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THE CORRELATION BETWEEN TOURISM ACCOMMODATION CAPACITY AND TOURIST INFLOW BY MICRO REGION OF DEVELOPMENT IN ROMANIA

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Abstract

The paper aimed to analyze the relationship between the tourism accommodation capacity in terms of the number of units, and the number of tourist flows in terms of arrivals in Romania and by its 8 micro regions in the period 2007-2015. In this purpose, the data provided by the National Institute of Statistics were processed using the indices with fixed and variable basis, comparison method, statistical parameters, Pearson coefficient of correlation, and linear regression function. In Romania, the number of units with accommodation function increased by 65.3 % from 4,694 units in the year 2007 to 6,821 units in the year 2015, and the number of tourists' arrivals increased by 63 % from 6,091.9 thousands in 2007 to 9,930.4 thousands in 2015. While the highest number of accommodation units is in the Central, SE and NE Romania, the highest number of tourists' arrivals was recorded in the Central Romania, Bucharest Ilfov and SE region. Even thou at the national level, the average number of tourists' arrivals per unit for tourists' accommodation was 1,456 arrivals/unit, by 12.18 % higher in 2015 compared to 2007, there is still a gap between the territorial dispersion of the accommodation capacity and the tourists flow. The high correlation coefficient r = 0.909 and the high determination degree 82.76 % at the national level, reflect that tourists flow has a major influence on the tourism accommodation capacity. Using the linear regression functions, there were estimates the units for tourists' accommodation depending on the tourists' arrivals for the period 2016-2020. In conclusion, the development of tourism accommodation capacity must be a priority in order to assure a better correlation with the tourist arrivals in the territory of Romania.

Key words**:** *accommodation units, tourists' arrivals, correlation, regression, forecast, micro regions, Romania*

INTRODUCTION

The development of tourism is determined, among other factors, by accommodation capacity and service quality.
The creation of units with accommodation function in various regions is a way to better use the local material and human resources, to create jobs and diversify services, to increase income and living standard of the local population and communities.
Among various tourism indicators there are interconnections. The link between the accommodation capacity and the number of tourists in terms of arrivals and overnight stays must be not ignored, on the contrary, it could be successfully used in tourism planning and development programmes in order to grow turnover in travel and tourism industry [6].
As a component of tourism infrastructure, the number of units with accommodation function must be adapted to the tourism market demand in order to generate direct tourist flows and strengthen tourism industry in terms of investments, vacancies, employment, wage, receipts and contribution to GDP [8].
Tourist flows are close related to the dynamics of the number of tourists arrivals and the number of nights spent in a hotel or any other unit with tourist reception, having a deep impact on the economic efficiency [1].
The higher the number of units for tourists' accommodation, the higher the number of tourists arrivals [2].
In Romania, the number of tourist accommodation structure increased in general since the year 2000, and maily after Romania's entry into the EU. At the same

time, the number of tourists' arrivals has also increased. Most of the people visiting Romania come from Europe (more than 90 %) and more than 60 % come from the EU. Most visitors are from the neighboring countries: Hungary, Rep. of Moldova, Bulgaria, Ukraine, Germany, Italy, Turkey, Yugoslavia and Poland [3].

In this context, the purpose of the paper was to identify and characterize the relationship between the number of tourists' arrivals, as an independent variable, and the number of units for tourists' accommodation, as a dependent variable. The two indicators were studied in dynamics at the national level and by the eight micro regions of development of Romania. Also, there were studied: their dispersion by micro region, their correlation and regression, and also there were forecasted the estimates for the both indicators for the period 2016-2020.

MATERIALS AND METHODS

In order to set up this research paper, the following indicators were taken into consideration: (I) the number of units for tourists' accommodation in Romania by the 8 micro regions of development (NW, Central, NE, SE, Bucharest Ilfov, S Muntenia, SW Oltenia and W, and (ii) the number of tourists' arrivals in Romania by the 8 micro regions of development (NW, Central, NE, SE, Bucharest Ilfov, S Muntenia, SW Oltenia and W.

The empirical data were collected from the Data base of the National Institute of Statistics for the period 2007-2015.

