AN ANALYSIS OF CHANGES IN THE USE OF TOURISM SERVICES IN THE PERIOD 2018-2021

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Abstract: *The year 2020 was a time when all tourism-related transactions showed considerable decease in many locations worldwide. The paper analyzed the evolution of the indicator representing the number of nights spent in tourist accommodation establishments in Romania, based on the Eurostat data. The differences between the values of this indicator for the years 2018, 2019 on the one hand and 2020 and 2021 on the other hand have been evaluated. The correlation between similar monthly values in different years of the two time frames has been also tested.*

Key words*: nights spent accommodation, tourism statistics, direct comparisons*

INTRODUCTION

The tourism industry in Romania is known as an essential branch in the national economy due to the multiple forms it takes [10,11], and, the most important aspect, it involves a large segment of the population in its activities. Due to the economic impact that tourism has in a society, it has often been considered as a real opportunity for development [4,9]. It is therefore understandable that changes in the current tourism market are directly and rapidly inducing various reactions [15].

The number of nights spent in tourist accommodation establishments (NSTAE) is an indicator that effectively characterises the tourist offer both qualitatively and quantitatively [8]. The interest in characterizing the tourism market, the current state, profitability, some evolution trends or even indirect characterization of the environment in which tourism activities take place, can be observed by following the evolution of this indicator [5,7,13]. The study is based on initial data provided by the Eurostat platform [8].

MATERIALS AND METHODS

The Eurostat data on NSTAE in Romania for the period January 2018-July 2021, measured each month [8], were statistically processed using IBM SPSS version 23. Average values over one year timeframe were calculated as the arithmetic mean of all monthly values., Mean values for the period 2021 were calculated using the arithmetic mean of the values recorded in the months January-July, where specified. Statistical tests were used to determine differences between groups for independent or pairwise variables, correlations, respectively appropriate graphical representations showing occurrence frequency or positioning on the axis by boxplots. [1-3,6,12,14].

RESEARCH RESULTS

At the time of writing, the values available to us consist in monthly records ending in July 2021. For this reason comparisons were made either between whole years or for similar periods.

Based on all NSTAE monthly data for the period January 2018-July 2021, Table 1 shows a statistical summary describing the values grouped by months. Here are the annual mean values, standard deviation, confidence interval for mean, median value, differences between minimum and maximum values recorded during a year revealed by amplitude.

Figure 1 also shows, by boxplot diagram, the positioning of the minimums and maximums of the monthly quartiles, for the months of the year, in relation to each other.

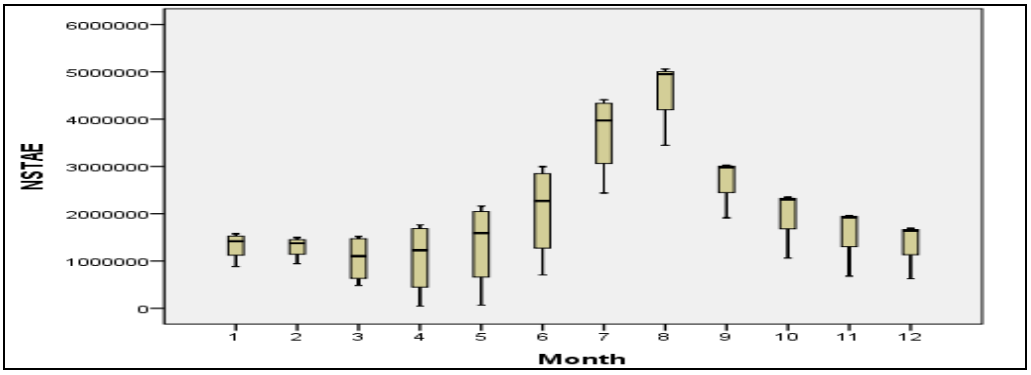

Figure 1. Monthly mean of NSTAE values calculated for the timeframe January 2018 - July 2021

Source: Own representation using SPSS, based on NSTAE data from Eurostat

The highest mean NSTAE value is for August and the lowest is for March.

Table 1.

