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Tourism falls apart: How insecurity affects African tourism

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Abstract

Although it seems obvious that tourism flows would be adversely affected by terrorism, crime and corruption, not all the empirical evidence supports this view. This article investigates the extent to which insecurity hurts tourism in Africa. We use a new data set consisting of 187 countries, 38 of which are in Africa, for the period 1995–2017. It combines information on the number of tourist arrivals in African countries with information on three types of security risk – terrorism, crime and corruption. While we find no statistically significant evidence that connects terrorism to tourism globally, we do find an effect for tourists travelling to Africa. Crime, too, hurts tourism, but we find no robust relationship between corruption and tourism. Our results emphasize the importance of government expenditure on safety and security to protect this labour-intensive and pro-poor sector.

Keywords

corruption, crime, gravity model, safety and security, terrorism

Introduction

Tourism contributes to the economic livelihood of many Africans. The World Travel and Tourism Council (2020) estimates that 7.4% of GDP in sub-Saharan Africa is earned from tourism. Its share in job creation is much larger than its share in GDP. Its impact, though, is not equal across the continent. It contributes less than 5% of GDP in Nigeria, but 15% in Madagascar, Lesotho and Rwanda, 20% in the Gambia, 25% in Mauritius, 46% in Cape Verde and 67% in the Seychelles. These percentages, obtained from the World Development Indicators (World Bank, 2020a), make it clear that many African countries depend heavily on tourism.

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It is therefore worth identifying risks that might not just hurt the tourism sector's growth prospects but threaten its very existence. As the 2020 Covid-19 pandemic has demonstrated, a shutdown of international travel can have devastating effects on countries that rely on international tourism. However, the attention that Covid-19 has received should not blind us to other potential risks to tourism.

This article investigates one such risk: insecurity. A large and recent literature already points to insecurity, in the form of political instability, civil conflict and terrorism, as a deterrent to tourism market development in developing countries. This may be especially true for international tourists from outside Africa. Although a strong domestic tourism sector should ideally be the backbone of the industry, many African countries have explicitly focused on luxury tourism. Such luxury expenses are often the first to be deprioritized during either a demand shock (like Covid-19) or a supply shock (like a natural disaster).

Our article makes three contributions to this literature. First, we construct a large, new data set, consisting of 187 countries, 38 of which are in Africa, to estimate a gravity model of inbound tourism to Africa. In this model, we include a comprehensive, bilateral data set of three insecurity proxies: crime, corruption and terrorism. This allows us to measure the direct effects of insecurity on inbound tourism to African countries. Second, because tourism has spatial spillover effects, our approach also allows us to measure the indirect effects that a rise in insecurity in one country could have on neighbouring countries. To the best of our knowledge, ours is the first study to do this. Third, our results allow us to quantify the size of the impact that terrorism, in particular, has on tourist arrivals in Africa. This has policy implications. Because policymakers have to make trade-offs between different government priorities, quantifying the tourism benefits of less insecurity (or the damage done to tourism by more terrorist activity) could make these trade-offs more explicit.

Insecurity and tourism

It comes as no surprise that tourists do not want to travel to places where they feel they will be unsafe (Lepp and Gibson, 2003; Neumayer, 2004; Sönmez and Graefe, 1998). As a consequence, measuring the extent to which political instability, civil conflict or terrorism, real or perceived, affects tourism has long been part of the study of tourism demand. Most studies focus, as we do, on international tourism. But it is equally likely that domestic tourism may also be affected (Adeloye et al., 2019). In a seminal contribution, Sönmez and Graefe (1998) used questionnaires to show that 'risk perception level' was one of three factors that significantly affected tourists' choice of destination. Several studies have since confirmed the relationship between risk perception and tourism flows.

Yet the nature of the relationship between insecurity and tourism has not been demonstrated conclusively. Several studies have found either no relationship, a non-linear relationship or the expected negative relationship only once other factors are included as controls. It has even been suggested that causality could run the other way: tourism could lead to terrorism (Goldman and Neubauer-Shani, 2017). Using annual data from 95 countries for the period 1995–2012, Liu and Pratt (2017) found that, on aggregate, terrorism did not have an adverse impact on tourism in the long run. Of their 95 destinations, only 9 (from all the world's major regions except Africa), exhibited a significant long-run relationship, and even here the elasticities were small enough to suggest that terrorism had a minimal impact.

