TOURISM MOBILITY IN TIME AND SEASONALITY IN TOURISM¹

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1. Introduction

Tourism is nowadays viewed as the movement of people in time and space (De Cantis et al., 2013). From this point of view, a convenient approach to study tourist flows is based on the analysis of tourism mobility. Within a spatial perspective, which is the most commonly used in the field, tourism mobility in space still raises several statistical and methodological challenges; e.g., the estimation of movements and distances travelled at destinations, or the relative importance of multi-destination trips (McKercher and Zoltan, 2014; Ferrante et al., 2017, De Cantis, 2013). Nonetheless, the temporal dimension also has a significant role in the investigation of tourism mobility.

The main feature related to tourism mobility in time is undoubtedly seasonal variation. Although it is present in many population movements (Charles-Edwards and Bell, 2015), it is in the tourism related trips where it has received the greatest academic interest.

The main body of this literature is focused on the seasonality of tourist arrivals, its impacts, and the different policies to tackle this phenomenon (Coshall et al. 2015), mainly because tourism seasonality at destinations is often seen as a problem with negative effects on employment, economic turnover, and social and natural environment (Fernández-Morales et al., 2016).

In this paper, however, in order to highlight population mobility from origin, the analysis focused on a population’s seasonal distribution of tourism movement, which in our case is Spain. Thus, we investigated the temporal distribution of trips for the resident population, distinguishing (i) by travel purpose (leisure, visit friends and relatives, business, and other purposes) and (ii) by destination (national or international).

This paper is structured as follows: in section 2 some issues on tourism seasonality and mobility in time are discussed. The method used to measure tourism seasonality is described in section 3. The main results on the seasonality

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analysis of the tourism mobility in Spain are in section 4 and; finally, the conclusions are stated in section 5.

2. Tourism mobility and seasonality in tourism

Tourism mobility, as a social phenomenon, may be studied as a process that affects a population in a geographical area, such as a country or a region. Although these population movements have an origin and a destination, in this work we were interested in the origin side of the trips.

Under this approach, authors like McCabe et al. (2011) have studied the population that does not participate in tourism mobility. Other researchers have been interested in the frequency of tourism activities of a population, and distance-related indicators for trips (Charles-Edwards and Bell, 2015). In addition, tourism movements show unequal monthly distributions throughout the year, being this the main concern of this work.

Seasonality is usually defined as the tendency of tourist flows to concentrate in relatively short periods of the year (Allcock, 1994). Moreover, it is often viewed as an intrinsic feature of the tourism industry (Baum and Lundtorp, 2001) with several negative effects on destinations, e.g., inefficient use of resources and facilities (Manning and Powers, 1984), or variability in income and employment (Jang, 2004; Ashworth and Thomas, 1999).

There are a wide range of studies analysing the causes of tourism seasonality. Baron (1975) makes a distinction between natural (mainly weather) and institutional factors (cultural and social). Most of the subsequent works have either followed or delved into some elements of this categorisation (Allcock, 1994; Baum and Hagen, 1999; Butler and Mao, 1997; Commons and Page, 2001; Connell et al., 2015; Goulding, Baum and Morrison, 2004; Higham and Hinch, 2002). For instance, Koenig-Lewis and Bischoff (2005) have highlighted the role of school and work calendars as the main drivers within the institutional factors.

Moreover, seasonal variations in tourism demand have also been studied from diverse perspectives, mostly in economic terms or focusing on particular destinations (Fernández-Morales et al., 2016). Besides, the most common approach to analyse tourism seasonality relies on the estimation of tourism demand by looking at tourist flows received in a destination, usually measured by the number of persons received or the number of nights spent at a particular destination.

In contrast, the approach followed in this work is based on the mobility of the resident population, and thus, tourist flows are studied by their origin. Accordingly, the main variable used is the number of trips undertaken by residents; hence, the monthly distribution throughout the year of this variable is the main characteristic of interest for the study of seasonality.
Despite the fact that the movements of the population of origin have been studied less from this perspective, impacts are also experienced at tourist-origins. Some examples of these effects are seasonal reductions in business turnover (Charles-Edwards and Bell, 2015) and traffic congestion in big cities (Memmott and Young, 2008).

