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A new look to the tourism and economic growth nexus: A clustering and panel causality analysis

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Abstract

This paper explores the dynamic relationship between tourism and economic growth using panel data for 144 countries over the period 1995–2019. The study was carried out in two steps. First, the set of countries was classified by considering simultaneously two criteria, tourism and the economic development of the countries over time. Two classifications of homogeneous countries with four clusters each are obtained using a non-parametric methodology and two tourism indicators. Second, the Granger causality was tested for each of the identified groups and the entire sample. The results determined that there were significant differences between clusters and that causality from tourism to economic growth could only be verified for the group of countries with low income and low tourism. This relationship was confirmed by estimating impulse response functions, which showed a positive response of economic growth to innovations in tourism. The tourism sector could, therefore, be a way out of poverty and generate development and prosperity in low-income countries that are in the early stages of tourism development.

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KEYWORDS
cluster analysis, economic growth, impulse response functions, panel data causality, regime dynamics, TLGH, tourism development

1 | INTRODUCTION

Tourism is considered a potential source of employment and economic growth. Prior to the Covid-19 crisis, according to the World Travel and Tourism Council (WTTC) (2020), tourism's contribution to the global economy was around 10.3% of GDP (US $ 9.6 trillion) and 10.3% of total employment (333 million). The tourism sector was severely hit by the pandemic and tourism's contribution to GDP decreased to 5.3% in 2020. This share grew to 6.1% in 2021, and WTTC (2022) has estimated that Travel and Tourism GDP could return to 2019 levels by the end of 2023, demonstrating the resilience of the tourism industry. Over the next 10 years, this industry is expected to generate nearly 126 million new jobs. These data show that tourism is an industry that benefits the development of the countries as it creates direct and indirect jobs and increases the production of the countries. For this reason, understanding the relationship between tourism and growth has generated a lot of interest.

The hypothesis that tourism development generates economic growth, known as the Tourism-Led Growth Hypothesis (TLGH), has been the subject of a lot of research, especially from an empirical perspective. Theoretically, the TLGH can be derived from the export-led growth hypothesis (ELGH), which postulates that economic growth can be generated by expanding exports (Balassa, 1977; Edwards, 1998; Emery, 1967). Exports contribute to economic growth by providing foreign exchange, which is necessary for importing capital goods for production (McKinnon, 1964), and promoting technological progress that can increase the total factor productivity. The study by Balaguer and Cantavella-Jordá (2002) is recognised as the first paper to have analysed the TLGH. Since this seminal study, an increasing number of empirical studies have emerged aiming to discover whether there is a unidirectional or bidirectional causal relationship between tourism and economic growth, as described in the reviews by Brida et al. (2016) and Pablo-Romero and Molina (2013). Many of these studies have tested the TLGH using time series analysis, but in recent years studies using panel data have increased considerably. The TLGH can be tested more effectively in a panel context because cross-sectional information can improve the power of the tests. In addition, because the panel data includes a larger sample of countries, the TLGH analysis is more global and the results can be used as overall recommendations for growth. However, existing literature shows that the validity of the TLGH depends on country-specific characteristics, such as the level of economic and tourism development (Enilov & Wang, 2021; Pablo-Romero & Molina, 2013). In this regard, the homogeneity of the countries according to the tourism and economic development must be considered when the TLGH is analysed using data from a set of countries. This paper focuses on this issue.

In order to obtain groups of homogeneous countries to test the TLGH with panel data, some studies have used geographical or economic criteria. In these studies, countries have been classified on the basis of a single criterion. In an attempt to extend this strand of the literature, our proposal is to group countries according to two country characteristics at the same time, tourism and economic development. Moreover, our classification is based on the behaviour of both variables in each time period. Therefore, countries with similar behaviour in tourism and economic development over time belong to the same group. The objective of this paper is to test the TLGH in these groups and determine whether there are different links between tourism and economic growth in each group. In this case, different policy actions should be proposed depending on the temporal evolution of the country's tourism and economic development.

Using panel data from 144 countries over the period 1995–2019, the relationship between tourism and economic growth was analysed using a two-step methodology. In the first step, a cluster methodology was used to group the countries according to their economic and tourism development over the time. This methodology uses a new description based on the notion of economic regimes. An order was imposed on the regimes and an analytical technique—called symbolic time series analysis—was applied (Brida et al., 2020). In a second step, the Granger non-causality test for panel data models proposed in Dumitrescu and Hurlin (2012) was applied to each of the country groups obtained. This causality analysis allows identifying the sequential relationship between tourism and economic growth. In addition, in order to address the cause-and-effect relationship between both variables, impulse response functions were also estimated for the groups of countries. These functions—which show the dynamic reaction of one variable to innovations in another variable—were calculated by applying a GMM panel vector autoregressive approach (Love & Zicchino, 2006; Sigmund & Ferstl, 2021). Therefore, unlike most of the empirical literature that relies solely on Granger causality, this study also uses impulse response analysis.

This paper follows the convention in the existing literature of measuring the economic development of a country by real GDP per capita. However, given that there were more differences with respect to the indicator for tourism, two different variables were considered when performing both the cluster and causality analysis: the number of tourist arrivals, which captures the destination's tourism activity, and the percentage of arrivals relative to the population, which defines tourism specialisation. These two indicators provide different information about the tourism development of a destination. This analysis makes it possible to find out whether the use of these two indicators leads to qualitatively different results.

The results of this study identified four groups of countries based on their dynamic behaviour in terms of tourism and economic development. The first group includes countries with low income and high tourism, the second group includes countries with high income and high tourism, the third group includes countries with high income and low tourism and the fourth group includes countries with low income and low tourism. As far as the causality between tourism and economic growth is concerned, it is found that this relationship depends on both the level of economic development of the country and the level of tourism development. The analysis by homogeneous groups of countries showed unidirectional causality from tourism to economic growth only in countries with low income and low tourism. For these countries, the impulse response analysis showed a positive causal effect of tourism innovations on economic growth. This result is robust for the tourism indicator used. Thus, the TLGH is validated for the group of low-income, low-tourism countries. Encouraging the development of the tourism industry in these countries could be a way to promote economic growth.

This paper contributes to the empirical literature on the relationship between tourism and economic growth with panel data primarily in two ways. First, a non-parametric methodology is proposed to group countries by considering simultaneously two criteria, tourism and the economic development of the countries over time. Most previous studies have used a single criterion to classify countries. Second, Granger causality is tested in groups of countries with a similar evolution in tourism and economic development over time. Testing Granger causality in these homogeneous groups is more effective for examining the TLGH and suggesting economic policies.

Moreover, the TLGH is not only tested using Granger causality analysis but is also complemented by an estimation of impulse response functions, which show the dynamic relationship between tourism and economic growth.

The remainder of this article is organised as follows. Section 2 presents the literature review. In section 3, the study describes the methodology of dynamic clustering to divide the sample into groups of homogeneous countries, and the econometric analysis applied in the study. Section 4 presents the data and empirical results. Finally, in section 5, the concluding remarks are presented.

2 | LITERATURE REVIEW

The study by Balaguer and Cantavella-Jordá (2002) is recognised as being the seminal paper that formalised the TLGH, offering a theoretical and empirical connection between tourism and economic growth. Since this study, more than 200 papers on the TLGH have been published along with several review papers on this literature, including Ahmad et al. (2020), Brida et al. (2016), Castro-Nuño et al. (2013), Chingarande and Saayman (2018), Comerio and Strozzi (2019), Fonseca and Sánchez-Rivero (2020a, 2020b), Li et al. (2018), Nunkoo et al. (2020), Pablo-Romero and Molina (2013), Seetanah et al. (2017). As the majority of these review papers show, despite the extensive examination of the relationship between tourism and economic growth, the results remain inconclusive. Many of the studies found evidence for the TLGH (Balsalobre-Lorente & Leitao, 2020; Mitra, 2019), but there are also others that found no significant relationship between tourism and economic growth (Brida et al., 2011; Katircioglu, 2009; Ozturk & Acaravci, 2009; Tang, 2011).

