

**Title:**

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## A MEASUREMENT OF SEASONAL CONCENTRATION IN TOURISM

### 1. ABSTRACT

The present paper aims to establish a methodology for measuring the seasonal concentration in tourism into undiversified destinations, particularly in coastal destinations based on the sun and sand tourism. Specifically, this new form of measurement can be applied on a coastal destination, characterized by high seasonal concentration in the summer months generally. Fundamentally, this paper aims to demonstrate, by applying a decomposition of the Gini index, the contribution of each tourist segment to the overall seasonal concentration, plus get marginal relative effects which will be translated to what extent an increase in the number of travelers from each segment will contribute to reduce seasonality in this coastline. The purpose of applying this methodology is to provide additional information to tourism managers regarding what type of tourists should direct their promotion strategies, as long as their goal is to reduce the seasonal concentration in tourism into a given destination.

### 2. INTRODUCTION

The phenomenon of seasonality affects many economic activities but undoubtedly affects the tourism in a natural way. Allcock (1994) describes it as the tendency of tourist flows that concentrates in relatively short periods of the year; and it also notes that the widespread acceptance of seasonality as an inevitability within the tourist sector has been accompanied by a clear lack in research. Furthermore, Butler (1994) performed a review of all the literature on seasonality and realized that the focus was on the analysis of patterns of demand, the description of the seasonality in specific destinations, the negative effects on employment and investment, and policies against seasonality and its implications.

The main problem that causes the effects of seasonality is the underutilization of the tourist establishments in low season and the almost total occupancy of them in the high season. This fact is explained by the concentration of tourist flows in certain periods of the year, representing a temporary mismatch between supply and demand of tourism. This has a negative consequence, that is, an instability causing various problems that managers and employers of tourism have to cope with, such as unstable employment, limits on the profitability of investments, a mismatch in load capacity, alteration of prices, environmental degradation, and various socio-cultural effects among visitors and residents in a given destination.

In Spain, the states and regional tourism managers and even the local ones certainly know that in coastal destinations, non-residents have a less seasonal behavior than residents by empirical data on the evolution of them with regard to several available variables that confirm this statement. However, it is complicated for them to identify which kind of non-residents are contributing to the deseasonalization and, on the other hand, if there is any type of residents who can contribute significantly to deseasonalize a destination. Nevertheless they pass unnoticed due to the lack of a methodology that identifies them.

Considering this problem, this paper aims to reach a broader measurement approach that provides information about the type of resident and non-resident who are the target in a highly concentrated destination in the summer season. In order to do this, it has been used both conventional analysis of the seasonal indices like the Gini index calculation, a measure that has traditionally been used to measure the concentration of wealth in a country or region and, sometimes in the seasonal concentration measurement of tourism. However, in this study, the Gini index has been decomposed, in such a way that the seasonal component can be expressed through relative marginal effects which allow for identifying those travelers which manifest more favorable in order to deseasonalize a given coastal destination.

This decomposition of the Gini index has been already used in the study carried out by Fernández-Morales & Mayorga-Toledano (2008) for measuring the seasonal concentration of demand hotels in the Costa del Sol. The results of this study yielded successful measures as to the type of tourists by nationality, were more favorable to deseasonalize this destination. But still, even though for the first time relative results were obtained that could be used by tourism managers to bet on these tourists accurately, the counter-seasonal policies orientation still being limited in terms of the knowledge about what type of tourists, in accordance with their nationality, truly contributed to the deseasonalization of the destination, since not all tourists from the same nationality have an homogeneous behavior. In this connection, the proposal of this study is to classify to residents and non-residents within of some touristic segments, who have been grouped by the similarities on their travel behavior, specifically in the sun and sand segment, the cultural segment and other segments.

### **3. METHODOLOGY**

In general terms, the seasonality of tourism demand is manifested by the number of visitors who come to a destination at certain periods of the year, although it is known that it can also be measured in relation to other more specific variables, such as overnight stays, the provenance, the type of accommodation, the average stays, the reasons for travel, the travel arrangements or the average spending of tourists. Furthermore, it is noteworthy that seasonality can be measured by variables related with touristic supply, such as number of establishments open, number of places available, prices and staff employee. Therefore, one can distinguish in this respect between seasonality of demand and supply although logically, the latter is subject to the demand.

Following Crouch (1994), who states that the number of tourists is usually the basic unit of measurement of tourism demand and considering the shortage in the availability of monthly variables related to tourism demand with sufficient time dilation, the incidence of tourism seasonality on a coastal destination can be analyzed in terms of travelers staying in hotels or passengers arrived by airports, differentiating between residents and non-residents in Spain.

