Analyzing the Concentration of Overnight Stays in Constanta City, over the Period 2010-2016

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Abstract

In tourism literature, seasonality is approached as an evolution mode of the activity and, in most cases, it is seen as a problem faced by tourist destinations/ units, but also by other economic and social agents connected to the tourism activity, including local government authorities. This paper aims to analyze the seasonality in terms of the concentration of the activity over a certain period. As a case study, we analyzed the concentration of the tourism activity in Constanta city, using as a database the evolution of the indicator "number of overnight stays", over the period 2010-2016.

It is important to know the concentration tendency of tourism activities, the consequences that may occur and the entities that may be more interested in or affected by the concentration phenomenon. The results of the study may be used in drafting a marketing strategy for the sustainable development of Constanta, as a tourist destination.

Key words: concentration, tourism overnight stays, Lorenz curve, Gini coefficient, Struck coefficient
J.E.L. Classification: C10, C15, C38,L83, M21, M31,R11

1. Introduction

The tourism demand and supply are constantly facing oscillations. When these oscillations are not accidental or conjunctural and become repeatable, like the calendar period, we can talk about seasonality. The repeatability aspect must be accompanied by activity concentrations in certain periods, but also by obvious discrepancies between maximum and minimum values, in order to establish correctly whether seasonality manifests itself (Grigorescu, 2003). When considering tourism seasonality, two important aspects are taken into consideration: the intensity and the dynamics of the seasonal concentration (Bigovic, 2011). This study addresses seasonality in both aspects. The used database represents the monthly values of the indicator "number of overnight stays" recorded in Constanta (including Mamaia resort) from 2010 to 2012; for adjustment, we used the method of arithmetic means and, for concentration, we used the Lorenz curve, the Gini coefficient and the Struck coefficient.

In order to understand the tourism activity in Constanta, we consider it appropriate to use qualitative research and to discuss some aspects of the history of this city. Since the sixth century BC, a Greek colony, called Tomis, was established on the Western shore of the Black Sea. Here, Greek ships were drawn to the shelter of a peninsula (in the shape of a trapeze, with a small base towards the sea, surrounded on three sides by water) and to the bay that formed a natural harbor (Păuleanu, 2006). Tomis city (as well as Histria and Callatis) was organized according to the urban civilization model of ancient Greece. The first port facilities were built in the fourth-third century BC and contributed to the intensification of the trade carried out by Tomis with important centers

such as Byzantium, Apollonia, Athens, Rhodes, Thasos, Cos. The whole history of the settlement is marked by exchanges (both commercial and also of influences, knowledge, mentalities, cultures and civilizations) and by the succession of different administrations (Greek, Roman, Byzantine, Ottoman, and ultimately Romanian). As far as Constanta city is concerned, it may be stated that it has demonstrated, over time, a real "survival vocation" (Păuleanu, 2006).

The modern history of Constanta begins around the second half of the nineteenth century, and since then it has been known as a city marked by port and tourism activities. In the documents of the time, it is noted that, in 1896, Constanta played important "port and balneary roles" (Constanta, 1897, p.3, in: Păuleanu , 2006). Then, in 1899, it was considered a "first-rate spa resort", and, in a report sent to King Carol I in 1903 by the Minister of the Interior, Constanta was regarded as "the country's first prime port and the most important spa resort" (Păuleanu, 2006, p.195). The exact date when the tourism activity began is unknown. However, it is recalled that, at Constanta, people have been taking sunbaths since the Ottoman administration. The documentation that we have performed (represented by the collection of information from various materials published in the late nineteenth and early twentieth centuries), revealed that the tourism activities in Constanta had, from the beginning, a seasonal nature. In the records of those times, it was mentioned that, since 1892, tourism activities had been concentrated between 15th June and 15th September (DJAN .1892, f.2-6, in: Păuleanu, p.188), and only a few years later (in 1899), the tourist season started earlier, namely on the 1st of June (DJAN,1899, f.3-5, in:Păuleanu, p.145).

2. Data, results and discussions

In order to characterize the concentration of the tourism activities in Constanta municipality, we selected one of the most used indicators of tourist traffic, i.e. the number of overnight stays. The database is represented by the values of this indicator registered by NIS, between 2010 and 2016 (Table 1).