These divergences in the conclusions seem to be a consequence of the use of different econometric methodologies, of the variables chosen to measure tourism and income, and also of country-specific factors, such as the weight of tourism in the economy as a whole or the level of economic development. So, for example, Cárdenas-García et al. (2015) and Enilov and Wang (2021) showed that the stage of a country's development is a determining factor in the relationship between tourism and economic development. Pablo-Romero and Molina (2013) and Shahzad et al. (2017) found that the degree of tourism specialisation of the countries analysed is also a decisive factor in the link between tourism and economic growth.

The results of the empirical analysis may also be affected by the indicators used to represent income and tourism (Castro-Nuño et al., 2013; Fonseca and Sánchez-Rivero, 2020a, 2020b; Rosselló-Nadal & He, 2019). Income is usually measured by real GDP in absolute or per capita terms. However, there is less consensus on measuring the level of tourism development. Most studies use an indicator of tourism demand, typically tourism arrivals or tourism receipts, which captures the tourism activity of a destination (Ekeocha et al., 2021; Liu et al., 2021; Mitra, 2019; Tugcu, 2014). A smaller number of studies focus on a related yet distinct indicator: tourism specialisation, commonly defined either as tourism arrivals as a percentage of population, as tourism receipts as a percentage of GDP or as tourism receipts as a percentage of exports (Adamou & Clerides, 2010; De Vita & Kyaw, 2017; Zuo & Huang, 2018). Another difference between TLGH studies relates to whether the relationship between income and tourism is examined using variables in levels (Chou, 2013; Tugcu, 2014) or in growth rates (Dogru & Bulut, 2018; Enilov & Wang, 2021; Mitra, 2019).

As far as the econometric methodology for examining the relationship between tourism and economic growth is concerned, some of the more recent papers focus on panel data analyses.

These include studies using small groups of countries (Dogru & Bulut, 2018; Xia et al., 2022) and studies with a large panel of countries (Mitra, 2019). The majority of papers studying the TLGH with panel data have been conducted using Granger non-causality tests, such as the one proposed by Dumitrescu and Hurlin (2012) (Dogru & Bulut, 2018; Mitra, 2019; Roudi et al., 2019; Tugcu, 2014). An advantage of this test is that it accounts for cross-section dependence and heterogeneity across countries. However, as with other panel causality tests, evidence of causality can be obtained for the pooled sample with only a few countries verifying the relationship. Consequently, when the sample is made up of a large, heterogeneous group of countries, the robustness of policy implications inferred from the findings may decrease. Some papers reduce the heterogeneity of the sample by grouping countries according to criteria that reflect their economic, political and tourism dimension, but each of these classifications depends on a single criterion. Mitra (2019) groups countries according to their tourism intensity (high, medium and low) to evaluate the causality, and Tugcu (2014) groups them according to the continent in which they are located (Europe, Asia or Africa). Antonakakis et al. (2019) make six classifications according to the standard of living, level of development, government effectiveness, political regime, level of tourism specialisation and tourism competitiveness.

The present study contributes to the existing literature on the TLGH with panel data by grouping countries in a more homogeneous way. Since previous literature indicates that the tourism and economic development of countries can affect the relationship between tourism and economic growth, a non-parametric technique was applied to classify countries according to their dynamics in both variables. Therefore, in this paper the classification used two criteria simultaneously, tourism and economic development. Then, Granger causality tests were used to examine the TLGH in these homogeneous groups. In addition, an impulse response analysis was used to estimate the dynamic response of economic growth to innovations in tourism, with the aim of providing robustness and complementing the results of causality tests. The impulse response functions have been used to examine the dynamic interactions between tourism and economic growth in some time series studies (Aratuo et al., 2019; Bassil et al., 2015; Kyara et al., 2021; Sokhanvar et al., 2018), but their use in studies with panel data is limited.

3 | METHODOLOGY

This paper proposes a two-step approach to examining the causal relationship between tourism and economic growth using panel data. In the first stage, a non-parametric methodology is introduced to divide the sample into groups of homogeneous countries according to their dynamics in terms of tourism and economic development. In the second stage, causality is tested by applying the Dumitrescu and Hurlin (2012) procedure to each of the groups obtained, as well as to the entire sample. In addition, the impulse response analysis is used to estimate the dynamic response of one variable to shocks in the other.

3.1 | Grouping countries according to their dynamic behaviours

The method suggested by Brida et al. (2020) was used to find homogeneous country groups in relation to their dynamic behaviours in tourism and economic performance. The method is based on a hierarchical cluster analysis using a metric that makes it possible to compare the dynamic trajectories of the different countries. This metric was constructed through a process of symbolisation, which involves transforming the original two-dimensional series which defined the dynamic trajectories in tourism (x_t) and economic performance (y_t) of the different countries into a symbolic series identifying the changes in the economic regimes of the countries.

The state space of each period of time was divided into four regions or regimes using the annual averages of tourism (μ_x) and economic performance (μ_y) for all countries. In other words, four regimes were defined to represent each period of time as follows:

$$
\begin{aligned}
R_1 &= \left\{ (x_t, y_t) : x_t \geq \mu_{x_t}, y_t \leq \mu_{y_t} \right\} \\
R_2 &= \left\{ (x_t, y_t) : x_t \geq \mu_{x_t}, y_t \geq \mu_{y_t} \right\} \\
R_3 &= \left\{ (x_t, y_t) : x_t \leq \mu_{x_t}, y_t \geq \mu_{y_t} \right\} \\
R_4 &= \left\{ (x_t, y_t) : x_t \leq \mu_{x_t}, y_t \leq \mu_{y_t} \right\}
\end{aligned}
$$

From these dynamic regime partitions, the dynamics of regime changes could be represented as follows: each country was assigned a symbol, 1, 2, 3 or 4, at each time, depending on the region in which it was located, R_1, R_2, R_3 or R_4, respectively. Then the two-dimensional time series of tourism and economic performance were transformed into the symbolic time series $s = \{s_1, s_2, \ldots, s_T\}$ in such a way that $s_t = j$ if and only if (x_t, y_t) was in the R_j regime. This time series contains all the relevant information about the dynamics of the regimes and symbolic sequences that represent each of the economies, highlighting different types of performance.

The binary distance, which is one of the most used measurements for symbolic time series, was used to measure the distance between each pair of countries. Then, given two countries, i and j, with symbolic sequences $\{s_{it}\}_{t=1}^{t=T}$ and $\{s_{jt}\}_{t=1}^{t=T}$, the distance between them is defined by:

$$
d(s_i, s_j) = \sum_{t=1}^{T} f(s_{it}, s_{jt}), \text{where } f(s_{it}, s_{jt}) = \begin{cases} 0 & if \quad s_{it} = s_{jt} \\ 1 & if \quad s_{it} \neq s_{jt} \end{cases} \text{ with } t = 1, \ldots, T
$$

In other words, each of the T adding terms was 0 where countries i and j were in the same regime at that time, or 1 where they were not in the same regime. Thus, we obtained a distance that took a value of 0 where both countries were in the same regimes throughout the entire period and a maximum value of T where they were not in the same regime at any time during the period considered.

The Hierarchical Tree (HT) cluster technique was used with the distance obtained before to classify the countries in the study. The nearest-neighbour single-linkage cluster algorithm as described in Mantegna (1999) and Mantegna and Stanley (2000) was used to build this tree (see Brida et al., 2020 for a detailed description of the construction of the HT).

3.2 | Econometric analysis

Both the Granger (1969) causality tests and the impulse response analysis were used to learn about the dynamic relationships between tourism and economic growth. Granger causality refers to the usefulness of one variable in predicting another. Therefore, it is useful for establishing a temporal order of the movements of the variables, but it should not be interpreted as a cause-and-effect relationship between two variables. Impulse response functions were used to find out the response of one variable to shocks in another variable.