This result stands in sharp contrast to the seminal contribution of Saha and Yap (2014) who, using annual data on political instability and terrorism from 139 countries for the period

1999–2009, found large adverse effects. Asongu et al. (2019) used a panel of 158 countries for the period 2010–2015 and broadened the measures of insecurity. They found that political instability, violent demonstrations and the number of homicides negatively affected tourist arrivals. Yet the effects in the literature are generally non-linear: Saha and Yap (2014) found that 'a very low to moderate level of political instability' increased tourism arrivals but at a certain threshold it substantially decreased them.

These results are echoed in recent work by Harb and Bassil (2020), investigating the impact of terrorism on tourism flows within the group of countries of the Organization for Economic Co-operation and Development. They also found an inverse U-shaped relationship: below a certain level, terrorism had a positive correlation with tourism, but beyond a certain threshold the relationship turned negative. They concluded that, given these countries' relatively high level of development and political stability and the trustworthiness of their institutions, tourists would still visit them despite terrorist attacks, so long as the attacks did not reach a level perceived as 'endemic', beyond which they would choose safer destinations or stay in their own country.

Buigut et al. (2017) confirmed the negative relationship between terrorism and tourist arrivals but found that travel warnings as issued by travel advisory services exacerbated the effects. Fatalities from terrorism, absent travel advice, have a smaller effect on tourism than the same number of fatalities combined with travel advice.

Insecurity affects not only the host country but also its neighbours. Neumayer and Plümper (2016) used the example of fatal terrorist attacks in Islamic countries to test the spillover effects on Western tourism to those countries. They found that one additional fatal incident in an Islamic country reduced tourism flows to that country by 4.2% in the same year and 7.4% in the next year, and to other Islamic countries by 3.8% in the same year and 3.7% in the next.

The impact of insecurity on tourism to African countries has not attracted much research attention. One strand of the literature has investigated the effect of instability on economic performance. Gaibulloev and Sandler (2011) regressed terrorism on income per capita across 51 African countries for the period 1970–2007 and found a significant, but modest, impact on income per capita growth. They calculated that for each additional terrorist attack per million people, growth would decline by about 1%. A country with 10 million people would thus see a decline of 0.1% in per capita income for each additional terrorist attack. Asongu and Nwachukwu (2017) found that terrorism negatively affected political governance and its constituents in Africa.

Another strand has investigated the determinants of tourism to Africa. This literature has occasionally touched on issues of insecurity, although insecurity has never been its focus. In their seminal contribution, Naudé and Saayman (2005) concluded, using annual data between 1995 and 2000, that factors that typically explain tourism demand in developed countries – such as income, relative prices and the cost of travel – are less important in explaining tourist arrivals in Africa. They found that factors such as tourism infrastructure, marketing and information and *political stability* had greater predictive power and should therefore be the focus of policymakers.

Du Toit and Fourie (2012) confirmed these results by using the Balassa (1965) index. Their results show that more than half of African countries have a comparative advantage in tourism. This advantage, they argued, can be strengthened through government investment in measures that increase safety and health infrastructure. A World Bank report by Christie et al. (2014) echoed this sentiment too. It advised that many African countries in the early stages of their development

should prioritize security and health concerns associated with political uncertainty and underdeveloped healthcare infrastructure. Surveys of hotel developers showed that African destinations 'fall short in comparison with Asia and the Americas in perceptions of political, economic, and security risks and the quality of infrastructure' (Christie et al., 2014: xviii).

In Africa, as elsewhere, this relationship is not uncontested. Tourism demand studies have often neglected to study insecurity. Fourie and Santana-Gallego (2013), for instance, did not include a measure of safety and security in their analysis of the determinants of African tourism. But some studies have found that insecurity is unimportant. A good example is a study by Viljoen et al. (2019), using a larger set of African countries and more recent annual data to test the importance of insecurity. They included a composite variable of four dimensions, personal safety, rule of law, accountability and corruption, and national security, measured on a scale of 1–100. The variable remained statistically insignificant in all their specifications. They concluded that safety is not one of the major factors influencing tourist arrivals in Africa, and the result was the same when they repeated the analysis at a regional level.

