

Tourism and economic development: a panel data analysis for island countries

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Abstract

Since the scientific literature has already shown that there is a causal relationship between tourism and economic growth in island countries, this paper aims, as an additional step, to determine whether there is a causal relationship between tourism and economic development in this type of destination. For this purpose, the Granger causality test is used, applying the econometric adaptation made by Dumitrescu and Hurlin, using a sample of 20 island countries for the period 1995-2019. From the analysis carried out, two results stand out. On the one hand, there is a causal relationship from tourism to economic development. This relationship occurs with a certain delay, to the extent that the public administration takes advantage of the economic growth generated by tourism to finance specific policies that improve the living conditions of the population. On the other hand, it has been shown that there is a causal relationship indicating that development contributes to the expansion of tourism. This is because tourists, in addition to valuing the factors that make a territory or its resources attractive, increasingly demand that destination countries have an adequate level of development in order to obtain a satisfactory tourist experience. Finally, policies are recommended to improve the living conditions of the inhabitants, as well as to reduce the levels of poverty of the population, health, education or security, which will translate into a final improvement of economic development.

Keywords: Tourism, economic development, island economies, causality, panel data.

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1. Introduction

In recent years, tourism has established itself as one of the economic sectors with the greatest weight in economic growth, both in developed and developing economies, which rely on this sector as a means to boost the economy and improve the welfare of society (Ady *et al.*, 2022).

Indeed, the idea that tourism contributes positively to the economic growth of countries has become increasingly widespread, thus supporting the TLGH (Tourism-led Growth Economic hypothesis), from the first work published on this subject by Balaguer and Cantavella-Jordá (2002) to the present day. In general, the importance of tourism lies in its contribution to GDP, close to 10% (Shahbaz *et al.*, 2018), taking into account the figures for tourist arrivals in the last few years -962.8 million in 2022, 455.7 million in 2021, 406.8 million in 2020 and 1465.4 million in 2019- (UNWTO, 2023). This contribution is explained by several factors; firstly, the impact that tourism has on employment by generating direct and indirect jobs (Ohlan, 2017), thus benefiting other sectors such as transport, construction or food, among others (Tugcu, 2014). In fact, employments created by tourism were more than 300 million before the pandemic and close to this number again after Covid-19 (WTTC, 2023); secondly, the ability to generate foreign exchange that helps to decrease the balance of payments deficit and to increase production thanks to the import of capital goods (Bassil *et al.*, 2015); thirdly, it helps to attract investments to improve local infrastructures (Habibi *et al.*, 2018) and; finally, tourism produces economies of scale (Ertugrul and Mangir, 2015).

Therefore, after this first paper, a large number of papers have emerged in the scientific literature, in which the predominant causality relationship is that tourism contributes to economic growth (Gül and Özer, 2019; Tang *et al.*, 2019). Although few in number, there are studies that provide evidence supporting the opposite relationship (Kumail *et al.*, 2022), and some that provide evidence in favor of the existence of a bidirectional relation (Tecil *et al.*, 2020). Given this ample empirical evidence supporting the existence of positive effects of tourism activity, countries around the world are betting heavily on tourism as a path to growth as many nations consider the sector as a tool that acts as an engine for economic growth (Corbet *et al.*, 2019; Ohlan, 2017).

European countries rank as the most visited destinations by tourists in recent years, so the European Union, aware that tourism is conducive to economic growth and development, is focusing attention on this sector (Liu *et al.*, 2015; Xia *et al.*, 2021). Similarly, the Asian region is experiencing rapid growth in its tourism development, especially in Pacific countries (Chiang *et al.*, 2017). For its part, the Middle East is no stranger to this and that is why it is reconfiguring the type of tourism (moving from Islamic travel and desert routes to recreational travel, vacations, business, etc.) and depending less and less on the oil sector in countries such as Bahrain, United Arab Emirates, Saudi Arabia, Oman or Kuwait (Khan *et al.*, 2021). Likewise, due to the rich landscape and biodiversity that Central and South America possess, sustainable tourism is key in this territory, both to take advantage of the positive impact on the economy and to mitigate the negative effects on the environment (Ben Jebli *et al.*, 2019). Africa has also been able to harness the benefits of tourism for its social and economic development, even if its growth rate is slower (Meyer and Meyer, 2016).

Once the importance of tourism on economic growth processes has been agreed upon, a new stream of analysis has opened up around the capacity of tourism to improve, in addition, economic development (Croes, 2012), given that the latter concept is much broader than economic growth, being linked to other factors of non-economic content but which influence the well-being of the resident population (Ranis *et al.*, 2000).

