

Geopolitical risk and tourism in Turkey

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Abstract

Purpose – The purpose of this paper is to show the effect of Turkey’s geopolitical risk on the number of international tourist arrivals to the country. When Turkish economy in 2019 is analyzed, it is seen that the share of tourism in national income is 11%. For this reason, national economy is significantly affected by changing of the number of international tourist arrivals. Security problems are an important variable affecting tourist arrivals.

Design/methodology/approach – The paper focused on secondary data for the period 2000–2019 for macroeconomic variables. Accordingly, the number of international tourist arrivals was added as a dependent variable, geopolitical risk as an independent variable, gross domestic product (GDP) and economic freedom index as control variables and inflations as an external variable to the model. The residual augmented least squares–the autoregressive distributive lag (RALS-ADL) cointegration test and the dynamic ordinary least squares (DOLS) coefficient estimator were used. It allows for more robust results to be obtained when the residues do not have a normal distribution.

Findings – The RALS-ADL cointegration test result shows that there is a cointegration relationship between variables at a 1% significance level. Moreover, the DOLS coefficient estimator results indicate that an increase in economic freedom and GDP increase the number of international tourists, whereas an increase in the Geopolitical Risk Index and inflation decreases the number of international tourism arrival. It can be said that tourists consider the security and economic stability of the host country when making tourism decisions.

Originality/value – Turkey is one of the most risky developing countries, as well as one of the most popular travel destinations. When the literature is examined, it has been found that studies for Turkey usually determine the relationship between the variables for a short period of time. However, to ensure sustainable growth and environment of confidence, the long-run relationship between variables should be determined so that policymakers can make more impactful decisions. Therefore, the aim of this study is to make a literature contribution, taking into account the long-term effects. In addition, unlike other studies, this study fills the gap in literature using the RALS-ADL cointegration test, which produces robust estimators.

Keywords Geopolitical risk, International tourist, GDP, The RALS-ADL cointegration test, DOLS estimator

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Introduction

The term “geopolitics” is used to define states’ ability to control and compete within the country (Gupta *et al.*, 2019). However, in recent years, events comprising corporations, non-governmental organizations, political parties and rebel groups are considered part of geopolitics. Hence, the word “geopolitics” today comprises various events with different causes and consequences (Caldara and Iacoviello, 2018; Gupta *et al.*, 2019). On the other hand, the term “geopolitical risk” is related with the interstate disputes and conflicts of the countries that are competing for territory (Caldara and Iacoviello, 2018).

Turkey has challenged with various geopolitical risks. Among these, the PKK (Partiya Karkerên Kurdistanê – Kurdistan Worker’s Party) takes the first place, whose influence and existence continues today. The PKK problem started to show itself with various terrorist

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incidents in the country in the 1980s (Ozkahraman, 2017; Park, 2012). In addition, especially in the last 10 years, Gezi Park incident (2013), the unsuccessful coup attempt (2016) and the Olive Branch operation (2018) were experienced, which have caused great tensions in the country (Demir *et al.*, 2020).

In this period, in addition to these military, political and civil conflicts within the country, tensions were also experienced with neighboring countries. The Mavi Marmara problem (2010) with Israel is one of them (Kyriazis and Economou, 2021). The uprisings occurred in the Arab countries at the same year caused the starting of the Arab Spring, leaving a negative impact on Turkey in the following periods (Perles-Ribes *et al.*, 2018). Especially the civil war that started in Syria in 2011 has grown rapidly (Kyriazis and Economou, 2021). In addition, recent participation in the Syrian civil war, as well as the armed conflicts of the PKK, brought Turkey which is North Atlantic Treaty Organization's (NATO) last point in the Middle East to be the focus of active terrorist acts that have been going on for more than thirty years (Afonso-Rodríguez, 2016). Another tension the country has experienced with neighboring countries is the plane crisis with Russia in 2015, which affected the relations between the two countries (Mansour-Ichraikie and Zeaiter, 2019). Finally, the continental shelf problem in 2020 between Turkey and Greece brought the countries to the brink of a hot war.

These geopolitical risks faced by Turkey are expected to have an impact on various macro and micro variables. Since geopolitical uncertainties and instabilities are among the main determinants of economic decision-making processes, geopolitical uncertainties and adverse geopolitical events have a significant impact on many variables of countries (Akadiri *et al.*, 2020). This study's main research question is to determine how geopolitical risk affects tourism from these variables for Turkey. The most important reason for this is that tourism is shown as a driving force that increases gross domestic product (GDP) and reduces social inequality in countries such as Turkey, which has an important share in the country's economy (Saha and Yap, 2014; Brida and Risso, 2010).

