An analysis of the stability of rural tourism as a desired condition for sustainable tourism.

Abstract

Tourism is a key sector in the sustainable development of rural environments. Its ability to create stable employment and an acceptable level of profits is conditioned by the stability of tourist activity throughout the year. This paper compares the level of seasonality of a group of rural destinations to that of coastal and urban destinations. By doing so, we intend to determine whether seasonality-related problems exist in the rural environment or not. The second aim is related to the first one: the proposal of a new, more comprehensive and objective methodology that can measure the intensity of seasonality based on a DP2 synthetic indicator. The DP2 indicator groups information about different representative variables of seasonality. The study takes the main tourist spots in Spain as a reference. The analysis concludes that the annual level of stability of rural tourism is not far from the stability of urban tourism, which is the most stable, as seasonality is much higher in coastal destinations. The methodology that provides the framework to build the DP2 indicator has allowed us to identify which variables explain the differences in the level of seasonality of each destination to a large extent. The results showed that the variables that do so are related to the internalization of the destination and changes in the availability of bed places.

Key words: rural tourism; economic sustainability; seasonality; sustainable development; index; Spain.

1. Introduction

When dealing with the concept of sustainable tourism we must first take into consideration a broader concept, that is, sustainable development. This concept refers to the capability of productive activities to satisfy the necessities of today without compromising the possibilities of future generations (United Nations, 1987). The World Tourism Organization indicates that sustainable tourism models must meet the necessities of both the recipient region and current tourists. At the same time, they must also protect the resources on which said activities rely, given that doing so will secure future opportunities ((World Tourism Organization, 1993). In this sense, the tourism industry is

acknowledged as having the potential to act as a social and economic tool for development, while balancing social, economic and environmental interests - even when said balance is not automatic or assured (Ivars, 2004; Park et al., 2012).

The outcome of tourism in the area that encompasses the destination is subject to several factors. The complex interactions generated by tourist activity in the environment where it is developed result in so-called tourism impacts (Mathieson & Wall, 1982), which can either be positive or negative (Yoon, 1999). These impacts are usually classified into three categories: economic, environmental, and sociocultural (Fennell, 2007). The development of tourist activity may generate positive effects such as job creation (Andereck & Nyaupane, 2011), improvement in the locals' quality of life, improvement in the public image of the region, preservation of cultural heritage, and even the development of the business network (Andereck et al., 2005). Other effects described previously include an increase in the opportunities for the locals to enjoy leisure time, a better valuation of the natural environment, improvements related to public transportation and facilities, and cultural interaction, among others (Almeida et al., 2016). On the other hand, negative effects include: overcrowding of public spaces and facilities, disruption of the locals' lifestyle, an increase in property prices, security concerns, environmental damage, an increase in waste-production and an intensive use of resources (Almeida et al., 2016). The intensity and origin of the negative impacts depend on different factors that condition the sustainability of tourism not only from an environmental perspective, but also from a social and economic perspective. The result of the assessment of tourism impacts is greatly dependent upon two characteristics of the activity that is being developed: the total number of tourist arrivals and the degree of concentration of tourists at certain times of the year (Martin et al., 2017, 2018a). Therefore, seasonality is understood to be one of the factors conditioning the degree of sustainability of tourist activity. The World Tourism Organization contemplates seasonality as one of the seven dimensions of tourism sustainability (UNWTO, 2004), namely: leakages, tourism seasonality, tourism as a contributor to nature conservation, community and destination economic benefits, competitiveness of tourism businesses and the alleviation of poverty (Hanquin, 2018). Seasonal fluctuations are considered by numerous authors as a key factor of business sustainability (Shen et al., 2017, Altinay, 2000). One of the factors that influence the sustainability of the destination to a large extent is, precisely, exceeding the carrying capacity. A situation quite common during the peak season of highly seasonal destinations (Hanquin, 2018). Rural destinations must face the challenges that are

partially responsible for seasonality, such as the lack of trained professionals or their capacity to make up for valley seasons with the earnings obtained during the rest of the year (Ribeiro, 2002; Martin, 2018b).

Seasonality affects a number of sectors, although tourism might be affected to a larger extent by it (Cisneros & Fernandez, 2015). There is not a widely accepted definition of tourism seasonality. However, we will visit Butler's (1994:332) "a temporal imbalance in the phenomenon of tourism, [which] may be expressed in terms of dimensions of such elements as numbers of visitors, expenditure of visitors, traffic on highways and other forms of transportation, employment, and admissions to attractions". Seasonality is considered one of the biggest challenges for tourism given that it jeopardizes sustainable development (Koenig-Lewis & Bischoff, 2005). From an environmental point of view, seasonality increases the pressure on the environment by concentrating the flow of demand during the peak season. On the other hand, during valley seasons, there is a loss of business profits and the continuity of employment contracts is interrupted, among other effects. As Martin et al. (2017:1693) argue, "a low degree of seasonality is a necessary or desirable condition, at least, since a steady flow of annual income, activity and employment is needed to position tourism as a real development alternative". Several authors share this point of view, for instance, Brida et al., (2011: 365), state that "Many economic activities are highly dependent on tourism and are at risk because the high seasonality of the tourist destination does not allow continuity in commercial and economic operations during the whole year". This will especially affect destinations with a weak production structure, since said destinations are more vulnerable to the fluctuations of demand (Kastenholz & Lopes de Almeida, 2008), as in the particular case of rural areas. In actual fact, public administrators consider seasonality to be a huge problem, particularly in view of the fall in revenue, the reduction in investment, unemployment, etc. (Candela & Castellani, 2009).

