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Geopolitical risk and tourism: Evidence from dynamic heterogeneous panel models

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Abstract

This paper provides an empirical insight into how geopolitical risks impact international tourism demand. An augmented tourism demand function was developed and empirically estimated in line with classical theory for a panel of 16 countries from 2005M1 to 2017M12 through the AMG and CCEMG estimation techniques that address underlying heterogeneity, non-stationarity, and cross-sectional dependence. The study further examines the potential moderating effect of covid-19 outbreak on the relationship between geopolitical risk and tourism by investigating the interactive effect of past outbreaks and geopolitical risks on tourism demand. Additional insight on causal relations between geopolitical risks and tourism demand was obtained using panel bootstrapping technique. The results show that geopolitical risk negatively impacts tourism demand, and that pandemic outbreaks aggravate the negative impact of geopolitical risks on tourism demand. Panel causality outcomes further confirm that geopolitical risk is a significant predictor of tourism demand (captured by either tourism receipts or number of inbound tourists). Our findings confirm that the dynamic attributes of both local and international political environments significantly impact the consumption decision of tourists and the economic performance of tourist destinations. Our recommendation is that pre-crisis, in proposing policy directions for tourism sector development, policy-makers should establish crisis management plans to protect the tourism sector. Post-crisis, policy-makers should initiate aggressive recovery marketing strategies to re-establish the image of safety and attractiveness required to reassure potential tourists of the safety of the destination, thereby ensuring return to competitiveness and economic recovery.

KEYWORDS

covid-19, geopolitical risk, second-generation panel, tourism

1 | INTRODUCTION

Tourism business development is increasingly gaining attention across the world because of its associated direct, indirect, and induced economic effects. The tourism business generates foreign exchange income, leads to job creations, and boosts industry revenues, and empirical evidence shows that tourism development positively impacts the gross domestic product (GDP) of nations (Lee & Chang, 2008). Sequeira and Campos (2005) confirm that while tourism development is not the sole determinant of economic growth, countries with well-developed tourism sectors generally exhibit higher economic growth rates than others.

To maximize the economic benefits attainable from tourism business development, there is a need to adequately identify the risk factors affecting the tourism industry and advance possible means of mitigating the effects. The susceptibility of the tourism industry to external shocks such as geopolitical risks is key among such risk factors. Balli, Uddin, and Shahzad (2019) posit that risks associated with wars, terrorism, tensions, ethnic, and political violence within and between states, generally referred to as geopolitical risks, heavily affect the socio-economic environment, and often lead to issues such as declining flow of tourism into affected regions.

The tourism business is highly sensitive and very prone to panic. Thus, events such as wars, terrorism, tensions, ethnic, and political violence can influence the behaviors of both investors and tourists. Investors in the tourism industry, like most other investors, behave in a risk-averse manner. They channel their resources much more toward the industry when industry projections suggest limited risk and uncertainties. The presence of geopolitical risks is thus likely to cause reduction in tourism investment. Geopolitical risks also have the capacity to influence tourists' destination choices. Hall and O'Sullivan (1996) claim that the presence or threat of occurrences of violent protests, social unrest, civil war, terrorist actions, and human rights violations are capable of altering the travel behaviors of tourists. International and/or local tourists mostly prefer to visit countries or locations with past and present records of social, economic, and political safety and security. Moreover, tourism demanders display higher willingness to pay for goods and services in safer locations. The short-term, mid-term, and long-term effects of geopolitical risks on tourism can therefore be detrimental to tourism industry gains and overall economic growth and development.

Geopolitical occurrences such as the US-Turkey, US-Russia, Russia-Ukraine, US-China, US-Saudi-Iran, Syrian, North Korean, and Yemen conflicts as well as the struggle for European fragmentation have raised concerns and called increased attention to the direct and indirect economic effects of geopolitical risks (Shahbaz, Olasehinde-Williams, & Balcilar, 2018). Consequently, geopolitical risk is currently classified as one of the top five business threats in the world (PricewaterhouseCoopers, 2018).

Furthermore, the covid-19 crisis is one of the greatest problems currently plaguing the entire world. Unlike other sources of global shocks, it is a health crisis with the capability to trigger all sorts of other crises, including those that are geopolitical in nature. The sudden advent of the covid-19 crisis is projected to have a multifaceted impact on how geopolitical risks affect tourism around the world. The outbreak has the potential to aggravate geopolitical risks by causing more havoc in fragile countries and regions and triggering series of unrests as the health and economic impacts of the outbreak put pressure on the relationship between citizens and governments and between countries. Early signs of this are already visible in countries like Brazil, Italy, Ukraine, Venezuela, and Colombia. It is also capable of providing political leaders with the opportunity to advance their objectives in ways that escalate domestic and international conflicts on the assumption that the world is too preoccupied to notice. Evidence of how the disease outbreak is already fueling geopolitical risks includes the accusations made by the United States and other countries that China is responsible for the spread of the disease and the xenophobic sentiments being directed toward people of Asian descent.

This study contributes to the ongoing debate in empirical literature on the interaction between geopolitical risk and the tourism sector by evaluating the role of geopolitical risk in tourism industry development and by determining whether geopolitical risk is a useful predictor of tourism sector performance. The study further examines the potential moderating effect of covid-19 outbreak on the relationship between geopolitical risk and tourism by investigating the interactive effect of past outbreaks and geopolitical risks on tourism. To achieve this, we adopt the recently introduced geopolitical risk index in a panel-based study that proxies tourism demand with international tourism receipts and tourist arrivals from abroad, using monthly frequency panel-based data for 16 countries (Brazil, China, Columbia, India, Indonesia, Israel, Malaysia, Mexico, Philippine, Russia, Saudi Arabia, South Africa, South Korea, Turkey, Ukraine, and the United States) from 2005M1 to 2017M12. This paper thus establishes, within a panel framework, the degree of impact of geopolitical risk on tourism sector development, the moderating impact of pandemics on the relationship between geopolitical risk and tourism, and the direction of causality between geopolitical risk and tourism.