According to World Travel and Tourism Council (2021), reports show that Turkey is listed among the top 10 countries that receive the most tourists due to its geographical location as well as its natural and cultural resources. The ratio of travel and tourism activities in Turkey to GDP in 2019 and 2020 ranks 5th and 8th in the world with 11 and 5%, respectively in this reports. In addition, considering the added value it creates within the country, tourism activities for Turkey have an important place in the labor market as well as economic growth. Approximately 10% of the workers in the country are employed in the tourism sector. However, the tourism industry is more sensitive than other industries in the face of events such as war, terrorism, tensions and violence (Gozgor *et al.*, 2017; Lee *et al.*, 2021). Tourist decision-making processes are based on the theory that tourist decision-making is a complex procedure that is impacted by a variety of factors, both internal and international. Therefore, tourists make predictions about the negative impacts of the destination center and the probability of these negative outcomes, relying on their travel risk perception (Sharifpour *et al.*, 2014; Karl *et al.*, 2020).

Uncertainties caused by geopolitical risks significantly affect the number of international tourists, tourism imports, the number of overnight stays and other sectors that develop depending on tourism (Akadiri *et al.*, 2020). The impact of these uncertainties on tourism have been separately addressed in literature (Saha and Yap, 2014; Ghaderi *et al.*, 2017; Gozgor *et al.*, 2017; Liu and Pratt, 2017; Bassil *et al.*, 2019; Lanouar and Goaid, 2019). However, a country may experience a few uncertainties such as terrorism, political instability and conflict. In the literature examining the effects of these uncertainties on tourism, studies that deal with all these uncertainties together were not encountered until the Caldara and Iacoviello (2018) study. Caldara and Iacoviello (2018) [1] contributed to the formation of a common consensus on the measurement and interpretation of geopolitical risk by calculating the Geopolitical Risk Index (GPR) (Demiralay and Kilincarslan, 2019; Gozgor *et al.*, 2017).

Turkey has struggled to solve many of its national security issues for a long time. Due to tensions in the border regions, it had to deal with international security problems. This study's goal is to determine whether the GPR significantly affects the number of international tourism arrivals to Turkey, one of the world's most popular tourist destinations and a significant geopolitical position. The residual augmented least squares-autoregressive distributive lag (RALS-ADL) cointegration test was used for this purpose, and the period 2000:1–2019:4 was discussed. This study differs from literature in methodology, country and time period. The paper period was included because it covers the period when various national and international uncertainties increased and the trust environment decreased, as well as the PKK terrorist attacks that have been present in Turkey since the 1980s. Given the increased geopolitical risk in Turkey during this time period, it is aimed that the results will be more reliable in order to make an effective policy recommendation. Furthermore, this cointegration test has been useful because it allows for more robust results to be obtained when the residues do not have a normal distribution. So, what makes this study different is that the empirical results are stronger and more reliable. It would also help Turkey's long-term plans to grow tourism and change its policies by taking away some of the uncertainties.

Following the description of the scope and purpose of the study in the introductory section, the relevant literature, methodology, data set and findings are presented. Thereafter, the Results section provides a comparison of the obtained empirical results with the literature and makes recommendations for future policies.

Literature review

Tourism, which plays an important role in the economies of developing countries, is a sector that is highly vulnerable to GPR that bring about security problems (Lanouar and Goaid, 2019). Investigating the relationship between security and tourism, Ghaderi *et al.* (2017) and Liberato *et al.* (2020) found that the effect of security on tourism is positive in developed countries and negative in developing countries. However, unlike the Fourie *et al.* (2020) literature, considering the security threats in the source country (the country where the tourist resides) and the host country (country where tourism activity takes place) together, this study examined the effect on international tourism and concluded that tourists travel to countries with similar security levels to their own countries. Thus, while tourists with stable security levels in the source country travel to countries with similar security levels, countries with unstable security levels may travel to more risky regions.

Conflict and terrorism are among the most used variables in examining the relationship between the security of the host country and tourism. Saha and Yap (2014) suggested that political conflict and terrorism negatively affect the tourism industry, and Lanouar and Goaid (2019) concluded that terrorist shocks have a longer-lasting impact on tourism than shocks from political conflict. Conversely, Liu and Pratt (2017) found that terrorism does not have a long-run effect on international tourism demand and that its short-run effect is quite limited from a global perspective. Bassil *et al.* (2019) investigated the fact that terrorism occurring in a destination center affects tourism inflows not only in the relevant country but also in other countries.

Okafor and Khalid (2021) took the debate between conflict and terrorism and international tourism to a different level. Due to the conflict and terrorism in the host country, international tourists' tendency to prefer a different destination center causes a decrease in tourism activities. In addition, Khalid *et al.* (2020) determined in his research that this reducing effect of security and military expenditures will vary depending on the relative military expenditure level as well as geographical location. According to the results, in the presence of conflict, moderate relative military expenditures help to increase the international tourism attractiveness of host countries, while high relative military expenditures cannot

reverse the reducing effect of conflict on tourism; on the contrary, it increases this problem more. Thus, it can be stated that military and security expenditures have both a substitute and a complementary effect on international tourism.

