Tourism and business cycles in Spain. Causality and structural breaks.

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Abstract

An increasing number of investigations studying the relationship between tourism and economic growth have arisen over the last years for many different countries. This paper is aimed to test the causality relationship between the cycles of tourism and economic development for the case of Spain using quarterly time series data on gross domestic product and the number of nights spent in Spanish tourist accommodations from 1980 to 2013. A distinction between nights spent by foreign tourists and nights spent by national tourists is also made. Although no evidence of causalities is found on preliminary results, structural breaks affecting the relationships between the variables are detected. Causality from economic growth towards tourist activity is found until 1994, when the relationship changes its direction. Results also confirm bidirectional causality from 1999 onwards, thus contributing to reconcile previous results.

Keywords: tourism; GDP; structural breaks; business cycle;

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1. Introduction

Tourism has proven to be an important source of revenue for numerous countries around the world, with 9% of total GDP (direct, indirect and induced impact) and 6% of the world's exports. Its influence on employment has been significant as well, since one out of eleven jobs in the world are related to this economic activity (UNWTO, 2013).

Likewise, this sector seems to keep growing at a constant pace globally, the increasing number of emerging tourist destinations being a good proof of it, which also involves higher levels of competitiveness between countries in order to attract international tourists. The amount of international arrivals is also expected to rise by 3.3% a year until 2030, with a pace of 4.4% for those emerging destinations (UNWTO, 2013).

In spite of those and many other facts, tourism has not been specially studied within the economic research at an empirical or quantitative level until hardly more than a decade ago. It is currently accepted that tourism expansion in a region is positive for its economic development both directly and indirectly due to the fact that it involves income increases for the country, boosts currency receptions and enhances competitiveness and employment within companies from the tourist sector and from other related sectors, among other positive effects.

In general, the objective of the researchers that have shown interest in this economic activity has been to verify the Tourism-Led Growth (TLG) hypothesis in different countries, either individually, by means of time series analysis, or by using panel data for a selection of countries.

The Tourism-Led Growth hypothesis, which is inspired by the Export-Led Growth hypothesis, was first introduced by Balaguer and Cantavella-Jordá (2002). This theory is aimed to test whether tourism can be a determinant factor of economic growth in the long-run and is thus based on the analysis of the potential relationship between tourism and economic development with the aim of finding potential causality and its direction between both variables. The basic method is to formulate a VAR model in order to apply Granger's causality test after analysing cointegration of the variables. Usually, this process also involves the identification of the integration properties of the selected variables, by means of DF, ADF, PP or KPSS unit root tests. The combination of those three econometric techniques should allow for researchers to identify whether tourism is the driving force of the economic growth or if it is the economic development which pushes tourism expansion in the region.

Since that particular research work, many authors have tried to attest this hypothesis for different countries from every continent, which has led to a wide range of results that have been contradictory in many occasions, thus demonstrating the volatility of the findings depending on the analysed period of time, the selected variables and even the methodology used.

Since then, several Research papers for African destinations have proven the TLG hypothesis for Jordan (Kreishan, 2010) South Africa (Akinboade & Braimoh, 2010) and Kenya (Obadiah et al., 2012). Although Belloumi (2010) found evidence of Tourism-

Led Growth in Tunisia, Cortés-Jimenez et al. (2011) rejected it while validating the TKIG[2] hypothesis in the short run.

Tourism-Led Growth has also been confirmed for several American countries like Chile (Gardella & Aguayo, 2002), Uruguay (Brida et al., 2008a), Mexico (Brida et al. 2008b), Colombia (Brida et al., 2009) and Jamaica (Amaghionyeodiwe, 2012). This theory has been discarded for USA by Tang & Jan (2009), who found signs of causality from economic development towards tourism.

Within the Asia-Pacific region, TLG has been approved for India (Mishra et al., 2010), Pakistan (Malik et al., 2010; Hye & Khan, 2013), Singapore (Katircioglu, 2011), Sri Lanka (Srinivasan et al., 2012; Jayathilake, 2013), Lebanon (Tang & Abosedra, 2013), among others. There are some countries for which the TLG hypothesis has been declined, like Fiji (Narayan, 2004) and Korea (Oh, 2005). However, results from the work by Cheng & Chiou-Wei (2009) suggest bidirectional causality between tourism and economic growth in Korea. These same authors also found indications of Tourism-Led Growth for the case of Taiwan in that same research paper despite the fact that Kim et al. (2006) and Lee & Chien (2008) had previously detected causality between tourism and economy in both directions.