3. Measuring tourism seasonality

There are several methods for measuring the seasonal concentration of tourism demand, which have been reviewed by Lundtorp (2001) and Koenig and Bischoff (2005), who outline the most commonly used methods of analysis. De Cantis et al. (2011), in a comprehensive study, considered the main approaches to measure tourism seasonality, including an analysis of the main seasonality measures used in the literature (seasonal ratio, seasonal index, seasonal range, seasonal peak, Coefficient of Variation and Gini and Theil indexes). They also distinguished between different facets of seasonality such as pattern and amplitude, which require specific measures. More recently, Duro (2016) used several measures of seasonal concentration (Gini and Theil indexes and the Coefficient of Variation), and Lo Magno et al. (2017) proposed a new seasonality index based on a transportation cost approach.

The method used in this work is comprised of three steps, which are focused, respectively, on (i) the seasonal pattern, (ii) the level of seasonal concentration, and (iii) the seasonal variation.

The most common method used to measure tourism seasonality is based on the estimation of seasonal factors to obtain a profile, often monthly, of the seasonal pattern that the analysed variables exhibit (López Bonilla et al., 2006, Cisneros-Martinez and Fernandez-Morales, 2015). This is the first step as it allows for a descriptive analysis of the distribution throughout the year of the variables, and reveals the seasons and their durations. There are several techniques to estimate the seasonal factors, but in this work the multiplicative decomposition has been used for its simplicity (Cuccia and Rizzo, 2011). According to this technique, for each series analysed, a set of 12 seasonal factors, \( F_i \), \( i=1, \ldots, 12 \), are obtained, indicating the seasonal effect corresponding to month \( i \).

However, additional measures are needed, in particular, some synthetic indicator of the degree of seasonal concentration for every year, as is noted by Fernandez-Morales (2003), Fernández-Morales and Mayorga-Toledano, 2008; Lundtorp (2001), Rosselló Nadal et al. (2004) or De Cantis et al. (2011). Thus, the second step is dedicated to analysising the degree of seasonal concentration. For the purpose of this work the Gini concentration index is used as a measure of annual seasonal concentration. Although there are several alternative measures
available, like the Theil index or the coefficient of variation, the Gini concentration index has some useful properties, for instance, it takes into account the skewness of the distribution, it satisfies the Pigou Dalton condition, allows for the decomposition by sources that makes possible the calculation of relative marginal effects (Cisneros-Martínez and Fernández-Morales, 2015).

The calculation of the Gini concentration index was performed using the covariance approach, which is the most convenient for the decomposition by sources (Yitzhaki and Schechtman, 2013), and was later applied. Thus, the annual Gini concentration index of a variable \( X \), that in our case takes 12 data series, one for each month, is

\[
G_X = \frac{2 \text{Cov}(X, F(X))}{\mu_X}
\]

Where \( F(X) \) and \( \mu_x \) stand for the empirical distribution function and the mean of \( X \), respectively.

\( G_X \) is bounded in the interval (0, 11/12) for a set of 12 monthly data. The greater the value of \( G_X \), the higher the degree of seasonal concentration; \( G_X \) values closer to 0 are associated with less uneven monthly distributions. The extreme case of \( G_X = 0 \) indicates a perfectly proportional distribution of \( X \) within months.

In addition, analysing the degree of tourism seasonal concentration often requires a decomposition by segments, like in our case where the number of trips can be decomposed by destination and by purpose. This decomposition of the Gini index is known in the field of economic inequality as the decomposition by income sources (Giorgi, 2011), and it is also being used to study the tourism demand seasonality decomposition across segments (Fernández-Morales and Mayorga-Toledano, 2008; Halpern, 2011; Cisneros-Martínez and Fernández-Morales, 2015; Duro, 2016; Cisneros-Martínez et al., 2017).