Academic literature on seasonality is extensive, although limited when it comes to rural tourism or destinations far from urban areas (Goulding, 2006; Martin, 2017). Some authors have pointed out the need to continue studying this very important phenomenon that conditions tourism development and job opportunities for local workers. For example, Koenig-Lewis and Bischoff (2005: 201), indicate that "considerable gaps still exist in published research in this area and argue that the field lacks a sound theoretical framework. They also suggest that "adopting a more exacting quantitative perspective might facilitate and accelerate progress". Likewise, Higham and

Hinch (2002: 176) argue that "seasonality is one of the most prominent features of tourism, yet, paradoxically, it is also one of the least understood". This paper addresses said research gaps by raising consciousness about tourism seasonality in rural environments and by offering a more comprehensive and objective methodology of analysis. The aim of this study is not to analyse the factors causing tourism seasonality or its effects, but to determine the annual level of stability of rural tourism comparatively with the aid of a set of indicators that offer a complete image.

In relation to the systems that measure tourism seasonality, the necessity for improvements is, as stated above, evident. It is noted that the variables used to measure seasonality are varied and have different natures. Thus, as Martin et al. (2014) suggest, the variable used to measure seasonality will condition any ranking of destinations and even, the conclusions. Given that this paper intends to compare seasonality levels between different destinations, we propose a system capable of gathering information from several descriptive variables to offer a ranking that overcomes the aforementioned limitations. The second contribution of the study comes from the methodology that was used. It is based on a synthetic indicator that groups information from several descriptive variables of seasonality. This paper intends to improve these suggestions and to do so, it makes use of the DP2 synthetic indicator proposed by Pena (1977), which allows for the measurement of disparities between regions. The advantage of this indicator is that it solves problems related to the arbitrary weighting of variables and the duplication of information (Zarzosa, 1996; Somarriba & Pena, 2008).

This study intends to answer the following questions: do rural destinations suffer from a higher level of seasonality in comparison to other types of destination? Which variables condition the different levels of seasonality? This paper analyses the annual stability of tourist activity developed in rural destinations while comparing it to urban and coastal destinations. It begins with the idea that annual stability is a desired condition to guarantee the sustainable development of any economic activity, such as tourism. Tourism is a key factor for the economic development of Spain, a country with a heterogeneous tourist product. The area of analysis covers the main tourist spots in Spain. Spanish tourist destinations have diversified their offer because of the growing tourist demand for new experiences (Ruiz et al, 2018). Tourist destinations are moving towards greater specialization, aiming to attract a significant market share (Lobo et al., 2018).

2. Sustainability in rural tourism, with a particular focus on the effects of seasonality

For some years now, activity linked to rural tourism has been increasing in numerous countries, becoming a fully realized activity instead of a secondary one (Busby & Rendle, 2000). In areas where economic activities are in decline, tourism has positioned itself as a beacon of hope, particularly in places where agriculture is not as competitive as it used to be (Canoves et al., 2004). However, rural tourism is, in terms of its characteristics, quite heterogeneous, and a sole tourism model does not exist (Gartnet, 2004; Sharpley & Roberts, 2004). This accounts for the fact that the academic literature on rural tourism includes a large number of studies focused on case studies located all over the world (Gao et al., 2009). This study analyses Spain's main tourist destinations given the heterogeneity of the Spanish tourist product, which is considered a positive factor. Nevertheless, it would be of great interest to replicate this study while staying loyal to the methodology proposed here. By doing so, the conclusions that have been drawn can be completed with data from different locations.

It is possible to differentiate two large research areas in rural tourism: the analysis of the sustainability of this activity and its potential contribution to the development of the environment where it takes place (Sharpley & Roberts, 2004). This paper approaches both of them, as stated in the previous section. The advantages that tourism has as a sustainable development strategy are numerous: it is more respectful to the environment than other alternatives (Ceballos-Lascurain, 1996; Master, 1998), conservationism is more present in this activity (Doswell, 1997), it is able to improve social structures and facilities (Puczko & Rats, 2000) and it diversifies the local economy so that it is viable in the long-term (Lane, 1994; Puczko & Ratz, 2000). Moreover, additional positive effects associated with this activity such as setting up new businesses, establishing contact between isolated communities and other people, and resettlement should not be overlooked (Roberts & Hall, 2001; Canoves et al., 2004; Paniagua, 2002). Sure enough, there are potentially negative effects, mostly derived from social and environmental impacts that can be associated with rural tourism (Puczko & Ratz, 2000). Said effects should be paid special attention in order to identify and reduce them as far as possible. The scale of said effects is subject to factors such as the number of tourist arrivals, the

annual degree of concentration of tourists, the fragility of the environment, the steadiness of the local culture and the type of activity carried out by the tourists (Roberts & Hall, 2001). It can be asserted, therefore, that rural tourism can potentially contribute to economic development and the diversification of the local economy, given that it entails a great deal of respect for the social and natural environment in which it is developed (Lane, 1994; Puczkó & Rátz, 2000). In relation to the above, this study contributes to the analysis of the sustainability of rural tourism in terms of its annual stability, given that a lower concentration of visitors may reduce environmental impacts, and that developing a stable activity throughout the year may increase both business profits and job stability. All of this would make tourism a consolidated activity able to complement the already existing ones.