Indicators of descriptive statistics on monthly NSTAE values calculated for January 2018-July 2021

Month			Statistic	Month			Statistic
1	Mean		1323553	7	Mean		3696686
	95% Confidence Interval for Mean	Lower Bound	837333		95% Confidence Interval for Mean	Lower Bound	2271191
		Upper Bound	1809772			Upper Bound	5122180
	Median		1417162		Median		3971456
2	Mean		1296880	8	Mean		4485165
	95% Confidence Interval for Mean	Lower Bound	908106		95% Confidence Interval for Mean	Lower Bound	2247545
		Upper Bound	1685655			Upper Bound	6722784
	Median		1374148		Median		4950941
3	Mean		1051979	9	Mean		2640587
	95% Confidence Interval for Mean	Lower Bound	255271		95% Confidence Interval for Mean	Lower Bound	1072116
		Upper Bound	1848686			Upper Bound	4209058
	Median		1102534		Median		2981911
4	Mean		1067013	10	Mean		1904511
	95% Confidence Interval for Mean	Lower Bound	-188329		95% Confidence Interval for Mean	Lower Bound	94679
		Upper Bound	2322355			Upper Bound	3714343
	Median		1229039		Median		2297351
5	Mean		1352174	11	Mean		1521255

	95% Confidence Interval for Mean	Lower Bound	-143529		95% Confidence Interval for Mean	Lower Bound	-289622
		Upper Bound	2847876			Upper Bound	3332132
	Median		1590270		Median		1924251
6	Mean		2060017	12	Mean		1319532
	95% Confidence Interval for Mean	Lower Bound	425719		95% Confidence Interval for Mean	Lower Bound	-174309
		Upper Bound	3694315			Upper Bound	2813373
	Median		2270676		Median		1641020

Source: Own calculation using SPSS, based on NSTAE data from Eurostat

A statistical summary based on the calculation of the monthly NSTAE data values, but this time for one whole year, is shown in Table 2. We note that only for the year 2021 the mean value has been calculated for the first 7 months data. For the other years, 2018-2020 the average was the mean monthly number of nights spent in tourist accommodation establishments is about 2.37 million in 2018, 2.48 million in 2019, after which there is a sudden drop in 2020 to about 1.20 million. Although the data for the year 2021 are not sufficient for a similar calculation, nevertheless until July there was a mean monthly value of about 1.46 million, higher than the value in 2020 calculated for the whole year. It is therefore a possible sign of a rebound, but one that can only be confirmed/disproved at the end of the year.

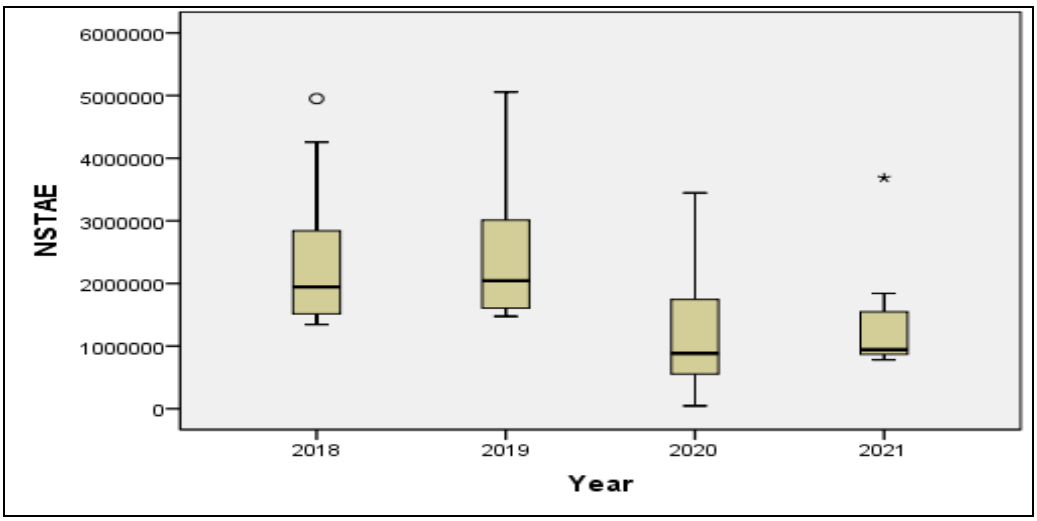

Figure 2. Boxplot of NSTAE values for whole years 2018-2020 and for the timeframe January – July 2021

Table 2.