The Gini index of \( X \), which is the sum of \( K \) variables \( X_k \), \( k=1, 2, \ldots, K \), with respective means \( \mu_1, \mu_2, \ldots, \mu_K \), \( X = X_1 + X_2 + \ldots + X_K \) can be decomposed as (Yitzhaki and Schechtman, 2013):

\[
G_X = \sum_{k=1}^{K} \frac{\mu_k}{\mu_X} \Gamma_{X_kX} G_k
\]

Therefore, the contribution of each segment \( X_k \) to the total Gini concentration index, \( G_X \), is the product of three components: (i) its share \( S_k = \mu_k/\mu_X \), (ii) its Gini concentration index, \( G_{X_k} \), and (iii) its Gini correlation coefficient with \( X \), \( \Gamma_{X_kX} \). The product of the second and third components is often called concentration ratio, \( C_k = G_{X_k} \Gamma_{X_kX} \). This result, which was first proposed by Lerman and Yitzhaki (1984), uses the Gini correlation coefficient between \( X_k \) and \( X \):
The Gini correlation coefficient between $X_k$ and $X$ is a measure of association that takes into account values and ranks, and it is bounded in the interval (-1,1) (Yitzhaki and Schechtman, 2013). Due to the fact that $\Gamma_{XkX}$ can be negative, the overall Gini concentration index, $G_X$, may be lower than the corresponding Gini indexes of the segments $X_k$. This case is found when some segments are concentrated in different seasons, generating a compensation effect that results in an overall less seasonally concentrated distribution.

Using (2), the calculation of marginal effects of changes in each segment $k$ over $G_X$ is straightforward, and divides the partial derivative of $G_X$ with respect to a small percentage change in segment $k$ (proportionally distributed) by $G_X$: (Lerman and Yitzhaki, 1985):

$$rme_k = \frac{S_k \Gamma_{XkX} G_k}{G_X} - S_k \quad (4)$$

This approach is very useful in order to assess the potential effects of promoting particular segments over the general level of seasonal concentration, especially for those ones with negative $rme_k$, which contribute to reduce seasonal concentration. In addition, the sum of $rme_k$ over $k$ equals 0.

To get a more in-depth insight into the change observed in the Gini index in the period studied, the decomposition by Podder and Chatterjee (2002) was used in this work. The difference between the final ($t=T$) and initial ($t=0$) Gini indexes, $\Delta G = G_X(T) - G_X(0)$, can be approximated by:

$$\Delta G \approx \sum_{k=1}^{K} C_k \Delta S_k + \sum_{k=1}^{K} S_k \Delta C_k \quad (5)$$

Where $\Delta S_k = S_k(T) - S_k(0)$ and $\Delta C_k = C_k(T) - C_k(0)$. Thus, the observed change in the overall Gini index is the result of combining two effects: a share effect and a concentration effect. The former is due to changes in the relative importance of each segment $k$ ($\Delta S_k$), while the latter is the consequence of changes in their levels of concentration ($\Delta C_k$), measured by the concentration index $C_k$. The weights used to calculate both effects are those proposed by Podder and Chatterjee (2002): $C_k = (C_k(0) + C_k(T))/2$ and $S_k = (S_k(0) + S_k(T))/2$.

Finally, to get an indicator of changes in the relative monthly positions, the symmetric Gini correlation coefficient is calculated for the initial and final
distributions. The symmetric Gini correlation coefficient between two variables $X_1$ and $X_2$ is defined as (Yitzhaki and Schechtman, 2013):

$$S_{X_1X_2} = \frac{G_{X_1}(1 - \Gamma_{X_1X_2}) + G_{X_2}(1 - \Gamma_{X_2X_1})}{G_{X_1} + G_{X_2}}$$

(6)

This symmetric correlation coefficient is based on the association between values and ranking positions of $X_1$ and $X_2$. Therefore, it has been used as a mobility measure in the field of income distribution (Fisher and Johnson, 2006; Wodon and Yitzhaki, 2003). In our case, when applied to the normalized initial and final monthly distributions, it provides an indication of the changes in the months’ relative positions in the seasonal profiles. The range of this coefficient is $(0, 2)$. The minimum is reached when $\Gamma_{X_1X_2}$ and $\Gamma_{X_2X_1}$ are 1, which occurs when the relative rankings are the same in both variables. On the contrary, the maximum value, 2, is associated to a complete reversal of rankings.

4. Seasonality of tourism mobility in Spain

In this section, the seasonality of tourism mobility in Spain is investigated by means of the methodology proposed in the previous section. As we are interested in the mobility of Spanish residents from a trip-origin viewpoint, the data analysed came from the Familitur Surveys. These surveys were conducted by the Instituto de Estudios Turísticos (IET) up to January 2015 and were continued by the Instituto Nacional de Estadística (INE) since then. The survey covers Spain’s national territory and provides monthly estimations of the number of tourism trips taken by Spanish residents.