2.1. Implications of tourism seasonality for rural tourism

The literature on tourism seasonality in rural destinations is not very extensive; however, some studies offer data from comparisons made with other types of destinations. These studies were taken into consideration in order to assess the seasonality level of the control groups with which we will compare the results of rural tourism. For example, many studies have pointed out that coastal destinations suffer particularly from seasonality (Fernandez, 2003), thus becoming a reference with which to compare the data relative to rural tourism. Martin et al. (2014) also arrive at a similar conclusion in their study of Spanish destinations. Even though both studies help to contextualize the levels of intensity of seasonality in different types of destinations, they were developed taking into consideration just one variable, which limits the explanatory power of the conclusions. Duro (2016) noted the lower seasonality of Spanish destinations whose focus is on their cultural appeal. Thus, proposing inland Spanish cities such as Seville, Grenada, and Cordoba (cities included in this particular analysis as well) as examples of destinations with a low level of seasonality. The same author also highlighted the role that the flow of foreign tourists plays in the reduction of seasonality, given that their travel patterns complement those of national tourists. Within the scope of rural tourism, most of the trips do not cross international borders, so the aforementioned effect is not as strong. According to Hernandez et al. (2016), communication infrastructures are relevant to the development of rural tourism, which draws upon weekend-travel spread throughout the year where the time needed to get to the destination itself is more relevant than in other cases. Therefore, the degree of development of the infrastructures might condition

the level of seasonality. Some studies have highlighted that the average length of stay might be conditioned by how accessible the rural destination is (Nicolau, 2016; Correia et al., 2008). This is particularly important for rural destinations, given that the disbursement made by the tourists depends on the number of visitors and the average length of stay (Alegre & Pou, 2006; Barros et al., 2010; Barros & Machado, 2010; Nicolau, 2016). As Kastenholz & Lopes (2008) state, policy makers should consider developing strategies able to improve the stability of tourist activity and attract a stable amount of revenue throughout the year.

Authors such as Cánoves et al. (2004) note that the level of seasonality associated with rural tourism should remain low as long as the resources that attract visitors, such as the landscape and the environment, remain unspoilt throughout the year. Determining the causes of seasonality in the countryside is a complex matter, which is why finding solutions is also complex. Martinez & Rodriguez (2006), on the other hand, indicate that the factors that condition rural tourism are not very different from those associated with other types of tourism. Opinions about the capability of rural tourism to generate stable activity are varied. Molera & Albaradejo (2007) indicate that rural tourism should not be considered a homogeneous category since each destination attracts individuals with different profiles and motivations. That is why it is of great importance to conduct studies like this one in different locations. The motivations and the profile of the tourist might condition the level of seasonality, although some studies have found that age and interest in natural resources are the only distinguishing characteristics of tourists attracted by the rural environment (Yagüe, 2002).

3. Causes and consequences of tourism seasonality. Particular attention paid to implications for rural development

It is imperative to know the causes of tourism seasonality in order to improve the understanding of this phenomenon. Several classifications about the causes of tourism seasonality have been proposed. One of the most extended is Hylleberg's (1992), which differentiates three groups of factors responsible for seasonality: those related to festivals and events, weather factors, and time-planning factors such as business or school holidays and accounting periods. Higham and Hinch (2002) show that the conditioning factors of seasonality are the same ones that condition tourist activity overall. Martin et al. (2014) indicate that destinations with a more diversified tourist product and less dependence on

weather enjoy a lower level of seasonality. In line with this, Fernandez (2003) points out that given the complementarity of tourist segments and source markets, their diversification can reduce seasonality.

The consequences of a high level of seasonality are diverse and they condition the ability of tourism to act as a strategy for rural development. They are related to the alternation of peak and underutilization periods. Usually, the effects of seasonality are divided into the following categories: environmental, sociocultural and economic effects, and effects on the job market. Economic effects are associated with the loss of benefits derived from off-peak periods (Cuccia & Rizzo, 2011) and the misuse of facilities (Rossello et al., 2004; Getz & Nilsson, 2004; Georgantzas, 2003). Moreover, the quality of the service can be affected during peak periods (Koc & Altinay, 2007). During off-peak periods several businesses are closed, affecting the image of the destination (Flognfeldt, 2001). What is more, families economically dependent on tourism must make up for revenue loss during off-peak periods by increasing their savings during peak periods (Murphy, 1985). As far as the job market is concerned, we can appreciate difficulties associated with finding qualified staff who work discontinuously (Murphy, 1985). Companies located in seasonal destinations must, therefore, hire less qualified staff, who usually do not receive long-term training (Mill & Morrison, 1998), which in turn causes the quality of the service to drop (Baum, 1999). The factors that have been described might condition the ability of rural tourism to act as a tool for development, given that more stable destinations are better suited for business development and quality job opportunities.