The choice of panel data analysis is due to its superiority over cross-sectional data analysis and time series data analysis. The use of panel data series makes it possible for econometricians and/or researchers to construct and investigate more complex models than the time series or single cross-sectional data set would permit (Baltagi, 2005; Hsiao, 2007). Panel data combine time series and cross-sectional characteristics for empirical analyses (Baltagi, 2005; Hsiao, 2007). The ability of panel data to combine inter-cross-section differences and intra-cross-section dynamics leads to a series of benefits. First, it demonstrates superior capability for modeling complex human behavior (Hsiao, 2007). Second, it is more efficient for modeling both common and individual behaviors of countries (Hsiao, 2007). Third, it is more suitable for detecting dynamic relationships. Lastly, it is more efficient in minimizing estimation biases that one might encounter in regression analyses (Hsiao, 2007; Saint Akadiri, Eluwole, Akadiri, & Avci, 2019).

Two important issues need to be mentioned upfront. First, the different developmental progressions noticeable in the paneled countries are expected to be duplicated in the development of their various tourism sectors. Also, the nature and intensity of geopolitical risks vary across the paneled countries. The possibility that the panel of countries is heterogeneous in nature is thus quite high. Second, the flow of information about potential and existing geopolitical risks across international borders is capable of influencing international tourism demand. This suggests the possibility of cross-sectional dependence as shocks are transmittable between the paneled countries.

To deal with potential heterogeneity and cross-sectional dependence, this study employs relatively new panel regression methodologies that are robust to these factors (Common Correlated Effects Mean Group and Augmented Mean Group estimators). For the direction of causal relationships among the panel series, we employ the panel bootstrap causality approach that is also robust to these factors. This study is one of the first studies to examine the connection between geopolitical risk and tourism in a multivariate panel-based empirical study that specifies a tourism demand function, which includes the traditional determinants of tourism demand. Thus, we contribute to extant literature on tourism both empirically and methodologically.

The remaining sections of this paper are structured as follows: Section 2 highlights the conceptual perspectives on tourism and geopolitical risk from extant literature, Section 3 discusses the data and panel-based methodologies adopted for empirical estimations, Section 4 presents and discusses empirical findings, and Section 5 provides the concluding remarks and possible policy recommendations.

2 | TOURISM AND GEOPOLITICAL RISK

Lanouar and Goaied (2019), in their study, establish that global tourism is affected by political unrests, terrorism, and natural disasters. Available literature on the interconnectedness of political risk and tourism reveals that geopolitical conflicts, tensions, or political risks generate uncertainties or fluctuations in economic and political scenes, and significantly impact tourism demand (Haddad, Nasr, Ghida, & AlIbrahim, 2015; Muzindutsi & Manaliyo, 2016).

Antonakakis, Gupta, Kollias, and Papadamou (2017), on the other hand, argue that the tourism sector responds to external shocks and adjusts to wider political and economic environments as it transforms and develops. Fundamentally, the characteristic features of both domestic and foreign political and economic environments have a large effect on tourism, market agents as well as the economy as a whole.

However, according to Kozak (2007), the choice of travel destination of tourism demanders is significantly affected by their risk perception. Slevitch and Sharma (2008) further show that tourism demanders display higher willingness to pay for goods and services in safer locations. No country has so far succeeded in shielding its tourism industry from the negative effect of geopolitical risks. Therefore, if adequate policy is not put in place, geopolitical risk can exercise significant impact on the international tourist arrivals, number of overnight stays, tourism imports, and several significant measures of tourism development (Drakos & Kallandranis, 2015; Lanouar & Goaied, 2019; Omar, Wisniewski, & Nolte, 2017; Sönmez, 1998).

It is widely understood that personal safety is highly valued by everyone and that people naturally try to avert any form of threat to their personal safety. According to Bassil, Saleh, and Anwar (2019), the presence of danger in tourism-supplying locations can adversely affect the number of tourists received; even the perception of insecurity within a tourism-supplying country is able to create significant travel anxiety that could negatively impact tourist arrivals and length of stay. Tourists may, however, be willing to accept the risk if the destination is exceptional enough to entice them (Frey, Luechinger, & Stutzer, 2007; Lepp & Gibson, 2003). In the same vein, a number of papers have shown that the effect of political instability/terrorism on tourism may be non-linear; that is, it starts adversely impacting tourism after reaching a certain threshold (Harb & Bassil, 2019; Mitra, Pham, & Bandyopadhyay, 2018; Saha & Yap, 2014). Sharifpour, Walters, and Ritchie (2013) and Morakabati and Kapuściński (2016) opine that risk appetite varies across tourist groups, from allocentric to psychocentric, and is mainly determined by the personality traits of tourists and the uniqueness of the destination.

Das, Kannadhasan, and Bhattacharyya (2019), in their study, infer that geopolitical risk is an influential indicator of economic market reaction to shocks or volatility. Balcilar, Bonato, Demirer, and Gupta (2018) further buttress this notion and assert that geopolitical risk is the major factor affecting business cycles, financial markets, and economic directions. Lanouar and Goaied (2019) argue that shocks and volatility have both transitory and permanent impacts on tourism demands. For instance, findings from the study of Liu and Pratt (2017) reveal that terrorism impacts tourism in the short run. Similarly, Agiomirgianakis, Serenis, and Tsounis (2017) posit that terrorist upheavals and political instability contribute* significantly to fluctuation in tourism demands in the short run.

A limited body of literature argues that tourism is resilient to the adverse effect of geopolitical risks. For example, Uriely, Maoz, and Reichel (2009) claim that geopolitical conflicts are often ignored in cases where there is an opportunity for both sides to benefit from tourism. The success of the Israeli tourism industry in spite of constant conflict was put forward by Krakover (2013) as a prime example.

Another group of authors such as Jurkovich and Gesler (1997), Smith (1998) and Weaver (2011) argues that tourism and geopolitical risk are, as a matter of fact, complementary under certain conditions. It is claimed that elements of geopolitical risk often support tourism growth. The upsurge in war tourism demand in Afghanistan by people visiting combat scenes and former terrorist camps was given as an example of this complementary nature by Adams (2001). Overall, however, empirical evidence is skewed in favor of a negative relationship between elements of geopolitical risk and tourism.