In the context of Asian countries, Malaysia has been one of the most analysed destinations and the results have been heterogeneous. Lean & Tang (2010) came to the conclusion that TLG hypothesis could be confirmed for that country. The research made by Kadir & Jusoff (2010) suggested that tourism in Malaysia is caused by diverse variables such as exportations, importations and total trade. More recently, Tang (2011) carried out an investigation in which he attempted to test the TLG hypothesis in Malaysia based on a database of twelve tourism markets from which Malaysia receives tourists. Even though the results showed cointegration between international arrivals and economic development for all twelve countries, only five of them were proved to contribute to the economic growth in the long run and just six of them did it in the short run according to the Granger causality test. This demonstrated that not all tourism markets enrich economic development with the same intensity.

Tourism-Led Growth in Europe

Due to the fact that the present document is aimed to test the TLG hypothesis in Spain, it is more interesting to review what has been written about the European countries within this specific literature, since those countries are more likely to have certain common aspects with Spain.

One of the most investigated countries up to date with regard to the Tourism-Led Growth conjecture and whose characteristics are similar to those from Spain is Turkey. The results derived from the research papers have been discordant in general. There has been found evidence of causality from tourism towards economic development (Gunduz & Hatemi-J, 2005; Kaplan & Çelik, 2008; Zortuk, 2009; Husein & Kara, 2011;

[2] The TKIG (Tourism - capital import - growth) hypothesis was first introduced by Nowak, Cortés-Jiménez & Sahli (2007) for the case of Spain. This hypothesis is used to corroborate an indirect tourism-led growth by means of capital imports financed by tourism receipts.

Arslanturk & Atan, 2012), of bidirectional causality (Demiröz & Ongan, 2005) and of absence of causality as well (Katircioglu, 2009a).

There is also a lack of consensus in relation to the results obtained for the case of Greece, which is also a similar country to Spain. On one hand, Dristakis (2004) found long run bidirectional causality between tourist expansion and economic growth. On the other hand, Eeckels et al. (2012) validated the unidirectional causality from tourism to economic development in the short run. This disparity in the results might be due to the fact that the latter authors analysed the cycles of those variables instead of their long term trends.

Something quite similar has happened among the researched made for Cyprus. Causality from economic development towards tourism expansion has been encountered for this country (Katircioglu, 2009b). However, Louca (2006) detected indications of bidirectional causality between tourism and a number of variables related to the supply-side expenditure. The author used international tourism receipts and international arrivals as indicators of the tourist activity and the results showed two-way causality with marketing expenditure and with expenditures in hotels and restaurants.

Even more interesting is the case of Italy, due to its proximity to Spain and the similarities that these two countries share. In fact, Cortés-Jiménez (2010), Cortés-Jiménez & Pulina (2010) and Cortés-Jiménez et al. (2010) scrutinized both countries together.

On one hand, Cortés-Jiménez (2010) attempted to assess TLG hypotheses within different regions; namely, coastal, internal and Mediterranean regions. In order to accomplish that task, the author made use not only of international arrivals, but also of domestic tourism data. The outcome corroborated causality from international tourism towards economic development in coastal and Mediterranean regions while domestic tourism was proved to be influential in every region. On the other hand, Cortés-Jiménez & Pulina (2010) evaluated the TLG hypotheses for Italy and Spain, leading to the conclusion that there exist bidirectional relationships between economic growth and tourism expansion in Spain while in the case of Italy the relationship was unidirectional from tourism to economic growth. Bidirectional causality between tourism and economic development in Italy was later found by Cortés-Jiménez et al. (2010), one of the differences with respect to the previous work being the addition of a new variable concerning exports of goods. The latter result was later corroborated by Massidda & Mattana (2013), who also found bidirectional causality between tourism and economic growth when applying the hypothesis within the context of a trade, tourism and growth triangle of relationships.

The case of Spain

Spain is considered to be the paradigm of economic development supported by a strong tourism expansion by many authors. Following UNWTO (2013) data, Spain is fourth in the international arrivals ranking and is the second most popular destination just below the USA. Thus, tourism in Spain has been studied in multiple occasions.