On the other hand, the effects that seasonality has on the environment and the social setting are associated with periods when the concentration of tourists is high. The disturbance of wildlife, the physical erosion of footpaths, litter problems, and congested rural lanes are, among others, environmental impacts of seasonality (Grant et al., 1997). The unequal distribution of tourist activity throughout the year might limit the carrying capacity of the destinations, particularly during peak periods (Manning and Powers, 1984). Actually, one of the main problems associated with tourism seasonality is the harm caused to the natural environment as a consequence of the pressure put on natural spaces (Butler, 1994), which is especially relevant in the case of rural tourism. It could be said that the ideal situation implies a homogeneous distribution of the activity throughout the year, which would result in a decrease in this pressure (Martin, 2019a). The social effects of seasonality are related to the impacts caused by the activity on the receiving

community. To list a few: the disruption of the local lifestyle due to the higher concentration of visitors, problems of access to services and infrastructures, and an increase in noise disturbance (Waitt, 2003; Kuvan and Akan, 2005). Tourism models which do not take into consideration the pressure put on the social setting will encounter problems in obtaining the locals' collaboration, a factor that is crucial in the planning of successful tourist destinations (Martin et al., 2018c, 2019b).

4. Methodology

One of the most important aspects when analyzing tourism seasonality is the measurement of its intensity, given that doing so is important in order to compare both destinations and the success of public policies, but also, to discern the characteristics of an adequate model of development for each destination (Martin, 2018a). In this case, an adequate measurement will allow for the comparison of the intensity of seasonality in rural destinations with that of coastal and urban destinations.

Renowned authors in the field of seasonality have indicated the lack of statistical procedures capable of describing and quantifying this phenomenon (Koenig-Lewis & Bischoff, 2005). In fact, there is no measurement procedure generally accepted for measuring the intensity of seasonality and the number of studies is scarce (Koenig-Lewis & Bischoff, 2005). Regarding the measurement of how intense seasonality is; the most widespread approach is based on the use of concentration indexes such as the Gini Index (GI), the Coefficient of Variation (CV) and the Theil Index (Fernandez, 2003; Lundtorp, 2001; Rossello et al., 2004; Wanhill, 1980). All of them allow us to measure the annual concentration of tourist activity with respect to a representative variable of tourism seasonality, such as the number of visitors and the number of overnight stays (Grainger & Judge, 1996). The GI is the most used among these indicators, whose properties are highlighted by several researchers. Fernandez (2003) points out that it is the most used measurement system, even though several others have been proposed. Lundtorp (2001) shows that it is the most stable indicator of seasonality. Aguilo & Sastre (1984) indicate that this indicator fulfils the Pigon-Dalton Principle.

The GI shows the range of cumulative frequency of the observations, beginning with the lowest value (Lundtorp, 2001).

$$GI = 1 + \left(\frac{1}{n}\right) - \left(\frac{2}{(n^2 . \grave{} x)}\right) . (x_1 + 2x_2 + 3x_3 + \cdots . nx_{n1})$$

In this expression, n is the number of months where data are gathered (although it can also refer to trimesters or weeks), `x represents the average of the observations for the variables that are taken as a reference, and $x_1, x_2, x_3 \ldots, x_n$ are each of the observations associated with the number of months ranked by descending magnitude (Weaver & Oppermann, 2000). The result of the GI is between a range of 0-1, in which the lowest value corresponds to an equal distribution throughout the year (for example, the number of arrivals) and 1 refers to the highest concentration. Even though this measure is quite useful, as we have explained, it has some limitations. Depending on the variables used for its calculation, the results and the ranking of destinations will be different because the selected variable only shows a part of the phenomenon. This makes it impossible to measure the intensity of seasonality in a complete and objective way. To overcome this limitation, we propose the construction of a synthetic indicator that consists of various partial indicators of seasonality that represent different aspects of this trend. The synthetic indicator is calculated using partial indicators, which are estimated by applying the GI to each individual variable. This indicator offers a complete measure of tourism seasonality. We propose the estimation of GIs calculated over the number of national tourist arrivals at each destination, the number of foreign tourists, the number of overnight stays by national tourists, the number of foreign tourists staying overnight, the number of employees in the tourism sector; and the number of bed places offered at each tourist destination. It is also interesting to analyse the behaviour of other variables such as the degree of occupancy of beds available, the specific degree of occupancy at weekends and the average length of stay. These variables are expressed in ratios instead of absolute values, which are necessary for the calculation of the GI. That is why the CV is used to estimate annual stability in those cases.

The CV measures the dispersion of a data series around an average, as a percentage of that average. In the formula below, S represents the standard deviation and $\overline{x}$ represents the average provided by monthly data. Diverse authors have noted the legitimacy and usefulness of this indicator in the description of tourism seasonality (Koenig & Bischoff, 2003; Lundtorp, 2001).

$$CV = \frac{S}{\overline{x}}$$

The variables selected here show the changes that tourist activity undergoes throughout the year from the point of view of its unequal monthly distribution. The present literature on tourism seasonality includes numerous references to the variables

that have been used in the paper, something that corroborates the usefulness of the partial indicators we propose.

The proposed method to construct the synthetic indicator of seasonality is based on the DP2 Distance Method developed by Pena (1977). This indicator offers several advantages in comparison to the possible alternatives: it avoids problems related to the aggregation of variables expressed in different measures, arbitrary weighting of variables and the duplication of information (Murias et al., 2006; Somarriba & Pena, 2009; Somarriba et al., 2015; Zarzosa & Somarriba, 2013; Ravaillon, 2010). This indicator has experienced a new wave of interest in the last few years and has been used in various areas of economic research (Canaviri, 2016; Sánchez & Prada, 2015; Holgado et al., 2015; Martinez et al., 2016; Somarriba & Zarzosa, 2016; Ray, 2014; Somarriba et al., 2015). This system of aggregation of information offers, for this reason, advantages over other alternatives. It deletes duplicated information, determines the weight of each variable objectively, and allows for the synthesis of information that variables express in different units. This entails an improvement in the systems that measure tourism seasonality.