The Spanish population tourism mobility, in general terms, has shown in the last years a decreasing trend as a consequence of the financial crisis. This trend is depicted in figure 1, which shows the number of trips taken by Spanish residents for the period 2005-2016. Nonetheless, since 2014 one can observe a change in that trend, a notable increase in the total number of trips, which may be a reflection of the economic improvements of the last two years.

However, trips with an international destination, being proportionally less important (with shares below 10%) than domestic ones, exhibit a different behaviour, with a general observed increasing trend along the whole period. In addition, when one distinguishes by trip purpose, there are also remarkable differences. Leisure and business trips are the ones with trends closer to the general one, while visits to friends and relatives (VFR trips) increase practically throughout the whole period.
These annual figures of the total number of trips reveal that there are remarkable differences between segments by destination and purpose which should also be considered in the seasonality analysis of this phenomenon.

As our interest was the monthly distribution of the tourism mobility in the Spanish population, estimating seasonal patterns with monthly data was the first step to obtain a picture of the population’s tourism distribution throughout the year. The seasonal patterns of trips taken by Spanish residents were analysed by estimating seasonal factors in the monthly series for the observed period, which are represented in Figure 2. The seasonal pattern for total trips showed a concentrated distribution in the summer months, especially in August. This pattern was characterised by two summer months: July and August had seasonal factors greater than one. April, May, June and September had factors close to one; the remaining months seasonal factors were below one.

Figure 2 – Seasonal factors by destination and purpose
When one differentiates by destination, the seasonal profile of international trips is very similar but with a higher concentration in the summer months. Whereas, domestic trips practically have the same total number of trips (due to its high share).

Regarding the seasonal profiles of trip purpose, there were two well-differentiated patterns. The first one is analogous to the general seasonal profile, i.e., it is highly concentrated in the summer, and was exhibited by leisure and VFR trips. Yet, between these two trip purposes there are also some differences; leisure trips showed a higher number of trips in August than VFR ones, which also presented high seasonal factors in December and January (the seasonal factors for leisure trips in December and January were the lowest within all type of purposes).

The second pattern, observed in Business and other trips, were characterised by the low seasonal factors during the summer (July and August) and winter months (December and January). In addition, the seasonal factors were relatively close to one in the remaining months, with a slight predominance of May and June in Business trips and April and May in other trips.

We were also interested in an annual measure of seasonal concentration. For this purpose, as mentioned above, the Gini concentration index was estimated for every year in the observed period. The degree of seasonal concentration showed an increasing trend in the last decade for the total trips (the evolution of the Gini index is represented in figure 3), revealing a more concentrated monthly distribution at the end of the period. However, by distinguishing by trip destination we found that the Gini index of international trips exhibited a decreasing trend, getting closer to the degree of concentration of domestic trips, although it was still higher at the end of the observed period.

**Figure 3 – Gini concentration index by destination and by purpose**

Travel purpose is another relevant factor that generates different degrees of seasonal concentration. Leisure trips are those with the most concentrated distribution throughout the year and, in addition, the evolution of the Gini concentration index of this type of travels observed has been increasing since 2008.
(Figure 3 also shows the evolution of Gini index by purpose). On the contrary, business related trips showed the smallest Gini indexes in practically all the years observed, according to monthly distributions, with less variation than the rest of trips. Finally, the amount of seasonal concentration for VFR and other trips is closer to that of total trips, with a slight decrease in the last two years.

The importance of domestic travels among the resident population, with shares above 90%, is the main reason that the total Gini index is so similar to the one corresponding to domestic trips (Table 1). Moreover, international trips, which have higher Gini indexes, contribute to the index total increase but with a limited effect due to their small shares and to their relatively high Gini correlations with total trips (above 0.8).

The decomposition by travel purpose provides some additional features of interest (Table 2). Firstly, leisure travels are the main contributors to the total annual seasonal concentration during the whole observed period. Aside from the highest Gini indexes, these trips account for the highest shares and thus the highest Gini correlations. Business-related and other purpose trips, on the contrary, exhibit negative Gini correlations. Therefore, both types of trips contribute to reducing the level of concentration as they tend to compensate the monthly distribution of leisure trips. Nevertheless, the importance of their effect is reduced as a consequence of relatively low shares (below 16% and 10%, respectively). On the other hand, VFR trips also contribute to reducing seasonal concentration since their correlations are below 0.81 and they also produce a compensation of leisure trips distributions along the year.

