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Asymmetric effects of geopolitical risks on Turkey's tourist arrivals

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ABSTRACT

This paper applies a nonlinear autoregressive distributed lag model to examine the effects of geopolitical risks (GPRs) on Turkey's tourist arrivals (TAs) from January 1990 to December 2018. The newly developed Geopolitical Risk Index (GPRI) is used to measure GPRs. Test results reveal interesting findings. While the effects of GPRs on TAs are expected, the effects are found to be asymmetric in the short run. Specifically, an increase in GPRI reduces TAs in Turkey, but a decrease in GPRI has no effect in the short run. Moreover, there is no evidence for such an asymmetry in the long run.

1. Introduction

Tourism plays an important role in driving the economic development of emerging countries. However, those countries face severe risks such as conflicts, political instability, security issues, and terror. When geopolitical risks (GPRs) increase in a country, tourists' concerns for their personal safety will lead them to postpone or cancel their travel plans. Tourists will be reluctant to visit a country that has experienced a rise in GPRs. Consequently, a decrease in tourist arrivals (TAs) and tourism receipts will limit a country's economic growth.

This study examines the impact of GPRs on TAs to Turkey. Turkey has experienced rising tension with Syria (October 2012), the Gezi Park protests (May 2013), downing of a Russian warplane (November 2015), a failed coup (July 2016), and Operation Olive Branch (January 2018), all of which increased the GPRs (Fig. 1). The downing of the Russian warplane caused an especially sharp decrease in tourist arrivals from 36.2 million (USD 31.5 billion in receipts) in 2015 to 25.3 million (USD 22.1 billion) in 2016. In Turkey, the contribution of travel and tourism to GDP and employment was 12.1% of the total economy and 7.7% of total employment in 2018 (WTTC, 2019). The share of tourism in total exports was 20.1% in 2019. Tourism is an important source of foreign currency for financing the current account deficit. Therefore, rising GPRs in Turkey will have negative consequences for the national economy. Fig. 1 shows that Turkey experienced several events that dramatically increased the GPRI in the short run. Therefore, it is important to examine the effects of GPRs in both the short run and the long run.

Caldara & Iacoviello, 2018 based their Geopolitical Risk Index (GPRI) on automated text searches of newspapers. Since its introduction, there has been a rising interest in the use of GPRI as a proxy for geopolitical risks (Gupta, Gozgor, Kaya, & Demir, 2019). Demir, Díez-Esteban, et al. (2019) and Demir, Gozgor, et al. (2019) are the first to link the effect of GPRI on tourism demand. They find that an increase in geopolitical risks leads to a decrease in inbound tourist arrivals in 18 countries. In a similar vein, Balli, Uddin, & Shahzad, 2019 show that GPRs negatively affect tourism demand, but this effect is heterogeneous, meaning that some countries are more affected from GPRs while others are immune to GPRs' shocks. Tiwari, Das, and Dutta (2019) compare the effects of GPRs and economic policy uncertainty (EPU) on tourist arrivals. They show that the impact of geopolitical risks is stronger than the impact of economic policy uncertainties. Demiralay and Kilincarslan (2019) examine the impact of GPRs on travel and leisure (T&L) industry stock indices. They document the negative effect of GPRs on T&L stock index returns except for Asia and the Pacific. This effect is asymmetric, with a significant effect in lower quantiles. Saint Akadiri, Eluwole, Akadiri, and Avci (2020) find a unidirectional causality running from GPRs to economic growth and from GPR to tourism growth.