In essence, this methodology makes it possible to measure how intense seasonality is in each of the destinations by aggregating information provided by the different variables that express the heterogeneous distribution of activity throughout the year. These variables represent changes both in tourism demand and supply, which makes this measuring system more comprehensive than others developed until now.

4.1. Characteristics and features of the DP2 indicator

There are a few alternatives that make it possible to build a synthetic indicator like this one to compare destinations. This section describes the mathematical properties that justify choosing this methodology over others to build an indicator of seasonality.

One of the advantages of this methodology in comparison with others is that it fulfils a series of properties, guaranteeing that the weighting of the partial indicators is not done arbitrarily (Canaviri, 2016), and it also guarantees an economic interpretation of the same (Rodríguez & Salinas, 2012; Somarriba & Pena, 2009; Rodríguez, 2014; Somarriba & Zarzosa, 2016; Rodríguez et al., 2015a; Rodriguez et al, 2015b). Namely, this indicator fulfils the following properties: invariance in comparison with the base reference, additivity, existence and determination, monotony, neutrality, uniqueness,

homogeneity of degree one, quantification, invariance, transitivity exhaustiveness, and conformity (Rodríguez et al., 2012; Escobar, 2006; Zarzosa, 1996). Moreover, it also satisfies the conditions of distance in a metric space (competitiveness, non-negativity, triangular inequality) (Pena, 1977; Zarzosa, 2005; Somarriba & Pena, 2008). The DP2 indicator offers a cardinal measure that is appropriate for the comparison of regions (Somarriba & Pena, 2008; Montero et al., 2010; Rodriguez et al, 2018). What is more, it solves the problem of aggregation of variables expressed in different units by dividing the indicator by the standard deviation so that the partial indicators are expressed in abstract units (Ray, 2014).

The DP2 indicator for a region r is defined by the following expression (Pena, 1977; Zarzosa & Somarriba, 2013).

$$DP_2 = \sum_{i=1}^{n} \left\{ \left({}^{d_i}/_{\sigma_i} \right) \left(1 - R^2_{i,i-1,\dots\dots 1} \right) \right\}$$

Where $d_i = d_i(r^*) = |x_{ri} - x_{*i}|$ with the reference base $X_* = (x_{*1}, x_{*2}, \dots, x_{*n})$ where:

- N is the number of partial indicators
- x_{ri} Is the value of i for the destination r
- σ_i is the standard deviation of indicator *i*
- $R^2_{i,i-1,\dots\dots 1}$ is the coefficient of determination in the regression of X_i over $X_{i-1}, X_{i-2}, \dots\dots, X_1$, already included, where $R^2_1 = 0$

In the previous expression, the coefficient of determination $R^2_{i,i-1,\dots\dots 1}$measures the percentage of variance of each variable explained by the linear regression estimated using the preceding variables (Pena, 2009; Rodríguez, 2014). As a result, $(1 - R^2_{i,i-1,\dots\dots 1})$ leaves information provided by previous variables aside, avoiding redundancy. This is, as Pena (1977) called it, "the correction factor", which expresses the part of the variance of X_i not explained by$(X_{i-1}, X_{i-2}, \dots\dots, X_1)$. As Sanchez & Martos (2014) show, the part already explained by previous indicators is obtained by multiplying each partial indicator by the corresponding coefficient of determination $R^2_{i,i-1,\dots\dots 1}$.

To improve understanding of the results provided by the DP2 indicator, we make use of a hypothetical region that represents the best scenario possible, whose values are 0 (Zarzosa & Somarriba, 2013). In this case, that situation would refer to the region with the lowest level of seasonality. The indicator's results associated with each tourist

destination show the distance to the baseline, or in other words, to the best scenario possible (Rodriguez et al., 2012; Ray, 2014). Which means the higher the value of the indicator, the more intense seasonality is.

One of the characteristics of this indicator is the way in which the weight of the variables is determined. The entry order of the partial indicators of seasonality will condition their weights, which are determined by an algorithm that reaches convergence and stabilizes to verify the condition of conformity with a non-random, neutral method for the classification of variables (Rodriguez et al., 2017a; 2017b). The partial indicators of seasonality are ranked in increasing order, using their correlation to the first indicator as the criterion, while irrelevant information is removed at the same time (Somarriba & Pena 2008). Thus, differences in the i-th variable between a region and the reference region are weighted by the percentage of new information (i.e., information not provided by other variables) that this variable provides (Chasco, 2014; Zarzosa 2009; Somarriba and Zarzosa, 2016).

In this methodology, the partial indicators are the independent variables. The calculation method on which the DP2 indicator is based is iterative. The entry order of each partial indicator in the calculation will condition the result. Such order is determined according to the amount of information contributed to the indicator. Pena's proposal (1977) consisted of ranking the variables hierarchically in descending order according to the absolute value of the coefficient of correlation with the synthetic indicator. Likewise, the first iteration of the process should begin with the following solution: assuming that every variable is supposed to be correlated between them, which is why the correction factors would assume a value of 1 in every case, given that $R^2_{i,i-1,i-2,\ldots 1}$ is equal to zero. The result is known as the Frechet Indicator, which represents the maximum value that the DP2 can assume for each destination. After the second iteration, the partial indicators are ranked according to their correlation to the Frechet Indicator in descending order. Once the new DP2 indicator has been calculated, the variables are ranked once again according to their correlation with the DP2. This iterative process continues until the values of the synthetic index reach convergence, which Zarzosa (1996: 2005) describes thoroughly.