Relative marginal effects (rme) obtained from both Gini decompositions are represented in figure 4. During the whole observed period, leisure and international trips exhibited positive marginal relative effects, according to the decomposition results. Among the trips with negative relative marginal effects, it was striking to observe that during the first years studied, business and other trips were those with lower rmes, while in the last years, the rmes of VFR trips were smaller. This was partly due to an increase of VFR trips shares combined with a reduction in their Gini indexes at the end of the period observed.
Table 1 – Gini index decomposition by destination

<table>
<thead>
<tr>
<th></th>
<th>G</th>
<th>S</th>
<th>R</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Internat.</td>
<td>Domestic</td>
</tr>
<tr>
<td>2005</td>
<td>0.114</td>
<td>0.205</td>
<td>0.111</td>
</tr>
<tr>
<td>2006</td>
<td>0.096</td>
<td>0.181</td>
<td>0.090</td>
</tr>
<tr>
<td>2007</td>
<td>0.130</td>
<td>0.227</td>
<td>0.124</td>
</tr>
<tr>
<td>2008</td>
<td>0.104</td>
<td>0.193</td>
<td>0.099</td>
</tr>
<tr>
<td>2009</td>
<td>0.114</td>
<td>0.177</td>
<td>0.110</td>
</tr>
<tr>
<td>2010</td>
<td>0.117</td>
<td>0.195</td>
<td>0.112</td>
</tr>
<tr>
<td>2011</td>
<td>0.138</td>
<td>0.180</td>
<td>0.136</td>
</tr>
<tr>
<td>2012</td>
<td>0.132</td>
<td>0.183</td>
<td>0.129</td>
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<tr>
<td>2013</td>
<td>0.137</td>
<td>0.170</td>
<td>0.136</td>
</tr>
<tr>
<td>2014</td>
<td>0.137</td>
<td>0.188</td>
<td>0.133</td>
</tr>
<tr>
<td>2015</td>
<td>0.137</td>
<td>0.174</td>
<td>0.135</td>
</tr>
<tr>
<td>2016</td>
<td>0.128</td>
<td>0.143</td>
<td>0.127</td>
</tr>
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Table 2 – Gini index decomposition by purpose

<table>
<thead>
<tr>
<th></th>
<th>G</th>
<th>S</th>
<th>R</th>
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<tbody>
<tr>
<td>2005</td>
<td>0.08 0.12 0.20 0.16</td>
<td>0.12 0.30 0.49 0.09</td>
<td>-0.33 0.81 0.94 -0.24</td>
</tr>
<tr>
<td>2006</td>
<td>0.09 0.14 0.23 0.18</td>
<td>0.13 0.28 0.52 0.07</td>
<td>-0.27 0.77 0.93 -0.60</td>
</tr>
<tr>
<td>2007</td>
<td>0.07 0.12 0.20 0.13</td>
<td>0.16 0.23 0.52 0.08</td>
<td>-0.50 0.40 0.93 -0.89</td>
</tr>
<tr>
<td>2008</td>
<td>0.06 0.13 0.19 0.14</td>
<td>0.16 0.23 0.52 0.08</td>
<td>-0.58 0.70 0.96 -0.61</td>
</tr>
<tr>
<td>2009</td>
<td>0.07 0.12 0.19 0.12</td>
<td>0.12 0.25 0.56 0.07</td>
<td>-0.18 0.45 0.99 -0.40</td>
</tr>
<tr>
<td>2010</td>
<td>0.07 0.14 0.19 0.15</td>
<td>0.10 0.27 0.55 0.07</td>
<td>-0.39 0.67 0.97 -0.71</td>
</tr>
<tr>
<td>2011</td>
<td>0.07 0.15 0.22 0.15</td>
<td>0.10 0.29 0.54 0.07</td>
<td>-0.16 0.71 0.96 -0.49</td>
</tr>
<tr>
<td>2012</td>
<td>0.07 0.12 0.22 0.17</td>
<td>0.08 0.33 0.53 0.06</td>
<td>-0.29 0.71 0.96 -0.44</td>
</tr>
<tr>
<td>2013</td>
<td>0.07 0.12 0.21 0.12</td>
<td>0.07 0.35 0.52 0.06</td>
<td>0.06 0.75 0.99 -0.55</td>
</tr>
<tr>
<td>2014</td>
<td>0.08 0.14 0.21 0.15</td>
<td>0.06 0.34 0.54 0.06</td>
<td>-0.23 0.74 0.95 -0.49</td>
</tr>
<tr>
<td>2015</td>
<td>0.07 0.11 0.24 0.09</td>
<td>0.09 0.38 0.46 0.07</td>
<td>-0.21 0.76 0.99 0.45</td>
</tr>
<tr>
<td>2016</td>
<td>0.10 0.09 0.24 0.07</td>
<td>0.09 0.39 0.47 0.05</td>
<td>-0.19 0.63 0.96 0.48</td>
</tr>
</tbody>
</table>
The observed trend in the Gini index of tourism mobility for Spanish residents, as it is mentioned above, consists of an increase in the total seasonal concentration for the observed period. The change in the Gini index from 2005 to 2016, which accounts for 0.015, can be decomposed into concentration and share effects (Table 3), using the decomposition of Podder and Chatterjee (2002). This approach allows one to get a deeper insight into the contributions of each segment from a temporal point of view.