In this regard, although economic development has been boosted thanks to tourism in some places, in recent years there has been a trend that has questioned whether this is really the case, because the

expansion of this activity can lead to a reduction in the welfare of the resident population (Intermón Oxfam, 2007; Lee and Brahmasrene, 2013). This has given rise to two opposing positions (Cárdenas-García *et al.*, 2015), given that on the one hand it is argued that for tourism to have a positive impact on the development of a country, certain optimal conditions must be present, which occur to a lesser extent in less developed countries (Rahnama *et al.*, 2019; Pulido-Fernández *et al.*, 2008). Although empirical studies on the impact of tourism on economic development are scarcer than those on the relationship of tourism with economic growth, there are findings that support the idea that tourism favors economic development in Malaysia (Tan *et al.*, 2019), Costa Rica, Guatemala, El Salvador, Panama, Nicaragua and Dominican Republic (Gunter *et al.*, 2018).

In addition, it is necessary to highlight that tourism has gained great relevance in some island countries where its contribution to GDP has reached rates around 45% (Figini and Vici, 2009). Island countries have certain advantages such as their scenic environment, beaches, flora and fauna which contribute to increase the attractiveness of the territory; however, they have great difficulties caused by geographical limitations and availability of resources (Seetanah, 2011), as well as exposure to natural disasters to which small island developing states are exposed (Akadiri *et al.*, 2019; Roslan and Noor, 2008). In recent decades, Pacific Island countries have relied on tourism as a form of economic growth, as the manufacturing and agricultural sectors have not progressed as expected, leading the tourism sector to position itself as the leading sector in these island destinations (Narayan *et al.*, 2010).

However, unlike the analysis of the relationship between tourism and economic growth (of which there are a large number of works that analyze this relationship in is-land destinations), there are no empirical studies that have examined the capacity of tourism as a tool for economic development in island countries.

Therefore, given that it has been demonstrated by a large number of works that tourism contributes to economic growth in island destinations, the objective of this paper, in line with the position of most international organizations, is to analyze whether the expansion of tourism activity in this type of destinations allows, in addition to contributing to economic growth, to improve the socioeconomic conditions of the resident population and, therefore, to be considered as an instrument of economic development.

To achieve this objective, this article analyzes the relationship between tourism and economic development, taking into account development as a multidimensional variable, using panel data for 20 island countries during the period 1995-2019. To carry out this analysis, causality tests have been used to detect the existence, or not, of relationships between the variables indicated above.

This article contributes to generating knowledge about the role of tourism as an instrument of economic development in island destinations by analyzing the relationship between these two variables. The innovative aspect of the work lies in the lack of empirical articles which analyze the relationship between tourism and economic development in island destinations. The study of tourism and economic growth in island destinations has been investigated in different studies, but there has been no in-depth study of whether this relationship can lead to something more general, such as economic development. The results obtained provide empirical evidence that there is a causal relationship between tourism development and economic development in the island countries analyzed.

The rest of the document is organized as follows: the next section reviews the literature on the subject under study, section three presents the data used and gives a brief explanation of the methodology used,

section four details the results obtained and, finally, section five contains the final conclusions of the paper, establishing some recommendations for tourism policy.

2. Literature review

There are currently a large number of empirical analyses in the scientific literature that analyze the relationship between tourism and economic growth, for example, in the work on 7 Mediterranean countries where income and tourist arrivals per capita drive economic growth (Dritsakis, 2012), in the work on Turkey, Greece, Spain, Italy, France and Portugal with a bidirectional causality result (Dücan *et al.*, 2016) or the investigations about European, Asian and African countries that border the Mediterranean Sea where several causality results were found (Tugcu, 2014). In addition, a new trend has emerged in the scientific literature that analyzes the relationship between tourism and economic development, which should not be confused with economic growth, as they are different concepts. Indeed, economic growth is conceived as the increase in a country's economy due to the acquisition of goods and services, linked exclusively to an economic aspect, while economic development encompasses a broader concept that, in addition to including variables of economic content, includes other factors such as the well-being of the population, education or quality of life.

2.1. Tourism and economic growth

Tourism has been established as a tool that enables economic growth in island destinations, given that, in these territories, despite having certain climatic, geographic or logistical limitations, there are a number of conditions valued by tourists, such as natural, social or cultural attractiveness (Seetanah, 2011). Therefore, several empirical studies have been conducted by the scientific literature that have analyzed the relationship between tourism and economic growth in island destinations.

First, there is a group of papers that have found a unidirectional causality relationship running from tourism to economic growth (Table 1). In this sense, the TLGH has been validated in Sri Lanka, both in the short and long run through the Granger causality test analyzing the relationship between tourism expenditure and GDP (Srinivasam *et al.*, 2012); in Singapore, through the indicators of the number of tourist arrivals and GDP (Katircioglu, 2011); in Antigua and Barbuda, through an analysis relating tourism expenditure, exchange rate and GDP (Schubert *et al.*, 2010); in Barbados, where this relationship is demonstrated for any type of tourism - domestic or international - (Jackman, 2012); in Bahrain, Cuba, Cyprus, Dominican Republic, Haiti, Iceland and Malta, where a multivariate model has been used that results in increased economic growth due to tourism leading to increased CO₂ emissions and, therefore, they propose a relationship of diminishing marginal returns between international tourism and CO₂ emissions (Akadiri *et al.*, 2019). All these empirical analyses conclude that policies should be aimed at boosting the tourism sector, as it has established itself as a clear instrument of economic growth.