*Table no.1 Number of overnight stays in Constanta city, between 2010 and 2016*

Month	2010	2011	2012	2013	2014	2015	2016
Jan	20240	15920	22813	21056	21012	26129	37372
Feb	24786	18989	24378	22270	27577	26984	32830
Mar	23821	20322	29831	26759	31192	33955	39921
Apr	38496	37875	57255	32848	39245	39040	66200
May	70417	55227	48084	86430	94803	88844	227716
Jun	207847	188299	229681	226356	194745	221013	475752
Jul	383317	358732	421697	397119	405834	485207	508437
Aug	445265	441421	445671	438786	456783	499090	154000
Sep	101257	151004	151864	85105	123268	150092	34527
Oct	29398	34211	29578	31206	36853	49460	32710
Nov	24472	26672	27135	27630	31615	42838	25016
Dec	17217	21755	24591	20838	26658	36938	37372

Source: National Institute of Statistics, Romania

In analyzing a distribution series, we were interested in determining the extent to which population units are concentrated around certain values, for example in certain months of the year. The statistician Corrado Gini formulated the problem of measuring the concentration phenomenon in 1912, in connection to the analysis of the distribution of a population's incomes. By this concentration, he highlighted the agglomeration of a population's units or the global values of a distribution around a value (e.g., the central value) of the grouping characteristic. The concentration assessment involves the comparative study of the structure of a population number and the global value structure on the same variation variant of the grouping characteristic. The concentration is applied to any phenomenon that possesses features susceptible to summation.

Figure 1 highlights the evolution of the number of overnight stays in Constanta. The analyzed phenomenon shows a seasonal evolution, with a peak in August and the lowest point in February.

Figure no. 1. Concentration of the number of overnight stays in Constanta, per months, between 2010 and 2016
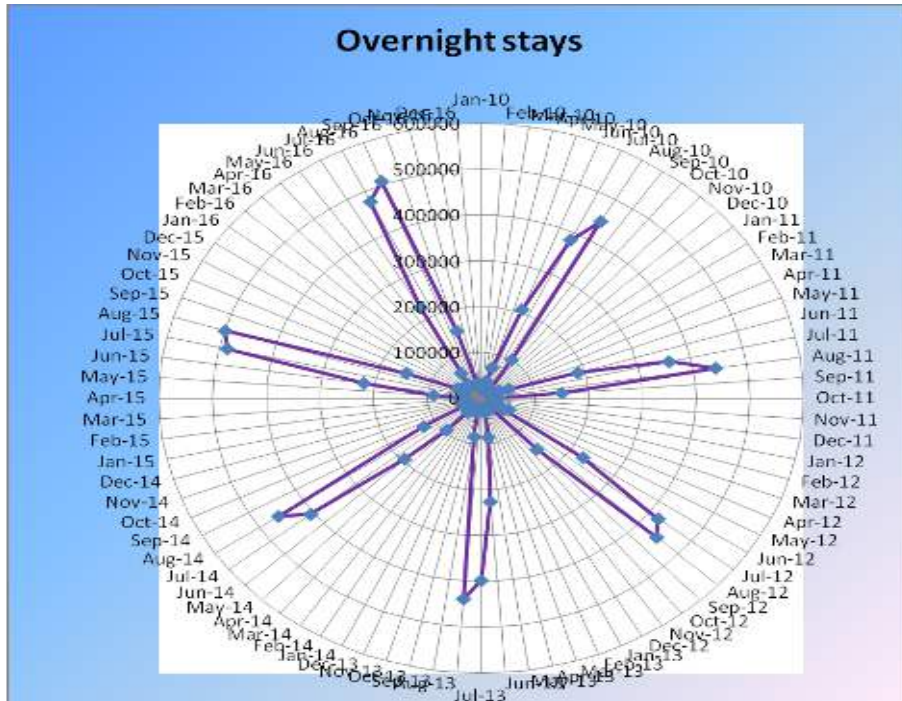
Source: Authors' own processing of NIS data

The statistical characterization of the concentration may be achieved by two categories of methods: numerical (by calculation) and graphical. Measuring the concentration degree by numerical methods implies calculating some concentration indicators.

