ASSESSING THE IMPACT OF GEOPOLITICAL RISKS AND ECONOMIC GROWTH ON TOURISM IN ADVANCED COUNTRIES

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Abstract

The exploration of tourism and its determinants constitutes a well-established domain within research. However, in recent years, the significance of geopolitical risks as a crucial determinant of tourism has gained increasing attention. This study employs a comprehensive analytical framework, incorporating the Kao and Westerlund co-integration test, the panel autoregressive distributed lag (ARDL) model, and Dumitrescu Hurlin (2012) panel causality tests. The analysis focuses on discerning the impact of geopolitical risks and economic growth on tourism receipts across advanced countries, spanning the period from 1996 to 2018. The application of Kao and Westerlund co-integration tests reveals evidence of co-integration among the examined variables. The ARDL model results indicate that geopolitical risks and economic growth are key long-term drivers of tourism receipts: a 1% increase in geopolitical risk raises receipts by about 0.13%, while a 1% GDP increase boosts them by 3.23%. These findings highlight the sustained nature of their influence on tourism receipts over an extended temporal horizon.

Keywords: Panel Data, Economic Growth, Tourism, Geopolitical Risks

JEL Codes: C23, O47, Z32

GELİŞMİŞ ÜLKELERDE JEOPOLİTİK RİSKLER VE EKONOMİK BÜYÜMENİN TURİZM ÜZERİNDEKİ ETKİSİNİN DEĞERLENDİRİLMESİ

Özet

Turizmin ve belirleyicilerinin incelenmesi, araştırmalar içinde köklü bir alan teşkil etmektedir. Ancak son yıllarda, turizmin önemli bir belirleyicisi olarak jeopolitik risklerin önemi dikkat çekmektedir. Bu çalışmada, Kao ve Westerlund koentegrasyon testi, panel otoregresif dağıtılmış gecikme (ARDL) modeli ve Dumitrescu Hurlin (2012) panel nedensellik testlerini içeren kapsamlı bir analitik çerçeve kullanılmaktadır. Analiz, jeopolitik risklerin ve ekonomik büyümenin gelişmiş ülkelerdeki turizm gelirleri üzerindeki etkisini 1996'dan 2018'e kadar olan dönemi kapsayacak şekilde ayırt etmeye odaklanmaktadır. Kao ve Westerlund eş-bütünleşme testlerinin uygulanması, incelenen değişkenler arasında eş-bütünleşme olduğuna dair kanıtlar ortaya koymaktadır. ARDL modeli sonuçları, jeopolitik risklerin ve ekonomik büyümenin turizm gelirlerinin uzun vadeli temel belirleyicileri olduğunu göstermektedir: jeopolitik riskteki %1'lik bir artış gelirleri yaklaşık %0,13 oranında artırırken, GSYH'deki %1'lik bir artış gelirleri %3,23 oranında artırmaktadır. Bu durum, turizm gelirleri üzerindeki etkilerinin uzun bir zamansal ufukta süreklilik arz ettiğinin altını çizmektedir.

Anahtar Kelimeler: Panel Veri, Ekonomik Büyüme, Turizm, Jeopolitik Riskler

JEL Kodları: C23, O47, Z32

INTRODUCTION

The role of tourism as a crucial driver of economic growth is widely recognized. Empirical research has consistently demonstrated a positive correlation between tourism development and the overall Gross Domestic Product (GDP) of nations, as highlighted by the work of Lee and Chang in 2008. Additionally, Ashley and Mitchell (2009) indicated that foreign tourists' income directly lowers the cost of living in many nations, stimulating economic growth and contributing to the eradication of poverty. These reasons clarify why so many developing country governments are keen to attract tourists to their regions. Additionally, Cárdenas-García et al. (2015)'s study, featuring a sizable sample of nations, highlights how the relationship between tourism and growth differs for nations at various levels of development. The findings show that less developed nations are more likely to gain from global tourism. However, it is imperative to recognize the multifaceted nature of the tourism sector, wherein geopolitical factors wield significant influence. Balli et al. (2019) underscore the intricate interplay between tourism and geopolitical risks, encompassing conflicts such as wars, terrorism, tensions, ethnic strife, and political

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violence within and between states. These phenomena, collectively termed as geopolitical risks, exert profound effects on the socio-economic milieu, precipitating challenges such as a diminished influx of tourism into regions marred by such adversities.

Tourism dynamics are shaped by a multitude of complex factors that have been addressed through a diverse array of methodological approaches. These factors include, but are not limited to, oil prices (Al-Mulali et al., 2020), winter temperatures (Falk and Lin, 2018), environment (Lee et al, 2022), terrorist attacks or uprisings in competing countries (Afonso-Rodríguez and Santana-Gallego, 2018; Trindade, 2017), the stock market index of the tourism industry (Demiralay and Kilincarslan, 2019; Polat et al., 2021), and epidemic diseases (Dwyer et al., 2006). Tourism preferences were generally associated with economic variables, however, non-economic variables, such as cultural predilections, can likewise exert an influence on the choice of a travel destination., as indicated by the study of Cho (2010) which found that people from different regions exhibit distinct preferences such as; Europeans and Asians, for example, tend to prefer destinations with cultural heritage sites, while Americans prefer socially-rich environments.

