

## Use of Accommodation Capacity in the South-Muntenia Development Region, Romania, in the Second Decade of the XXI Century

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### Abstract

The balance between effort and effect is a challenge for many areas, not just tourism. This study aims to find out whether the accommodation capacity in the South-Muntenia Development Region of Romania is used efficiently, given the statistic analysis of the number of over night stays, the number of tourists, accommodation capacity in operation, average stay and net index use of accommodation capacity in operation. Across the region, there is an increase in the net utilization index of the accommodation capacity in operation in the period 2010-2019 and faster growth rates for the number of tourists and for the accommodation capacity in operation compared to the number of overnight stays. The results can be taken into account by the accommodation units, but also by the local authorities insofar as they want to make investments in finding solutions regarding the increase of the number of overnight stays.

### Keywords

Efficiency, net capacity utilization index in operation, South Muntenia, accommodation capacity.

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### Introduction

In the business world, competitiveness has always been the driving force behind the development of a business. Regarding the tourism competitiveness index, it seems that the most competitive development region in Romania is the Center Region, and the least competitive is the South-West Development Region (Mahika, et al., 2014). Within Central and Eastern Europe, in 2017, Romania was at an average level in terms of competitiveness in tourism (Popescu, et al., 2018). Many times, competition for economic advantages and mismanagement of activities has brought some tourism businesses and not only to the brink of financial collapse. For this reason, tourism enterprises and not only should focus on the concept of efficiency. Like individuals who want to meet as many needs as possible with as little expense as possible, businesses should achieve the best possible results with the least investment possible. Thus, economic efficiency can be seen as a comparison between efforts and effects (Vasiliu and Dobreă, 2014). In general, increasing efficiency can be an important goal to be achieved for any field of activity, including tourism.

Due to specific activities such as transport service, accommodation service or food service, the economic efficiency in the field of tourism is considered to be complex (Cristache, 2008). Regarding the efficiency of tourism, Minciu (2004, p. 288) states that "rational management" of resources such as labor, electricity, and the full use of tourism capacity is efficiency. Thus, the present study considers

the analysis of the efficiency of the accommodation capacity in operation and of the tourist circulation in the South-Muntenia Development Region. According to the Agency for Regional Development South-Muntenia, the development region is not a territorial administrative unit, but represents several counties united by conventions of county councils, and the South-Muntenia Development Region is composed of counties: Argeş, Călăraşi, Dâmboviţa, Giurgiu, Ialomiţa, Prahova and Teleorman.

### **Review of the scientific literature**

Various studies have shown that efficiency in tourism can be influenced by several factors, including the process of auditing tourism activities (Barisic and Vukovic, 2014) or the economic situation of the tourist destination (Yongquan, et al., 2020). Also, among the factors that can influence the efficiency in tourism are the geographical position of the tourist reception units, the number of overnight stays and tourists, the average stay, but also the legislation in force (Alberca and Parte, 2020). Efficiency in tourism is very important, given that this notion requires rigorous and rational management of resources and that tourism is one of the largest areas consuming resources. This has been the basis for many studies that have found that tourism is a major consumer of electricity and is a major generator of carbon emissions (Xiaoping, et al., 2017; Chengcai, et al., 2018). In this sense, the efficiency of resource consumption is an imperative objective to be achieved for the field of tourism, as is the full use of accommodation capacity.

Among the most important indicators of tourist activity is the accommodation capacity, which can be treated in relation to certain indicators of tourist traffic, such as the number of arrivals (Untaru, 2008) or the number of nights spent (Gheorghe, 2015). Thus, the accommodation units must attract as many tourists as possible through the specific endowments and the quality of the services in order to register a use of the accommodation capacity in operation as close as possible to the percentage of 100%. The net index of utilization of the accommodation capacity in operation is a very important indicator, as behind the values of this indicator can be aspects such as the capacity of local communities to capitalize on tourism potential, the level of investments made by tourist reception units, the level of seasonality or involvement local authorities in tourism development. These aspects can be seen through the differences between localities, development regions or even countries in terms of this indicator.