Secondly, there is another group of research in which empirical evidence has been found pointing to a bidirectional relation of the variables, i.e., there is a causal relationship running from tourism to economic growth and vice versa, thus a bidirectional relationship. In line with this stream, Mohamed Mustafa (2019) analyzes the case of Sri Lanka in the period 1978-2016 using tourism receipts and GDP as leading indicators. Seetanah (2011), finds bidirectionality using Granger causality test in 19 island economies during 1990 and 2007, using GDP at constant prices and the number of tourism arrivals and receipts as indicators of economic growth and tourism. Ghartey (2013) and Amaghionyeodiwe (2012) examined Jamaica using VECM and the Granger causality test for the periods 1963-2008 and 1970-2005, respectively; the former uses GDP and number of tourist arrivals along with the real exchange rate as indicators, finding results of bidirectional causality in the short and long run; however, the latter author only finds results in the long run using tourism receipts as the tourism variable. During the period 1972-2011, Ridderstaat, Croes and Nijkamp (2013) analyzed Aruba, determining the bidirectional relation

using VECM, Johansen cointegration and Granger test, analyzing GDP and tourism receipts, both in the short and long run.

Table 1. Empirical analysis: tourism contributes to economic growth in island countries.

Authors (date)	Journal	Frequency (time span)	Destination	Methodology	Economic growth (Y)	Tourism (T)	Others variables	Short run	Long run
Akadiri, Akadiri and Alola (2019)	Current Issues in Tourism	annual 1995-2013	Bahrein, Cuba, Cyprus, Dominican Republic, Haiti, Iceland and Malta	Johansen Cointegration - Granger Causality	GDP per cápita (constant prices)	Number of tourist arrivals	CO ₂ emissions and energy use	-	Y←T
Jackman (2012)	Regional and Sectorial Economic Studies	quarterly 1975-2010	Barbados	VECM - Granger Causality	GDP	Tourism revenues	-	-	Y←T
Katircioglu (2011)	Singapore Economic Review	annual 1960-2007	Singapore	VECM - Granger Causality	GDP	Number of tourist arrivals	Exchange rate	-	Y←T
Schubert <i>et al.</i> (2010)	Tourism Management	annual 1970-2008	Antigua and Barbuda	VECM - Granger Causality	GDP USA	Tourism expenditure	Exchange rate	-	Y←T
Srinivasan, Kumar and Ganesh (2012)	Environment and Urbanization Asia	annual 1969-2009	Sri Lanka	ARDL - Granger causality	GDP	Tourism expenditure	-	Y←T	Y←T

Third, there is another set of analyses in which a unidirectional causal relationship has been found whereby economic growth favors tourism expansion (Table 3). Nayaran *et al.* (2010), found a short-term relationship between tourism and economic growth in Fiji, Solomon Islands, Papua and New Guinea, using the Granger causality test and Pedroni cointegration applied to GDP and tourism exports; likewise, for the long term they were able to validate the TLGH, whereby tourism causes economic growth in the countries analyzed during the period. Amaluddin (2019), investigated the causal relationship of the variables represented by regional GDP and the number of tourist arrivals and private investment in the tourism sector in 12 provinces of Indonesia; the empirical results for the period 2010-2017, determined a unidirectional relationship of economic growth towards tourism in the short run and a bidirectional causality in the long run using the Granger causality test and the PVECM.

In summary, it can be said that most of the empirical studies that have been carried out to date in island destinations determine that the most frequent relationship, after analyzing the behavior of the variables tourism and economic growth, measured through different indicators, is that which establishes a unidirectional causal relationship between tourism and economic growth or a bidirectional relationship between the two variables. Therefore, special attention should be paid by governments when designing their economic policies, so that these policies are aimed at taking advantage of the economic growth generated by tourism to improve the living conditions of the resident population.

Table 2. Empirical analysis: bidirectional relationship between tourism and economic growth in island countries.