The following aspects were approached in this study: the dynamics of number of units for tourists' accommodation in Romania by the 8 micro regions of development, the indices reflecting the growth rate of the number of units for tourists' accommodation, the description statistics for number of units for tourists' accommodation in Romania by the 8 micro regions: mean, standard error of mean, median, standard deviation, sample variance, kurtosis, skewness, minimum value, maximum value, confidence level and coefficient of variation, the dispersion by micro region of the number of units for tourists' accommodation, the dynamics of number tourists' arrivals in Romania by the 8 micro regions of development, the indices reflecting the growth rate of the number of the dynamics of number of units for tourists' accommodation in Romania by the 8 micro regions of development, the indices reflecting the growth rate of the number of tourists' arrivals, the description statistics for number of tourists' arrivals in Romania by the 8 micro regions: mean, standard error of mean, median, standard deviation, sample variance, kurtosis, skewness, minimum value, maximum value, confidence level and coefficient of variation, the dispersion by micro region of the number of tourists' arrivals, the average number of tourists' arrivals per unit for tourists' accommodation, the correlation between the tourists' arrivals and the number of units for tourists' accommodation, the determination degree of the number of units for tourists' accommodation by tourists' arrivals, the linear regression function for the number of units for tourists' accommodation, the comparison between the average growth rate for the number of tourists' arrivals and the average growth rate for the number of units for tourists' accommodation, and the forecast of the number of units for tourists' accommodation depending on the tourists' arrivals in the period 2016-2020.

The data were processed using the following methods: indices with fixed and variable basis, growth rate, descriptive statistics, Pearson correlation, linear regression function $Y= ax + b$, using Excel facilities.

The results were tabled and illustrated in graphics and also interpreted.

RESULTS AND DISCUSSIONS

Evolution of the number of units for tourists' accommodation. The number of units with accommodation function in Romania increased by 65.3 % from 4,694 units in the year 2007 to 6,821 units in the year 2015. However, after a continuous growth from 4,694 units in 2007 to the peak of 5,222 units in 2010, it the year 2011 it was

recorded an important decline to 5,003 units (-4.2 %). But, starting from 2012, the number of units recovered, accounting for 5,821 in that year. Since 2012, it has continuously increased because of the demand growth in close relationship with the number of tourists (Fig.1).

The indices reflecting the growth rate of the number of units for tourists' accommodation were calculated and their results are shown in Table 1.

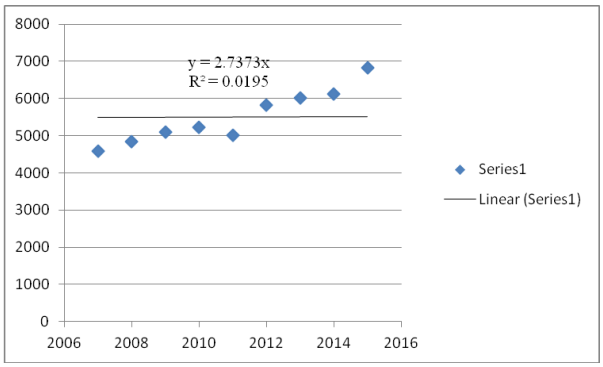

Fig.1. Units for tourists' accommodation in Romania, 2007-2015

Source: Own design based on NIS Database, 2016 [4].

Table 1. The growth rate for the number of units with accommodation function, Romania, 2007-2015 (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Growth rate (%)	100	103.1	108.5	111.2	106.5	124.0	128.0	130.5	145.3

Source: Own calculation based on NIS Database, 2016, [4].

The description statistics regarding: mean, standard error of mean, median, standard deviation, sample variance, kurtosis, skewness, minimum value, maximum value, confidence level and coefficient of variation is presented in Table 2.

Table 2. Descriptive statistics for units for tourists' accommodation in Romania by micro-region, 2007-2015

	Romania	NW	C	NE	SE	Bucharest Ilfov	S Muntenia	SW Oltenia	W
Mean	5503.88	664.22	1454.33	624.22	1172.88	164.66	550.22	358.66	525.77
St. Error	242.91	22.64	108.27	43.43	44.25	3.41	36.63	26.38	31.76
Median	5222	658	1268	604	1111	164	533	377	513
St. Dev.	728.75	67.92	324.81	130.31	132.77	10.25	109.90	79.14	95.28
Sample variance	531085.11	4613.44	105506.5	16981.94	17630.36	105.25	12079.94	6263.75	9078.44
Kurtosis	-0.568	-0.293	0.429	-1.221	-0.950	-0.786	-1.012	-2.025	-1.358
Skewness	0.593	-0.129	1.112	0.165	0.228	0.253	0.541	-0.231	-0.259
Minimum	4594	554	1188	459	974	151	426	255	389
Maximum	6821	771	2107	830	1385	182	740	448	652
Confidence level	560.17	52.20	249.67	100.16	102.06	7.88	84.48	60.83	73.23
Coefficient of variation (%)	13.2	10.2	22.3	20.8	11.3	6.2	19.9	22.0	18.1

Source: Own calculation based on NIS Database, 2016, [4].

The coefficient of variation accounted for 13.2 % at the national level, reflecting that this variable is relatively homogenous and the mean is relatively a representative one.

