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Research note

The effect of safety and security issues on international tourism

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Safety and security is one of the key concerns when tourists choose their destination. It is therefore surprising that, except for a few earlier studies (Albuquerque & McElroy, 1999; Enders & Sandler, 1991; Sönmez & Graefe, 1998), the security of a destination is often overlooked in the traditional tourism demand literature. Recent events related to terrorism and extreme violence in different destinations around the world have, however, shown the importance of safety on inbound tourism. This has resulted in renewed interest in the effect of violent episodes on tourism, including terrorism (Neumayer & Plümper, 2016; Liu & Pratt, 2017), crime (Altindag, 2014) and corruption (Propawe, 2015; Saha & Yap, 2015).

This literature frequently considers isolated case studies for a specific violent event or for a specific country. The main objective of this research note is, however, to estimate the effect of security issues on worldwide international tourism flows. This is a first attempt to explore the effect of three types of security threats on inbound tourism depending on travel motivations, as well as to study if tourists' reactions to security threats depend on the tourism attractiveness or development level of the destinations. The idea is that the tourist attractiveness (often proxied by the number of World Heritage Sites) of a destination might, in some way, compensate for its lack of safety and security (Yap & Saha, 2013). We also hypothesise that more developed countries better react after an increase in insecurity, since they have more resources available.

We contribute to the existing literature by: (i) expanding the analysis to the global level using a large pool of countries; (ii) defining a tourism demand model for tourist arrivals differentiating by the purpose of trip (personal or business tourism); and (iii) exploring differences on the effects for countries according to countries' tourist attractiveness or level of development.

Data and methodology

We investigate the effects of security threats on tourism by using a panel dataset of annual data with 171 destination countries (i) for the period (t) from 1995 to 2013. Analytically, the tourism demand model using a conventional log linear functional form can be expressed as:

$$LnTou_{it} = \beta_0 + \beta' Controls_{it} + \gamma' Threats_{it} + \lambda_t + u_{it} \quad (1)$$

The model is estimated by a panel fixed effects technique which absorbs country time invariant characteristics. Year fixed effects (λ_t) are included to capture trends and common shocks to all countries. Table 1 presents all variable definitions and sources, including independent variables in $Control_{it}$. The variables of interest, $Threats_{it}$, are: terrorism ($Terrorism_{it}$), corruption ($Corruption_{it}$), and crime ($Crime_{it}$).[1]

We also investigate the effect of lagged instability variables since it may take some time for potential tourists to update their expectations, under the assumption that they book their holidays in advance after an increase on security threats and to avoid potential endogeneity problems (Altindag, 2014; Propawe, 2015).

Finally, we allow for the possibility that tourists' response to the security environment differs according to the leisure

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[1] We only consider one type of crime, homicide. We do this because violent crime is expected to have a larger effect on tourists' decisions than other types of crime, such as theft, and because due to data availability.

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Table 1
Variable definition.

Variable	Obs	Mean	Definition	Source
$LnTou_{it}$	3396	13.44	Logarithm of total tourist arrivals.	UNWTO (2018)
$LnPersonal_{it}$	2650	13.22	Logarithm of tourist arrivals for personal reasons.	
$LnBusiness_{it}$	2591	11.52	Logarithm of tourist arrivals for business and professional reasons.	
$LnGPpc_{it}$	3047	8.16	Logarithm of real GDP per capita.	WDI (2018)
$LnPrice_{it}$	3012	−0.01	Logarithm of the ratio of PPP conversion factor to market exchange rate.	
VA_{it}	3237	0.098	Voice and accountability. Perceptions about citizens' participation in selecting their government, as well as freedom of expression and a free media, that ranks from −2 (low) to 2 (high).	WGI (2018)
$Terrorism_{it}$	3248	0.016	Ratio of successful terrorist attacks with fatalities per 100,000 inhabitants. It ranges from 0 to 1.38.	START (2018).
$Crime_{it}$	2014	8.60	Ratio of homicides per 100,000 inhabitants. It ranges from 0 to 139.13.	WDI (2018)
$Corruption_{it}$	2044	4.36	Index of perceived levels of public sector corruption, ranging from 10 (more corrupted) to 0 (less corrupted). Available since 1998.	Transparency International (2018)

Table 2
Effects of security threats on tourism demand.

	Terrorism		Crime		Corruption		All	
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
$LnGDPpc_{it}$	1.189***	1.131***	1.276***	1.261***	0.879***	0.929***	0.840***	0.964***
VA_{it}	0.198**	0.187**	0.352**	0.302**	0.161**	0.175**	0.170*	0.106**
$LnPrice_{it}$	0.0718	0.111	−0.0620	−0.0532	0.0420	−0.0324	−0.0380	−0.0955*
$Terrorism_{it}$	−0.454**						−0.472**	
$Terrorism_{it-1}$		−0.440**						−0.519***
$Crime_{it}$			−0.007***				−0.003	
$Crime_{it-1}$				−0.006***				−0.003**
$Corruption_{it}$					−0.011		0.011	
$Corruption_{it-1}$						−0.013		0.010
F-test	124.8***	121.6***	81.6***	73.1***	102.3***	98.6***	65.7***	66.9***
Hausman test	65.1***	61.9***	151.5***	84.2***	41.2***	171.7***	32.4**	32.0**
Observation	2985	2841	1884	1810	1972	1833	1472	1396
Within R-sq	0.496	0.491	0.514	0.486	0.520	0.518	0.516	0.523
Countries	171	171	166	164	163	163	155	154

Note: Estimate by Panel-FE. Year FE and constant are not reported.
Robust standard errors are clustered by destination.
Significance level:
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

attractiveness of the country in terms of world heritage sites (WHS) and its economic development level. We split the sample according to number of WHS: (i) countries with high number of WHS (those with more than two world heritage sites – the median in our sample) and (ii) countries with low or none WHS (those with two or fewer world heritage sites). We also split countries according to their level of economic development: (i) developed countries (those with a high or very high human development index (HDI) as classified by the UN), and (ii) developing countries (those with a medium or low HDI).