Authors (date)	Journal	Frequency (time span)	Destination	Methodology	Economic growth (Y)	Tourism (T)	Others variables	Short run	Long run
Amaghionyeod iwe (2012)	Tourism Economics	annual 1970-2005	Jamaica	VECM Johansen - Granger causality	GDP	Tourism revenues	-		Y↔T
Ghartey (2013)	Tourism Economics	annual 1963-2008	Jamaica	VECM Johansen - Granger causality	GDP	Number of tourist arrivals	Real exchange rate and Structural changes	Y↔T	Y↔T
Mohamed Mustafa (2019)	Journal of Asian Finance, Economics and Business	annual 1978-2016	Sri Lanka	Cointegración de Johansen - Granger Causality	GDP	Tourism revenues	Foreign direct investment and Index of economic freedom	-	Y↔T
Ridderstaat, Croes, and Nijkamp (2013)	International Journal of Tourism Research	annual 1972-2011	Aruba	VECM - Johansen - Granger causality	GDP	Tourism revenues	-	Y↔T	Y↔T
Seetanah (2011)	Annals of Tourism Research	annual 1990-2007	19 island economies	GMM - Granger Causality	GDP (constant prices)	Number of tourist arrivals - Tourism revenues	GFCF, Secondary school students, E+I, Index of economic freedom	-	Y↔T

Table 3. Empirical analysis: economic growth contributes to tourism in island countries.

Authors (date)	Journal	Frequency (time span)	Destination	Methodology	Economic growth (Y)	Tourism (T)	Others variables	Short run	Long run
Amaluddin (2019)	Jurnal Perspektif Pembiayaan dan Pembangunan Daerah	annual 2010-2017	12 provinces of Indonesia	PVECM - Granger Causality	Regional GDP	Number of tourist arrivals and Private investment in the tourism sector	-	Y→T	Y↔T
Nayaran, Narayan, Prasad and Prasad (2010)	Tourism Economics	annual 1988-2004	Fiji, Tonga, Salomon island, Papua, Nueva Guinea	Pedroni Cointegration - Granger causality	GDP	Tourism exports	-	Y→T	Y←T

2.2. Tourism and economic development

Currently, there is practically no empirical research on the relationship between tourism and economic development in island destinations.

Of the few studies that analyze the relationship between tourism and economic development in this type of destination, specifically with the distribution of income among poor households, Roslan and Noor (2008), for a study in Langkawi Island (Malaysia), show that tourism is a disequalising factor rather than an equalising one in income distribution among poor households. However, in some research that has been conducted on the relationship between tourism and economic growth, reference is made to certain indicators of economic development.

On the one hand, in the work carried out by Akadiri *et al.* (2017), focused on small island states, it is concluded that the expansion of tourism activity causes certain negative impacts on the natural environment such as, for example, the fact that the discharge of waste into the waters can cause harmful effects on the health of the resident population, which negatively affects the quality of life, an element linked to economic development.

On the other hand, as Ashe (2005) points out, tourism development is a key tool for reducing poverty in small island states, so that policies aimed at reducing poverty levels in the countries should be aimed at promoting tourism, without relegating it to a secondary position. It should be noted that the contribution of the tourism sector to economic development is lower in island territories than in other countries (Seetanah, 2011).

Therefore, there are practically no studies that analyze the relationship between tourism and economic development in island destinations, and there are contradictory results, so this lack of empirical literature on the relationship between tourism and economic development in island destinations is the reason for conducting this analysis to generate knowledge about these two variables in the specific case of island countries.

3. Methodological approach

3.1. Data collection

In order to achieve the objective proposed in this work, different sources of information have been used, both to characterize tourism activity and to measure economic development in the island destinations that have been analyzed in this work. According to the available databases, there is information to characterize a total of 20 island countries, representing the different geographical areas worldwide (Annex 1 shows the island countries that have been analyzed). The databases used in this study were:

- Tourism. To measure tourism, the number of international tourist arrivals is used as an indicator, such data being provided by the United Nations World Tourism Organization (UNWTO, 2022).
- Economic development. The Human Development Index (HDI) is used to measure economic development, such data being provided by the United Nations Development Programme (UNDP, 2022).
- Inhabitants. The total number of residents is used, provided by the World Bank (WB, 2022).

In this study, an empirical analysis has been carried out to determine the relationship between tourism and economic development, with these concepts being measured on the basis of the following variables:

- Tourism has been measured through a double indicator. On the one hand, through the number of international tourist arrivals, given that this indicator has been widely used by the literature reviewed. In addition, to give robustness to the empirical analysis, the number of international tourists per capita (number of international tourists / total number of inhabitants of the country) is also used as a measurement variable. Thus we have two indicators: one of tourism activity and the other of tourism specialization respectively.
- Economic development has been measured through the Human Development Index (HDI).

The time span 1995-2019 has been used as the period of analysis, in order to be able to count the widest possible time period. It should be taken into account, on the one hand, that the first available data on international tourists provided by the UNWTO refer to the period 1995 and, on the other hand, so that

the results are not affected by the crisis that affected tourism due to the pandemic caused by Covid-19, the time series ends in the year prior to that crisis (2019).