It is widely postulated that travelers gravitate towards secure destinations that are devoid of undesirable occurrences such as political turmoil or acts of terrorism. Nevertheless, investigations carried out by Liu and Pratt (2017) posit that terrorist attacks may exert a transient deleterious influence on the tourism industry, with no enduring effect. Likewise, Agiomirgianakis et al. (2017) have demonstrated the veracity of the short-term adverse impact of terrorist attacks or political instability on tourism, while indicating that they bear no long-term effect. The research landscape, as underscored by studies conducted by Balli et al. (2019) and Hasan et al. (2020), has exhibited a pronounced proclivity towards directing attention to emerging countries rather than advanced nations. This trend is discernible due to the prevailing perception that geopolitical risks are intrinsically more likely to manifest in economies categorized as emerging, as opposed to their more established and advanced counterparts. Geopolitical risks, encompassing factors such as political instability, social unrest, and economic volatility, are often perceived as heightened in emerging economies, thereby becoming a focal point in academic inquiries. Contrary to this predominant focus, the present paper seeks to depart from the conventional research trajectory by concentrating on the performance of advanced countries in the context of geopolitical risks' influence on tourism. This deliberate deviation stems from a recognition that advanced nations, despite being perceived as more resilient to geopolitical disruptions, are not immune to their effects. Thus, the study employs a comprehensive approach by incorporating various advanced nations as integral components of the analytical framework.

By examining the influence of geopolitical risks on tourism in advanced countries, the research endeavors to unravel nuanced patterns and outcomes that may have been overshadowed in the existing literature predominantly centered on emerging economies. This departure from the prevailing research emphasis not only contributes to a more holistic understanding of the dynamics at play but also sheds light on the specific vulnerabilities and resilience mechanisms exhibited by advanced nations in the face of geopolitical uncertainties. Consequently, the study aspires to enrich the scholarly discourse on the multifaceted relationship between geopolitical risks and the tourism sector, offering insights that extend beyond the traditional confines of emerging economies to encompass the broader global landscape.

The study endeavors to examine the influence of geopolitical risks and economic prosperity on tourism, a burgeoning sphere of inquiry within the domain of tourism studies. The study imparts novel insights into the existing corpus of literature by examining these factors over an extensive period from 1996 to 2018, encompassing advanced nations which is generally ignored in the literature. Furthermore, the study adopts Kao co-integration test, Westerlund co-integration test, Dumitrescu Hurlin panel causality

test, panel Autoregressive Distributed Lag (ARDL) model to explore the linkage between these factors and tourism.

To this end, the study is arranged in the ensuing manner: The following chapter presents a brief illustration of the literature review, while the third chapter outlines the data and methodology used in the study. the empirical findings are reported in the fourth chapter, while the final chapter deliberates upon the results and presents the overarching conclusions. This research generates a considerable addition to the literature on the impact of geopolitical risks and economic growth on tourism and provides valuable insights that can inform tourism policy and strategy.

1. LITERATURE REVIEW

An abundance of recent studies has investigated the underlying determinants of tourism, and among the most closely examined factors are geopolitical risks. These risks, which can be detrimental to tourism in affected regions, may also have a positive impact on tourism in alternative locations. For example, the Arab Spring uprisings caused great upheaval in the MENA region, severely affecting its tourism industry. However, this resulted in a simultaneous increase in Spain's tourism sector, as evidenced by Afonso-Rodríguez and Santana-Gallego's (2018) research. Similarly, conflicts and terrorist attacks in one country may lead to a surge in tourist arrivals and revenues in another country, as shown by Trindade's (2017) study, which indicated that terrorist attacks in Türkiye and Egypt led to increased tourism in Portugal.

On the other hand, a sizable amount of research looked at the relationship between geopolitical risks and tourism from the opposite angle. For instance, Demir et al. (2020) examined the asymmetric effects of geopolitical risks on tourism in Türkiye during 1990 and 2018 with a focus on the asymmetric interactions and a nonlinear approach. The results suggested that geopolitical risks had an asymmetric short-term influence on tourism but no long-term impact. In particular, a rise in geopolitical risks is detrimental to tourism, while a fall in risks has little influence. Additionally, Akadiri et al. (2020) examined how tourism, geopolitical risks, and economic growth interacted in Türkiye from 1985Q1 to 2017Q4 and discovered that geopolitical concerns have a detrimental impact on both economic growth and tourism.

Furthermore, Tiwari and colleagues (2019) conducted a comprehensive case study in India spanning the period from 2003 to 2017, employing wavelet analysis to scrutinize the influences of geopolitical risks, economic policy uncertainties, and tourism on the country's dynamics. Their findings underscored the prominence of geopolitical concerns, revealing a robust and enduring impact compared to the more transient effects of uncertain economic policy. This suggests that fluctuations in geopolitical stability hold greater significance in shaping the trajectory of India's economic and tourism sectors over the examined timeframe.

The adverse impact of geopolitical risks on tourism is not limited to emerging economies; it is also evident in advanced nations. Hailemariam and Ivanovski (2021) conducted a meticulous examination of the repercussions of geopolitical risks on tourism service exports in the United States over the period from 1999 to 2020. Their analysis revealed a detrimental effect on tourism service exports, indicating that heightened geopolitical risks can impede the outbound flow of tourism services from the United States. These findings are consistent with previous studies, which have consistently shown that an escalation in geopolitical risks leads to an unfavorable influence on the tourism sector.

Apart from nation-specific studies, research has also been carried out in groups of countries. The impact of geopolitical concerns on tourism in several emerging economies was examined by Balli et al. (2019). The findings were not uniform across countries, with some countries experiencing a significant impact, while others had only a limited influence.

Due to the installation of restrictions on foreigners' entry into countries, the recent Pandemic outbreak has significantly impacted the tourism income of countries. Furthermore, the Covid-19 pandemic amplified the negative effects of geopolitical risks on tourism, according to Lee et al.'s (2021) analysis of the association between geopolitical risks and tourism for 16 countries spanning the years 2005 to 2017.

Demir et al.'s (2019) analysis of the effect of geopolitical risks on inbound travel to 18 countries between 1995 and 2016 confirmed that geopolitical risks had an unfavorable influence on inbound tourism.