Analyses of the international tourism demand were developed long time ago by many authors and with different objectives. Perhaps the most common aim back then was to identify the trend of the tourism demand in Spain and to develop reliable predictions for the number of tourist arrivals or the amount of international receipts. In that regard, González & Moral (1995) employed data concerning international tourism receipts and two price indexes, one related to client countries and the other one related to competitor countries. By means of STSS and ARIMA forecasting methods, high elasticity between international tourism demand and relative prices was found. However, the utility and the appropriateness of the variables and methodologies used within that research was later questioned (García-Ferrer & Queralt, 1997; Young & Pedregal, 1997).

Nevertheless, it was not until the formulation of the Tourism-Led Growth hypothesis when investigations in the field of tourism reached a breaking point. Balaguer & Cantavella-Jordá (2002) developed the Tourism-Led Growth hypothesis when examining the relationship between tourism and economic development in Spain for a time period from the first quarter of 1975 to the first quarter of 1997. In order to do so, they made use of data concerning the Spanish GDP, international tourism receipts and effective exchange rate as a proxy of external competitiveness. By means of Johansen's cointegration test and Granger's causality test, the results confirmed that tourism caused a positive impact in the economic development in the long run. In that article, the authors ensure that, unlike the traditional ELG hypothesis, the TLG hypothesis is not exclusive for developing countries. Besides the aforementioned research works for countries all over the world, there exist a number of investigations aimed to apply this theory in Spain.

Nowak et al. (2007) made a contribution to the understanding of the interactions between tourism and economy in Spain with the addition of capital-goods imports as a new variable for the analysis, which allowed testing not only the Tourism-Led Growth hypothesis, but also the possibility that tourism income might finance capital-goods imports (i.e. the TKIG hypothesis), which in the end turns in an enhancement of the Spanish economy. In their model, the authors employed annual data for the period from 1960 to 2003 of the GDP, real tourism exports and real manufactured-items imports. By means of a multivariate Granger test based on a VECM, the results confirmed both theories.

While those two works identified causality from tourism towards economic growth, a bidirectional relationship between these variables has also been detected after another application of the methodology proposed for testing the TLG hypothesis (Cortés-Jimenez & Pulina, 2010) and also when testing TLG together with ELG (Cortés-Jiménez et al, 2010). The aim of this paper is to make a contribution with respect to the Tourism-Led Growth issue for the case of Spain by adding another econometric technique to identify potential structural breaks[3] within the selected time series, which should help to test TLG consistence within smaller sub-periods.

[3] To the best of our knowledge, Lee & Chien (2008) were the first authors to consider structural breaks in the relationship between tourism and economic growth –for the case of Taiwan-. Instability in the causalities between those variables motivated by structural breaks was found.

Tourism and business cycles

Although awareness of the presence of cyclical movements in tourism demand has long existed, not many authors have tried to analyse them properly in order to identify potential break points or trend changes leading to causality shifts between tourism and other variables like economic growth.

It is understandable why there is a lack of literature investigating that particular element of the tourism conjuncture, for it is complicated to identify tourism cycles due to two major aspects. Firstly, the existence of different irregularities and structural changes, such as modifications in working hours, technological advances, infrastructure enhancements or even significant events that might cause tourism flow to change dramatically within a certain period of time. Secondly, business cycles can make impacts on the destination chosen by tourists in either direction, meaning that economic recessions can provide price advantages for certain destination countries over their competitors (Guizzardi & Mazzocchi, 2010).

In spite of those difficulties, some authors have used the cyclical component of tourism income as the basis for short-run forecasting, mainly with the aim of predicting the tourism demand for a country. To the best of our knowledge, short-run tourism demand predictions for Spain were first made by González and Moral (1996) and García-Ferrer and Queralt (1997). Nonetheless, the Tourism-Led Growth hypothesis has not been tested for Spain using the cyclical components to detect short-run causalities. In fact, the use of cyclical components when testing the TLG hypothesis is quite unusual; hence the lack of research studies focusing on the causality between tourism and economic growth in the short-run despite the fact that this hypothesis has been tested multiple times for several countries.

Perhaps the prime example of the use of cyclical components when testing the TLG hypothesis is the investigation developed by Eeckels et al. (2012) for the case of Greece. The authors explain they decided to use cyclical components in order to identify the short-run relationship between the economic output and the tourist activity.

The cyclical component of a time series provide evidence of periodic fluctuations around the long-run trend, which means they can be used to detect short-run stages that may be hiding additional information which cannot be appreciated if only the trend is studied. Since the aim of this paper is to add a different point of view to the TLG testing by making use of structural breaks along the selected time series, it is necessary to isolate their cyclical components.

