.41	.000
Terrorism	21.42	.000
ICT Infrastructure	285.19	.000
Phy. Infrastructure	29.59	.000
Governance	3.43	.001

Table 3
Correlation matrix is based on the overall sample

	I	II	III	IV	V
I Tourism	1				
II Terrorism	0.226***	1			
III ICT Infrastructure	0.670***	0.006	1		
IV Phy. Infrastructure	0.244***	0.009	0.157***	1	
V Governance	0.619***	-0.143	0.601***	0.010***	1

*** indicates significance at 1%

Table 5
Second generation unit root test results

Variable	Cross-section augmented Dickey-Fuller (CADF)			Cross-sectionally augmented IPS (CIPS)		
	Level		1 st Difference	Level		1 st Difference
	Intercept	Intercept + Trend	Intercept	Intercept	Intercept + Trend	
Tourism	-0.093	3.320	-2.352***	-2.456***	-2.777***	
Terrorism	-2.193**	-1.005	-2.193**	-2.294***	-2.741***	
ICT Infrastructure	-3.192***	-3.052***		-2.393***	-2.877***	
Phy. Infrastructure	2.832	6.197	-11.669***	-1.966	-2.478	-3.801***
Governance	-0.709	4.466	-8.715***	-2.196	-2.439	-3.976***

country’s Gross Domestic Product (GDP). Therefore, we not only estimated ARDL for the overall model but also divided the sample into different income groups to find any potential difference among the variables of interest due to differences in the level of economic development.

Column 1 in Table 6 contains estimation results based on the overall sample, while column 2 to 5 contains estimation results based on different income levels. Results from the PMG model show that the error correlation term (ECT) is negative with a significance level of 1%, indicating a long-run relationship between tourism and the independent variables. The ECT coefficient represents that the adjustment process to equilibrium after disturbance is quickest in high-income countries (-0.336) while it is lowest in lower-middle-income countries (-0.144). Physical infrastructure is a positive and significant predictor of tourism receipts in the overall sample and lower-middle-income and high-income countries in the short and long run. Bramo (2013) noted that physical infrastructure enhanced

overall output growth by facilitating the transportation of goods and services while helping the tourism industry. Kanwal et al. (2020) stated that road and transport infrastructure provides easy access to tourism destinations and increases business activities. Some researchers suggest that road and transport infrastructure plays a vital role in enhancing existing tourism activities and promoting the development of new tourism sites in the region (Currie & Falconer, 2014; Musa & Ndawayo, 2011). Kurihara and Wu (2016) and Li et al. (2019) found that high-speed train service has significantly increased the volume of tourism in Japan and China, as rapid mass transport facilitates the movement of individuals across tourist destinations.

ICT infrastructure has a positive and statistically significant influence on tourism in the long run, while its effect is not statistically robust in the short run. Adeola and Evans (2020) reported similar findings for ICT infrastructure on tourism. However, they explained that because digitalizing tourism is time-consuming, the technology

Table 6
Panel ARDL estimation results

Variable	Overall	Low	Lower Middle	Upper Middle	High
ECT	-0.306*** (0.022)	-0.337*** (0.099)	-0.144** (0.065)	-0.264*** (0.054)	-0.366*** (0.036)
D.Terrorism	0.006 (0.018)	-0.019 (0.074)	-0.074 (0.049)	-0.011 (0.010)	0.042 (0.037)
D.ICT Infrastructure	-0.067 (0.083)	-0.303 (0.427)	0.065 (0.095)	0.064 (0.097)	0.116 (0.159)
D.Phy. Infrastructure	0.229*** (0.084)	-0.072 (0.254)	0.435** (0.203)	0.110 (0.110)	0.463*** (0.086)
D.Governance	0.208* (0.112)	0.575 (0.524)	0.510* (0.304)	-0.046 (0.151)	0.069 (0.117)
Long-run					
Terrorism	0.006 (0.008)	0.185*** (0.047)	0.123*** (0.034)	-0.056*** (0.011)	0.009 (0.009)
ICT Infrastructure	0.251*** (0.014)	0.231*** (0.031)	0.109*** (0.042)	0.132*** (0.020)	0.642*** (0.029)
Phy. Infrastructure	0.457*** (0.060)	0.258 (0.203)	4.496*** (0.283)	-0.0003 (0.089)	0.485*** (0.076)
Governance	-0.103 (0.086)	-0.309 (0.383)	-0.547 (0.476)	-0.055 (0.098)	0.202* (0.106)
Constant	5.931*** (0.425)	5.379*** (1.469)	0.776** (0.320)	5.747*** (1.175)	6.821*** (0.683)
Observations	1734	170	493	459	612
Hausman Test Result					
MG & PMG	3.89 (0.422)	3.47 (0.482)	16.78 (0.002)	4.12 (0.391)	0.66 (0.9956)
PMG & DFE	1.01 (0.907)	0.11 (0.998)	3.96 (0.411)	0.13 (0.998)	0.13 (0.998)

***, **, and * shows statistical significance at 1%, 5%, and 10%, respectively, while values in parenthesis are standard errors

adoption rate is slow in most parts of the world. Therefore, in the short run, ICT does not play a significant role in tourism development.

The governance positively influences tourism in the overall sample in the short run, but its coefficient, in the long run, is negative and statistically insignificant. The governance is only positive and significant at 10% in high-income countries in the long run, while its coefficient is negative

and insignificant in developing countries. There can be several reasons for these results. First, many developing countries suffer political instability, leading to weak policy implementation. Second, corruption in developing countries and bureaucratic red tape create hurdles and obstruct business activities, including the tourism sector. Third, the weak law and order situation in many developing countries can also be the reason for this result. Fourth, in many

developing countries, civil bureaucracy is inefficient and military establishment plays a key role in decision making, which leads to poor policy formation and weak coordination among government agencies. Similarly, the situation of human rights in developing countries is not satisfactory, which leads to a poor ranking of these countries in the voice and accountability index. All the above factors contribute to the developing countries' weak performance in tourism.

