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DECOMPOSING SEASONAL CONCENTRATION

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Abstract: The main purpose of this article is to analyze seasonal concentration in tourism demand series in three Spanish Mediterranean destinations by means of the Gini index, decomposing it into inequality between and within seasons. This method is applied to the monthly series of hotel nights, covering the period 1980–2001. The results suggest that the "between" seasons component is the most significant one. In the most mature destination this component is stabilized around 90% of the annual Gini index. In contrast, in the destination with the smallest Gini index, which offers a more diversified tourism product, the between component only rises to the 70% and is still decreasing. **Keywords:** seasonal concentration, Gini index. © 2003 Elsevier Ltd. All rights reserved.

Résumé: La décomposition de la concentration saisonnière. Cet article a comme but principal l'analyse de la concentration saisonnière de la demande touristique dans trois destinations méditerranéennes espagnoles en utilisant l'indice de Gini et en la décomposant en parties inégales « entre » et « pendant » les saisons. La méthode est appliquée à des séries de nuits d'hébergement pendant la période 1980-2001. Les résultats suggèrent que le composant le plus significatif est celui qui est « entre » les saisons. Dans la destination la plus mûre ce composant s'est stabilisé vers 90% de l'indice annuel de Gini. Dans la destination ayant l'indice de Gini le plus bas, par contre, dû a un produit touristique plus diversifié, le composant « entre » atteint seulement 70% et continue à décroître. **Mots-clés:** concentration saisonnière, indice de Gini. © 2003 Elsevier Ltd. All rights reserved.

INTRODUCTION

Seasonality is one of the most representative attributes of tourism and it is often seen as a major problem that this industry has to face, particularly in peripheral regions of Southern Europe, which base their tourism product on sun and sea.

There are many definitions of this concept. Following Allcock (1994) it is the tendency of tourist flows to become concentrated into relatively short periods of the year. This characterization is based on the annual distribution of the tourist flows, stressing the fact that it can be found not only in the climatic conditions of the destination, but also in originating markets. Along the same line, Butler (1994) describes it as a temporal imbalance, which may be expressed in terms of elements

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such as numbers or expenditure of tourists, traffic on highways, employment, or admissions to attractions. At this point, it is important to recall one of the distinctive features of seasonality: its regularity. In this sense, BarOn (1999) considers that it gathers the effects occurring each year with more or less the same timing and magnitude.

It is widely recognized that the main causes of seasonality are natural and institutional (BarOn 1976). The former are originated by regular fluctuations of the weather (temperature, rainfall, sunlight, daylight, etc.) in a destination. In contrast, the latter are related to cultural, ethnic, and social factors that affect several human activities like the vacation. In addition, Butler (1994) cites other causes: social pressure or fashion, sporting calendars, and inertia or tradition. Butler and Mao (1997) distinguish between factors in origin and in receiving areas, which do not act independently, but are interrelated and interact with each other.

Seasonality is mainly perceived as a problem with serious implications for all aspects of supply-side behavior (Baum 1999). The problems more often mentioned are related to investment (difficulties in securing the return of capital and under-utilization of physical capital) and employment (seasonal unemployment and difficulties for the employers to recruit and retain full-time staff). There are also adverse effects on the environment, caused by the intensity of pressure on this fragile resource and by its overuse during the peak period.

As a consequence of this problematic perception, much attention has been paid and much effort made by both public and private sectors to reduce seasonality through a variety of approaches (Butler 1994). The main strategies to reach this objective are the variation in the product mix and the use of price differentials (Allcock 1994). In the case of Spain, Sutcliffe and Sinclair (1980) proposed deseasonalization by the development of other cheap off-season holidays for old-age pensioners; the provision of packages based on cultural events, tours of historic sites, and sports such as skiing, horse riding, or golf; and the promotion of business tourism by providing adequate facilities for international conferences. These recommendations can still be seen, some 20 years later, in many regional and local government policy programs.