2. Data

According to Gunduz & Hatemi (2005), there are three main variables which may be used to estimate tourism flows. Perhaps the most commonly used are the international tourism receipts, which represent the amount of income originating from foreign visitors. Although this indicator has been used by many authors within the field of the TLG application, some multicolinearity problems caused by this variable have been reported, namely in Turkey (Gunduz & Hatemi, 2005; Katircioglu, 2009a). The volume

of tourism can also be estimated through international tourist arrivals or through the number of nights spent by visitors from abroad. These two have the advantage of not being monetary measures, thus helping to avoid any casual multicolinearity issue.

The selected variable to use as proxy for the tourism activity in Spain is the number of nights spent at Spanish touristic accommodation because of two main reasons. First, the time series of number of nights spent considers the length of the stay (Garín-Muñoz & Pérez-Amaral, 2000). The second reason refers to length availability problems concerning international tourism receipts and international tourist arrivals. Moreover, the utilization of the number of nights spent allows to distinguish nights spent by foreign visitors and nights spent by domestic tourists, which may be an interesting aspect for the analysis, since major differences might exist between foreign and domestic tourism concerning the contribution to the economic growth.

Due to the fact that the Tourism-Led Growth hypothesis is supposed to provide relationships between tourism and economic development, real gross domestic product will be used as an indicator for the economic growth.

The number of nights spent is expressed in thousands of units and has been obtained from the INE[4]. The source of the GDP data is the OECD and REMSDB[5], the variable being expressed in millions of 2008 euros. Both time series have quarterly periodicity and are available from 1980QI to 2013QIII.

3. Empirical results

Although the common methodology[6] for testing the Tourism-Led Growth hypothesis consists of integration analysis, cointegration tests and causality detection; in this paper some different econometric techniques are implemented.

Firstly, co-movements between the number of nights spent (by foreign visitors, domestic tourists and total nights spent) and the output (GDP) are calculated. After the bivariate correlations have been shown, the process will continue by analysing the potential causality between those variables by means of the Granger causality test supported by a VAR structure model for the whole sample. Thirdly, the potential existence of structural breaks in cyclical relationships at different moments is tested.

Bivariate Correlations

To start with the econometric analysis, the co-movements between total nights spent, nights spent by foreign tourists and nights spent by domestic tourists will be estimated. Correlations coefficients *cor(k),*$k \in \{0, \pm 1, \pm 2, \pm 3, \pm 4\}$, can be used to identify the different degrees of the co-movements between each couple of variables (Burns &

[4] INE: *Instituto Nacional de Estadística*. National Statistics Institute.

[5] REMSDB is the quarterly database of the Spanish economy, developed by the Spanish Government. It is available at the *Secretaría de Estado de Presupuestos y Gastos* (Spanish Government) website: http://www.sepg.pap.minhap.gob.es/

[6] See Table 1 for a classification of different research papers on Tourism-Led Growth testing by methodology, data and variables used.

Mitchell, 1946). Hodrick-Prescott filter has been applied to de-trend the time series as is usual within the business cycle literature.

Table 2 shows estimated correlation coefficients considering as many as four leads and lags between the output ($Y_t - Y_t^*$) and the tourism variables ($T_{t+k} - T_{t+k}^*$). For a better understanding of the attached correlations table, it is important to clarify certain aspects. The contemporaneous coefficient, c*or(0),* measures the contemporaneous co-movement between the output and each one of the variables representing the nights spent. If *cor(0)* equals zero, then no contemporaneous co-movement would exist between two variables. C*or(k)* are the cross-correlation coefficients and represent the level of co-movement that exist between a variable with respect to another variable in a different period of time. That is, if the *cor(t+k)* is big enough, then it can be considered that the series lags the cycle with *k* periods of difference. Similarly, a large number in *cor(t-k)* would indicate that the series leads the cycle with *k* periods of time in advance. While not only one of the correlation coefficients has to be distinct to zero, it is the largest coefficient -in absolute value- which will be taken as relevant.

Therefore, it can be stated that cycles from total nights spent are more significantly related to the economic cycle with two quarters in advance in a positive way, just like the cycles from nights spent by domestic tourists. On the other hand, cycles from nights spent by foreign tourists seem to be more relevant for the output cycle with four lags. Plus, the latter exhibits a negative relationship with the output cycle, unlike what happens with the other two tourism variables. This indicates counter-cyclicality from nights spent by foreign visitors to the output, which might differ from what intuition could tell.

