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The African economic growth experience and tourism receipts: A threshold analysis and quantile regression approach

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Abstract

By applying threshold analysis and quantile regression techniques, we investigate the linearity of the relationship between tourism receipts and economic growth. We find that a threshold exists, below and above which the relationship between tourism receipts and economic growth changes. In our sample, the threshold for tourism receipts is at 3.82% of gross domestic product. Specifically, our findings suggest that tourism receipts have a more pronounced effect on economic growth below the threshold than above the threshold. From the quantile regression analysis, we further find that countries have greater benefits from tourism at lower levels of economic growth. Thus, policy makers designing tourism policy may consider that the marginal benefit of tourism on growth wanes beyond certain levels in spite of the fact that tourism receipts are an important driver of economic growth at all levels of growth.

Keywords

Africa, economic growth, fixed effects, panel data, panel quantile regression, threshold regression, tourism

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Introduction

Since the advent of the civil air transportation industry in the late 1950s, the tourism sector has been one of the fastest growing and lucrative sectors in the world. The year 2018 also marked the seventh year in a row where the growth in tourism exports surpassed the growth in merchandise exports, with sub-Saharan Africa leading the way by outpacing the global averages in tourism receipts and arrivals (WEF, 2019). The 2019 World Tourism Organization Report finds that direct tourism receipts almost tripled from US$485 billion in 1995 to US$1526 billion in 2017 (UNWTO, 2019). In the same period, the same statistic for sub-Saharan African countries as a group increased fivefold from US$7.4 billion to US$34 billion, or about US$3 million a day. This finding is not surprising because the region is price competitive with a high degree of international openness and accounts for nearly 17% of UNESCO World Heritage Natural sites. Based on this fact, there is immense popularity and political interest in unilaterally promoting tourism products as economic development instruments in the African continent. In this article, we take a step back and focus on the circumstances in which tourism drives economic growth in Africa.

The extant tourism literature over the past three decades shows how the expansion of the tourism sector has led to long-term sustainable economic development goals of many countries across the world (see e.g. Brida et al., 2016; Pablo-Romero and Molina, 2013; Song et al., 2012). The empirical support for the tourism-led growth hypothesis (TLGH) is robust for the most part. By surveying 87 related studies, Pablo-Romero and Molina (2013) point out that more than 60% of them directly show that tourism influences economic growth. However, it is important to also note that the empirical estimates differ substantially from study to study. Some of these differences can be explained by the possible nonlinearity in the tourism-growth relationship (Brida et al., 2016; Pablo-Romero and Molina, 2013) and by country-specific attributes that might influence tourism in one way or another (Brau et al., 2003, 2007; Brida et al., 2015). Our methodological strategy resolves these two concerns taken together: (a) nonlinearity and (b) intercountry tourism heterogeneity. First, we address the former by computing static discontinuous nonlinear tourism-growth estimates for our sample of African countries using panel threshold regressions. We, then, fix the latter by analyzing whether those estimates computed previously vary across the growth spectrum using a quantile regression approach.

Our study contributes to the empirical literature on the relationship between tourism receipts and economic growth in two distinct avenues. First, this study provides a direct evidence of the nonlinear relationship between tourism receipts and the economic growth in African countries. Specifically, we find that tourism receipts contribute more to economic growth at the lower levels of tourism receipts than at the higher levels. Second, we address the issue of whether tourism receipts have more pronounced effects at the lower or the upper end of the gross domestic product (GDP) per capita growth rate distribution. Here, we find that African countries tend to benefit more from tourism receipts when they are at the lower end of the spectrum of GDP per capita growth rate. In both the threshold and the quantile regression techniques, we control for the conventional sources of the neoclassical growth models such as investments in physical and human capital, the openness of the economy, and institutional factors. The major policy implication of this study is to understand the limitations of the tourism-based economies. While it is essential for African countries, especially those in their initial stages of growth to commit resources to increase reliable infrastructure and the security of tourists to maximize tourism benefits, it is also important to understand that those benefits taper off as economies grow, making it prudent to diversify their investments in growth resources.

The article is organized as follows. The “Literature review” section provides a review of selected literature, detailing the relationship between tourism and growth. The “Methodology and data” section describes the analytical modeling techniques that we employ in this article including the threshold analysis and quantile regression techniques and the data. The “Empirical results” section reports the regression estimates. The “Discussion” section describes certain key characteristics of countries based on where they fall in the distribution of tourism specialization. Finally, the “Conclusion” section summarizes the results, draws conclusions, and makes policy recommendations for promoting tourism as an engine of economic growth and development strategy.

Literature review

Many studies have found a positive impact of tourism on economic growth in various countries. For example, see Dritsakis (2004, 2012) and Eeckels et al. (2012) for Greece, Fayissa et al. (2008) for Africa, Proença and Soukiazis (2008) for Portugal, Chen and Chiou-Wei (2009) and Lee and Kwag (2013) for Korea, Husein and Kara (2011) for Turkey, and Perles-Ribes et al. (2017) for Spain. Moving beyond the positive relationship between tourism and growth, there is also strong evidence that tourism-intensive economies grow at a much faster rate than others (Brau et al., 2003, 2007). Consequently, the tourism industry has been an integral part of growth and development for many countries, stimulating their foreign exchange earnings, job creation, and technical assistance (Dieke, 2003).

Prior studies mainly focused on the linear relationship between tourism and economic growth by showing gains in public infrastructure, productivity, and employment (e.g. see Brida et al., 2010; Dritsakis, 2004; Durbarry, 2004; Fayissa et al., 2008; Holzner, 2011; Katircioglu, 2009; Kumar and Kumar, 2012; Mushtaq and Zaman, 2013; Narayan et al., 2010; Pablo-Romero and Molina, 2013; Seetanah, 2011). But are these gains sustainable across all levels of tourism specialization? It is quite possible that overinvestments in tourism may have limits on growth due to increasing environmental costs (Hunter, 1997; Ko, 2001). In their study, Perles-Ribes et al. (2016) argue that the increasing frequency and intensity of disaster events are causes of concern that test the resiliency of the tourism demand. In a similar fashion, Samitas et al. (2018) also show that terrorism has a permanent adverse impact on tourist arrivals in Greece. Therefore, it is also possible that certain events have lasting effects on the visitors’ choice of tourist destinations. If this is the case, then countries with prolonged dependence on tourism may experience a severe impact on the entire economy (Adamou and Clerides, 2010).

It is also not always clear why tourism elasticities with respect to growth vary significantly over time even in the absence of rising environmental costs and negative shocks. Here, we posit that the rising popularity of tourism in a particular country may increase its price of tourism services well beyond the point at which they are considered reasonable, thereby diminishing their returns over time. Putting all this together, we can state that there is a strong indication to move beyond the linearity assumption when studying the tourism-growth relationship.

