Received: 7 October 2022 | Revised: 19 July 2023 | Accepted: 28 September 2023

DOI: 10.1002/ijfe.2897

SPECIAL ISSUE ARTICLE

WILEY

# How important is tourism for growth?

**Theodore Panagiotidis**[1] | **Maurizio Mussoni**[2] | **Georgios Voucharas**[1]

[1]Department of Economics, University of Macedonia, Thessaloniki, Greece

[2]Department of Management, University of Bologna, Rimini, Italy

**Correspondence**
Theodore Panagiotidis, Department of Economics, University of Macedonia, Thessaloniki, Greece.
Email: tpanag@uom.edu.gr

**Funding information**
Greece and the European Union (European Social Fund-ESF); Operational Programme "Human Resources Development, Education and Lifelong Learning" in the context of the project "Strengthening Human Resources Research Potential via Doctorate Research", Grant/Award Number: MIS-5000432; State Scholarships Foundation (IKY)

**Abstract**

We revisit the tourism-led growth hypothesis by utilising a panel set of 108 countries over the period 1996–2017. We quantify the effects of tourism on the entire conditional distribution of economic growth for both relatively poor and relatively rich countries within a panel quantile regression framework. We address the unobserved heterogeneity and potential endogeneity concerns. We reveal that the lower the conditional growth rate a country experiences the more important is tourism development for the conditional growth distribution for both developing and developed countries. The size of the effect in developed countries is twice as high as in developing ones. On the other hand, tourism specialisation is beneficial only at higher quantiles of the conditional growth distribution and only for developed countries. On the contrary, it brings about an undesirable effect in developing countries. Finally, we examine the impact of a reduction in tourism activity on economic growth due to an exogenous shock (i.e., COVID-19). Simulation analysis based on the quantile regression estimates shows that countries facing relatively low growth rates conditionally to the growth distribution are affected the most. Policymakers may consider the importance of tourism activity in the growth process and formulate strategies that align with the growth experience of each country.

**KEYWORDS**

tourism-led-growth, growth regression, panel quantile regression

## 1 | INTRODUCTION

It is well known that tourism is important for the economy overall. Its contribution to economic development and growth is well-established in the literature (Adamou & Clerides, 2010; Antonakakis et al., 2019; Balaguer & Cantavella-Jorda, 2002; Brau et al., 2007; Lee & Chang, 2008; Sequeira & Maçãs Nunes, 2008, among others).

Tourism comprises a vital area of the service sector and the positive effect of the former on economic growth is known as the tourism-led growth hypothesis-TLGH (Balaguer & Cantavella-Jorda, 2002). For several countries, tourism is integral to economic prosperity and the consequences these countries might face if the sector shrinks are significant. The latter is supported by a plethora of arguments through different mechanisms: (i) tourism increases national income; (ii) promotes and stimulates investments; (iii) constitutes a source of employment; (iv) develops positive economies of scale and (v) is intimately linked to other industries (see Andriotis, 2002; Balaguer & Cantavella-Jorda, 2002; Brida et al., 2016; Croes, 2006; Seetanah, 2011, among others). Despite the aforementioned benefits of tourism, the expansion of the sector can lead to: (i) prohibitive costs related to infrastructures' provision and maintenance and to human capital investment (Sinclair, 1998); (ii) negative environmental impacts and negative externalities (Holden, 2000; Lozano et al., 2008)[1] and (iii) increase of crime in tourism destinations (Biagi & Detotto, 2014). Although there is a general consensus underpinning the significance of tourism on the growth process, some empirical evidence supports that heavy reliance on tourism could lead to moderating effects (Bojanic & Lo, 2016) or show signs of Dutch Disease (Capo et al., 2007).

From an empirical perspective, the TLGH has mainly been tested via regression models, that in most cases, explore the effect that tourism has on the conditional mean of economic growth. We claim this as one important explanation of the still mixed empirical evidence existing in the relevant literature and, thus, we re-examine the macroeconomic challenges and prospects of TLGH by applying an alternative econometric approach.

In this paper, we contribute to the literature and enhance our understanding of the tourism-growth nexus in several ways. First, we take into account the nonlinear nature of the tourism-growth nexus and we employ a panel quantile regression approach that, unlike previous literature, accounts for the unobserved heterogeneity, while at the same time, we address potential endogeneity issues. By doing this, we are able to reveal the potential heterogeneous effects of tourism on different quantiles of the conditional distribution of economic growth instead of focusing only on the conditional means.[2] To our knowledge, this is the first study that operates within this methodological framework utilising data from 108 heterogeneous countries for more than 20 years. Second, we model the entire conditional distribution of economic growth rates and we investigate the impact of tourism on specific-income groups of countries. Given our data, the economic growth of a country could be independent of their income status. For instance, a low-income country (i.e., a developing country) could experience relatively high-growth rates. Thus, the reason for undertaking this approach is that countries may respond differently not only with respect to their relative growth level but also with respect to the income group they belong to (see also Eugenio-Martin et al., 2004). Third, using the quantile regression estimations, we pin down the impact of a hypothetical reduction in tourism activity on different parts of the conditional distribution of growth rates due to an exogenous shock (i.e., due to COVID-19). Since we expect the tourism-growth relationship to vary significantly among countries and to depend on their individual growth levels, our analysis is of particular interest as it could inform policymakers to implement reforms tailored to different countries' characteristics.

To get a taste of the tourism-growth nexus, we present the following figures. Figure 1 illustrates the average growth rate of GDP per capita across the average tourism receipts as a percentage of GDP for each country in our sample. At first glance, the regression's fitted line reveals a positive correlation between the variables of interest. However, it becomes apparent that given the level of tourism, GDP per capita growth does not lie along the regression line. In Figure 1, we plot the corresponding fitted lines after applying simple quantile regressions on the low (5th), middle (50th) and high (95th) conditional quantile levels of growth. The relationship between the variables of interest changes across different quantiles. Hence, given the nature of the data, a quantile regression approach could shed further light on the relationship of interest compared to conventional regression approaches that only focus on mean responses and, thus, it motivates us further towards this approach (Figure 2).

This paper aims to further investigate the following research questions. Does indeed tourism affect economic growth? What is the impact of tourism in countries facing relatively low growth rates and countries facing relatively higher ones? How does tourism affect the developed and developing countries? To answer these research questions, we focus on tourism development (tourism receipts per capita) and tourism specialisation (tourism receipts as a percentage of GDP). Using annual data for a wide range of countries and for a period that spans from 1996 to 2017, we show that tourism development is beneficial for both developing and developed countries, especially at the lower tail of the conditional growth distribution. Interestingly, we find that the size of the effect in developed countries is twice as high as in developing countries. On the other hand,

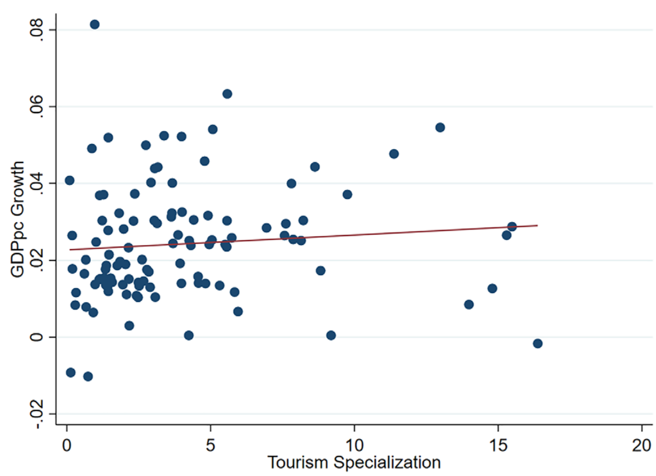


FIGURE 1 Tourism and Growth: OLS. [Colour figure can be viewed at wileyonlinelibrary.com]

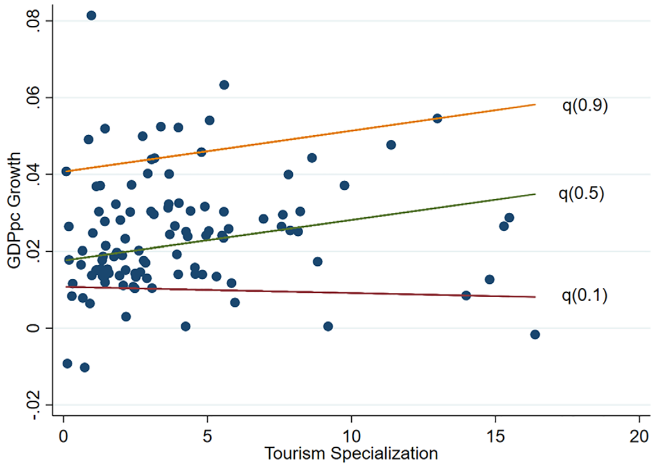


FIGURE 2 Tourism and Growth: QR. [Colour figure can be viewed at wileyonlinelibrary.com]

tourism specialisation can lead to negative effects at higher quantiles of the conditional distribution. The latter is also valid for the developing countries. Quantile regression results show further insights and interest patterns across countries compared to traditional econometric approaches. The latter highlights the importance of applying alternative models and specifications to explore the TLGH. This is the main contribution this paper intends to give.

Recently, the coronavirus pandemic has triggered a tremendous crisis in the sector, affecting the wider economy and causing a global economic recession (OECD, 2020). As UNCTAD (2021) reports, international tourist arrivals decreased by 74% in 2020 compared with 2019, while the effect was detrimental in many developing countries, where the corresponding decline reached 90% in some cases. While the recovery from the public health crisis is still fragile, the researchers' response has focused on understanding the impact of the crisis and the prospects of the global economic comeback. To this end, we propose a simulation approach that can quantify the impact of a reduction in tourism activity on economic growth. Simulation analysis based on the quantile regression estimates shows that countries facing relatively low growth rates conditionally to the growth distribution are affected the most, recording a decline of 4.82% decline in their growth rate while the average decline is found to be approximately 1.9%.