Only a few studies have explicitly investigated the impact of insecurity on tourism in Africa. Of those that have, almost all have focused on terrorism, and most have taken a case study approach. Buigut and Amendah (2016), for example, using annual tourist arrivals in Kenya from 124 origin countries between 2010 and 2013 to measure the effect of terrorism, found that a 1% increase in fatalities reduced arrivals by 0.13% or 2507 visitors per year. A 1% increase in terrorism fatalities thus meant an annual tourism revenue loss of 157 million Kenyan shillings (about US$1.8 million in 2013). Other case studies have considered Botswana (Kaynak and Marandu, 2006), Rwanda (Anbalagan and Lovelock, 2014; Gatsinzi and Donaldson, 2010), South Africa (Donaldson and Ferreira, 2009; George and Booyens, 2014; Lepp and Gibson, 2011; Perry and Potgieter, 2013), Kenya (Buigut, 2018; Fletcher and Morakabati, 2008; Masinde and Buigut, 2018), Uganda (Lepp et al., 2011), Burundi (Novelli et al., 2012), Ghana (Boakye, 2012; Imbeah and Bujdoso, 2018) and Egypt (Mohamed and Alseyoufi, 2018). All of these found at least some negative effect of insecurity on tourist arrivals.

Our article advances this field of research in three ways. First, we use a larger data set of African countries than has been used before, covering a longer time period. Second, we define three types of insecurity variable: terrorism, crime and corruption. Third, we use a novel econometric strategy that allows us to test the asymmetries in potential risks. It allows us to ask questions like: Are tourists from a relatively 'safe' origin country more likely to cancel a trip to a relatively 'unsafe' destination country if that country suffers a terrorism event? These three innovations, discussed in detail in the next section, provide us with the most reliable account of how much insecurity affects African tourism; evidence that should be useful when designing policies to attract tourists to countries across the continent.

Data and methods

Our full model includes 187 tourist destination countries, of which 38 are in Africa, for the period 1995–2017. The aim of our study was to assess the effect of insecurity on tourism to the 38 African countries as compared with the countries in the rest of the world. See Table A1 in the Online Appendix for the list of African countries.

We begin the analysis by defining a gravity model for bilateral tourism flows. This type of model has been extensively used in the tourism economics literature (De Vita, 2014; Fourie et al., 2020; Khadaroo and Seetanah, 2008; Neumayer, 2004, 2010). Morley et al. (2014) provide a

theoretical background to support the use of this model. The baseline gravity model to estimate the effect of security threats on tourism is defined as follows

$$\text{Tou}_{ijt} = \beta_0 + \beta' \text{Controls}_{it} + \gamma' \text{Threats}_{it} + \delta' \text{Threats}_{it} \times \text{Africa}_i + \lambda_{jt} + \lambda_{ij} + \varepsilon_{ijt} \quad (1)$$

For the empirical analysis we apply the *Poisson pseudo-maximum-likelihood* (PPML) estimator first developed by Santos Silva and Tenreyro (2006, 2010). The PPML overcomes the known biases – the existence of heteroscedastic residuals and zeros in the dependent variable – when estimating gravity equations with ordinary least squares.[1] The new gold standard in gravity models includes structural forces or high-dimensional fixed effects in the specification to capture multilateral resistance terms (Anderson and Yotov, 2012; Fally, 2015). As discussed by Harb and Bassil (2020), bilateral tourism flows not only are determined by factors affecting the attractiveness of the destination country but also depend on the attractiveness of alternative destinations. This effect can be termed 'multilateral resistance to tourism' and can be controlled for by including source- and destination-specific year fixed effects as well as dyadic fixed effects in the PPML estimation procedure.

We therefore apply the iterative PPML algorithm developed by Larch et al. (2019) that accounts for multilateral resistance, pair-specific heterogeneity and correlated errors across countries and time. Standard errors (ε_{ijt}) are adjusted by clustering observations on dyads. In the baseline model as presented in equation (1), origin-year (λ_{jt}) and country-pair fixed effects (λ_{ij}) are included. Since our variables of interest, security threats in destination countries, are destination-specific and time-variant, we cannot include destination-year fixed effects. We instead add to the model a set of controls (Controls_{it}), such as GDP per capita or a proxy for the quality of institutions, such as the rule of law. These variables are obtained from the World Development Indicators (World Bank, 2020a) and the World Governance Indicators (World Bank, 2020b), respectively.