TLGH studies with nonlinear formulations are not new. While many studies with this formulation show that growth increases substantially in the initial levels of tourism specialization, but by very little (and even negative) later on (Chang et al., 2010), some studies show the exact opposite (Chiu and Yeh, 2016; Kumar and Stauvermann, 2016). In their paper, Chang et al. (2010) document the evidence of a nonlinear tourism-growth relationship in East Asia and the Pacific, Europe, Central Asia, Latin America and the Caribbean, the Middle East and North Africa, North America, South Asia, and sub-Saharan Africa over the period 1991–2008. Specifically, they establish two threshold cutoffs of 15% and 17.5% and find that growth increases to some degree only up to the point where tourism specialization is 17.5%. The growth increase is nonexistent afterward. Kumar and Stauvermann (2016) perform a case study on the tourism–growth relationship in Sri Lanka and detect a long-run U-shape at 1.26% of tourism specialization. Chiu and Yeh (2016) document the same relationship pattern using a much broader sample of 84 countries. Some studies show a mixed nonlinear tourism–growth relationship. For example, using threshold analysis for 88 countries, Po and Huang (2008) document an s-shaped relationship between tourism specialization and growth. Specifically, they find that growth increases up to 4.1% of tourism specialization, remains insignificant up to 4.7% of tourism specialization, and then increases, thereafter.

The tourism–growth relationship differs significantly across countries. Brida et al. (2015) study of four MERCOSUR countries (Argentina, Brazil, Paraguay, and Uruguay) demonstrates that results on TLGH vary substantially from country to country. Going further, Cortés-Jiménez (2008) concluded that the influence of tourism on growth varies even between different regions of the same country. Contrastingly, Oh (2005) and Tang and Jang (2009) find no relationship for developed economies such as Korea and the United States, respectively. In their theoretical work, Lanza and Pigliaru (2000) formulate the notion that small countries experience larger-than-normal growth when they specialize in tourism. They argue that natural resource endowments are the vital ingredients of tourism production and to the extent that small countries are rich in these resources, one would observe small countries to have more economic gains due to tourism production. Empirical support for this argument is presented by Eugenio-Martin et al. (2004) who show that gains to economic growth from the tourism sector are predominantly observed in low- and medium-income countries, though not necessarily in developed countries. Along the same lines, Brau et al. (2003, 2007) show that only tourism-intensive small countries experience considerable growth, contesting the notion that smallness per se is generally good for growth.

Therefore, the tourism effect on growth that we observe may not be representative across the entire growth distribution, establishing the need to study the tourism-growth relationship in a quantile regression setting.

The extant literature on TLGH demonstrates one simple fact: though mostly confirmed, TLGH lacks empirical consensus for the estimates on tourism-based economic growth, which mostly emanate from differences in the degree of tourism specialization and differences in the stages of economic growth and development. The threshold analysis addresses the former and the quantile regression analysis addresses the latter.

In this article, we provide nonlinear estimates on tourism specialization that delineates the tourism-growth relationship using Hansen's (1999) endogenous threshold regression analysis and then perform an unconditional quantile regression (UQR) analysis proposed by Firpo et al. (2009) to study how these estimates vary across the growth spectrum.

Methodology and data

Empirical methodology

Focusing on the impact of tourism receipts on economic growth in Africa, previous empirical studies have documented that receipts from the tourism industry contribute significantly both to the current level of GDP and to the economic growth of sub-Saharan African countries, as do investments in physical and human capital (Fayissa et al., 2008; Olayinka, 2013).

Under the assumption of linearity, most previous studies have invariably applied several estimation techniques to test the relationship between tourism receipts and GDP growth. However, in recent years, some studies (Chang et al., 2012) have questioned such an assumption and show that the impact of tourism on economic growth is region-dependent.

In our study, we argue that the nonlinear relationship between the tourism receipts and the economic growth arises from two possible sources: (i) level of tourism expenditures or (ii) level of economic growth. This distinction is important because factors that are relevant at the lower end of the economic growth distribution may not be as important at the higher end of the income growth distribution.

To analyze the possible existence of nonlinearity in the relationship between tourism receipts and economic growth, we use the threshold regression technique. Subsequently, we also analyze the difference in the impact of tourism receipts at different levels of GDP growth using a newly developed unconditional fixed-effects quantile estimation technique for panel data (henceforth, known as UQR model).

We first use the fixed-effect panel threshold model postulated by Hansen (1999) to analyze the possible nonlinear relationship between the African growth experience and the tourism receipts by specifying a baseline-panel regression model presented as follows

$$y_{it} = \alpha_i + \delta q_{it} + \beta_i X_{it} + \varepsilon_{it} \tag{1}$$

where y_{it} denotes the growth rate experienced in country i at time period t; $(1 \leq i \leq N)$ and $(1 \leq t \leq T)$. α_i and ε_{it} denote country-specific fixed effects and random errors, respectively. q_{it} denotes the ratio of tourism receipts to GDP in country i at time period t and X_{it} is a k-dimensional vector of time-varying control variables commonly used as economic growth determinants in previous literature. To operationalize equation (1), we conjecture a case of one threshold by transforming equation (1) to obtain equation (2)

$$y_{it} = \alpha_i + \delta_1 q_{it} I(q_{it} \leq \gamma) + \delta_2 q_{it} I(q_{it} > \gamma) + \beta_i X_{it} + \varepsilon_{it} \tag{2}$$

where γ is the threshold that demarcates the two regimes (region 1 and region 2), $I(.)$ is the indicator function that identifies the two regimes, and δ_1 and δ_2 are the slopes of the threshold variable in region 1 and region 2, respectively. y_{it}, α_i, q_{it}, X_{it}, and ε_{it} are as described above. We then test the validity of the threshold model in comparison with its linear counterpart using the following F statistic

$$F_1 = \frac{S_0 - S_1}{\hat{\sigma}^2} \tag{3}$$

where S_0 is the residual sum of squared errors of a linear model, S_1 is the residual sum of squared errors of the panel threshold estimate model, and $\hat{\sigma}^2$ is the residual variance of the panel threshold estimation. Following Hansen's (1999) recommendation to obtain asymptotically valid p values, we also bootstrap our estimate. The null hypothesis of the non-identification of γ (no threshold effect $\rightarrow$ linear relation) and its accompanying alternate hypothesis of the existence of at least one threshold given as follows

$$H_0 : \delta_1 = \delta_2 \qquad H_{\mathrm{a}} : \delta_1 \neq \delta_2$$

Note that under the null hypothesis of no threshold effect, the model specified in equation (2) reduces to the linear model specification given in equation (1). In some cases, it is technically possible that more than one threshold exists. If one were to estimate a two-threshold system, the model presented in equation (2) can be rewritten without loss of generality as follows

$$y_{it} = \alpha_i + \delta_1 q_{it} I(q_{it} \leq \gamma_1) + \delta_2 q_{it} I(\gamma_1 < q_{it} \leq \gamma_2) + \delta_3 q_{it} I(q_{it} > \gamma_2) + \beta_i X_{it} + \varepsilon_{it} \qquad (4)$$