Figure no. 2. The concentration curve of the number of overnight stays in Constanta
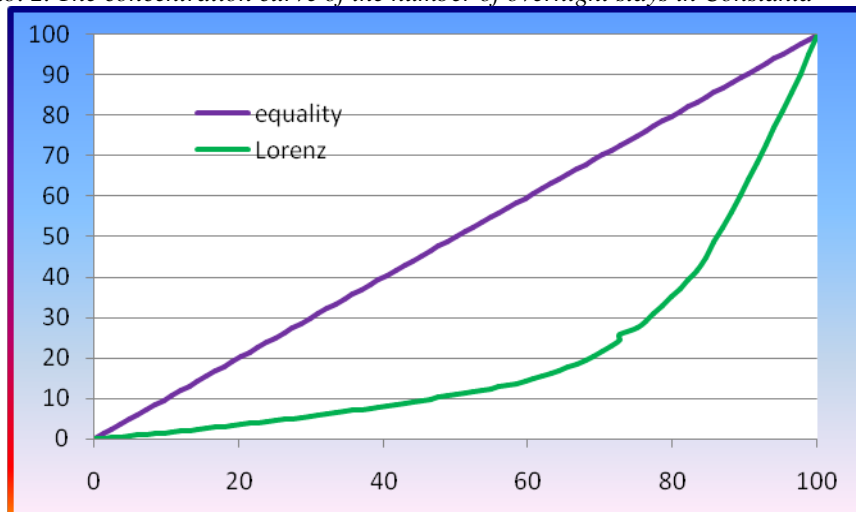
Source: Authors' own processing of NIS data

The graphical determination of the concentration involves the construction of the concentration curve (Lorenz-Gini curve), and in connection to this curve, the concentration index (Gini index) is calculated. If we see the concentration as an inequality in the evolution of the activity, it can be noticed that, by the Gini coefficient, the statistical measurement of inequality is performed (Black, 2002), and by the Lorenz curve, the graphical representation of this inequality is obtained (Lundtorp, 2001).

In order to create the concentration curve, the data must be systematized into groups, both for occurrence frequencies and for the overall level of the interest variable. The graphical representation of the cumulated shares gives us the image of the concentration curve. The analysis of the graph is performed comparatively, in connection to the main diagonal: the further away the curve lines from the baseline and the larger the area delimitated by the curve and the baseline, the more accentuated the concentration phenomenon is. The closer the curve lines from the baseline and the smaller the area, the more equally spread the phenomenon is.

If the distribution of the number of overnight stays had been uniform throughout the months of the year, then the Lorenz curve would have coincided with the first bisectrix. As can be seen from the graph, the concentration curve is situated far from the first bisectrix, indicating a large concentration of the number of overnight stays in certain months of the year.

The Gini index or the Gini concentration coefficient takes values in the range [0,1], and the concentration degree of the number of overnight stays is directly proportional to the indicator value (Juganaru, 1998).

The Gini index, as a concentration measurement, may be calculated as follows:

G_I = *Concentration area / the area of the triangle under the baseline*

A coefficient value greater than 0,579956 indicates a high concentration, 57% of the number of overnight stays being recorded only in several months of the year (especially in July and August)

The seasonality indices have been calculated by directly applying the method of arithmetic means. First, an average was calculated for every month ($\bar{y_i}$), covering the period of the seven consecutive years; then, a general monthly average was calculated ($\bar{\bar{y}}$).

Table 2 centralizes the results obtained for the monthly averages and the calculated seasonality indices.

Table no. 2 Monthly average values of overnight stays and seasonality indices

Month	Monthly average	Seasonality index
January	22770.14286	0,1814385
February	26050.85714	0,2075801
March	28387.14286	0,2261963
April	40668.57143	0,324058
May	72857.85714	0,5805507
June	213665.2857	1,702542
July	418236.8571	3,332622
August	462207.5714	3,682992
September	130941.4286	1,043376
October	35033.28571	0,2791545
November	30438.85714	0,2425449
December	24716.14286	0,1969448
Total	125497.8333	

Source: authors' own processing of NIS data

The general monthly average was obtained as an average of the monthly averages or by summing up all time series terms and by dividing this sum by the number of series terms (84 terms). It is noteworthy that, on average, between 2010 and 2016,125,497.8333 overnight stays were recorded in Constanta city.

By comparing each monthly average to the general monthly average, we obtained the seasonality indices that characterize the average deviation degree of each month, compared to the defining monthly average for the entire 7-year period. Thus, if in January the number of overnight stays averaged 18.14%, compared to the general monthly average, in August the average number of overnight stays was by 268.29% higher than the general monthly average. In June, July, August and September, the number of overnight stays exceeded the general average (the seasonality indices are supraunitary).