In Romania, there are development regions in which the net index of capacity utilization in operation is higher than at the national level. In this situation is the South-East Development Region, at least in the period 2007-2015 (Roşu and Voicilas, 2019). The net capacity utilization index was also used by other authors to analyze the differences between the development regions of Romania, the results indicating that the South-East Development Region registers the highest value in terms of the analyzed indicator, and the North-East Development Region registers the lowest value (Arionesei, et al., 2016) or to analyze the tourist activity in different counties (Roşu, 2016).

### **Research methodology**

The purpose of this research is to find out whether the accommodation capacity in operation in the South-Muntenia Development Region of Romania is used efficiently in relation to the number of overnight stays, the number of tourists, the number of accommodation days and the average stay. In order to analyze the efficiency of the accommodation capacity in operation and of the tourist circulation in the South-Muntenia Development Region, the calculation methodology from the paper "Statistical methods with applications in tourism management" was used (Cristache, 2008). Thus, for the calculation of the net utilization index of the accommodation capacity in operation and for the analysis of the tourist circulation, data from the period 2010-2019 were used, because the year 2010 represents a transition year, in the sense that the national economy is in full process recovery after the economic-financial crisis of 2008, and 2019 is the last year for which data were found in the statistics of the National Institute of Statistics.

The analyzed elements were the accommodation capacity in operation, the overnight stays, the net capacity utilization index, the number of tourists arriving in the South-Muntenia Development Region

and the average stay. The statistical indicators used were the dynamic statistical indicators, the average statistical indicators and the Spearman and Kendall correlation coefficients.

In order to carry out the statistical research, several steps were followed:

- Collection of data from the website of the National Institute of Statistics (online tempo statistics): accommodation capacity in operation by region and counties, expressed in millions of places-days; overnight stays by region and counties, expressed in millions; the number of tourists by counties;
- Calculation of the net utilization index of the accommodation capacity in operation by counties for the years 2010 and 2019 and by region for the period 2010-2019;
- Establishing the correlation between the accommodation capacity in operation and the number of overnight stays by region, using the Spearman and Kendall coefficients.
- Calculation of the average stay and the number of days of accommodation by counties.

## Results

We note the net utilization index of the accommodation capacity in operation with IUCF which is calculated as a ratio between the number of overnight stays and the accommodation capacity in operation. After studying and processing the statistics regarding the accommodation capacity in operation and the number of overnight stays by counties, we obtained the following results:

**Table no. 1. Net index of capacity utilization in operation by counties**

No.	County	Number of nights (y)		Accommodation capacity in operation (places-days)-(f)		Net capacity utilization index in operation% - (x)	
		2010	2019	2010	2019	2010	2019
		y0	y1	f0	f1	x0	x1
						%	%
1	Arges	206235	409227	1164642	1745240	17	23.45
2	Calarasi	27570	66986	191570	282745	14	23.69
3	Dambovita	218526	289510	885204	1061492	24.69	27.27
4	Giurgiu	84968	46577	236821	287496	35.88	16.20
5	Ialomița	199574	184076	573151	506494	34.82	36.34
6	Prahova	799048	1302244	3606562	4369945	22.16	29.80
7	Teleorman	28776	19916	223678	209197	12.86	9.52
8	TOTAL	$\sum y_0 = 1.56$ million	$\sum y_1 = 2.31$ million	$\sum f_0 = 6.88$ million	$\sum f_1 = 8.46$ million	-	-

Source: data processed based on data retrieved from [www.insse.ro](http://www.insse.ro) (National Institute of Statistics, online tempo, accessed 20 december 2020)

$$IUCF_0 = \frac{\sum y_0}{\sum f_0} \quad (1)$$

$IUCF_0$  - net index of capacity utilization in operation for the reference year, 2010

$\sum y_0$  - the sum of the number of overnight stays for the reference year, 2010

$\sum f_0$  - sum of places-days for thereferenceyear, ie 2010

Thus  $IUCF_0 = \frac{\sum y_0}{\sum f_0} = \frac{1.56}{6.88} = 0.2267$ , percentage 22.67%

$$IUCF_1 = \frac{\sum y_1}{\sum f_1} \quad (2)$$

$IUCF_1$  - the net index for the use of accommodation capacity in operation for 2019