In case of the Center micro region, the coefficient of variation accounted for 22.3 %, the highest level among micro regions, and 6.2 %, the lowest coefficient of variation in case of Bucharest-Ilfov micro area.

Only Bucharest-Ilfov micro region registered this low of 6.2 % reflecting that this variable is a homogenous one and the average is a representative one.

The highest values of 22.3 % in the Central micro region, of 22 % in SW Oltenia micro region and 20.8 % in NE micro region reflects that the number of units for tourists' accommodation is a heterogenous variable, and the average is less representative.

The micro regions NW, SE, S Muntenia and W recorded a coefficient of variation ranging between 10 % and 20 %, respectively: 10.2 %, 11.3 %, 10.9 % and 18.1 %. This shows that the number of units with accommodation

function is a relative homogenous variable and the average is a relative representative one.

The number of units for tourists' accommodation by micro region recorded a large range of values in the territory of Romania (Fig.2.).

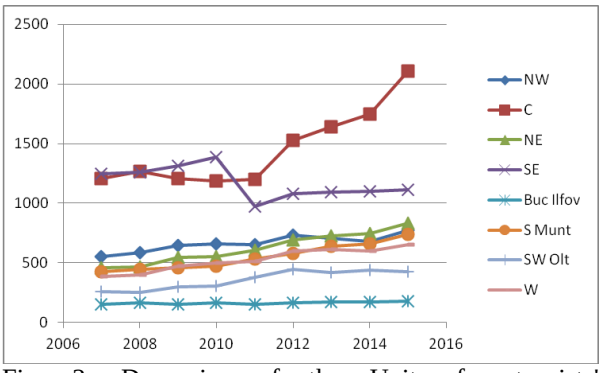

Fig. 2. Dynamics of the Units for tourists' accommodation in Romania by micro region, 2007-2015

Source: Own design based on NIS Database, 2016, [4].

In the NW micro region, it ranged between 554 units in 2007 and 771 units in 2015, the growth rate being 30.1 % for the whole analyzed period 2007-2015. In the Central micro region, it varied between 1,209 units in 2007 and 2,107 units in 2015 (+74.2 %). In the NE micro region, the number of units for tourists' accommodation increased by 80.8 % from 459 units in 2007 to 830 units in 2015. in the SE micro region, this indicator varied between 1,247 units in 2007 and 1,111 units in 2015 (+89%). In Bucharest-Ilfov area it varied between 151 units in 2007 and 182 units in 2015 (+20.5 %). In the S muntenia area, this indicator ranged between 426 units in 2007 and 740 units in 2015 (+73.7 %). In the SW Oltenia region, it varied between 259 units in 2007 and 428 units in 2015 (+65.2 %), and in the W region, it ranged between 389 units in 2007 and 652 units in 2015 (+67.6%) (Fig.2.).

The structure of the units for tourists' accommodation by micro-region has recorded the following time changes:

In 2007, the highest share of units was recorded in the SE micro region, 26.57 %, in the Central micro region 25.75 % and in the NW area 11.80 %. The lowest share was 3.2 % belonging to Bucharest-Ilfov micro region.

In 2015, the Central region of Romania was situated on the top position with the largest share 30.88 %, being followed by the SE micro region 16.28 %, and the NE micro region with 12.1 %. The lowest weight was recorded by Bucharest-Ilfov micro-region (Table 3).

Table 3. The dispersion of the number of units for tourists' accommodation by micro region, Romania, 2007-2015 (%)

	National level	NW	C	NE	SE	Bucharest Ilfov	S Muntenia	SW Oltenia	W
2007	100	11.8	25.8	0.9	26.5	3.2	9.1	5.5	8.3
2015	100	11.2	30.8	12.1	16.3	2.6	10.8	6.7	9.5

Source: Own calculation based on NIS Database, 2016, [4].

The number of tourists (foreigners plus Romanians) in Romania increased by 63 % from 6,091.9 thousands in 2007 to 9,930.4 thousands in 2015 (Fig.3.).

The number of tourists' arrivals recorded a decline in 2009 and mainly in 2010, accounting for 6,072.5 thousands tourists. This situation was created by the economic crisis which determined an increase in unemployment and affected the income per household.

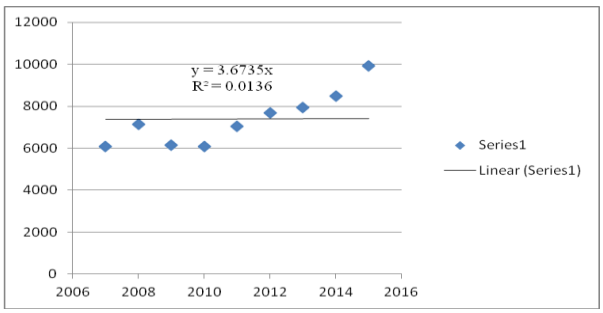

Fig.3.Tourists' arrivals in Romania, 2007-2015 (Thousands)

Source: Own design based on NIS Database, 2016, [4].