The investigation extends its analysis to explore the influence of geopolitical risks on stock markets. This expanded examination delves into the broader financial landscape, aiming to elucidate the interconnectedness between geopolitical events and market dynamics.

Jiang et al. (2022) investigated the ramifications of geopolitical risks and economic policy uncertainty on the stock performance of Chinese tourism-listed companies. Employing the quantile-on-quantile methodology and a causality-in-quantiles framework, they sought to discern the nuanced impact across different levels of stock returns. Their empirical findings reveal a sustained adverse influence of geopolitical risks on tourism stock returns, with particularly pronounced negative effects observed at lower quantiles compared to higher quantiles.

Demiralay & Kilincarslan (2019) conducted an analysis of the vulnerability of travel and leisure (T&L) industry stock indices in the global, Asia-Pacific, European and North American regions to geopolitical risks. The negative impact of geopolitical risk stems primarily from the perceived threat of adverse geopolitical events, which is particularly noticeable during periods of falling T&L stock prices. However, it is worth noting that the actual occurrence of adverse geopolitical events has a significant impact on T&L stocks regardless of market conditions.

The prevailing trend indicates a negative relationship between geopolitical risks and tourism; however, certain studies have identified instances where this relationship may exhibit positive dynamics. Weaver (2011) proposes that despite apparent contradictions, the tourism industry and the military-industrial complex possess interrelated and complementary qualities, with commerce playing a pivotal role in facilitating and steering their interaction through profitable antagonisms.

Uriely et al. (2009) delved into the attitudes towards tourism in both Israel and Egypt, despite the ongoing conflict between the two nations. Despite the geopolitical tensions, it is suggested that countries embroiled in conflict often find common ground in their shared interests in tourism. This observation underscores the recognition on both sides of the benefits that positive interactions and cooperation in the tourism sector can yield. By actively pursuing opportunities for collaboration in tourism, even amidst conflict, these countries may lay the groundwork for potential reconciliation and normalization processes. In essence, the findings highlight the potential of tourism as a constructive avenue for fostering understanding and dialogue between nations with historical animosities.

Previous studies have generally focused on developing countries; however, developed countries are also susceptible to geopolitical risks, which can lead to variations in their tourism revenues. This study aims to address this gap in literature by examining the impact of geopolitical risks on tourism revenues in developed countries.

2. DATA AND METHODOLOGY

2.1. Data

The study investigates the impact of Gross Domestic Product (GDP) and the Geopolitical Risk Composite Index (GPRC) on tourism. To measure economic growth, real GDP data was extracted from the World Bank, while the GPRC data, which measures political risk, was obtained from Caldara and

Iacoviell's (2022) research. The current US dollar value of international tourism receipts was used as an indicator of tourism. The definitions of these variables and the data sources that correspond to them are shown in Table 1.

The study analyzed a dataset spanning from 1996 to 2018, covering 11 advanced nations, Australia, Denmark, Finland, Germany, Hong Kong, Israel, Japan, Norway, Portugal, Switzerland, USA. The scope of the analysis was delimited to the specified period, primarily attributable to constraints in data accessibility, with a particular emphasis on the availability of tourism-related data.

Table 1. Definition of Variables

	Variables	Explanations	Data Source
1	TOURISM	International tourism, receipts (current US $)	World Bank
2	GDP	GDP per capita constant 2015 US	World Bank
3	GPRC	Geopolitical Risk Index	Caldara and Iacoviello (2018)

Table 2 offers the descriptive statistics for the variables employed in this inquiry. The table offers a comprehensive description of the variables used in this study, including the number of observations, their mean, standard deviation, and minimum and maximum values. The International Monetary Fund's (IMF) country classification scheme is the foundation for the categorization of the countries in the table.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TOURISM	253	23.26258	1.175477	20.21411	26.21214
GDP	253	10.65008	.3964142	9.69775	11.37086
GPRC	253	.0891748	1.459049	-2.370792	3.955016

Moreover, Table 3 provides information on the correlation among the variables used in the study. The correlation amongst variables is positive across in all samples. The descriptive statistics indicate that the sample includes 253 observations for each variable. Tourism receipts have a mean of 23.26, with a standard deviation of 1.18 and a range from 20.21 to 26.21. GDP shows a mean of 10.65, a standard deviation of 0.40, and ranges from 9.70 to 11.37. Geopolitical risk (GPRC) has a mean of 0.089, with greater variability (standard deviation of 1.46), ranging from -2.37 to 3.96.

Table 3. Correlation Matrix

Variables	Tourism	GDP	GPRC
Tourism	1.0000		
GDP	0.1405	1.0000	
GPRC	0.5988	0.0452	1.0000

The next chapter provides a comprehensive overview of the econometric methodologies utilized in this study's estimations. It details the selection, justification, and application of each methodological

approach, with an emphasis on their relevance to accurately estimating the relationships between variables of interest.

2.2. Methodology

Employing the Kao co-integration test, Westerlund co-integration test, Dumitrescu Hurlin test, panel ARDL model, the current study aimed to reveal the intricate interplay between tourism, economic growth, and geopolitical risks across advanced countries. Two cointegration tests are employed to enhance result accuracy and assess the robustness of the cointegration relationships. Specifically, the Westerlund cointegration test is used due to its suitability for variables with mixed levels of stationarity.