Regarding the measurement of these two components, on the one hand, the number of international tourists is used to measure tourism, which is one of the indicators most used by the literature reviewed previously, and in addition, the arrival of international tourists in relation to the population is considered, thus capturing the degree of tourism specialization of a tourist destination (Dritsakis, 2012; Tang and Abosedra, 2016) and, on the other hand, the Human Development Index (HDI) is used to measure economic development, incorporating other variables that are not based exclusively on economic factors (Ngoo and Tey, 2019; Sajith and Malathi, 2020). Although other measurement variables could have been used, the variables that have been used are more consistent and reliable, in addition to having fewer limitations, than what could be obtained through other sources of information. Finally, control variables included in this study were selected taking into account the most cited reviews of the literature on the TLGH, including Nunkoo *et al.* (2020), Brida *et al.* (2016) and Ahmad *et al.* (2020).

3.2. Methodology applied

First, the stationarity of the series is analyzed through the application of the Im, Pesaran and Shin (2003) test, which is a unit root test applied to panel data. In this unit root test, the null hypothesis is established that, jointly, each time series in the panel is non-stationary, i.e., that all panels contain unit root versus the alternative hypothesis that at least some panel is stationary. In addition, and following Im *et al.* (2023), we verified the stationarity of the series by means of the unit root tests in panel data (LLC test) as in Levin *et al.* (2002).

Once the stationarity of the series is confirmed, we proceed to test for causality between the variables measuring tourism and economic development. Specifically, Granger (1969) causality tests are considered, in which causality indicates whether one variable precedes the other. This should not be confused with a cause-effect relationship between the variables, but rather indicates which variable moves first.

There are different variants of this test, for panel data. The original Granger causality test assumes that all the coefficients of the countries in the panel are equal. One of the most widely used variations in the literature is the Dumitrescu and Hurlin (2012) test, since it admits the possibility that the coefficients are different among the countries in the panel. For this reason, in this paper, Granger causality is analyzed using the Dumitrescu and Hurlin (2012) test. In this causality test, the null hypothesis is homogeneous non-causality; that is, under the null hypothesis posed, there is no causality for any of the countries in the sample analyzed. Note that this methodology has been successfully applied in similar studies in the area of the TLGH, including Bilen *et al.* (2017), Tugcu (2014), Abbasi *et al.* (2021), Ghosh *et al.* (2022), Odhiambo & Saungweme (2022) and references therein.

4. Results

The results obtained from the application of the stationarity test to the variables analyzed and the existence of a causal relationship between tourism and economic development are presented below. As mentioned above, the Human Development Index (HDI) is used as a measure of economic development and two indicators are considered as a measure of tourism: Tourist Activity (TA) and Tourist Specialization (TS).

Table 4 shows the results of the unit root test for panel data proposed by Im, Pesaran and Shin (2003). As can be seen, from the p-values obtained, the test for the variables in levels does not allow the unit root hypothesis to be rejected, but when the series are tested considering their first differences, the null

hypothesis of unit root is rejected; therefore, it is concluded that the variables used are integrated of order 1.

Table 4. Panel unit root tests on levels and differences of variables.

Variables	IPS Statistics	p-value
HDI	2.3252	0.9900
TA	9.0975	1.0000
TS	13.0506	1.0000
d_HDI	-10.7965	0.0000
d_TA	-8.3172	0.0000
d_TS	-7.4248	0.0000

Next, we proceed to analyze the causality between tourism and economic development, using the Granger causality test, through the adaptation of Dumitrescu and Hurlin (2012). This test is selected because it considers different coefficients between the territories that make up the panel, thus allowing for individual causality relationships to be obtained, but not necessarily for all the territories in the panel. Through this econometric test analyses the relationship between tourism and economic development in both directions, i.e. whether there is a causal relationship whereby tourism contributes to economic development, indicating that there is a unidirectional causal relationship from tourism to economic development, and whether there is a causal relationship whereby economic development conditions tourism, indicating the existence of a unidirectional causal relationship from economic development to tourism.

Table 5. Dumitrescu and Hurlin causality: Tourism to HDI in Island Economies

Ho: Tourism does not cause HDI in island economies			
Lags	Statistics	TS	TA
1	Z-bar	-0.7730 (0.4395)	-0.9991 (0.3178)
	Z-bar tilde	-0.9286 (0.3531)	-1.1153 (0.2647)
2	Z-bar	0.4314 (0.6662)	0.4402 (0.6598)
	Z-bar tilde	-0.1272 (0.8988)	-0.1204 (0.9041)
3	Z-bar	1.6101 (0.1074)	1.7037 (0.0884)
	Z-bar tilde	0.4880 (0.6256)	0.5535 (0.5799)
4	Z-bar	7.8482 (0.0000)	6.1444 (0.0000)
	Z-bar tilde	3.8681 (0.0001)	2.8452 (0.0044)
5	Z-bar	8.5716 (0.0000)	3.5530 (0.0004)
	Z-bar tilde	2.8107 (0.0049)	0.5409 (0.5886)

(Variables in differences. Numbers in parentheses are p-values).