The paper is organised as follows. Section 2 reviews the related literature. Sections 3 and 4 describe the empirical methodologies applied and the data used. Section 5 presents the empirical findings. Sections 6, 7 and 8 report further evidence and the robustness analysis. Section 9 provides concluding remarks.

## 2 | RELATED LITERATURE

The literature dealing with the role of tourism in economic growth is voluminous. For a comprehensive literature review, one can see the studies of Pablo-Romero and Molina (2013) and Brida et al. (2016) as well as the recent contributions of Ahmad et al. (2020) and Eluwole et al. (2022) that provide fresh evidence on the TLGH through systematic literature review analysis. In what follows, the extant literature classifies the tourism-growth causal relationship into the following groups of studies. As regards the first one, tourism is the vehicle of economic growth, suggesting one-way causality (see Xia et al., 2021). The second one postulates that the causality can also run in the opposite way and thus economic growth could be the driving force of tourism (see Payne & Mervar, 2010). The third group indicates that economic growth and tourism development are highly interdependent and thus the feedback hypothesis holds (see Mitra, 2019 and Roudi et al., 2019. Finally, the fourth group finds no evidence in support of TLGH which is known as the neutrality hypothesis (see Ekeocha et al., 2021; Tugcu, 2014).[3] These mixed and inconclusive findings in some cases could be attributed to different sample data and time dimensions, but also to different econometric methodologies.

While there is an ongoing debate on the direction of causality between tourism and growth as well as the mechanisms through which tourism can be beneficial to economic growth,[4] in light of new data and econometric methodologies we aim to address the macroeconomic effect of tourism on economic growth from a different point of view. Our paper mainly fits into the literature that investigates the long-run effect that tourism has on economic growth in the context of a neoclassical growth model that also captures the common determinants of economic growth. At the same time, we account for two important features that recent evidence suggests, that is (a) the existence of non-linearities in the tourism-growth nexus and (b) heterogeneous tourism effects among countries in different levels of economic growth. The are many initiatives that encourage us towards this approach. For instance, Chiu and Yeh (2017) and Sahni et al. (2022) find evidence of a nonlinear relationship in samples of heterogeneous countries, while Brida et al. (2016) highlights the importance of using non-linear assumptions when investigating the TLGH. In addition, according to Eugenio-Martin et al. (2004) and Lee and Chang (2008), the effect of tourism is heterogeneous across different parts of the distribution of economic growth.[5] Further, Tang and Tan (2018) show that the level of income and institutional quality of a country plays a significant role in explaining the tourism-growth nexus. Recently, Portella-Carbó et al. (2023) highlight the importance of examining the tourism-growth relationship in all phases of business cycles. Following a causality-in-quantile approach for 12 European countries, they find that the contribution of tourism to economic growth is challenging during crises and booms.

But, to what extent does the tourism sector contribute to economic growth, and, most importantly, how does this contribution depend on the level of economic growth of a country? In our approach, we differentiate from previous studies that use traditional regression techniques that focus only on mean responses that might overlook the effect at different levels of the growth spectrum. For this reason, we model the whole growth distribution of growth rates and we follow a panel quantile regression approach. By doing this, we are able to quantify the asymmetric effect of tourism on the conditional distribution of growth rates and thus come up with a more comprehensive picture of this relationship.

Despite the fact that TLGH is intensively documented in the literature, the empirical studies applying quantile regression approaches to investigate the heterogeneous effects of tourism on different parts of the distribution of growth rates are limited. More specifically, there is a strand of literature supporting that countries facing relatively low-growth rates can benefit more from tourism than countries facing relatively high ones. For instance, Fayissa et al. (2011) investigate the impact of tourism on the economic growth of 18 Latin American countries over the period 1990–2005, and they find that international tourism receipts have a larger positive impact at the lower quantiles of the income growth distribution than at the higher quantiles. Similarly, Sahni et al. (2020) by employing a panel quantile regression methodology and by focusing on 23 African countries over the period 2002–2015, find that tourism receipts have a positive effect on countries that are at the lower part of the spectrum of growth. In the same vein, Aslan et al. (2021) in the context of a panel quantile regression framework, focus on 17 Mediterranean countries over the period 1995–2014 and find that the TLGH is confirmed in low-growth levels. Lolos et al. (2021) report similar findings for Greece. In a more recent study, Saboori et al. (2022) examine the effect of tourism market diversification (TMD) on economic growth for 109 countries using a quantile regression approach over the period 1995–2018. Their findings suggest that in low- and lower-middle-income countries, TMD has a positive effect on economic growth that holds at the lower part of the growth distribution. On the contrary, there are several studies pointing out that tourism can have undesirable effects on economic growth. For instance, in the aforementioned paper of Saboori et al. (2022), the effect of TMD on economic growth in high-income countries is negative when considering higher quantiles of economic growth and they do not find evidence in lower quantiles. In another study, Bojanic and Lo (2016) use data from 1995 to 2014 for 187 countries and find that tourism reliance has a moderating effect on economic development for all countries, but mainly at higher levels of economic development. Finally, there is a body of literature pointing out that there is no direct effect of tourism on growth. For instance, Du et al. (2016) use cross-sectional data for 109 countries, and by applying standard quantile regression methods, they find no evidence supporting the direct relationship between tourism and growth, suggesting that tourism affects economic growth through standard income determinants.

Apart from the aforementioned studies, there is a body of literature that operates within a Quantile-on Quantile approach.[6] For instance, Shahzad et al. (2017) focus on 10 popular tourist destinations and investigate the TLGH by applying a quantile-on-quantile approach and standard quantile regression techniques. They observed wide differences across countries and across different quantiles, however, according to their results the TLGH is confirmed in most cases. In another study, Wu et al. (2023) explore the TLGH in 12 western regions of China, and although they reveal a positive correlation between tourism and growth, a large regional variation was reported.

Overall, some of these recent studies that follow quantile regression approaches find evidence supporting the TLGH, while others find mixed or poor results. The extent to which previous literature that applies quantile regression techniques captures significantly the effect of tourism on growth can be challenging. Most of the relevant studies in the literature use standard quantile regression methods (e.g., Koenker & Bassett Jr, 1978) which may be biased for several reasons. For instance, they do not take into account the unobserved heterogeneity (i.e., the unobserved country-specific effect) and specific time-varying effects or they treat fixed effects as a constant term across quantiles (e.g., Koenker, 2004). In addition, they do not consider the potential endogeneity between the variables of interest, or potential growth determinants are overlooked in their specifications. We aim at filling this gap in the literature and complement the existing literature on the topic by first, employing a novel panel quantile regression approach proposed by Machado and Silva (2019); second, using a wide set of both developed and developing countries, and third, accounting for the unobserved heterogeneity and time-varying effects and handling the potential endogeneity between tourism and economic growth.

# 3 | EMPIRICAL FRAMEWORK

## 3.1 | The model

To examine the relationship between tourism and growth we initiate our analysis by following a Neoclassical growth model. In line with the existing literature, we consider the following regression model:

$$y_{it} = \alpha + \beta_1 Y_{i,t-1} + \beta_2 Tourism_{it} + \beta_3 X_{it} + \eta_i + \delta_t + \varepsilon_{it}, \quad (1)$$

where $y_{it}$ captures the real growth rate of the outcome variable, $Y_{i,t-1}$ is one period lag of the outcome variable, $Tourism_{it}$ denotes the tourism variable, $X_{it}$ is a set of explanatory variables[7] $\varepsilon_{it}$ is the error term for country $i = 1,2,...,N$ and period $t = 1,2,...,T$. In all regressions, we account for the unobserved country-specific effect ($\eta_i$) and we include year dummies ($\delta_t$) to capture all time-varying effects.

## 3.2 | Quantile regression

Quantile regression methods for panel data have received growing attention over the last years and they are widely used in empirical research (see e.g., Boikos et al., 2022; Jiang et al., 2022; Khattak et al., 2023, among others).

Quantile regression methods quantify the effect of the independent variable (in our case, *tourism*) on the dependent one (in our case, *economic growth*) by modelling the entire conditional distribution of the latter and shedding light on the behaviour on the tails. On top of this, they allow for greater flexibility over the "symmetric" assumption that traditional regression methods assume and can be more informative as they focus on lower, middle and upper levels of the conditional distribution of the outcome variable instead of only focusing on mean responses. The aforementioned approaches are robust to outliers, can take into account the unobserved heterogeneity and capture the heterogeneous effects of covariates. This being said, in this study, we adopt the novel "Method of Moments" quantile regression estimator (MMQR) proposed by Machado and Silva (2019).

Given a sample of panel data with $i = 1,2..,N$ cross-sections and $t = 1,2..,T$ time periods, we consider the conditional location-scale model that has the following form:

$$y_{it} = \alpha_i + X_{it}'\beta + \left(\eta_i + H_{it}'\gamma\right)\varepsilon_{it} \quad (2)$$

The parameters $\alpha_i$ and $\eta_i$ capture the individual effects of the $i$th cross-section. $X$ denotes a $k$-vector of covariates. $H$ includes the known differentiable transformations of vector $X$ and $Pr\{\eta_i + H_{it}'\gamma\} > 1$. The error term is independent and identically distributed for each $i$ and $t$, does not statistically depend on $X$, and satisfies the moment conditions. Then, we consider the conditional quantiles $Q_y(\theta|X)$ of the following model that can be estimated sequentially based on the method of moment regression as defined comprehensively in Machado and Silva (2019).

$$Q_y(\theta|X) = \left(\alpha_i + \delta_{iq}(\theta)\right) + X'\beta + H_{it}\gamma q(\theta) \quad (3)$$

One of the novelties of the estimator is that the $\theta$th quantile of cross-section $i$, that is captured by $\alpha_i + \delta_i q(\theta)$, is allowed to affect the entire distribution of the outcome variable rather than considered constant across quantiles.[89]

For comparative purposes, we also implement traditional panel regression methodologies focusing on conditional means. Namely: (a) fixed-effect regression and (b) two-stage least-squares regression with instrumental variables to handle endogeneity.