When the studies conducted for Turkey are examined, [Dragičević et al. \(2018\)](#) and [Kaya et al. \(2022\)](#) determined that conflict/terrorism plays a role in reducing international tourism activities. The findings of the [Karamelikli et al. \(2020\)](#) study not only support the results of these studies but also offer a different perspective by including the number of domestic tourists in the analysis. This point of view is based on the view that international tourists consider the news in the press when deciding on their destination choices. Although tourism centers in Turkey are generally located in the west and terrorist activities take place in the east, relevant news is presented for the whole country. Thus, the findings show that terrorist events do not affect the tourism decision of domestic tourists but affects the decisions of international tourists. In contrast, [Gozgor et al. \(2017\)](#) argued that international tourism inflows increase when there is a low influence of military power in politics in Turkey, and it decreases in the opposite case. Differently from these papers, [Asgary and Ozdemir \(2020\)](#), who examined the effects of global risk perceptions for Turkey on tourism, determined that risk perceptions and effects may vary at global and country levels.

The security of the host country can be determined with a common variable thanks to GPR, calculated by [Caldara and Iacoviello \(2018\)](#), which takes into account political and military criteria. Thus, it has become easier to investigate the fragility of the tourism sector. The literature confirms that geopolitical risks are an important determinant of tourism ([Demir et al., 2019, 2020](#); [Tiwarei et al., 2019](#); [Akadiri et al., 2020](#); [Hassan et al., 2020](#); [Jiang et al., 2020](#)). In addition, unlike other studies, studies by [Tiwarei et al. \(2019\)](#), [Payne and Apergis \(2020\)](#), [Ghosh \(2021\)](#), [Zhang et al. \(2022\)](#) and [Shahzad et al. \(2022\)](#) examined the extent to which the changes in tourism activities affect the variables of economic uncertainty and geopolitical risk and determined that tourism is more affected by geopolitical risk.

Theoretical and empirical findings in the literature show that the security problems experienced in the host country in general reduce the tourist attraction potential of the country ([Balli et al., 2019](#); [Demir et al., 2019](#); [Jiang et al., 2020](#); [Ghosh, 2021](#); [Hailemariam and Ivanovski, 2021](#); [Lee et al., 2021](#)). [Balli et al. \(2019\)](#), who conducted one of the first studies examining the relationship between tourism activities and the GPR, determined that this relationship differs in terms of countries. The main reason for this situation is the tourism attraction potential of the countries. For examples, there was no significant effect of geopolitical risk on tourism in Indonesia, Thailand, The Philippines and Turkey, which are all attractive tourism destinations. In this context, international tourists make their travel plans to these countries by ignoring the security risk. This shows that these countries' tourism demands are unaffected by national and international risks. [Hassan et al. \(2020\)](#)'s findings, based on the causality-in-quantiles and cross-quantilogram approaches, suggested that national and international geopolitical risks have a significant potential in predicting the returns and volatility of tourism stocks in most developing countries' economies with normal market conditions, although it was not the case in some countries. [Kazakova and Kim \(2021\)](#), on the other hand, in their study examining the effect of geopolitical risk on the number of tourists coming to South Korea from neighboring countries, determined that geopolitical risk shocks vary according to the source country. In addition, the duration of the reaction of tourists from the source country to the risks experienced in the host country also differs. This reaction may be short or medium term, or it may be temporary or permanent. Unlike these studies, [Gozgor et al. \(2022\)](#) used social globalization as a moderating factor to examine the link between the GPR and tourism for 18 developing countries. The findings indicate that social globalization contributes an essential part in mitigating the adverse effects of geopolitical risks on tourism.

Zhang *et al.* (2022) have examined the emergence time of the impact of geopolitical risks on tourism activities. In addition, although these effects are heterogeneous, their strength is also different. Ghosh (2021) also argues that a 10% increase in the host country's GPR will result in a 6.2% decrease in tourism growth, while Hailemariam and Ivanovski (2021) predict a 12.6% decrease. Thus, it is recommended to develop strategies to increase the safety of tourists in order to prevent shrinkage in the tourism market of the host country. In addition to these studies, a negative effect of geopolitical risk on tourism was found in a study of 18 developing countries by Demir *et al.* (2019), a study of 16 developing countries by Lee *et al.* (2021), a study of China by Jiang *et al.* (2020), a study of India by Ghosh (2021) and a study of the USA by Hailemariam and Ivanovski (2021) and Shahzad *et al.* (2022).

When the studies conducted for Turkey, which is the subject of this study, are examined, Balli *et al.* (2019) determined that there is no relationship between the variables, Demir *et al.* (2020) determined that the geopolitical risk causes a decrease in the number of international tourists coming to the country and Bayraktaroğlu *et al.* (2021) determined that there is a statistically significant relationship between the variables because of the causality tests they have done. It has been determined that causality is bidirectional between domestic risks and the number of tourists and unidirectional between geopolitical risk and the number of tourists.