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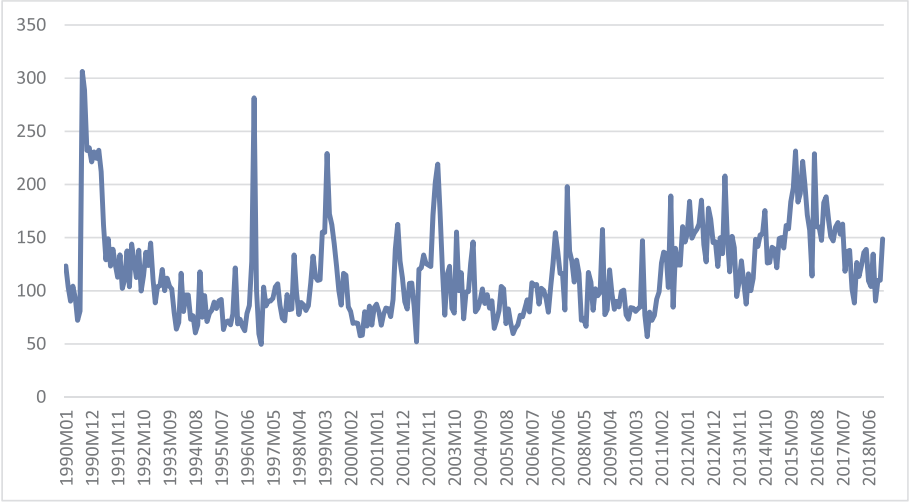

Fig. 1. Geopolitical risk index of Turkey
Source: Caldara & Iacoviello, 2018.

While the previous studies focus mainly on the linear (symmetric) relationship among variables such as oil prices, uncertainty, exchange rates, GPRI on tourism demand, this study investigates whether the effects of GPRs on Turkey's TAs are asymmetric. There is a scarce literature on the asymmetric effects of those variables on tourism. Al-Mulali, Gholipour, & Al-hajj, 2019 reveal that increases have a stronger impact on TAs than decreases in oil prices in Malaysia. Falk and Lin (2018) find that an increase in winter temperatures causes a decrease in the number of winter TAs, while decreases in temperature have no effect.

The contribution of this study is to apply the nonlinear autoregressive distributed lag (NARDL) approach to examine the asymmetric effects of GPRs on TAs. The NARDL model can capture the asymmetric effects in the short- and long-run relationships among variables. The NARDL model allows two separate coefficients (decreases or increases) to measure the effects of GPR on TAs. We find that an increase in GPRI reduces TAs in Turkey, but a decrease in GPRI has no effect in the short run. Moreover, there is no evidence for such an asymmetry in the long run.

2. Data and variables

All sample monthly data used in the study are from January 1990 to December 2018. The dependent variable is the number of inbound TAs to Turkey. The independent variable is the Geopolitical Risk Index (GPRI) developed by Caldara & Iacoviello, 2018 to measure GPRs for 18 emerging economies. *Geopolitical risk* is defined as "the risk associated with wars, terrorist acts, and tensions between states that affect the normal and peaceful course of international relations" (Caldara & Iacoviello, 2018, p. 6). GPRI is calculated by dividing the total number of articles about GPRs in each newspaper by the total number of news articles on a monthly basis. This process is performed by running automated text searches of 11 newspapers. The index is organized in six categories: "Geopolitical Threats, Nuclear Threats, War Threats, Terrorist Threats, War Acts, and Terrorist Acts." The first four categories are related to geopolitical threats and tensions; the last two pertain to geopolitical events and acts.[1] This index measures an important dimension of uncertainty: the risk of events that interfere with the normal, democratic, and peaceful course of relations across countries and societies.

The study uses inflation and oil price as control variables. Consumer price index is used as a proxy to measure the impact of inflation and crude oil price series are chosen to observe the effect of oil price. The data series are obtained from Federal Reserve Bank of St. Louis (FRED). As seasonality is an important aspect of tourism in terms of employment and capital investment, we seasonally adjust our series by applying the X-12-ARIMA filter in Eviews.