The impact of terrorism on tourism is positive and statistically insignificant in the short-run and long-run in the overall sample. However, in the long run, terrorism positively and significantly affects tourism at 1% in the low and lower-middle-income countries while negatively influencing tourism in the upper-middle-income countries.

Many previous studies found the negative impact of terrorism on tourism (Asongu & Acha-Anyi, 2020; Bassil, 2014; Llorca-Vivero, 2008; Nadeem et al., 2020; Raza & Jawaid, 2013; Stankova et al., 2019). However, in the current study, we observed a positive impact of terrorism on tourism in low and lower-middle-income countries, which is contradictory to the previous literature. The possible reason for this result is that tourist spots in these countries may not be affected by terrorism. According to Fourie et al. (2020) and Seabra et al. (2020), tourists from safe countries favor traveling to countries with a comparable level of security. In contrast, tourists from unstable countries are less

concerned with the insecurity situation in the destination country. Baggio and Sainaghi (2011) argued that tourist flow might affect in the short run due to terrorism, but in the long run, tourists may return to the place of their choice.

Hausman test results show that only lower-middle-income countries' P-value is less than 0.05, indicating the MG model's selection. However, we mentioned PMG model results to maintain consistency and for comparison purposes among different income groups. In contrast, the DFE model selection is impossible as the P-value is greater than .05.

Regional Analysis

We also conducted a regional analysis for a robustness check and used World Economic Forum (2019) regional classification. Regional analysis is required in addition to the overall analysis as there are stark differences between countries belonging to different regions. Therefore, the regional analysis is the backbone of this study, showing similarities and differences among different world regions depending on their characteristics. The Travel and Tourism Competitive Report 2019 by the World Economic Forum divides the world into five regions: the Americas, Asia-pacific, Europe and Eurasia, Middle East and North Africa (MENA), and Sub-Saharan Africa.

Table 7 shows descriptive statistics of each region. The mean value of terrorism is highest in the Asia Pacific region, followed by the MENA region, and lowest in the Americas. Despite the highest mean score

Table 7
Descriptive analysis by region of the world

Variable	Europe & Eurasia					Asia Pacific				
	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max
Terrorism	612	2.107	2.037	0	7.519	270	3.494	2.848	0	8.931
Tourism (Million \$)	612	13100	17700	5	81300	270	11900	14300	59	65200
ICT Infrastructure	612	55.991	28.202	0.055	98.046	270	32.774	30.928	0.140	96.158
Phy. Infrastructure	612	24.045	5.627	9.137	57.990	270	28.057	7.729	14.123	58.151
Governance	612	0.552	0.939	-1.223	1.969	270	-0.028	0.906	-1.311	1.862
The Americas										
Variables	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max
Terrorism	396	2.208	2.010	0	7.002	324	01.864	1.782	0	8.034
Tourism (Millions \$)	396	900	1930	1	11200	324	12900	43400	76	256000
ICT Infrastructure	396	11.613	13.689	0.072	63.999	324	37.208	25.301	0.893	91.16
Phy. Infrastructure	396	21.350	8.384	1.525	53.988	324	21.915	5.862	9.138	44.308
Governance	396	-0.552	0.553	-1.607	0.8546	324	-0.084	0.828	-1.784	1.675
The Middle East & North Africa (MENA)										
Variables	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max
Terrorism	234	2.845	2.240	0	7.345	234	2.845	2.240	0	7.345
Tourism (Millions)	234	5080	4380	111	21400	234	5080	4380	111	21400
ICT Infrastructure	234	45.172	28.990	1.592	100	234	45.172	28.990	1.592	100
Phy. Infrastructure	234	27.266	8.447	12.835	50.780	234	27.266	8.447	12.835	50.780
Governance	234	-0.175	0.527	-1.232	0.818	234	-0.175	0.527	-1.232	0.818

in terrorism, Asia Pacific is in third place in tourism receipts, only eight percent lower than the Americas, which has the lowest mean score for terrorism. Asia Pacific region has the highest mean score for physical infrastructure, indicating it has a solid worldwide and homegrown travel industry market. In Europe and Eurasia, terrorism has a low mean value, and this region has performed well on all other indicators.

MENA region has the highest mean value for terrorism after the Asia Pacific region, and its performance in the governance structure is also not very impressive. In contrast, this region has better-quality ICT and physical infrastructure than other regions in the study. MENA region is additionally the sole region where international visitor spending is more prominent than domestic visitor spending. Nevertheless, despite improved competitiveness and a strong reliance on tourism for the overall economic process, MENA regions continue to underperform in the worldwide Travel and Tourism Competitiveness Index (TTCI). The intensity of terrorism is the lowest in the Americas and has the second-highest tourism receipts after Europe and Eurasia. However, it is ranked third in ICT and governance and fourth in physical infrastructure. Since 1995, the number of international tourists has grown by 330% for Central America and 230% for South America (World Tourism Organization, 2013).

Results of Panel ARDL based on different regions of the world are presented in Table 8. The ECT coefficient is less than one for all regions, which shows

convergence speed. Europe and Eurasia has the highest convergence rate (0.37), while Sub-Saharan Africa (SSA) has the lowest convergence rate (0.22) among all regions. Statistically, significant ECT means a long-run relationship exists between tourism receipt, terrorism, ICT infrastructure, physical infrastructure, and governance structure.

Long-run results show that terrorism is positively and significantly related to tourism in MENA, Sub-Saharan Africa, and the Asia Pacific. However, in the short run, it does not influence tourism. There are many possible reasons for these findings. First, there are many religious sacred places of different religions in these regions, and pilgrims visit these places as a religious obligation. For example, Muslims go for Hajj in Saudi Arabia and visit their sacred places in other nations in MENA countries. The Sikhs and Hindus visit Pakistan for their sacred places, and Jews visit Temple Mount in Jerusalem as a religious obligation. Second, these countries do not observe the continuous and enduring existence of terrorist activities but isolated terrorism incidents here and there. Saha and Yap (2014) stated that isolated terrorist incidents are less detrimental to tourism. Third, terrorist incidents in these regions are not frequently propagated to international media, and sometimes these incidents have only regional importance; that is why tourism arrival to these regions is not negatively influenced.