We could have used alternative methodologies rather than the DP2 indicator to achieve the goals of the study, but they pose more limitations. This is the case with Data Envelopment Analysis (Murias et al., 2006; Shen et al., 2013; Carrillo & Jorge, 2016), which does not weight indicators in an objective way (Zarzosa & Somarriba, 2013).

Moreover, this system does not fulfil the properties of monotony and singularity necessary to preserve variation in changes of origin and/or scale of units of measure or to guarantee the interdependence of the indicators (Pena 2009).

5. Results

5.1. Area of study

Selecting Spain as the area of study is justifiable for several reasons. In the first place, because of the strong tourist activity developed in the country. In 2016, tourism accounted for 11.7% of the national GDP and directly supported 1.4 million jobs, a figure that is higher than for any other activity. (Exceltur, 2017). Taking the world ranking as a reference, in 2016, Spain ranked third in terms of income derived from tourism: USD 57,000 million; a figure that is only lower than The USA and China, countries that generated USD 178,000 million and USD 114,000 respectively. (Hosteltur, 2016). The second reason is that Spain has a heterogeneous tourist product, which permits an analysis of the stability of rural tourism in comparison with other types.

The comparison of the annual stability of rural tourism was carried out by taking three groups of tourist destinations as references (Table 1). In first place, the main rural destinations in Spain ranked by number of visitors: the Pyrenees region in Navarra, Northern Extremadura and The "Picos de Europa" National Park. The stability of the activity that takes place in them was compared with the main urban destinations in Spain: the cities of Madrid, Barcelona, and Seville. The second comparison group consists of the three main coastal destinations: The Balearic Islands (Mallorca), Andalusia (Costa del Sol); and Valencia (Costa Blanca).

Table 1

5.2. Main results

The nine variables -or partial indicators- that were selected for the calculation of the synthetic indicator provide a first look at the level of seasonality in each tourist destination. The variables represent the evolution of demand, the response of supply in light of those changes and the alterations that take place in the job market. The results of the partial indicators are shown in Table 2. This table shows the value of the GI or the CV associated with each of the variables for each destination. Thus, there are nine

indicators of the intensity of seasonality for each destination. The results closest to 0 show the lowest level of seasonality (where 0 equals a perfectly homogeneous distribution of activity throughout the year), whereas a value of 1 shows the maximum level of seasonality (1 = the activity is concentrated in just one month). Although it is complicated to analyse the intensity of seasonality by taking 9 indicators into account, it is easy to draw the conclusion that urban destinations enjoy a better stability across the board, although a comparative assessment of rural destinations is more complex given that nine different criteria are taken into consideration. That is why it is necessary to count on a synthetic indicator able to offer a full picture of how intense seasonality is in each destination.

From the point of view of urban destinations, the values assumed by the indicators of seasonality are lower than 0.1 except in the case of the number of international tourist arrivals and their overnight stays, as well as in the case of the degree of occupancy. In coastal destinations, only rarely are the values of the indicator lower than 0.25. In some cases, the values come close to 0.5, for instance, "Valencia: Costa Blanca" reaches an IG value of 0.467 in terms of overnight stays by local tourists. In "Balearic Islands: Mallorca", this value reaches a score of 0.447. Therefore, both extremes of the continuum of the intensity of seasonality are clearly defined, whereas the evaluation of rural destinations is somewhat complex.

Table 2

The problem of degrees of freedom when calculating the synthetic indicator was solved by introducing the same number of destinations and variables (Escobar, 2008; Somarriba & Pena, 2009; Murias et al., 2006; Somarriba & Zarzosa, 2016).

The values obtained from each partial indicator were introduced in a model with a minus sign so that in the case of a high level of seasonality, the value corresponds to a high value of the synthetic indicator. Thus, the synthetic value of each destination shows the distance to the best scenario, a situation with 0 seasonality (Murias et al., 2006). In that situation, every partial indicator's value would be 0, thus 0 is the value of the synthetic indicator (Zarzosa & Somarriba, 2013). Each synthetic indicator represents an expression of the seasonality of a destination.

Table 3 shows the results of the DP2 indicator of seasonality. These data prove that seasonality in coastal destinations is more intense than in any other destination that

was analysed. Coastal destinations, which bore the weight of the Spanish tourist model for decades, host the majority of the tourist arrivals in Spain. Rural destinations have a level of seasonality that is halfway between coastal and urban destinations, the latter being the most stable. This ranking does not always match the results obtained from different partial indicators of seasonality given that rankings based on partial data are different from each other.

Results provided by the indicator proposed here are in line with previous studies on tourism seasonality, which gives legitimacy to this system of measuring seasonality. For example, destinations more dependent upon seasons and their effect on the landscape suffer from higher seasonality, as coastal destinations do (Ahas et al., 2005; Palang et al., 2005; Silm & Ahas, 2005). On the contrary, urban destinations enjoy a more reduced seasonality as a consequence of their tourist product, which is exploitable throughout the year in a stable way (Martin et al., 2014).