# 4 | DATA

The relationship between tourism and growth is investigated using annual data for an unbalanced panel of 108 countries during the period 1996–2017.[10] The sample size consists of 2331 observations and the choice was driven by data availability.[11] Based on the World Bank's Atlas classification methodology, our sample combines 56 developing and 52 developed countries: 25 countries are in Africa, 19 are in the Americas, 27 in Asia, 35 are in Europe and 2 are in Oceania. Our sample consists of heterogeneous countries including both islands and non-island countries. One could expect island countries to rely relatively more on tourism than non-island ones, and thus the tourism effect on growth to be driven by the former than the latter ones. However, this is not the case for our analysis, given that individual fixed effects that are included in all specifications can absorb these effects. In the standard literature of economic growth, it is quite common for variables to be expressed in 3- or 5-year intervals in order to reduce the effect of measurement errors and business cycles. However, taking into account, the unavailability of historical tourism data in conjunction with the advantages of quantile regression techniques over business cycles, we use annual data. In addition, transforming the sample into specific year intervals will decrease the time dimension of the analysis and thus could increase bias in the quantile regression results.

To account for economic growth, we consider the growth rate of real GDP per capita. In addition, in Section 6.2, we introduce the growth rate of real GDP per capita net of tourism, to avoid the accounting effect on the relation between GDP and tourism and address the potential endogeneity. As far as the tourism variable is concerned, we use separately international tourism receipts per capita to capture tourism development and international tourism receipts as a percentage of GDP to measure tourism specialisation.[12] To account for human capital, we use an index based on average schooling years and return-to-education rates.[13] Gross capital formation as a percentage of GDP is used to measure the stock of physical capital, while at the same time, it serves as a proxy for infrastructure (see also Adeola & Evans, 2020). Following the empirical growth literature, we also include the following control variables in our specification. More specifically, we control for trade openness (measured by the sum of international exports and imports as a percentage of GDP), government's size (measured as government expenditure as a percentage of GDP), inflation (measured as the log difference of the consumer price index), population growth, the level of democracy (measured by the political regime index) and the level of corruption (measured by the Bayesian Corruption index). The data were retrieved from the World Development Indicators of the World Bank (2020), except for the human capital index which was obtained from the Penn World Tables 9.0 (Feenstra et al., 2015) and the political regime index and the Bayesian corruption index which were retrieved in the Quality of Government Dataset (Teorell et al., 2020).[1415] The list of countries used in the analysis is provided in Table A1. To get further insight into the nature of the data, we present descriptive statistics in Table 1.

## 5 | EMPIRICAL FINDINGS

### 5.1 | Tourism and growth: MMQR

We report the results for the case of tourism development in Table 2 and the findings for the case of tourism specialisation in Table 3. In each table, column (1) reports the results of the fixed effects model, column 2 reports the 2SLS estimates and the rest columns present selective quantiles from the quantile regression.

As we observe, in Tables 1 and 2, the lagged value of the log of GDP per capita ($lagGDP_{pc}$), which represents the rate of conditional convergence, is negative and statistically significant in all cases, both in the FE and in the MMQR model as we expect from the growth literature. As far as the coefficient of tourism development is concerned, it is clear that both models (FE and MMQR) positively support tourism receipts as a significant determinant of growth.[16] On top of this, in the MMQR model, there is variation in the coefficients, which range from 0.0128 in the 10th quantile to 0.0048 in the 50th one. That is, a decline of 62.5% in the aforementioned coefficients is noted when we move from low values of the distribution of growth rates to middle ones. In other words, countries that experience low growth rates benefit more from tourism revenues than the higher ones, taking into account the conditional growth distribution. On the contrary, tourism specialisation (Table 3) is found to have an adverse effect on economic growth. Interestingly, this effect is only statistically significant under the MMQR specification and especially at higher quantiles. The higher the level of economic growth, the more intensive the impact of tourism specialisation. As far as the control variables are taken into account, the findings are remarkably consistent with the literature in both

**TABLE 1** Descriptive statistics.

| Variable | Obs | Mean | Std. dev. | Min | Max |
|---|---|---|---|---|---|
| $GDP_{pc}$ growth | 2331 | 0.024 | 0.034 | −0.163 | 0.215 |
| Tourism development | 2331 | −4.251 | 2.015 | −11.405 | 0.033 |
| Tourism specialisation | 2331 | 0.921 | 1.081 | −3.326 | 3.084 |
| Human capital | 2331 | 2.556 | 0.687 | 1.069 | 3.974 |
| Capital formation | 2331 | 3.120 | 0.292 | 0.146 | 4.063 |
| Trade openness | 2331 | 4.284 | 0.528 | 2.750 | 6.081 |
| Government's size | 2331 | 2.693 | 0.376 | −0.093 | 3.418 |
| Population growth | 2331 | 1.284 | 1.247 | −3.848 | 8.118 |
| Inflation | 2331 | 5.503 | 8.477 | −4.581 | 244.960 |
| Democracy | 2331 | 7.273 | 2.771 | 0 | 10 |
| Corruption | 2331 | 3.708 | 0.507 | 1.864 | 4.268 |

*Note*: All variables are expressed in natural logarithms apart from the indices of the human capital, democracy and corruption.

TABLE 2 Tourism development and growth: Method of moments quantile regression estimator (MMQR).

| Dependent variable $GDP_{pc}$Growth | (1) FE | (2) 2SLS | (3) $q_{10}$ | (4) $q_{30}$ | (5) $q_{50}$ | (6) $q_{70}$ | (7) $q_{90}$ |
|---|---|---|---|---|---|---|---|
| *lag*$GDP_{pc}$ | −0.0441*** | −0.0510*** | −0.0574*** | −0.0485*** | −0.0436*** | −0.0390*** | −0.0327*** |
| | (0.0095) | (0.0098) | (0.0154) | (0.0117) | (0.0101) | (0.0097) | (0.0107) |
| Tourism development | 0.0050** | 0.0024 | 0.0128*** | 0.0076** | 0.0048* | 0.0021 | −0.0016 |
| | (0.0025) | (0.0033) | (0.0048) | (0.0034) | (0.0028) | (0.0026) | (0.0030) |
| Human capital | 0.0080 | 0.0196* | 0.0042 | 0.0067 | 0.0082 | 0.0095 | 0.0113 |
| | (0.0108) | (0.0108) | (0.0164) | (0.0127) | (0.0117) | (0.0121) | (0.0143) |
| Physical capital | 0.0338*** | 0.0449*** | 0.0551*** | 0.0409*** | 0.0331*** | 0.0257*** | 0.0156 |
| | (0.0080) | (0.0072) | (0.0083) | (0.0076) | (0.0081) | (0.0092) | (0.0114) |
| Trade openness | 0.0032 | 0.0046 | 0.0009 | 0.0024 | 0.0033 | 0.0040 | 0.0051 |
| | (0.0062) | (0.0066) | (0.0086) | (0.0069) | (0.0064) | (0.0063) | (0.0069) |
| Gov. cons. | −0.0196 | −0.0162 | −0.0046 | −0.0146 | −0.0201 | −0.0253** | −0.0324*** |
| | (0.0135) | (0.0137) | (0.0166) | (0.0145) | (0.0135) | (0.0128) | (0.0122) |
| Population | −0.0116*** | −0.0122*** | −0.0085*** | −0.0106*** | −0.0117*** | −0.0128*** | −0.0142*** |
| | (0.0016) | (0.0018) | (0.0024) | (0.0018) | (0.0017) | (0.0020) | (0.0026) |
| Inflation | −0.0008*** | −0.0008*** | −0.0009** | −0.0008*** | −0.0008*** | −0.0007*** | −0.0007*** |
| | (0.0002) | (0.0001) | (0.0004) | (0.0003) | (0.0002) | (0.0002) | (0.0002) |
| Democracy | 0.0020 | 0.0022 | 0.0026 | 0.0022* | 0.0020* | 0.0018 | 0.0014 |
| | (0.0012) | (0.0014) | (0.0017) | (0.0013) | (0.0012) | (0.0012) | (0.0013) |
| Corruption | −0.0052 | −0.0088 | −0.0018 | −0.0041 | −0.0053 | −0.0065 | −0.0082 |
| | (0.0091) | (0.0100) | (0.0154) | (0.0105) | (0.0095) | (0.0106) | (0.0143) |
| Observations | 2331 | 2218 | 2331 | 2331 | 2331 | 2331 | 2331 |
| Countries | 108 | 108 | 108 | 108 | 108 | 108 | 108 |
| *R*-squared | 0.32 | 0.34 | | | | | |

*Note*: Column 1 reports the results of the Fixed Effects model. Column 2 reports the results of the 2SLS model where *lag*$GDP_{pc}$ and tourism variables are instrumented using both the first and second lags as instruments, respectively. Robust standard errors clustered at the country level are in parentheses. Columns 3–7 report the results of MMQR. Jackknife standard errors clustered at the country level using 500 replications are in parentheses. All regressions include time dummies and a constant term. ***, **, * denote statistical significance at the 1%, 5% and 10% level, respectively.

tables. The coefficients have the expected signs and are statistically significant in the majority of cases in both specifications.

Figures 3 and 4 illustrate the coefficients of the tourism variables along the distribution of growth rates. The shaded area represents the confidence interval at the 90% level. The dashed line depicts the corresponding coefficient of the FE and 2SLS models.

Although we observe differences in terms of magnitude and the level of significance in some cases, our findings are consistent with the existing literature supporting that countries benefit more from tourism development when they face relatively low growth rates based on the corresponding distribution of growth rates (such as Fayissa et al., 2011; Lolos et al., 2021; Sahni et al., 2020). As regards the finding of the negative effect of tourism specialisation on higher parts of the conditional distribution of growth rates, this finding is in line with Bojanic and Lo (2016). Finally, our findings are contrary to the findings of Du et al. (2016) that find no direct effect of tourism on economic growth.