ICT shows a positive and significant relationship with tourism receipts in the long run, except for Sub-Saharan Africa, which

Table 8
Panel ARDL estimation results for different regions of the world

Variable	Europe & Eurasia	The Middle East & North Africa	Sub-Saharan Africa	Americas	Asia Pacific
ECT	-0.370*** (0.042)	-0.340*** (0.121)	-0.220*** (0.083)	-0.240*** (0.031)	-0.142** (0.067)
D.Terrorsim	0.038 (0.042)	-0.007 (0.023)	0.026 (0.028)	-0.005 (0.010)	-0.036 (0.026)
D.ICT Infrastructure	0.159 (0.155)	0.162 (0.184)	-0.096 (0.113)	-0.211** (0.103)	0.137 (0.136)
D.Phy. Infrastructure	0.417*** (0.077)	0.084 (0.181)	0.121 (0.266)	0.264*** (0.101)	0.215 (0.196)
D.Governance	0.175 (0.156)	0.205 (0.375)	0.238 (0.363)	0.266* (0.155)	0.068 (0.243)
Long-run					
Terrorism	0.013 (0.010)	0.091*** (0.011)	0.847*** (0.109)	-0.042 (0.029)	0.250*** (0.038)
ICT Infrastructure	0.312*** (0.027)	0.481*** (0.022)	-0.216*** (0.027)	0.234*** (0.043)	0.469*** (0.035)
Phy. Infrastructure	0.425*** (0.066)	-0.232* (0.120)	1.128*** (0.200)	0.497** (0.194)	0.806*** (0.177)
Governance	-0.393*** (0.103)	0.347** (0.136)	-2.775*** (0.437)	1.198*** (0.267)	0.538** (0.253)
Constant	7.492*** (0.864)	7.116*** (2.549)	2.839*** (1.081)	4.691*** (0.600)	2.555** (1.178)
Observations	578	221	374	306	255
Hausman Test Results					
MG & PMG	3.32(0.505)	1.24(0.872)	10.27(0.036)	0.53(0.970)	5.04(0.283)
PMG & DFE	0.45(0.978)	4.74(0.315)	1.49(0.828)	0.00(1.00)	0.24(0.993)

Note. ***, **, and * shows statistical significance at 1%, 5%, and 10%, respectively, while values in parenthesis are standard errors

is negative. Similarly, the ICT coefficient is negative and significant in the short-run for the Americas. The negative impact of ICT on tourism is contradictory to the previous studies; however, the possible reason for this effect is the lack of ICT infrastructure in Sub-Saharan Africa. Contrary to our findings, Adeola and Evans (2020) asserted ICT's positive impact on Africa's tourism. It may be due to the difference in the number of countries included in the sample and

proxies used to measure the ICT. Physical infrastructure enhances tourism in Europe, Eurasia, and the American region in the short run. At the same time, it fosters tourism in all regions except MENA, where its effect is negative at the 10% level of significance. This finding contradicts Adeola and Evans (2019), who found a positive impact of physical infrastructure in Africa.

In the long run, the governance structure is positively and significantly related to

tourism in the Americas, MENA, and Asia Pacific region. Our findings match the previous studies (Detotto et al., 2021; Dritsakis, 2004; Fayissa et al., 2008). However, only in the Americas region does governance plays a role in fostering tourism in the short run. Interestingly, governance is negatively related to tourism income in Europe and Eurasia, and Sub-Saharan Africa in the long run. This finding contradicts the existing literature, which states that good governance promotes tourism. Tang (2018) stated that tourists are more concerned about the political stability in a destination country.

Similarly, Saha and Yap (2014) reported that state political instability is more detrimental to tourism than an isolated terrorism incident. Based on these studies, we can conclude that many countries in Eurasia and sub-Saharan Africa are politically unstable, leading to weak implementation of rules and laws. That is why we observed a negative impact on governance in both regions. Hausman test results reveal that the PMG model is selected over MG as the

P-value is greater than .05. On the contrary, only the P-value of Sub-Saharan Africa is less than .05, which specifies that the MG model can also be used to maintain the consistency we selected PMG.

Dumitrescu-Hurlin Granger Causality Test in Panel Data

Dumitrescu-Hurlin panel Granger causality is applied to check the causative relationship between the analyzed variables (Dumitrescu & Hurlin, 2012).

Results from the Granger causality test in Table 9 revealed a unidirectional causality from Tourism receipt to terrorism, supported by previous studies such as Raza and Jawaid (2013). Our study found bidirectional causality among physical infrastructure and tourism receipts, and the results are supported by Mustafa (2019). However, there is no causality from ICT infrastructure to tourism receipt and from governance to tourism receipt. It is worth noting that physical infrastructure and tourism both have bidirectional causality because both are interrelated in generating cash inflow in

Table 9
Dumitrescu-Hurlin Panel Granger causality test

Hypothesis	W- bar	Z-bar tilde	P-Value	Result	Conclusion
Terrorism → Tourism	8.193	1.236	0.244	No	Unidirectional causality from Tourism to Terrorism
Tourism → Terrorism	13.193	5.862	0.007	Yes	
ICT Infrastructure → Tourism	10.647	3.223	0.095	No	No causality between ICT Infrastructure and Tourism
Tourism → ICT Infrastructure	9.373	2.191	0.157	No	
Physical Infrastructure → Tourism	11.839	4.187	0.018	Yes	Bidirectional causality between Physical Infrastructure and Tourism
Tourism → Physical Infrastructure	15.557	7.199	0.003	Yes	
Governance → Tourism	9.125	1.990	0.118	No	No Causality between Governance and Tourism

countries that ultimately increase their gross domestic product. However, the study found no causal relationship between governance structure and tourism.