$\sum y_1$  - the sum of the number of overnight stays for 2019

$\sum f_1$  - sum of places-days for 2019

Thus,  $IUCF_1 = \frac{\sum y_1}{\sum f_1} = \frac{2.31}{8.46} = 0.2730$ , percentage 27.30%

In order to establish the average efficiency of the use of the accommodation capacity in operation for 2019 compared to 2010, the average net utilization index of the accommodation capacity in operation ( $\bar{IUCF}$ ) will be calculated:

$$IUCF = \frac{IUCF_1}{IUCF_0} \tag{3}$$

Thus,  $IUCF = \frac{IUCF_1}{IUCF_0} = \frac{27.30}{22.67} = 1.2042$ , percentage 120.42% - 100% = 20.42%

$$\Delta IUCF = IUCF_1 - IUCF_0 \tag{4}$$

$\Delta IUCF$  - absolute difference of the net capacity utilization index in operation

Thus,  $\Delta IUCF = IUCF_1 - IUCF_0 = 27.30\% - 22.67\% = 4.63\%$

The average efficiency of using the accommodation capacity in operation in 2019 compared to 2010 increased by 20.42%, which means that it increased by 4.63 percentage points. In conclusion, the use of accommodation capacity in operation for 2019, compared to 2010 is relatively efficient. To determine the influence of effort on the effect, the Spearman and Kendall correlation coefficients were calculated as follows:

**Table no. 2. Correlation between accommodation capacity in operation and number of nights spent**

Years	(f)	(y)	Rf	Ry	Rfgrowing	Ry/Rfgrowing	di(Rfgrowing-Ry/Rfgrowing)	di2	Pi	Qi	Si=Pi-Qi
2010	6.88	1.56	1	1	1	1	0	0	9	0	9
2011	7.19	1.67	2	2	2	2	0	0	8	0	8
2012	7.80	1.77	3	5	3	5	-2	4	5	2	3
2013	8.06	1.71	4	3	4	3	1	1	6	0	6
2014	8.18	1.71	5	4	5	4	1	1	5	0	5
2015	8.52	1.90	8	6	6	10	-4	16	0	4	-4
2016	8.58	1.99	9	7	7	9	-2	4	0	3	-3
2017	8.75	2.06	10	8	8	6	2	4	2	0	2
2018	8.50	2.24	7	9	9	7	2	4	1	0	1
2019	8.46	2.31	6	10	10	8	2	4	0	0	0

Source: data processed based on data retrieved from [www.insse.ro](http://www.insse.ro) (National Institute of Statistics, online tempo, accessed 20 december 2020).

f - Accommodation capacity in operation - million places-days

y - Number of nights - millions

Rf - ranks of accommodation capacity in operation (variable f)

Ry - ranks of number of nights spent (variable y)

Rfgrowing - the ranks of the variable f ordered in ascending order

Ry/Rfgrowing - the ranks of the variable y ordered according to the ranks of the variable f ordered ascending

di - the difference between the ranks of the variable f in ascending order and the ranks of the variable y ordered according to the ranks of the variable f in ascending order

Pi = concordance between ranks

Qi = discordance between ranks

Si = score (difference between concordance and discordance)

The Spearman correlation coefficient, denoted by  $C_s$  is calculated as follows:

$$C_s = 1 - \frac{6\sum di^2}{n(n-1)} \tag{5}$$

Thus,  $C_s = 1 - \frac{6 \cdot 38}{990} = 0.77$ , and  $C_s^2 = (0.77)^2 = 0.59$ , meaning 59%

The Kendall correlation coefficient, denoted by  $C_k$  is calculated as follows:

$$C_k = \frac{2 \cdot \sum Si}{n(n-1)} \tag{6}$$

Thus,  $C_k = \frac{2 \cdot 27}{90} = 0.6$ , and  $C_k^2 = (0.6)^2 = 0.36$ , meaning 36%

Based on the Spearman and Kendall coefficients, it is found that there is a direct correlation between the ranks of accommodation capacity and the ranks of overnight stays, of medium intensity and that the connection between them is direct. Also, the influence of the accommodation capacity in operation in the variation of overnight stays is between 36% and 59%. This means that an increase in overnight stays will lead to an increase in accommodation capacity in operation, but with a slower growth rate. At the same time, based on the value of the influence of the effort (accommodation capacity in operation) in varying the effect (overnight stays), it can be deduced that there are other effort factors that influence the value of the effect, given that only 59% of overnight stays are generated by accommodation capacity.