# 6 | FURTHER EVIDENCE

## 6.1 | Developing versus developed countries

Overall, tourism revenues are found to be beneficial in the growth process while tourism specialisation led to the opposite result at the upper quantiles of the conditional growth distribution. But, how important is tourism specifically for developing and developed countries? Is tourism specialisation linked negatively to economic growth both in relatively poor and relatively rich countries? To address these issues, we split the sample into two groups using the average per capita gross national income based on the World Bank's Atlas method as a threshold

**TABLE 3** Tourism specialisation and growth: Method of moments quantile regression estimator (MMQR).

| Dependent variable $GDP_{pc}$Growth | (1) FE | (2) 2SLS | (3) $q_{10}$ | (4) $q_{30}$ | (5) $q_{50}$ | (6) $q_{70}$ | (7) $q_{90}$ |
|---|---|---|---|---|---|---|---|
| $lag\mathrm{GDP}_{pc}$ | −0.0382*** (0.0081) | −0.0485*** (0.0085) | −0.0426*** (0.0135) | −0.0397*** (0.0100) | −0.0380*** (0.0086) | −0.0364*** (0.0083) | −0.0343*** (0.0096) |
| Tourism specialisation | −0.0009 (0.0021) | 0.0008 (0.0031) | 0.0048 (0.0047) | 0.0010 (0.0031) | −0.0012 (0.0024) | −0.0032 (0.0022) | −0.0061** (0.0028) |
| Human capital | 0.0067 (0.0104) | 0.0196* (0.0108) | 0.0039 (0.0162) | 0.0058 (0.0122) | 0.0068 (0.0111) | 0.0078 (0.0115) | 0.0092 (0.0139) |
| Physical capital | 0.0351*** (0.0081) | 0.0453*** (0.0073) | 0.0565*** (0.0086) | 0.0423*** (0.0077) | 0.0340*** (0.0082) | 0.0266*** (0.0092) | 0.0163 (0.0112) |
| Trade openness | 0.0070 (0.0059) | 0.0056 (0.0065) | 0.0042 (0.0084) | 0.0061 (0.0067) | 0.0072 (0.0062) | 0.0081 (0.0061) | 0.0095 (0.0067) |
| Gov. cons. | −0.0191 (0.0137) | −0.0161 (0.0138) | −0.0050 (0.0175) | −0.0144 (0.0150) | −0.0198 (0.0136) | −0.0247* (0.0127) | −0.0316*** (0.0118) |
| Population | −0.0118*** (0.0015) | −0.0123*** (0.0018) | −0.0086*** (0.0024) | −0.0107*** (0.0017) | −0.0119*** (0.0017) | −0.0130*** (0.0019) | −0.0145*** (0.0026) |
| Inflation | −0.0008*** (0.0002) | −0.0008*** (0.0001) | −0.0010** (0.0004) | −0.0009*** (0.0003) | −0.0008*** (0.0002) | −0.0007*** (0.0002) | −0.0007*** (0.0002) |
| Democracy | 0.0020 (0.0012) | 0.0023 (0.0014) | 0.0026 (0.0018) | 0.0022* (0.0013) | 0.0020* (0.0011) | 0.0018 (0.0011) | 0.0015 (0.0013) |
| Corruption | −0.0043 (0.0094) | −0.0087 (0.0101) | −0.0020 (0.0154) | −0.0035 (0.0106) | −0.0044 (0.0096) | −0.0051 (0.0107) | −0.0062 (0.0144) |
| Observations | 2331 | 2218 | 2331 | 2331 | 2331 | 2331 | 2331 |
| Countries | 108 | 108 | 108 | 108 | 108 | 108 | 108 |
| $R$-squared | 0.32 | 0.34 | | | | | |

*Note*: Column 1 reports the results of the Fixed Effects model. Column 2 reports the results of the 2SLS model where $lag\mathrm{GDP}_{pc}$ and tourism variables are instrumented using both the first and second lags as instruments, respectively. Robust standard errors clustered at the country level are in parentheses. Columns 3–7 report the results of MMQR. Jackknife standard errors clustered at the country level using 500 replications are in parentheses. All regressions include time dummies and a constant term. ***, **, * denote statistical significance at the 1%, 5% and 10% level, respectively.

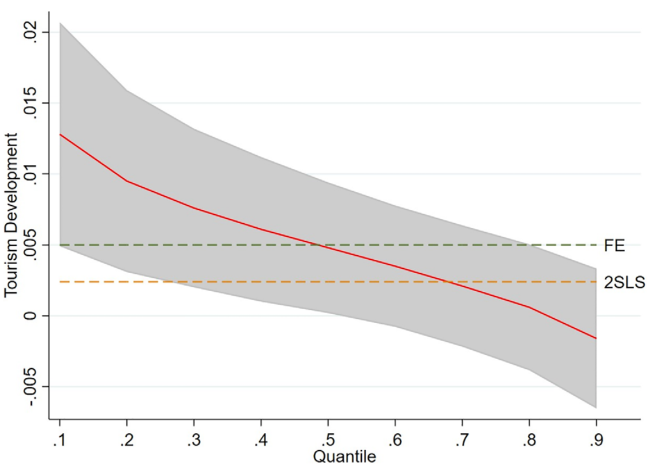


**FIGURE 3** Tourism development and growth, method of moments quantile regression estimator. [Colour figure can be viewed at wileyonlinelibrary.com]

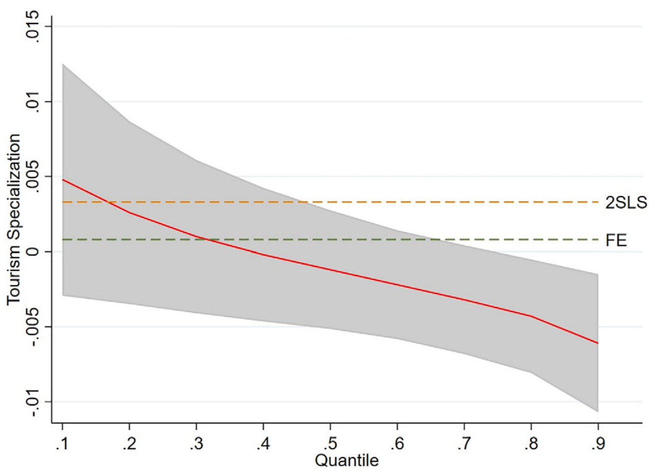


**FIGURE 4** Tourism specialisation and growth, method of moments quantile regression estimator. [Colour figure can be viewed at wileyonlinelibrary.com]

**TABLE 4** Tourism and growth in developing and developed countries: Method of moments quantile regression estimator for selected quantiles.

| Quantile | Developing countries: Tourism dev. | Developing countries: Tourism spec. | Developed countries: Tourism dev. | Developed countries: Tourism spec. |
|---|---|---|---|---|
| $q_{10}$ | 0.0095* (0.0052) | 0.0037 (0.0048) | 0.0193*** (0.0048) | 0.0057 (0.0091) |
| $q_{30}$ | 0.0047 (0.0037) | −0.0001 (0.0032) | 0.0103*** 0.0067 (0.0034) (0.0070) | |
| $q_{50}$ | 0.0022 (0.0030) | −0.0020 (0.0026) | 0.0045 (0.0028) | 0.0073 (0.0060) |
| $q_{70}$ | −0.0006 (0.0029) | −0.0043* (0.0026) | −0.0005 (0.0026) | 0.0078 (0.0054) |
| $q_{90}$ | −0.0041 (0.0035) | −0.0070** (0.0034) | −0.0075** (0.0030) | 0.0083 (0.0052) |
| FE | 0.0024 (0.0029) | −0.0019 (0.0025) | 0.0179*** (0.0055) | 0.0072 (0.0056) |
| 2SLS | −0.0026 (0.0038) | −0.0031 (0.0037) | 0.0178*** (0.0064) | 0.0139** (0.0065) |

*Note*: Dependent variable: $GDP_{pc}$ *Growth*. Sample size of MMQR: 56 developing countries (1194 observations) and 52 developed countries (1137 observations). The findings are obtained after estimating Equation (1) for different income groups using the MMQR. Only the coefficients of tourism variables are reported for selected quantiles. Jackknife standard errors clustered at the country level using 500 replications are in parentheses. The last two rows report the results of FE and 2SLS, respectively. In the latter, the *lag*$GDP_{pc}$ and tourism variables are instrumented using both the first and second lags as instruments, respectively. Sample size of 2SLS: 56 developing countries (1082 observations) and 52 developed countries (1033 observations). For 2SLS, robust standard errors clustered at the country level are in parentheses. ***, **, * denote statistical significance at the 1%, 5% and 10% level, respectively. All regressions include a constant term and time dummies.

variable, over the period of the analysis. We reproduce the analysis using the MMQR methodology and we report only the coefficients of tourism development and tourism specialisation for both the developing and developed countries in Table 4.

Although tourism offers opportunities for economic expansion and diversification, it seems to affect countries heterogeneously based on their income level. It becomes apparent that tourism receipts are positively linked to the economic growth for both the developing and developed economies at lower levels of the conditional distribution of economic growth. However, it is noteworthy that the magnitude of the reported coefficient in rich countries is twice as high as in poor ones when we consider the lower part of the conditional distribution of growth rates. In terms of tourism development, this finding contradicts the general consensus that tourism has a more profound impact on low-income countries rather than high-income ones (Lee & Chang, 2008; Paramati et al., 2017). More precisely, it provides further insights into the tourism-growth nexus in lower parts of the conditional distribution of growth that might be overlooked in previous studies focusing on conditional means. Similar to the full-sample approach, the lower the growth rate based on the conditional growth distribution of a country, the more important tourism is for its economy. To continue with, tourism specialisation is statistically significant and negatively associated with economic growth in the sample of developing countries at higher quantiles of the conditional growth distribution. While we report positive coefficients when we focus on the sample of the developed countries, they are not statistically significant under the MMQR approach. However, under the 2SLS approach, where endogeneity is taken into account, the corresponding coefficient becomes significant. For this reason, we address potential endogeneity problems in the following section.