First, Table 5 shows the results of the Granger causality test, through the Dumitrescu and Hurlin (2012) test, considering as null hypothesis that tourism does not condition the level of development in island countries. In addition, as indicated above, in order to give greater robustness to the empirical analysis, we proceed to measure tourism through two variables: Tourism Activity (TA) and Tourism Specialization (TS). The measurement of the tourism variable presents a lack of consensus in the scientific literature; moreover, the use of one or the other indicators conditions the results, so, following Rosselló-Nadal and He (2020), it is appropriate to use several indicators to represent tourism in order

to obtain greater precision in the analysis. In both cases, we work with the first differences of the variables, capturing their variation.

After applying the causality test of Dumitrescu and Hurlin (2012), the results show a positive relationship between the variables under study. In this sense, it can be affirmed that there is a unidirectional causality from tourism to economic development. Specifically, the economic development of the island countries analyzed is driven by the tourism sector, both when measured through tourism activity (TA) and when analyzed through tourism specialization (TS). However, it should be emphasized that this causal relationship occurs when 4 and 5 lags are considered. This causal relationship occurs with such a time lag, a result that is in line with the scientific literature, because the expansion of tourism activity in island destinations, as in any other tourist destination country, needs a certain amount of time for the impacts produced as a consequence of tourism to affect the economic growth of the territories and, this in turn, to be able to affect the socio-economic conditions of the local population, i.e. economic development. Of course, economic and/or social benefits do not occur automatically, since it is complicated for the economic impact associated with the increase in tourism activity in a given period of time to translate into an increase or improvement in the standard of living of the local population in that period (Akadiri *et al.*, 2017); rather, it will be the responsibility of governments and institutions to take advantage of the economic growth generated by tourism in order to develop appropriate policy measures and actions to channel this economic growth, usually through an increase in GDP, towards improving the social and economic conditions of the inhabitants, for example, by increasing safety, providing infrastructure, improving health or education levels (Cárdenas *et al.*, 2015). In short, taking advantage of the benefits that tourism has on other sectors, in order to make the destination more attractive to potential visitors.

On the other hand, when analyzing the existence of causality relationship from tourism to economic development, taking into account that this study uses a short panel of subjects (20 island countries), the most appropriate indicator is the Z-bar tilde and, however, the results for a level of 5 lags, indicate that there is a causal relationship whereby tourism drives economic development if the tourism variable is measured through tourism specialization (TE), but there is no causal relationship between these variables if measured through tourism activity (TA). This situation justifies the importance of the indicators used to measure the variables to be tested, in this case, tourism (Fonseca and Sánchez-Rivero, 2020) and; specifically, the advantages of using tourism data relativized in relation to the countries analyzed, such as through population or geographic extension, as opposed to data in absolute values of the number of tourists received (Dritsakis, 2012; Tang and Abosedra, 2016).

Secondly, Table 6 shows the results of the Granger causality test, through the Dumitrescu and Hurlin (2012) test, considering as null hypothesis that the level of development does not condition tourism activity in island countries. Also in this case, analogous to the previous analysis, we proceed to measure tourism through Tourist Activity (TA) and Tourist Specialization (TS).

The results of the causality test show that economic development drives tourism activity. In this case, the existence of a unidirectional causality from economic development to tourism is confirmed when 1 and 2 lags are considered. The existence of the causal relationship is confirmed for each of the indicators with which tourism is analyzed, i.e., for both tourism specialization (TE) and tourism activity (TA). In contrast to the previous case, which occurred with more lags, the impacts are reflected almost instantaneously, which is a quite logical result, since, thanks to the preconditions that a country has at the outset, it achieves a certain degree of attractiveness for tourists, who will select that territory as their destination.

Table 6. Dumitrescu and Hurlin causality: HDI to Tourism in Island Economies

Ho: HDI does not cause Tourism in island economies

Lags	Statistics	TS	TA
1	Z-bar	-1.8290 (0.0674)	-1.9984 (0.0457)
	Z-bar tilde	-1.8008 (0.0717)	-1.9407 (0.0523)
2	Z-bar	-2.0385 (0.0415)	-1.9619 (0.0498)
	Z-bar tilde	-2.0330 (0.0421)	-1.9739 (0.0484)
3	Z-bar	-0.1760 (0.8603)	-0.1618 (0.8715)
	Z-bar tilde	-0.7621 (0.4460)	-0.7521 (0.4520)
4	Z-bar	-1.3145 (0.1887)	-1.0146 (0.3103)
	Z-bar tilde	-1.6330 (0.1025)	-1.4530 (0.1462)
5	Z-bar	-0.1042 (0.9170)	0.0424 (0.9662)
	Z-bar tilde	-1.1131 (0.2656)	-1.0468 (0.2952)

(Variables in differences. Numbers in parentheses are p-values).