Indicators of descriptive statistics on monthly NSTAE values calculated for whole years 2018-2020 and for the timeframe January-July 2021

Year			Statistic	Year			Statistic
2018	Mean		2370760	2020	Mean		1203727
	Confidence Interval for Mean (95%)	Lower Bound	1624864		Confidence Interval for Mean (95%)	Lower Bound	560776
		Upper Bound	3116657			Upper Bound	1846678
	Median		1942919		Median		884576
	Standard deviation		1173956		Standard deviation		1011932
	Minimum value		1343719		Minimum value		45196
	Maximum value		4950941		Maximum value		3446880
2019	Mean		2489196	2021	Mean		1463162
	Confidence Interval for Mean (95%)	Lower Bound	1737770		Confidence Interval for Mean (95%)	Lower Bound	495513
		Upper Bound	3240622			Upper Bound	2430812
	Median		2043370		Median		942710
	Std. Deviation		1182658		Standard deviation		1046282
	Minimum value		1472761		Minimum value		781780
	Maximum value		5057673		Maximum value		3685506

Source: Own calculation using SPSS, based on NSTAE data from Eurostat

In order to make a uniform comparison including the months of 2021 for which statistical data are available at this time, the descriptive statistical indicators for the timeframe January to July have been recalculated. This was done for each separate year, 2018 -2021. While in 2018 the calculated monthly average for the first 7 months was over 2.08 million NSTAE and even 2.25 million NSTAE in 2019, 2020 brings a very significant decrease. NSTAE is downsized to almost 0.96 million. The first 7 months of 2021 however show a slight recovery, with a monthly mean value of about 1.46 million NSTAE (Table 3).

Table 3.

Indicators of descriptive statistics on monthly NSTAE values calculated the timeframe January-July of the year 2018-2021

Year			Statistic	Year			Statistic
2018	Mean		2088307	2020	Mean		959497
	95% Confidence Interval for Mean	Lower Bound	1099126		95% Confidence Interval for Mean	Lower Bound	142258
		Upper Bound	3077487			Upper Bound	1776735
	Median		1605651		Median		705305
	Std. Deviation		1069563		Std. Deviation		883649
	Minimum		1343719		Minimum		45196
	Maximum		4257406		Maximum		2436496
2019	Mean		2259492	2021	Mean		1463163
	95% Confidence Interval for Mean	Lower Bound	1249530		95% Confidence Interval for Mean	Lower Bound	495513
		Upper Bound	3269453			Upper Bound	2430813
	Std. Deviation		1092032		Std. Deviation		1046282
	Minimum		1472761		Minimum		781780
	Maximum		4407335		Maximum		3685506

Source: Own calculation using SPSS, based on NSTAE data from Eurostat

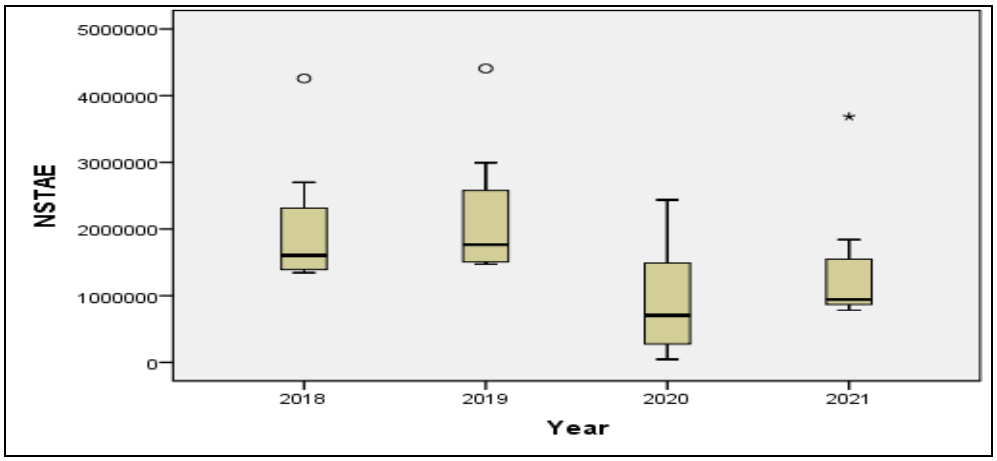

Figure 3. Boxplot of NSTAE monthly values for the timeframe January – July of the years 2018-2020

Source: Own representation using SPSS, based on NSTAE data from Eurostat

One way ANOVA was used to assess the differences between the groups of monthly values of the full years from 2018-2020 and Tukey HSD test was used for post hoc assessment. Differences are significant with F=4.781 and sig.=0.015. Furthermore, a non-parametric Kruskal Wallis test was also applied, confirming the statistical significance of the differences (chi square 9.3 having p=0.01), the descending order of ranks being 2019, followed by 2018 and at a significant distance, by 2020.