The model is:

$$Tourism_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 GPRC_{it} + \epsilon_{it} \quad (1)$$

Since cross-sectional dependence can influence the unit root test, determining the presence of such dependence is critical in accurately establishing stationarity. Thus, as an initial step, the inquiry delved into cross-sectional dependence through various approaches. The primary objective of these cross-section tests is to validate the non-intercorrelation of cross-section units.

$$H_0 = \rho_{ij} = \text{Corr}\left(u_{ij}, u_{jt}\right) = 0, i \neq j \quad (1)$$

Concerning the assessment of cross-sectional dependency among units, the LM test has been employed to examine the null hypothesis that there is no correlation. The LM test is specifically designed to detect the existence of cross-sectional correlation among the units by attempting to reject the null hypothesis. The LM test is capable of being executed in various forms which is first introduced by Breusch-Pagan (1980). Then, various LM test approaches have been developed. Pesaran (2004) recommended the usage of scaled LM test to obtain robust results. Moreover, Baltagi et al. (2012) put forward the bias-corrected version of scaled LM test. Additionally, CD test is also another approach which is generally employed to determine the cross-sectional dependence among panels. The expressions of these tests are as follows:

$$LM = \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} T_{ij} \hat{P}_{ij}^2 \rightarrow \chi^2 \frac{N(N-1)}{2}$$

$$LM_{\text{SC}} = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left(T_{ij} \hat{P}_{ij}^2 - 1\right) \rightarrow N(0,1)$$

$$LM_{\text{BC}} = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left(T_i \hat{P}_{iy}^2 - 1\right) - \frac{N}{2(T-1)} \rightarrow N(0,1), \quad (2)$$

$$CD_\rho = \sqrt{\frac{2}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} T_{ij} \hat{P}_j \rightarrow N(0,1)$$

The identification of cross-sectional dependence among panels is crucial in selecting an appropriate unit root test. In instances where cross-sectional dependence exists, conventional first-generation unit root tests such as LLC, IPS, ADF, and PP tests are inappropriate. Rather, second-generation unit root tests, such as the one introduced by M. H. Pesaran (2007), are more appropriate. Additionally, the homogeneity of the series is another critical issue that must be examined, which was assessed using the Delta homogeneity test proposed by Pesaran and Yamagata (2008). To determine cross-sectional

dependence among panels and select the appropriate unit root tests, various cross-sectional dependence tests were conducted in the current study. The cross-sectional Im Pesaran and Shin (CIPS) test was utilized, which involves several stages to consider cross-sectional dependence:

$$\Delta y_{it} = \gamma_i + \alpha_i y_{i,t-1} + \beta_i \bar{y}_{t-1} + \sum_{j=0}^{P} d_{ij} \Delta \bar{y}_{t-j} + \sum_{j=0}^{P} \varepsilon_{ij} \Delta \bar{y}_{i,t-j} + \mu_{it} \quad (3)$$

Where $yt - 1$ and $\Delta yt - j$ represents cross sectional averages of the lagged and fist differenced series. Hence, cross-sectional augmented Dickey-Fuller (CADF) can provide the CIPS results as it can be seen in the formula below:

$$CIPS = \frac{1}{N} \sum_{i=1}^{N} CADF_i \quad (4)$$

The Pesaran CIPs test was selected because of its ability to test the stationarity of variables that exhibit cross-sectional correlation. Unit root tests play a crucial role in assessing the stationarity of time series data and selecting appropriate methods to obtain accurate results.

The co-integration among variables is investigated with Kao co-integration test proposed by Kao (1999) embraces DF and ADF tests on residuals to determine co-integration among variables.

$$Y_{it} = \alpha_i + \mathrm{B} X_{it} + e_{it} \quad (5)$$

The equation above indicates the regression and e_{it} represents the residuals. Co-integration with DF can be expressed as:

$$\hat{e}_{it} = p\hat{e}_{it-1} + v_{itp} \quad (6)$$

Co-integration with ADF can be expressed as:

$$\hat{e}_{it} = pe_{it-1} + \sum_{j=1}^{p} \emptyset \Delta \, \hat{e}_{it-j} + v_{itp} \quad (7)$$

The Westerlund co-integration test proposed by Westerlund (2007) is another co-integration test adopted in this study and it is applied as it is described by Persyn and Westerlund (2008).

$$\begin{aligned} G_t &= \frac{1}{N} \sum_{i-1}^{N} \frac{\dot{\alpha}}{SE(\dot{a}_i)} \\ G_\alpha &= \frac{1}{N} \sum_{i-1}^{N} \frac{T_{\dot{\alpha}}}{\dot{\alpha}_i(1)} \\ P_T &= \frac{\dot{a}}{SE(\dot{\alpha})} \\ P_\alpha &= T\dot{\alpha} \end{aligned} \quad (9)$$

G_t and G_α are for the group statistics and P_t and $P_\alpha$are for the panel statistics. Another model utilized in this study is the panel ARDL model which applies both Mean Group (MG) estimation proposed by (H. Pesaran et al., 1995) and Pooled Mean Group (PMG) estimation proposed by (H. Pesaran et al., 1995; M. H. Pesaran et al., 1999). The primary advantage of using the Panel ARDL model is its ability to analyze series with different levels of stationarity. Given that the series used in this study are both I(0) and I(1), the Panel ARDL model was selected as the appropriate method.

The PMG estimator differs from MG and DFE by using both average and pooling of coefficients. The Panel ARDL model can be expressed as:

$$\begin{aligned}\Delta\text{TOURISM}_{it} \quad &= \beta_0 + \beta_{1i}\text{TOURISM}_{i,t-1} + \beta_{2i}\text{GDP}_{i,t-1} + \beta_{3i}\text{GPRC}_{i,t-1} \\ &+ \sum_{j-1}^{N1} \lambda_{ij}\Delta\text{TOURISM}_{i,t-1} + \sum_{j-1}^{N2} \alpha_{ij}\Delta\text{GDP}_{i,t-1} + \sum_{j-1}^{N3} \delta_{ij}\Delta\text{GPRC}_{i,t-1} + \varepsilon_i + \mu_i \\ &t = 1,2,\dots T \quad \text{i} = 1,2,\dots \text{N}\end{aligned} \tag{10}$$

The analytical framework being scrutinized entails the usage of the natural logarithm of tourism receipts (Tourism), the natural logarithm of gross domestic product (GDP), and the natural logarithm of geopolitical risk of countries (GPRC). The subscripts "i" and "t" pertain to cross-sectional and time units, correspondingly.

