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SOME EVOLUTION DIRECTIONS OF THE TOURISTIC ACTIVITY IN ROMANIA RESULTED FROM THE STATISTICAL ANALYSIS

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Abstract:
The paper presents an introduction, in which is highlighted the importance of the time series analysis in the statistics studies, due to the multitude of information that can be detached from their calculation, the mode in which are used the statistical and econometrical analysis methods of the time series components in the foreign and Romanian specialized literature, as the statistical methodology used for the characterization of the tourism activity in Romania, in the period 1997-2011, consisting of: average ranks method used for the bi-criteria hierarchy of the territorial series, the time series analysis methods namely: graphical method, average indicators analysis of series comprised of total tourist arrivals, foreign and Romanian tourist arrivals, statistical methods of time series adjustment, grouped in two categories: mechanical methods (moving averages method, average spore method and average index method) and analytical methods (linear function and 2nd degree parabola) and statistical forecasting based on the above mentioned methods. Indicators taken in study were the tourist arrivals and overnight stays on total country, on foreign and Romanian tourists and, on their basis, it could be calculated and analyzed also the average length of stay. Considered horizon of prognosis was a medium one that is until the year 2015. Data source is represented by Anuarul statistic al României, published by the National Institute of Statistics.

Key words: time series, adjustment, forecasting, tourism, Romania.

JEL Classification: C220, L830, O520.

INTRODUCTION

Using of the time series methods in the statistical analysis is frequent, given being the assambly of information that emerges from this, the time series models being used in regression calculation, for the studying of a phenomenon evolution within a previous period and the calculating and analyzing its future development. Time series presents some characteristics, which give the specifics of their statistical analysis, namely: time flowing is measured in succession, by using the interval scale; a time series is viewed as a random variable, because the individual values are formed as a result of the action of some common or specific factors, essential and nonessential factors a.s.o.; into a chronological series, the is variable and the space and organizational structure are constant, variable (Y) being functionally linked with time variable. Knowledge of a time series informational message requires that it be subjected to a qualitative, content, interdisciplinary, theoretical and statistical analysis, consisting in the time series calculation, the regularities detachment from the phenomenon evolution, the elaboration of the analytical indicators system that characterizes it, the use of the statistical modeling methods of the movement as an assembly and its components (trend, cyclicity, seasonality, residual component), the establishment of the intervals in the forecasting calculations related to the likely future evolution a.s.o. In the context of this complex analysis, the time series preliminary analysis, consisting in the graphical representation and the calculation and interpretation of the indicators system occupy a special place. In this paper, the analysis of the tourism activity in Romania was realized on the basis of time series methods, passing through the preliminary analysis, application of the trend determination methods and ending with the series terms forecasting until the year 2015, being used data on the tourist arrivals

and overnights in the accommodation establishments in Romania, in the years 1997-2011 $(T = 15\ years)$.

TIME SERIES COMPONENTS APPROACH IN STUDIES AND RESEARCES

The usefulness in the evolution study of the economic and social phenomena the time series components analysis methods is highlighted by the variety of domains and the multitude of studies in which they find the applicability (Mark, Reichardt and Sanna, 2000; De Gooijer and Hyndman, 2006). Remarkable from this point of view is the work of J.G. De Gooijer and R.J. Hyndman, which have achieved a very useful systematization of the articles published in time series forecasting domain in the period 1985-2005, in the publications of the International Institute of Forecasters namely: the Journal of Forecasting (1982-1985) and the International Journal of Forecasting (1985-2005). They have analyzed more than 940 articles, from 380 revues and 20 books and monographs, which they have systematized on domains such as: the exponential smoothing, the ARIMA models, the seasonality, the non-linear models, the ARCH/GARCH models, the evaluation, the forecasting and the measurements precision and other. Researches demonstrate two important domains in the time series analysis, one of time and one of the frequencies (Brillinger, 1982; Rua, 2010). The classical model of time series analysis with linear trend is the autocorrelation model, used in many studies as basis for the elaboration of some more general techniques, smoothing models, applicable for the structural identification of non-linear series models, for correlation functions a.s.o., which tend to become important additional analysis instruments (Nielsen and Madsen, 2001).

In the macroeconomic domain, the application of calculation and interpretation methods for the time series components has in view the highlighting of the dynamics of macroeconomic results aggregates, their comparison in time, which raises also the question of construction and use of some adequate price indices. Trend and cyclicity in the macroeconomic data series were modeled in Bayesian approach, too using developments of the Markov's chain and Monte Carlo methods in univariate and multivariate models (Harvey, Trimbur and Van Dijk, 2007). V. Zarnowitz and A. Ozyildirim (2006) have applied the decomposition methods of the time series components on the quarterly values of the real gross domestic product and on the Coincident Index of USA, monthly. They highlighted that the business cycle study not requires the trend estimation and its elimination, unlike the study of the economic growth cycle. Authors compared several trend estimations and deviations from trend, deterministic or stochastic, linear and non-linear and the corresponding series of deviations from these tendencies by several methods, but these have led to similar conclusions on the business cycle and the economic growth cycle in the post-war period. Cyclical component was studied also by M.W. Watson (2001), who used a spectral density function for the decomposition of a regular stochastic process into its periodic components and he approached the cyclical properties of time series using an autoregressive moving average model (ARMA).