3 | MODEL AND DATA

Classical economic theory suggests that tourism demand is a function of income and relative prices (Naudé & Saayman, 2005; Walsh, 1996).

$$Q_t = f(Y_t, P_t), \tag{1}$$

where Q_t denotes tourism demand, Y_t represents per-capita income of countries of tourism demanders and P_t represents relative prices.

According to the theory, income of tourism demanders is the most important determinant of tourism consumption. The greater the purchasing power of potential tourism demanders, the higher the level of tourism consumption. Another factor that strongly influences tourism demand is relative prices. Relative price effects are mainly felt through the relative exchange rates and the cost of goods and services demanded by tourists.

With regard to costs of goods and services, it is natural for tourists to be concerned about the costs of products and services such as transportation, accommodation, site fees, cost of feeding, and cost of souvenirs, among others. The lower the general price levels in the tourism-supplying country, the higher the demand for tourism, ceteris paribus. As for exchange rate, it measures the relative price differences between the home country of the tourism demander and the tourism-supplying country. A weakening of the domestic currency of the tourism-supplying country means that the costs incurred by foreign tourists will be lowered, ceteris paribus. The relatively lower prices will most likely be translated into either longer stays or increased expenditures by visitors. It will also likely lead to relatively increased inflow of tourists, compared to other tourist destinations.

We extend the demand function expressed in Equation (1) by augmenting it with geopolitical risk. This is in line with our earlier argument that geopolitical risk is a useful determinant of tourism demand. We thus re-specify Equation (1) as follows:

$$Q_t = f(Y_t, P_t, G_t), \tag{2}$$

where G_t refers to geopolitical risk.

We thus adopt the tourism demand model from Equation (2) and rewrite it in an econometric form:

$$\mathrm{LQ}_{it} = \beta_{0i} + \beta_{1i}\mathrm{LG}_{it} + \beta_{2i}\mathrm{LY}_t + \beta_{3i}\mathrm{LPI}_{it} + \beta_{4i}\mathrm{LREX}_{it} + \beta_{5i}\mathrm{LTI}_{it} + e_{it}, \tag{3}$$

where

$$e_{it} = \alpha_i + \lambda_i f_t + \varepsilon_{it}, \tag{4}$$

L refers to natural log, i represents country (i = 1, …, 16), t stands for the monthly time period (t = 2005M1, …, 2017M12), β_k(k = 1, 2, 3, 4, 5) is the country-specific parameter estimate for the regressors and e_{it} is the error term which includes the following; group fixed effects (α_i) that account for time-invariant heterogeneity across cross-sections, common factor (f_t) with heterogeneous factor loadings (λ_i) that accounts for time-variant heterogeneity and cross-sectional dependence and the white noise component (ε_{it}).

LQ is tourism demand. It is most commonly measured either through tourism receipts (expenditures made by inbound international tourists) or through the number of inbound tourists (number of foreign visitors). As a form of robustness check, we use both variables as regressands in separate regressions. To convert the data from annual to monthly, an interpolation method based on constant-match sum as described in Startz (2007) and Chaiechi (2014) was used. The technique converts from low to high frequency by dividing each low frequency observation by the number of high frequency observations associated with that particular low frequency observation and then assigns the same value to all observations in the high frequency series.

LG, which represents the variable of interest, geopolitical risks, is measured using the Caldara and Iacoviello (2018) geopolitical risk index. The authors create the index from searches of electronic archives of major newspapers for words related to geopolitical risks such as military-related tensions, nuclear tensions, acts and threats of war, and acts and threats of terrorism. Monthly counts of newspaper articles with these words are conducted. The 2000–2009 decade is then set to a mean value of 100 via normalization such that values greater than 100 reflect higher levels of geopolitical risks than those recorded in the 2000–2009 decade, and values lower than 100 indicate lower levels of geopolitical risk than those observed in the 2000–2009 decade.

LY denotes real average global income proxied with global GDP per capita. It serves as a measure of the income of tourism demanders. It functions in our model as a control for the impact of purchasing power of international tourists. Global GDP per capita is calculated as the global GDP divided by mid-year global population. Global GDP is calculated as the total value added created by global producers plus product taxes, minus subsidies. Also, no deductions are made for depreciation of assets and natural resources in the calculation.

LREX represents real effective exchange rate between the tourism-supplying country's currency and the weighted average of several foreign currencies deflated with a cost index. It is included to control for the influence of relative price differences. Higher values of the real effective exchange rate reflect costlier exports and cheaper imports, indicating that the country has become less competitive in trade.

LPI stands for the general price level of the tourism-supplying country. It is measured using the consumer price index of the countries included in the data series. Its purpose is to serve as a control for the impact of the cost of goods and services on tourism demand.

LTI refers to the number of tourism industries available in each of the tourism-supplying countries. It is included to account for time-varying destination-specific factors. As defined by the World Tourism Organization, tourism industries refer to the industries that provide tourism characteristic products, such as (a) those that provide accommodation for visitors, (b) those that provide food and beverage serving activities, (c) those that provide railway passenger transport, road passenger transport, water passenger transport, air passenger transport, and transport equipment rentals, (d) travel agencies and other reservation services activities, (e) cultural activities, (f) sports and recreational activities, (g) retail trade of country-specific tourism characteristic goods, and (h) other country-specific tourism characteristic activities.