The growth rate for the number of tourists' arrivals in the analyzed period is presented in

Table 4. This also attests the decline of tourists' arrivals in the years 2009 and 2010, and the continuous increase starting since 2011.

Table 4. The growth rate for tourists' arrivals, Romania, 2007-2015 (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Growth rate (%)	100	16.9	0.6	-0.1	15.4	26.1	30.3	38.9	63.0

Source: Own calculation based on NIS Database, 2016, [4].

The descriptive statistics for tourists' arrivals in Romania presents: mean, standard error of mean, median, standard deviation, sample variance, kurtosis, skewness, minimum value, maximum value, confidence level and coefficient of variation in Table 5.

The coefficient of variation varied between 27.3 5 in the Central micro region and 7.8 % in the SE micro region. The SE micro region is the only region where the coefficient of variation was below 10 % reflecting a uniform distribution of the number of tourists, and that the average is a representative one.

In case of NW, NE, S Muntenia, SW Oltenia and W micro regions, the coefficient of variation varied between 10 % and 20 %, reflecting that the variables were relatively homogenous and that the average is relatively representative.

In case of the Central and Bucharest-Ilfov micro regions, the coefficient of variation was higher than 20 % reflecting that the variables were relatively heterogenous and the average is less representative.

Table 5. Descriptive statistics for tourists arrivals in Romania by micro-region, 2007-2015

	Romania	NW	C	NE	SE	Bucharest Ilfov	S Muntenia	SW Oltenia	W
Mean	7386.12	877.44	1562.81	740.60	1203.44	1300.42	687.85	430.97	674.25
St. Error	428.38	42.82	140.85	30.98	31.30	100.12	29.06	20.10	31.58
Median	7124.9	889.7	1435.70	725.60	1178.1	1282.6	692.8	429.3	674.5
St. Dev.	1285.16	131.47	422.57	92.94	93.90	300.37	87.19	60.31	94.76
Sample variance	1651648.42	17286.07	178571.25	8538.32	8818.24	90226.74	7602.70	3637.91	8980.05
Kurtosis	0.501	1.071	-0.371	2.064	-0.279	-0.378	0.260	-0.324	2.242
Skewness	0.866	0.723	0.686	1.165	-0.026	0.734	0.485	-0.129	0.951
Minimum	6072.5	702.8	1072.70	620.9	1044	989.8	572.9	337.1	542.8
Maximum	9930.4	1140.6	2340.9	939.4	1347.9	1850.8	852.6	528.1	875.5
Confidence level	987.86	101.06	324.82	71.44	72.18	230.89	67.02	46.36	72.84
Coefficient of variation (%)	17.39	14.98	27.03	12.54	7.80	23/09	12.67	13.99	14.05

Source: Own calculation based on NIS Database, 2016, [4].

The number of tourists' arrivals by micro region recorded different values from a region to another depending on the purpose of the visit and mainly by the tourist attractions.

In the NW, this indicator varied between 889.7 thousand arrivals in 2007 and 1,140.6 thousands in 2015 (+28.2 %). In the Central micro region, it varied between 1,330.1 thousand arrivals in 2007 and 2,340.9 thousand arrivals in 2015 (+75.9%). In the NE micro region, the indicator ranged between 717.6 thousand arrivals in 2007 and 939.4 thousand arrivals in 2015 (+30.9 %). In the SE micro region, it varied between 1,231.1 thousand arrivals in 2007 and 1,347.9 thousand in 2015 (+9.48 %). In Bucharest-Ilfov area, the indicator ranged between 996.7 thousand arrivals in 2007 and 1,850.8 thousand tourist arrivals in 2015 (+85.6%). In the S Muntenia micro region, it varied between 729.2 thousand arrivals in 2007 and 852.6 thousand arrivals in 2015 (+16.9%). In the SW Oltenia micro region, the indicator varied between 403 thousand arrivals in 2007 and 528.1 arrivals in 2015 (+31 %). Finally, in the W micro region, the indicator ranged between 674.5 thousand arrivals in 2007 and 875.7 thousand arrivals in 2015 (+29.6%).

Therefore, the highest increase, +85.6 %, was noticed in Bucharest-Ilfov micro region, where the highest number of tourists' arrivals was recorded, 1,850.8 thousands in 2015, representing 18.6 % of the total number of 9,930.4 thousands arrivals (Fig.4).