3. Methodology

The NARDL framework is useful to study the impact of an explanatory variable on dependent variable both in the long and short runs. To detect whether the impact of GPR on inbound tourism is asymmetric, the GPRI is decomposed into increases and decreases:

$$GPRI_t^+ = \sum_{t=1}^{T} \Delta GPRI_t^+ = \sum_{t=1}^{T} \max(\Delta GPRI_t, 0), \tag{1a}$$

and

$$GPRI_t^- = \sum_{t=1}^{T} \Delta GPRI_t^- = \sum_{t=1}^{T} min(\Delta GPRI_t, 0) \tag{1b}$$

where $\Delta GPRI$ represents changes in the GPRI. The model that we establish for inbound tourism is as follows:

$$\begin{aligned}\Delta IT_t = {} & \sigma_1 + \gamma IT_{t-1} + \phi_1 GPRI_{t-1}^+ + \phi_2 GPRI_{t-1}^- + \phi_3 CPI_{t-1} + \phi_4 OIL_{t-1} + \\ & \textstyle\sum_{i=0}^{j} \gamma_i \Delta OIL_{t-i} + \sum_{i=0}^{k} \gamma_i \Delta CPI_{t-i} + \sum_{i=1}^{l} \gamma_i \Delta IT_{t-i} + \\ & \textstyle\sum_{i=0}^{m} (\Pi_i^+ \Delta GPRI_{t-i}^+ + \Pi_i^- \Delta GPRI_{t-i}^-),\end{aligned} \tag{2}$$

where IT denotes the monthly TAs, CPI is consumer price index, and OIL is crude oil price.[2] All variables are in natural logarithms. The equality $\Pi_i^+ = \Pi_i^-$ is tested to see if an asymmetry exists in the short run. If the equality is rejected, it indicates that there is an asymmetric impact.

For the long-run case, the equality of $\phi_1 = \phi_2$ should be examined. We apply the NARDL bounds test approach to determine whether there is cointegration. The only restriction on this approach is that no variable should be integrated more than order one. We use the augmented Dickey-Fuller (ADF) test to check whether all variables are eligible to be

[1] The GPRI data were downloaded from the website of Caldara and Iacoviello (see https://www2.bc.edu/matteo-iacoviello/gpr.htm for more details about the construction of index).

[2] Due to the high correlation between CPI and Exchange Rate (USD/TL), only CPI variable is included in the estimations.

present in the model. The ADF test results show that all variables, except GPRI, are found to be I(1), meaning that a differentiation of these variables will generate stationary series. GPRI variable is found to be I (0), which is originally stationary. After meeting the specification for integration, we continue with the determination of cointegration. The null and alternative hypotheses are as follows.

H_0: $\gamma = \phi_1 = \phi_2 = \phi_3 = \phi_4 = 0$,

versus

H_1: $\gamma \neq \phi_1 \neq \phi_2 \neq \phi_3 \neq \phi_4 \neq 0$.

There are two tests for this exercise: BDM t-statistic (t_{BDM}) and PSS F-statistic (F_{PSS}). Two critical values are identified for these tests by Pesaran, Shin, and Smith (2001): upper bound and lower bound. There is cointegration if the test result is above the upper bound. There is no evidence of cointegration if the result is below the lower bound, or if it falls within the boundaries. Akaike information criterion (AIC) is used to choose optimal lag length. The automatic lag selection of the AIC criteria provides us NARDL (1,0,0,1,0) as the model which creates least errors.

4. Test results and discussion

Before conducting the nonlinear version of ARDL estimation, we have to confirm the existence of long-run relationship between inbound tourism and explanatory variables. We therefore begin our analysis with the F bounds test of t_{BDM} and F_{PSS} cointegration test statistics (Table 1). In both tests, the obtained result exceeds the upper bound, suggesting cointegration between inbound tourism and the explanatory variables used. After we identify cointegration in our model, we continue with the results of the established model presented in Table 2. As expected, the GPR has a negative sign both in the long run and in the short run.