Table 2. Correlation between tourism cycles and the output cycle at different leads and lags (Hodrick-Prescott filter)

$T_{t+k} - T_{t+k}^*$	$cor(Y_t - Y_t^*, T_{t+k} - T_{t+k}^*)$								
	-4	-3	-2	-1	0	1	2	3	4
Total nights spent	0.177	0.236	**0.261**	0.242	0.206	0.120	0.041	-0.071	-0.128
Nights spent by foreign tourists	0.097	0.150	0.157	0.141	0.139	0.041	-0.030	-0.138	**-0.195**
Nights spent by domestic tourists	0.255	0.295	**0.370**	0.344	0.260	0.239	0.207	0.133	0.101

Granger Causality Tests

As in the majority of the research papers dedicated to test the Tourism-Led Growth hypothesis, the potential causality between tourism and economic growth will be tested by means of the causality test proposed by Granger (1969).

Due to the distinction made between total nights spent, nights spent by foreign visitors and nights spent by domestic visitors, three different Granger causality tests will be run by means of VAR models, which can be expressed as follows:

$$\begin{pmatrix} Y_t - Y_t^* \\ T_t^T - T_t^{T*} \end{pmatrix} = \sum_{i=1}^{p} \phi_i \begin{pmatrix} Y_{t-i} - Y_{t-i}^* \\ T_{t-i}^T - T_{t-i}^{T*} \end{pmatrix} + \varepsilon_i$$

$$\begin{pmatrix} Y_t - Y_t^* \\ T_t^F - T_t^{F*} \end{pmatrix} = \sum_{i=1}^{p} \varphi_i \begin{pmatrix} Y_{t-i} - Y_{t-i}^* \\ T_{t-i}^F - T_{t-i}^{F*} \end{pmatrix} + \upsilon_i$$

$$\begin{pmatrix} Y_t - Y_t^* \\ T_t^D - T_t^{D*} \end{pmatrix} = \sum_{i=1}^{p} \psi_i \begin{pmatrix} Y_{t-i} - Y_{t-i}^* \\ T_{t-i}^D - T_{t-i}^{D*} \end{pmatrix} + \omega_i$$

The difference $Y_t - Y_t^*$ represents the Hodrick-Prescott filtered cycle of the output. $T_t^T - T_t^{T*}$denotes the same but for the total nights spent, $T_t^F - T_t^{F*}$ for the nights spent by foreign visitors and $T_t^D - T_t^{D*}$ for the nights spent by domestic tourists. ϕ_i, φ_i and ψ_i are matrices of coefficients while ε_i, υ_i and ω_i represent the errors caused by irregular components and omitted variables.

With regard to the optimal lag length criteria, the Schwarz information criteria has been followed for all three systems above, indicating that the optimal lag length of the VAR is one for all of them.

The results of these preliminary Granger causality tests can be observed in Table 3. In Granger causality test, the null hypothesis is based on the absence of causality between a pair of variables. *P-values* under 0.10, 0.05 or 0.01 are considered to indicate that the null hypothesis can be rejected with a significance level of 90%, 95% or 99% respectively. As can be seen on Table 3, the only causality relationship that cannot be rejected at conventional levels of significance is the one happening from nights spent by domestic tourists towards economic growth.

The fact that no causality is detected from nights spent by foreign visitors and total nights spent towards the output does not seem to concur with previous works dedicated to test the TLG hypothesis in Spain, where either unidirectional causality from tourism to economic growth (Balaguer & Cantavella-Jordá, 2002; Nowak et al., 2007) or bidirectional relationship between them (Cortés-Jiménez & Pulina, 2010; Cortés-Jiménez et al., 2010) was found. While this incident might be caused by manifold factors such as the employment of different variables, the potential existence of structural changes could be concealing deeper findings that may be totally different from what these results show. Moreover, it is pertinent to highlight the fact that cyclical components have been used in this paper instead of long term trends of the data, which may also be causing these results to be different from previous works.

Table 3. Granger causality tests between tourism cycle and nights spent by total number of tourists, foreign tourists and domestic tourists.

Null hypothesis	***p*-value**
$Y_t - Y_t^* \not\rightarrow T_t^T - T_t^{T*}$	0.739
$T_t^T - T_t^{T*} \not\rightarrow Y_t - Y_t^*$	0.128
$Y_t - Y_t^* \not\rightarrow T_t^F - T_t^{F*}$	0.332
$T_t^F - T_t^{F*} \not\rightarrow Y_t - Y_t^*$	0.593
$Y_t - Y_t^* \not\rightarrow T_t^D - T_t^{D*}$	0.122
$T_t^D - T_t^{D*} \not\rightarrow Y_t - Y_t^*$	**0.003**

Note: Significant *p*-values for F-test are in boldface. Similar results obtained for Wald tests.