## 6.2 | Endogeneity concerns: The case of growth net of tourism

Despite the fact that we found interesting results on the tourism-growth nexus, one may worry that the findings are biased as endogenous variables may be included in the model. The dependent variable used in the model presented in Equation (1) consists of the growth rate of the real GDP per capita. Nevertheless, GDP (and consequently GDP growth rate) in its construction includes tourism revenues, and hence it is endogenous to the tourism variable by definition. Although the MMQR estimator can perform well in cases of an endogenous regressor, it is worth verifying our main findings through an additional robustness check. In order to avoid the accounting effect on the relation between tourism and GDP, the variable GDP without tourism is created by subtracting tourism receipts from GDP. In the same way, $GDP_{pc}$Net of tourism is generated (see also Dreger & Herzer, 2013; Sharma & Panagiotidis, 2005).[17] Thus, Equation (1) takes the following form:

$$ynet_{it} = \alpha + \beta_1 Ynet_{i,t-1} + \beta_2 Tourism_{it} + \beta_3 X_{it} + + \eta_i + \delta_t + \varepsilon_{it}, \quad (4)$$

where $ynet_{it}$ and $Ynet_{i,t-1}$ are the growth rate of the real GDP per capita and GDP per capita lagged one period, respectively, both without tourism receipts. We replicate the analysis presented in Section 5.1 and Section 6.2 and we report the coefficients of interest in Table 5. We observe differences in the magnitude of the corresponding coefficients compared to those of the main analysis, nonetheless, the results tie the main findings presented in previous sections in most cases. Thus, for the full sample estimates, we highlight: (i) the importance of tourism development in growth, in particular at lower quantiles of the conditional growth distribution; (ii) the negative effect of tourism specialisation as a determinant of growth especially at the upper tail of the conditional distribution. These findings align with the studies of Saboori et al. (2022) and Bojanic and Lo (2016). When we split the sample into rich and poor countries we found heterogeneous effects and patterns between countries with different income levels. After controlling for potential endogeneity, developing countries at higher quantiles of the conditional distribution could experience a disadvantageous impact on their growth process if they extensively rely on tourism. This is not happening in the case of developed countries where the effect of tourism specialisation is positive and statistically significant, especially at higher parts of the growth distribution.

This finding could be supported by the study of Can and Gozgor (2018) which reports a positive relationship between tourist market diversification and economic growth in a group of high-income countries while it contradicts the findings of Saboori et al. (2022) for the high-income countries. However, our result seems reasonable given that high-income countries afford better tourism infrastructures and usually face lower geopolitical risks and economic policy uncertainty. Thus, they might attract a relatively higher number of tourists resulting in higher income generation and foreign exchange earnings, contributing more to economic growth.[18]

## 7 | THE "TWO-STEP" QUANTILE REGRESSION ESTIMATOR

In this section, we aim to further explore the robustness of our findings. For this reason, we operate within an alternative quantile regression approach. We follow the methodology of Canay (2011) and the well-established in the literature "two-step" estimator (FEQR). Canay (2011) proposed a novel panel quantile regression methodology that accounts for fixed effects (i.e., fixed effects are treated as "location shifters") and at the same time is computationally simple. We replicate the main analysis presented in previous sections and we present our findings in the following tables (Tables 6, 7 and 8).

It is worth noting that the FEQR model performs consistently better than the MMQR one. The FEQR produced remarkably similar but more strong results in terms of statistical significance compared with the MMQR approach. Tourism development is positively associated with growth and its effect is greater at higher quantiles. Tourism specialisation has a negative impact on growth and this is evident in higher parts of the conditional distribution of income growth. In addition, human capital, capital formation and trade openness contribute positively to economic growth in contrast with governments' size, population growth and inflation have a negative effect on growth as the literature suggests. Finally, institutions do matter for growth as democratic regimes and lower levels of corruption are beneficial for economic prosperity. However, taking into consideration that the sample size and specifically the time dimension of our analysis is relatively short the results of the FEQR approach should be interpreted with caution.[19,20]

**TABLE 5** Tourism and net growth: Method of moments quantile regression estimator (MMQR) for selected quantiles.

| Sample | Tourism variable | (1) $q_{10}$ | (2) $q_{30}$ | (3) $q_{50}$ | (4) $q_{70}$ | (5) $q_{90}$ |
|---|---|---|---|---|---|---|
| Full | Tour. dev. | 0.0152*** (0.0052) | 0.0090** (0.0037) | 0.0058* (0.0031) | 0.0028 (0.0029) | −0.0012 (0.0034) |
| Full | Tour. spec. | 0.0064 (0.0051) | 0.0020 (0.0034) | −0.0006 (0.0027) | −0.0029 (0.0025) | −0.0060* (0.0031) |
| Developing | Tour. dev. | 0.0104* (0.0056) | 0.0058 (0.0039) | 0.0031 (0.0031) | 0.0000 (0.0030) | −0.0035 (0.0037) |
| Developing | Tour. spec. | 0.0043 (0.0052) | 0.0009 (0.0035) | −0.0011 (0.0028) | −0.0041 (0.0028) | −0.0068* (0.0036) |
| Developed | Tour. dev. | 0.0236*** (0.0094) | 0.0125*** (0.0037) | 0.0053* (0.0031) | −0.0006 (0.0029) | −0.0088*** (0.0034) |
| Developed | Tour. spec. | 0.0050 (0.0093) | 0.0072 (0.0071) | 0.0085 (0.0061) | 0.0097* (0.0056) | 0.0111** (0.0056) |

*Note*: The findings are obtained after estimating Equation (2) using separately tourism development and tourism receipts and are based on the MMQR method. Only the coefficients of tourism variables are reported for selected quantiles. Jackknife standard errors clustered at the country level using 500 replications are in parentheses. ***, **, * denote statistical significance at the 1%, 5% and 10% level, respectively.

**TABLE 6** Tourism development and growth: FEQR.

| Dependent variable $GDP_{pc}$Growth | (1) $q_{10}$ | (2) $q_{30}$ | (3) $q_{50}$ | (4) $q_{70}$ | (5) $q_{90}$ |
|---|---|---|---|---|---|
| *lag*$GDP_{pc}$ | −0.0439*** (0.0020) | −0.0444*** (0.0014) | −0.0429*** (0.0009) | −0.0429*** (0.0013) | −0.0430*** (0.0026) |
| Tourism development | 0.0058*** (0.0012) | 0.0059*** (0.0007) | 0.0045*** (0.0005) | 0.0040*** (0.0008) | 0.0037*** (0.0013) |
| Human capital | 0.0098*** (0.0035) | 0.0064*** (0.0018) | 0.0057*** (0.0013) | 0.0075*** (0.0019) | 0.0069** (0.0034) |
| Physical capital | 0.0436*** (0.0049) | 0.0369*** (0.0033) | 0.0360*** (0.0028) | 0.0348*** (0.0031) | 0.0307*** (0.0054) |
| Trade openness | −0.0009 (0.0026) | 0.0014 (0.0014) | 0.0036*** (0.0012) | 0.0056*** (0.0015) | 0.0111*** (0.0028) |
| Gov. cons. | −0.0240*** (0.0057) | −0.0191*** (0.0030) | −0.0195*** (0.0020) | −0.0191*** (0.0021) | −0.0226*** (0.0046) |
| Population | −0.0113*** (0.0012) | −0.0126*** (0.0008) | −0.0127*** (0.0007) | −0.0124*** (0.0006) | −0.0121*** (0.0013) |
| Inflation | −0.0018*** (0.0003) | −0.0010*** (0.0002) | −0.0007*** (0.0001) | −0.0005*** (0.0002) | −0.0004* (0.0002) |
| Democracy | 0.0027*** (0.0005) | 0.0024*** (0.0004) | 0.0020*** (0.0003) | 0.0018*** (0.0003) | 0.0016** (0.0006) |
| Corruption | −0.0058** (0.0028) | −0.0059*** (0.0016) | −0.0046*** (0.0011) | −0.0033** (0.0014) | −0.0011 (0.0030) |
| Observations | 2331 | 2331 | 2331 | 2331 | 2331 |
| Countries | 108 | 108 | 108 | 108 | 108 |

*Note*: Columns 1–5 report the results of FEQR. Standard errors clustered at the country level using 500 replications are in parentheses. All regressions include time dummies and a constant term. ***, **, * denote statistical significance at the 1%, 5% and 10% level, respectively.

**TABLE 7** Tourism specialisation and growth: FEQR.

| Dependent variable $GDP_{pc}$Growth | (1) $q_{10}$ | (2) $q_{30}$ | (3) $q_{50}$ | (4) $q_{70}$ | (5) $q_{90}$ |
|---|---|---|---|---|---|
| *lag*$GDP_{pc}$ | −0.0377*** (0.0017) | −0.0377*** (0.0010) | −0.0380*** (0.0007) | −0.0382*** (0.0010) | −0.0382*** (0.0020) |
| Tourism specialisation | −0.0002 (0.0012) | 0.0000 (0.0007) | −0.0006 (0.0005) | −0.0017** (0.0007) | −0.0018 (0.0014) |
| Human capital | 0.0094*** (0.0036) | 0.0044** (0.0018) | 0.0052*** (0.0013) | 0.0062*** (0.0017) | 0.0057* (0.0034) |
| Physical capital | 0.0452*** (0.0049) | 0.0387*** (0.0033) | 0.0373*** (0.0026) | 0.0360*** (0.0032) | 0.0310*** (0.0056) |
| Trade openness | 0.0017 (0.0026) | 0.0051*** (0.0014) | 0.0061*** (0.0012) | 0.0094*** (0.0014) | 0.0145*** (0.0030) |
| Gov. cons. | −0.0224*** (0.0058) | −0.0181*** (0.0032) | −0.0187*** (0.0019) | −0.0178*** (0.0021) | −0.0241*** (0.0048) |
| Population | −0.0111*** (0.0012) | −0.0131*** (0.0008) | −0.0129*** (0.0006) | −0.0126*** (0.0006) | −0.0126*** (0.0013) |
| Inflation | −0.0019*** (0.0003) | −0.0010*** (0.0002) | −0.0007*** (0.0001) | −0.0005*** (0.0002) | −0.0004* (0.0002) |
| Democracy | 0.0028*** (0.0005) | 0.0025*** (0.0004) | 0.0019*** (0.0002) | 0.0017*** (0.0003) | 0.0016** (0.0006) |
| Corruption | −0.0049* (0.0028) | −0.0045*** (0.0015) | −0.0035*** (0.0011) | −0.0023* (0.0013) | −0.0010 (0.0030) |
| Observations | 2331 | 2331 | 2331 | 2331 | 2331 |
| Countries | 108 | 108 | 108 | 108 | 108 |

*Note*: Columns 1–5 report the results of FEQR. Standard errors clustered at the country level using 500 replications are in parentheses. All regressions include time dummies and a constant term. ***, **, * denote statistical significance at the 1%, 5% and 10% level, respectively.