Granger causality test: The Granger causality was analysed using the Dumitrescu and Hurlin (2012) causality test for panel data models. This test considers two stationary series and the following linear panel regression model:

$$y_{it} = \alpha_i + \sum_{j=1}^{p} \gamma_i^{(j)} y_{i,t-j} + \sum_{j=1}^{p} \beta_i^{(j)} x_{i,t-j} + \varepsilon_{yit} \tag{1}$$

$$x_{it} = \delta_i + \sum_{j=1}^{p} \theta_i^{(j)} x_{i,t-j} + \sum_{j=1}^{p} \lambda_i^{(j)} y_{i,t-j} + \varepsilon_{xit} \tag{2}$$

where index i refers to the country ($i = 1, \ldots, N$), t to the time period ($t = 1, \ldots, T$), y is economic growth and x is tourism growth. Dumitrescu and Hurlin (2012) suppose that lag orders, p, are identical for all cross-section units of the panel and the panel is balanced. They allow the regression coefficients may differ across cross-sectional units but are constant over time. The individual effects α_i and δ_i are also time-invariant.

They consider the null hypothesis of homogeneous non-causality against the alternative hypothesis of heterogeneous non-causality. For example, in order to test whether x Granger causes y, the null hypothesis is no causality for any of the countries in the panel (H_0: $\beta_i = 0$ $(i = 1, \ldots, N)$). Under the alternative, where the regression model could be different across different countries, there is at least one subgroup for which there is causality, (H_0: $\beta_i = 0$ $\left(i = 1, \ldots, N_1\right)$; $\beta_i \neq 0$ $\left(i = N_{1+1}, N_{1+2}, \ldots, N\right)$). However, the procedure does not provide any guidance with respect to the number or the identity of the particular countries for which the null of non-causality is rejected. Despite this drawback, this test has the advantage of supporting two dimensions of cross-country heterogeneity: the heterogeneity of the regression model and the heterogeneity of the causal relationship between tourism and economic growth. In addition, another advantage is that it makes it possible to account for cross-sectional dependence by proposing a block bootstrap procedure to correct the empirical critical values. It is important to take this dependency into account, as ignoring it can lead to substantial bias and size distortions (Pesaran, 2006).

Dumitrescu and Hurlin (2012) test is based on the cross-sectional average of individual Wald statistics associated with standard Granger (1969) causality tests. They propose two standardised average Wald statistics to test the null hypothesis: $Z_{N,T}^{HNC}$ and $\tilde{Z}_{N}^{HNC}$. The first statistic, $Z_{N,T}^{HNC}$, can be considered in macro panels with large cross-section dimension (N) and temporal dimension (T) samples. However, the second statistic $\tilde{Z}_{N}^{HNC}$ should be favoured for small T samples. Using Monte-Carlo methods, Dumitrescu and Hurlin (2012) showed that the standardised panel statistics have very good small sample properties, even in the presence of cross-sectional dependence.

Impulse response functions: A bivariate panel vector autoregressive (PVAR) model was considered to estimate the impulse response functions. Since the PVAR model treats all variables as endogenous, this framework is suitable for allowing a bidirectional relationship between tourism and economic growth. The PVAR model used in this study is specified as follows:

$$Y_{it} = \mu_i + \sum_{j=1}^{p} A_j Y_{i,t-j} + \varepsilon_{it} \tag{3}$$

where index i refers to the country ($i = 1, \ldots, N$), t to the time period ($t = 1, \ldots, T$), and Y_{it} is a vector of two dependent variables, tourism and economic growth. A_j is the matrix of coefficients to be estimated. The disturbances ε_{it}, are independently and identically distributed for all i and t with $E\left[\varepsilon_{it}\right] = 0$ and $Var\left[\varepsilon_{it}\right] = \Sigma_\varepsilon$. Σ_ε is a positive semidefinite matrix. μ_i captures individual heterogeneity or fixed effects between different countries.

Since the fixed effects μ_i are correlated with the regressors due to lags of the dependent variables, the forward orthogonal transformation proposed by Arellano and Bover (1995) was applied to remove the fixed effect. Then, lagged regressors can be used as instruments and the coefficients were estimated by applying the generalised method of moments (GMM) (Canova & Ciccarelli, 2013; Love & Zicchino, 2006).

Impulse response functions were generated using Cholesky decomposition, which involves rewriting the PVAR in terms of orthogonal shocks with an identity covariance matrix. Thus, shocks only occur in one variable at a time, and, since the variance of the error terms are equal to one, a unit shock is just an innovation of size one standard deviation. These orthogonalised impulse responses depend on the order of the variables in the PVAR, with the first variable being the one that can have an immediate impact on the others (Lütkepohl, 2007). Therefore, it is important to determine the order of the variables in the system. Given that tourism makes a direct contribution to a destination's GDP, we expect that changes in international tourism may have contemporaneous effects on economic growth, but that changes in a country's growth rate have delayed effects on international tourism. We are aware that the higher the economic growth, the stronger an economy is and the more opportunities there are to create a stable economic environment with better infrastructure that can attract more tourists. However, these effects cannot be observed contemporaneously. Consequently, in this study, international tourism was ordered first in the PVAR model.

4 | DATA AND EMPIRICAL APPROACH

4.1 | Data

The empirical analysis proposed in this article requires a large and very diverse set of countries, and hence, annual data on tourism and economic development from 144 countries over the period 1995–2019 were used. The time period was selected to maximise the number of countries from all geographic regions that could participate in the study. The complete list of countries included can be found in the Table in Appendix 1.

The data set includes real GDP per capita (at constant 2010 U.S. dollars) to measure economic development (GDPPC), which is the variable commonly used in the literature. To measure the tourism, two indicators were used, the number of international tourist arrivals (in thousands of people) to measure tourism activity (TA) and international tourist arrivals as a percentage of population to define the tourism specialisation (TS). Tourism specialisation, capturing the tourism intensity of a destination, is not the same as tourism activity, which is determined by the volume of tourists at the destination. There are countries with a high degree of tourism specialisation but low tourism demand in absolute terms, such as the small islands in the Caribbean, for example Antigua and Barbuda, Dominica or St Lucia. By contrast, there are countries with high tourist demand but where the importance of tourism in their economy is low, such as the United States.

Data on real GDP per capita and population were obtained from the World Development Indicators database. Data on international tourist arrivals were obtained from the World Tourism Organisation (UNWTO) and refer to overnight visitors. This study used the levels of income

(GDPPC) and tourism (TA and TS) in the cluster analysis, but their growth rates in the causality analysis, as many of the underlying arguments from the TLGH concern effects on economic growth rates. Economic growth was measured by the growth rate of real GDP per capita (GDPPCG) and tourism growth by two variables: the growth rate of tourist arrivals (TAG) and the growth rate of tourist arrivals per capita (TSG). Growth rates were calculated as the difference of logarithms. Descriptive statistics of each variable are presented in Table 1.

4.2 | Grouping homogeneous countries

Two cluster analyses were carried out to classify the 144 countries according to their dynamics in tourism and income. In both analyses, GDPPC was used for measuring income, but in the first classification, tourism was measured by tourism activity (TA) and, in the second, by tourism specialisation (TS). Four main groups were obtained in both cluster analyses using the Pseudo-F (Calinski & Harabasz, 1974) and Pseudo-t^2 (Duda & Hart, 1973) methodologies. The countries belonging to each group are shown in Figure 1 for the analysis made with the TA variable, and in Figure 2 for the one made with the TS variable. The country clusters can also be found in the Table in the Appendix 1.