To test the moderating effect of pandemics on the relationship between geopolitical risk and tourism, we further include a dummy variable for pandemic outbreaks (PO). The dummy variable takes the value of one during years with pandemic outbreaks (Swine flu, Ebola, MERS-CoV, and Zika virus) and the value of zero otherwise. PO is then interacted with geopolitical risk as shown in Equation (5).

$$\begin{aligned}\mathrm{LQ}_{it} = {} & \beta_{0i} + \beta_{1i}\mathrm{LG}_{it} + \beta_{2i}\mathrm{PO}_t + \beta_{3i}(\mathrm{LG}*\mathrm{PO})_{it} + \beta_{4i}\mathrm{LY}_t + \beta_{5i}\mathrm{LPI}_{it} \\ & + \beta_{6i}\mathrm{LREX}_{it} + \beta_{7i}\mathrm{LTI}_{it} + e_{it}.\end{aligned} \tag{5}$$

The data set used for the empirical analysis consists of monthly observations on 16 countries (listed in the introductory part) over the period 2005M1–2017M12. The countries are selected mainly on the basis of availability of data on geopolitical risks. The geopolitical index is available for 19 countries. We, however, dropped three of these countries—Argentina, Thailand, and Venezuela—due to their lack of sufficient historical data. All the variables apart from the dummy variable are converted into logarithmic forms before conducting econometric analyses. Taking natural logarithms leads to estimates of elasticity. The measure of geopolitical risks used is the Geopolitical Risk Index of Caldara and Iacoviello (2018). Data on real average global income, real effective exchange rate, and consumer price index were extracted from the International Financial Statistics database of the International Monetary Fund (IMF). Data on tourism receipts and inbound tourists were taken from the World Development Indicators of the World Bank (WDI). Data on tourism industries were obtained from the World Trade Organization (UNWTO) database. Data on pandemic outbreaks were taken from the World Health Organization (WHO) database on disease outbreaks.

4 | PRE-ESTIMATION ANALYSIS AND METHODOLOGY

Econometric evolution shows that conventional estimation techniques produce invalid and unreliable outcomes when faced with heterogeneity and cross-sectional dependency. As a result, new econometric approaches to unit root testing, cointegration testing and regression estimations that are robust to these challenges are now widely employed. Since the presence of these twin challenges largely determines the course of empirical techniques relevant to panel data studies, testing for both heterogeneity and cross-sectional dependence is of great importance. We thus begin the empirical analysis by testing for cross-sectional dependency through the following tests; Breusch and Pagan (1980) Lagrange Multiplier (LM) test, Pesaran (2004) Scaled LM test, Pesaran (2004) CD test, and Pesaran, Ullah, and Yamagata (2008) Bias-adjusted LM test. We follow up by testing for slope heterogeneity via the Pesaran and Yamagata (2008) test (delta tests). These tests are applied to all the variables except real global average income since it does not vary across sample countries.

The results are presented in Tables 1 and 2. As shown in Table 1, the test statistics for the Breusch-Pagan LM test, Pesaran scaled LM test, bias-corrected scaled LM test, and Pesaran CD test all reject the null of no cross-sectional dependence in inbound tourists, tourism receipts, geopolitical risk, exchange rate, price level, and tourism industries at 1% significance level. The slope homogeneity results in Table 2 confirm that the null of slope homogeneity can be rejected at 1% in both measures of tourism demand, exchange rate, geopolitical risk, price level, and tourism industries. These results suggest that

TABLE 1 Cross-sectional dependence tests

Variable	Test	Test stat.	*p* value
Panel A: Tourism receipts	Breusch-Pagan LM	11,088.34	.000
	Pesaran scaled LM	663.0522	.000
	Bias-corrected scaled LM	662.9974	.000
	Pesaran CD	86.46889	.000
Panel B: Inbound tourists	Breusch-Pagan LM	12,335.95	.000
	Pesaran scaled LM	738.6998	.000
	Bias-corrected scaled LM	738.6450	.000
	Pesaran CD	91.51471	.000
Panel D: Geopolitical risk	Breusch-Pagan LM	1,321.278	.000
	Pesaran scaled LM	70.83728	.000
	Bias-corrected scaled LM	70.78244	.000
	Pesaran CD	22.24865	.000
Panel E: Exchange rate	Breusch-Pagan LM	8,390.954	.000
	Pesaran scaled LM	499.4993	.000
	Bias-corrected scaled LM	499.4445	.000
	Pesaran CD	8.457125	.000
Panel F: Price level	Breusch-Pagan LM	20,129.03	.000
	Pesaran scaled LM	1,211.225	.000
	Bias-corrected scaled LM	1,211.170	.000
	Pesaran CD	141.8392	.000
Panel G: Tourism industries	Breusch-Pagan LM	7,317.437	.000
	Pesaran scaled LM	463.559	.000
	Bias-corrected scaled LM	463.508	.000
	Pesaran CD	14.268	.000

Note: In all cases, the null hypothesis is no cross-sectional dependence.

TABLE 2 Slope homogeneity tests

Test	Tourism receipts	Inbound tourists	Geopolitical risk	Exchange rate	Price level	Tourism industries
$\hat{\Delta}$	23.859	23.859	3.901	10.192	23.859	35.154
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\hat{\Delta}_{adj}$	24.225	24.225	3.960	10.349	24.225	35.832
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Note: (a) The $\tilde{\Delta}$ and $\tilde{\Delta}_{adj}$ tests are the modified versions of the Swamy (1970) test proposed by Pesaran and Yamagata (2008). (b) The null hypothesis in both cases is slope homogeneity.

although each of the paneled countries may retain its own economic dynamics, shocks to the tourism industry in one of the paneled countries may affect the tourism sector of the other countries. Likewise, political instability in one country is likely to spread to the other countries.

Due to the fact that first-generation unit root tests generate unreliable outcomes when cross-sectional dependence and slope heterogeneity exist in the data series, we employ unit root testing approaches that are robust to the presence of these issues. The first test applied is the cross-sectionally augmented IPS (Im, Pesaran, & Shin, 2003) panel unit root test of Pesaran (2007), commonly referred to as CIPS. The second test applied as a complementary test is the Hadri and Kurozumi (2012) panel unit root test (H-K). The outcomes of these tests are reported in Tables 3 and 4. The results from both tests indicate that unit roots are present in both measures of tourism demand, geopolitical risk, exchange rate, price level, and tourism industries. The ADF unit root rests are reported for average global income, as it is not country-specific. These results also show the presence of unit roots in average global income.

We then test for cointegration using two different complementary panel cointegration tests. The first is the Westerlund and Edgerton (2007) panel bootstrap test, which supports dependence either within or between cross-sections. In terms of small sample properties, it also has small size distortions and superior power when compared with other cointegration tests. The second is the Persyn and Westerlund (2008) error correction model (ECM) test, which accommodates cross-sectional dependence and slope heterogeneity.