While many studies have examined the effects of conflict, war, risk and terrorism on tourism, there is no consensus in the empirical literature because all risk variables changes to national or international factors. We can examine the effect of all of these on tourism using the GPR. However, there are a few studies about the relationship between the GPR and tourism; hence, there is a lack of research on how to characterize it. On the other hand, especially considering this relationship for attractive and developing countries is crucial. The reason why tourism has an important role in the economies of these countries. Despite Turkey being a popular tourist destination, there remains a lack of common ground on the impact of geopolitical risks on the tourism, both in the short and long term. Therefore, this study aims to investigate the effect of geopolitical risk on the number of tourist arrivals, which is a determinant of tourism activities in Turkey. Turkey is among the top 10 countries (World Tourism Barometer, 2019) that attract the most tourists despite the geopolitical risks it faces, indicating that Turkey is an attractive tourism center. As a result, the findings obtained for Turkey are critical for the implementation of effective policies. For this reason, the paper includes a discussion of Turkey's example. When the studies conducted for Turkey are examined, it has been observed that the short-run impact of the relationship between the variables is considered (Balli *et al.*, 2019; Demir *et al.*, 2020; Bayraktaroğlu *et al.*, 2021). The findings usually show the short-run impact of geopolitical risk on tourism. However, tourism demand is negatively impacted by shocks in the medium and long run (Gricar *et al.*, 2022) and there is no evidence that this effect occurs in Turkey in a long run. Thus, this study is expected to fill the gap in the literature. This situation is the primary shortcoming in the literature.

Given this shortcoming in the literature, the relationship between tourism and GPR is intended to be studied over long term using control and external variables (GDP, inflation and economic freedom index). For this purpose, the RALS-ADL integration test was used to ensure stronger results are obtained even if the residuals were not distributed normally. Furthermore, the literature does not include the direction (positive-negative) and power of the relationship between variables. The dynamic ordinary least squares (DOLS) coefficient estimator is used in this study to eliminate these weaknesses. In addition, in order to correctly analyze the effect of geopolitical risk on tourism, the period 2000:1–2019:4 has been taken into account, when geopolitical risk began to rise for Turkey. Given these circumstances, the purpose of this paper is to fill the shortcoming in the literature by covering the country, time and method.

Methodology

The purpose of this paper is to investigate how the effect of geopolitical risk on the number of tourists is realized in the long term with control variables. To determine the cointegration relationship between variables, it is necessary to determine the order of integration, and thus, the series were first subjected to a unit root test. The Augmented Dickey–Fuller (ADF) test proposed by [Dickey and Fuller \(1981\)](#) and the Zivot–Andrews (ZA) unit root test by [Zivot and Andrews \(1992\)](#) were used to determine the unit root orders of the series.

The ADF unit root test attempts to overcome the autocorrelation problem by adding the delays of the dependent variable to the equations. ADF is considered to be one of the traditional unit root tests because it does not take into account structural changes. These unit root tests may provide misleading results in cases where the series contain structural breaks. Therefore, the ZA unit root test, which allows structural breaks, was used in this study. The ZA unit root test was developed by [Zivot and Andrews \(1992\)](#) on the basis of criticism of the external determination of structural breaks. In this context, it determines the structural break date internally and allows a structural break in the relevant period. The breakage dates were added as dummy variables to the model, which takes into account the level, slope and level + slope processes, and were analyzed and calculated using the least squares method. Unit root testing of variables was compared with critical values from the [Zivot and Andrews \(1992\)](#) table critical values.

The RALS-based cointegration test developed by [Lee et al. \(2015\)](#) was used to examine the research model. The RALS procedure was developed by [Im and Schmidt \(2008\)](#), who investigated the presence of the unit root under non-normally distributed residues. When the actual distribution of residues is known, maximum likelihood estimators can be obtained by using the appropriate density function. However, the true density function of non-normally distributed residues is often unknown. Moreover, the use of the wrong density function also causes deterioration in the results ([Lee et al., 2015](#)).

There are many reasons why this test is used in the study. One of these is the RALS procedure which allows the development of stronger tests with the help of information obtained from high moments when residues do not exhibit normal distribution. Furthermore, it is a simple testing process that does not need the underlying functional form to be specified in advance and to predefine a particular density function or verify the presence of a specific form of non-normality ([Oh et al., 2020](#); [Yilanci et al., 2023](#)). Finally, the main benefit of RALS is that it is also effective when the errors are non-normal and normal.

The RALS term was calculated using [Equation \(1\)](#) under the second and third moments of the error terms of the respective cointegration test. The RALS term was recalculated using [Equation \(2\)](#).

$$\hat{w}_t = h(\hat{e}_t) - \hat{K} - \hat{e}_t \hat{D}_2, t = 1, 2, \dots, T \quad (1)$$

$$\hat{w}_t = [\hat{e}_t^2 - m_2, \hat{e}_t^3 - m_3 - 3m_3 \hat{e}_t^3] \quad (2)$$

where \hat{e}_t is residuals, $\hat{D}_t = \frac{1}{T} \sum_{i=1}^T h'(\hat{e}_i)$, $\hat{K}_t = \frac{1}{T} \sum_{i=1}^T h(\hat{e}_i)$, $h(\hat{e}_i) = [\hat{e}_i^2, \hat{e}_i^3]'$ and $m_j = T^{-1} \sum_{i=1}^T \hat{e}_i^j$.