The destinations analyzed in this article belong to the most southern region of Spain: Andalusia. They are three of the eight provinces of the region (the ones with the greatest numbers of tourists). They share some features like the combination of coastal and interior areas and the predominance of the sun and beach in their product, but have important differences. The regional government is highly concerned with the tourism industry as it contributes 13% to the regional GDP. The most recent plan developed by the regional government to improve the sector, *Plan General de Turismo*, mentions the problem of seasonality and considers its reduction as a challenge.

There is another related area of interest in this field that needs further investigation: the definition of seasons in particular destinations. Uysal, Fesenmaier and O'Leary (1994) used a standard quarterly calendar breakdown to study the concentration of travel time in

the United States. They mentioned that research is needed to examine the nature of travel during the different seasons, and that it is possible that specific states may view their monthly configuration for a "season" to be different. For example, a winter period may actually stretch across one year into the next. In this sense, Allcock (1994) points that it is impractical to assume that time can invariably be organized into spring, summer, fall, and winter. This paper presents seasons as "socially significant periods of time rather than natural events", because the evaluation of time is made with respect to tourist flows, which are human cycles of activities.

There are different forms of seasonality; Butler and Mao (1997) distinguish among three forms: one-peak, two-peak and non-peak. The first is typical of "Medsun" countries like Spain, Portugal, Greece, and Cyprus. It is characterized by a significant peak period, three to four months, usually in the summer. A very simple method for defining the peak season is considering the months which systematically are over the trend-cycle of the series, and hence their seasonal factors are greater than one (Lim and McAleer 2001). But this approach can be significantly improved, for example, by including the introduction of a "shoulder" season. On the other hand, the definition for seasons can change due to the evolutionary nature of the industry (Kennedy 1999), and a measure of stability could be very useful.

Butler (1994) mentions that the literature about this topic has been focused on the analysis of the demand patterns, the description of particular destinations' seasonality, the negative effects on employment and investment, and counter-seasonal policies and their implications. In addition, he recognizes that there is little research on concepts or theories and only a few specific works examine problems of measurement, citing BarOn (1976) and Sutcliffe and Sinclair (1980).

The main contributions of the present paper are in this field, namely measuring and decomposing the seasonal concentration of the hotel demand in three Mediterranean Spanish destinations. To do so, the evolution over the last 20 years of the monthly series of hotel demand is analyzed. On one hand, the Gini index is used as a measure of the annual level of concentration. On the other hand, through the application of the additive decomposition of this coefficient proposed by Dagum (1997), it is used for measuring this concept within and between seasons, providing a measure of the stability of the seasons' definition. A cluster analysis is also performed to validate the partition of the year used in this work. Although the additive decomposition of the Gini index is well known in the field of economic inequality, it has not been applied to the tourism industry.

SEASONALITY IN THREE MEDITERRANEAN DESTINATIONS

In general, the Spanish tourism product is based on sun and sea, so the industry is seriously affected by seasonality. Sutcliffe and Sinclair (1980) found that the Gini index of arrivals increased by 45% between 1952 and 1975. One of their findings is that this trend was due to a greater concentration of arrivals in certain months of the year and not

to an increase in fluctuations in the monthly pattern. Ramón and Abellán (1995) in a more recent study which covers 1983 to 1993, state that the Gini index was almost stabilized during those years. They also found that the demand is concentrated in the summer months of July, August, and September (which absorb 40% of the total).

The three destinations analyzed in this article are three contiguous Spanish provinces facing the Mediterranean Sea: Málaga, Granada, and Almería. They belong to the southern region of Spain, Andalusia. Ramón and Abellán, in their study, mention that in Andalusia the domestic hotel nights are concentrated in July and August, and the nonresident hotel nights expand to the May–October period. The reasons for this are the good climate, even in winter, the development of a product based on the history and culture of Andalusian cities, and improvements in communications and transportation.