In this case, our threshold estimates, $\{\gamma_1, \gamma_2 \in \mathbb{R} | \gamma_1 < \gamma_2\}$, divide our analysis into three distinct regimes that produce regime-dependent coefficients δ_1, δ_2, and δ_3, respectively. Similar to the F test for a single threshold model, we can analyze the significance of the second threshold by estimating another F statistic as given below

$$F_2 = \frac{S_1(\hat{\gamma}_1) - S_2^r(\hat{\gamma}_2^r)}{\hat{\sigma}^2} \qquad (5)$$

where $S_1(\hat{\gamma}_1)$ denotes the residual sum of squared errors from stage one threshold estimation and $S_2^r(\hat{\gamma}_2^r)$ and $\hat{\sigma}^2$ are the residual sum of squared errors and the residual variance from the second threshold estimation, respectively. Given that the threshold effect is sequential, rejecting the null hypothesis for one level of threshold (say, the single threshold) implies automatically testing for the existence of the next threshold (the second threshold). In our analysis, we will test up to three thresholds. In this article, the threshold estimator is obtained using the STATA command *xthreg* developed by Wang (2015).

The impact of tourism at different levels of the income growth distribution should be of interest to policy makers as well. The question we seek to answer here is if tourism receipts are impactful at the lower end of the GDP growth, or more effective at the higher end of the GDP growth of countries. The answer to the question obviously begs the use of quantile regression estimation.

Unlike the traditional ordinary least-squares regression analysis which provides estimates for the conditional mean of the explanatory variables, quantile regression provides analysts the ability to estimate models for a full range of conditional quantile functions as introduced by Koenker and Bassett (1978). Quantile regression has three major advantages over the traditional models. First, the estimated coefficients are not sensitive to the dependent variables' outliers because a quantile regression provides estimates on the median rather than on mean estimates. Second, quantile regression provides a description of the entire conditional distribution of the dependent variable. Lastly, the quantile regression also provides more statistically efficient estimates of the error term, which is non-normal.

Specifically, we employ a UQR based on the work of Firpo et al. (2009) and has been normalized into a STATA via the *xtrifreg* estimation function developed by Borgen (2016). Unlike previous quantile regression estimation methods that are conditional quantiles (Harding and Lamarche, 2009; Koenker, 2004), our model is based on unconditional quantile estimates, which allows us to further divide the growth structure and the composition effects into the contribution of each covariate. On the whole, this methodology is unique in its capability to separate the overall components of the decomposition into the contribution of a single variable, or a group of variables. It will allow us to draw inferences on our covariates, especially our tourism measure which remains invariant across the entire distribution of the GDP growth.

The estimation methodology involves the regression of the re-centered influence function (RIF) of the dependent variable (the per capita income growth rate on all regressors *X*), which makes the estimation of the contribution of each regressor for the components of the income growth decomposition. To estimate our UQRs, we have to first derive the RIF of our dependent variable (the per capita income growth rate). The RIF for the τth quantile is specified as follows

$$\mathrm{RIF}\big(y; q_\tau, F_y\big) = q_\tau + \frac{\tau - I(y \leq q_\tau)}{f_y(q_\tau)} \tag{6}$$

where q_τ is the sample quantile estimated by the kernel approach, F_y denotes the cumulative distribution function, and $f_y(q_\tau)$ and $I(y \leq q_\tau)$ denote the marginal density of our dependent variable Y at the point q_τ and an indicator function reflecting whether the outcome value is below q_τ, respectively. We can infer that the RIF allows for a linear approximation of a nonlinear function, and the RIF quantile regression may be implemented using a linear regression of the new transformed-dependent variable on the explanatory variables X_i. In our particular case, we have 23 countries for which the RIF regressions for the per capita income growth can be estimated using equation (7)

$$E[\mathrm{RIF}(Y_{it}; q_\tau | X_{it})] = X_{it}\beta_{\tau,i} \tag{7}$$

where $\beta_{\tau,i}$ denotes the approximation of the marginal effects of our explanatory variables on the per capita income growth rate quantile q_τ for countries $i \in \{1, \ldots, 23\}$. Basically, the model fits a regression model of the RIF of the quantile marginal distribution of the dependent variable (per capita income growth rate) on the explanatory variables. Here, the RIF regressions can be interpreted as UQRs, where the dependent variable is replaced with the transformed (re-centered) influence function of the quantile in question.

Empirical analysis and data

Our sample consists of 23 African countries (see Supplementary Table A1) between 2002 and 2015. The decision to use this set of countries was solely dictated by data availability and the need for a balanced panel for the period of our study. The final sample has 322 country-year observations. The dependent variable is the per capita GDP growth rate. The main variable of interest (threshold variable) is tourism receipts as a percent of GDP (TOURGDP). We follow previous literature to select the most often used explanatory variables in the growth literature (e.g. see Barro, 2003; Ndoricimpa, 2017).

The control variables in our regressions include the one period lag of the log of per capita income, gross fixed capital formation as a percent of GDP, government final consumption as a percent of GDP, semi-log inflation rate which proxies macroeconomic stability, sum of exports and imports as a percent of GDP which controls for openness to trade, the terms of trade and its square root which control for the global product market competitiveness, the log of political instability index which captures episodes of political violence and conflicts, log of mean years of schooling (MYSCH) which controls for human capital formation, log of an institutional variable (INST) which captures the level of democracy, and population growth.

We follow Ibarra and Trupkin (2016) and use the semi-log transformation of the inflation rate (see equation (8)) to transform our inflation rate into a symmetric distribution

$$\pi = \begin{cases} \pi_{it} - 1, & \text{if } \pi_{it} \leq 1 \\ \ln(\pi_{it}) & \text{otherwise} \end{cases} \tag{8}$$

where π_{it} denotes the inflation rate for country i at time period t. Thus, the semi-log transformation of the data for the inflation rate follows the inflation augmentation process, that is, when the inflation rate is at most unity, or less, we reduce it by one, and when the inflation rate exceeds unity, we take its natural logarithm.

Table 1. Variable description, summary statistics, and variable sources.