Moreover, to address any disparities from the long-run equilibrium, an error correction term can be integrated into the model. Thus, the resulting equation, incorporating the error correction term, can be articulated as follows:

$$\begin{aligned}\Delta\text{TOURISM}_{it} = \quad &\theta_1 v_{i,t-1} + \sum_{j=1}^{N1} \lambda_{ij}\ \Delta\text{TOURISM}_{i,t-1} \\ &+ \sum_{j=1}^{N2} \alpha_{ij}\Delta\text{GDP}_{i,t-1} + \sum_{j-1}^{N3} \delta_{ij}\Delta\text{GPRC}_{i,t-1} + \varepsilon_i + \mu_{it}\end{aligned} \tag{11}$$

The adequacy of the mean group estimator and pooled mean group estimator has been evaluated for the given series. To determine the more suitable estimator, a Hausman test has been conducted. With respect to the pmg and mg models, the pooled mean group estimator is the more precise estimator that should be used for emerging, advanced, and full samples according to the results of the Hausman test.

Finally, The Dumitrescu-Hurlin test was implemented in the present study to search for the causation link between the series, which was formulated by Dumitrescu and Hurlin (2012). The Dumitrescu-Hurlin test takes into account the cross-sectional heterogeneity of coefficients.

$$\begin{aligned}&\alpha_{0,i} \neq \alpha_{0,;}, \alpha_{1,i} \neq \alpha_{1,j}, \dots, \alpha_{2,i} \neq \alpha_{h,\rho} \forall\forall i,j \\ &\beta_{1,i} \neq \beta_{1,j} \dots, \beta_{2,} \neq \beta_j \forall i,j\end{aligned} \tag{12}$$

The test adjusts for heteroscedasticity and cross-sectional dependence and is based on the augmented Granger causality test.

3. EMPIRICAL RESULTS

To comprehensively evaluate the correlation between tourism, economic growth, and geopolitical risks across different nations, the first step is to establish the degree of integration among the variables.

However, it should be noted that the reliability of unit root tests may be undermined by the existence of cross-sectional dependency. Therefore, multiple tests of cross-sectional dependence have been carried out, including LM tests recommended by Breusch-Pagan (1980), Pesaran's (2004) scaled LM tests, Baltagi et al.'s (2012) bias-corrected scaled LM tests, and Pesaran's (2004) CD tests.

The findings from these tests indicate that the null hypothesis was rejected, suggesting that cross-sectional dependence can exist. Consequently, it is crucial to take this into account in subsequent analyses to ensure the validity of the findings.

Table 4. Cross-Section Dependence

Variables	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
TOURISM	979.7006***	88.16675***	87.91675***	31.15174***
GDP	1022.005***	92.20034***	91.95034***	31.84783***
GPRC	311.8379***	24.48853***	24.23853***	13.55535***

The outcome of rejecting the null hypothesis concerning the absence of cross-sectional independence implies that second generation unit root tests may be better equipped to gauge the degree of integration among the variables under consideration.

Table 5. Delta Homogeneity Test

	Delta	p-value
	7.398	0.000
Adjusted	8.475	0.000

The information derived from the results in Table 5 indicates that the series used in the study are not homogeneous. Hence, Consequently, the CIPS unit root test is particularly advantageous, as it is specifically designed to accommodate heterogeneous data structures.

Hence, the CIPs test, a second-generation unit root test proposed by Pesaran (2007), to assess the stationarity of the variables. The findings, which are presented in Table 6, reveal that GDP have unit root at the level, where tourism and GPRC does not contain unit root at the level. After the first difference of series, all series are stationary.

Table 6. Unit Root Test

Variable	Level		First difference	
	Constant	**Intercept And Trend**	**Constant**	**Intercept And Trend**
TOURISM	-3.443***	-3.677***	-4.665***	-4.551***
GDP	-2.281*	-2.071	-2.934***	-3.218***
GPRC	-3.493***	-3.465***	-4.607***	-4.846***

Kao co-integration test represented in table 7 illustrated that co-integration among variables exist in modified dickey-fuller, dickey-fuller t, augmented dickey-fuller unadjusted modified dickey-fuller unadjusted dickey-fuller t statistics for three different samples apart from Augmented Dickey-Fuller t statistics for advanced countries and full sample.

Table 7. Kao Co-Integration Test

	Statistics	P-value
Modified Dickey–Fuller t	-6.3767	0.0000
Dickey–Fuller t	-7.2230	0.0000
Augmented Dickey–Fuller t	-0.1413	0.4438
Unadjusted modified Dickey–Fuller	-6.7714	0.0000
Unadjusted Dickey–Fuller t	-7.2977	0.0000

Table 8 indicates the results of Westerlund co-integration test with 1000 bootstrap replications. Results indicate that series are co-integration for both group statistics and panel statistics.

Table 8. Westerlund Co-Integration Test

Statistic	*Value*	*Z-value*	*P-value*
Gt	-2.395	-1.298	0.045
Ga	-6.847	1.205	0.026
Pt	-17.403	-11.351	0.001
Pa	-14.171	-4.927	0.002

Therefore, both co-integration tests confirmed the presence of a long-run relationship among the variables, validating the existence of co-integration among them.