The RALS term, which generates the RALS-ADL [\[2\]](#) cointegration test given in [Equation \(3\)](#), was added to the ADL model proposed by [Banerjee et al. \(1998\)](#).

$$\Delta y_{1t} = d_{1t} + \delta_1 y_{1,t-1} + \gamma' y_{2,t-1} + \phi' \Delta y_{2t} + \hat{w}_t' \gamma + u_t \quad (3)$$

where d_{1t} controls the deterministic terms and the autocorrelation problem of the residues and is the residuals obtained from the least squares estimation. In addition, the null hypothesis, which suggests that there is no cointegration relationship between variables in the RALS-

ADL cointegration test, was tested with its counterpart arguing for the presence of cointegration. The hypothesis expressing this is expressed as $H_0 : \delta = 0, H_1 : \delta < 0$.

Cointegration tests do not provide information about the direction and the strength of the effect that independent variables have on the dependent variable. Thus, a coefficient estimator was used to determine the effect of the independent variable on the dependent variable. The DOLS methods proposed by [Stock and Watson \(1993\)](#) were employed to this end. The DOLS estimator removes the deviations that occur in the static equations by adding dynamic elements to the equations. Monte Carlo simulation was used to obtain the estimators. One of the reasons why the DOLS predictor was used in this study is that DOLS estimators provide more effective results in models with a small number of observations and a heterogeneous structure ([Mark and Sul, 2003](#)). Moreover, this estimator performs better in small samples and can support higher degrees of integration as well as potential simultaneity within regressors of a potential demand system ([Masih and Masih, 1996](#)) and demonstrates robustness in addressing serial correlation and endogeneity ([Bulut, 2021](#)).

Data

This paper aimed to investigate the effect of Turkey's GPR [3] on the number of international tourist arrivals for 2000:1–2019:4 quarterly data set [4]. Although the GPR is published monthly and the other variables are published annually, they were transformed into quarterly data using the EViews 10 package program [5]. In this context, the quarterly interpolation technique [6] used by [Romero and Mendez-Carbajo \(2005\)](#) and [McDermott and McMenamin \(2008\)](#) was employed [7]. Descriptions and sources regarding the variables used in the study are given in [Table 1](#).

This study tests the hypothesis that the GPR is negatively associated with the number of international tourism arrivals. The econometric model includes control variables in line with previous research on international tourism. GDP and EF are included in the model as control variables, and INF is an external variable not explained by any other variables in the model. GDP [8], one of the control variables used to examine the effect of GPR on tourism, was suggested by [Balli et al. \(2019\)](#), [Akadiri et al. \(2020\)](#) and [Lee et al. \(2021\)](#), and INF [9] was suggested by [Demir et al. \(2020\)](#) and [Lee et al. \(2021\)](#). In addition, the EF [10] variable, which expresses the right of individuals to control their labor and property, is included in the model because it has been suggested to affect tourism activities ([Ozcan et al., 2017](#); [Saha et al., 2016](#)).

$$TUR_t = \alpha_0 + \alpha_1 GPR_t + \alpha_2 GDP_t + \alpha_3 EF_t + \alpha_4 INF_t + \varepsilon_t$$

where t is time period, α_i ($i = 0,1,2,3,4$) is a coefficient estimator and ε_t is residuals.

The variables in [Table 1](#) were considered non-logarithmical, and the descriptive statistics of the variables are shown in [Table 2](#). When the results in [Table 2](#) were examined, it was found that the mean and median values for all variables were close to each other, and the standard deviation was close to zero. In this case, the variability of the variables can be stated to be low. The variables TUR, GPR, GDP and EF all have negative skewness, whereas INF has positive

Variables	Description	Source
TUR	International tourism, number of arrivals	World Bank Database
GPR	Geopolitical Risk Index	Caldara and Iacoviello (2018)
GDP	GDP (local currency at constant prices)	World Bank Database
INF	Inflation, consumer prices (annual %)	World Bank Database
EF	Economic Freedom Index	Heritage Found

Table 1.
Variables

skewness. Furthermore, when the kurtosis values of the variables were calculated, it was determined that, with the exception of INF, the others have a platykurtic distribution, whereas INF has a leptokurtic distribution.

Results

In this paper, the cointegration relationship between the variables was examined by considering the RALS-ADL cointegration test. This is used in the study because it provides stronger results with the help of information obtained from high moments when residues do not exhibit normal distribution. The application of the RALS-ADL cointegration test depends on the precondition that the variables are stationary at I(1). For this reason, the variables in the study were first subjected to a unit root test. To determine the unit root order of the variables, the ZA unit root test, which takes into account structural breaks, and the ADF root test were used. The results obtained from the unit root tests are displayed in Table 3.

The null hypotheses for the ADF and ZA unit root tests suggest that the series is not stationary. The results given in Table 3 indicate that the null hypothesis is rejected at the first difference of the variables. Therefore, the variables are stationary at I(1). Thus, the results obtained from the analysis performed after the prerequisite of the RALS-ADL cointegration test are met can be seen in Table 4 [11].