CONCLUSION

This study investigated the effect of terrorism, ICT and physical infrastructure, and governance structure on tourism receipts of 102 countries for the period 2002–2019 by using Panel ARDL. The Panel ARDL approach confirmed the long-run relationship among the variables. The result of the overall sample revealed that physical and ICT infrastructure have a positive and statistically significant impact on tourism. Whereas governance structure has a negative and terrorism has a positive impact on tourism, both effects are not statistically significant. This study divided the overall sample into different income groups and regions for robustness analysis. The results showed that governance structure has an optimistic influence on the tourism income of high-income countries while ICT and physical infrastructure positively affect the income of the different income groups. However, terrorism positively impacts tourism in the long run, except for the upper-middle-income sample. Regional analysis showed a positive relationship between terrorism and tourism in MENA, Sub-Saharan Africa, and the Asia Pacific, indicating that despite terrorism incidents, tourism is gaining traction in these regions. ICT has a positive impact on tourism in Europe and Eurasia, MENA, America, and the Asia Pacific, while it has an adverse

impact on tourism in Sub-Saharan Africa. Physical infrastructure positively impacts tourism in Europe and Eurasia, Sub-Saharan Africa, Asia Pacific, and the Americas, whereas the impact is negative in MENA. The governance structure positively affects tourism in MENA, Asia Pacific, and America while negatively affecting Sub-Saharan Africa, Europe, and Eurasia.

Furthermore, DH causality results showed unidirectional causation from Tourism receipt to terrorism. In contrast, bidirectional causality exists between physical infrastructure and tourism because both generate cash inflow in countries that will increase their gross domestic product. DH results revealed no causal relationship between ICT infrastructure, governance structure, and tourism. This study concludes that governance structure positively influences tourism only in high-income nations while physical and ICT infrastructure are significant factors. Therefore, it is suggested that governments must invest in physical and ICT infrastructure to develop the tourism sector. Furthermore, governments must decrease terrorism with all means and advance governance structures to develop tourism.

Policy Implications

The results of this study have certain policy implications. Terrorism in any form and any tendency would be a devastating blow for the tourism industry as it influences the location choice of tourists. Therefore, to boost tourism income world must take rigorous

steps to minimize any chances of terror activities. For this purpose, individual states need to build the capacity of law enforcement agencies to tackle terrorism incidents. At the same time, there is a need for global coordination among international agencies to curb terrorism. There is also a need to investigate the root cause of terrorism, and the world must jointly make strategies to eliminate such root causes. Finally, there is a dire need to improve the governance structure as government efficiency and supervisory quality significantly influence the capability of a state to produce vacation industry income.

Better Physical and ICT infrastructure play a significant role in attracting tourists. There is also a need to install better information communication technologies, especially in remote areas, to resolve the connectivity issues to enhance tourists' exposure to distant tourist places.

Given this, policymakers and governments need to pay more attention to ICT and Physical infrastructure development. All stakeholders in the tourism industry are responsible for collaborating to develop policies and applications that will maximize the potential benefits of physical and ICT infrastructure to every level of tourism, travel, and hospitality enterprises. Tourism organizations can use the internet for promotion through pop-ups, newsletters, websites, and search engine optimization strategies. Artificial intelligence, machine learning and fintech can play a pivotal role in understanding tourists' arrival patterns, spending patterns, and decision choices

and can facilitate tourists through the development of innovative solutions.

Limitation of the Study

This study has several limitations that future studies can address. The COVID-19 pandemic severely affected the travel and tourism industry. Future studies can investigate the effect of COVID-19 on the travel & tourism industry. Future studies can also analyze the non-linear relationship among these variables and calculate the turning points at which any independent variable changes its sign from positive to negative or vice versa on tourism. Furthermore, future studies can also study the interaction effect of ICT, physical infrastructure, governance structure, and terrorism on tourism. Furthermore, future research can employ alternative proxies for Physical and ICT infrastructure.

ACKNOWLEDGEMENT

We are grateful to our colleagues at the Department of Management Sciences, CUI, Abbottabad Campus, for their valuable insights and suggestions on the earlier drafts of this manuscript.

REFERENCES

- Adeloye, D., & Brown, L. (2018). Terrorism and domestic tourist risk perceptions. *Journal of Tourism and Cultural Change*, 16(3), 217-233. <https://doi.org/10.1080/14766825.2017.1304399>
- Adeola, O., & Evans, O. (2019). Digital tourism: Mobile phones, internet and tourism in Africa. *Tourism Recreation Research*, 44(2), 190-202. <https://doi.org/10.1080/02508281.2018.1562662>