Variable	Description	Mean	Standard deviation	Minimum	Maximum
PCIG	Growth rate of real GDP per capita	2.35	2.76	−9.22	12.82
TOURGDP	Tourism receipts (% of GDP)	3.50	3.72	0.06	20.40
PCIL	One period lag GDP per capita	2180.48	2147.85	219.36	9163.64
POPG	Population growth (annual %)	2.32	0.86	0.13	3.84
GOEXP	General government final consumption expenditure (% of GDP)	14.92	3.59	4.58	25.90
GFCF	Gross fixed capital formation (% of GDP)	21.61	6.75	3.95	42.26
MYSCH	Mean years of schooling (years)	5.07	2.11	1.20	10.10
TRADE	Trade (% of GDP)	70.44	29.89	19.10	170.41
TOT	Net barter terms of trade (2000 = 100)	128.96	39.46	21.40	290.93
TOTSTD	Square root of TOT	11.23	1.70	4.63	17.06
π	Inflation, consumer prices (annual %)	6.47	5.97	−4.79	36.91
π log	Semi-log transformation of inflation rate	−0.94	0.06	−1.05	−0.63
INST	Political regime index (POLITY2)	71.72	18.81	36.67	100.00
POLINST	Political instability index (CIVTOT)	52.27	6.53	50.00	80.00

Note: Supplementary Table A2 describes the variables used in this study in detail. The annual data for 23 African countries span over the 2002–2015 period. The first per capita income period lag is for 2001. All data are from the World Development Indicators apart from MYSCH (Human Development Indicators), INST, and POLINST (Center for Systematic Peace).

Table 2. Estimation of a model with a unitary threshold.

		95% CI	
Model	Threshold	Lower	Upper
Single threshold	0.0382	0.0379	0.0386

Note: CI: confidence interval. Threshold estimator (CI = 95%), with 1000 bootstrap estimates.

Empirical results

Single threshold analysis

Table 1 describes the variables and presents summary statistics and variable sources.

To avoid selecting the number of thresholds for this model arbitrarily, we first proceed with the test for the existence of a single threshold. Our null hypothesis, $H_0 : \delta_1 = \delta_2$ indicates the absence of a threshold, and our alternate hypothesis, $H_a : \delta_1 \neq \delta_2$ indicates the presence of a single threshold. Upon rejecting the null, we then proceed and test for three thresholds and work our way up or down to arrive at the appropriate number of thresholds. We use 1000 bootstrap replications to estimate and test for the existence of a single threshold effect. Tables 2 and 3 report the findings of the threshold analysis. In Table 2, we find that a single threshold occurs when tourism receipts is 3.82% of GDP, with a 95% confidence interval between 3.79% and 3.86%.

The results of the tests of significance for the single threshold are reported in Table 3. The calculated F statistic is greater than the critical value of 15.59 (p value $< 5\%$), suggesting the existence of one or more thresholds in the relationship between the tourism receipts and the per capita income growth, thereby rejecting the null of linearity in favor of nonlinearity.

Table 3. Test for the unitary threshold model.

Threshold	RSS	MSE	*F* statistics	Probability	Crit10	Crit5	Crit1
Single	0.1537	0.0005	19.42	0.0170	12.9880	15.9312	20.8000

Note: CI: confidence interval; RSS: residual sum of squares; MSE: mean squared error. Threshold estimator (CI = 95%), with 1000 bootstrap estimates.

Table 4. Estimation of models with multiple thresholds.

		95% CI	
Model	Threshold	Lower	Upper
Th-1	0.0382	0.0379	0.0386
Th-2	0.0540	0.0539	0.0552
Th-3	0.0552	0.0540	0.0552

Note: CI: confidence interval. Threshold estimator (CI = 95%), with 1000 bootstrap estimates.

Table 5. Test for multiple threshold models.

Threshold	RSS	MSE	*F* statistics	Probability	Crit10	Crit5	Crit1
Single	0.1537	0.0005	19.42	0.0230	13.4707	16.0417	22.3747
Double	0.1510	0.0005	5.50	0.6800	12.1896	14.4904	19.2961
Triple	0.1479	0.0005	6.47	0.4930	12.3300	14.7827	20.3306

Note: CI: confidence interval; RSS: residual sum of squares; MSE: mean squared error. Threshold estimator (CI = 95%), with 1000 bootstrap estimates.

Multiple threshold analysis

Next, we proceed to estimate double and triple threshold models to assess whether higher order thresholds exist in defining the relationship between tourism receipts and per capita income growth. These results are reported in Tables 3 and 4. The three estimated thresholds occur when tourism receipts are 3.82%, 5.40%, and 5.52% of GDP, respectively.

Table 5 presents the three estimates of the threshold effects. Once again, we employ the bootstrap method to approximate the test statistic. The single threshold test statistic is significant at the 5% level, but the double and triple threshold test statistics are statistically insignificant with p values of 0.68 and 0.49, respectively. Thus, we can empirically validate the existence of only a single threshold in the relationship between tourism receipts and the per capita income growth.

We now reestimate our model with a single threshold and present the results in Table 6. By setting our model this way, we split our sample into two regimes based on the threshold variable $\mathrm{TOURGDP}_{it}$ and its value γ. That is, the first regime includes the countries where tourism receipts to GDP ratio are below the threshold ($\leq \gamma$), and the second regime includes the countries where the tourism receipts to GDP ratio is above the threshold ($> \gamma$).

Table 6. Full single-threshold panel regression estimates.

Variable	Description	Coefficient	Standard error
Control variables			
log(PCIL)	Log of one period lag GDP per capita	−0.124***	0.029
POPG	Population growth rate	−1.282	0.912
GOEXP	General government final consumption expenditure (% of GDP)	−0.190*	0.102
GFCF	Gross fixed capital formation (% of GDP)	0.035	0.051
log(MYSCH)	Log of mean years of schooling	0.110***	0.032
TRADE	Trade (% of GDP)	0.021	0.026
TOT	Net barter terms of trade (2000 = 100)/100	−0.021	0.028
TOTSTD	Square root of TOT	0.076	0.053
π log	Semi-log transformation of inflation rate	−0.053	0.038
log(INST)	Log of POLITY2	0.042	0.033
log(POLINST)	Log of CIVTOT	−0.007	0.039
Threshold variable			
TOURGDP	The ratio of Tourism receipts to GDP		
	≤ 0.0382	1.104***	0.270
	> 0.0382	0.290	0.247

Note: The standard errors are bootstrapped (1000 reps). Our estimates cover 14 years of annual data for 23 African countries. The number of stars is in the order of decreasing statistical significance: ***1%, **5%, and *10%.