In spite of the proximity, the degrees of seasonal concentration of the three destinations analyzed in this paper are very different. Málaga coasts are known as the *Costa del Sol,* a very important sun, sand, and sea destination since the sixties. Of the hotel nights of the province, 97% correspond to the coastal area, and grew to 15.3 million in 2001. This is the reason there is a high concentration ratio in Málaga. Recent local policies that try to diversify the supply with golf and rural tourism have not yet been fully successful in reducing this level significantly. Málaga is a mature destination, with some of the negative effects of mass tourism. The main resorts of the province—Torremolinos, Marbella, and Fuengirola—reached the last stage of Butler's cycle (1980), and show an almost saturation level in the peak period with its adverse effects on the environment and on the image of the destination, as Pollard and Domínguez Rodríguez (1993) noticed for Torremolinos.

The province of Granada shows a more diversified supply. The city of Granada (at 50 km. from the coast) is a very attractive historic and cultural destination. There is a ski resort in the *Sierra Nevada*, the southernmost ski resort of Western Europe, and the beaches of the province are the destination of a (mainly national) tourism of sun and beach. In 2001, the number of total hotel nights in the province grew to 3.7 million. Due to the diversified character of the supply, the seasonal concentration in Granada is the smallest among the three studied areas.

The third destination is the province of Almería. This one is even more specialized in sun, sand, and sea and has shown a spectacular growth in recent years: from one million overnights in 1980 to 4.2 million in 2001. The seasonal concentration in this province is the highest among the three. Almería experienced a late tourism development, compared to other coastal areas of Spain, mainly due to the lack of communications and infrastructure. The main resort of Almería, Roquetas, ranks third in Andalusia in hotel nights and absorbs 60% of the province total. Since 1990, the supply in this province grew at higher rates than the average of the region, and the construction of the Mediterranean and the A-92 highways (connecting Almería with the rest of the Spanish Mediterranean coast and with the main interior cities of Andalusia) contributed enormously to the expansion of tour-

ism in this destination. Almería, in spite of its short life is also beginning to experience problems of saturation in summer months, and the local and regional authorities are looking for solutions.

The three destinations face the problems of seasonal concentration, with saturation in some of their resorts; and the local and regional authorities, as well as the private sector agents, are concerned. As a consequence, in recent years a close coordination has been observed between municipal authorities and private enterprise in an effort to implement measures to restructure the tourism product, as Priestley and Mundet (1998) mention for Catalonia resorts. In this sense, it is very important to get deeper quantified insight, by extending the measuring of the demand, defining the seasons in every destination, and investigating the stability and the concentration within and between seasons.

Study Methods

The most common approach for measuring seasonality in tourism consists of estimating seasonal factors in time series, using proportional deviates to moving averages, or through dummy variables in multiple linear regression. Examples of more advanced econometric models are those of Sorensen (1999) who uses univariate ARIMA models for studying hotel nights in Denmark; Ashworth and Thomas (1999) who apply recent econometric tests to examine changes in the seasonality in employment in the United Kingdom, and González and Mora (1996) who use structural time series models with stochastic factors to analyze international arrivals to Spain. These factors are often estimated over a monthly basis. In addition to their descriptive use, they are often used to deseasonalize series in order to study the changes in the trend-cycle component of the series.

Because monthly or quarterly factors do not provide a synthetic measure of the annual level of seasonality, an annual single measure of the extent of this phenomenon may permit the identification of those years in which it has increased or decreased as well as providing information about whether counter-seasonal policies had been effective or not. Many statistical measures of dispersion and concentration can be used to estimate the degree of seasonality, like the standard deviation, the Theil and the Gini index. Although there is not enough empirical evidence, it seems that all three give very similar results when estimating the changes in the degree of seasonality. Sutcliffe and Sinclair (1980) applied these coefficients to monthly arrivals in Spain for the period 1951 to 1976, and found correlations higher than 0.989 among the three measures. In this study, the linear correlations among the Gini and Theil indexes and the standard deviation in the three destinations are all higher than 0.99.