Moreover, with the aim to determinate sun and sand or cultural tourists it should be used of the available statistics sources. For example, the quarterly time series expressed as percentages of the main motivations of tourists visiting Andalusia, supplied by the headquarters of the public company Turismo Andaluz, S.A. (TURASA by its Spanish initials) has offered the possibility of classifying this tourists under the assumption that travelers can be grouped into touristic segments according to their main travel motivation. These segments can be established according to the main travel motivation of the tourists as follows: sun and beach segment (weather and beach); cultural segment (popular festivals and folklore and visit to monuments) and other segments (prices, nature and rural tourism, visiting family and friends, sports, etc.).

In this paper, it has been used the Gini index as a measure yearly seasonal concentration. This measure, which is often used to quantify inequalities of distribution of economic variables, it also has been used in several studies analyzing the seasonal concentration on tourist variables, Ramón y Abellán (1995), Lundtorp, (2001), Fernández-Morales (2003), Roselló Nadal, J., Riera Font, A., & Sansó Roselló, A. (2004).

It has been proposed in the literature several ways of calculating the Gini index ( $G$ ) which differ from the original formula developed by Gini in 1912, as the formula based on the covariance of Lerman and Yitzhaki (1985), which in our case, applied to the monthly values of the variable  $Y$  ( $Y = Y_1, Y_2, \dots, Y_{12}$ ) corresponding to year analyzed is represented as follows:

$$G = \frac{2}{\bar{Y}} \text{cov}(Y, F) \quad (1)$$

where  $\bar{Y}$  is the mean of  $Y$ ,  $F$  is the distribution function of  $Y$ , and  $\text{cov}(Y, F)$  stands for the covariance between  $Y$  and  $F$ . The Gini index ranges from 0 to 1, and to the extent that approaches 1 indicates higher temporary concentration of the selected variable in the year observed and consequently, greater seasonality in the behavior of the variable, while a value close to 0 determines a more equitable distribution in time and, therefore, lower seasonality. An advantage of this specification of the Gini index is the possibility of using weights based on the duration of each month. In this paper it has been used this approach, assigning 29 days for February in a leap year and 30 or 31 days for the corresponding months.

In order to estimate the effect over the annual Gini index of the components of a series, it is necessary to decompose the index. Since the Gini index is not additively decomposable, it has been used the proposal made by Yitzaki Lerman (1985) as it provides to what extent each component of the series contributes to the result of the overall Gini index, and also provides a measure of the marginal effect of changes to the market shares. For a monthly series  $Y = Y^1 + Y^2 + \dots + Y^K$ , the annual Gini index of  $Y$  can be decomposed as:

$$G = \sum_{k=1}^K S_k R_k G_k \quad (2)$$

where  $G_k$  is the annual Gini index of  $k$ ,  $S_k$  is annual participation of  $Y^k$  in the annual value of  $Y$ , and  $R_k$  represents the Gini correlation between  $Y^k$  and  $Y$ , that is  $\text{cov}(Y^k, F)/(Y^k, F^k)$ , where  $F$  and  $F^k$  are the distribution functions of  $Y$  and  $Y^k$ , respectively.

Through this decomposition it can be obtained the contribution of each component  $k$  to the overall seasonal concentration.  $C_k = S_k R_k G_k$ , depends directly on these three factors:  $S_k$ ,  $R_k$ , and  $G_k$ . The larger the share of one of the components,  $S_k$ , to the total, the larger the contribution will be to the total concentration ratio,  $G$ . The same occurs with the Gini index,  $G_k$ , and the Gini correlation of every component of the series,  $R_k$ . The contribution of each component to the seasonal concentration can be expressed in relative terms as  $k = S_k R_k G_k / G$ .

This decomposition facilitates the estimation of the marginal effect that produces a given variation in any of the components analyzed at the overall Gini index (Fernández-Morales & Mayorga-Toledano 2008). The relative marginal effect (ERM by its Spanish initials), which quantifies in relative terms, how increases or decreases the overall Gini index when a small relative increase,  $e^k$  (equally distributed throughout the year), occurs in the component  $k$ , can be calculated as follows:

$$ERM_k = \frac{\partial G / \partial e^k}{G} = S_k \left( \frac{R_k G_k}{G} - 1 \right) \quad (3)$$

This means that with the ERM, it can be identified to what extent a change in any of the components will contribute to increase the overall Gini index. Specifically, is represented as the percentage of variation of the overall Gini index when the number of travelers from a particular tourist segment increases by 1%, keeping constant the monthly distribution of them and the number and monthly distribution of the rest of travelers. In short, the percentage change in  $G$  resulting from a small percentage change in the number of travelers from a particular segment, keeping the rest constant, is equal to the ERM.

In general, Spain must deal with the seasonality effects. It is true that local and regional administrations and tourism employers are currently facing this problem with the implementation of remedial measures to reduce the seasonal concentration with the relentless pursuit of new formulas for product diversification. This can be corroborated by the observance of recent coordination between the public administration and the private sector to address this problem. To make this coordination work efficiently, it must have available the knowledge and the right tools to measure the seasonality.

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