Causality considering structural breaks

Due to the aforementioned incongruous results and taking into account that the analysed period of time is quite long, it seems appropriate to identify potential structural breaks to test the consistency of the previous results and to detect possible causality changes between the studied variables.

In the case that no structural breaks were found, then there would be no reason to consider the outcomes above to be wrong, despite the discrepancy with results from previous investigations. Nonetheless, if one or more structural breaks existed, then causalities would need to be recalculated in order to overcome possible bias caused by their existence.

The procedure used for checking for potential structural breaks in this paper is based on the methodology developed by Bai and Perron (1998. 2003a, 2003b), which consists on a chain of tests where the first one tests the absence of structural breaks against the existence of at least one break. When the null hypothesis is rejected the next step is to find out how many breaks exist. In order to accomplish such task a second set of tests is run where the null hypothesis of no breaks is matched up with the presence of an integer number of *l* breaks. In the case that null hypothesis is rejected at least once, then a final set of tests is executed to contrast the existence of *l* breaks against the existence of *l+1* breaks until the null hypothesis cannot be rejected anymore, thus leading to identify both the number of breaks and the exact points where they take place.

Tables 5a, 5b and 5c (see Appendix) show the exact number of structural breaks that exist in the three relationships that are being studied and the precise break points where those breaks happen. In the case of the relationship between the total number of nights spent and the output cycle, the execution of the Bai-Perron methodology has led to identify two structural breaks taking place at the fourth quarter of 1994 and at the fourth quarter of 1999. Three breaks were detected for the relationship with the number of nights spent by foreign tourists, meaning four sub-periods can be distinguished. The first two breakpoints are exactly the same as in the case of the total number of nights spent, which seems logical if we consider the fact that the number of nights spent by foreign visitors represents 60% of the total as an average. The third structural break appears at the third quarter of 2008, probably motivated by the financial crisis that started by that year. Lastly, one structural break was discovered for the relationship between the output cycle and the nights spent by domestic tourist happening at the last quarter of 1986.

Tables 4a, 4b and 4c show the different sub-periods for each relationship as well as the *p-values* of every Granger causality test run. The three previous systems have been recalculated for the new sub-periods and the results can be seen on those three tables.

Taking a look at Table 4a it is possible to observe the three new sub-periods for the total nights spent and output relationship and the *p-values* for the respective Granger causality test. The first row exhibits the existence of causality from the economic growth cycle towards the cycle of the number of total nights spent at Spanish accommodations in the first sub-period and in the third one. The second row shows results for the reverse causality between these variables, indicating causality running

from total nights spent to the output since 1995Q1. These results confirm the existence of Tourism-Led Growth but only since 1995, which might contradict previous results, especially those from Balaguer & Cantavella-Jordá (2002), who approved the TLG hypothesis from 1975 to 1997. Furthermore, the causality appears to be bidirectional since the year 2000.

Although results in Table 4a can be accepted as a contribution to the TLG testing within Spain, the aim of this research paper is to go a step further by differentiating the influence of domestic tourism and international tourism since it might help to better understand the influence that the tourist activity causes on the Spanish economy. In consequence, it is interesting to examine what Table 4b and Table 4c exhibit.

Table 4b provides the Granger causality tests between the foreign tourism cycle and the output cycle within the four new sub-periods for this relationship. Observing the *p-values* it is easy to see that the results imply causality from economic growth to the entrance of foreign visitors for the whole sample except for the second sub-period -1995Q1 to 1999Q4-. On the other hand, evidence of causality from international tourism towards economic growth is detected since the beginning of 1995, but not earlier. There seems to be bidirectional causality during the last sub-period, that is, from the first quarter of 2000 to the third quarter of 2013.

Finally, Table 4c contains the causality tests run for the relationship between domestic tourism cycles and output cycles for the sub-periods that were detected previously. The results seem to show bidirectional causality between these two variables since 1987. However, no evidence of causality in any direction is detected for the first sub-period.

Table 4a. Granger causality tests between the cycles of the output and the total number of nights spent in different sub-periods.