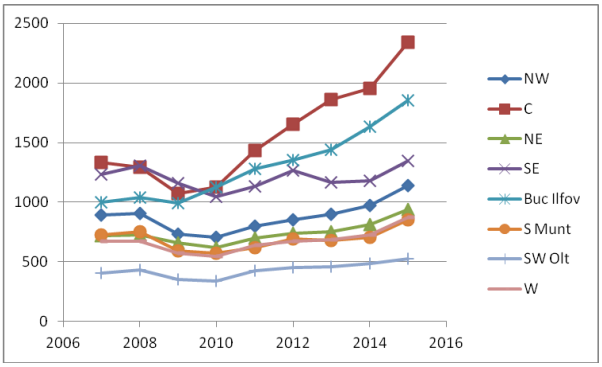

Fig. 4. Dynamics of Tourists' arrivals in Romania by micro-region in the period 2007-2015 (Thousands)
Source: Own design based on NIS Database, 2016, [4].

The average number of tourists' arrivals per unit for tourists' accommodation depends on the dynamics of the number of tourists and the number of units with accommodation function. At the national level it was recorded an increase by 12.1 % regarding the number of tourists per accommodation unit.

Also, an important growth was noticed in Bucharest-Ilfov micro region of 54 %, followed by the SE micro region with 22.87 % and the Central micro region with only 1 %, In fact, the highest number of tourists/unit of accommodation was recorded in 2015, more exactly 10,169 arrivals/unit in Bucharest-Ilfov area (Table 6).

Table 6.The average number of arrivals/unit for tourists' accommodation at the national level and by micro region, Romania, 2007-2015 (arrivals/unit)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Romania	1,297.8	1,472	1,203	1,162	1,405	1,320	1,322	1,381	1,456
NW	1,605	1,552	1,134	1,068	1,229	1,167	1,268	1,439	1,479
C	1,100	1,018	888.7	948.4	1,199	1,0984	1,132	1,119	1,111
NE	1,563	1,567	1,197	1,120	1,152	1,073	1,042	1,091	1,131
SE	987.2	1,040	882	753	1,165	1,170	1,070	1,070	1,213
Bucharest Ilfov	6,600	6,329	6,427	6,903	8,274	8,100	8,310	9,423	10,169
S Muntenia	1,711	1,670	1,293	1,213	1,156	1,192	1,064	1,076	1,152
SW Oltenia	1,556	1,683	1,187	1,105	1,132	1,014	1,092	1,112	1,234
W	1,733	1,692	1,213	1,092	1,247	1,124	1,119	1,216	1,343

Source: Own calculation based on NIS Database, 2016, [4].

The lowest number of arrivals per unit of accommodation was 753 registered in 2010 in the SE micro region.

Important decreases were recorded in NW (-8 %), NE (-27.7%), S Muntenia (-32.7%0, S W Oltenia (-20.7%), and W (-32.6 %).(Table 6).

The correlation between the tourists' arrivals and the number of units for tourists' accommodation. At the national level, the correlation coefficient between these two indicators was r = 0.909 reflecting a strong positive relationship. The coefficient of correlation varied between r = 0.253 in SE micro region and r = 0.966 in the Central micro region.

Also, a relative moderate relationship between these two indicators was found in NE (r = 0.754), SW Oltenia (r = 0.714), S Muntenia (r = 0.526) and W (r =0.547).

A weak positive relationship was found in NW (r = 0.416), SE (r = 0.253), and Bucharest Ilfov (r = 0.277).

Table 7. The correlation between arrivals and accommodation units by micro region, Romania, 2007-2015

	Romania	NW	C	NE	SE	Bucharest Ilfov	S Muntenia	SW Oltenia	W
Correlation coefficient (%)	0.909***	0.416	0.966***	0.754**	0.253	0.277	0.526	0.714**	0.547

Source: Own calculation based on NIS Database, 2016, [4].

Similar correlation, r = 0.8446 were found between the accommodation capacity and the number of foreign tourists' arrivals in the period 199802008 and R square= 0.7134, reflecting that 71.34 % of the variation in touristic accommodation capacity is determined by the number of tourists [5].

In another study, for the period 1991-2014, the correlation between the accommodation capacity and the number of arrivals was r = 0.767 [6].

Also, a r = 0.95 was found between foreign tourists arrivals and accommodation capacity in Romania's sea shore resorts at the Black Sea [7].

In Suceava County, in the period 2000-2006, the relationship between the existing accommodation capacity and the number of tourists' arrivals was concretized in r = 0.92 [8].

The determination degree of the number of units for tourists' accommodation by tourists' arrivals varied between 6.41 % in SE micro region and 93.41 % in the Central micro region. At the national level, it accounted for 82.76 %, reflecting that the number of tourists' arrivals is a major factor influencing the number of units for tourists' accommodation.