- Adeola, O., & Evans, O. (2020). ICT, infrastructure, and tourism development in Africa. *Tourism Economics*, 26(1), 97-114. <https://doi.org/10.1177/1354816619827712>
- Alford, P., & Clarke, S. (2009). Information technology and tourism a theoretical critique. *Technovation*, 29(9), 580-587. <https://doi.org/10.1016/J.TECHNOVATION.2009.05.006>
- Almuhri, H., Scott, N., & Alriyami, H. (2017). Introduction. In H. Almuhri, H. Alriyami, & N. Scott (Eds.), *Tourism in the Arab World* (pp. 1-15). Multilingual Matters. <https://doi.org/10.21832/9781845416157-002>
- Alvarez, M. D., & Campo, S. (2014). The influence of political conflicts on country image and intention to visit: A study of Israel's image. *Tourism Management*, 40, 70-78. <https://doi.org/10.1016/J.TOURMAN.2013.05.009>
- Anwar, M. A., Carmody, P., Surborg, B., & Corcoran, A. (2014). The diffusion and impacts of information and communication technology on tourism in the Western Cape, South Africa. *Urban Forum*, 25(4), 531-545. <https://doi.org/10.1007/s12132-013-9210-4>
- Araña, J. E., & León, C. J. (2008). The impact of terrorism on tourism demand. *Annals of Tourism Research*, 35(2), 299-315. <https://doi.org/10.1016/J.ANNALS.2007.08.003>
- Asongu, S. A., & Acha-Anyi, P. N. (2020). Global tourism and waves of terror: Perspectives from military expenditure. *Journal of Policy Research in Tourism, Leisure and Events*, 12(2), 239-261. <https://doi.org/10.1080/19407963.2019.1676762>
- Ayuningtyas, D., & Ariwibowo, D. A. (2020). The strategic role of information communication technology in succeeding medical tourism. *Enfermería Clínica*, 30, 170-173. <https://doi.org/10.1016/J.ENFCLI.2020.06.039>
- Baggio, R., & Sainaghi, R. (2011). Complex and chaotic tourism systems: Towards a quantitative approach. *International Journal of Contemporary Hospitality Management*, 23(6), 840-861. <https://doi.org/10.1108/09596111111153501>
- Bassil, C. (2014). The effect of terrorism on tourism demand in the Middle East. *Peace Economics, Peace Science and Public Policy*, 20(4), 669-684. <https://doi.org/10.1515/peps-2014-0032>
- Bassil, C., Saleh, A. S., & Anwar, S. (2019). Terrorism and tourism demand: A case study of Lebanon, Turkey and Israel. *Current Issues in Tourism*, 22(1), 50-70. <https://doi.org/10.1080/13683500.2017.1397609>
- Bayram, G. E. (2020). Impact of information technology on tourism. In A. Hassan & A. Sharma (Eds.), *The Emerald Handbook of ICT in Tourism and Hospitality* (pp. 243-257). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-83982-688-720201015>
- Bethapudi, A. (2013). The role of ICT in tourism industry. *Journal of Applied Economics and Business*, 1(4), 67-79.
- Bhattarai, K., Conway, D., & Shrestha, N. (2005). Tourism, terrorism and turmoil in Nepal. *Annals of Tourism Research*, 32(3), 669-688. <https://doi.org/10.1016/j.annals.2004.08.007>
- Bramo, F. (2013). The role of railway infrastructure on the tourism development (case Albania). *Albanian Journal of Agricultural Sciences*, 12(2), 297-300.
- Buhalis, D. (2004). eAirlines: strategic and tactical use of ICTs in the airline industry. *Information & Management*, 41(7), 805-825. <https://doi.org/10.1016/J.IM.2003.08.015>
- Buhalis, D. (2020). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review*, 75(1), 267-272. <https://doi.org/10.1108/TR-06-2019-0258>

- Buigut, S., Kapar, B., & Braendle, U. (2021). Effect of regional terrorism events on Malaysian tourism demand. *Tourism and Hospitality Research*, 22(3), 271-283. <https://doi.org/10.1177/14673584211021895>
- Catudan, J. M. J. (2016). The impact of tourist arrivals, physical infrastructures, and employment, on regional output growth. *Procedia - Social and Behavioral Sciences*, 219, 175-184. <https://doi.org/10.1016/j.sbspro.2016.05.003>
- Causevic, S., & Lynch, P. (2013). Political (in)stability and its influence on tourism development. *Tourism Management*, 34, 145-157. <https://doi.org/10.1016/J.TOURMAN.2012.04.006>
- Choudhary, S. A., Khan, M. A., Sheikh, A. Z., Jabor, M. K., Nordin, M. S. bin, Nassani, A. A., Alotaibi, S. M., Abro, M. M. Q., Vo, X. V., & Zaman, K. (2020). Role of information and communication technologies on the war against terrorism and on the development of tourism: Evidence from a panel of 28 countries. *Technology in Society*, 62, Article 101296. <https://doi.org/10.1016/J.TECHSOC.2020.101296>
- Currie, C., & Falconer, P. (2014). Maintaining sustainable island destinations in Scotland: The role of the transport-tourism relationship. *Journal of Destination Marketing & Management*, 3(3), 162-172. <https://doi.org/10.1016/J.JDMM.2013.10.005>
- Detotto, C., Giannoni, S., & Goavec, C. (2021). Does good governance attract tourists? *Tourism Management*, 82, Article 104155. <https://doi.org/10.1016/j.tourman.2020.104155>
- Dlugosz, D. B., Dlugosz, M. M., Dlugosz, A. P., & Rzetala, M. (2022). The impact of revolutions and terrorist attacks on tourism. Case study of Egypt. *Journal of Environmental Management and Tourism*, 13(2), 354-366.
- Dorcic, J., Komsic, J., & Markovic, S. (2019). Mobile technologies and applications towards smart tourism – state of the art. *Tourism Review*, 74(1), 82-103. <https://doi.org/10.1108/TR-07-2017-0121>
- Dritsakis, N. (2004). Cointegration analysis of German and British tourism demand for Greece. *Tourism Management*, 25(1), 111-119. [https://doi.org/10.1016/S0261-5177\(03\)00061-X](https://doi.org/10.1016/S0261-5177(03)00061-X)
- Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450-1460. <https://doi.org/10.1016/j.econmod.2012.02.014>
- Fayissa, B., Nsiah, C., & Tadasse, B. (2008). Impact of tourism on economic growth and development in Africa. *Tourism Economics*, 14(4), 807-818. <https://doi.org/10.5367/000000008786440229>
- Fernando, S., Bandara, J. S., Liyanaarachch, S., Jayathilaka, R., & Smith, C. (2013). Political violence and volatility in international tourist arrivals: The case of Sri Lanka. *Tourism Analysis*, 18(5), 575-586. <https://doi.org/10.3727/108354213X13782245307876>
- Fletcher, J., & Morakabati, Y. (2008). Tourism activity, terrorism and political instability within the commonwealth: The cases of Fiji and Kenya. *International Journal of Tourism Research*, 10(6), 537-556. <https://doi.org/10.1002/JTR.699>
- Fourie, J., Rosselló-Nadal, J., & Santana-Gallego, M. (2020). Fatal attraction: How security threats hurt tourism. *Journal of Travel Research*, 59(2), 209-219. <https://doi.org/10.1177/0047287519826208>
- Gretzel, U., Sigala, M., Xiang, Z., & Koo, C. (2015). Smart tourism: Foundations and developments. *Electronic Markets*, 25(3), 179-188. <https://doi.org/10.1007/s12525-015-0196-8>
- Guemide, B., Benachaiba, C., & Maouche, S. (2019). Integrating ICT-based applications for sustainable tourism development in Algeria. *Journal of Tourism & Hospitality*, 8(5), 1-15.
- Haider, A., ud Din, M., & Ghani, E. (2011). Consequences of political instability, governance and bureaucratic corruption on inflation and