To implement equation (4) for our empirical estimation framework, we specify equation (9) as follows

$$\begin{aligned}\mathrm{PCIG}_{it} = {} & \alpha_i + \delta_1 \mathrm{TOURGDP}_{it} I(\mathrm{TOURGDP}_{it} \leq \gamma) + \delta_2 \mathrm{TOURGDP}_{it} I(\mathrm{TOURGDP}_{it} > \gamma) \\ & + \beta_1 \log(\mathrm{PCIL}_{i,t-1}) + \beta_2 \mathrm{POPG}_{i,t} + \beta_3 \mathrm{GFCF}_{i,t} + \beta_4 \log(\mathrm{MYSCH}_{i,t}) + \beta_5 \mathrm{TRADE}_{i,t} \\ & + \beta_6 \mathrm{TOT}_{i,t} + \beta_7 \mathrm{TOTSD}_{i,t} + \beta_8 \pi \log_{i,t} + \beta_9 \log(\mathrm{INST}_{i,t}) + \beta_{10} \log(\mathrm{POLINST}_{i,t}) + \varepsilon_{it}\end{aligned} \tag{9}$$

From Table 6, we observe that the only control variables that are significant are the coefficients of the lag of per capita income, government expenditures, and MYSCH. The lag of per capita income has a significantly negative impact on current per capita income growth, indicative of the existence of convergence (the catch-up effect). In the case of government expenditures, we find that a 1% increase results in about 0.19% decrease in GDP growth, indicating a crowding out impact of government spending. We also find that a 1% increase in the MYSCH leads to a 0.11% increase in economic growth.

One surprising result that emerges from the analysis is the effect of population growth on economic growth. There is a long-held view that the population growth rate has an undeniable negative effect on the economic growth of a country (Headey and Hodge, 2009; Li and Zhang, 2007). However, we find a negative albeit insignificant effect, which to a large extent can be explained by the simultaneity between population growth rate and economic growth and by the bias of omitted variables (such as technological change) present in the model specification (Brueckner and Schwandt, 2015). Using a sample of 159 countries between the years 1989 and 2008, Chang et al. (2012) also find a non-result for population growth rate causing economic growth.

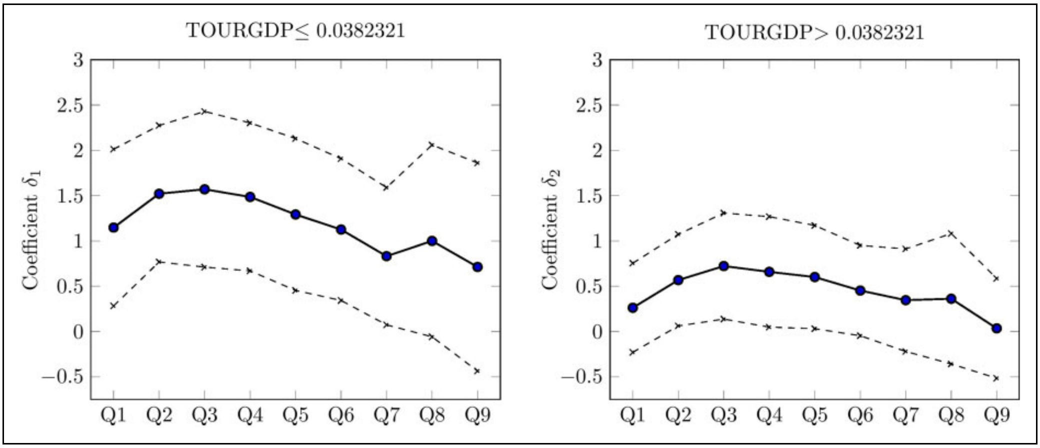

Figure 1. Impact of tourism expenditure on per capita income: quantile regression estimates. The dashed lines denote the upper and lower bounds (95% CI).

Now, we return to our main variable of interest: tourism receipts to GDP ratio. Here, not only do we find that the impact of the level of tourism receipts on economic growth is both positive and statistically significant, but we also find that the impact on economic growth also diminishes as tourism receipts increase. More precisely, we document the existence of a kink between tourism and growth when tourism receipts are 3.82% of GDP. Below this kink, a 1% increase in tourism receipts to GDP ratio results in a 1.1% increase (significant at 1%) in economic growth. And above this kink, a 1% increase of tourism receipts to GDP ratio results in a statistically insignificant increase of 0.29% in economic growth. The relatively larger impact of tourism on growth at the lower end of the tourism receipts to GDP ratio spectrum indicates that the benefits of tourism receipts on growth begin to decline above the threshold as presented in Table 6.

Unconditional quantile regression

For our quantile regression, we apply 1000 bootstrap replications in the derivation of our estimates and standard errors. Since our focus for this study is on the impact of tourism receipts to GDP ratio, we only present the results of the impact of tourism on economic growth in Figure 1.

From Figure 1, we can deduce that the impact of tourism receipts on growth varies based on the level of economic growth. The relationship between tourism receipts and economic growth is overwhelmingly positive for all income growth distributions. However, we find that the magnitude of the relationship is larger at the lower end of the growth distribution which suggests that the low growth performing countries realize the maximum gains from tourism receipts.

Thus, our results indicate a diminishing marginal impact of tourism on growth above a certain level of growth (after the third growth quantile). Interestingly, we also find that for all the growth quantiles, the impact of tourism on growth is higher below the threshold than above the threshold when tourism receipts are 3.82% of GDP.

To illustrate the differential impact of tourism on growth by the quantile of growth, we reestimate equation (9) for three quantiles of growth (0.25, 0.50, and 0.75). In the interest of saving space, we only discuss the results for our variable of interest (TOURGDP) reported in Table 7. The

Table 7. Quantile regression.

	0.25 Quantile regression		0.50 Quantile regression		0.75 Quantile regression	
Variable	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Control variables						
log(PCIL)	−0.122***	0.025	−0.114	0.027	−0.145	0.043
POPG	−0.910	1.164	−2.222	1.398	−1.910*	1.044
GOEXP	−0.172	0.116	−0.227*	0.127	−0.203*	0.107
GFCF	0.005	0.056	0.080*	0.041	0.069	0.068
log(MYSCH)	0.129***	0.024	0.129***	0.028	0.132**	0.051
TRADE	0.024	0.023	0.013	0.017	0.002	0.027
TOT	−0.014	0.043	−0.027	0.023	0.021	0.041
TOTSTD	0.055	0.098	0.067	0.048	−0.022	0.077
π log	−0.064**	0.028	−0.100***	0.035	−0.087*	0.051
log(INST)	0.034	0.025	0.019	0.027	0.011	0.027
log(POLINST)	−0.023	0.048	0.051	0.047	0.032	0.024
Threshold variable						
$\leq$ 0.0382	1.487***	0.435	1.292***	0.428	1.016**	0.437
$>$ 0.0382	0.689**	0.314	0.601*	0.291	0.321	0.340

Note: The standard errors are bootstrapped (1000 reps). Our estimates cover 14 years of annual data for 23 African countries. The number of stars is in the order of decreasing statistical significance: ***1%, **5%, and *10%.

magnitude of the impact of tourism on economic growth is larger when tourism receipts are below the threshold value (3.82% of GDP) for all quantiles than when tourism receipts which are above the threshold value. We also find that for both below and above the threshold, the magnitude of the impact of tourism receipts on economic growth becomes smaller at higher quantiles. This finding suggests that while the impact of tourism on growth is higher at lower levels of tourism receipts, the effect is more pronounced for low-growth economies. This effect may possibly reflect the higher share of foreign spending that those countries receive relative to their GDP. However, after a certain level of tourism receipts to GDP ratio, the diversification of the growth sources becomes more important, thereby reducing the marginal impact of tourism expenditure on economic growth for high-growth countries.