**TABLE 8** Tourism and growth in developing and developed countries: FEQR for selected quantiles.

| | Developing countries | | Developed countries | |
|---|---|---|---|---|
| Quantile | Tourism dev. | Tourism spec. | Tourism dev. | Tourism spec. |
| $q_{10}$ | 0.0061*** (0.0019) | −0.0006 (0.0020) | 0.0101*** (0.0020) | 0.0083*** (0.0019) |
| $q_{30}$ | 0.0031*** (0.0009) | −0.0013 (0.0008) | 0.0088*** (0.0010) | 0.0065*** (0.0010) |
| $q_{50}$ | 0.0029*** (0.0008) | −0.0013* (0.0008) | 0.0106*** (0.0009) | 0.0082*** (0.0010) |
| $q_{70}$ | 0.0021*** (0.0008) | −0.0023** (0.0009) | 0.0100*** (0.0012) | 0.0075*** (0.0012) |
| $q_{90}$ | 0.0003 (0.0017) | −0.0046** (0.0020) | 0.0096*** (0.0023) | 0.0062*** (0.0022) |

*Note*: Dependent variable: GDP$_{pc}$ *growth*. Sample size of FEQR: 56 developing countries (1194 observations) and 52 developed countries (1137 observations). The findings are obtained after estimating Equation (1) for different income groups using the FEQR. Only the coefficients of tourism variables are reported for selected quantiles. Standard errors clustered at the country level using 500 replications are in parentheses.

## 8 | TOURISM REDUCTION AND PROJECTIONS

Recently the COVID-19 pandemic severely hit countries worldwide. The tourism sector did not avoid harm. Although our approach is not taking into account the recent pandemic due to data unavailability on key variables, our findings could provide preliminary evidence on the potential impact of a reduction in tourism activity on different quantiles of the distribution of the growth rates. To do so, we make use of the estimated coefficients $(\widehat{a})$ of the tourism-growth model presented in Table 2 and we calculate the equation: $Y = \widehat{a}_0 + \widehat{a}_1 Tourism + \sum_{i=2} \widehat{a}_i X'$, where *Tourism* corresponds to the median value of tourism development and $X$ is a vector of the median values of the corresponding variables used in the analysis. With all other values being constant, we allow tourism to be reduced by 25%, 50% and 75%, respectively. We illustrate the values of $Y$ (i.e., GDP$_{pc}$ *growth rate*) across different rates of reduction of tourism development in Figure 5. The red dot represents the mean effect and the grey dots correspond to the quantile regression approach. Although the figure should be interpreted with caution as it gives a complementary notion by simulating the effect of a reduction in tourism development on growth under a specific framework, it clearly depicts that, on average, higher reduction rates in tourism receipts lead to lower growth rates (red dots). That is, GDP per capita growth declined by 1.88 percentage points (i.e., from 3.26% under the zero reduction scenario to 1.48% under the 75% reduction scenario). The latter is not far away from reality and recent projections. The estimated average losses in GDP due to a reduction in tourism activity are ranging from 1.93% to 2.7% (UNCTAD, 2021).

While there is no significant variation in higher quantiles of the growth rate distribution (lighter dots), this is not the case for the lower ones where the magnitude of the effect is greater (darker dots). More specifically, GDP per capita growth rate drops from 2.24% (no reduction) to −3.88% (75% reduction) at the 10th quantile. This is a decline of 4.82% in income growth. Thus, one could expect countries facing relatively low growth rates to be affected the most by the reduction in tourism receipts.

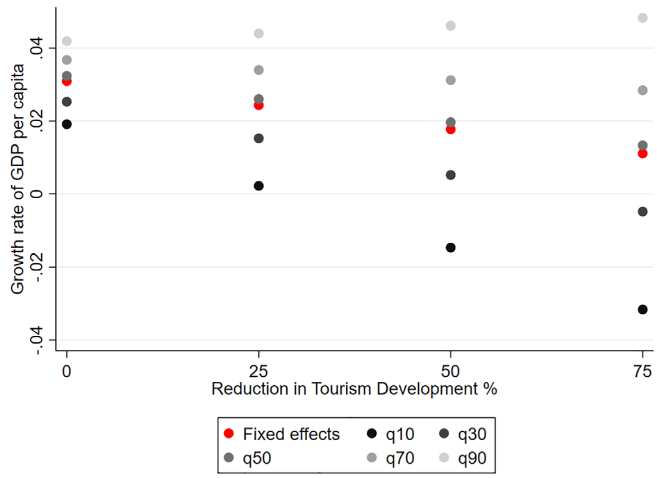


**FIGURE 5** Economic growth and the reduction of tourism development: Full sample. [Colour figure can be viewed at wileyonlinelibrary.com]

## 9 | CONCLUDING REMARKS

We provide evidence supporting the importance of the tourism sector to the growth process. Unlike previous literature, we model the entire conditional distribution of growth and we investigate the behaviour on the tails (low and high growth rates) by accounting for fixed effects and handling potential endogeneity issues in a neoclassical growth model context. The results are robust across a number of dimensions, including alternative econometric settings and tourism definitions.[21] Traditional econometric methods (fixed effects regressions and 2SLS regressions) failed to support the TLGH in some cases, while quantile regression models shed more light on the research questions. The findings indicate that countries at lower levels of the conditional growth distribution benefit more from tourism development compared to countries at higher ones. While tourism development brings advantages, this is not the case when tourism specialisation is taken into account. Dependence on tourism in some cases could have an undesirable negative effect on economic growth. This effect is more intensive in countries at the upper tail of the conditional distribution. The results are in line with the majority of the literature which documents the positive impact of tourism on economic growth in lower parts of the spectrum of growth (such as Aslan et al., 2021; Fayissa et al., 2011; Sahni et al., 2020) and at the same time complement the studies that support that heavy dependence on tourism is not always beneficial for the economies (for instance, Bojanic & Lo, 2016). In addition, apart from the growth level, we emphasise that the stage of a country's development plays a significant role in explaining the tourism-growth relationship. After controlling for unobserved heterogeneity, time-varying effects, several growth determinants as well as endogeneity concerns, in contrast with the relevant literature, we reveal that developed countries could benefit more from the tourism sector than developing ones at lower quantiles of the conditional distribution of growth rates. Finally, we propose a simulation approach and we quantify three scenarios of the effect of a hypothetical reduction in tourism activity on economic growth due to an exogenous shock. Using the quantile regression estimates, we find that countries facing relatively low growth rates conditionally to the growth distribution are affected the most, recording a decline of 4.82% decline in their growth rate while the average decline is found to be approximately 1.9%.

Tourism could be the road to recovery as long as continued vigilance on measures targeting the bullet-proofing of the economies of the nations is maintained. Given the contribution of the tourism sector to the global economy and welfare, our results are promising for the implementation of more effective policies in the future. Given that our findings reveal substantial parameter heterogeneity across quantiles of the conditional distribution of growth, countries' responses could vary with respect to their stage of growth. To this end, policymakers before formulating any strategies could take into account the growth experience of each country. At the same time, decision-making could target implementing reforms tailored to different countries' characteristics based on their income level. Our findings suggest that both low- and high-income countries benefit from tourism development and thus, tourism-oriented reforms should be enforced in both cases. The fact that the effect is found to be greater in developed countries than in developing ones may underscore the hidden channels through which tourism affects economic growth. High-income countries usually have better-developed infrastructures and information/communication technologies, entail lower geopolitical and political risks, exhibit lower corruption levels, and have relatively higher institutional quality compared to low-income countries. All these could be significant factors influencing tourist activity (see also Ghalia et al., 2019; Khan & Rasheed, 2016; Nadeem et al., 2020) and should be considered in the process of effective decision-making. Finally, our findings suggest that a tourism-specialised economy could have unfavourable consequences, especially at the upper tails of the conditional distribution of growth. Heavy reliance on one sector (i.e., tourism) might have adversely impacted other important sectors of the economy, such as agriculture and manufacturing (see also Bojanic & Lo, 2016). The last decades were characterised by a substantial shrinkage of the manufacturing sector and the rise of services. In the presence of the premature deindustrialisation phenomenon (Rodrik, 2016), several economies adopted service-led growth strategies. Therefore, in light of this structural transformation, it would be interesting for future research to focus on the relationship and interaction of the tourism sector and the determinants of tourism demand with other important industries aiming to foster economic growth.

## ACKNOWLEDGEMENTS

We are thankful to two anonymous referees for their valuable comments and suggestions. We would also like to thank for the useful comments session participants and seminar attendees at the 19th Annual European Economics and Finance Society Conference-EEFS, 2022 (Krakow, Poland), the 23rd International Network for Economic Research annual conference-INFER, 2021 (Lisbon, Portugal), 19th Annual European Economics and Finance Society Conference-EEFS, 2021 (London, UK), 17th International Conference of IATE, 2019 (La Plata, Argentina) and 18th Annual European Economics and Finance Society Conference-EEFS, 2019 (Genoa, Italy).