For the variables of interest (Threats_{it}) we follow the paper by Fourie et al. (2020) and create three different measures of insecurity. To differentiate the effects of security threats in Africa, we interact the variables of interest with a dummy variable for African countries (Africa_i) that takes the value one if the destination country is located on the African continent (or off the African coast) and zero otherwise.

Terrorism_{it} is defined as the number of fatalities caused by terrorist attacks per 100,000 inhabitants as a proxy for the intensity of the shock. The data are obtained from the Global Terrorism Database (START, 2020), where terrorism is defined as 'the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation'.

For our indicator of corruption, Corrup_{it}, we use the Corruption Perceptions Index (Transparency International, 2018). This index measures perceived (not actual) levels of public sector corruption, ranging from 10 (*more corrupt*) to 0 (*less corrupt*). It is a composite index based on surveys and professional assessments and reflects the views of observers from around the world, including experts living and working in the surveyed countries. This is an appropriate variable for our model since the choice of destination is usually based on perceived rather than actual corruption.

Finally, to define crime, Crime_{it}, we consider only one type of crime, homicide. We do this because violent crime is expected to have a larger effect on tourists' decisions than other types, such as theft, and because it is the crime variable with both more reliable and more frequent data. The variable we use is the number of homicides per 100,000 inhabitants. The data are obtained from the World Development Indicators (World Bank, 2020a).

Our strategy relies on the largest data set yet created to measure the effect of insecurity on tourism in Africa. Data on bilateral tourism flows Tou_{ijt}, tourist arrivals to destination i from origin j in year t, are obtained from the World Tourism Organization database (UNWTO, 2020). The data set comprises information on inbound tourism from 222 origin countries to 187 destination countries (38 located in Africa) for the period 1995–2017. However, the panel is unbalanced since there are many missing values at country-pair basis.

For the estimation, we follow three steps. First, we estimate the baseline equation (1) by introducing a proxy for the security threats in neighbouring countries. We do this to control for possible spillover effects (contagion or deviation), which are expected to be relevant for African tourism. The interaction term is $\eta' \text{BorderThreats}_{it} \times \text{Africa}_i$. The variable $\text{BorderThreats}_{it}$ includes the maximum values of terrorism, crime or corruption in the neighbouring country (i.e. one that shares a common border). An example helps to explain what we mean. For Tanzania in 1995, the variable BorderTerror_{it} takes the value 0.583, which corresponds to the number of fatalities in terrorist attacks in Burundi, a western neighbour, that year, a simple way of controlling for possible spillover effects. If the parameters η return positive values, we interpret this as evidence of tourist deviation (substitutes); if negative values, as evidence of contagion (complements).

Second, we introduce a proxy to control for similarities in the security threats between the origin and destination countries. Following De Groot et al. (2003), we construct dummy variables (SimilTerror_{ij}) that take the value one/zero if the absolute value of the differences in instability defined as $\left|\text{Threats}_{it} - \text{Threats}_{jt}\right|$ is below/above the median of this variable in the sample. This variable captures the similarity in the incidence of terrorism, crime or corruption between the origin and destination countries. If tourists travel from a relatively safe country, say the Netherlands, to one with a very high incidence of terrorism, say Somalia, this pair of countries would have a low similarity index, whereas if the pair of countries is, say, the Netherlands and Canada, the similarity index would be high. We posit that a higher insecurity similarity score would lead to more tourism flows. We also interact this measure with an Africa dummy.

Finally, we control for risk asymmetry, that is, dissimilarities in the security threats between the destination and the origin country. We generate two types of variable: $\text{ThreatsLowtoHigh}_{ijt}$ defined as $\left|\text{Threats}_{it} - \text{Threats}_{jt}\right|$ if $\text{Threats}_{it} \leq \text{Threats}_{jt}$, and 0 otherwise, and $\text{ThreatsHightoLow}_{ijt}$ defined as $\left|\text{Threats}_{it} - \text{Threats}_{jt}\right|$ if $\text{Threats}_{it} > \text{Threats}_{jt}$ and 0 otherwise. The first measures the effect of security threats when a tourist travels from a safer country to a more unsafe one and the second measures the effect of security threats when a tourist travels from a more unsafe country to a safer one.

Results

We first look at the effects that issues of safety and security have on tourist arrivals in the destination African countries. We do this while also accounting for the fact that security threats in neighbouring countries also affect inbound tourism. As explained in the previous section, our baseline equation is estimated by a PPML procedure. These estimates are presented in Table 1.