The results obtained by micro region were the following ones: in SE micro region it was founded 6.41 %, in NW 17.38 %, in S Muntenia 27.77 % and in W 30.01 %. These values reflect that the number of accommodation units was mainly determined by other factors than the number of tourists' arrivals (Table 8).

Table 8. The determination degree of the number of units for tourists accommodation (Y, dependent variable) by tourists' arrivals (X, the independent variable), Romania, 2007-2015 (%)

	Romania	NW	C	NE	SE	Bucharest Ilfov	S Muntenia	SW Oltenia	W
Determination degree (%)	82.76	17.38	93.41	56.93	6.41	77.17	27.77	50.98	30.01

Source: Own calculation based on NIS Database, 2016, [4].

The linear regression function for the number of units for tourists' accommodation (Y= dependent variable) depending on the tourists' arrivals (X= independent variable) is presented in Fig. 5-13 both at the national level and by each micro region.

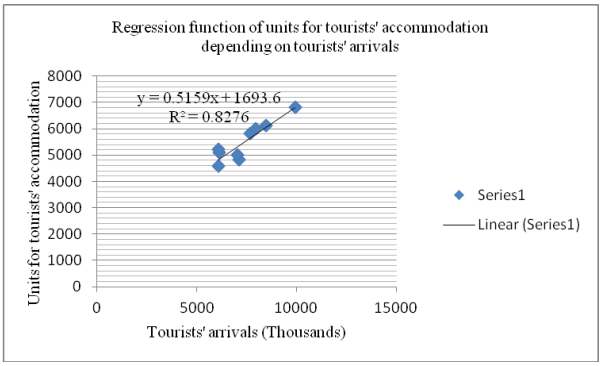

Fig.5. Regression function of units for tourists' accommodation depending on tourists' arrivals in Romania

Source: Own design based on NIS Database, 2016, [4].

At the national level, in this study it was found a regression function: y = 0.5159x + 1693.6 for the period 2007-2015. In another study, for the period 2000-2008, it was found a regression function y = 310.02 x +4164.4 between the number of arrivals and the accommodation capacity, and a coefficient of correlation r= 0.952 and R square equal to 0.9067, reflecting that 90.67 % of the variation in tourists' accommodation capacity is determined by the number of tourists' arrivals [9].

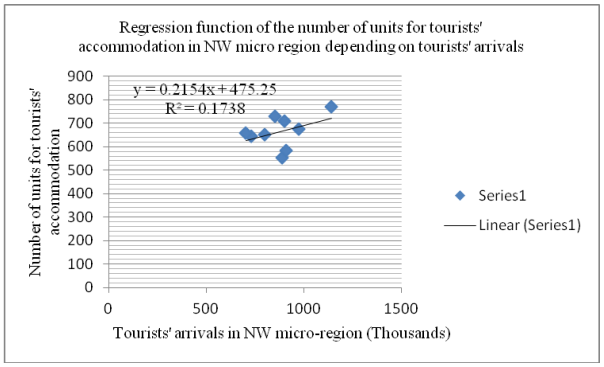

Fig.6. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in NW micro-region

Source: Own design based on NIS Database, 2016, [4].

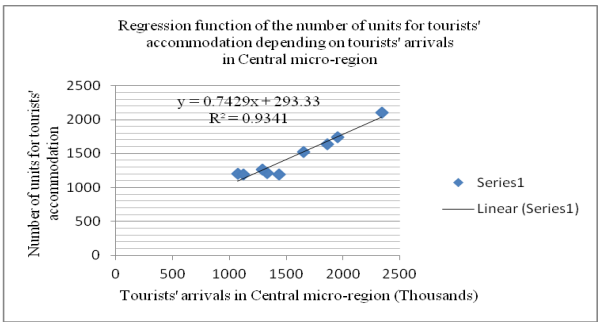

Fig.7. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in the Central micro-region
Source: Own design based on NIS Database, 2016, [4].

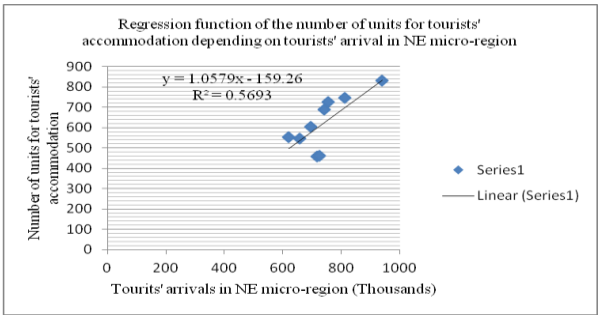

Fig.8. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in the NE micro-region
Source: Own design based on NIS Database, 2016, [4].