The Gini coefficient is possibly the most widely used in this area. Some authors who apply it are Sutcliffe and Sinclair (1980), Yacoumis (1980), Lee (1996), Grabler (1997), Wöber (1997), and Lee and Kang (1998). In addition, this index can be decomposed in a very useful

way for assessing the degree of variation within and between seasons, as well as providing a measure of transvariation between them.

In a monthly series Y, the Gini index (G) of an annual set of observations Y_1, Y_2, ..., Y_{12}, can be expressed in various ways. The original formula, Gini (1912), is shown in Table 1, where Δ is the Gini mean difference. This means that the mean absolute difference between all the 12×12 pairs (Y_i,Y_j), and $\bar{Y}$ is the arithmetic mean. Continuous variable G ranges from 0 to 1. But here the data set has a finite size, 12, and the range is (0, 0.9167). G equals 0 when the 12 data are the same, $Y_1 = Y_2 = ... = Y_{12}$, indicating that there an egalitarian distribution over all months. On the other hand, the maximum value of G is reached when 11 data are 0 and only one month has a non-null value. Therefore, the higher the Gini index, the greater the degree of seasonal concentration.

The former consideration reveals that this measure is not useful to compare series with different periodicity. For example, the index of

Table 1. Additive Decomposition of the Annual Gini Index

Annual Gini index	$G = \frac{\Delta}{2\bar{Y}} = \frac{1}{2}\frac{\sum_{i=1}^{12}\sum_{j=1}^{12}\frac{\lvert Y_i - Y_j\rvert}{12^2}}{\bar{Y}}$
Decomposition of the annual index	$G = G_w + G_{nb} + G_t$
"Within" seasons component	$G_w = \sum_{r=1}^{k} G_{r,r} p_r s_r$
"Net between" seasons component	$G_{nb} = \sum_{r=2}^{k}\sum_{t=1}^{r-1} G_{r,t}(p_r s_t + p_t s_r) D_{r,t}$
"Transvariation" component	$G_t = \sum_{r=2}^{k}\sum_{t=1}^{j-1} G_{r,t}(p_r s_t + p_t s_r)(1 - D_{r,t})$
Gini ratio between seasons r and t	$G_{r,t} = \frac{\Delta_{r,t}}{\bar{Y}_r + \bar{Y}_t} = \frac{1}{\bar{Y}_r + \bar{Y}_t}\sum_{i=1}^{n_r}\sum_{j=1}^{n_t}\frac{\lvert Y_i - Y_j\rvert}{n_r n_t}$
Distance ratio between seasons r and t	$D_{r,t} = (\bar{Y}_r - \bar{Y}_t)/\Delta_{r,t}, \bar{Y}_r > \bar{Y}_t$

quarterly series varies between 0 and 0.75, while for monthly series the range goes from 0 to 0.9167. This is due to the fact that indexes obtained from quarterly data are implicitly imposing an egalitarian distribution within every quarter. Therefore, in practice, every variable shows smaller Gini indexes for quarterly than for monthly data.

According to the observed monthly patterns, the year can often be decomposed into well-defined seasons. They can exhibit a homogeneous internal distribution or, in the contrary, an important degree of internal concentration. On the other hand, the differences among them also affect the level of annual concentration. Hence, it is of great interest to measure both contributions to the annual coefficient. These measures can help to explain if a decrease in the value of G is due to an internal homogenization of a specific season or to an approximation between seasons.

In order to estimate the effect over the annual value of G of internal and external differences among seasons, it is necessary to carry out a mathematical decomposition of the index. Although there are several ways to decompose it, an important topic in the literature of economic inequality since the 70s, the one proposed by Dagum (1997) is used in this work because it has very interesting features. With this decomposition, it is possible to assess the inequality within the seasons, the inequality among them, and how they contribute to the total (yearly) concentration ratio, and to obtain a measure of transvariation (overlapping) within this annual frame.

