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## CORRELATION AND EVOLUTION OF ROMANIAN TOURISM

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**Abstract:** *The purpose of this paper is studying the link between the touristic accommodation capacity and the number of foreign tourists arrivals in romanian tourist structures. Data were analyzed from 1998-2008. There are applied statistical and econometrical methods such as the graphical method, the regression function, the correlation coefficient and the dispersion analysis.*

**Keywords:** *correlation, regression, touristic accommodation capacity, foreign tourists arrivals*

### 1. INTRODUCTION

Tourism as an economic and social activity is characterized by flexibility and adaptability to different economic situations, social, environmental. Tourist activities are in a permanent existence, just change its intensity, direction, volume. Tourist activities depend on a number of factors: the level of household income, the tourist infrastructure, comfort, discomfort.

Contemporary tourist activities are a component of the vector quality of life, are a consequence of real savings market. The interdependence of the market economy (Anglo-Saxon, Western European market paternalistic, social market, Nordic-European oriented and dependent on outside) tourist activities in some way are directed. Romania, with over 2,000 years experience in tourism activities is improving its present forms of tourism, tourism infrastructure and adopting a strategy in front of tourist activities, taking into account the experience of advanced scientific elaborations of the major universities and academic.

Romania has universal scope, specific, unique tourism development. Romania can not (and should not) take a model developed and

used in other countries. Romania has its own scientific potential and practical strategy to base its own, entirely original, which means to apply also fully specific. Such an orientation can not be explained only by historical experience or originality geography, climate, traditions, customs, arts, culture, etc.

### 2. ANALYSIS OF THE CORRELATION BETWEEN THE TOURISTIC ACCOMMODATION CAPACITY AND THE NUMBER OF FOREIGN TOURISTS ARRIVALS IN ROMANIAN TOURIST STRUCTURES

The independent variable is the touristic accommodation capacity which is defined as X and the dependent variable is the number of foreign tourists arrivals in Romanian tourists structures denominated as Y

Table no.1: The evolution of the touristic accommodation capacity ( $x_i$ ) and the number of foreign tourists arrivals in Romanian tourists structures ( $y_i$ ) between 1998-2008

Year	$x_i$	$y_i$
1998	53.16	0.81

1999	51.28	0.80
2000	50.20	0.87
2001	51.88	0.92
2002	50.75	1.00
2003	51.63	1.11
2004	53.99	1.36
2005	54.98	1.43
2006	56.5	1.38
2007	57.14	1.55
2008	59.19	1.47
Total	590.7	12.70

Source: Statistical Yearbook 2009, Tourism

Noting that the data in the table have similar values and almost constant evolution, we can assume in a first stage that the connection between the two variables follow the linear model.

Linear model adjustment equation is:

$$\hat{y}_i = a + b \cdot x_i \quad \forall i = 1, n \quad (1)$$

The values a and b are determined using the method of least squares, which will result in the normal equations system:

$$\begin{cases} n \cdot a + b \cdot \sum_{i=1}^n x_i = \sum_{i=1}^n y_i \\ a \cdot \sum_{i=1}^n x_i + b \cdot \sum_{i=1}^n x_i^2 = \sum_{i=1}^n x_i \cdot y_i \end{cases}$$

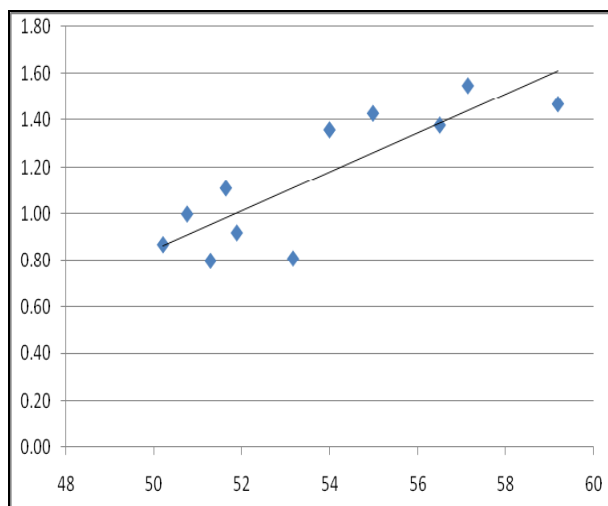


Figure no.1: the graphical representation of the relationship between the touristic accommodation capacity ( $x_i$ ) and the number of foreign tourists arrivals in Romanian tourists structures ( $y_i$ ) between 1998-2008

Table no. 2: Data processed to calculate the parameters of the regression function