Null hypothesis	**Sub-period 1 1980(I)-1994(IV)**	**Sub-period 2 1995(I)-1999(IV)**	**Sub-period 3 2000(I)-2013(III)**
	p-value	*p*-value	*p*-value
$Y_t - Y_t^* \not\rightarrow T_t^T - T_t^{T*}$	**0.054**	0.147	**0.011**
$T_t^T - T_t^{T*} \not\rightarrow Y_t - Y_t^*$	0.171	**0.099**	**0.004**

Note: Significant *p*-values in bold

Table 4b. Granger causality tests between the cycles of the output and the number of nights spent by foreign tourists in different sub-periods.

Null hypothesis	**Sub-period 1 1980(I)-1994(IV)**	**Sub-period 2 1995(I)-1999(IV)**	**Sub-period 3 2000(I)-2008(III)**	**Sub-period 4 2008(IV)-2013(III)**
	p-value	*p*-value	*p*-value	*p*-value
$Y_t - Y_t^* \not\rightarrow T_t^F - T_t^{F*}$	**0.016**	0.281	**0.020**	**0.056**
$T_t^F - T_t^{F*} \not\rightarrow Y_t - Y_t^*$	0.126	**0.058**	**0.073**	**0.003**

Note: Significant *p*-values in bold

Table 4c. Granger causality tests between the cycles of the output and the number of nights spent by domestic tourists in different sub-periods.

Null hypothesis	Sub-period 1 1980(I)-1986(IV)	Sub-period 2 1987(I)-2013(III)
	p-value	*p*-value
$Y_t - Y_t^* \not\rightarrow T_t^D - T_t^{D*}$	0.320	**0.093**
$T_t^D - T_t^{D*} \not\rightarrow Y_t - Y_t^*$	0.246	**0.005**

Note: Significant *p*-values in bold

4. Conclusions

In general terms, the results obtained within this paper indicate three different stages in the relationship between the economic growth and the tourist activity in Spain from the first quarter of 1980 to the third quarter of 2012. The main breaks seem to take place at the end of 1994 and at the end of 1999. First, results show that Spanish inner economic development was a crucial factor for foreign tourists to visit the country, which can be understood as a tourism specialization stage. From 1995 to the end of 1999 it is the tourist conjunction which acts as an engine of the economic growth in Spain. Therefore, the results suggest that the relationship between these two variables can be likened to a sowing and reaping process in which Spain collected the benefits of having invested in tourism specialization during many years -before the first structural break-. From 2000 onwards there exists causality on both directions meaning the influence between the economic growth and the tourism development is reciprocal.

In addition, there are two other structural breaks that need to be considered, one affecting the nights spent by foreign visitors only and the other one affecting just the nights spent by domestic tourists.

In relation to the domestic tourists, the structural break indicates that prior to 1987 there was no causality between the nights spent by these tourists and the economic growth in any sense. However, after 1987 there is a bidirectional causality relationship. This fact may well respond to bigger purchase power after the inner development of the country during the ‘80s as well as to a slow but progressive mentality change in the society after the end of the dictatorship, which led people to consider tourism as a relevant option to spend their holidays and their leisure time, thus contributing to the economic expansion at the same time.

The case of the international tourists is more interesting since it perfectly matches the evolution of the relationship between the output and the total tourist activity. Additionally, there exists another structural break for the relationship with the foreign visitors exclusively, coinciding with the inception of the global financial crisis. Nonetheless, the existence of that last structural break does not seem to result in changes on the causality relationship, since it keeps being bidirectional.

After a brief look at the results, two main questions arise: Why does the causality changes in 1995 and why is the relationship bidirectional since 2000? A retrospective view of the Spanish economic situation and its tourist conjuncture within that period of time might shed light on this topic.

Back in the late ‘70s, Spain observed how the number of foreign tourists visiting the country decreased dramatically probably due to a combination of both external factors like the oil crisis in 1973 or the energy crisis in 1979 and internal factors such as the end of the dictatorship, the birth of an emerging democracy, a new constitution, a coup d´état and some other inner instabilities that were likely to turn Spain into a less appealing destination. The ‘80s decade was full of political measures in matters of tourism protection and promotion as well as the integration of Spain in the European Union –in 1986-. Plus, relevant support to the tourist development took place during that decade, for example through foreign direct investment and through grants and subsidies for reformation and expansion of tourist establishments from the government. It was, then, a modernization and expansion stage of the tourist activity within the country. Moreover, there were two major events which took place in 1992: the Expo in Seville and the Olympic Games in Barcelona. Besides, the famous construction boom also motivated a fast economic growth in the country, which also had an impact on the construction of infrastructures like airports, roads and motorways, among others. Last but not least, there were additional political measures on the subject of tourism targeting competitiveness improvements, the prime example being the first policy framework plan for Spanish tourism competitiveness (1992-95), which settled down the bases for the modernization of the tourist supply in Spain, and which was later continued with a second framework plan in 1996.