With respect to trip destinations, the highest component was the concentration effect of domestic trips; they showed an increase in the Gini indexes that resulted in a concentration effect. However, this segment has a slight negative share effect due to a decrease in its share throughout the period. On the contrary, international trips had opposite indicators. The concentration effect was negative, as a consequence of the decrease in the Gini index of the international segment. Nevertheless, the increasing importance of international trips, which are more seasonally concentrated than domestic ones, generates a positive share effect.

When one distinguishes by trip purpose, leisure trips generated the highest positive component: their concentration effect. This effect is caused by a considerable increase in the Gini concentration index for this segment, which is also the most numerous with shares above 45%. Yet, a decrease in the leisure shares was responsible for the negative share effect. In contrast, VFR trips showed the opposite behaviour. While the Gini index for VFR trips decreased from 2005 to 2016, generating a negative concentration effect, this increase in their shares caused a positive share effect, being the second effect in order of magnitude in this decomposition. The concentration and share effects of business trips were small but positive due to a slight increase in their Gini indexes and a decrease in their shares.
Therefore, from a temporal viewpoint, the change of the degree of seasonal concentration of residents’ trips is the result of the combination of several different effects that vary in magnitude and/or sign. The most important ones in the observed period that contributed positively to the increase in the total Gini index were the concentration effects of leisure and domestic trips (caused by an increase in their respective Gini indexes) and the share effects of international and VFR trips (caused by an increase in their respective shares). On the contrary, the higher effects with negative indicators were the concentration effect of VFR trips and the share effects of leisure and domestic trips. However, the former were greater than the latter, resulting in an increase in the overall degree of seasonal concentration.

Table 3 – Decomposition of Gini index change (2005-2016) by destination and purpose

<table>
<thead>
<tr>
<th></th>
<th>Concentration effect</th>
<th>Share effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>International</td>
<td>-0.002</td>
<td>0.004</td>
</tr>
<tr>
<td>Domestic</td>
<td>0.015</td>
<td>-0.003</td>
</tr>
<tr>
<td>Business</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>VFR</td>
<td>-0.014</td>
<td>0.007</td>
</tr>
<tr>
<td>Leisure</td>
<td>0.018</td>
<td>-0.004</td>
</tr>
<tr>
<td>Other</td>
<td>0.005</td>
<td>0.000</td>
</tr>
</tbody>
</table>

In order to have an additional measure that took into account the variation in monthly rankings within each monthly distribution, the symmetric Gini correlation index, between the observed distributions in 2005 and 2016, has been calculated (Figure 5). This index for the total trips equals 0.06. This low value reveals a very stable distribution with few changes between 2005 and 2016.

The low variation level within months is also observed when the distributions of domestic and international trips between 2005 and 2016 are compared; the estimated indexes are 0.07 and 0.11, respectively. Therefore, the measurement of the seasonal concentration level for these distributions with the Gini index is barely affected by the change between the positions of the months.