The subsequent step involves examining the impact of economic growth and geopolitical risks on the tourism industry using a panel ARDL model. The outcomes of the panel ARDL estimation, encompassing both the long and short run, are displayed in table 9. The results divulge that in advanced countries, the long-run estimates for both GDP and GPRC are statistically significant. In the long term, the relationship between Gross Domestic Product (GDP) and tourism is notably positive and statistically significant. A 1 percent increase in GDP is associated with a substantial 3.22% rise in tourism. However, in the short term, despite maintaining a positive sign, the impact of GDP on tourism lacks statistical significance, indicating that immediate fluctuations in GDP may not consistently influence tourism patterns.

Conversely, the influence of geopolitical risks on tourism demonstrates distinct patterns in the short and long term. In the short run, geopolitical risks exert a negative impact on tourism, though this effect is not statistically significant. This suggests that transient increases in geopolitical tensions may result in a downturn in tourism, yet these effects may not be reliably discernible over short time intervals. In the long term, however, geopolitical risks exhibit a positive impact on tourism, with a 1 percent increase in such risks associated with a modest 0.129% rise in tourism. This nuanced relationship underscores the

complexity of the interplay between geopolitical factors and the tourism industry over varying time scales. The findings suggest that, while short-term effects may be influenced by immediate geopolitical uncertainties, a broader perspective reveals a positive association between geopolitical risks and long-term tourism trends.

However, for the short term, the variables do not demonstrate a significant effect, although the error correction term (ECT) is negative and significant. Consequently, no definitive conclusions can be drawn regarding the impact of these series on tourism in the short run.

Table 9. Panel ARDL Results

	Variables	*Coefficient*	*Standard error*	*p-value*
Long-run	GDP	3.225471	.6790284	0.000
	GPRC	.1297428	.0492983	0.008
Short run	ECM(-1)	-.2781152	.0618974	0.000
	GDP	.2090474	.8243904	0.800
	GPRC	-.0882505	.0586137	0.132
	Year	.0098251	.0036339	0.007
	Constant	-22.86785	7.751059	0.003

Panel ARDL results uncover an unforeseen phenomenon wherein geopolitical risks exert a counterintuitively favorable influence on the tourism sector, diverging from conventional expectations. The investigation delves into potential explanatory mechanisms, proposing that heightened risks in advanced nations may disproportionately enhance the prospects of emerging economies. This paradoxical outcome challenges prevailing perceptions, underscoring the attractiveness of advanced nations due to their perceived stability amid global uncertainties. Furthermore,

The positive influence of geopolitical risks on tourism in advanced countries can be attributed to several factors: their robust governance, strong institutional frameworks, and a generally favorable perception of safety. As noted by Cavlek (2002), travel agencies tend to avoid destinations where safety concerns may pose risks to their clients. However, in the case of developed nations, despite rising geopolitical risks, these countries typically retain a secure environment that supports tourism activities. Although geopolitical risks often lead to declining tourism revenues in developing countries, the effect appears to be different for advanced economies. As Liu et al. (2021) observed, major crises, such as the COVID-19 pandemic, tend to have a short-lived impact, underscoring Hong Kong's resilience and capacity for rapid recovery, often followed by renewed growth. Consistent with this, the findings of the current study suggest that, in the long run, geopolitical risks may indeed foster tourism growth in developed countries. Additionally, the short-term insignificance of the series can be attributed to the robust economic structures of developed countries, their resilient institutional frameworks against geopolitical risks, and the relative stability observed in economic growth and geopolitical factors, which prevents major fluctuations.

Table 10. Dumitrescu Hurlin Test Results

Null Hypothesis:	W-bar	Z-bar	Prob.	Z-bar Tilde	Prob.	Causality
GPRC ⟶ Tourism	1.5027	1.1789	0.2384	0.7376	0.4608	NO
Tourism ⟶ GPRC	0.5612	-1.0290	0.3035	-1.0658	0.2865	NO
GDP ⟶ Tourism	3.7827	6.5260	0.0000	5.1049	0.0000	YES
Tourism ⟶ GDP	1.6084	1.4268	0.1536	0.9400	0.3472	NO

The last analysis is Dumitrescu Hurlin (2012) Panel Causality Tests which provides non causality analysis amongst variables. Dumitrescu Hurlin test illustrates that null hypothesis of no causality is rejected from GDP to Tourism, not vice versa. Additionally, it can be asserted that GPRC and tourism does not have causality relation between each other. Hence, the only causality according to Dumitrescu Hurlin test results is from GDP to tourism.

CONCLUSION

The objective of the present study is to investigate the relationship between tourism, economic growth, and geopolitical risks. To conclude, the impact of GDP and GPRC on tourism was examined in the analysis spans from 1996 to 2018, as this is the period for which data is available.

The empirical findings of this study provide valuable insights into the persistent nature of both geopolitical risks and economic growth within advanced countries. The application of both the Kao and Westerlund cointegration tests confirmed the existence of a long-run equilibrium relationship between the variables studied. This statistically significant result implies the interconnectedness and dynamic interaction between these variables over time.

Despite the significance of the Error Correction Mechanism (ECM), it is noteworthy that none of the variables under consideration demonstrate statistical significance in the short term, as evidenced by the Autoregressive Distributed Lag (ARDL) results. Delving deeper into the long-term dynamics, the study uncovers a positive influence of Gross Domestic Product (GDP) on the tourism sector. This implies that as GDP expands over an extended period, it has a beneficial impact on the tourism industry. This positive relationship may be attributed to various factors, such as increased consumer spending, improved infrastructure, a conducive economic environment etc., all of which contribute to fostering growth in the tourism sector.