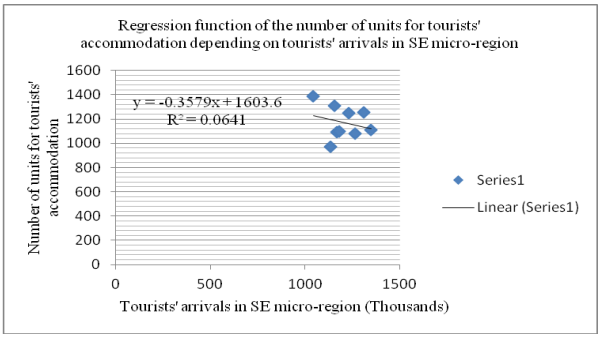

Fig.9. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in the SE micro-region
Source: Own design based on NIS Database, 2016, [4].

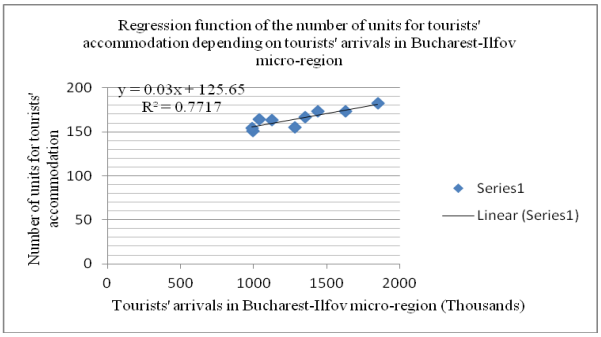

Fig.10. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in Bucharest-Ilfov micro-region
Source: Own design based on NIS Database, 2016, [4].

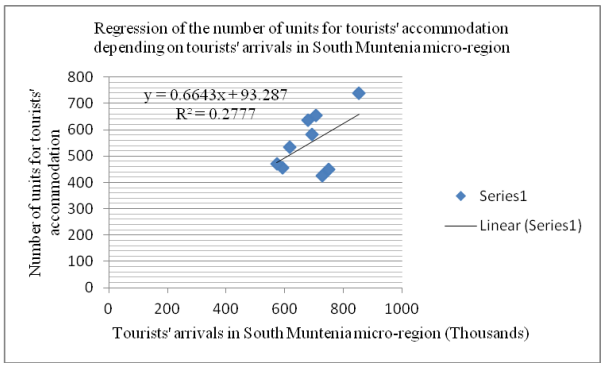

Fig.11. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in South Muntenia micro-region
Source: Own design based on NIS Database, 2016, [4].

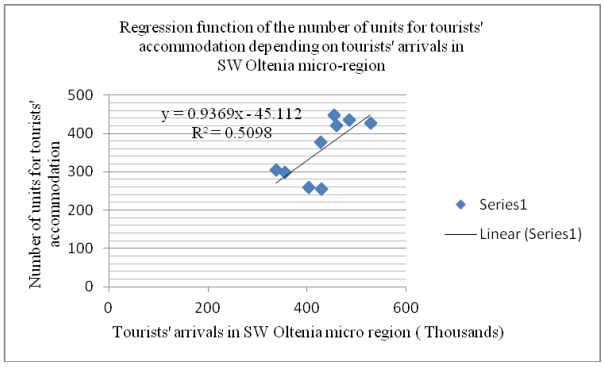

Fig.12. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in SW Oltenia Muntenia micro-region
Source: Own design based on NIS Database, 2016, [4].

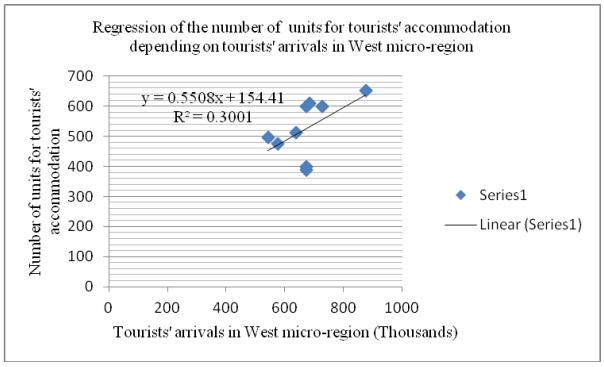

Fig.13. Regression function of the number of units for tourists' accommodation depending on tourists' arrivals in West micro-region
Source: Own design based on NIS Database, 2016, [4].

The comparison between the average growth rate for the number of tourists' arrivals and the average growth rate for the number of units for tourists' accommodation pointed out the aspects mentioned in Table 9.