For the two cluster analyses, each group represents a regime. Regardless of which tourism variable is used, cluster 1 represents regime 1, which is characterised by high levels of tourism but low GDPPC. Cluster 2 represents the second regime, which is characterised by a high level of tourism and a high GDPPC. Cluster 3 is characterised by a high GDPPC but a low level of tourism. Finally, cluster 4 represents countries characterised by a low level of tourism and low GDPPC. Figure 3 shows the temporal evolution of the averages of the real GDP per capita and international tourist arrivals for each group in the first cluster analysis, and Figure 4 the temporal evolution of the averages of the real GDP per capita and international tourist arrivals per capita for the groups in the second cluster analysis. It should be noted that, although there was an increasing trend in tourism for all groups, this trend was more pronounced in groups with a high tourism activity (cluster 1 and cluster 2). Something similar happened in terms of real GDP per capita, there was also an increasing trend in all groups, being more pronounced in the groups with a high GDPPC (cluster 2 and cluster 3).

It is important to highlight that the countries in cluster i ($i = 1,2,3,4$) in the first classification were different from the countries in cluster i ($i = 1,2,3,4$) in the second classification, showing that the tourism indicator used in the analysis has had consequences on the results obtained.

TABLE 1 Descriptive statistics.

	Mean	Median	Maximum	Minimum	Std. deviation	Observations
GDPPC	13,997.41	5203.3	181,709.3	226.08	20,633.57	3600
TA	5765.15	1274.5	90,914	0.9	11,973.03	3600
TS	0.84155	0.26346	29.27808	0.00056	2.11063	3600
GDPPCG	0.02252	0.02337	0.65338	−0.45503	0.040876	3456
TAG	0.05754	0.04915	3.96734	−1.97537	0.19399	3456
TSG	0.04507	0.03831	3.96891	−2.00093	0.19418	3456

Abbreviations: GDPPC, real GDP per capita; GDPPCG, growth rate of real GDP per capita; TA, international tourist arrivals; TAG, growth rate of international tourist arrivals; TS, international tourist arrivals per capita; TSG, growth rate of per capita international tourist arrivals.

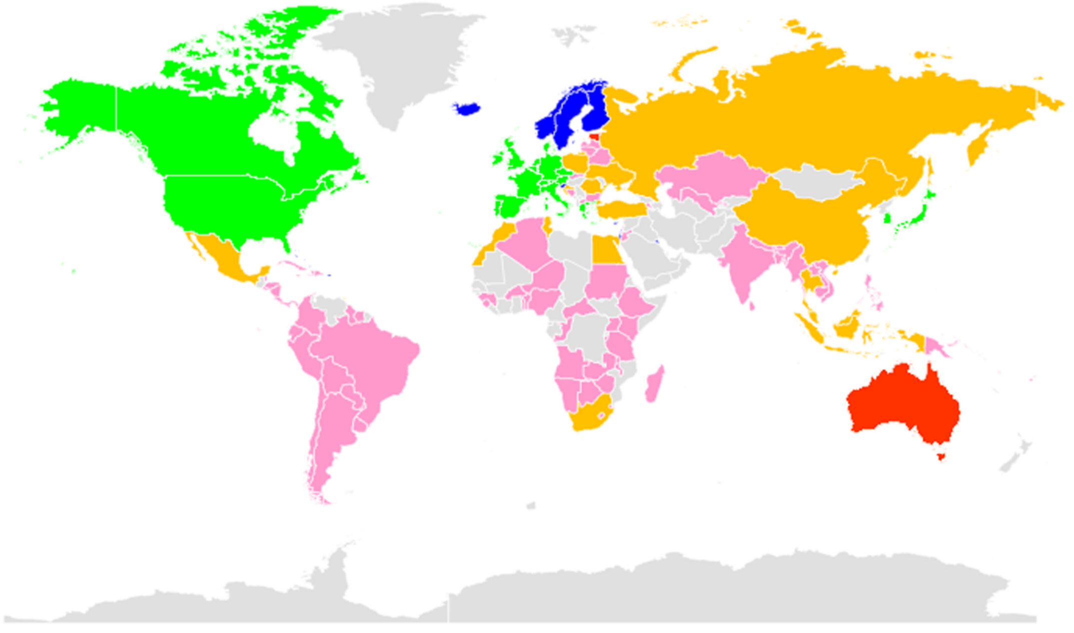


FIGURE 1 First classification: Geographical distribution of the countries. Cluster 1 is coloured orange, Cluster 2 green, Cluster 3 blue and Cluster 4 pink. [Colour figure can be viewed at wileyonlinelibrary.com]

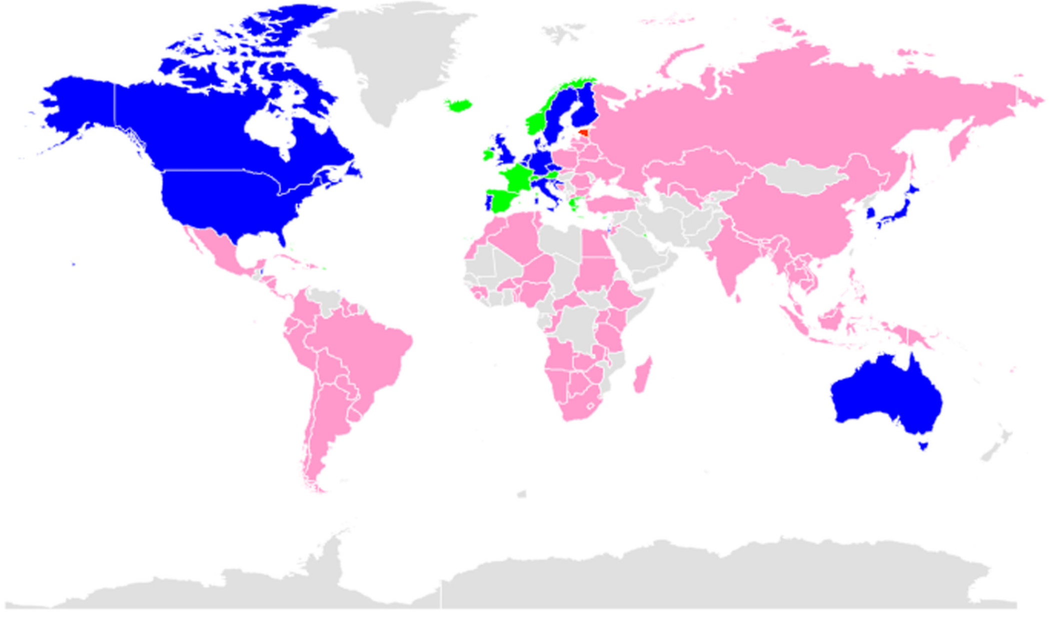
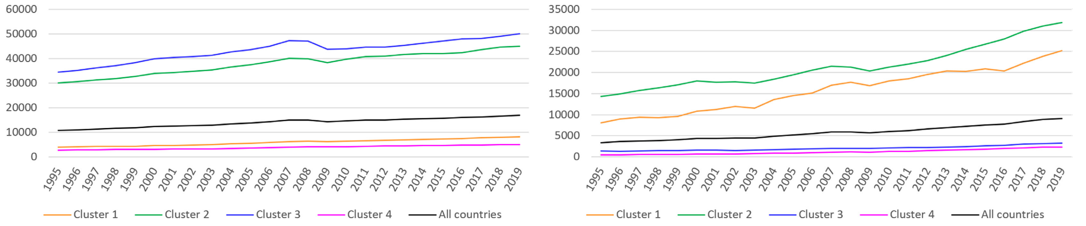