In the case of short-run, there is evidence of the asymmetric effect. The increases in GPRs are found to be statistically significant but the decreases are not. This implies that an increase in the GPR will lead to a decline in TAs, but a decrease in the GPR will have no significant effect on the number of tourists in the short run. Sharma (2020) shows that economic uncertainty has asymmetric effects on tourism demand in India. In this regard, our finding supports the asymmetric effect of another dimension of uncertainty, namely geopolitical risk. However, Sharma (2020) finds that the negative effect of the increasing uncertainty is stronger than the positive effect of the decreasing uncertainty. We document that only increases in the geopolitical risks matter for tourist arrivals to Turkey.

It is also found that both increases and decreases of GPR are statistically significant to explain TAs in the long run. In other words, an increase in GPR decreases the demand for tourism and vice versa. However, the asymmetric condition cannot be rejected, indicating that decreases and increases have the same effect on TAs in the long run.[3] Our finding for the case of long run is in line with Demir, Díez-Esteban, et al. (2019) and Demir, Gozgor, et al. (2019) and Balli, Uddin, & Shahzad, 2019 who document the negative effect of GPRs on tourism demand.

The asymmetric dynamic multiplier (Fig. 2) provides useful information about the reaction of TAs to a unit shock in GPRI. It illustrates that a 1% increase in GPRI decreases the demand for tourism and vice versa. However, the magnitude of impact on TAs is not the same, showing that an increase in GPRI depresses the demand for tourism more than it stimulates it when GPRI decreases. The coefficient of oil prices is positive at time *t* but turns negative at time *t*-1 in the short run. In the long-run, oil prices have a positive effect on tourist arrivals to Turkey. Moreover, we find that an increase in CPI decreases the number of tourist arrivals in the short run.

In addition, we test the linear ARDL model. Test results reveal that the coefficient of GPRI in the model is negative, implying that an increase (decrease) in GPRI leads to a decrease (increase) in tourist arrivals to Turkey.[4] However, the impact of GPRs on inbound tourism

Table 2
Nonlinear ARDL estimation results.

Variables	Coefficient	Standard error
IT_{t-1}	−0.26***	(0.04)
$\Delta GPRI_t^+$	−0.05**	(0.02)
$\Delta GPRI_t^-$	N.S	N.S.
ΔOIL_t	0.08*	(0.05)
ΔOIL_{t-1}	−0.09*	(0.05)
ΔCPI_t	−0.70**	(0.36)
OIL_{t-1}	0.05***	(0.02)
$GPRI_{t-1}^+$	−0.05**	(0.02)
$GPRI_{t-1}^-$	−0.10***	(0.02)
χ^2_{HET}	55.50	[0.000]
χ^2_{SER}	0.02	[0.962]
R^2	0.28	

Note: The superscript "+" and "-" denote positive and negative cumulative sums, respectively. N.S. indicates the insignificancy of the variable. Heteroskedasticity consistent standard errors are used. Value in bracket are *p*-values. *, **, *** indicate significance at 10%, 5% and 1% level, respectively.

Table 1
Bounds cointegration test.

	T_{BDM}	F_{PSS}
GPRI	−7.04***	10.21***

Note: *** indicates significance at 1% level. F_{PSS} test the critical values are 2.26 and 3.35, 2.62 and 3.79, 3.41 and 4.68 for 10%, 5% and 1%, respectively. For T_{BDM} test, the critical values are −2.57 and −3.86, −2.86 and −4.19, −3.43 and −4.79 for 10%, 5% and 1%, respectively.