It seems feasible to think that all the aforementioned facts helped to position Spain as one of the most attractive tourism destination by the decade of the 1990s, which in the end resulted in increasing numbers of foreign visitors –also thanks to the free movement of persons and capital within the EU country members-, who now were determined to spend more money due to the better quality and conditions within the country –many of them even decided to buy houses for their holidays, thus contributing to the construction boom that was happening in Spain by that time-. Therefore, the tourist sector became highly relevant for the Spanish economy, helping to create countless jobs, which in the end resulted in higher purchase power for local inhabitants as well, thus contributing to the inner development of the country. This might explain why there is evidence of Tourism-Led Growth between 1995 and the beginning of the new millennium.

After a brief breather, the Spanish government developed a new integral plan of Spanish tourism quality. The aim was then to increase the quality standards within the country in terms of infrastructure and global service. This might have resulted in higher influence from economic development towards tourist inflows, which in combination with the relevance of the tourist activity for the economic growth in Spain explains the bidirectional causality during this last stage.

Recommendation for future research

Despite the hard research process, some limitations need to be pointed. Firstly, a similar investigation using longer data would have been of interest in order to identify previous structural breaks in earlier decades. Moreover, it would be appropriate to follow the same procedure that has been applied through the present document

incorporating new variables such as tourism income or tourism arrivals to test the consistency of the results. In that regard, the structural break happening in 2008 should be reexamined with those other variables to test whether the financial crisis made an impact on the causality relationship between economic growth and tourism in Spain, since it is possible that the number of nights spent does not help to detect further effects.

Appendix

Table 5a. Bai-Perron tests of multiple structural changes in the relationship between the total number of nights spent and the output cycle.

Statistics						
UDmax	*WDmax*	$SupF_t(1)$	$SupF_t(2)$	$SupF_t(3)$	$SupF_t(4)$	$SupF_t(5)$
41.891***	52.727***	41.891***	25.489***	17.430***	13.071***	21.065***
$SupF_t(2/1)$	$SupF_t(3/2)$	$SupF_t(4/3)$	$SupF_t(5/4)$			
10.974**	3.394	2.343	0.000			
Break dates estimates						
T_1	1994:4	[1994:1-1998:4]				
T_2	1999:4	[1997:3-2000:2]				

Notes: *,**,and *** denote significance at the 10%, 5% and 1% levels, respectively. The critical values are taken from Bai and Perron (1998), Tables 1 and 2; and from Bai and Perron (2003b), Tables 1 and 2. The number of breaks has been determined according to the sequential procedure of Bai and Perron (1998), at the 1% size for the sequential test. 90% confidence intervals for T_1 in square brackets.

Table 5b. Bai-Perron tests of multiple structural changes in the relationship between the output cycle and the number of nights spent by foreign tourists.

Statistics						
UDmax	*WDmax*	$SupF_t(1)$	$SupF_t(2)$	$SupF_t(3)$	$SupF_t(4)$	$SupF_t(5)$
70.289***	73.818***	70.289***	37.952***	25.683***	22.694***	29.491***
$SupF_t(2/1)$	$SupF_t(3/2)$	$SupF_t(4/3)$	$SupF_t(5/4)$			
11.353***	11.353**	11.353*	0.000			
Break dates estimates						
T_1	1994:4	[1994:1-1997:4]				
T_2	1999:4	[1998:4-2000:1]				
T_3	2008:3	[2007:1-2011:4]				

Notes: As in table 5a.

Table 5c. Bai-Perron tests of multiple structural changes in the relationship between the output cycle and the number of nights spent by domestic tourists.

Statistics						
UDmax	*WDmax*	$SupF_t(1)$	$SupF_t(2)$	$SupF_t(3)$	$SupF_t(4)$	$SupF_t(5)$
25.970***	25.970***	25.970***	10.906***	12.202***	7.554***	6.453***
$SupF_t(2/1)$	$SupF_t(3/2)$	$SupF_t(4/3)$	$SupF_t(5/4)$			
2.171	4.707	0.739	0.000			
Break dates estimates						
T_1	1986:4	[1985:1-1987:3]				

Notes: As in table 5a.

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