We report three coefficients for each type of security threat. For terrorism, we report a terrorism coefficient as well as an interaction term for terrorism with an Africa dummy. A negative coefficient on the terrorism variable would suggest that higher levels of terrorism are associated with lower levels of tourism. A negative and significant coefficient on the interaction term would suggest that this relationship is stronger in African countries. We also introduce the interaction with the insecurity in neighbouring countries ($\text{BorderThreats}_{it}$). As previously discussed, if the

Table 1. Impact of security threats on inbound tourism.

	(1)	(2)	(3)	(4)
Terrorism	−0.0627* (0.0376)			−0.0776** (0.0393)
Terrorism × Africa	−0.371*** (0.0824)			−1.227*** (0.274)
BorderTerrorism × Africa	−0.433*** (0.0884)			0.176 (0.408)
Crime		0.00278 (0.00345)		0.00488 (0.00352)
Crime × Africa		−0.00911 (0.00615)		−0.0183** (0.00751)
BorderCrime × Africa		0.00157 (0.00252)		0.000521 (0.00288)
Corrup			0.00244 (0.00164)	0.00121 (0.00168)
Corrup × Africa			−0.0152** (0.00755)	−0.0155 (0.00954)
BorderCorrup × Africa			−0.00102 (0.00371)	−0.00204 (0.00262)
Observations	228,187	147,604	154,836	110,803

Note: Robust standard errors in parentheses. Controls, dyadic and origin × year fixed effects included but not reported. Table A1 in the Online Appendix reports observations and mean values of the variables of interest for positive tourism flows to the African destinations.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

interaction is positive, it can be interpreted as evidence of tourist deviation (substitutes), while if the parameter is negative, it can be interpreted as evidence of contagion (complements).

Our first three specifications consider terrorism, crime and corruption separately and the final specification includes all three variables, because corruption data are not reported for many countries in the data set. Our sample varies significantly given the data constraints, from 228,187 observations in specification (1) to 110,803 in specification (4). This is because there are many missing values in the variables, so the sample is considerably reduced when the three proxies for instability are included in the regression all together.

We consider terrorism first. We find consistent results between specifications (1) and (4), meaning that once we include data on crime and corruption, the results stay largely the same. The first coefficient – Terrorism_{it} – is negative and significant at the 5% level. This suggests, as we would expect, that a higher incidence of terrorism is associated with lower tourism flows. The size of the coefficient is small, however, and the statistical significance not as strong as one would expect. This seems to confirm what we found in the literature: a general negative relationship, but one that also reveals some variation. Not all the countries across all time periods show a negative relationship between terrorism and tourism.

The second coefficient is, however, our variable of interest: the interaction of terrorism and the Africa dummy ($\text{Terrorism}_{it} \times$ Africa). This coefficient is large, negative and statistically significant at the 1% level. It suggests that there is a strong negative relationship between terrorism and tourism on the African continent: the higher the incidence of terrorism, the lower the inbound tourism. This is an important result. The coefficient suggests that a 1% increase in deaths in terrorist attacks (per 100,000 inhabitants) in Africa would reduce inbound tourist arrivals by 0.023%, which on average across all the countries included in our data set implies a decrease of 2.8 million in tourist arrivals.

The third coefficient is $\text{BorderTerrorism}_{it} \times$ Africa. Here we find, surprisingly, a large negative coefficient, although admittedly the statistical significance disappears in specification (4). We

Table 2. Impact of similarities of security threat on inbound tourism.

	(1)	(2)	(3)	(4)
Terrorism	−0.0907** (0.0407)			−0.122*** (0.0413)
Terrorism × Africa	−0.429*** (0.0934)			−0.748*** (0.261)
SimilTerror	−0.0343* (0.0184)			−0.0452*** (0.0171)
SimilTerror × Africa	0.167*** (0.0333)			0.111*** (0.0279)
Crime		0.00323 (0.00350)		0.00604* (0.00345)
Crime × Africa		−0.0102* (0.00596)		−0.0170** (0.00720)
SimilCrime		−0.0504** (0.0202)		−0.0525*** (0.0198)
SimilCrime × Africa		−0.259*** (0.0709)		−0.226*** (0.0690)
Corrup			0.00271 (0.00172)	0.00168 (0.00177)
Corrup × Africa			−0.0178** (0.00775)	−0.0110 (0.00864)
SimilCorrup			0.0447 (0.0286)	0.0426 (0.0289)
SimilCorrup × Africa			−0.0466 (0.0617)	−0.0372 (0.0514)
Observations	227,760	147,360	154,572	110,637

Note: Robust standard errors in parentheses. Controls at destination level, dyadic and origin × year fixed effects not reported.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

interpret this tentatively to mean that there is *some* indication that terrorism activity in a neighbouring country affects the tourist arrivals of a neighbour – and this is particularly pronounced in Africa. The fact that the coefficient disappears (and reverses) in the final specification, however, suggests that this result may be an artefact of the data and should be interpreted with caution.