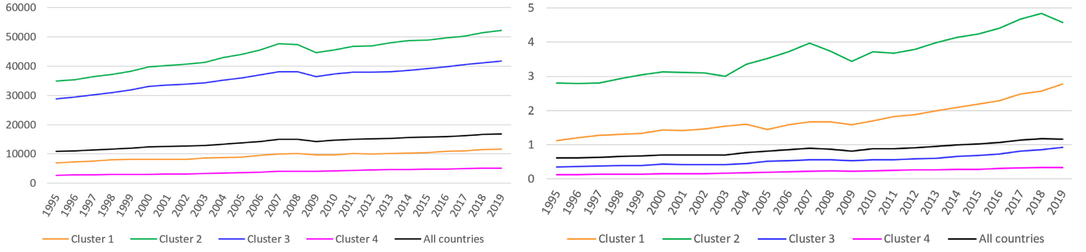
FIGURE 2 Second classification: Geographical distribution of the countries. Cluster 1 is coloured orange, Cluster 2 green, Cluster 3 blue and Cluster 4 pink. [Colour figure can be viewed at wileyonlinelibrary.com]

Note that each indicator measures tourism differently as explained in the data section. However, the 38 countries in clusters 2 and 3 in the first classification also belong to clusters 2 and 3 in the second classification. Both clusters include countries characterised by high GDPPC. The difference between the countries in each classification was their levels of tourism activity or tourism



(a) Per capita GDP mean (b) International tourists mean

FIGURE 3 First classification: Evolution of average real GDP per capita and average international tourist arrivals. [Colour figure can be viewed at wileyonlinelibrary.com]



(a) Per capita GDP mean (b) Int. tourists per inhabitant mean

FIGURE 4 Second classification: Evolution of average real GDP per capita and average international tourist arrivals per inhabitant. [Colour figure can be viewed at wileyonlinelibrary.com]

specialisation. There were countries with a high level of tourism activity and also a high tourism specialisation, such as Austria, Bahrain, Switzerland, Spain, France, Greece, Ireland, Macau and Singapore. They are, therefore, in cluster 2 in both classifications. Other countries received a high number of tourists, but did not specialise in tourism, such as Belgium, Canada, Czech Republic, Germany, Denmark, the UK, Italy, Japan, Korea, the Netherlands, Portugal and the USA. These are found in cluster 2 in the first classification and cluster 3 in the second. Finally there were countries that specialised in tourism, but had few tourist arrivals, such as Aruba, Bahamas, Barbados, Cyprus, Iceland, Saint Kitts and Nevis, Kuwait, Luxembourg, Monaco, Malta, Norway and Puerto Rico, which are, therefore, in cluster 3 in the first classification and cluster 2 in the second classification.

Clusters 1 and 4 grouped the countries with low GDPPC in both classifications, with the difference between both being their different levels of tourism activity and tourism specialisation. There were countries that did not have a high number of tourists in absolute terms, but this number was high in per capita terms, such as Dominica, Grenade, Saint Lucia, Maldives and Seychelles. They are in cluster 4 in the first classification and cluster 1 in the second classification. All of them are very small countries where tourism has a dominant role in their economy. There were also countries that received a lot of tourists but had a low number of tourists per capita, such as China, Egypt, Indonesia, Morocco, Mexico, Malaysia, Poland, Romania, Russia, Thailand, Tunisia, Turkey, Ukraine and South Africa. These countries are classified in cluster 1 in the first classification and cluster 4 in the second classification. The only country with high tourism regardless of the indicator considered was Croatia. Finally, most of the countries had a low level as far as both indicators of tourism are concerned. Thus, cluster 4 in both classifications is the most numerous.

The classifications obtained grouped the countries by comparing their dynamics in terms on tourism and economic development. This involved a more homogeneous classification than using a single criterion. In addition, the results obtained provided evidence of the fact that the tourism indicator used in the analysis has consequences on the groups obtained because the countries with the highest demand for tourism are not always those with the highest specialisation in tourism.

4.3 | Testing TLGH

The relationship between tourism growth and economic growth (GDPPCG) was analysed for each of the groups of countries resulting from the two clustering analyses performed and also for the full sample of countries. As mentioned above, tourism growth is measured by two variables: the growth rate of tourist arrivals (TAG) and the growth rate of tourist arrivals per capita (TSG). Consequently, subsequent analyses were performed separately for each of the tourism indicators and for each of the groups of countries considered.

The analysis started by examining the existence of cross-sectional dependence across the countries using the CD test proposed by Pesaran (2021).[1] To do this, individual ADF regressions were estimated for 1 and 2 lags and pairwise cross-section correlation coefficients of the residuals were calculated from these regressions. The results presented in Table 2 indicate that the CD test is statistically significant for GDPPCG and TAG for the clusters resulting from the first classification and for the sample as a whole. The null hypothesis of no cross-sectional dependence was rejected at 1% level of significance, and consequently, a shock occurring in one country may be transmitted to other countries in the panel data set. This result is robust for the number of lags included in the ADF regressions. Table 2 also shows the same results for GDPPCG and TSG for the clusters resulting from the second classification, except for cluster 1, which was made up only by six countries, where the null hypothesis was not rejected for TSG.

Before testing causality, the stationarity of the variables was examined using the cross-sectionally augmented IPS (CIPS) test proposed by Pesaran (2007). This second-generation unit root test allows cross-sectional dependence and heterogeneity in the autoregressive coefficients of the Augmented Dickey-Fuller (ADF) regressions.[2] Table 3 shows the CIPS test statistics for the clusters resulting from the first and second classifications and for the whole sample. Results are presented for models with 1 and 2 lags. Since growth rates were considered, the most appropriate specification only included a constant. Table 3 shows that the null hypothesis of unit root can be rejected in all cases. Therefore, all variables were stationary.

In order to test Granger causality, the two standardised statistics: $Z_{N,T}^{HNC}$ and $\tilde{Z}_{N}^{HNC}$ proposed in Dumitrescu and Hurlin (2012) were calculated, considering panel data models with 1 and 2 lags. For the present study, due to T being relatively small, $\tilde{Z}_{N}^{HNC}$ will be more suitable. Tables 4 and 5 and report the results of causality tests between tourism activity and economic growth and between tourism specialisation and economic growth, respectively. To deal with the cross-sectional

[1]This test is based upon an average of all pair-wise correlations of the ordinary least squares (OLS) residuals from the individual regressions in the panel data model, and it is asymptotically distributed as standard normal and efficient even in panels with small sample sizes.

[2]First-generation unit root tests do not allow for dependency across countries. Pesaran (2007) shows that these tests tend to over reject the null hypothesis if the degree of cross-section dependence is sufficiently large.

TABLE 2 Cross-sectional dependence tests.

		First classification			Second classification		
	Lags	TAG	GDPPCG	N	TSG	GDPPCG	N
Cluster 1	1	6.008***	14.003***	15	0.985	2.945***	6
	2	5.407***	16.563***	15	0.913	2.125**	6
Cluster 2	1	14.800***	34.793***	21	12.840***	22.323***	21
	2	13.924***	36.054***	21	12.546***	22.014***	21
Cluster 3	1	8.226***	19.753***	16	12.379***	33.062***	17
	2	8.095***	18.725***	16	11.379***	33.461***	17
Cluster 4	1	12.124***	28.032***	88	14.486***	38.111***	96
	2	11.254***	28.497***	88	13.365***	40.622***	96
All countries	1	34.186***	83.149***	144	33.761***	83.149***	144
	2	32.99***	86.706***	144	32.552***	86.706***	144

Note: The table reports the statistics obtained from the Pesaran (2021) CD tests. The tests were performed in R using the command pcdtest.

Abbreviations: GDPPCG, growth rate of real GDP per capita; TAG, growth rate of international tourist arrivals; TSG, growth rate of international tourist arrivals per capita.

*, **, ***Denote rejection of the null hypothesis at 1%, 5% and 10% level, respectively.

TABLE 3 Panel unit root test.