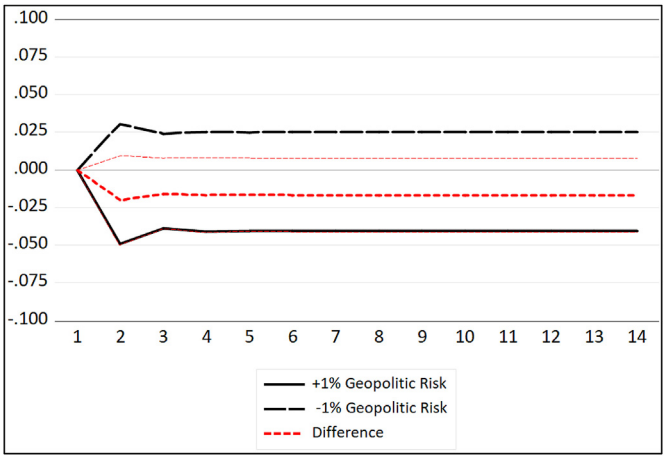

Fig. 2. Asymmetric Dynamic Multiplier
Note: 1% increase in geopolitical risk is shown by black line, whereas 1% decrease is shown by dashed black line. The dashed red line shows the overall asymmetric impact with dotted red lines being 5% confidence interval. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

[3] For a robustness check, we estimate a regression with asymmetric dynamics for all independent variables, and there is no evidence of heteroscedasticity in the residuals using Breusch/Pagan heteroskedasticity test. The GPR related coefficient are similar to those in Table 2.

[4] Results are available upon request.

Table 3
Test for nonlinear causality.

Relation (A = > B)		*F*-statistics	*p*-value
GPR = > TA	Symmetric case	1.5600	0.2125
GPR = > TA	Asymmetric case for positive GPR	4.5782	0.0331
GPR = > TA	Asymmetric case for negative GPR	0.4101	0.5224

Note: If *p*-value < 0.05, it indicates the null hypothesis that A does not cause B is rejected at the 5% significance level.

may exhibit asymmetric behavior. Therefore, we apply the asymmetric test for nonlinear causality of Hristu-Varsakelis and Kyrtsou (2008) to analyze whether there is an symmetric or asymmetric nonlinear causality from GPR to tourist arrivals. The results in Table 3 show no evidence of symmetric nonlinear causality from GPRI to tourist arrivals. Further asymmetric nonlinear causality test documents that positive GPRs cause tourist arrivals but negative GPR does not.

5. Implication and conclusion

This paper applies the NARDL model to examine the asymmetric effects of GPRI on Turkey's TAs from January 1990 to December 2018. Test results reveal interesting findings. While the effects of GPRs on TAs are expected, the effects are found to be asymmetric in the short run. Specifically, an increase in GPRI reduces TAs to Turkey, but a decrease in GPRI has no effect in the short run. Moreover, there is no evidence for such an asymmetry in the long run.

Asymmetric effects can be expected as increases in GPRs lead to greater public attention and have widespread global media coverage, especially in the short run. Such increases are likely to negatively affect TAs in the short term. In contrast, decreases in GPRs may not be considered newsworthy and hence it would take longer to observe the positive effects of decreasing GPRs on tourism.

The finding of the asymmetric impact of GPRs on tourism has important policy implications. Given that Turkey is prone to GPRs due to both domestic and regional developments, the national government and hospitality/tourism business managers should closely monitor the development of GPRs and take the necessary actions to prevent or eliminate any potential increase in the GPRs as the negative effects can be immediately observed in TAs.

The government should take proactive strategies to mitigate the possible negative effects of GPRs in the short run. However, the increase in GPRs can be beyond the control of policymakers (for example, should there be a war or a conflict in a neighboring country). In this case, Turkey should focus on other drivers of inbound tourism. At this stage, diversification in the tourism markets can be a wise strategy for Turkey.

The hospitality companies in Turkey will be negatively affected by the rising GPRs. For example, Demir, Díez-Esteban, et al. (2019) and Demir, Gozgor, et al. (2019) show that the cash holdings of hospitality companies decrease as GPRI increases in emerging economies. Therefore, governments should open new credit channels to cope with the liquidity problem of those companies. In addition, hospitality/tourism business managers in Turkey could hold excess cash to meet their ongoing financial costs or losses due to the risk of declining tourist inflows in the short run.

Declaration of competing interest

None.

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