## FUNDING INFORMATION

This research is co-financed by Greece and the European Union (European Social Fund-ESF) through the Operational Programme "Human Resources Development, Education and Lifelong Learning" in the context of the project "Strengthening Human Resources Research Potential via Doctorate Research" (MIS-5000432), implemented by the State Scholarships Foundation (IKY).

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## ORCID

*Theodore Panagiotidis* https://orcid.org/0000-0002-5328-3054
*Maurizio Mussoni* https://orcid.org/0000-0003-3932-6588

## ENDNOTES

[1] Interestingly, Akadiri et al. (2021) show that tourism, through the channels of globalization and income, decreases $CO_2$ emissions.

[2] There are several studies pointing towards a non-linear relationship between tourism and economic activity. For instance, Adamou and Clerides (2010) and Sahni et al. (2020).

[3] There is also a strand of literature that reports mixed evidence across countries. For instance, Aslan (2014) finds heterogeneous effects for different groups of countries. That is a bidirectional causal effect for Portugal, a unidirectional one for Bulgaria, Croatia, Cyprus, Greece, Italy, Spain and Tunisia, and no empirical evidence of a causal effect in Egypt and Malta.

[4] We refer to these mechanisms in Section 1.

[5] More specifically, Eugenio-Martin et al. (2004) find that the tourism sector is contributing more to the economic growth in low- and medium-income countries. In addition, Lee and Chang (2008) report a stronger effect of tourism on non-OECD countries than on OECD ones.

[6] This approach is proposed by Sim and Zhou (2015) and connects the quantile regression with a nonparametric estimation technique. It tests the local effect of a quantile of a variable $x$ on a quantile of the variable ($y$).

[7] By following the Neoclassical growth literature, we treat the explanatory variables as growth determinants. However, their relationship with tourism is documented in the literature. For instance, for the effect of trade openness see Keho (2017), for the effect of inflation see Meo et al. (2018) and for the effects of corruption and democracy, see Maria et al. (2022) and Neumayer (2004), respectively.

[8] For instance, previous QR estimators, such as the ones proposed by Koenker (2004) and Canay (2011) treat the individual effects as pure "location shifts."

[9] The MMQR estimator also provides reasonable results in situations where one of the explanatory variables is endogenous.

[10] The first observation of $GDP_{pc}$ lagged one period is in 1995.

[11] To provide consistent results, we drop countries reporting less than 15 observations and/or containing gaps.

[12] Bojanic and Lo (2016) follow a different specification by integrating both tourism receipts and the product of tourism receipts per capita and tourism receipts as a percentage of GDP in the same regression with GDP per capita as the dependent variable. In our case, we follow the empirical growth literature and we allow for a wide range of growth determinants. Thus, we use tourism development and tourism specialization separately and we consider the growth rate of GDP per capita to be the dependent variable.

[13] For more information about the human capital index, visit https://www.rug.nl/ggdc/docs/human_capital_in_pwt_90.pdf.

[14] The political regime index is based on the *Polity*2 index of the Polity IV dataset (see Marshall et al., 2010) and the political rights and civil liberties indices of the House (2019). Higher values correspond to higher levels of democracy. For more details, see Hadenius and Teorell (2005) and Teorell et al. (2020).

[15] The Bayesian corruption index ranges between 0 and 100. The higher the value, the higher the level of corruption. For more details about the construction of the index and its advantages over alternative indicators measuring corruption, see Standaert (2015).

[16] Under the 2SLS approach, the corresponding coefficient is consistent in terms of sign but not statistically significant.

[17] As of today, the research on panel quantile regression estimators that account for unobserved heterogeneity and at the same time control for endogeneity concerns is actively ongoing. While the MM-QR estimator could perform well in cases where an endogenous variable is included in the model (see also Machado & Silva, 2019), we further try to deal with the potential endogeneity by introducing a new variable, the GDP per capita net of tourism. However, we are aware of the potential limitations of this approach and we interpret the findings with caution.

[18] For a study on the effect of geopolitical risks and economic policy uncertainty and tourism, see Raheem and le Roux (2023). For a study on the effect of ICT on tourism development see Lee et al. (2021).

[19] The FEQR estimator is consistent when both $T$ and $N$ tend to infinity.

[20] The MMQR estimator is unbiased under smaller samples when jackknife correction is implemented. See (Machado & Silva, 2019).

[21] One could be interested in exploring whether the findings stemming from our analysis are driven by specific time periods. While there is empirical evidence in the literature in favour of time-varying effects on the tourism-growth relationship (see for instance Mérida & Golpe, 2016 and Sharif et al., 2017), the short time dimension of our sample due to the non-availability of data restricts us from splitting the sample into sub-periods. Hence we quote this as a limitation of our study. To this end, in all specifications, we include year-specific dummies to capture time-varying effects.

## REFERENCES

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

Adeola, O., & Evans, O. (2020). ICT, infrastructure, and tourism development in Africa. *Tourism Economics*, *26*, 97–114.

Ahmad, N., Menegaki, A. N., & Al-Muharrami, S. (2020). Systematic literature review of tourism growth nexus: An overview of the literature and a content analysis of 100 most influential papers. *Journal of Economic Surveys*, *34*, 1068–1110.

Akadiri, S. S., Uzuner, G., Akadiri, A. C., & Lasisi, T. T. (2021). Environmental Kuznets curve hypothesis in the case of tourism Island states: The moderating role of globalization. *International Journal of Finance & Economics*, *26*, 2846–2858.

Andriotis, K. (2002). Scale of hospitality firms and local economic development—Evidence from Crete. *Tourism Management*, *23*, 333–341.

Antonakakis, N., Dragouni, M., Eeckels, B., & Filis, G. (2019). The tourism and economic growth enigma: Examining an ambiguous relationship through multiple prisms. *Journal of Travel Research*, *58*, 3–24.

Aslan, A. (2014). Tourism development and economic growth in the Mediterranean countries: Evidence from panel granger causality tests. *Current Issues in Tourism*, *17*, 363–372.

Aslan, A., Altinoz, B., & Özsolak, B. (2021). The nexus between economic growth, tourism development, energy consumption, and $CO_2$ emissions in Mediterranean countries. *Environmental Science and Pollution Research*, *28*, 3243–3252.

Balaguer, J., & Cantavella-Jorda, M. (2002). Tourism as a long-run economic growth factor: The Spanish case. *Applied Economics*, *34*, 877–884.

Biagi, B., & Detotto, C. (2014). Crime as tourism externality. *Regional Studies*, *48*, 693–709.

Boikos, S., Panagiotidis, T., & Voucharas, G. (2022). Financial development, reforms and growth. *Economic Modelling*, *108*, 105734.

Bojanic, D. C., & Lo, M. (2016). A comparison of the moderating effect of tourism reliance on the economic development for islands and other countries. *Tourism Management*, *53*, 207–214.

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

Brida, J. G., Cortes-Jimenez, I., & Pulina, M. (2016). Has the tourism-led growth hypothesis been validated? A literature review. *Current Issues in Tourism*, *19*, 394–430.

Can, M., & Gozgor, G. (2018). Revisiting the tourism-growth nexus: Evidence from a new index for the market diversification of tourist arrivals. *Current Issues in Tourism*, *21*, 1157–1170.

Canay, I. A. (2011). A simple approach to quantile regression for panel data. *The Econometrics Journal*, *14*, 368–386.

Capo, J., Font, A. R., & Nadal, J. R. (2007). Dutch disease in tourism economies: Evidence from the Balearics and the Canary Islands. *Journal of Sustainable Tourism*, *15*, 615–627.

Chiu, Y.-B., & Yeh, L.-T. (2017). The threshold effects of the tourism-led growth hypothesis: Evidence from a cross-sectional model. *Journal of Travel Research*, *56*, 625–637.

Croes, R. R. (2006). A paradigm shift to a new strategy for small Island economies: Embracing demand side economics for value enhancement and long term economic stability. *Tourism Management*, *27*, 453–465.

Dreger, C., & Herzer, D. (2013). A further examination of the export-led growth hypothesis. *Empirical Economics*, *45*, 39–60.

Du, D., Lew, A. A., & Ng, P. T. (2016). Tourism and economic growth. *Journal of Travel Research*, *55*, 454–464.

Ekeocha, D. O., Ogbuabor, J. E., Orji, A., & Kalu, U. I. (2021). International tourism and economic growth in Africa: A post-global financial crisis analysis. *Tourism Management Perspectives*, *40*, 100896.

Eluwole, K. K., Bekun, F. V., & Lasisi, T. T. (2022). Fresh insights into tourism-led economic growth nexus: A systematic literature network analysis approach. *Asia Pacific Journal of Tourism Research*, *27*, 374–410.

Eugenio-Martin, J. L., Martn Morales, N., & Scarpa, R. (2004). Tourism and economic growth in Latin American countries: A panel data approach.

Fayissa, B., Nsiah, C., & Tadesse, B. (2011). Research note: Tourism and economic growth in Latin American countries—further empirical evidence. *Tourism Economics*, *17*, 1365–1373.

Feenstra, R. C., Inklaar, R., & Timmer, M. P. (2015). The next generation of the Penn World Table. *American Economic Review*, *105*, 3150–3182.

Ghalia, T., Fidrmuc, J., Samargandi, N., & Sohag, K. (2019). Institutional quality, political risk and tourism. *Tourism Management Perspectives*, *32*, 100576.

Hadenius, A., & Teorell, J. (2005). *Assessing alternative indices of democracy*. C&M Working Papers, IPSA.

Holden, A. (2000). *Environment and tourism*. Routledge.

House, F. (2019). Freedom of the World and Freedom of the Press.

Jiang, Y., Tian, G., Wu, Y., & Mo, B. (2022). Impacts of geopolitical risks and economic policy uncertainty on Chinese tourism-listed company stock. *International Journal of Finance & Economics*, *27*, 320–333.

Keho, Y. (2017). The impact of trade openness on economic growth: The case of Cote d'Ivoire. *Cogent Economics & Finance*, *5*, 1332820.