		First classification			Second classification		
	Lags	TAG	GDPPCG	*N*	TSG	GDPPCG	*N*
Cluster 1	1	−3.533***	−2.643***	15	−4.692***	−4.315***	6
	2	−3.066***	−3.729***	15	−4.692***	−4.315***	6
Cluster 2	1	−2.871***	−2.537***	21	−2.841***	−2.981***	21
	2	−2.170*	−2.339**	21	−2.170*	−2.399***	21
Cluster 3	1	−3.112***	−3.221***	16	−3.229***	−2.566***	17
	2	−2.263**	−2.287**	16	−2.307**	−2.314**	17
Cluster 4	1	−3.110***	−2.801***	88	−3.129***	−2.789***	96
	2	−2.422***	−2.179**	88	−2.441***	−2.446***	96
All countries	1	−3.052***	−2.628***	144	−3.0215***	−2.628***	144
	2	−2.264***	−2.294***	144	−2.249***	−2.294***	144

Note: The table reports the statistics obtained from the Pesaran (2007) CIPS panel unit root tests. All statistics are based on univariate $AR(p)$ specifications with $p = 1, 2$ including an intercept term. The tests were performed in R using the command cipstest.

Abbreviations: GDPPCG, growth rate of real GDP per capita; TAG, growth rate of international tourist arrivals, TSG, growth rate of international tourist arrivals per capita.

*, **, ***Denote rejection of the null hypothesis at 1%, 5% and 10% level, respectively.

dependence, the critical values based on a bootstrap procedure were calculated, and the *p*-values corrected for cross-sectional dependence are shown. The results indicate that the null hypothesis of no causality running from economic growth to tourism growth cannot be rejected for any

TABLE 4 Panel Granger causality tests. Tourism activity growth and economic growth.

	Lags	H_0: $TAG \neq > GDPPCG$		H_0: $GDPPCG \neq > TAG$	
		$Z_{N,T}^{HNC}$	$\tilde{Z}_N^{HNC}$	$Z_{N,T}^{HNC}$	$\tilde{Z}_N^{HNC}$
Cluster 1	1	−0.754 (0.544)	−0.874 (0.405)	0.189 (0.864)	−0.096 (0.935)
	2	−0.516 (0.700)	−0.796 (0.460)	0.911 (0.496)	0.304 (0.782)
Cluster 2	1	2132 (0.141)	1.463 (0.184)	−0.502 (0.715)	−0.712 (0.563)
	2	1.892 (0.225)	0.989 (0.385)	1.989 (0.211)	1.063 (0.368)
Cluster 3	1	0.379 (0.759)	0.054 (0.952)	1.854 (0.159)	1.271 (0.220)
	2	2.159 (0.131)	1.255 (0.214)	0.988 (0.491)	0.351 (0.773)
Cluster 4	1	5.429 (0.006)	3.875 (0.006)	1718 (0.334)	0.811 (0.490)
	2	5.610 (0.008)	3.364 (0.008)	1.989 (0.390)	0.569 (0.609)
All countries	1	4.999 (0.017)	3.351 (0.017)	1.881 (0.363)	0.775 (0.537)
	2	5.849 (0.016)	3.278 (0.016)	2.982 (0.289)	1.067 (0.437)

Note: The table reports statistics $Z_{N,T}^{HNC}$ y $\tilde{Z}_N^{HNC}$ obtained from Dumitrescu and Hurlin (2012) panel Granger causality test. Numbers in parentheses are *p*-values computed using 1000 bootstrap replications. The tests were performed in STATA using the command xtgcause.

Abbreviations: GDPPCG, growth rate of real GDP per capita; TAG, growth rate of international tourist arrivals.

group of countries. However, causality running from tourism growth to economic growth varied across the different clusters. Regardless of the tourism indicator used, the results indicated unidirectional causality from tourism to economic growth for the entire sample of countries. Consequently, we found evidence in favour of the TLGH using pooling data from a large sample of countries around the world. This was a general result that only indicated what happened in the pool case. However, it did not allow us to identify for which kind of countries the TLGH was actually verified.

When causality was tested for the clusters of homogeneous countries, the results showed that the null hypothesis of no causality from tourism to economic growth was clearly rejected for the cluster 4 for both classifications. This cluster includes countries with the lowest income level and the least tourism development. As far as the rest of the clusters as concerned, the null hypothesis of no causality from tourism to economic growth cannot be rejected when tourism activity was used to measure tourism. However, considering the tourism specialisation, the null hypothesis can be rejected at the 5% level for the cluster 2 for $p = 2$. The result changed when Puerto Rico was excluded from cluster 2 ($Z_{N,T}^{HNC} = 1.483$ and $\tilde{Z}_N^{HNC} = 0.684$ with *p*-values equal to .292 and .500, respectively). Puerto Rico is the country in cluster 2 with the lowest specialisation in tourism in 2019, with an income considerably below the average for cluster 2. Therefore, unidirectional causality from tourism to economic growth for low-income countries with low-tourism development was confirmed, whichever tourism indicator is used. For the rest of the clusters, regardless of the tourism indicator, there is no causality either from tourism to the economy or the reverse.

The impulse response analysis was used to find out the dynamic cause-and-effect relationship between tourism and economic growth. Following Sigmund and Ferstl (2021), a PVAR (Adamou & Clerides, 2010) model was estimated and the orthogonal impulse response functions were

TABLE 5 Panel Granger causality tests. Tourism specialisation growth and economic growth.

		$H_0: TSG \neq > GDPPCG$		$H_0: GDPPCG \neq > TSG$	
	Lags	$Z_{N,T}^{HNC}$	$\tilde{Z}_N^{HNC}$	$Z_{N,T}^{HNC}$	$\tilde{Z}_N^{HNC}$
Cluster 1	1	−0.009 (0.998)	−0.152 (0.905)	−0.727 (0.507)	−0.759 (0.428)
	2	−0.628 (0.594)	−0.737 (0.458)	0.8596 (0.485)	0.411 (0.696)
Cluster 2	1	0.852 (0.495)	0.407 (0.723)	0.305 (0811)	−0.046 (0.966)
	2	3.194 (0.047)	1.993 (0.052)	2.105 (0.196)	1.153 (0.318)
Cluster 3	1	3.134 (0.063)	2.320 (0.063)	0.667 (0.615)	0.283 (0.811)
	2	1.939 (0.213)	1.072 (0.356)	0.374 (0.804)	−0.136 (0.918)
Cluster 4	1	5.094 (0.009)	3.572 (0.009)	1.958 (0.281)	0.981 (0.398)
	2	5.268 (0.014)	3.057 (0.014)	2.146 (0.383)	0.648 (0.573)
All countries	1	5.421 (0.016)	3.699 (0.016)	1.906 (0.360)	0.796 (0.523)
	2	6.045(0.014))	3.429 (0.014)	2.921 (0.300)	1.019 (0.458)

Note: The table reports statistics $Z_{N,T}^{HNC}$ y $\tilde{Z}_N^{HNC}$ obtained from Dumitrescu and Hurlin (2012) panel Granger causality test. Numbers in parentheses are *p*-values computed using 1000 bootstrap replications. The tests were performed in STATA using the command xtgcause.

Abbreviations: GDPPCG, growth rate of real GDP per capita; TSG, growth rate of international tourist arrivals per capita.

calculated.[3] Only in cluster 4 did a positive shock of tourism growth produce a significantly positive impact on economic growth, regardless of the tourism indicator used. Figures 5 and 6 display the impulse response functions together with their corresponding 95% confidence bands for cluster 4. Confidence bands were calculated using the cross-sectional bootstrap method proposed in Kapetanios (2008) with 1000 draws.[4] All graphs show responses for the first 8 years with the periods on the horizontal axis. The results show that a positive shock of tourism growth produces a significantly positive impact on economic growth. The magnitudes and significance levels of the effects do not differ between both indicators. These positive effects will gradually diminish and become practically equal to zero after 4 or 5 years. However, the figures show that a shock to economic growth does not have a significant effect on tourism growth. This result is in line with the Granger causality analysis, which did not find evidence for causality from economic growth to tourism growth regardless of the tourism indicator used. For the rest of the clusters, economic growth did not react to a shock to tourism for either of the two tourism indicators used. Similarly, there was also no response of tourism growth to a shock in economic growth. In this paper, only the results for cluster 4 have been presented for reasons of simplicity, but they are available upon request.