Within the ambit of the Autoregressive Distributed Lag (ARDL) analysis, the research underscores that both Gross Domestic Product (GDP) and geopolitical risks exhibit long-term characteristics rather than short term dynamics. The juxtaposition of a positive short-term correlation with GDP and a negative association with geopolitical risks, despite their non-significance within the short-term timeframe, serves as a focal point for investigation. Panel data analysis brings forth an intriguing pattern where geopolitical risks manifest a counterintuitive yet statistically significant positive impact on the tourism sector in the long term. This divergence from conventional expectations prompts an in-depth exploration into potential explanatory mechanisms. Advanced countries are often equipped with sophisticated institutional frameworks and mature tourism industries that enable them to manage geopolitical risks. As Kirci Altinkeski (2023) notes, these risks may primarily originate from advanced nations and subsequently extend their influence to impact other countries. Developing nations can be particularly

affected by geopolitical tensions within their borders and neighboring regions. Furthermore, they may face the consequences of increased geopolitical uncertainties in advanced economies, which can have a negative impact on the economies of developing countries across the globe. Therefore, the intensification of geopolitical risks in advanced countries may have a disproportionate impact on emerging economies, contributing to the observed long-term positive effect on tourism in advanced countries. Furthermore, as delineated by Afonso-Rodríguez and Santana-Gallego (2018) and Trindade (2017), disturbances in developing regions may lead to heightened tourism activity in advanced countries. This phenomenon arises from an amplified desire for stability and security, thus positioning advanced nations as relatively more appealing destinations amid a backdrop of escalating global uncertainties. Furthermore, our examination of the causal relationship between the Geopolitical Risk Index (GPRC) and tourism reveals a lack of statistically significant causality between these two variables. This implies that fluctuations in geopolitical risk levels do not appear to have a discernible causal effect on the tourism sector. In particular, our analysis shows a significant rejection of the null hypothesis suggesting no causality from Gross Domestic Product (GDP) to tourism. In contrast, when examining the causality from tourism to GDP, the results do not reach statistical significance. This suggests that while there may be some impact of tourism on GDP, it is not robust enough to be statistically significant based on our test results.

In light of the empirical findings, a discernible conclusion emerges, asserting that tourism is predominantly influenced by Gross Domestic Product (GDP), as evidenced by the higher magnitude of its coefficient. Moreover, it is noteworthy that Geopolitical Risks do not present a hindrance to tourism income; on the contrary, there appears to be a beneficial aspect associated with them in advanced countries. The lack of immediate impact of economic growth and geopolitical risks on tourism revenues in developed countries may lead policymakers and authorities in the tourism sector to overlook the need for preventive policies against potential long-term declines in tourism income. Findings from this study highlight the importance of implementing policies that address these anticipated declines, such as measures to mitigate the adverse effects on tourism-dependent sectors.

REFERENCES

Afonso-Rodríguez, J. A., & Santana-Gallego, M. (2018). Is Spain benefiting from the Arab Spring? On the impact of terrorism on a tourist competitor country. *Quality and Quantity*, 52(3), 1371–1408. https://doi.org/10.1007/s11135-017-0527-2

Agiomirgianakis, G., Serenis, D., & Tsounis, N. (2017). Effective timing of tourism policy: The case of Singapore. *Economic Modelling*, 60, 29–38. https://doi.org/10.1016/j.econmod.2016.09.001

Akadiri, S. Saint, Eluwole, K. K., Akadiri, A. C., & Avci, T. (2020). Does causality between geopolitical risk, tourism and economic growth matter? Evidence from Turkey. *Journal of Hospitality and Tourism Management*, 43, 273–277. https://doi.org/10.1016/j.jhtm.2019.09.002

Al-Mulali, U., Gholipour, H. F., & Al-hajj, E. (2020). The nonlinear effects of oil prices on tourism arrivals in Malaysia. *Current Issues in Tourism*, 23(8), 942–946. https://doi.org/10.1080/13683500.2019.1586844

Ashley, C., & Mitchell, J. (2009). *Tourism and Poverty Reduction: Pathways to Prosperity* (1st ed.). Routledge.

Balli, F., Uddin, G. S., & Shahzad, S. J. H. (2019). Geopolitical risk and tourism demand in emerging economies. *Tourism Economics*, 25(6), 997–1005. https://doi.org/10.1177/1354816619831824

Baltagi, B., Feng, Q., & Kao, C. (2012). *A Lagrange Multiplier Test for Cross-Sectional Dependence in a Fixed Effects Panel Data Model*. https://surface.syr.edu/cprhttps://surface.syr.edu/cpr/193

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies*, 47(1), 239. https://doi.org/10.2307/2297111

Caldara, D., & Iacoviell, M. (2022). Measuring Geopolitical Risk. *American Economic Review*, *112*(4), 1194–1225. https://doi.org/10.1257/aer.20191823

Cárdenas-García, P. J., Sánchez-Rivero, M., & Pulido-Fernández, J. I. (2015). Does Tourism Growth Influence Economic Development? *Journal of Travel Research*, 54(2), 206–221. https://doi.org/10.1177/0047287513514297

Cavlek, N. (2002). Tour operators and destination safety. *Annals of Tourism Research*, 29(2), 478–496. https://doi.org/10.1016/S0160-7383(01)00067-6

Cho, V. (2010). A Study of the non-economic determinants in tourism demand. *International Journal of Tourism Research*, 12(4), 307–320. https://doi.org/10.1002/jtr.749

Demir, E., Gozgor, G., & Paramati, S. R. (2019). Do geopolitical risks matter for inbound tourism? *Eurasian Business Review*, 9(2), 183–191. https://doi.org/10.1007/s40821-019-00118-9