Indeed, this scenario shows that, in addition to the existence of its own resources or factors of attraction, a tourist destination has certain socioeconomic characteristics in its economic bases, including the provision of infrastructure, income levels, security, education and health, which make it a territory with the potential to increase the expansion of tourism activity (Pulido and Cárdenas, 2021).

However, in view of the results obtained, caution should be exercised and one should not make the mistake of generalizing them, since it is necessary to take into account the great heterogeneity existing in the island destinations that have been analyzed, with very different levels of development in each one of them. Indeed, there are some island economies that have high human development indexes, such as Iceland, which has a value of 0.960 in 2019, while other island destinations have quite low human development indexes, such as Haiti, which has a value of 0.433 in 2019. Similarly, there are also important differences in terms of tourism activity, given that, for example, the Bahamas has received 18 international tourists per inhabitant at the end of the period analyzed and, at the other extreme, Sri Lanka receives less than 2 international tourists per inhabitant at the beginning of the series analyzed. In this regard, Table 7 presents the averages of the variables analyzed: development (HDI) and tourism (TA and TS), as well as the minimum and maximum values for each of them.

Table 7. Descriptive statistics of the 3 variables considered.

Variable	Mean	Minimum	Maximum
TA	5,410,799	211,000	41,080,000
TS	2.2313	0.0172	17.9208
HDI	0.778	0.433	0.960

In addition, by way of example, some countries are selected from the panel analyzed (United Kingdom, Haiti and Bahamas), detailing the evolution of the three variables considered (Figure 1), in which the differences indicated above can be seen graphically.

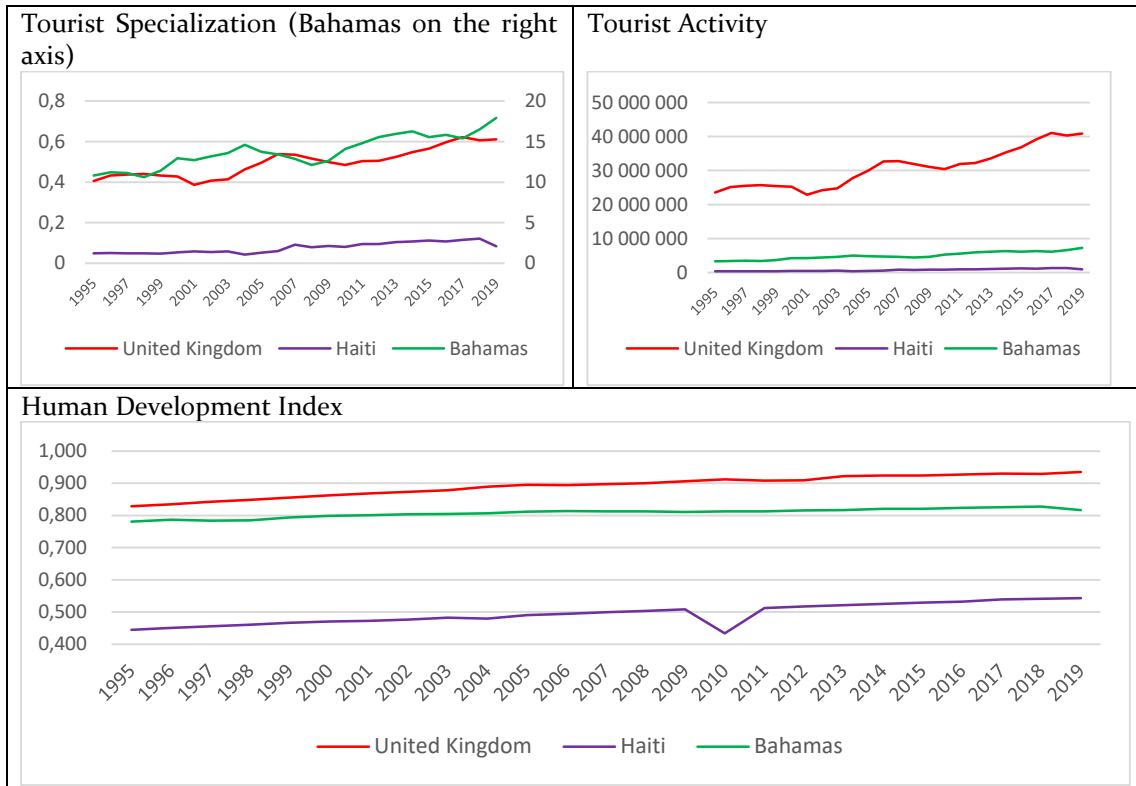


Figure 1. Time evolution of the variables considered (United Kingdom, Haiti and Bahamas)

5. Conclusions

A previous review of the scientific literature has shown that there is a causal relationship between tourism and economic growth in island destinations, in which, fundamentally, it is determined that there is both a causal relationship from tourism to economic growth and a bidirectional relationship between the two variables.