Table 4 provides a cointegration result that TUR is dependent, GPR is independent and the others are control variables. When the RALS-ADL cointegration test statistics were compared to the table critical values, it was found that the H_0 hypothesis, which says that the

Table 2.
Descriptive statistics

	TUR	GPR	GDP	INF	EF
Mean	29,736,400	29.47	1.18 E+12	16.30	60.41
Median	31,740,781	28.93	1.06 E+12	8.98	62.35
Maximum	53,310,906	44.76	1.77 E+12	56.12	65.73
Minimum	10,078,938	14.95	6.90 E+11	5.93	50.07
Standard deviation	12,101,075	7.25	3.51 E+11	15.48	4.70
Skewness	-0.11086	0.32	0.309904	1.81	-0.87

Source(s): Author's calculation

Table 3.
Unit roots tests

Variables	ADF		ZA	
	C	C + T	Model A	Model C
TUR	-1.605	-1.814	-4.019 (2005:4)	-3.928 (2006:3)
GPR	-2.351	-3.127	-4.550 (2012:4)	-2.332 (2017:4)
GDP	-1.115	-3.018	-3.828 (2010:4)	-3.690 (2010:4)
INF	-2.509	-2.003	-4.141 (2005:4)	-3.867 (2003:2)
EF	-1.630	-3.088	-3.098 (2005:3)	-4.557 (2010:4)
Δ TUR	-5.666***	-5.848***	-7.012*** (2017:1)	-7.319*** (2014:4)
Δ GPR	-6.104***	-5.987***	-7.830*** (2009:3)	-8.211*** (2009:4)
Δ GDP	-4.240***	-4.103***	-4.700** (2009:2)	-4.852* (2009:1)
Δ INF	-5.125***	-6.015***	-7.128*** (2004:2)	-8.641*** (2004:2)
Δ EF	-5.346***	-5.449***	-5.695*** (2004:3)	-5.403** (2004:3)

Note(s): The optimal lag length was determined by considering the Akaike information criterion. ** and *** are statistically significant levels at 5% and 1%, respectively. The values in parentheses indicate the break dates

Source(s): Author's calculation

variables do not have a cointegration relationship, was rejected. Thus, the results in Table 4 show that there is a cointegration relationship between variables at a 1% significance level; in other words, the variables in the research model are interrelated in the long term. It is aimed at determining how GPR affects TUR in this study. The hypothesis assumed that GPR has a negative effect on TUR. However, cointegration tests provide information about the long-term relationship of variables, and they do not show the direction and the order of this relationship. Thus, the coefficients of the model with cointegration are determined using the DOLS estimator. The results obtained are given in Table 5.

Cointegration tests can detect whether there are long-term correlations between variables, but they do not explain how other variables affect the dependent variable. In this case, for variables with a cointegration relationship between them, coefficient estimators are used. Thus, positive and negative effects on the dependent variable can be identified. The DOLS coefficient estimator was employed to figure out how GPR and control variables affected TUR. It is preferred that this estimator gives consistent results even in small samples. Based on the results obtained from the DOLS coefficient estimator, it was seen that all variables were statistically significant and the hypothesis that GPR causes decreased TUR is valid. Moreover, the empirical results indicate that an increase in economic freedom and GDP increase the number of international tourist arrivals, whereas an increase in GPR and inflation decreases it.

Conclusion

Tourism activities, which contribute greatly to countries in economic, social and cultural terms, have a rather fragile structure. Tourism occupies an important place, especially in developing countries. However, the higher risk level of these countries compared to developed countries increases their economic vulnerability. The empirical literature lacks a consensus over the characterization of the relationship between GPR and tourism in both the short and long term. Especially, there are limited studies on attractive tourism centers and/or developing countries (where tourism activities make significant contributions). This study

TUR = f(GPR, GDP, INF, EF)		Test statistic	Table vritical values
p^2	k		
0.073	11	-3.648	-3.037; -2.357; -1.993

Note(s): k is the optimal lag length determined using recursive t-statistics, p^2 is a long-run correlation coefficient

Source(s): Author's calculation

Table 4.
RALS-ADL
cointegration test

Variables	Depended variable: TUR	
	Coefficient	Test statistic
GPR	-0.344	-2.162**
GDP	0.958	5.419***
INF	-0.296	-5.931***
EF	1.878	3.576***
Constant	-15.267	-4.127***

Note(s): ** and *** are statistically significant levels at 5% and 1%, respectively

Source(s): Author's calculation

Table 5.
DOLS estimator

makes a valuable contribution to the existing literature by taking into account Turkey in both circumstances. Moreover, Turkey has experienced many past political and military tensions. For this purpose, the effect of the geopolitical risk on the number of international tourists' arrival to the country has been examined by including GDP and EF as control variables and INF as an external variable. The RALS-ADL cointegration test was used in the analysis from 2000:1 to 2019:4. The DOLS coefficient estimator, which was used after determining the long-run relationship between the variables, indicates that increases in geopolitical risk and inflation will occur with a decrease in the number of international tourists' arrival to the country. In addition, increases in GDP and economic freedoms increase the number of international tourists' arrival.