Following the decomposition of Dagum (1997), the Gini index of an annual set of the monthly data that is partitioned into k seasons (i.e., if the year is divided into low, peak, and shoulder, k = 3) of sizes $n_1, n_2, ..., n_k$; $\Sigma_i\, n_i = 12$ can be decomposed in the following additive components: G_w, the contribution of the inequality within seasons to the annual ratio G; G_{nb}, the net contribution of the inequality between seasons; and, G_t, the contribution of the intensity of transvariation between seasons. The formulae of these components are shown in Table 1. A more detailed explanation can be found in Dagum (1997).

The component G_w indicates the part of G that can be attributed to the internal concentration within each season. This component is obtained as a weighted sum of the Gini indexes of each period (in the formulas of Table 1, $G_{r,t}$ stands for the Gini index between seasons r and t, being $G_{r,r}$ the internal index of the former r; p_r for the ratio of the number of months of season r to 12, and s_r for the share of season r in the annual value of Y). If the variable shows very similar values for the months of each season (that is, very homogeneous periods), this component will be small. The extreme case consists of seasons with identical monthly values (for example, low: $Y_1 = Y_2 = Y_3 = Y_4 = Y_5 = 15$, shoulder: $Y_6 = Y_7 = Y_8 = 35$, and peak: $Y_9 = Y_{10} = Y_{11} = Y_{12} = 100$), which yields $G_{L,L} = 0$, $G_{S,S} = 0$ and $G_{P,P} = 0$, and thus $G_w = 0$.

The other two terms of the decomposition need additional explanations. Dagum (1997) calls G_{nb} the "net contribution" of the inequality between groups to G. The magnitude of this component is a measure of the contribution to the annual of the differences between seasons. If very pronounced, the component G_{nb} will be responsible

for an important annual concentration index, but if there are few differences, this component will be small.

The effect of overlapping is measured by G_t. Dagum calls this the contribution of the intensity of transvariation to G (other authors call it interaction or cross-over term). The concept of transvariation goes back to Gini (1916). There is no null transvariation between two seasons when at least one of the possible differences between an element of one and that of the other has the opposite sign than the difference between the means of their corresponding seasons.

The component, G_t, may be very useful to the analysis of seasonality. It is an indicator of the stability of the definition of the seasons. A stable classification of the months should show null transvariations year after year, while no null transvariations components appear when the seasonal distribution of the months changes over the observed period.

Although it is possible to obtain the decomposition of Table 1 using alternative approaches, in this article, the method of Dagum (1997) is followed in the calculations. The hotel demand is studied by means of the monthly series of nights spent in every one of the three provinces. The series of hotel nights are published by the *Instituto Nacional de Estadística* (1999), and are an essential part of the survey *Movimiento de Viajeros en Establecimientos Hoteleros*, conducted over all the national territory.

Study Results

The evolution of the Gini index (G) of the monthly series over the period since 1980 to 2001 can be seen in Figure 1. It shows that during the 21 observed years, Granada was the destination with the lowest index. In addition, this province began at the end of the 80s to reduce even more its seasonal concentration, and now shows values around 0.10. Almería has also experienced a general decreasing trend over the years, but remains with the highest values of G. In contrast, Málaga shows a more erratic pattern. These trends are consistent with the gen-