Data on the number of tourists, the number of accommodation days and the average stay and their processing are presented in the following table:

**Table no. 3. Efficiency of tourist traffic based on average stay**

Y	(x)		(a)		(y)		b		
	2010	2019	2010	2019	2010	2019	(x)	(a)	(y)
	x0	x1	y0*x0	y1*x1	y0	y1			
A	111254	267349	205819.9	409043.97	1.85	1.53	2.40	1.99	0.83
B	10600	27472	27560	67246.4	2.60	2.44	2.59	2.44	0.94
C	56204	122107	218633.56	518161.53	3.89	2.37	2.17	2.37	0.61
D	28217	26540	84933.17	148633.04	3.01	1.75	0.94	1.75	0.58
E	36480	43567	199545.6	844077.88	5.47	4.23	1.19	4.23	0.77
F	318810	585785	800213.1	1776473	2.51	2.22	1.84	2.22	0.88
G	11347	11471	28821.38	50149.20	2.54	1.74	1.01	1.74	0.69

Source: data processed based on data retrieved from [www.insse.ro](http://www.insse.ro) (National Institute of Statistics, online tempo, accessed 20 december 2020).

Y - Counties

A: Arges; B: Calarasi; C: Dambovita; D: Giurgiu; E: Ialomita; F: Prahova; G: Teleorman; x - Number of tourists

a - Number of accommodation days (tourists days); y - average stay

b - Dynamics of indicators 2019/2010

Analyzing the number of tourists in 2010 and 2019, respectively, significant increases are observed for the counties of Călărași (159%), Argeș (140%), Dâmbovița (117%), Prahova (84%), Ialomița (19%). Also, there is a constancy in the case of Teleorman county (1%) and a decrease for Giurgiu county (6%). The average stay in 2019 compared to 2010 registers decreases in all seven counties, the decrease being due to the faster increase of the number of tourists compared to a slower increase of the number of overnight stays. Decreasing the average stay at the level of the entire development region may mean decreasing the efficiency of use of accommodation capacity.

In analyzed period (table no. 4) it can be observed that the highest increase of the net utilization index of the accommodation capacity in operation is registered in 2019 compared to the reference year 2010, the increase being by 4.63 percentage points, which means an increase of 1.20 times, transposed by an average increase of 20%. Also, the largest decrease is recorded in 2014 compared to the reference year

2010, the decrease being 1.77 percentage points, which means a decrease of 0.92 times, transposed by an average decrease of 8%.

**Table no. 4. Net index of capacity utilization in operation by total region**

Years	A%	B		C		D%	
		An-A1	An-An-1	An/A1	An/An-1	(An/A1-1)*100	(An/An-1-1)*100
2010	22.67	-	-	1	-	-	-
2011	23.22	0.55	0.55	1.02	1.02	2	2
2012	22.69	0.02	-0.53	1	0.98	0	-2
2013	21.21	-1.46	-1.48	0.94	0.93	-6	-7
2014	20.90	-1.77	-0.31	0.92	0.99	-8	-1
2015	22.30	-0.37	1.4	0.98	1.07	-2	7
2016	23.19	0.52	0.89	1.02	1.04	2	4
2017	23.54	0.87	0.35	1.04	1.02	4	2
2018	26.35	3.68	2.81	1.16	1.12	16	12
2019	27.30	4.63	0.95	1.20	1.04	20	4

Source: data processed based on data retrieved from [www.insse.ro](http://www.insse.ro) (National Institute of Statistics, online tempo, accessed 20 december 2020).

A - Net operating capacity utilization index; B - Absolute indicators; C - Indices of dynamics; D – Rhythms

### Conclusions

The efficiency indicator must have a super unit result, then the result must be as high as possible. In this study, the net capacity utilization index in operation in the South-Muntenia Development Region (Romania) meets the first condition, while the second condition is partially met, given that, during the analyzed period, the indicator does not exceed the percentage of 27.30% (registered in 2019). Regarding the component counties, at the level of 2019, only the counties of Ialomița and Prahova exceed the percentage of 27.30%. Thus, at regional level, the two counties mentioned above are the most efficient in terms of using the accommodation capacity in operation.