The test results are reported in Table 5. As shown in panel A, where tourism receipts serve as the measure of tourism demand, the bootstrap *p* value from the LM test statistic of the Westerlund and Edgerton (2007) test indicates the presence of cointegration. All the four test statistics reported for Persyn and Westerlund (2008) ECM panel cointegration test similarly confirm cointegration. Similar results are obtainable in panel B where number of inbound tourists serves as the measure of tourism demand. In summary, the cointegration results indicate that although the variables are non-stationary, tourism demand and the regressors are cointegrated such that the residual (e_{it}) of the process is I(0) for all i and is iid across t. This is an indication that a long-run relationship exists among tourism demand, geopolitical risks, exchange rate, price levels, and tourism industries.

When the nulls of cross-sectional independence, slope homogeneity, and stationarity are rejected, long-run effects are best estimated via the augmented mean group (AMG) estimator of Eberhardt and Teal (2010) and the common correlated effects mean group (CCEMG) estimator of Pesaran (2006). This study thus adopts these panel techniques in assessing the effect of geopolitical risk on tourism demand.

AMG estimates a pooled model augmented with year dummies through first-order difference OLS. A new variable representing the common dynamic process is then created from the coefficients attached to the year dummies. The generated variable is next introduced as an extra regressor in each group-specific regression model apart from an intercept to capture time-invariant fixed effects.

CCEMG allows for cross-sectional dependence and time-variant unobservables with heterogeneous impact across panel members (Pesaran, 2006). The procedure involves the inclusion of the cross-section averages of the dependent and independent variables as extra regressors when applying OLS to each unit. CCEMG displays satisfactory small sample properties, accounts for possible structural breaks, unit roots, non-cointegrated common factors, certain serial correlation, and is a robust estimator of short-run dynamics (Kapetanios, Pesaran, & Yamagata, 2011).

5 | ESTIMATION RESULTS

The long-run relations of the model specified in Equation (5) obtained from the CCEMG and AMG estimation procedures are shown in Tables 6 and 7. Both estimation techniques record a negative long-run effect of geopolitical risk on tourism demand irrespective of whether tourism receipts or number of inbound tourists are used as the dependent variable. As shown in Table 6, 1% increase in geopolitical risk will lead to 0.011% decline in the size of tourism receipts based on the AMG estimation, and 0.014% decline in tourism receipts based on the CCEMG estimation. Table 7 similarly shows that 1% increase in geopolitical risk will lead to 0.010% decline in number of inbound international tourists based on the AMG estimation, and 0.001% decline in number of inbound international tourists based on the CCEMG estimation. We are thus able to conclude that the conditional marginal impact of geopolitical risk on tourism demand is negative when there are no pandemics. This outcome emphasizes the importance of geopolitical stability to tourism and confirms our assertion that geopolitical risk is a non-traditional determinant of tourism demand. The finding agrees with the conclusions of Kozak (2007), Slevitch and Sharma (2008), Haddad et al. (2015), and Muzindutsi and Manaliyo (2016).

TABLE 3 Unit-root tests

Variable	Level	First difference	Level	First difference
Panel A:	**CIPS (Intercept only)**		**CIPS (with Intercept and trend)**	
Tourism receipts	−1.450	−6.190***	−2.423	−6.420***
Inbound tourists	−1.811	−6.190***	−2.104	−6.420***
Geopolitical risk	−2.051	−6.110***	−2.055	−6.373***
Exchange rate	−1.623	−6.190***	−2.130	−6.420***
Price level	−1.482	−6.147***	−1.756	−6.367***
Tourism industries	−1.395	−2.216*	−1.224	−2.816***
Panel B:	**ADF (Intercept only)**		**ADF (Intercept and trend)**	
Average global income	−1.802	−12.723***	−1.933	−12.800***

Note: (a) The null hypothesis of the CIPS unit-root test is presence of unit root in panel data with cross-sectional dependence. (b) Critical values are taken from Pesaran (2007). (c) CIPS provides means of cross-sectional ADF test statistics for the entire panel. (d) ADF values are reported for average global income since it is a global average value. (e) Lag length selected is 4.
$^*p < .1$.
$^{***}p < .01$.

TABLE 4 Hadri and Kurozumi (2012) unit-root tests

		H-K (intercept only)		H-K (intercept and trend)	
Variable	**Model**	**Level**	**First difference**	**Level**	**First difference**
Tourism receipts	ZA_spac	3.681***	0.547	3.132***	0.909
	ZA_la	−3.429	0.599	−3.111	0.883
Inbound tourists	ZA_spac	3.095***	0.688	3.864***	1.009
	ZA_la	−3.468	0.690	−3.172	1.020
Geopolitical risk	ZA_spac	8.473***	−3.482	7.511***	−3.842
	ZA_la	12.878***	−3.365	9.220***	−3.556
Exchange rate	ZA_spac	30.756***	−2.242	0.982	−1.474
	ZA_la	124.650***	−2.369	1.685**	−1.798
Price level	ZA_spac	2.458***	−0.438	1.7798**	−0.656
	ZA_la	70.838***	−0.965	46.177***	−1.096
Tourism industries	ZA_spac	88.675***	0.020	1.007*	−1.008
	ZA_la	30.561***	0.031	2.932**	−0.986

Note: (a) The null hypothesis of the H-K unit-root test is stationarity in heterogeneous panel data with cross sectional dependence. (b) ZA_spac is the augmented panel KPSS test statistic with long-run variance corrected by the SPC method. (c) ZA_la is the augmented panel KPSS test statistic with long-run variance corrected by the LA method.
$^*p < .1$.
$^{**}p < .05$.
$^{***}p < .01$.