Results and discussion

Table 2 presents the results of estimating Eq. (1) for the total tourist arrivals $LnTou_{it}$. Hausman tests indicate that fixed effects procedure is more appropriate than random effects.[2] The economic size of the destination country ($GDPpc_{it}$) positively affects tourism demand. Conversely, price competitiveness ($Price_{it}$) is not significant at the global level. Finally, institutional quality (VA_{it}) positively affects tourism destination choice.

Regarding safety and security issues, and their lags, results show that they negatively affect tourist arrivals. A unitary increase on the ratio of terrorist attacks (with fatalities) per 100,000 inhabitants reduces international tourist arrivals between 35.6%–36.5%, while an additional homicide per 100,000 inhabitants reduces tourist arrivals by 5.8%–6.8%.[3] For the effect of corruption on tourism demand, the coefficients are not significant. These results hold after including the three security threats jointly, although the sample

[2] We also run multicollinearity (VIF) and correlation tests and they are correct. Results are available upon request.
[3] Semi-elasticity calculated as $\exp(\beta - 1) * 100$.

Table 3
Effects of security threats on tourist arrivals according to purpose of trip.

		Terrorism	*Crime*	*Corruption*
All countries (171)	$LnTou_{it}$	−0.454**	−0.007***	−0.011
	$LnPersonal_{it}$	−0.502*	−0.007***	0.017
	$LnBusiness_{it}$	−0.284	−0.003	0.067*
High WHS countries (87)	$LnTou_{it}$	−0.612***	−0.006	0.039
	$LnPersonal_{it}$	−0.677**	−0.001	0.038
	$LnBusiness_{it}$	−0.00790	0.011	0.058
Low WHS countries (82)	$LnTou_{it}$	−0.249	−0.007***	−0.095**
	$LnPersonal_{it}$	−0.265	−0.008***	−0.015
	$LnBusiness_{it}$	−0.527*	−0.007*	0.084
Developed countries (98)	$LnTou_{it}$	−0.430**	−0.008***	0.030
	$LnPersonal_{it}$	−0.423	−0.006*	0.037
	$LnBusiness_{it}$	−0.350	−0.002	0.030
Developing countries (71)	$LnTou_{it}$	−0.963	−0.0021	−0.157**
	$LnPersonal_{it}$	−1.306**	−0.002	−0.020
	$LnBusiness_{it}$	−0.761	−0.004	0.151

Note: For simplicity, constant, fixed effects and explanatory variables as defined in Eq. (1) are not reported.
Significance level:
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.1$.

size falls due to low data availability for crime and corruption index.[4]

Table 3 presents estimates of Eq. (1) differentiating according to purpose of trip, the attractiveness of the destination and their development levels.[5] Firstly, for the whole sample, we observe that the effects of terrorism and crime on tourism are only significant for personal reasons. Corruption, curiously, only affects tourism for business purposes and its impact is positive.[6]

Secondly, our results show that the effect of terrorism is only significant in countries with high WHS while for business tourism the negative effect only occurs in less tourist attractive countries. For crime, the negative effect is concentrated in less attractive countries regardless of the purpose of the trip, while it does not yield any significant effect on tourist attractive countries. Perceived corruption has a significant effect only on total tourism in less tourist attractive countries. These results, in short, show that crime and corruption mainly affect tourism in less attractive countries. As suggested by Yap and Saha (2013), the presence of WHS seems to partially compensate the insecurity (crime and corruption) of the destination country.

Thirdly, terrorism has a larger effect on tourism for personal purposes to developing than to developed countries, presumably because violent events are more common in the former. In contrast, crime has a negatively significant effect on total tourism and on leisure tourism to developed countries but no significant effect on tourism to developing countries, possibly because tourists accept that they have to tolerate a certain level of crime in the latter. Finally, we find that an increase in the perceived level of corruption reduces tourist arrivals to developing countries while it is not significant in the rest.

Conclusion

Governments should realize that security policies are not only a domestic issue but will also affect international tourism demand. Our analysis has quantified the negative effect of terrorism and crime on total international tourism arrivals. We show that corruption has no significant effect on total tourism. When we consider the purpose of the trip, we find that the effects of terrorism and crime are larger for tourism for personal/leisure reasons than for business trips, and that corruption is a significant determinant for business tourism. Results suggest also that the attractiveness to tourists evaluated in terms of world heritage sites seem to moderate the effect of crime and corruption and that when tourists are travelling to developing countries they tolerate a higher level of crime.

For future research, a more detailed analysis using more disaggregated data could be performed to understand the effects of other socio-demographic indicators on the relationship of security threats and tourism demand. Additionally, spatial dependence across countries should be considered in future in order to discard potential biases associated to neighbourhood effects.

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[4] Ditzen (2016) test for weak cross sectional dependence show that there is not spatial dependence in the residuals.
[5] For simplicity, only the coefficients of the variables of interest are presented. Results are similar when lagged variables are used. Full results are available upon request.
[6] Disaggregation by purpose of the trip is not available for all countries. Total tourism is therefore not exactly the sum of personal and business tourism.

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