Table 9. Compariosn regarding the growth rate for the number of tourists' arrivals and the growth rate for the number of units with accommodation function, Romania, 2007-2015 (%)

	Romania	NW	C	NE	SE	Bucharest Ilfov	S Muntenia	SW Oltenia	W
Arrivals' growth rate (%)	5.98	5.86	9.34	4.32	5.26	7.77	4.99	6.08	5.66
Units' growth rate (%)	4.81	4.88	7.48	6.93	2.65	3.40	6.38	7.22	6.33

Source: Own calculation based on NIS Database, 2016, [4].

-At the national level, the average growth rate for the number of tourists' arrivals was 5.98 %, higher than the average growth rate for the number of units with accommodation function, 4.81 %.
-In some micro regions such as: Central, SE and Bucharest Ilfov, the average growth rate was higher than the average growth rate of the number of units for tourists' accommodation.
-In the other micro regions: NE, S Muntenia, SW Oltenia and W, the average growth rate of tourists' arrivals was lower compared to the average growth rate of the units for tourists' accommodation.

The forecast of the number of units for tourists' accommodation depending on the tourists' arrivals in the period 2016-2020 was determined taking into account the following aspects: the number of tourists' arrivals in the year 2015, the last year of the analysis, the average growth rate of tourists' arrivals in the period 2007-2015 (Table 9) and the regression functions for the number of units for tourists' accommodation depending on the number of arrivals in each micro region (Fig.5-13).
The calculus was made both at the national level and by micro region. The results are shown in Table 10.

Table 10. Forecast for the number of units for tourists' accommodation (Y, Thousands) depending on the number of tourists' arrivals (X) in Romania for the period 2016-2020

	2016		2017		2018		2019		2020	
	X	Y	X	Y	X	Y	X	Y	X	Y
Romania	10,524	7,123	11,153	7,447	11,819	7,791	12,525	8,155	13,274	8,541
NW	1.207	735	1,278	750	1,352	766	1,431	783	1,514	801
C	2,559.5	2,195	2,598.5	2,372	3,059.8	2,566	3,345.5	2,779	3,657.9	3,011
NE	979.9	877	1,022.2	922	1,066.3	969	1,112.3	1,017	1,160.3	1,068
SE	1,418.7	1,096	1,493.3	1,069	1571.8	1,041	1.654.4	1,011	1.741.4	980
Bucharest Ilfov	1,994.6	185	2,149.5	190	2,316.5	195	2,496.4	201	2,690.3	206
S Muntenia	895.1	688	939.7	718	986.5	749	1,035.7	781	1,087.3	816
SW Oltenia	560.2	480	594.2	512	630.3	545	668.6	581	709.2	619
W	925.2	664	977.5	693	1,032.8	723	1,091.2	755	1,152	789

Source: Own calculation.

CONCLUSIONS

The increased demand for visiting Romania' attractions determined a continuous growth of the accommodation capacity in tourism. So, the number of units with accommodation function increased by 65.3 % from 4,694 units in the year 2007 to 6,821 units in the year 2015. Among regions there are different growth rates, depending both on the growth rate of the number of tourists, but also of other factors.
The highest number of units for tourists' accommodation have been developed mainly in the Central, SE and NE Romania, and the lowest number was noticed in the West part of the country.
The number of tourists increased by 63 % from 6,091.9 thousands in 2007 to 9,930.4 thousands in 2015. The highest growth rate

was noticed in the Central Romania, Bucharest Ilfov and SE region.

At the national level, the average number of tourists' arrivals per unit for tourists' accommodation accounts for 1,456 arrivals /unit in 2015, being by 12.18 % higher than in 2007. The highest number of arrivals per unit of accommodation was 10,169 recorded in Bucharest Ilfov area and the lowest one, 1,111 arrivals was found in the Central region in the year 2015.

The correlation coefficient between the two indicators was r = 0.909 reflecting a strong positive relationship at the national level. The lowest correlation coefficient was 0.253 registered in SE micro region, and the highest one was 0.966 in the Central micro region.

About 82.76 % of the variation of the number of accommodation units at the national level is determined by the number of tourists' arrivals. However, the lowest determination degree was 6.41 % in SE micro region and the highest one, 93.41 %, in the Central micro region.

The average growth rate for the number of tourists' arrivals was 5.98 %, higher than the average growth rate for the number of units with accommodation function, 4.81 % at the national level.

The linear regression functions for each pair of indicators allowed to forecast the estimated values for the number of units for tourists' accommodation depending on the number of tourists' arrivals for the period 2016-2020.

In conclusion, the increased interest both of the foreign tourists and Romanian ones has a deep impact on the accommodation capacity in Romania's tourism. For this reason, the managers developing business in the field of tourism must pay attention, among other aspects, to the growth of the number of units with accommodation function and the number of places, as well as to the quality of services.

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