The predominantly upward evolution of the number of overnight stays and the accommodation capacity in operation, from the analyzed period, shows that the efficiency of the use of accommodation in operation tends to increase at the level of the entire development region, supported by the six years in which the index is increasing, which means a 60% probability that the efficiency of the use of accommodation in operation will increase in the coming years. In conclusion, we can say that in order to be more efficient with regard to the use of accommodation capacity in operation, accommodation units must find solutions to balance the growth rates regarding the number of tourists, the number of over night stays and the accommodation capacity in operation.

### References

- Alberca, P. and Parte, L., 2020. Efficiency in the Holiday and Other Short -Stay Accommodation Industry. *Sustainability*,12(22), pp.1-22.
- Arionesei, G., Hapenciuc, C.V.and Costea, M., 2016. Statistical Confrontation of the Evolution of Tourism in the North East Region in Comparison with the other Regions of Romania. *Amfiteatru economic*, 18 (Special Issue10), pp.798-814.
- Barisic, P. and Vukovic, D., 2014. The performance audit as a function for increasing tourism efficiency. In *International OFEL Conference on Governance, Management and Entrepreneurship*. Zagreb: Centar za istrazivanje i razvoj upravljanja doo, pp. 659-671.
- Chengcai, T., Linsheng, Z. and Qun'ou, J., 2018. Energy efficiency and carbon efficiency of tourism industry in destination. *Energy Efficiency*,11(3), pp. 539-558.

- Cristache, S.E., 2008. *Statistical methods with applications in tourism management*. Bucharest: ASE Publishing House.
- Gheorghe, A., 2015. The influence of the number of overnight stays on the capacity of the accommodation in Salaj County. *Knowledge Horizons. Economics*, 7(3), pp.147-150.
- Mahika, C., Bran, F. And Țigu, G., 2014. Travel and tourism competitiveness index - regional empirical analysis for Romania. *Quality: Access to Success*, 15(S5), pp.74-85.
- Minciuc, R., 2004. *Tourism Economics*. Bucharest: URANUS Publishing House.
- National Institute of Statistics, 2020. *Insse tempo online statistics*, [online] Available at: <<http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>> [Accessed 20 December 2020].
- Popescu, D., Oehler-Șincai, I.M., Bulin, D. and Tănase, I.A., 2018. ECE - 16: A cluster analysis based on tourism competitiveness and correlations with major determinants. *Amfiteatru economic*, 20(12), pp. 597-616.
- Roșu, E., 2016. Touristic activity in Suceava County. The Research Institute for Agriculture Economy and Rural Development. In *International Symposium. Agrarian Economy and Rural Development: Realities and Perspectives for Romania*. Proceedings Bucharest: The Research Institute for Agriculture Economy and Rural Development, pp.325-331.
- Roșu, E. and Voicilas, D.M., 2019. The competitiveness of tourism in Romania after EU accession-regional analysis. *Economics Poljoprivrede*, 66(4), pp.1023-1028.
- South-Muntenia Regional Development Agency, 2021. *Regional development in Romania*, [online] Available at: <<https://adrmuntenia.ro/dezvoltare-regionala/static/2>> [Accessed January 18, 2021].
- Untaru, E.N., 2008. The analysis of the tourist flow and occupancy rate as regards the capacity of tourist accommodation in the Brasov County. *Bulletin of the Transilvania University of Brasov. Economic Sciences*, 1 (Series V), pp.229-234.
- Vasiliu, C. and Dobrea, M., 2014. *Managementul operațiunilor comerciale*. Bucharest: ASE Publishing House.
- Xiaoping, Q., Yiping, F., Xueting, Y. and Fubiao, Z., 2017. Tourism Eco-Efficiency Measurement, Characteristics, and Its Influence Factors in China. *Sustainability*, 9(9), pp.1-19, Article number: 1634.
- Yongquan, L., Rui, L., Wenqi, R. and Chih-Hsing, L., 2020. Research of the Effect of Tourism Economic Contact on the Efficiency of the Tourism Industry. *Sustainability*, 12 (4), pp.1-17.