However, the empirical analysis carried out in this work has been aimed at analyzing, in an additional step, whether, in addition to contributing to economic growth, tourism can be configured as a tool for economic development in island countries, given that the main motivation of this study has been to generate knowledge on the relationship between tourism and development in this type of destination, of which there is a significant lack in the scientific literature.

5.1. Theoretical implications

On the one hand, according to the results obtained in this work through the analysis of causality between tourism and economic development, it is determined that tourism contributes to an improvement in development in island destinations, although, in this case, it is necessary to emphasize that this causal relationship occurs with a certain delay, that is, that the expansion of tourism does not contribute to the improvement of socioeconomic conditions automatically, but rather that this relationship occurs in the medium term. Indeed, economic growth, in this case due to the expansion of tourism, as shown in development theories, requires a certain period of time in which public administrations develop public policies associated with this growth, which allow improvements in the living conditions of the population (health, education, security, infrastructure, telecommunications, etc.) and, therefore, improve economic development in island destinations.

On the other hand, it has also been proven in this work that the level of development contributes to tourism in island destinations; in this case, this relationship occurs almost instantaneously. Indeed, as soon as a destination, in addition to having resources or factors of attraction that generate tourist motivation, has adequate levels of development that are demanded by the tourist demand, which translate into adequate levels of safety, infrastructure or health at the destination, there is an increase in tourist flows that visit these destinations.

This work also proposes a critical view of the indicators used to measure the variables in an empirical causality analysis, in this case, between tourism and economic development, given that it has been demonstrated in this work that using a different variable to measure tourism, specifically tourism activity or tourism specialization, leads to different results, so that the usefulness of using variables that measure tourism in a relativized form is defended instead of using them in absolute value.

As has been shown in previous studies analyzing tourism and economic growth in island destinations, this study also determines that there is a relationship between tourism and development in this type of destination, both a causal relationship from tourism to economic growth and a causal relationship from development to tourism.

5.2. Practical implications

Therefore, the commitment made by national and international administrations in projects linked to tourism with the aim of improving the living conditions of the population, specifically in island destinations and, especially, in countries classified as least developed, must take into account that the results of this strategy are not immediate or automatic, but that, in addition to financing these specific projects to increase the flow of tourists, it is necessary to develop specific policies that take advantage of the economic growth generated by tourism to finance policies linked to the improvement of development.

On the other hand, the public administrations of island destinations should develop specific public policies aimed at improving these factors (safety, infrastructure or health at the destination) as a prior step to an increase in tourism and take advantage of the economic growth linked to this activity, which has been highlighted in the review of scientific literature, with all the benefits associated with this process.

5.3. Limitations and further research lines

A limitation of this study is that, although a short panel of 20 countries is used, there is a significant heterogeneity of the island countries analyzed, and it is necessary to be cautious with the generalization of the results obtained, so it would be interesting to apply this same analysis with homogeneous groups of island countries around some common characteristic between groups.

In addition, as a future line of research, it would be interesting to analyze whether some factors linked to island destinations, such as size, dispersion, remoteness, communications, dependence on imports, existence of leakages or environmental degradation, determine the causal relationship between tourism and development in island destinations.

Appendix 1. Island countries analyzed.

Country code	Country name	OMT Region (*)	HDI classification (+)
AUS	Australia	Asia and the Pacific	Very high human development
BHR	Bahrain	Middle East	Very high human development
BHS	Bahamas	Americas	Very high human development
CYP	Cyprus	Europe	Very high human development
DOM	Dominican Republic	Americas	High human development
FJI	Fiji	Asia and the Pacific	High human development
GBR	United Kingdom	Europe	Very high human development
HTI	Haiti	Americas	Low human development
IDN	Indonesia	Asia and the Pacific	High human development
IRL	Ireland	Europe	Very high human development
ISL	Iceland	Europe	Very high human development
JAM	Jamaica	Americas	High human development
JPN	Japan	Asia and the Pacific	Very high human development
LCA	Saint Lucia	Americas	High human development
LKA	Sri Lanka	Asia and the Pacific	High human development
MDV	Maldives	Asia and the Pacific	High human development
MLT	Malta	Europe	Very high human development
NZL	New Zealand	Asia and the Pacific	Very high human development
PHL	Philippines	Asia and the Pacific	High human development
SGP	Singapore	Asia and the Pacific	Very high human development

(*) Classification based on the World Tourism Organization (UNWTO).

(+) Human development (2019): very high (HDI > 0,800), high (HDI > 0,700), medium (HDI > 0,550), low (HDI < 0,550)

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