Discussion

In this section, we take a closer look at some of the characteristic differences between countries based on where they fall in the distribution of tourism specialization. Specifically, we report the country's level of tourism development, human capital, and political sophistication, as well as whether the country is landlocked or not. Figure 2 and Table 8 describe the results of this analysis.

We classify our sample of 23 countries into three distinct categories: (i) group A—countries with tourism specialization always above the threshold value (i.e. Mauritius, Morocco, Tanzania, and Tunisia), (ii) group B—countries with tourism specialization that are sometimes below and sometimes above the threshold value (i.e. Botswana, Egypt, Ghana, Kenya, Rwanda, Togo, and Uganda), and (iii) group C—countries with tourism specialization that are always below the threshold value (Algeria, Benin, Burundi, Cameroon, Republic of Congo, Côte d'Ivoire, Eswatini, Malawi, Mali, Niger, South Africa, and Sudan).

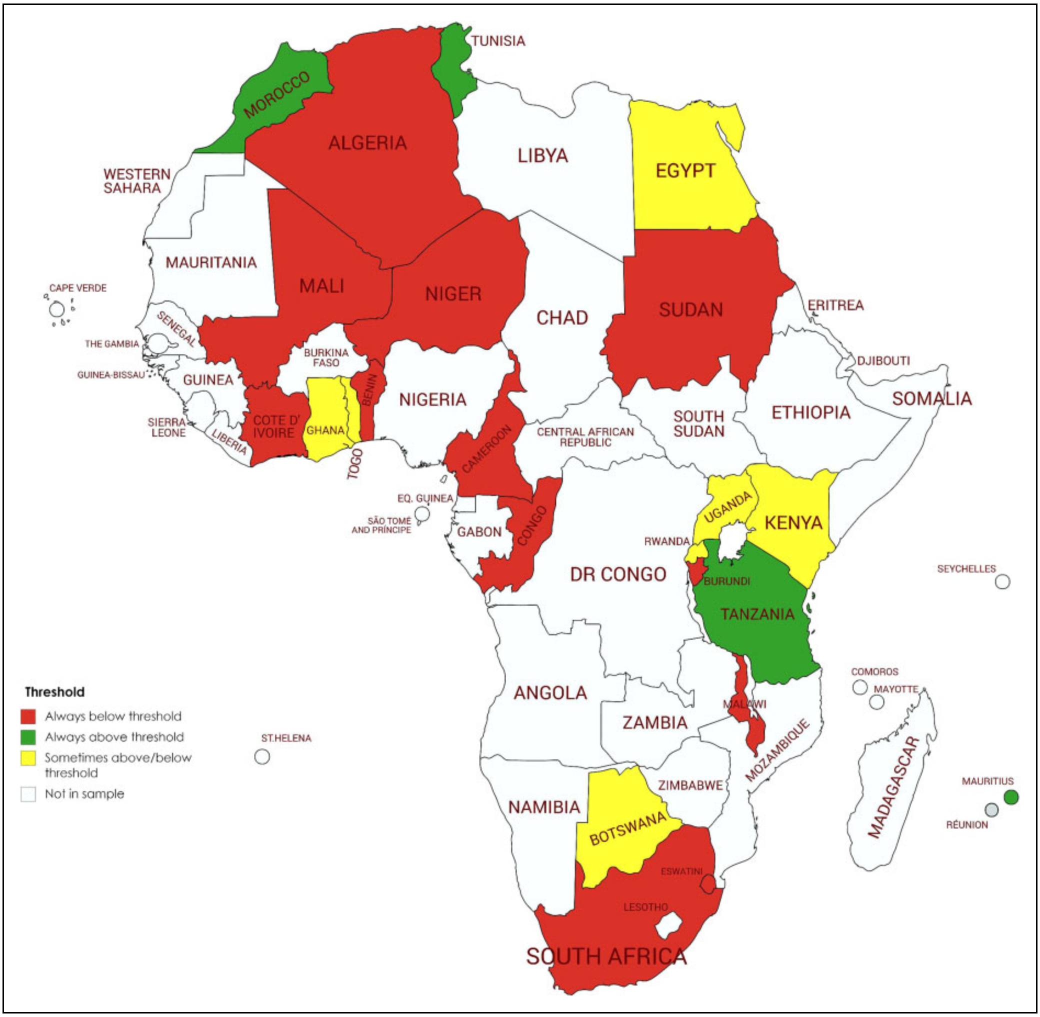

Figure 2. Threshold groups and African countries. The map created using mapchart.net.

The categorization based on the above criterion reveals some interesting points. For example, the four countries in group A, on average, have a tourism to GDP ratio of 9.32%, which is twice and eightfold the tourism to GDP ratios of group B (4.10%) and group C (1.67%) countries, respectively. Tourist arrivals also show a similar pattern: the average for group A (4.0 million per year) is approximately twice and fourfold the averages for group B (2.1 million per year) and group C (1.1 million per year), respectively. Further, we find that countries in group A have a relatively high travel and tourism competitiveness index (TTCI) score with a mean value of 3.73, a score compiled by taking many factors and policies into account that enables sustainable development of the travel and tourism sector of countries (WEF, 2019). This goes to show that the countries with tourism specialization above our estimated threshold cutoff are more or less the same countries that are

Table 8. Summary statistics by threshold categories.

Means reported		Categories			
		Group A	Group B	Group C	Total
Tourism receipts (% of GDP)	TOURGDP	9.32	4.10	1.21	3.50
Tourist arrivals (in millions)	TOURARR	4.00	2.12	1.13	1.93
Travel and tour competitiveness	TTCI	3.73	3.42	3.07	3.32
GDP per capita growth rate	PCIG	3.20	3.03	1.67	2.35
Mean schooling (years)	MYSCH	5.86	5.73	4.43	5.07
Political regime index	INST	69.58	72.52	71.96	71.72
Country-year observations		56	98	168	322
Number of countries		4	7	12	23

ranked higher in TTCI. The TCCI scores for group B is 3.42 and for group C is 3.07. Supplementary Table A3 describes the individual TCCI factors in detail.