Table 4.

Comparisons of mean NSTAE values calculated as the average of monthly values for the whole years 2018-2020 using Tukey HSD test

(I) Year	(J) Year	Mean Difference (I-J)	Sig.
2018	2019	-118435.833	0.964
	2020	1167033.417*	0.041
2019	2018	118435.833	0.964
	2020	1285469.250*	0.023
2020	2018	-1167033.417*	0.041
	2019	-1285469.250*	0.023

* The mean difference is significant at the 0.05 level.

Source: Own calculation using SPSS, based on NSTAE data from Eurostat

A correlation study between the 2018-2019 series and the months of January-July was carried out in order to assess the existence of a certain degree of association between the evolution of the indicator under study. The Kendall coefficients data are shown in Table 5. The NSTAE values corresponding to 2018 correlate very strongly and statistically significantly (τ=0.905, p=0.004) only with similar values of 2019. However, we do not find high and statistically assured correlations with the years 2020 and 2021, which prove to be atypical again.

Table 5.

Correlation study between the values corresponding to the timeframe January-July of the years 2018-2021 using Kendall's tau_b coefficient

		NSTAE_ 2018	NSTAE_ 2019	NSTAE_ 2020	NSTAE_ 2021
NSTAE_2018	Correlation Coefficient	1.000	0.905**	0.048	0.524
	Sig. (2-tailed)	.	0.004	0.881	0.099
NSTAE_2019	Correlation	0.905**	1.000	-0.048	0.619
	Sig. (2-tailed)	0.004	.	0.881	0.051
NSTAE_2020	Correlation Coefficient	0.048	-0.048	1.000	0.333
	Sig. (2-tailed)	0.881	0.881	.	0.293
NSTAE_2021	Correlation Coefficient	0.524	0.619	0.333	1.000
	Sig. (2-tailed)	0.099	0.051	0.293	.

**. Significant at the 0.01 level (2-tailed).

Source: Own calculation using SPSS, based on NSTAE data from Eurostat

Another aspect of the study was to make observations on monthly basis. The histogram shown in Figure 5 indicates that the months when the presence of tourists leads to approximately 1.5-2 million NSTAE are the most frequent. The frequency of months between January 2018 and July 2019 when the number of tourists has exceeded 3.5 million NSTAE but also those when there were less than 0.5 million NSTAE is low, suggesting some similarity to the normal distribution.

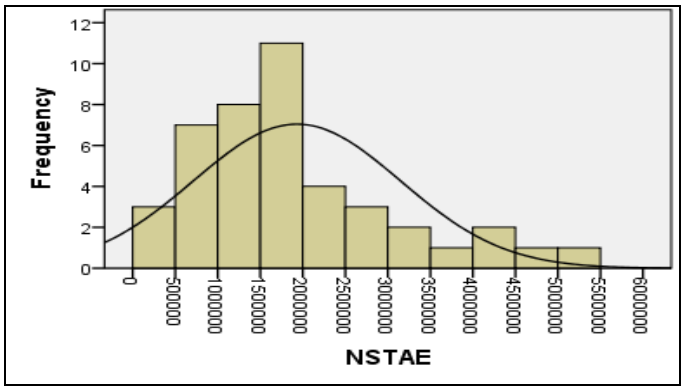

Figure 4. Histogram of monthly NSTAE values for the timeframe January 2018-July 2021
Source: Own representation using SPSS, based on NSTAE data from Eurostat

CONCLUSIONS

The statistical data presented facilitate us to understand the changes in the evolution of the number of tourists in Romania. The statistical tests confirm a fact already observed, namely the decrease in the number of tourists in 2020 compared to the year 2018 and 2019. Also noteworthy is the absence of correlations between the monthly series of 2018 and 2019 with the year 2020 and 2021 respectively. Most likely, the periods of restriction alternating with the permissive ones caused tourists to have requested accommodation facilities in a different number and in other periods of the year than those that characterized previous tourist seasons.

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