Demir, E., Simonyan, S., Chen, M. H., & Marco Lau, C. K. (2020). Asymmetric effects of geopolitical risks on Turkey's tourist arrivals. *Journal of Hospitality and Tourism Management*, 45, 23–26. https://doi.org/10.1016/j.jhtm.2020.04.006

Demiralay, S., & Kilincarslan, E. (2019). The impact of geopolitical risks on travel and leisure stocks. *Tourism Management*, 75, 460–476. https://doi.org/10.1016/j.tourman.2019.06.013

Dumitrescu, E. I. & Hurlin, C. (2012), Testing for Granger Noncausality in Heterogeneous Panels. *Economic Modelling*, 29(4), 1450-1460. https://doi.org/10.1016/j.econmod.2012.02.014

Dwyer, L., Forsyth, P., & Spurr, R. (2006). Effects of the Sars Crisis on the Economic Contribution of Tourism to Australia. *Tourism Review International*, *10*(1), 47–55. https://doi.org/10.3727/154427206779307231

Falk, M., & Lin, X. (2018). Sensitivity of winter tourism to temperature increases over the last decades. *Economic Modelling*, 71, 174–183. https://doi.org/10.1016/j.econmod.2017.12.011

Hailemariam, A., & Ivanovski, K. (2021). The impact of geopolitical risk on tourism. *Current Issues in Tourism* 24(22) 3134–3140. https://doi.org/10.1080/13683500.2021.1876644

Hasan, M., Naeem, M. A., Arif, M., Shahzad, S. J. H., & Nor, S. M. (2020). Geopolitical Risk and Tourism Stocks of Emerging Economies. *Sustainability*, 12(21), 9261. https://doi.org/10.3390/su12219261

Jiang, Y., Tian, G., Wu, Y., & Mo, B. (2022). Impacts of geopolitical risks and economic policy uncertainty on Chinese tourism-listed company stock. *International Journal of Finance & Economics*, *27*(1), 320–333. https://doi.org/10.1002/ijfe.2155

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90(1), 1–44. https://doi.org/10.1016/S0304-4076(98)00023-2

Kirci Altinkeski, B. (2023). Geopolitical Risk Spillovers: Evidence from G20 Countries. *Journal of Economics and Political Sciences*, 3(2), 64-77.

Lee, C. C., & Chang, C. P. (2008). Tourism development and economic growth: A closer look at panels. *Tourism Management*, 29(1), 180-192. https://doi.org/10.1016/j.tourman.2007.02.013

Lee, C. C., Olasehinde-Williams, G., & Akadiri, S. Saint. (2021). Geopolitical risk and tourism: Evidence from dynamic heterogeneous panel models. *International Journal of Tourism Research*, 23(1), 26–38. https://doi.org/10.1002/jtr.2389

Lee, C.-C., Olasehinde-Williams, G. O., & Ibikunle, J. A. (2022). An asymmetric examination of the environmental effect of tourism in China. *Tourism Economics*, 28(7), 1872–1887. https://doi.org/10.1177/13548166211021173

Liu, A., & Pratt, S. (2017). Tourism's vulnerability and resilience to terrorism. *Tourism Management*, *60*, 404–417. https://doi.org/10.1016/j.tourman.2017.01.001

Liu, H., Wu, P., & Li, G. (2021). Do crises affect the sustainability of the economic effects of tourism? A case study of Hong Kong. *Journal of Sustainable Tourism*, 31(9), 2023–2041 https://doi.org/10.1080/09669582.2021.1966018

Persyn, D. & J. Westerlund (2008) Error Correction Based Cointegration Tests for Panel Data. *Stata Journal* 8 (2), 232-241. https://doi.org/10.1177/1536867X0800800205

Pesaran, M.H. & Shin, Y., 1995. An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis, *Cambridge Working Papers in Economics*, Faculty of Economics, University of Cambridge.

Pesaran, M. H. (2004). *General Diagnostic Tests for Cross Section Dependence in Panels*. (Cambridge Working Papers in Economics No. 0435). Faculty of Economics, University of Cambridge.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, *22*(2), 265–312. https://doi.org/10.1002/jae.951

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

Peseran, H.M. & Yamagata, T. (2008). Testing Slope Homogeneity in Large Panels. *Journal of Econometrics*, 142, 50–93. https://dx.doi.org/10.2139/ssrn.671050

Polat, M., Alptürk, Y., & Gürsoy, S. (2021). Impact of geopolitical risk on BIST tourism index and tourist arrivals in Turkey. *Journal of Tourism Theory and Research*, 71–78. https://doi.org/10.24288/jttr.926617

Tiwari, A. K., Das, D., & Dutta, A. (2019). Geopolitical risk, economic policy uncertainty and tourist arrivals: Evidence from a developing country. *Tourism Management*, *75*, 323–327. https://doi.org/10.1016/j.tourman.2019.06.002

Trindade, M. (2017). *The Impact of Terrorism on the Portuguese Tourism Demand* [Unpublished Master Dissertations]. NOVA- School of Business and Economics.

Uriely, N., Maoz, D., & Reichel, A. (2009). Israeli guests and Egyptian hosts in Sinai: A bubble of serenity. *Journal of Travel Research*, *47*(4), 508–522. https://doi.org/10.1177/0047287508326651

Weaver, A. (2011). Tourism and the military. *Annals of Tourism Research*, *38*(2), 672–689. https://doi.org/10.1016/j.annals.2010.12.005

Westerlund, J. (2007) Testing for Error Correction in Panel Data. *Oxford Bulletin of Economics and Statistics* 69(6): 709-748. https://doi.org/10.1111/j.1468-0084.2007.00477.x

World Bank [03.01.2023] World Development Indicators. https://databank.worldbank.org