The results also indicate that the outbreak of pandemics generally has a negative conditional marginal impact on tourism demand. As shown in Table 6, tourism receipts are usually lower in years of pandemic outbreaks by about 6.7% (exp [−0.069] − 1 = −0.067 = −6.7%) based on the AMG result and by about 13.2% (exp [−0.141] − 1 = −0.132 = −13.2%) based on the CCEMG result. Similarly, Table 7 shows that the number of inbound tourists drop in years of pandemic outbreaks by about 22.2% (exp [−0.251] − 1 = −0.222 = −22.2%) based on the AMG result and by about 6.7% (exp [−0.069] − 1 = −0.067 = −6.7%) based on the CCEMG result. These results align with the findings of Wilder-Smith (2006) and Kuo, Chang, Huang, Chen, and McAleer (2009).

The interactions between geopolitical risk and pandemic outbreak are also negative in all cases. This confirms our suspicion that the outbreak of pandemics has a moderating effect on the relationship between geopolitical risk and tourism. The results indicate that pandemics aggravate the negative impact of geopolitical risks on tourism demand. As reported in Table 6, the negative impact of geopolitical risks on tourism receipts increases by approximately 2.1 and 2.4% according to the AMG and CCEMG outcomes, respectively. In Table 7,

TABLE 5 Panel bootstrap cointegration tests

Model	Test statistic	Asymptotic *p* value	Bootstrap *p* value
Panel A: Cointegration between tourism receipts and its determinants			
Westerlund & Edgerton	−1.821	1.000	0.966
Persyn& Westerlund ECM			
g_tau	−26.174	0.000	0.000
g_alpha	−31.362	0.000	0.000
p_tau	−25.141	0.000	0.000
p_alpha	−25.141	0.000	0.000
Panel B: Cointegration between Inbound tourists and its determinants			
Westerlund & Edgerton	−4.054	1.000	1.000
Persyn & Westerlund ECM			
g_tau	−57.586	0.000	0.000
g_alpha	−48.523	0.000	0.000
p_tau	−54.079	0.000	0.000
p_alpha	−54.079	0.000	0.000

Note: (a) Test statistics are obtained from 1,000 bootstrap replications. (b) Null hypothesis for Westerlund and Edgerton (2007) is cointegration between tourism demand and its determinants. (c) Null hypothesis for group mean statistics (g_tau and g_alpha) is no cointegration against the alternative that at least one section of the panel is cointegrated. (d) Null hypothesis for panel statistics (p_tau and p_alpha) is no cointegration against the alternative that the panel is cointegrated as a whole.

TABLE 6 Mean group estimates (Dependent variable: Tourism receipts)

Variable	AMG	*p* value	CCEMG	*p* value
Geopolitical risk	−0.011	.042	−0.014	.077
Pandemic outbreak	−0.069	.051	−0.141	.091
Geopolitical risk * pandemic outbreak	−0.021	.041	−0.024	.065
Average global income	0.668	.000	0.065	.000
Price level	−0.667	.018	−0.380	.002
Exchange rate	−0.194	.057	−0.189	.010
Tourism industries	0.179	.021	0.139	.062
No of observations	156		156	
No cross-sections	16		16	

Note: (a) AMG: Augmented mean group (AMG) estimator of Eberhardt and Teal (2010) (b) CCEMG: Common correlated effects mean group (CCEMG) estimator of Pesaran (2006).

TABLE 7 Mean group estimates (Dependent variable: Inbound tourists)

Variable	AMG	*p* value	CCEMG	*p* value
Geopolitical risk	−0.010	.032	−0.001	.073
Pandemic outbreak	−0.251	.084	−0.069	.074
Geopolitical risk * pandemic outbreak	−0.009	.708	−0.012	.065
Average global income	0.550	.002	0.026	.000
Price level	−0.125	.058	−0.484	.013
Exchange rate	−0.025	.097	−0.029	.083
Tourism industries	0.132	.088	0.053	.087
No of observations	156		156	
No cross-sections	16		16	

Note: (a) AMG: Augmented mean group (AMG) estimator of Eberhardt and Teal (2010). (b) CCEMG: Common correlated effects mean group (CCEMG) estimator of Pesaran (2006).

the negative impact of geopolitical risks on the number of inbound tourists increases by 0.9 and 1.2% according to the AMG and CCEMG results, respectively. The AMG coefficient is, however, insignificant, pointing to the absence of a moderating effect.

With regard to the control variables, as expected, average global income positively contributes to tourism demand. As reported in Table 6, when average global income increases by 1%, the size of tourism receipts is expected to increase by 0.668% based on the AMG estimation, and by 0.065% based on the CCEMG estimation. In Table 7, when average global income increases by 1%, number of inbound tourists is expected to increase by 0.550% based on AMG estimation, and by 0.026% based on the CCEMG estimation. This finding suggests that rising purchasing power of tourism demanders promotes international tourism.

The general price level has a negative long-run effect on tourism demand, while real exchange rate has a negative long-run impact on tourism demand. Results reported in Table 6 indicate that when the price level rises by 1%, tourism demand is expected to drop by 0.667 and 0.380% according to the AMG and CCEMG estimators, respectively. Results reported in Table 7 likewise indicate that when the price level rises by 1%, tourism demand is expected to drop by 0.125% and 0.484% according to the AMG and CCEMG estimators, respectively. In Table 6, a percentage rise in exchange rate (currency appreciation) will cause tourism receipts to fall by 0.194 and 0.189% based on AMG and CCEMG, respectively. Table 7 reports similar outcomes, a percentage rise in exchange rate leads to 0.025 and 0.097% rise in the number of inbound international tourists based on AMG and CCEMG, respectively. These outcomes suggest that tourism demand is positively related to price competitiveness as captured by the cost of goods and services and exchange rate movements.

With regard to tourism industries, the findings show that demand for tourism is strongly correlated with the availability in the tourism-supplying country of industry-supporting facilities such as accommodation for visitors, food and beverage serving, passenger transportation, and travel agencies/reservation services. The estimation outcomes show that when a country is able to raise its tourism-related facilities by 1%, we can expect to witness a rise of about 0.179 and 0.139% in tourism receipts according to the AMG and CCEMG estimations, respectively. We can also expect to experience an increase of about 0.132 and 0.053% in the number of inbound tourists based on the AMG and CCEMG estimations, respectively.