Table 3

It can be determined that in the rural destinations that were analysed, seasonality is lower than in the traditional Spanish tourist destinations. This puts rural destinations closer to the most stable destinations, urban ones. The annual concentration of visitors does not appear to be a limiting factor for tourism to act as a developing tool in rural destinations. Rural tourism tends to be developed at a reduced scale, which means it does not generate peak periods that can disrupt the lives of the locals in rural destinations or interfere with the environment.

Table 4 shows descriptive information about the DP2 indicator of seasonality that this paper calculated. The average and median have relatively close values. There is considerable dispersion in the seasonality synthetic indicator values around the mean in relative terms (the standard deviation is 2.709). This reveals that according to the results of this research, there is a significant degree of disparity between these destinations with regard to seasonality levels.

Table 4

This methodology permits, besides creating a synthetic indicator of seasonality, the determination of which variables contribute a greater amount of information to the

creation of the indicator. This contribution, apart from its methodological interest, makes it possible to discern which factors are more influential when explaining differences in the level of seasonality of different destinations. This analysis is presented below.

5.3. Information provided by each partial indicator

Finally, in this section, we analyse the amount of information provided by each partial indicator when calculating the synthetic indicator. This gives clues about which factors are more influential in the assessment of the global level of seasonality to a great extent.

As mentioned before, the correction factor $(1 - R^2_{i,i-1,\ldots\ldots 1})$ expresses the amount of new information given by each simple indicator (Zarzosa, 1996). The absolute values of the linear correlation coefficient provide us with the measure needed to rank simple indicators, repeating synthetic indicator calculations. The correction factors presented in Table 5, were estimated from the coefficient of linear correlation that was obtained in the last iteration. Doing so allows for the deletion of redundant information (Somarriba & Zarzosa, 2016).

Taking the results obtained into consideration, the GI calculated for the monthly bed offer is the variable containing the total useful information, which translates into a correction factor value of 1. This is interesting given that the business response in the face of possible changes in demand is what makes the main expression of the phenomenon occur. The GI of the number of foreign tourists staying overnight holds the second position. It contains 29.4% of the new information, a level that is similar to the GI calculated for the number of foreign tourists -which provides 29.1% of the new information. Therefore, an increase in the number of foreign tourists who arrive at rural destinations is essential to reduce the level of seasonality. These three variables, which refer to the offer of available accommodation and the capacity of the destination to attract international travellers (whose travel patterns are complementary to the national tourists' ones), are decisive when building this indicator.

Table 5

6. Conclusions

Tourism has played an important role in the development of a multitude of regions both in developed and developing countries. As in many other activities, for tourism annual stability is a desired quality. That stability increases income, allows for the optimization of resources and avoids negative effects derived from both, underutilization and peak periods.

The capacity of rural tourism to complement other activities and offer job opportunities to locals is thus conditioned by annual stability. This paper analysed the level of seasonality of rural tourism in comparison with other types of destinations. To do so, we selected the three most important rural destinations in Spain, whose level of seasonality was compared with the seasonality levels of both the three most important coastal and urban destinations in the country. Selecting Spain derives from the importance that tourism has in the country and the heterogeneity of the Spanish tourist product, which permits comparisons.

The literature on tourism seasonality shows that there is no generally accepted method to measure how intense seasonality is. Concentration indexes applied to a representative variable of variations in the flow of visitors are generally used. However, this measuring system is severely limited given that different seasonality rankings are to be expected according to the selected variable. This makes it difficult to monitor destinations, compare them or even define public policies. That is why this study proposes the definition of a DP2 synthetic indicator of seasonality, which groups the information provided by several partial indicators representative of the different manifestations of seasonality into a single value. This indicator is clearly advantageous in comparison with others as it allows each partial indicator to be weighed objectively as well as deleting redundant information. Thus, this paper makes a methodological contribution to the analysis of seasonality, given that the proposed synthetic indicator permits the measurement of the level of seasonality in a comprehensive and objective manner. This methodology groups diverse facets of seasonality into a single indicator that can provide an overall view of the problem. The DP2 method proposed here makes it possible to aggregate the information provided by the whole set of partial indicators by assigning the weights of each indicator objectively. Moreover, it also deletes duplicated information and permits working with data expressed in different units. Such methodological innovation makes it possible to monitor seasonality more precisely, and thus, compare the achievements of different destinations, but also, analyse the success of public policies

and discern the development model of each destination. The results obtained by this indicator were compared with previous findings and remained coherent.

As a contribution to the literature on seasonality and rural tourism, this research demonstrated that the values of the indicator show that the annual stability of rural tourism is halfway between coastal and urban destinations. This, first of all, indicates that seasonality in this kind of destination is neither extreme nor higher than it is in coastal destinations. What is more, it is actually closer to urban destinations, which are the most stable ones. Therefore, as the seasonality of rural tourism is not high, it is not a factor that limits its capacity to contribute to rural development. This means that public authorities must promote the development of tourism in destinations where this phenomenon is evidenced, but always from a perspective that is sustainable and respects local communities. Furthermore, the theoretical conclusions are completed by means of the analysis of the partial indicators that explain the differences in the level of seasonality to a large extent and, therefore, have a greater weight in the construction of the synthetic indicator. As we pointed out before, the way in which each destination plans the number of bed places available throughout the year is extremely important when explaining the different level of seasonality of different contexts. What also seems to be crucial is the international component of demand, given that international tourist arrivals and the number of overnight stays condition the scope and effectiveness of policies seeking to reduce seasonality. Both of these factors should be taken into consideration when planning public policies. For instance, diversifying foreign markets should become a priority as well as encouraging and supporting hotel establishments to not close outside the peak season.