However, the differences in tourism averages between group A and group B do not seem to translate into differences in economic growth. This is consistent with our finding in Table 6 that the link between tourism and economic growth is generally weaker once we move beyond a particular cutoff of tourism specialization. Further, we did not find any differences in mean schooling years (MYSCH) and political regime index (INST) between group A and group B countries. That is, the differences in tourism levels in our sample are not associated with significant differences in human capital and democratization. There is also a general tendency to associate landlocked countries with lower levels of tourism development. We find that 3 of the 7 group B countries and 5 of the 12 group C countries are landlocked. Not surprisingly, all group A countries are either coastal or island countries. Also, among the 25 UNESCO Natural Sites present in our sample of countries in the year 2017, 4 are listed in group A, 7 in group B, and the remaining 14 in group C (UNESCO, 2017).

In our analysis here, South Africa is one of the anomalies as it has relatively high economic growth, above global average TTCI score (of 3.90) and the highest TTCI score in the entire continent (4.00), and yet falls in the group C list of countries. It is not clear why this is the case, especially when South Africa attracts a large number of tourists, averaging about 8.1 million tourist arrivals per year during our sample period. The reason might simply be arithmetic—the tourism's share of GDP is small because of the large size of their economy. Egypt is one of the group B countries that should have been categorized as a group A country as it has all the hallmarks of a great tourist destination. The country has a TTCI score of 3.90. However, tourism receipts (tourist arrivals) dropped by 32% (4.6 million) from 2010 to 2011 due to the advent of anti-government protests in the December of 2010, commonly referred to as Arab Springs. In fact, the average tourism specialization prior to this Arab Springs (2002–2010) was 6.87%, and the average of the same statistic after the Arab Springs (2010–2015) was 2.97%. One country that we did expect to find in group C is Rwanda, a country ravaged by civil war and genocide in the early 1990s. To put it in context, Rwanda had a tourism specialization of 0.31% in 1995. But, during our sample period, the statistic grew from 1.85% in 2002 to 5.52% in 2015, earning its place in group B. It goes to show that the Rwandan government has made considerable strides in putting policies in place that foster the tourism attractiveness of the country.

Taking a closer look at the constituents of TCCI (in Supplementary Table A3), we identify the individual factors where group C countries performed poorly relative to the countries listed in groups A and B, namely the indices that represent the country's prioritization of travel and tour, health and hygiene, ICT readiness, and tourist service infrastructure. Policies that focus on promoting these factors may be the key to solving group C countries' low tourism indicators.

Conclusion

Many previous empirical studies have established that there is a positive and statistically significant linear relationship between tourism receipts and the per capita income growth. The main objective of this study is to investigate the previously established relationship may, in some cases, be nonlinear. Additionally, we evaluate whether such nonlinearity is observed in a similar manner across the spectrum of the country's income. We employ the threshold regression and the quantile regression framework on the data set of 23 countries over the 2002–2015 period.

First, we find the existence of a kink in the relationship between tourism receipts and economic growth. Specifically, in our sample, we find that tourism receipts tend to contribute to economic growth more so below the threshold when tourism receipts are 3.82% of GDP. The quantile regression results seem to suggest that countries that benefit more from tourism do so at the lower end than at the upper end of their GDP per capita growth distribution. The result of the threshold analysis that we reported earlier in this article comes up with one single estimate for our sample of African countries. This estimate is endogenously determined by the model, highly sensitive to the sample of countries included in its estimation, and only valid in the aggregate. That is, it may not in the true sense represent the optimum level of tourism development for every individual country in the sample. Future research may considerably benefit by testing how representative our threshold estimate is and estimate longitudinal threshold cutoffs for each country in the African continent.

Since we find an overwhelmingly positive impact of tourism receipts on growth, irrespective of the presence of a threshold and the level of economic growth, we conclude that tourism receipts are one of the key drivers of economic growth. Hence, African policy makers may pay particular attention in terms of choosing effective strategies and promoting their tourism industry. Despite the vast tourism potential for most African countries, except in a few instances, not much has been done to attract foreign tourists, especially pertaining to investments in tourism-related infrastructure. Thus, a policy implication from our findings is that African countries that aim to maximize their economic growth should coordinate the allocation of resources among the various sectors of the economy, mainly the tourism sector to provide the needed infrastructure and security to attract foreign tourists. It is also crucial for policy makers to understand that the impact of tourism receipts on growth wanes after a while and it may be important to diversify their sources of economic growth.

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Supplemental material

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References

Adamou A and Clerides S (2010) Prospects and limits of tourism-led growth: the international evidence. *Review of Economic Analysis* 3: 287–303.

Barro RJ (2003) Determinants of economic growth in a panel of countries. *Annals of Economics and Finance* 4(1): 231–274.

Borgen NT (2016) Fixed effects in unconditional quantile regression. *The Stata Journal* 16(2): 403–415.

Brau R, Lanza A and Pigliaru F (2003) How fast are the tourism countries growing? The cross-country evidence. FEEM Working Paper No. 85. DOI:10.2139/ssrn.453340.

Brau R, Lanza A and Pigliaru F (2007) How fast are small tourism countries growing? Evidence from the data for 1980-2003. *Tourism Economics* 13(4): 603–613.

Brida JG, Cortés-Jiménez I and Pulina M (2016) Has the tourism-led growth hypothesis been validated? A literature review. *Current Issues in Tourism* 19(5): 394–430.

Brida JG, Lanzilotta B, Lionetti S, et al. (2010) The tourism-led growth hypothesis for Uruguay. *Tourism Economics* 16(3): 765–771.

Brida JG, Lanzilotta B and Pereyra JS (2015) A nonlinear approach to the tourism-led growth hypothesis: the case of the MERCOSUR. *Current Issues in Tourism* 18(7): 647–666.

Brueckner M and Schwandt H (2015) Income and population growth. *The Economic Journal* 125(589): 1653–1676.

Chang CL, Khamkaew T and McAleer M (2012) IV estimation of a panel threshold model of tourism specialization and economic development. *Tourism Economics* 18(1): 5–41.

Chang CL, Khamkaew T, McAleer M, et al. (2010) A panel threshold model of tourism specialization and economic development. *International Journal of Intelligent Technologies and Applied Statistics* 3(2): 159–186.

Chen CF and Chiou-Wei SZ (2009) Tourism expansion, tourism uncertainty, and economic growth: new evidence from Taiwan and Korea. *Tourism Management* 30(6): 812–818.

Chiu YB and Yeh LT (2016) The threshold effects of the tourism-led growth hypothesis: evidence from a cross-sectional model. *Journal of Travel Research* 56(10): 625–637.

Cortés-Jiménez I (2008) Which type of tourism matters to the regional economic growth? The cases of Spain and Italy. *International Journal of Tourism Research* 10(2): 127–139.

Dieke PUC (2003) Tourism in Africa's economic development: policy implications. *Management Decision* 41(3): 287–295.