The reported outcomes for the control variables are in consonance with claims that income, price level, exchange rates, and availability of tourism-related facilities are traditional determinants of tourism demand (Divisekera, 2003; Khadaroo & Seetanah, 2008; Lim, 1997; Morley, 1998; Okafor, Khalid, & Then, 2018; Santana-Gallego, Ledesma-Rodríguez, & Pérez-Rodríguez, 2010; Santana-Gallego, Ledesma-Rodríguez, Pérez-Rodríguez, & Cortés-Jiménez, 2010; Seetaram, 2012; Shafiullah, Okafor, & Khalid, 2019; Švec & Solarová, 2016; Van Truong & Shimizu, 2017; Zhang & Jensen, 2007).

Finally, to gain additional country-level insight on the relationship between geopolitical risk and tourism demand, we carry out Granger causality testing. The bootstrap panel causality of Kónya (2006) that allows both cross-sectional dependency and country-specific heterogeneity across countries is employed. The summary of the causality results is reported in Table 8 with the complete estimation outcomes reported in Tables A1 and A2 of the Appendix. We find bidirectional causality between geopolitical risk and tourism receipts in China, Colombia, India, Malaysia, Philippines, Russia, Saudi Arabia, South Korea, and Ukraine. We find unidirectional causality from geopolitical risk to tourism receipts in Brazil, Mexico, South Africa, and the United States. We find unidirectional causality in the other direction only in Israel. We, however, find no causal relations between both variables in Indonesia and Turkey. We also detect bidirectional causal relations between the number of inbound tourists and geopolitical risk in Indonesia, Israel, Russia, Saudi Arabia, and Ukraine. In Brazil, China, Mexico, Philippines, South Korea, Turkey, and the US, we find that geopolitical risk Granger causes inbound tourists. We find the opposite only in India and South Korea. No causal relations are detected in Colombia and Malaysia. These outcomes confirm that the countries are heterogeneous and that geopolitical risk is a significant predictor of tourism demand (tourism receipts or inbound tourists) in all the counties sampled. This finding further supports our claim that geopolitical risks affect tourism demand and is in consonance with the findings of Kozak (2007), Slevitch and Sharma (2008), Haddad et al. (2015), Muzindutsi and Manaliyo (2016), and Saint Akadiri et al. (2019).

TABLE 8 Summary of causal relations between tourism and geopolitical risk

Result	Countries
LG= > LTR	Brazil, China, Colombia, India, Malaysia, Mexico, Philippines, Russia, Saudi Arabia, South Africa, South Korea, Ukraine, and US.
LTR= > LG	China, Colombia, India, Israel, Malaysia, Philippines, Russia, Saudi Arabia, and Ukraine.
LG= > LIT	Brazil, China, Indonesia, Israel, Mexico, Philippines, Russia, Saudi Arabia, South Korea, Turkey, Ukraine, and US.
LIT= > LG	India, Indonesia, Israel, Russia, Saudi Arabia, South Africa, and Ukraine.

Abbreviations: LG, log of geopolitical risk; LIT, log of inbound tourists; LTR, log of tourism receipts.

6 | CONCLUDING REMARKS AND IMPLICATION

We examined the relationship between geopolitical risks and tourism demand within a multivariate panel-based model. Based on the classical theory, we first developed a traditional demand function, which treats tourism demand as a function of income, exchange rate, and price level, and then augmented it with geopolitical risks. We also controlled for time-varying destination-specific factors by including the number of tourism-related facilities in each of the sampled countries in the demand function. Furthermore, we examined the potential moderating effect of covid-19 outbreak on the relationship between geopolitical risk and tourism by investigating the interactive effect of past outbreaks and geopolitical risks on tourism. We were thus able to create a useful model for empirical analysis based on the theory of demand. As a next step, the empirical model was estimated for a panel of 16 countries from 2005M1 to 2017M12 through the AMG and CCEMG estimation techniques that address underlying heterogeneity, non-stationarity, and cross-sectional dependence in the panel series. Additional insight on the patterns of causal relationships between geopolitical risks and tourism demand was obtained through the aid of panel bootstrapping technique of Kónya (2006).

Empirical results from the adopted estimation techniques indicate a negative long-run impact of geopolitical risk on tourism demand. Consequently, the dynamic attributes of both local and international political environments significantly affect the consumption decision of tourists and the economic performance of tourist destinations. This outcome emphasizes the importance of geopolitical stability to tourism and confirms our assertion that geopolitical risk is a non-traditional determinant of tourism demand. Overall, we conclude that peace and stability are a key requirement for tourism sector growth. As tourism is an important driver of economic growth (Akadiri, Lasisi, Uzuner, & Akadiri, 2018; Fahimi, Akadiri, Seraj, & Akadiri, 2018; Katircioglu, 2009; Lee & Chang, 2008; Liu & Song, 2018; Wu & Wu, 2019), geopolitical risks can indirectly stifle economic growth through their adverse effect on tourism. The causality results, however, show that the relationship between geopolitical risks and tourism demand is heterogeneous as it varies across countries. In spite of this, geopolitical risk turns out to be a significant predictor of tourism demand in all the 16 countries sampled.

The findings also confirm that the outbreak of pandemics has a moderating effect on the relationship between geopolitical risk and tourism. Our findings indicate that pandemics aggravate the negative impact of geopolitical risks on tourism demand. This suggests that the sudden outbreak of covid-19 pandemic is likewise likely to amplify the negative relationship between geopolitical risk and tourism. Concerning the control variables, as expected, average global income positively contributes to tourism demand. This finding suggests that rising purchasing power of tourism demanders promotes international tourism. Also, currency appreciation lowers tourism demand, while increasing price levels lower tourism demand. This is an indication that tourism demand is positively related to price competitiveness as captured by the cost of goods and services and exchange rate movements. Moreover, our findings indicate that tourism demand is more sensitive to price variations (price level and exchange rate movements) than it is to geopolitical risks. Since countries experiencing geopolitical risks are often negatively portrayed internationally and this often leads to the lowering of prices in their tourism sector, less risk-averse travelers are bound to take advantage of cheaper holiday costs in such places. Geopolitical risks may thus indirectly cause an upsurge in tourism demand.