Khan, R. E. A., & Rasheed, M. K. (2016). Political economy of tourism in Pakistan: The role of terrorism and infrastructure development. *Asian Development Policy Review*, *4*, 42–50.

Khattak, M. A., Saiti, B., & Khan, S. (2023). Does market power explain margins in dual banking? Evidence from panel quantile regression. *International Journal of Finance & Economics*, *28*, 1826–1844.

Koenker, R. (2004). Quantile regression for longitudinal data. *Journal of Multivariate Analysis*, *91*, 74–89.

Koenker, R., & Bassett, G., Jr. (1978). Regression quantiles. *Econometrica: Journal of the Econometric Society*, *46*, 33–50.

Lee, C. C., & Chang, C. (2008). Tourism development and economic growth: A closer look at panels. *Tourism Management*, *29*, 180–192.

Lee, C.-C., Chen, M.-P., Wu, W., & Xing, W. (2021). The impacts of ICTs on tourism development: International evidence based on a panel quantile approach. *Information Technology & Tourism*, *23*, 509–547.

Lolos, S., Palaios, P., & Papapetrou, E. (2021). Tourism-led growth asymmetries in Greece: Evidence from quantile regression analysis. *Portuguese Economic Journal*, *22*, 1–24.

Lozano, J., Gomez, C. M., & Rey-Maquieira, J. (2008). The TALC hypothesis and economic growth theory. *Tourism Economics*, *14*, 727–749.

Machado, J. A., & Silva, J. S. (2019). Quantiles via moments. *Journal of Econometrics*, *213*, 145–173.

Maria, K.-K., Ioanna, S., & Salomi, D. (2022). Nonlinear nexus between corruption and tourism arrivals: A global analysis. *Empirical Economics*, *63*, 1997–2024.

Marshall, M. G., Jaggers, K., & Gurr, T. R. (2010). Polity IV project: Political regime characteristics and transitions, 1800-2010. *Center for Systemic Peace*, *10*, 24–37.

Meo, M. S., Chowdhury, M. A. F., Shaikh, G. M., Ali, M., & Masood Sheikh, S. (2018). Asymmetric impact of oil prices, exchange rate, and inflation on tourism demand in Pakistan: New evidence from nonlinear ARDL. *Asia Pacific Journal of Tourism Research*, *23*, 408–422.

Mérida, A., & Golpe, A. A. (2016). Tourism-led growth revisited for Spain: Causality, business cycles and structural breaks. *International Journal of Tourism Research*, *18*, 39–51.

Mitra, S. K. (2019). Is tourism-led growth hypothesis still valid? *International Journal of Tourism Research*, *21*, 615–624.

Nadeem, M. A., Liu, Z., Xu, Y., Nawaz, K., Malik, M. Y., & Younis, A. (2020). Impacts of terrorism, governance structure, military expenditures and infrastructures upon tourism: Empirical evidence from an emerging economy. *Eurasian Business Review*, *10*, 185–206.

Neumayer, E. (2004). The impact of political violence on tourism: Dynamic cross-national estimation. *Journal of Conflict Resolution*, *48*, 259–281.

OECD. (2020). Tourism Policy Responses to the coronavirus (COVID-19). https://read.oecd-ilibrary.org/view/?ref=124_124984-7uf8nm95se&title=Covid-19_Tourism_Policy_Responses

Pablo-Romero, M. d. P., & Molina, J. A. (2013). Tourism and economic growth: A review of empirical literature. *Tourism Management Perspectives*, *8*, 28–41.

Paramati, S. R., Alam, M. S., & Chen, C.-F. (2017). The effects of tourism on economic growth and $CO_2$ emissions: A comparison between developed and developing economies. *Journal of Travel Research*, *56*, 712–724.

Payne, J. E., & Mervar, A. (2010). Research note: The tourism—growth nexus in Croatia. *Tourism Economics*, *16*, 1089–1094.

Portella-Carbó, F., Pérez-Montiel, J., & Ozcelebi, O. (2023). Tourism-led economic growth across the business cycle: Evidence from Europe (1995–2021). *Economic Analysis and Policy*, *78*, 1241–1253.

Raheem, I. D., & le Roux, S. (2023). Geopolitical risks and tourism stocks: New evidence from causality-in-quantile approach. *The Quarterly Review of Economics and Finance*, *88*, 1–7.

Rodrik, D. (2016). Premature deindustrialization. *Journal of Economic Growth*, *21*, 1–33.

Roudi, S., Arasli, H., & Akadiri, S. S. (2019). New insights into an old issue–examining the influence of tourism on economic growth: Evidence from selected small Island developing states. *Current Issues in Tourism*, *22*, 1280–1300.

Saboori, B., Ghaderi, Z., & Soleymani, A. (2022). A revised perspective on tourism-economic growth nexus, exploring tourism market diversification. *Tourism Economics*, *13548166221134183*, 1812–1835.

Sahni, H., Nsiah, C., & Fayissa, B. (2020). The African economic growth experience and tourism receipts: A threshold analysis and quantile regression approach. *Tourism Economics*, *27*, 915–932.

Sahni, H., Nsiah, C., & Fayissa, B. (2022). Tourism specialization, growth stage, and economic growth. *Tourism Economics*, *29*, 1533–1550.

Seetanah, B. (2011). Assessing the dynamic economic impact of tourism for Island economies. *Annals of Tourism Research*, *38*, 291–308.

Sequeira, T. N., & Maçãs Nunes, P. (2008). Does tourism influence economic growth? A dynamic panel data approach. *Applied Economics*, *40*, 2431–2441.

Shahzad, S. J. H., Shahbaz, M., Ferrer, R., & Kumar, R. R. (2017). Tourism-led growth hypothesis in the top ten tourist destinations: New evidence using the quantile-on-quantile approach. *Tourism Management*, *60*, 223–232.

Sharif, A., Saha, S., & Loganathan, N. (2017). Does tourism sustain economic growth? Wavelet-based evidence from the United States. *Tourism Analysis*, *22*, 467–482.

Sharma, A., & Panagiotidis, T. (2005). An analysis of exports and growth in India: Cointegration and causality evidence (1971–2001). *Review of Development Economics*, *9*, 232–248.

Sim, N., & Zhou, H. (2015). Oil prices, US stock return, and the dependence between their quantiles. *Journal of Banking & Finance*, *55*, 1–8.

Sinclair, M. T. (1998). Tourism and economic development: A survey. *The Journal of Development Studies*, *34*, 1–51.

Standaert, S. (2015). Divining the level of corruption: A bayesian state-space approach. *Journal of Comparative Economics*, *43*, 782–803.

Tang, C. F., & Tan, E. C. (2018). Tourism-led growth hypothesis: A new global evidence. *Cornell Hospitality Quarterly*, *59*, 304–311.

Teorell, J., Dahlberg, S., Holmberg, S., Rothstein, B., Pachon, N. A., & Axelsson, S. (2020). *The quality of government standard dataset*. University of Gothenburg. https://doi.org/10.18157/qogstdjan20

Tugcu, C. T. (2014). Tourism and economic growth nexus revisited: A panel causality analysis for the case of the Mediterranean region. *Tourism Management*, *42*, 207–212.

UNCTAD. (2021). Covid-19 and tourism. An update. Assessing the economic consequences. https://unctad.org/system/files/official-document/ditcinf2021d3_en_0.pdf

World Bank. (2020). World Development Indicators.

Wu, T.-P., Wu, H.-C., Wei, Z.-R., Chen, Y., & Gao, R. (2023). The dynamic effect of international tourism on economic development: China's experience. *Journal of Policy Research in Tourism, Leisure and Events*, 1–19. https://doi.org/10.1080/19407963.2023.2189263

Xia, W., Doğan, B., Shahzad, U., Adedoyin, F. F., Popoola, A., & Bashir, M. A. (2021). An empirical investigation of tourism-led growth hypothesis in the european countries: Evidence from augmented mean group estimator. *Portuguese Economic Journal*, *21*, 1–28.

**How to cite this article:** Panagiotidis, T., Mussoni, M., & Voucharas, G. (2024). How important is tourism for growth? *International Journal of Finance & Economics*, *29*(4), 4704–4720. https://doi.org/10.1002/ijfe.2897

## APPENDIX

**TABLE A1** List of countries.

| Classification | Countries |
|---|---|
| Developed | Australia, Austria, Bahrain, Belgium, Botswana, Brazil, Canada, Chile, Costa Rica. Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany. Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Rep., Kuwait, Latvia. Lithuania, Luxembourg, Malaysia, Malta, Mexico, Netherlands, New Zealand. Norway, Panama, Poland, Portugal, Romania, Russian Federation, Saudi Arabia. Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland. Turkey, United Kingdom, United States, Uruguay. |
| Developing | Albania, Algeria, Armenia, Bangladesh, Benin, Bolivia, Bulgaria, Burkina Faso. Burundi, Cambodia, Cameroon, China, Colombia, Cote d'Ivoire, Dominican Republic. Ecuador, Egypt, Arab Rep., El Salvador, Eswatini, Ghana, Guatemala, Honduras, India. Indonesia, Iran, Islamic Rep., Jamaica, Jordan, Kenya, Kyrgyz Republic, Lao PDR. Madagascar, Malawi, Mali, Moldova, Mongolia, Morocco, Namibia, Nepal, Nicaragua. Niger, Nigeria, Pakistan, Paraguay, Peru, Philippines, Rwanda, Senegal, Sri Lanka. Tajikistan, Tanzania, Thailand, Togo, Tunisia, Uganda, Ukraine, Vietnam. |

*Note*: The data covers the period 1996–2017. The first observation of $lag\text{GDP}_{pc}$ is in 1995. The following countries cover a shorter period: Burkina Faso (2000–2017), Honduras (2000–2017), Lao PDR(2000–2016), Namibia (2003–2017), Nicaragua (2000–2017), Saudi Arabia (2003–2017), Tajikistan (2002–2017), Vietnam (2003–2017).