The results obtained regarding the relationship between geopolitical risk and tourism appear to be in line with those by [Saha and Yap \(2014\)](#), [Ghaderi *et al.* \(2017\)](#), [Demir *et al.* \(2020\)](#), [Jiang *et al.* \(2020\)](#) and [Lee *et al.* \(2021\)](#). They show that an increase in the risk level of the host country reduces the number of international tourists. On the other hand, [Balli *et al.* \(2019\)](#) found that this relationship do not exist in a short time in popular tourist destinations such as Turkey.

The results of the time-varying causality test used for robustness checks in [Figure A1](#) show that the number of international tourist arrival is affected even in the short run during times of conflict in the country unlike [Balli *et al.* \(2019\)](#). Empirical findings suggest that although Turkey is a highly attractive center of tourism, the deterioration in the security of the country due to the increase in the GPR (country becoming a more risky destination center) will likely be influential in the decisions of international tourists who consider visiting the country. These findings indicate that the impacts of GPR are not temporary and/or short term. Furthermore, it is possible that even a tourism destination with substantial attraction may relinquish this competitive edge in the next period. These results should be considered when it is important for the development of tourism activities and, thereby, the sustainability of their contribution to the national economy.

Based on these results, public authorities should take into account the security policies of the country while determining the steps to be taken for the development of the tourism industry. However, Turkey is dealing with a number of internal tensions as well as ongoing border conflicts. As a result, decisions made by public authorities may not be effective on their own. In this case, given that most terrorist activities in Turkey take place in the east, it can organize public awareness campaigns about the security of other regions. Additionally, attempts are being made to attract tourists from different countries and/or regions. Furthermore, improvements in the justice system may have a positive impact on the country's international credibility.

The results of the relationship between GPR and tourism have been built by using control and external variables. While earlier research has typically concentrated on GDP, these results indicate that EF and INF are also crucial variables to explain the relationship between GPR and tourism. In addition to the improvements in GDP, the increase in the value of economic freedom, which expresses the right of each individual to control their own labor and property, allows the country to be perceived as a more reliable country beyond the borders. The empirical findings in this study support [Saha and Yap \(2014\)](#), [Balli *et al.* \(2019\)](#) and [Akadiri *et al.* \(2020\)](#). As a result, based on their studies, it can be claimed that improvements in Turkey's GDP and economic freedom will increase the reliability of the country and thus increase the number of tourists visiting the country and also that the tourism-led growth hypothesis, that tourism activities positively affect national income, is valid for Turkey. On the other side, it was found that inflation decreases the number of international tourist arrivals, similar to [Demir *et al.* \(2020\)](#). According to [Demir *et al.* \(2020\)](#), the rise in the host country's accommodation and transportation expenditures is the cause of this problem. Thus, increasing inflation in Turkey makes the country a more costly destination. In this

way, international tourists can choose a destination center that is safer and less costly among attractive tourism centers. It is very easy for international tourists to access the macroeconomic variables of the host countries today. This provides the opportunity to make comparisons between countries. In this case, it can be stated that the country will become a safe and stable destination center following the reduction of its GPR and the improvement of its macroeconomic variables, thus leading to the development of the tourism industry.

This study has some limitations. The first of these is that it covers the period during which the variables are reported regularly. Because of this, recent events (such as the Ukraine–Russian war, etc.) could not be considered in the analysis. Moreover, since no detailed classification was made for the number of international tourist arrivals to Turkey by source country, the overall number was taken into account. In the future, comparisons can be made by determining which source countries send the most tourists to the host country. In this way, it is possible to estimate the impact of the number of visitors from source nations that differ from or are similar in terms of risk and macroeconomic characteristics. Taking into account the number of international tourists in countries with risk levels similar to Turkey, differences found through empirical research can be used to make effective policy recommendations. Besides, in future studies on the subject, the contribution of global activities to countries' economies and security can be investigated based on an examination of the impact of GPR on foreign trade and foreign investment activities through tourism activities.