In contrast, there are greater differences by segments when one distinguishes by travel purpose. VFR and leisure travels also show low indexes; this is an indication that their seasonal patterns have a considerable degree of stability. But, business and other trips show relatively higher mobility indexes within months. Thus, both monthly distributions –business and other– have not only experienced changes in the amount of seasonal concentration, but also in the monthly rankings within their respective distributions. With regards to the business trips, the distribution in 2016 was more concentrated during April-June and September-October, while March and November, notably reduced their shares since 2005 to 2016.
5. Conclusions

Population mobility, especially when it concerns tourism flows, has a temporal dimension that deserves its own specific analysis. Although spatial mobility is of undoubted interest in tourism research, in time, the distribution of tourism flows will also need to be understood and measured. The field of seasonality analysis has been focused on tourist flows by destinations, but it is also worthwhile considering analysing the seasonal distributions of population trips by regional or national residents.

A very useful methodological approach for this purpose, which is applied in this study, consists of estimating seasonal factors to expound the seasonal distribution of trips during the year, and calculating Gini concentration indexes as annual measures of seasonal concentration. This approach allows one to calculate several additional measures that make it possible to get more thorough information on the contribution of different segments to the overall concentration each year, using the decomposition of Lerman and Yitzhaki (1985), in the whole observed period, using the decomposition of Podder and Chatterjee (2002), or using the symmetric Gini correlation to have an indicator of the seasonal variation of patterns.

By using the available data for Spain from 2005 to 2016, this methodology has yielded some interesting results. During the observed period, the number of trips showed a decreasing trend up to 2014, as a consequence of the economic crisis, which especially affected business and leisure trips.
Seasonal patterns—both in international and domestic trips—are generally concentrated in summer months. However, distinguishing by either trip purpose, business, and other trips showed a different pattern, i.e., less concentrated in summer. Regarding the level of annual seasonal concentration, there are important differences between domestic and international trips as the latter are more seasonally concentrated. These differences are also observed within the trip purpose segments. While leisure trips are those with the highest Gini concentration indexes (more seasonally concentrated), business trips show the lowest levels of concentration (VFR and other trips are in an intermediate position).

In addition, the approach followed in this work allows one to detect which segments contribute the most to seasonal concentration. By destination, international trips contribute to the increasement of the Gini index but with a limited repercussion due to their small shares. On the other hand, by trip purpose, leisure trips are the main contributors to seasonal concentration, while business and other trips show a compensation effect by reducing seasonality.

From a temporal point of view, the level of seasonal concentration shows different trends by segments. International and VFR exhibit decreasing Gini indexes, while domestic and leisure trips have an increasing seasonal concentration. The overall trend is also increasing. The increase observed in the overall Gini index from 2005 to 2016 was the aggregate result of several factors across segments in which the most remarkable were the increase of the Gini indexes of domestic and leisure trips, and the share increase of international and VFR trips; all of them contributed to a higher level of seasonal concentration. Although some effects had the opposite sign, such as a decrease concentration in VFR trips and in the share effects of leisure and domestic trips, the combination of all the effects resulted in a higher seasonal concentration level.

Furthermore, the symmetric Gini correlation is a good complementary measure to know the pattern changes in a month’s position, which is not accounted by the standard Gini concentration index. In this study, only business and other trips experienced remarkable variations in this respect.

Finally, the results obtained in this work reveal that the methodological approach followed can help study the tourism flows of a given population (a country or region), which is certainly not only of great interest for researchers but also for the public policy and management fields. However, a highly interesting future line of research would be to expand this methodology to combine the analysis of inflow and outflow of tourists.
References


SUMMARY

Tourism Mobility in Time and Seasonality in Tourism

In this paper tourism mobility is studied as a process that affects the population of a geographical area, such as a country or a region, from the viewpoint of the trips generated in the region. To analyse mobility in time, the approach followed consisted of estimating seasonal factors to depict the seasonal distribution of the trips throughout the year, and calculating Gini indexes as annual measures of seasonal concentration. This approach allows for the calculation of several additional measures that permit one to go more in-depth into the contribution of different segments to the overall yearly concentration for the observed period, as well as to have an indicator of the seasonal variation of patterns.

Using available data for Spain from 2005 to 2016, this methodology has yielded some interesting results, revealing which are the segments (distinguishing by travel purpose and destination) that mostly contribute to the observed increase in the seasonal concentration of Spanish residents’ trips, as measured by the Gini index.

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