- growth: The case of Pakistan. *The Pakistan Development Review*, 50(4), 773-807.
- Isaac, R. K. (2021). An exploratory study: The impact of terrorism on risk perceptions. An analysis of the German market behaviours and attitudes towards Egypt. *Tourism Planning and Development*, 18(1), 25-44. <https://doi.org/10.1080/21568316.2020.1753106>
- Ishikawa, N., & Fukushige, M. (2007). Impacts of tourism and fiscal expenditure to remote islands: The case of the Amami islands in Japan. *Applied Economics Letters*, 14(9), 661-666. <https://doi.org/10.1080/13504850500461423>
- Kanwal, S., Rasheed, M. I., Pitafi, A. H., Pitafi, A., & Ren, M. (2020). Road and transport infrastructure development and community support for tourism: The role of perceived benefits, and community satisfaction. *Tourism Management*, 77, Article 104014. <https://doi.org/10.1016/J.TOURMAN.2019.104014>
- Karamelikli, H., Khan, A. A., & Karimi, M. S. (2020). Is terrorism a real threat to tourism development? Analysis of inbound and domestic tourist arrivals in Turkey. *Current Issues in Tourism*, 23(17), 2165-2181. <https://doi.org/10.1080/13683500.2019.1681945>
- Karanasios, S., & Burgess, S. (2008). Tourism and internet adoption: A developing world perspective. *International Journal of Tourism Research*, 10(2), 169-182. <https://doi.org/10.1002/JTR.649>
- Kaya, M. G., Onifade, S. T., & Akpınar, A. (2022). Terrorism and tourism: An empirical exemplification of consequences of terrorist attacks on tourism revenues in Turkey. *An International Interdisciplinary Journal Original Research Article*, 70(1), 28-36. <https://doi.org/10.37741/t.70.1.2>
- Kumar, S., & Sharma, D. (2017). Study of ICT and tourism led growth in India and Thailand. *Social Science Asia*, 3(3), 24-31.
- Kurihara, T., & Wu, L. (2016). The Impact of high speed rail on tourism development: A case study of Japan. *The Open Transportation Journal*, 10(1), 35-44. <https://doi.org/10.2174/1874447801610010035>
- Lanouar, C., & Goaid, M. (2019). Tourism, terrorism and political violence in Tunisia: Evidence from Markov-switching models. *Tourism Management*, 70, 404-418. <https://doi.org/10.1016/J.TOURMAN.2018.09.002>
- Li, L. S. Z., Yang, F. X., & Cui, C. (2019). High-speed rail and tourism in China: An urban agglomeration perspective. *International Journal of Tourism Research*, 21(1), 45-60. <https://doi.org/10.1002/jtr.2240>
- Liu, A., & Wall, G. (2006). Planning tourism employment: A developing country perspective. *Tourism Management*, 27(1), 159-170. <https://doi.org/10.1016/j.tourman.2004.08.004>
- Liu, Y., & Shi, J. (2019). How inter-city high-speed rail influences tourism arrivals: Evidence from social media check-in data. *Current Issues in Tourism*, 22(9), 1025-1042. <https://doi.org/10.1080/13683500.2017.1349080>
- Llorca-Vivero, R. (2008). Terrorism and international tourism: New evidence. *Defence and Peace Economics*, 19(2), 169-188. <https://doi.org/10.1080/10242690701453917>
- Lutz, B. J., & Lutz, J. M. (2020). Terrorism and tourism in the Caribbean: A regional analysis. *Behavioral Sciences of Terrorism and Political Aggression*, 12(1), 55-71. <https://doi.org/10.1080/19434472.2018.1518337>
- Maltese, I., & Zamparini, L. (2021). *Transport modes and tourism*. In R. Vickerman (Ed.), *International Encyclopedia of Transportation* (pp. 26-31). Elsevier. <https://doi.org/10.1016/B978-0-08-102671-7.10401-4>
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396. <https://doi.org/10.1037/h0054346>

- Masson, S., & Petiot, R. (2009). Can the high speed rail reinforce tourism attractiveness? The case of the high speed rail between Perpignan (France) and Barcelona (Spain). *Technovation*, 29(9), 611-617. <https://doi.org/10.1016/J.TECHNOVATION.2009.05.013>
- McElroy, J. L. (2006). Small island tourist economies across the life cycle. *Asia Pacific Viewpoint*, 47(1), 61-77. <https://doi.org/https://doi.org/10.1111/j.1467-8373.2006.00303.x>
- Musa, I. J., & Ndawayo, B. A. (2011). The role of transportation in the development of tourism in Nigeria. *Tourismos*, 6(1), 297-305. <https://doi.org/10.26215/TOURISMOS.V6I1.210>
- Mustafa, A. M. M. (2019). The impact of infrastructure on tourism: The case of Sri Lanka. *Asian Social Science*, 15(7), 174. <https://doi.org/10.5539/ass.v15n7p174>
- Muthoni, D. (2021). Effect of terrorism on the performance of tourism industry. A critical literature review. *International Journal of Modern Hospitality and Tourism*, 1(1), 58-71. <https://doi.org/10.47604/IJMHT.1364>
- Nadeem, M. A., Liu, Z., Xu, Y., Nawaz, K., Malik, M. Y., & Younis, A. (2020). Impacts of terrorism, governance structure, military expenditures and infrastructures upon tourism: Empirical evidence from an emerging economy. *Eurasian Business Review*, 10(1), 185-206. <https://doi.org/10.1007/s40821-020-00152-y>
- National Consortium for the Study of Terrorism and Responses to Terrorism. (2022). *Global Terrorism Database 1970 - 2020*. <https://www.start.umd.edu/gtd>
- Neumayer, E., & Plümper, T. (2016). Spatial spillovers from terrorism on tourism: Western victims in Islamic destination countries. *Public Choice*, 169(3), 195-206. <https://doi.org/10.1007/S11127-016-0359-Y>
- O'Brien, A. (2012). Wasting a good crisis: Developmental failure and Irish tourism since 2008. *Annals of Tourism Research*, 39(2), 1138-1155. <https://doi.org/10.1016/J.ANNALS.2011.12.008>
- Öcal, N., & Yildirim, J. (2010). Regional effects of terrorism on economic growth in Turkey: A geographically weighted regression approach. *Journal of Peace Research*, 47(4), 477-489. <https://doi.org/10.1177/0022343310364576>
- Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels* (IZA Discussion paper no. 1240). IZA. <https://ftp.iza.org/dp1240.pdf>
- Pesaran, M. H., Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. *Journal of the American Statistical Association*, 94(446), 621-634. <https://doi.org/10.1080/01621459.1999.10474156>
- Raza, S. A., & Jawaid, S. T. (2013). Terrorism and tourism: A conjunction and ramification in Pakistan. *Economic Modelling*, 33, 65-70. <https://doi.org/10.1016/j.econmod.2013.03.008>
- Roehl, W. S., & Fesenmaier, D. R. (1992). Risk perceptions and pleasure travel: An exploratory analysis. *Journal of Travel Research*, 30(4), 17-26. <https://doi.org/10.1177/004728759203000403>
- Saayman, A., & Saayman, M. (2008). Determinants of inbound tourism to South Africa. *Tourism Economics*, 14(1), 81-96. <https://doi.org/10.5367/000000008783554893>
- Saha, S., & Yap, G. (2014). The moderation effects of political instability and terrorism on tourism development. *Journal of Travel Research*, 53(4), 509-521. <https://doi.org/10.1177/0047287513496472>
- Santana-Gallego, M., & Fourie, J. (2020). Tourism falls apart: How insecurity affects African