This paper was conceived with a clear purpose, to determine whether the level of seasonality in rural destinations is a limiting factor for tourism to act as a development tool. A high level of seasonality would increase the pressure put on destinations during peak seasons and would reduce profits during periods of low activity, thus conditioning the stability of the job market. This study demonstrates that the intensity of seasonality in rural destinations is not high; in fact, it is close to the level of urban destinations. Therefore, it could be said that rural tourism fosters a stable enough activity throughout the year, something that contributes to the sustainable development of the area from an economic, social and environmental point of view. However, it cannot be guaranteed that the tourist activity entails sustainability by all means, given that this concept is dependent upon many other factors and this study is only focused on the stability of the activity.

The fact that some rural destinations are heterogeneous might alter the conclusions shown here, this being a limitation of the paper. Therefore, demonstrating how important it is to repeat tests such as the one we propose in order to contrast them with the conclusions of this paper. The system of measurement proposed here can be applied to any destination, city or country in order to compare their level of seasonality. As noted in this paper, rural tourism is quite a heterogeneous category, which makes it imperative to always contextualize every conclusion.

This limitation of the study calls for a future line of research, given that it is important to complete and compare the results of this study with other similar ones. It would be interesting to conduct this methodology in very different contexts from those described here. For instance, destinations with different weather conditions, different degrees of accessibility, or different levels of development. All of this will permit completion of the information on seasonality in the context of rural tourism, making it possible to determine the contexts in which tourism shows a higher or lower level of annual stability.

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Tables

Table 1
Tourist destinations studied. Number of visitors who stayed in tourist accommodation, 2016.

Destination	Travellers

Cultural-urban destinations	
City of Madrid	9,068,040
City of Barcelona	7,484,276
City of Seville	2,534,963
Coastal destinations	
Balearic Islands: Mallorca	7,345,866
Andalusia: Costa del Sol	4,716,864
Valencia: Costa Blanca	3,839,623
Rural destinations	
Pyrenees, Navarra	125,759
Northern Extremadura	107,043
"Picos de Europa" National Park	57,668

Source: Developed by the authors based on data provided by the Spanish National Statistics Institute.

Table 2
Selection of partial indicators of seasonality, 2016.

	GI local tourists	GI foreign tourists	GI overnight stays by local tourists	GI overnight stays by foreign tourists	GI staff	GI number of beds	CV length of stay	CV occupancy	CV occupancy at weekends
Pyrenees, Navarra	0.1674	0.3531	0.2504	0.4182	0.0411	0.0435	0.1656	0.4562	0.2466
Northern Extremadura	0.2056	0.3011	0.2281	0.3318	0.0478	0.0363	0.2355	0.4608	0.2928
"Picos de Europa" National Park	0.1989	0.2612	0.2394	0.2899	0.0682	0.0275	0.1782	0.2505	0.2838
Balearic Islands: Mallorca	0.3120	0.2834	0.4471	0.3514	0.2899	0.2023	0.2322	0.3925	0.3159
Andalusia: Costa del Sol	0.2793	0.2752	0.3156	0.2772	0.2284	0.1227	0.0818	0.3109	0.2808
Valencia: Costa Blanca	0.4322	0.4273	0.4670	0.4363	0.3782	0.2793	0.1644	0.4212	0.3305
City of Madrid	0.0690	0.1661	0.0862	0.1818	0.0411	0.0136	0.0228	0.1542	0.1059
City of Barcelona	0.0711	0.1782	0.0883	0.1744	0.0218	0.0077	0.0311	0.1296	0.0774
City of Seville	0.0712	0.1483	0.0854	0.1494	0.0283	0.0154	0.0203	0.1469	0.1221

Source: Developed by the authors based on data provided by the Spanish National Statistics Institute.

Table 3
Results of the synthetic indicator of seasonality, 2016.

Form of tourism	Area	DP2
Urban-cultural	City of Madrid	0.3270
Urban-cultural	City of Seville	0.5477

Urban-cultural	City of Barcelona	1.1265
Rural	Pyrenees, Navarra	1.8545
Rural	North side of Extremadura	2.1205
Rural	“Picos de Europa” National Park:	3.1542
Coast	Valencia: Costa Blanca	5.9997
Coast	Andalucía: Costa Del Sol	6.7922
Coast	Balearic Islands: Mallorca	7.1246

Source: Developed by the authors based on data released by the Spanish National Statistics Institute.

Table 4

Distribution of the synthetic indicator of seasonality.

Item	Value
Sample	9
Observations	9
Mean	3,227
Median	2,121
Maximum	7,125
Minimum	0,327
Stand. Dev.	2,709
Skewness	0,557
Kurtosis	-1,596
Jarque-Bera	1,421
Probability	0,294

Source: Developed by the authors.

Table 5

Order of the variables according to the amount of information they provide.

	Correction factor
GI number of beds	1.0000
GI overnight stays by foreign tourists	0.2941
GI foreign tourists	0.2911
CV occupancy at weekends	0.1181
GI local tourists	0.0871
CV length of stay	0.0628
GI overnight stays by local tourists	0.0498
CV occupancy	0.0419
GI staff	0.0203

Source: Developed by the authors based on data provided by the Spanish National Statistics Institute.