Notes

1. [Caldara and Iacoviello \(2018\)](#) developed the Geopolitical Risk Index (GPR) for 39 countries based on the electronic archives of 11 newspapers (*The Boston Globe*, *The Chicago Tribune*, *The Daily Telegraph*, *The Financial Times*, *The Globe and Mail*, *The Guardian*, *The Los Angeles Times*, *The New York Times*, *The Times*, *The Wall Street Journal* and *The Washington Post*). They have created a text search algorithm, taking into account the newspapers' headlines, which covered political tensions in national and international relations, threats and actions of a geopolitical or nuclear nature, and war and terrorism. The GPR has been calculated on a footmonthly basis since 1985 and is mainly shaped around the Gulf War, the September 11 attacks, the 2003 Iraq occupation, the 2014 Russia–Ukraine crisis and the Paris terror attacks. Geopolitical risk indexes are published online on the personal page of the authors.
2. There are differences between the autoregressive distributed lag (ARDL) model and the autoregressive distributive lag (ADL) model. [Pesaran et al. \(2001\)](#) proposed the ARDL model, and [Banerjee et al. \(1998\)](#) proposed the ADL model. The ADL model was used in this study and is written by using [equation \(3\)](#). The ARDL model includes lags of difference variables, unlike the ADL model ([Pesaran et al., 2001](#)).
3. The most significant contribution of the GPR is that it brings together national and international conflict, risk, security, threats, etc. in a single index. [Tiwari et al. \(2019\)](#) and [Payne and Apergis \(2020\)](#) determined in their studies that the effect of geopolitical risk on tourism is higher than other variables such as economic uncertainty. Furthermore, [Karamelikli et al. \(2020\)](#) emphasize the importance of the news in the host country in the decision of the destination center of the tourists. The fact that the [Caldara and Iacoviello \(2018\)](#) geopolitical risk index considers the news in the host country shows that this index has a significant impact on tourism.
4. The economic crisis experienced in 2000 allowed the pro-European Union (EU) circles in Turkey to realize not only financial–economic reforms but also political reforms that the EU put forward as a condition. In addition, there was a change in the constitution of Turkey during this period. Improving human rights, strengthening the rule of law and restructuring democratic institutions are among these changes. However, despite all these developments, since the political and military tensions in the country started with PKK actions and started to increase after the 2000s,

the year 2000 was considered as the starting date. In addition, since the end date of TUR, GDP and INF variables is 2019, it was included in the analysis as the last observation date.

5. Since the sample size was not long enough for various reasons, the annual data were converted into quarterly data using the quarterly interpolation technique with the help of EViews 10. Quarterly interpolation is a widely accepted econometric technique for converting annual data to quarterly data (Shahbaz *et al.*, 2014; Nadeem *et al.*, 2020).
6. For detailed information, see McKenzie and Takaoka (2012).
7. For seasonal adjustment, the X12 method has been used.
8. According to the tourism-led growth hypothesis, tourism activities have a growing impact on national income (Akadiri *et al.*, 2020). The impact of GDP should not be overlooked in studies on the validity of this effect and on tourism activities that also contribute directly to economic growth.
9. Increased inflation in the host country is anticipated to increase individual expenses for international tourists, which will have an impact on their budget (Lee *et al.*, 2021). This is expected to have an impact on the number of tourists arriving in the host country (Demir *et al.* (2020) and is thus added as an external variable to the study.
10. Approximately 21% of international tourism activities in Turkey are for business purposes (Turkish Statistical Institute, 2019). However, according to literature, if people's freedoms are under stress, they travel to places where they feel safer. This is why countries with higher economic freedom will have more tourists (Saha *et al.*, 2016). In countries where security problems are intense, economic freedoms are not sufficiently ensured, so EF control is included as a variable in the study of the relationship between the variables.
11. In order to check the validity of the cointegration results (for robustness), the variables were also tested with the RALS-EG2 cointegration test, as shown in Table A1, and results supporting the RALS-ADL result were obtained. In addition, the time-varying effect of geopolitical risk on the number of international tourists was examined with a time-varying causality test. The relevant results are given in the appendix.

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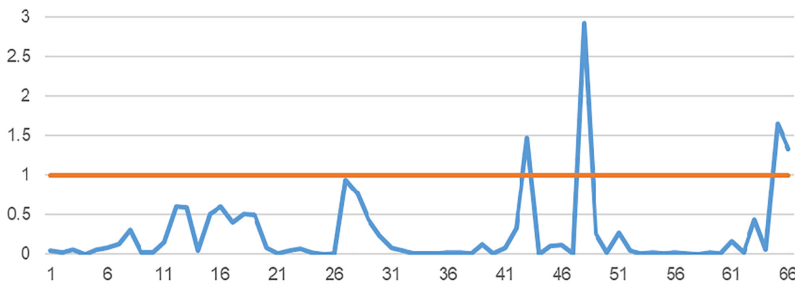
Appendix

The RALS-EG2 cointegration test in Table A1 results show that the variables are correlated. This supports the RALS-ADL cointegration result. In the time-varying causality test shown in Figure A1, the window size was taken as 15 periods and the results were obtained using 10,000 bootstraps. It has been determined that the variables in the periods above the critical values parallel to the horizontal axis have a causal relationship. These times refer to the years 2010:3 to 2019:4. The time period determined to be a causality from geopolitical risk to the number of international tourists shows the time period when PKK terrorist acts began to increase and many geopolitical risks in Turkey were experienced, which continued with the 2013 Gezi Park incident.

TUR = f(GPR, GDP, INF, EF)			
ρ^2	k	Test statistic	Table critical values
0.365	1	-3.357	-3.975; -3.331; -2.984

Note(s): k is the optimal lag length determined using recursive t-statistics, ρ^2 is a long-run correlation coefficient
Source(s): Author's calculation

Table A1.
RALS-EG2
cointegration test



Note(s): The horizontal axis represents the critical value, while the other displays the test statistics for each sub-period

Source(s): Author's calculation

Figure A1.
Time-varying
causality test

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