The impulse response results were consistent with the findings from the Granger causality test and validated the TLGH by detecting a positive response in economic growth to increase in tourism growth only in countries with low-tourism and low-economic development. Thus, depending on the economic and tourism development of a destination, the implications for economic policy are different.

[3]The VAR model with one lag was selected, over models with two, three and four lags using the model selection procedure of Andrews and Lu (2001). The stability of this VAR model was also tested. The results are available upon request.

[4]This bootstrap procedure uses cross-sectional resampling with replacement. For a matrix Z, cross-sectional resampling consists of constructing matrix Z* whose columns are a random resample with replacement of blocks of the columns of Z, where the number of columns of Z* and Z can be different.

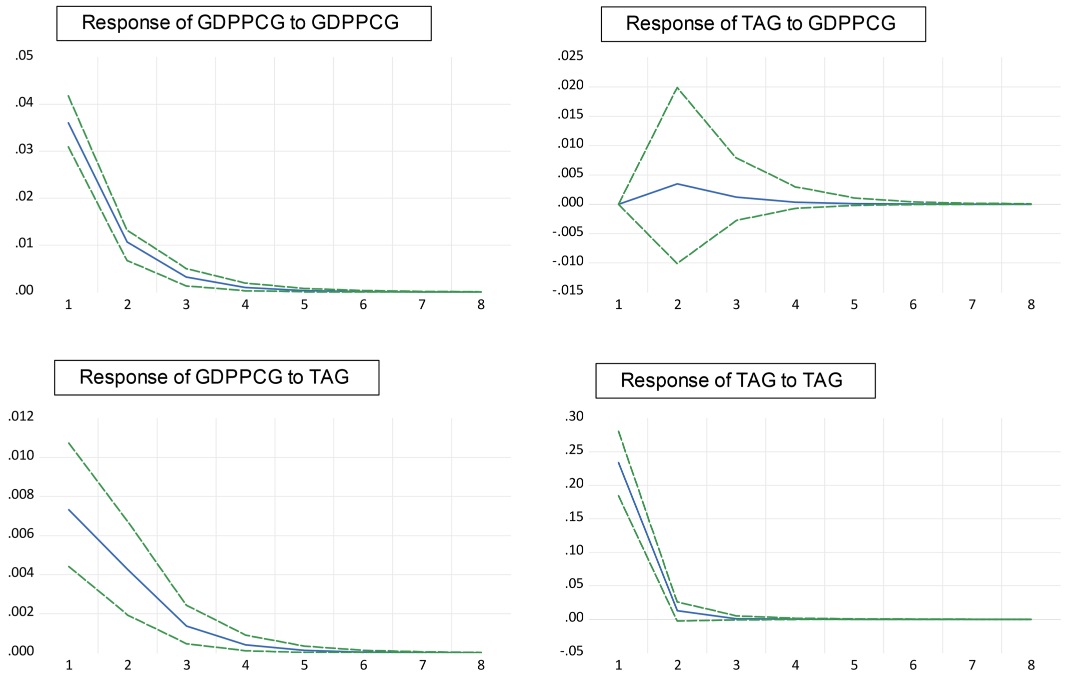


FIGURE 5 Impulse response functions for Cluster 4. Tourism activity growth and economic growth. The solid line represents the estimated impulse response function, and the dotted lines show 95% confidence intervals. The impulse response functions and 95% confidence intervals were calculated in R using the package panelvar. [Colour figure can be viewed at wileyonlinelibrary.com]

In the literature, there is a significant number of studies that find evidence in favour of the TLGH in countries with a lower income level (Cárdenas-García et al., 2015; Enilov & Wang, 2021; Eugenio-Martin et al., 2004; Lee & Chang, 2008; Seetanah, 2011). As far as the degree of tourism development in the countries is concerned, the existing literature shows more divergent results. Some studies consider that the greater the tourism specialisation of a country, the greater the effect that tourism growth has on economic growth (Narayan et al., 2010; Sequeira & Nunes, 2008). However, Chang et al. (2012) show that there is a higher impact of tourism on economic growth in countries with low-tourism specialisation. Adamou and Clerides (2010) and De Vita and Kyaw (2017) explained this result by the existence of diminishing returns of tourism specialisation on economic growth. They found that tourism specialisation is associated with higher rates of economic growth at relatively low levels of specialisation, which is in line with the results obtained in this paper. In this study, we have found that the positive impact of tourism on economic growth only occurs in countries that have both low-tourism and low-economic development. In fact, in the group of low income but high tourism countries, no evidence is found in favour of TLGH.

Finally, it should be noted that the results of the Granger panel causality tests for the full sample were not verified for all clusters. These results should be interpreted with caution because the panel data set consists of heterogeneous countries. The Granger causality analysis applied to homogeneous groups only showed evidence in favour of the TLGH for countries with low-tourism and economic development. Therefore, a more accurate result was obtained by reducing the heterogeneity of the sample.

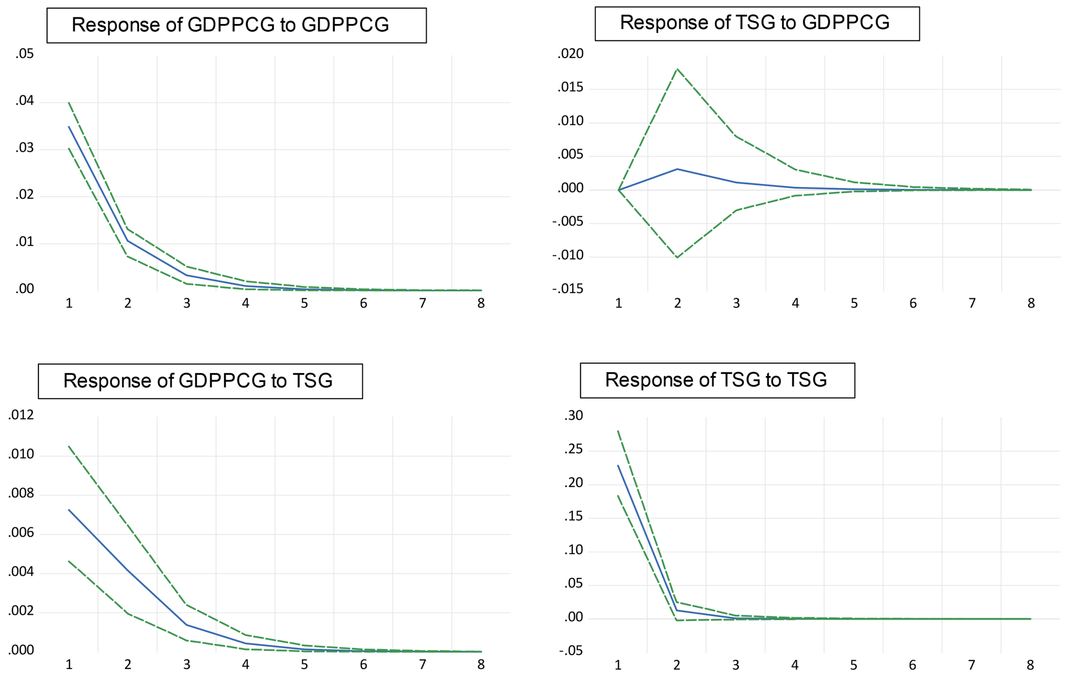


FIGURE 6 Impulse response functions for Cluster 4. Tourism specialisation growth and economic growth. The solid line represents the estimated impulse response function, and the dotted lines show 95% confidence intervals. The impulse response functions and 95% confidence intervals were calculated in R using the package panelvar. [Colour figure can be viewed at wileyonlinelibrary.com]

5 | CONCLUDING REMARKS

This paper has analysed the link between tourism and economic growth by splitting the whole sample of countries into homogeneous groups based on their tourism and economic development. To carry out this objective, a two-step methodology was applied to a sample of 144 countries over the period 1995–2019. First, the countries were grouped into clusters according to their similarity over the sample period in tourism and economic development. Both characteristics were taken into account jointly to classify the countries. Second, the TLGH was tested for each cluster obtained.