Dritsakis N (2004) Tourism as a long-run economic growth factor: an empirical investigation for Greece. *Tourism Economics* 10(3): 305–316.

Dritsakis N (2012) Tourism development and economic growth in seven Mediterranean countries: a panel data approach. *Tourism Economics* 18(4): 801–816.

Durbarry R (2004) Tourism and economic growth: the case of Mauritius. *Tourism Economics* 10(4): 389–401.

Eeckels B, Filis G and Leon C (2012) Tourism income and economic growth in Greece: empirical evidence from their cyclical components. *Tourism Economics* 18(4): 817–834.

Eugenio-Martin JL, Morales NM and Scarpa R (2004) Tourism and economic growth in Latin American countries: a panel data approach. FEEM Working Paper No. 26. DOI:10.2139/ssrn.504482.

Fayissa B, Nsiah C and Tadasse B (2008) The impact of tourism on economic growth and development in Africa. *Tourism Economics* 14(4): 807–818.

Firpo S, Fortin NM and Lemieux T (2009) Unconditional quantile regressions. *Econometrica* 77(3): 953–973.
Hansen BE (1999) Threshold effects in non-dynamic panels: estimation, testing, and inference. *Journal of Econometrics* 93(2): 345–368.
Harding M and Lamarche C (2009) A quantile regression approach for estimating panel data models using instrumental variables. *Economics Letters* 104(3): 133–135.
Headey DD and Hodge A (2009) The effect of population growth on economic growth: a meta-regression analysis of the macroeconomic literature. *Population and Development Review* 35(2): 221–248.
Holzner M (2011) Tourism and economic development: The beach disease? *Tourism Management* 32(4): 922–933.
Hunter C (1997) Sustainable tourism as an adaptive paradigm. *Annals of Tourism Research* 24(4): 850–867.
Husein J and Kara SM (2011) Research note: re-examining the tourism-led growth hypothesis for Turkey. *Tourism Economics* 17(4): 917–924.
Ibarra R and Trupkin DR (2016) Reexamining the relationship between inflation and growth: Do institutions matter in developing Countries? *Economic Modelling* 52(B): 332–351.
Katircioglu ST (2009) Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration. *Tourism Management* 30(1): 17–20.
Ko JTG (2001) Assessing progress of tourism sustainability. *Annals of Tourism Research* 28(3): 817–820.
Koenker R (2004) Quantile regression for longitudinal data. *Journal of Multivariate Analysis* 91(1): 74–89.
Koenker R and Bassett G (1978) Regression quantiles. *Econometrica* 46(1): 33–50.
Kumar RR and Kumar R (2012) Exploring the nexus between information and communications technology, tourism, and growth in Fiji. *Tourism Economics* 18(2): 359–371.
Kumar RR and Stauvermann PJ (2016) The linear and non-linear relationship between tourism demand and output per worker: a study of Sri Lanka. *Tourism Management Perspectives* 19(A): 109–120.
Lanza A and Pigliaru F (2000) Why are tourism countries small and fast-growing? In: Fossati A and Panella G (eds), *Tourism and Sustainable Economic Development*. Boston: Springer. DOI:10.1007/978-1-4615-4321-3_3.
Lee JW and Kwag M (2013) Green growth and sustainability: the role of tourism, travel and hospitality service industry in Korea. *Journal of Distribution Science* 11(7): 15–22.
Li H and Zhang J (2007) Do high birth rates hamper economic growth? *The Review of Economics and Statistics* 89(1): 110–117.
Mushtaq A and Zaman K (2013) Impact of macroeconomic factors on tourism receipts: evidence from SAARC region. *European Economic Letters* 2(2): 38–43.
Narayan PK, Narayan S, Prasad A, et al. (2010) Tourism and economic growth: a panel data analysis for Pacific Island countries. *Tourism Economics* 16(1): 169–183.
Ndoricimpa A (2017) Threshold effects of inflation on economic growth in Africa: evidence from a dynamic panel threshold regression. African Development Bank Working Paper Series No. 249. Available at: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/WPS_No_249_Threshold_Effects_of_Inflation_on_Economic_Growth_in_Africa.pdf (accessed 10 December 2019).
Oh CO (2005) The contribution of tourism development to economic growth in the Korean economy. *Tourism Management* 26(1): 39–44.
Olayinka IK (2013) A reassessment of tourism-exports led growth hypothesis in Africa. *American Journal of Tourism Research* 2(1): 130–140.
Pablo-Romero M and Molina JA (2013) Tourism and economic growth: a review of the empirical literature. *Tourism Management Perspectives* 8(1): 28–41.
Perles-Ribes JF, Ramón-Rodríguez AB and Rubia A (2017) Is the tourism-led growth hypothesis valid after the global economic and financial crisis? The case of Spain 1957-2014. *Tourism Management* 61(1): 96–109.
Perles-Ribes JF, Ramón-Rodríguez AB and Sevilla-Jiménez M (2016) The effects of economic crises on tourism success: an integrated model. *Tourism Economics* 22(2): 417–447.

Po WC and Huang BN (2008) Tourism development and economic growth—a nonlinear approach. *Physica A: Statistical Mechanics and Its Applications* 387(22): 5535–5542.
Proença S and Soukiazis E (2008) Tourism as an alternative source of regional growth in Portugal: a panel data analysis at NUTS II and III levels. *Portuguese Economic Journal* 7(1): 43–61.
Samitas A, Asteriou D, Polyzos S, et al. (2018) Terrorist incidents and tourism demand: evidence from Greece. *Tourism Management Perspectives* 25(1): 23–28.
Seetanah B (2011) Assessing the dynamic economic impact of tourism for island economies. *Annals of Tourism Research* 38(1): 291–308.
Song H, Dwyer L, Li G, et al. (2012) Tourism economics research: a review and assessment. *Annals of Tourism Research* 39(3): 1653–1682.
Tang CHH and Jang SS (2009) The tourism-economy causality in the United States: a sub-industry level examination. *Tourism Management* 30(4): 553–558.
UNESCO (2017) UNESCO Natural Sites, World Heritage List, 2017. Available at: https://worldmapper.org/wp-content/uploads/2018/04/UNESCO_NaturalSites_2017.xlsx (accessed 17 December 2019).
UNWTO (2019) The United Nations World Tourism Organization Report, Yearbook of Tourism Statistics. Available at: https://www.unwto.org/global/publication/yearbook-tourism-statistics-data-2013-2017-2019-edition (accessed 12 September 2019).
Wang Q (2015) Fixed-effect panel threshold model using Stata. *The Stata Journal* 15(1): 121–134.
WEF (2019) World Economic Forum Report, The Travel, and Tourism Competitiveness Report. Point Travel and Tourism at a Tipping, 2019. Available at: http://reports.weforum.org/travel-and-tourism-competitiveness-report-2019/ (accessed 12 September 2019).

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