- tourism. *Tourism Economics*, 28(4), 995-1008. <https://doi.org/10.1177/1354816620978128>
- Seabra, C., Reis, P., & Abrantes, J. L. (2020). The influence of terrorism in tourism arrivals: A longitudinal approach in a Mediterranean country. *Annals of Tourism Research*, 80, Article 102811. <https://doi.org/10.1016/j.annals.2019.102811>
- Sloboda, B. W. (2003). Assessing the effects of terrorism on tourism by use of time series methods. *Tourism Economics*, 9(2), 179-190. <https://doi.org/10.5367/000000003101298349>
- Stankova, M., Tsvetkov, T., & Ivanova, L. (2019). Tourist development between security and terrorism: Empirical evidence from Europe and the United States. *Oeconomia Copernicana*, 10(2), 219-237. <https://doi.org/10.24136/oc.2019.011>
- Sun, Y., & Luo, M. (2021). Impacts of terrorist events on tourism development: Evidence from Asia. *Journal of Hospitality & Tourism Research*, 46(4), 696-723. <https://doi.org/10.1177/1096348020986903>
- Tang, C. F. (2018). The impacts of governance and institutions on inbound tourism demand: Evidence from a dynamic panel data study. *Asia Pacific Journal of Tourism Research*, 23(10), 1000-1007. <https://doi.org/10.1080/10941665.2018.1513052>
- Tussyadiah, I. P., & Zach, F. J. (2012). The role of geo-based technology in place experiences. *Annals of Tourism Research*, 39(2), 780-800. <https://doi.org/10.1016/J.ANNALS.2011.10.003>
- Vujko, A., & Gajic, T. (2014). The government policy impact on economic development of tourism. *Ekonomika Poljoprivrede*, 61(3), 789-804. <https://doi.org/10.5937/ekopolj1403789v>
- Walters, G., Wallin, A., & Hartley, N. (2018). The threat of terrorism and tourist choice behavior. *Journal of Travel Research*, 58(3), 370-382. <https://doi.org/10.1177/0047287518755503>
- Wang, S., & Cheung, W. (2004). E-business adoption by travel agencies: Prime candidates for mobile e-business. *International Journal of Electronic Commerce*, 8(3), 43-63. <https://doi.org/10.1080/10864415.2004.11044298>
- World Economic Forum. (2019). *The travel & tourism competitiveness report 2019: Travel and tourism at a tipping point*. <https://www.weforum.org/reports/the-travel-tourism-competitiveness-report-2019>
- World Economic Forum. (2022). *Travel & tourism development index 2021: Rebuilding for a sustainable and resilient future* (Insight Report). https://www3.weforum.org/docs/WEF_Travel_Tourism_Development_2021.pdf
- World Tourism Organization. (2013). *Tourism in the Americas – 2013 Edition*. <https://doi.org/10.18111/9789284415885>
- World Travel and Tourism Council. (2021). *Travel and tourism: Economic impact 2021*. <https://wtcc.org/Portals/0/Documents/Reports/2021/Global Economic Impact and Trends 2021.pdf>
- Ziółkowska-Weiss, K., & Pieron, E. (2021). Assessment of the impact of terrorism on tourism in the 21st century: The example of Egypt. *Przedsiębiorczość - Edukacja*, 17(1), 244-256. <https://doi.org/10.24917/20833296.171.19>