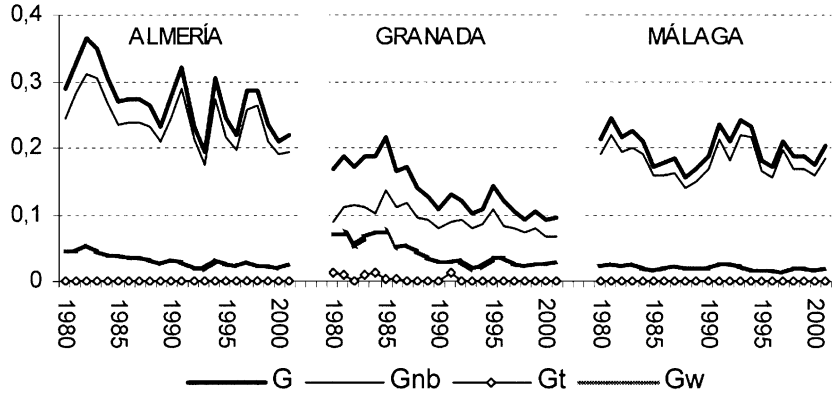

Figure 1. Decomposition of Gini Indexes

eral one observed in the whole country. With a set of data from 1980 to 2001, it seems that there has not been any important change in the monthly distribution of hotel nights in Spain, with the exception of a slight reduction in the peak months. G exhibits a slight decreasing trend during these years, from 0.24 in 1980 to 0.22 in 2001. In addition, this coefficient in Andalusia was 0.19 in 1980 and 0.18 in 2001. Between these years, the maximum was reached in 1983 (G = 0.22) and the minimum in 1988 (G = 0.16).

There are important differences among the monthly patterns of the three destinations. While Málaga and Almería exhibit a unimodal distribution, Granada has a bimodal one. In Málaga and Almería, the factors for the winter months (November, December, January, and February) are below 0.7 and for the summer ones (July, August, and September) are over 1.3. It is very interesting to notice that summer and winter in Almería and Málaga have the same pattern, but more marked in Almería (especially in the summer). In contrast, in Granada the factors are less dispersed. All of them are within the interval (0.7, 13). In this province, there is a peak in March, April, and May and another relative peak in July, August, and September.

The partition of the year could be done using the common and simple criterion of considering two seasons in such a way that the peak period would include all the months with a factor greater than one and the low one the rest of the year. In Málaga and Almería, the national factors can be adopted to define two seasons. But it seems more adequate to define a third shoulder season containing months with factors close to one, like April (0.88), May (1.12), or October (1.07), in spite of joining them with the peak or through months, like January (0.57) or August (1.76). Hence, in the provinces of Málaga and Almería, the year can be decomposed in three seasons: low, which comprehends the winter months (November, December, January and February), high, including the summer months (July, August, and September), and finally "shoulder" (March, April, June and October). This decomposition yields no null transvariations except for one year in Málaga and four years in Almería.

If the national factors were taken to define two seasons in Granada, the transvariation would have very high values (in 2001 $G_t = 0.0293$, a 31.19% of G). It is necessary to use specific seasonal factors in this province. Even with its own specific factors, the pattern of Granada does not allow three well-differentiated seasons. For this reason it is preferable to work with only two seasons in Granada: low (November, December, January, February, June, and July) and high (March, April, May, August, September, and October), which contains the two relative modes of the annual distribution.

A k-means non-hierarchical cluster analysis has been performed for the series of hotel nights in the three destinations to confirm the established year partition. To obtain a three seasons partition, it has been necessary to take a four-clusters solution, due to the fact that a previous hierarchical cluster analysis shows August in the three provinces as an independent cluster. In Málaga and Almería, the low season corresponds to the first cluster (November, December, January, and

February), the peak season to clusters three (July and September) and four (August), and the months in cluster two (March, April, May, June, and October) are classified as a shoulder season. In Granada, the peak season includes clusters three (March, April, May, September, and October) and four (August), and clusters one (November, December, January, and February) and two (June and July) are joined as the low season because the factors of these two groups of months are very similar in the observed years and show an important degree of transvariation between them.

The additive decomposition of the Gini index can be a very important tool to get a deeper insight into the monthly distribution of hotel demand in the three destinations. The evolution of the internal indexes of every season and the indexes among them is presented in Figure 2 for the years 1980 and 2001. In this pattern, although there are several oscillations, the province of Málaga shows along the observed period low values of the internal concentration ratios of the three seasons, $G_{L,L}$, $G_{S,S}$, and $G_{P,P}$ are below 0.08. This indicates a relative internal homogeneity of the three seasons. In contrast, Almería begins the period with high values of $G_{S,S}$, and shows high values of $G_{L,L}$ in the middle of the period. Only at the end of the 90s do the values of these ratios become smaller. This is due to the fact that this destination is not yet sufficiently mature and the seasonal patterns are still changing, as opposed to Málaga.