Two analyses were carried out: one considered economic development and tourism activity and the other looked at economic development and tourism specialisation. In order to classify the countries, both analyses were carried out using a hierarchical cluster technique with a distance measure constructed through a process of symbolisation, which compared the dynamic trajectories of the different countries. In both cases four main clusters were obtained. Cluster 1 was made up of countries with high tourism development and low economic development, cluster 2 had high levels in both indicators, cluster 3 had high economic development but low tourism and, finally, cluster 4 had low levels in both variables. The conformation of the clusters differed according to the tourism indicator used.

In a second step, TLGH was tested for all clusters obtained. Granger causality analysis showed that there were significant differences between clusters. The causality from tourism to economic growth was only verified for the cluster 4 in both classifications. No causal relationship between tourism and economic growth was found for the other clusters. The results also showed that causality seems to be tested more effectively in clusters of homogeneous countries than using the whole sample of countries. When causality was tested for the entire sample unidirectional causality from tourism to economic growth was also found. This result based on a panel data set made up of a large number of countries with very different characteristics could be misleading. Testing causality for the clusters obtained, the unidirectional causality was only verified for the countries with a low level of income and also low-tourism development.

The impulse response functions were estimated so as to find out the dynamic relationship between tourism and economic growth. The results were consistent with the Granger causality analysis, showing that a shock in tourism growth has a significant and positive impact on economic growth only in cluster 4. Therefore, both Granger causality and impulse response analyses show evidence in favour of the TLGH in countries with a low level of income and also low-tourism development. This conclusion is the same regardless of whether tourism development is measured using a tourism activity indicator or a tourism specialisation indicator.

This paper shows that the link between tourism and economic growth is influenced by both the economic and tourism development of the destination. The TLGH was validated in countries with a low-income level and low-tourism development. Despite increasing digitalisation, the tourism sector remains a labour intensive industry. Therefore, those countries with abundant cheap labour have comparative advantages over the developed countries and can benefit from the expansion of international tourism. Tourism revenues increase the incomes of workers in the sector, stimulate the creation of new jobs, either within the sector or in other sectors of the economy and foster economic growth. However, the effect on economic growth is limited by the level of tourism development in the countries. Investing in the tourism sector could be a way out of poverty and generate development and prosperity, but only in countries that are in the early stages of tourism development.

Considering that the tourism development of a destination evolves over time, a limitation of this study is to assume a stable relationship between tourism and economic growth. Modelling this relationship in a time-varying framework in order to account for potential structural changes may be a possible direction for future studies. Since the tourism development of a destination does not follow a linear evolution, it would be interesting to examine whether during periods of faster tourism development, the tourism-growth relationship is stronger than during periods of slower tourism development. If the nexus between tourism and economic growth varies over time, different economic policy measures could be adopted depending on the stage of tourism development of countries.

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DATA AVAILABILITY STATEMENT

The data sources cited in section 4.1 are open access. Data are also available upon request.

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APPENDIX 1

Cluster	Countries: Tourism and real GDP per capita	Countries: Tourism per inhabitant and real GDP per capita
1	China, Egypt, Croatia, Indonesia, Morocco, Mexico, Malaysia, Poland, Romania, Russia, Thailand, Tunisia, Turkey, Ukraine and South Africa	Dominica, Grenade, Croatia, Saint Lucia, Maldives and Seychelles
2	Austria, Belgium, Bahrain, Canada, Switzerland, Czech Republic, Germany, Denmark, Spain, France, United Kingdom, Greece, Ireland, Italy, Japan, South Korea, Macau, Netherlands, Portugal, Singapore and United States	Aruba, Austria, Bahrain, Bahamas, Barbados, Switzerland, Cyprus, Spain, France, Greece, Ireland, Iceland, Saint Kitts and Nevis, Kuwait, Luxembourg, Macau, Monaco, Malta, Norway, Puerto Rico and Singapore
3	Aruba, Bahamas, Barbados, Cyprus, Finland, Iceland, Israel, Saint Kitts and Nevis, Kuwait, Luxembourg, Monaco, Malta, Norway, Puerto Rico, Slovenia and Sweden	Australia, Belgium, Canada, Czech Republic, Germany, Denmark, Finland, United Kingdom, Israel, Italy, Japan, South Korea, Netherlands, Portugal, Slovenia, Sweden and United States
4	Angola, Argentina, Armenia, Burundi, Benin, Burkina Faso, Bangladesh, Bulgaria, Bosnia and Herzegovina, Belarus, Belize, Bolivia, Brazil, Bhutan, Botswana, Central African Republic, Chile, Republic of the Congo, Colombia, Comoros, Cape Verde, Costa Rica, Cuba, Dominica, Dominican Republic, Algeria, Ecuador, Ethiopia, Fiji, Federated States of Micronesia, Guinea, Gambia, Grenade, Guyana, Honduras, Haiti, India, Jamaica, Jordan, Kazakhstan, Kenya, Cambodia, Kiribati, Laos, Lebanon, Saint Lucia, Sri Lanka, Lesotho, Lithuania, Latvia, Madagascar, Maldives, Marshall Islands, North Macedonia, Myanmar, Mauritius, Malawi, Namibia, Niger, Nigeria, Nicaragua, Nepal, Panama, Peru, Philippines, Papua New Guinea, Paraguay, Gaza, Sudan, Sierra Leone, El Salvador, Suriname, Slovakia, Swaziland, Seychelles, Togo, Tonga, Tuvalu, Tanzania, Uganda, Uruguay, Uzbekistan, Saint Vincent and the Grenadines, Viet Nam, Vanuatu, Samoa, Zambia and Zimbabwe	Angola, Argentina, Armenia, Burundi, Benin, Burkina Faso, Bangladesh, Bulgaria, Bosnia and Herzegovina, Belarus, Bolivia, Brazil, Bhutan, Botswana, Central African Republic, Chile, China, Republic of the Congo, Colombia, Comoros, Cape Verde, Costa Rica, Cuba, Dominican Republic, Algeria, Ecuador, Egypt, Ethiopia, Fiji, Federated States of Micronesia, Guinea, Gambia, Guyana, Honduras, Haiti, Indonesia, India, Jamaica, Jordan, Kazakhstan, Kenya, Cambodia, Kiribati, Laos, Lebanon, Sri Lanka, Lesotho, Lithuania, Latvia, Morocco, Madagascar, Mexico, Marshall Islands, North Macedonia, Myanmar, Mauritius, Malawi, Malaysia, Namibia, Niger, Nigeria, Nicaragua, Nepal, Panama, Peru, Philippines, Papua New Guinea, Poland, Paraguay, Gaza, Romania, Russia, Sudan, Sierra Leone, El Salvador, Suriname, Slovakia, Swaziland, Togo, Thailand, Tonga, Tunisia, Turkey, Tuvalu, Tanzania, Uganda, Ukraine, Uruguay, Uzbekistan, Saint Vincent and the Grenadines, Viet Nam, Vanuatu, Samoa, South Africa, Zambia and Zimbabwe
Outliers	Antigua and Barbuda, Australia, Estonia and Trinidad and Tobago	Antigua and Barbuda, Belize, Estonia and Trinidad and Tobago

Note: Countries that make up the groups according to the indicator used (on the left side: GDPPC and tourism activity and on the right side: GDPPC and tourism specialisation).