APPENDIX*List of countries included in the sample*

Country	Region*	Income**
Albania	Europe and Eurasia	Upper-Middle-Income Economies
Algeria	Middle East and North Africa (MENA)	Lower-Middle Income Economies
Angola	Sub-Saharan Africa	Lower-Middle Income Economies
Argentina	The Americas	Upper-Middle-Income Economies
Armenia	Europe and Eurasia	Upper-Middle-Income Economies
Australia	Asia Pacific	High-Income Economies
Austria	Europe and Eurasia	High-Income Economies
Azerbaijan	Europe and Eurasia	Upper-Middle-Income Economies
Bahrain	Middle East and North Africa (MENA)	High-Income Economies
Bangladesh	Asia Pacific	Lower-Middle Income Economies
Belgium	Europe and Eurasia	High-Income Economies
Benin	Sub-Saharan Africa	Lower-Middle Income Economies
Bolivia	The Americas	Lower-Middle Income Economies
Bosnia and Herzegovina	Europe and Eurasia	Upper-Middle-Income Economies
Brazil	The Americas	Upper-Middle-Income Economies
Bulgaria	Europe and Eurasia	Upper-Middle-Income Economies
Burundi	Sub-Saharan Africa	Low-Income Economies
Cambodia	Asia Pacific	Lower-Middle Income Economies
Cameroon	Sub-Saharan Africa	Lower-Middle Income Economies
Canada	The Americas	High-Income Economies
Chile	The Americas	High-Income Economies
China	Asia Pacific	Upper-Middle-Income Economies
Colombia	The Americas	Upper-Middle-Income Economies
Costa Rica	The Americas	Upper-Middle-Income Economies
Cote d'Ivoire	Sub-Saharan Africa	Lower-Middle Income Economies
Cyprus	Europe and Eurasia	High-Income Economies
Czech Republic	Europe and Eurasia	High-Income Economies
Denmark	Europe and Eurasia	High-Income Economies
Ecuador	The Americas	Upper-Middle-Income Economies
Egypt, Arab Rep.	Middle East and North Africa (MENA)	Lower-Middle Income Economies
Estonia	Europe and Eurasia	High-Income Economies
Ethiopia	Sub-Saharan Africa	Low-Income Economies
Finland	Europe and Eurasia	High-Income Economies
France	Europe and Eurasia	High-Income Economies
Georgia	Europe and Eurasia	Upper-Middle-Income Economies
Germany	Europe and Eurasia	High-Income Economies
Greece	Europe and Eurasia	High-Income Economies
Guatemala	The Americas	Upper-Middle-Income Economies
Guinea-Bissau	Sub-Saharan Africa	Low-Income Economies
Haiti	The Americas	Low-Income Economies
Honduras	The Americas	Lower-Middle Income Economies

Country	Region*	Income**
Hungary	Europe and Eurasia	High-Income Economies
India	Asia Pacific	Lower-Middle Income Economies
Indonesia	Asia Pacific	Upper-Middle-Income Economies
Iran, Islamic Rep.	Middle East and North Africa (MENA)	Upper-Middle-Income Economies
Ireland	Europe and Eurasia	High-Income Economies
Israel	Middle East and North Africa (MENA)	High-Income Economies
Italy	Europe and Eurasia	High-Income Economies
Japan	Asia Pacific	High-Income Economies
Jordan	Middle East and North Africa (MENA)	Upper-Middle-Income Economies
Kazakhstan	Europe and Eurasia	Upper-Middle-Income Economies
Kenya	Sub-Saharan Africa	Lower-Middle Income Economies
Kuwait	Middle East and North Africa (MENA)	High-Income Economies
Kyrgyz Republic	Europe and Eurasia	Lower-Middle Income Economies
Lao PDR	Asia Pacific	Lower-Middle Income Economies
Lebanon	Middle East and North Africa (MENA)	Upper-Middle-Income Economies
Lesotho	Sub-Saharan Africa	Lower-Middle Income Economies
Malawi	Sub-Saharan Africa	Low-Income Economies
Mali	Sub-Saharan Africa	Low-Income Economies
Mauritius	Sub-Saharan Africa	High-Income Economies
Moldova	Europe and Eurasia	Lower-Middle Income Economies
Mongolia	Asia Pacific	Lower-Middle Income Economies
Morocco	Middle East and North Africa (MENA)	Lower-Middle Income Economies
Mozambique	Sub-Saharan Africa	Low-Income Economies
Namibia	Sub-Saharan Africa	Upper-Middle-Income Economies
Netherlands	Europe and Eurasia	High-Income Economies
New Zealand	Asia Pacific	High-Income Economies
Nicaragua	The Americas	Lower-Middle Income Economies
Nigeria	Sub-Saharan Africa	Lower-Middle Income Economies
Norway	Europe and Eurasia	High-Income Economies
Pakistan	Asia Pacific	Lower-Middle Income Economies
Panama	The Americas	High-Income Economies
Paraguay	The Americas	Upper-Middle-Income Economies
Peru	The Americas	Upper-Middle-Income Economies
Philippines	Asia Pacific	Lower-Middle Income Economies
Qatar	Middle East and North Africa (MENA)	High-Income Economies
Romania	Europe and Eurasia	High-Income Economies
Russia	Europe and Eurasia	Upper-Middle-Income Economies
Rwanda	Sub-Saharan Africa	Low-Income Economies
Saudi Arabia	Middle East and North Africa (MENA)	High-Income Economies
Senegal	Sub-Saharan Africa	Lower-Middle Income Economies
Serbia	Europe and Eurasia	Upper-Middle-Income Economies
South Africa	Sub-Saharan Africa	Upper-Middle-Income Economies
South Korea	Asia Pacific	High-Income Economies
Spain	Europe and Eurasia	High-Income Economies

Country	Region*	Income**
Sri Lanka	Asia Pacific	Lower-Middle Income Economies
Swaziland	Sub-Saharan Africa	Lower-Middle Income Economies
Sweden	Europe and Eurasia	High-Income Economies
Switzerland	Europe and Eurasia	High-Income Economies
Tajikistan	Europe and Eurasia	Low-Income Economies
Tanzania	Sub-Saharan Africa	Lower-Middle Income Economies
Thailand	Asia Pacific	Upper-Middle-Income Economies
Tunisia	Middle East and North Africa (MENA)	Lower-Middle Income Economies
Turkey	Europe and Eurasia	Upper-Middle-Income Economies
Uganda	Sub-Saharan Africa	Low-Income Economies
Ukraine	Europe and Eurasia	Lower-Middle Income Economies
United Arab Emirates	Middle East and North Africa (MENA)	High-Income Economies
United Kingdom	Europe and Eurasia	High-Income Economies
United States	The Americas	High-Income Economies
Uruguay	The Americas	High-Income Economies
Venezuela, RB	The Americas	Upper-Middle-Income Economies
Zimbabwe	Sub-Saharan Africa	Lower-Middle Income Economies

*Region Classification based on the Travel & Tourism Report 2019

** Income classification based on World Bank classification