The province of Granada has experienced an important decline in the internal concentration ratios of both the peak and the low seasons. The peak one shows a very low $G_{P,P}$ index (the smallest of all of them), that corresponds to a peak season with a distribution of hotel nights very close to the uniform distribution. However, the G_w in Granada represents a percentage of G higher than the ones of Málaga and Almería.

Turning attention to the Gini indexes between seasons, the greater values are found in the province of Almería. Although there is a

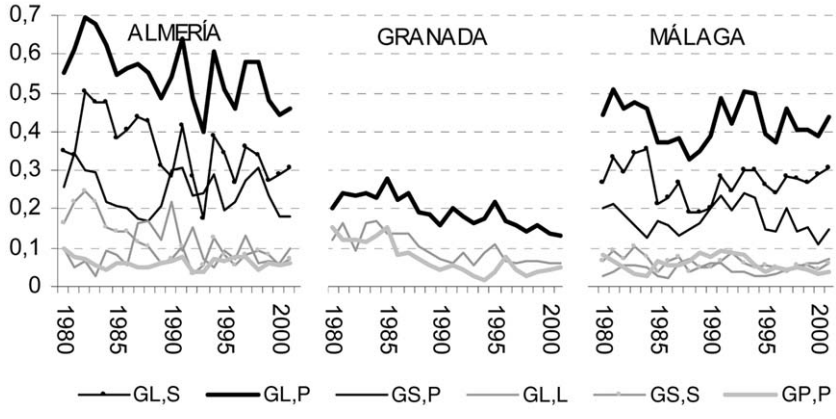

Figure 2. Gini Indexes Between and Within Seasons

decline in the evolution of the ratios between low- and shoulder-peak, $G_{L,P}$ and $G_{S,L}$ they are still high. $G_{L,P}$ was 0.5519 in 1980 and grew to 0.4592 in 2001. Something similar is observed in Málaga. These ratios are high throughout the whole period, indicating a marked seasonal pattern with few variations. In contrast, $G_{L,P}$ in Granada has experienced a significant decrease. This fact, and the decrease of the within component, G_w, are the causes of the very significant decrease of the total Gini index. In this destination, the monthly pattern of the hotel nights is evolving to be a more uniform distribution throughout the year, not only within every season, but also between seasons.

The previous results help in understanding the decomposition of the annual Gini indexes in the three destinations (Figure 1). In Málaga and Almería, the most important component is the "between" one, G_{nb}. However, Almería in 1980 showed a "within" component which accounted for the 15% of G and reduced it to a 11% in 2001, while in Málaga this component was around 10% during all the observed period. It seems that Almería is evolving into a structure similar to the one Málaga shows since 1980. These two destinations exhibit a concentration structure with a very important "between" component that accounts for the 90% of the annual ratio and the rest is due to the "within" component. The null transvariarion component is a symptom of a very stable definition of seasons. An immediate consequence of this is that in these two resorts it will be difficult to change the monthly distribution of the demand. The recent contra-seasonal experiences in Málaga do not seem to have been successful yet.

The case of Granada is completely different. This province, with lower values of G at the beginning of the observed period has been successful in the further reduction of the concentration ratio. In addition, in 2001 the "between" component was 70% of G, being this an indicator of a monthly structure with a lower distance between seasons than in the other two destinations.

CONCLUSION

Many Mediterranean resorts are trying to find solutions to the important degree of seasonal concentration that they face. The three Spanish destinations analyzed in this paper are among them. Although they are in the same region of Spain and are contiguous, they exhibit some important differences in their monthly patterns and struggle with seasonality in different ways.

Some of the resorts in these destinations are in the two last stages of Butler's product cycle: stagnation and post-stagnation. Hence, the three provinces are beginning to consider some of the solutions mentioned by Montanari (1995), such as rediscovering the cultural and natural riches that they possess, tourism in protected areas, archaeological and historic cities, and others like promoting senior or golf markets, in order to redefine their product, in a way similar to the Agarwal's (1994) reorientation phase. The main adopted strategies can be classified into Agarwall's (2002) product transformation in the coastal resort restructuring. In addition, it is also important to notice the col-

laboration strategy in the three destinations, by means of local and regional specific development plans.