The calculation of seasonality indices revealed that the number of overnight stays in Constanta municipality has a seasonal evolution. If the number of overnight stays is below the general monthly average in the first five months of the year, starting with June, there follows a period of 4 months when the number of overnight stays exceeds the general monthly average, followed by another three months with values far below the average.

In order to characterize the seasonality intensity and tendency, the Struck concentration coefficient (Cs) was applied. This is, in fact, a corrected form of the Gini coefficient and it is calculated using the relationship (Minciu, 2004, p. 43):

$$C_s = \sqrt{\frac{n \sum g_i^2 - 1}{n - 1}}$$

where,

n – is the number of categories or variants (classes, groups)

g_i – is the share of each category in total

This concentration coefficient may take values in the range $[0; 1]$. The minimum possible value $(C_s = 0)$ is independent from the number of the categories considered, which gives the coefficient the advantage of an easy and comparable interpretation. Value 1 is reached when the concentration is maximum (in a single group) and the value 0 is reached when there is a uniform distribution (Jaba, 2002, p. 198).

The calculations required in order to determine the concentration coefficient for the period 2010-2016 were centralized in the table below.

Table no. 3 Share of each category in total (g_i)

Month	2010	2011	2012	2013	2014	2015	2016
January	0.014598	0.011617	0.015082	0.014866	0.014106	0.015374	0.019332
February	0.017876	0.013856	0.016117	0.015723	0.018513	0.015877	0.022423
March	0.017180	0.014829	0.019722	0.018892	0.020940	0.019978	0.019698
April	0.027764	0.027637	0.037853	0.023191	0.026346	0.022970	0.023952
May	0.050786	0.040299	0.031789	0.061021	0.063644	0.052274	0.039719
June	0.149904	0.137402	0.151847	0.159810	0.130738	0.130039	0.136627
July	0.276457	0.261767	0.278794	0.280371	0.272448	0.285485	0.285445
August	0.321136	0.322105	0.294643	0.309789	0.306651	0.293653	0.305056
September	0.073029	0.110188	0.100401	0.060085	0.082753	0.088311	0.092398
October	0.021203	0.024964	0.019555	0.022032	0.024740	0.029101	0.020716
November	0.017650	0.019463	0.017940	0.019507	0.021224	0.025205	0.019626
December	0.012417	0.015875	0.016258	0.014712	0.017896	0.021733	0.015009
Total		1.000000	1.000000	1.000000	1.000000	1.000000	1.000000
Concentration Coef.		**0.38**	**0.37**	**0.36**	**0.37**	**0.36**	**0.35**	**0.37**

Source: authors' own processing of NIS data

The values obtained for the calculated concentration coefficients reveal a uniform monthly distribution of the number of overnight stays recorded in Constanta city, each year. As a trend, there is registered a stagnation of seasonality during 2010-2016, the levels of these coefficients being very similar (from 0.38 in 2010 to 0.37 in 2016).

3. Conclusions

The evolution of the tourism activity in Constanta municipality shows an important concentration between June and September, and the highest values are registered in July-August. This qualitative research brings to our attention that the concentration tendency has been present since the beginning of the tourism activity in Constanta. Our explanation is that the tourist offer is conditioned, largely, by climatic and temperature conditions, by natural resources (sea, beach, air), and the tourist demand is influenced by free time/holiday periods, income size, tourists' changing

behavior. At the same time, the change in demand and supply over time is the result of the combined action of a large number of factors.

The achieved quantitative research highlights the achievement of the research objective, i.e. concentration measurement and analysis of its evolution. Attracting a growing number of tourists to Constanta is a priority concern for tourism operators, but this may intensify the concentration of activities over a short time period. In this context, the negative consequences of concentration under different manifestation forms can affect the economic and social life of the city.

Taking into account the concerns about diminishing the concentration of tourism activities in Constanta, we consider that the achievement of a marketing research on the factors that influence tourism demand and supply could help to identify some action possibilities in this direction. The concentration phenomenon should be approached from both perspectives of the tourism market, i.e. the offer (with aspects related to the tourism product, its conception and realization/performance), the demand (with needs, wishes, motives, changes in buying and consumption behaviors) and also the meeting/ confrontation/ approach between supply and demand, in order to establish an effective marketing strategy.

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