We make the same calculation for each of the other two variables: Crime_{it} in specification (2) and Corruption_{it} in specification (3). Although crime does not seem to have any effect on tourism at the global level, the coefficient of the interaction term with African countries is negative and (weakly) statistically significant. This suggests that crime does affect inbound tourism to Africa. We see this especially in $\text{Crime}_{it} \times$ Africa but not in the $\text{BorderCrime}_{it} \times$ Africa interaction.

Finally, specification (3) reports the coefficients for corruption. The coefficients are small and insignificant, apart from one: the interaction of corruption and the Africa dummy ($\text{Corruption}_{it} \times$ Africa). When the controls for terrorism and crime are added, the interaction also becomes insignificant. It is clear that corruption, both in the origin and destination countries, has little effect on inbound tourism in Africa and elsewhere. It also worth noting, as Table 2a shows in the Online Appendix, the impact of insecurity threats on tourism is larger in least developed countries in Africa than in the rest of the continent.

In Table 2, we report the variables for similarities in the security threats between the origin and destination countries. The results suggest, as in Table 1, that terrorism, both globally and in Africa, is a strong predictor of reduced tourism flows. The signs are all in the expected direction, except for the similarity index in Africa, which has a positive and statistically significant coefficient. One way to interpret this is that it is mitigating to some extent the large negative coefficient on the $\text{Terrorism}_{it} \times$ Africa interaction term. But it does suggest that terrorist events in Africa are likely to have a larger negative effect on tourism from safer countries, a result with important policy implications that we explore in our concluding section.

Table 3. Risk asymmetry in the impact of security threats on inbound tourism.

	Terrorism	Crime	Corruption
Low to High	−0.0309 (0.0330)	0.00235 (0.00341)	−0.00381 (0.00296)
Low to High × Africa	−0.567*** (0.113)	−0.00637 (0.00650)	−0.0196** (0.00953)
High to Low	0.581*** (0.127)	−0.0114 (0.0141)	0.00170 (0.00175)
High to Low × Africa	−0.0479 (0.0311)	−0.0360*** (0.0124)	0.0120** (0.00544)
Observations	227,760	147,360	154,572

Note: Robust standard errors in parentheses. Controls at destination level, dyadic and origin × year fixed effects not reported.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

We also find that crime affects tourism flows, particularly in Africa. We note the negative and statistically significant coefficient for the similarity coefficient, but it is the economic size of the interaction term that is especially noteworthy. Perceptions of crime, it seems, especially in the safer origin countries, can really hurt inbound African tourism. Finally, we find almost no effect of corruption on tourism flows.

We next analyse the similarities indicators from Table 2 further. We now split the sample into two: tourists travelling from countries with low insecurity to countries with high insecurity and vice versa. Each time we interact the two with an Africa dummy. The results are reported in Table 3.

Almost all our statistically significant results relate to interactions with the Africa dummies. This provides an important general result: Africa seems more likely than elsewhere in the world to be affected by risk asymmetry caused by dissimilarities of threats between countries. We find, first, a particularly large and statistically significant negative coefficient on the Low toHigh_{ijt} × Africa terrorism variable. This would suggest that terrorist incidents on the continent particularly hurt inbound tourism from countries with few terrorist incidents, notably Europe. Although we find a statistically significant negative coefficient for corruption on the same variable, the small size suggests that it is not as important.

Turning to the high-to-low asymmetries, we find a large, positive and statistically significant coefficient on terrorism. The way to interpret this is that a terrorist incident causes an increase in tourism flows from high- to low-risk countries, presumably because tourists from high-risk countries exit. We find no similar effect in Africa. We do find a negative coefficient for crime and a positive coefficient for corruption, although, again, the size of both suggests that these effects do not warrant very much attention.