But in practical terms it is crucial to analyze in detail the main features of the seasonal concentration in every destination. The Gini index is a powerful statistical tool for this purpose. This ratio provides a synthetic measure of the annual level of concentration, which can be very useful to evaluate the need of contra-seasonal policies in particular destinations as well as in assessing the effectiveness of this type of policy. In addition, it also allows a decomposition, when the year is partitioned into seasons, that indicates the contribution to the annual index of concentration of the internal concentration within seasons, the differences among them and the contribution of the transvariation (if it exists).

The study carried out in this paper has shown that among the three examined Spanish destinations, Granada has experienced the most significant reduction in the concentration of hotel demand. The combination of sun and beach, ski, and cultural tourism is a very interesting example of how to reduce the seasonality. In 1980, the Gini index in Granada was 0.17 and in 2001 it has been reduced to 0.09. The performed decomposition indicates that the inequality both between and within the two seasons has decreased, but the most important reduction is that of G_w. In other words, the two seasons are approximating between them and, but more importantly, the homogeneity within them is increasing.

On the other hand, Málaga and Almería exhibit little variation in their concentration ratios through the 20 observed years. However, the evolution of their components has been different in each province. Málaga is a mature destination and the components of the index are very stable. In contrast, Almería is a younger destination and the observed decomposition shows important changes. The inequality within seasons has decreased notably, while the inequality among them has increased. Therefore, the pattern in Almería is evolving towards a sharper scheme, like the one of Málaga, in which the greater part of the inequality is attributed to the inequality among seasons and only a minor part is due to the inequality within them.

As a consequence of the difficulties to reduce seasonality in Málaga, and having in mind that Málaga is a mature destination, the local and council authorities are trying to renovate and revitalize the attractiveness of the destination, especially in other markets that could reduce the seasonal concentration. The observed evolution in the province of Málaga indicate that the contra-seasonal policies adopted until now have had little success. The most important ones have been the promotion of golf and senior markets. Recently, there has been an extraordinary development of golf, that concentrates in the winter months, and accounts for approximately 4% of the number of tourists. The other main market often mentioned as contra-seasonal in this destination is the senior one. In Spain, through programs of social tourism, there have been approximately 400,000 tourists annually, and the coast of Málaga is one of the favorite destinations in the winter.

The council of Málaga city, the main city of the province, which has

600,000 inhabitants and is now out of the tourist circuit, is involved in a redefinition of its role within the flows to the province. In 2003 it has planned the opening of the Picasso Museum, with over two hundred paintings, donated by Christine and Bernard Ruiz-Picasso, daughter-in-law and niece of the artist. The authorities expect that this museum, together with a new contemporary arts center and the interesting historic part of the city (which includes the remains of a Roman theatre and an Arab fortress) will include Málaga in the circuits of historic cities of Andalusia (Seville, Granada, and Cordoba). The Picasso museum could produce a similar, or even superior, effect to that observed in Bilbao with the opening of the Guggenheim Bilbao Museum, because the city has little else to offer (Plaza 2000). At this point, it is important to notice that cultural and museum markets could not only increase the number of tourists, but also reduce the seasonality of this destination. However, the magnitude of this effect will require more research.

In the case of Almería, it is even more important to fight against seasonal concentration, due to the water deficit in the province. Even though all the Andalusian region has a structural water deficit, it is more worrying in Almería, where the concentration is not only seasonal, but also geographical in a very few resorts. The main actions in this line are directed towards the solution of two main problems; the underuse of the natural richness and diversity besides the beaches, and the lack of complementary supply, aggravated by the predominance of domestic (70%) over international demand.

Finally, there is still much to do for the reduction of the seasonal concentration of tourism demand in these three destinations, in order to alleviate the problems that it causes. To move in this direction, it is important to implement adequate statistical measures that help in the understanding of the seasonality phenomenon and its peculiarities in every destination. A

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