In summary, at first glance, the concept of geopolitical risk seems unrelated to tourism. A closer look taken by this study, however, reveals that rising geopolitical risks negatively impact the tourism industry. This stands to reason since tourists are often regarded as soft targets and ambassadors of their home countries and are thus deliberately targeted for their symbolic value during geopolitical conflicts such as wars and terrorist attacks. International tourists are also commonly targeted during periods of crises for ideological reasons such as punishment for the support given by the government of their home countries to other governments or ideologies. The high profile nature of international tourists coupled with the news value they are able to generate is thus often exploited by violent actors during geopolitical conflicts. Overall, the tourism sector is extremely vulnerable to geopolitical risks.

From a policy perspective, international tourists are viewed as rational consumers who decide on destinations to visit by weighing the benefits (satisfaction to be derived from the experience) against the cost (risks associated with the experience). An increase in geopolitical risks raises the associated risks and thus the cost. This mainly results in destination substitution, as tourists choose either to stay at home or visit other destinations perceived as safer. The decisions by tourists to avoid unsafe destinations translate into significant economic losses for the tourism sector and the entire economy of the tourism-supplying country. We are, therefore, of the opinion that pre-crisis, in proposing global or destination-specific policy directions for tourism sector development, governments, private institutions and policy-makers should establish crisis management plans to protect the tourism sector. This should involve: (a) the creation of tourism-policing divisions made up of police officers specially trained to gauge the level of risk in the sector and adequately respond to crisis. (b) The establishment of crisis management task forces made up of government representatives, tourism industry representatives, and community representatives. The task force should be solely dedicated to managing crisis and ensuring full recovery post-crisis. (c) A crisis management action document designed to guide the actions of all stakeholders during periods of crises.

Post-crisis, tourism-supplying countries should initiate aggressive recovery marketing strategies to re-establish the image of safety and attractiveness required to reassure potential tourists of the safety of the destination, thereby ensuring return to competitiveness and economic recovery. Moreover, our findings indicate that tourism demand is more sensitive to price variations (price level and exchange rate movements) than it is to geopolitical risks. Since countries experiencing geopolitical risks are often negatively portrayed internationally and this often leads to the lowering of prices in their tourism sector, less risk-averse travelers can be persuaded through aggressive marketing to take advantage of cheaper holiday costs in such places.

It is important to point out two limitations of this study. The first is that the characteristics of vacation, business, and VFR (visiting friends and relatives) tourism can show marked variation, and seasonality plays an important role in the distribution of tourist numbers over the year. The second is that geopolitical risk data unavailability limited the number of countries covered in the study. As a direction for future research, we, therefore, suggest the use of disaggregated tourism data as they become available, and the expansion of the sample size as the geopolitical risk database grows.

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APPENDIX

TABLE A1 Panel bootstrap causality between geopolitical risk and tourism receipts

Country	Null hypothesis: Geopolitical risk does not Granger cause tourism receipt — Test statistic	*p* value	Tourism receipt does not Granger cause geopolitical risk — Test statistic	*p* value	Result
Brazil	5.855	.016	1.636	.201	LG= > LTR
China	6.014	.049	17.196	.000	LG < =>LTR
Colombia	4.661	.031	3.782	.052	LG < =>LTR
India	9.426	.002	3.007	.083	LG < =>LTR
Indonesia	4.576	.101	2.912	.233	NO
Israel	2.582	.108	7.475	.006	LG < =LTR
Malaysia	3.688	.055	5.286	.021	LG < =>LTR
Mexico	26.973	.000	1.351	.717	LG= > LTR
Philippines	13.390	.000	5.409	.020	LG < =>LTR
Russia	5.310	.070	14.322	.001	LG < =>LTR
Saudi Arabia	3.614	.057	9.157	.002	LG < =>LTR
South Africa	4.492	.034	1.182	.277	LG= > LTR
South Korea	6.164	.013	1.732	.188	LG= > LTR
Turkey	3.869	.145	0.866	.648	NO
Ukraine	6.237	.013	7.167	.007	LG < =>LTR
US	4.378	.036	0.578	.447	LG= > LTR

Notes: (a) Estimations are made for 1–4 lags. (b) Optimal lag length which minimizes Schwarz Bayesian Criterion is selected. (c) The test is based on seemingly unrelated regression (SUR) estimations with individual country specific bootstrap critical values. (4) LG = log of geopolitical risk.
Abbreviations: LG, log of geopolitical risk; LTR, log of tourism receipts.

TABLE A2 Panel bootstrap causality between geopolitical risk and inbound tourists

Country	Null hypothesis: Geopolitical risk does not Granger cause inbound tourists — Test statistic	*p* value	Inbound tourists does not Granger cause geopolitical risk — Test statistic	*p* value	Result
Brazil	5.301	.021	1.262	.261	LG= > LIT
China	12.383	.002	1.248	.536	LG= > LIT
Colombia	1.706	.191	0.758	.384	NO
India	2.021	.155	4.178	.041	LG < =LIT
Indonesia	5.336	.069	4.847	.089	LG < =>LIT
Israel	3.934	.047	4.753	.029	LG < =>LIT
Malaysia	1.687	.194	1.240	.265	NO
Mexico	8.420	.015	2.701	.259	LG= > LIT
Philippines	24.154	.000	2.446	.118	LG= > LIT
Russia	13.868	.001	5.709	.058	LG < =>LIT
Saudi Arabia	9.487	.002	6.107	.013	LG < =>LIT
South Africa	1.791	.181	4.352	.037	LG < =LIT
South Korea	6.860	.009	2.264	.132	LG= > LIT
Turkey	4.705	.030	0.426	.514	LG= > LIT
Ukraine	7.065	.008	7.112	.008	LG < =>LIT
US	5.078	.024	1.959	.162	LG= > LIT

Notes: (a) Estimations are made for 1–4 lags. (b) Optimal lag length which minimizes Schwarz Bayesian Criterion is selected. (c) The test is based on seemingly unrelated regression (SUR) estimations with individual country-specific bootstrap critical values.
Abbreviations: LG, log of geopolitical risk; LIT, log of inbound tourists.