Year	$x_i^2$	$x_i \cdot y_i$	$\hat{y}_i$
1998	2825.9856	43.0596	1.108664
1999	2629.6384	41.024	0.952812
2000	2520.04	43.674	0.86328
2001	2691.5344	47.7296	1.002552
2002	2575.5625	50.75	0.908875
2003	2665.6569	57.3093	0.981827
2004	2914.9201	73.4264	1.177471
2005	3022.8004	78.6214	1.259542
2006	3192.25	77.97	1.38555
2007	3264.9796	88.567	1.438606
2008	3503.4561	87.0093	1.608551
Total	31806.824	689.14	12.687730

Using the Excel Data Analysis submenu we obtain the values shown in the table below:

Table no. 3: Summary of indicators values

Correlation Report	R=0.8446
Coefficient of determination	R <sup>2</sup> =0.7134
Standard error	S <sub>e</sub> =0.1626
The parameters of the regression function	a= -3.2983 b=0.0829

Studying data from the above table it is found that between the two variables there is a direct, strong intensity relationship (R = 0.8446). The coefficient of determination (R<sup>2</sup> = 0.7134) indicates that a variable percentage of causal influence on the result is 71.34%, which means that the variation of the touristic accommodation capacity in function affects 71.34% of the variation of the number of foreign tourists arriving in Romanian tourists structures, given that other factors remain



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constant. Note that the standard deviation of error is close to zero ( $Se = 0.1626$ ) which means that most points are placed closer to the regression line.

Next we study the bond strength between the two variables using the coefficient of association and contingency coefficient.

Table no. 4: Association table

X \ Y	Y		Total
	under 1.15	1.15 and over	
under 53.7	6	0	6
53.7 and over	0	5	5
Total	6	5	11

$$\bar{x} = \frac{\sum_{i=1}^n x_i}{n} \Rightarrow \bar{x} = \frac{590.7}{11} = 53.7$$

$$\bar{y} = \frac{\sum_{i=1}^n y_i}{n} \Rightarrow \bar{y} = \frac{12.7}{11} = 1.154 \approx 1.15$$

$$Q_a = \frac{6 \cdot 5 - 0 \cdot 0}{6 \cdot 5 + 0 \cdot 0} = 1$$

$$Q_c = \frac{6 \cdot 5 - 0 \cdot 0}{\sqrt{6 \cdot 5 \cdot 6 \cdot 5}} = 1$$

Coefficients of association and contingency show that between the two variables analyzed there is a direct, very strong relationship. Confirmation of correct choice and use of unifactorial linear regression model is completed only after the following steps:

1) Testing the significance of the linear

regression model parameters and establishing the confidence intervals

Table no. 5: Items required for testing parameters of the regression model (data obtained using Excel, Data Analysis menu)

Elements for parameter a	Elements for parameter b
t calculat= -3.50165	t calculat= 4.733796
t theoretic=0.006706	t theoretic= 0.001068
The confidence intervals	
-5.4291 < a < -1.1675	0.0432 < b < 0.1225

Analyzing data from the above table it is found that theoretical values for the two parameters are lower than 0.05 which meant that they are statistically significant at  $\alpha = 0.05$  significance level.

2) Testing the linear model validity using ANOVA method

Table no. 6: ANOVA Table

Regression Variance	$\Delta_{Y/X}^2 = 0.592934$
Rezidual Variance	$\Delta_e^2 = 0.238139$
Total Variance	$\Delta_y^2 = 0.831073$
Corrected Dispersions	$S_{Y/X}^2 = 0.592934$ $S_e^2 = 0.02646$
F calculat=22.40883	F theoretic=0.001068

The hypotheses used to verify the validity of the linear model are:

$H_0$ : linear model is not valid

$H_1$ : linear model is valid

Since  $F_{theoretic} < 0.05 \Rightarrow$  the  $H_1$  hypothesis is accepted which means that the linear model is valid.

### 3.CONCLUSIONS

Among the tourist accommodation capacity and the number of foreign tourist arrivals in tourist structures between 1998-2008 it was identified a direct correlation of strong intensity. The link between the two variables is linear, as demonstrated by ANOVA method and testing parameters of the regression model. Thus, knowing the amount of tourist accommodation capacity in operation at a time, one can predict the number of foreign tourists who will arrive in Romania. In the terms of sustainable development of tourism in our country it is asked to maintain the best ratio between the capacity of accommodation and the number of tourists

because the evolution of one in an opposite direction quickly disturbs the evolution of the other. We can speak of the best ratio in the conditions of an offer that includes a capacity of accommodation at a high standard of quality with prices that more social categories can afford and a high number of tourists.

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