Conclusions, recommendations and next steps

The results reported above suggest three conclusions: that insecurity affects African inbound tourism and not the rest of the world, or not to the same extent; that terrorism is the main security threat affecting tourist arrivals to Africa; and that the impact of insecurity varies depending on the origin country. All three findings are new to the literature.

This is not to say that our study was without limitations. Data for African countries are notoriously poor (Jerven, 2013). Tourism is no exception. Several countries are not included in our data set. Many countries do not cover the full period (1995–2017). Our sample size falls significantly once

we include controls for crime and corruption. To what extent these exclusions bias the results is not clear.

We make three policy recommendations. The first is to recognize, at the highest level of government, that insecurity has an indirect economic cost beyond injury to victims and destruction of property – and that this cost can be quantified. A terrorist incident like the deadly attack on the Westgate shopping mall in Kenya in 2013 could substantially reduce tourist arrivals in the short and long run. Kenya's 'Vision 2030', launched in 2008, had hoped to increase tourist arrivals from 1.7 million in 2012 to 3 million in 2017; but in that year, however, the actual number was only 1.45 million. The Kenyan tourism sector – and economy – had suffered serious damage as a result of Westgate and other terrorist attacks.

It is important also to recognize that it is not *only* terrorist incidents that affect security and therefore threaten tourism arrivals. While the size of the effect is smaller, crime, as we show above, also reduces tourism, an effect that is found only in Africa. Combating terrorism and crime may, however, require different strategies and thus the collaboration of multiple stakeholders in government. Tourism authorities that hope to bolster tourism must actively participate in their government's crime prevention strategies.

Our findings suggest that corruption – or, at least, the perception of corruption – is not a strong predictor of reduced tourist arrivals to Africa. Possible reasons for this could be that corruption is inaccurately measured, or strongly correlated to other control variables, or simply not a big factor in a tourist's decision to travel. Our evidence suggests that tourism authorities wishing to encourage tourism should rather prioritize strategies for preventing terrorism and crime or, at the minimum, address visitors' concerns specifically in information campaigns.

The evidence we present that origin country insecurity characteristics matter should help countries direct their marketing campaigns effectively. A country with a high incidence of terrorism and crime may, for example, do better to target potential tourists in countries with a similar incidence of these problems.

One additional finding of our study – that neighbourhood effects matter – suggests an active role for interregional collaboration. An African country that attracts substantial international tourism could be adversely affected by terrorist activity in a neighbouring country, a country that might not have a sizeable tourism sector and therefore less incentive to combat terrorism. The flare-up of Islamic terrorist activity in the north of Mozambique in the second half of 2020 should be of concern for Mozambique and its neighbours, for many of whom tourism is an important economic sector. Interregional cooperation in fighting terrorism is critical to deal with this threat.

Our findings also open up new avenues for further research. While most attention has, understandably, been paid to the (large) effect of terrorist attacks on tourism, our results suggest that criminal activity – particularly in Africa – also demands scholarly attention. We need to know to what extent it is actual crime levels that deter tourists and to what extent mere perceptions. Is it criminal activity against tourists that matters or the general level of crime? And what can tourism agencies do to mitigate the effects of something that is clearly a systemic social issue?

Government responses to the Covid-19 pandemic have highlighted the precarious nature of the pro-poor tourism industry, a sector that contributes substantially to GDP in many African countries, particularly the smaller ones. Many African countries have been severely affected by the ban on global travel. For many tourist operators across the continent, though, such sudden shocks are not new. They have seen this happen before. Terrorist attacks can have devastating effects on the local and regional tourism industry. This article shows that in Africa these effects are real, at the

country and regional level. It is also true for crime, another indicator of insecurity. To protect their tourism sector, African governments must take urgent steps to improve security in their countries.

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Author contributions

María Santana-Gallego was primarily responsible for the data collection and estimation. Johan Fourie was primarily responsible for the literature review and write-up of the results.

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Supplemental material

Supplemental material for this article is available online.

Note

1. A drawback of bilateral tourism data is that we cannot control for zero tourism flows. The UNWTO does not discriminate between missing and zero tourism flows. For that reason, following Neumayer and Plümper (2016), Waqas et al. (2020) or Czaika and Neumayer (2020) among others, the PPML estimation procedure is just applied to positive tourism flows between country pairs.

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