Time series seasonality was studied by E.B. Dagum (2001) and E. Ghysels, D.R. Osborn and P.M.M. Rodrigues (2006). After E.B. Dagum, the most known seasonal adjustment methods, in stochastic processes, are grouped in: *methods based on the stochastic model*, that involve autoregressive integrated moving average models, *moving average methods*, that havn't explicit parametric models and that are used in official statistics for the adjustment of series seasonality. E. Ghysels, D.R. Osborn and P.M.M. Rodrigues dealt by the seasonal time series forecasting methods and also by the forecasting implications on seasonal adjustment. They highlighted that, currently, the economists believe that the adjustment of the seasonal time series removes the seasonality from them, but that this opinion is false and that the decisions based on seasonally adjusted data affect future results. P.-A. Cornillon, W. Imam and E. Matzner-Løber (2008) propose two new methods of time series forecasting, both based on a factorial analysis method, called *the principal component analysis*, regarding the instrumental variables, the first being a simple application of the mentioned method and the second a modified version, but proving that both adapt well to the time series analysis. W.R. Bell (1984) uses the time series ARIMA models in

forecasting and related to these he approaches the difficulties of forecasting by extrapolating a deterministic function of time, the importance of finding of some reasonable measures for the forecasting accuracy and the need to incorporate the subject of knowledge with the time series models when it is forecasted.

Methods used in the trend and periodic variations determination require the respecting of the data homogeneity, because both the trend character and the length and amplitude of periodicity aren't some constant values, but they can change over time, especially in the case of a long research horizon. Therewith, at present, the quality of the obtained results from the time series analysis, especially in the public statistics, requires also *the revision of indicators*, as operation of successive rectification of the provisional/estimated published values for certain periods. So, the elaboration of time series with a real contents of terms and especially comparable in time requires the application of three categories of revisions, namely: *the current revision*, which concerns the rectification of the provisional/estimated data and it is the result of the information flow (generally, it is achieved in the first 2-3 years compared to the reference period and in Romania at a period of 3 years for GDP, it affecting only the last period); *the periodic revision*, determined by the existence of the primary and secondary data, which is achieved at large time intervals, conditioned also by the interval at which are realised certain statistical researches and it affects the level of all time series data; *the methodological conditioned revision*, consequence of the introduction of new estimation methods, new extrapolation and interpolation methods, the seasonality elimination. Also, it is spoken about *a general revision*, which is achieved at longer time intervals and it affects all or almost all previous time periods, in developed countries these being made with a periodicity of 5 years, being accompanied also by the change of basis in the prices domain (Mitruț and Mitruț, A.C., 2004).

METHODOLOGY OF STATISTICAL ANALYSIS OF TOURISM IN ROMANIA

In order to integrate our country in European context, related to the touristic development, they were taken into analysis data published by Eurostat, on which it was applied the statistical analysis of the territorial series namely the hierarchy by the ranks method. In *the ranks statistics*, into a multi-criteria approach, for each criterion the value corresponding to each territorial unit is replaced with an order number called rank and the place of the unit is established making an arithmetic or geometric average of all ranks assigned to the unit (Biji, Lilea, Roşca and Vătui, 2010; Biji and Biji, 1979). In this study it was applied the ranks statistics for a bi-criteria analysis, on the basis of the number of hotels and similar establishments and number of collective tourist accommodation establishments by countries (1) and tourist arrivals by countries (2), using data for the year 2007.

Tourism activity analysis in Romania, based on statistical indicators which characterized the level, structure, dynamics, intensity of this sector (Zaman, Vasile, Goschin and Roşca, 2012; Cristureanu, 1992) was realized using the time series methods, consisting of the preliminary analysis of the time series comprised of the total tourist arrivals, foreign and Romanian tourists and the number of overnights, the trend determination through mechanical and analytical methods and the identification of the most adequate method of adjustment, for the series comprised of the total tourist arrivals in Romania, in the years 1997-2011 and the forecasting of the tourist arrivals in Romania, until the year 2015.

Within the preliminary analysis, it was realised *the graphical represenatation* of the time series comprised of the total tourist arrivals, foreign tourist arrivals and Romanian tourist arrivals in Romania, in the period 1997-2011, as first method which allows the visual illustration of the tourism demand dynamics (Biji, Lilea and Voineagu, 1994). They were calculated and analyzed the average indicators of the time series comprised of the tourist arrivals and the tourist overnights in Romania, in the period 1997-2011 (Biji, Biji, Lilea and Anghelache, 2002).

Next analysis stage consisted of the determination *the trend (central tendency)*, $\hat{y}_t$, which is a regular succession of slow systematic variations, detectable for long periods of time. In tourism, the trend component dimension is determined by the influence of the essential factors with long-acting, such as: the labor productivity increase as basis of the free time growth, the scientific

development, the population growth, as potential source of tourist demand, the economic and social progress, as source of structural-qualitative modifications of demand a.s.o. (Isaic-Maniu, Mitruţ and Voineagu, 2004; Biji, Lilea, Roşca and Vătui, 2010). Model which describes the trend is a continuous function, usually a polynomial function of time, as $\hat{y}_t = f(t)$ of n degree, with $n = 1 \, or \, 2 \, (seldom \, n \succ 2)$ (Jaba, 1998). Statistical theory uses the following methods and procedures of the central tendency determination: *the mechanical methods* (graphical method, moving averages method, average spore method, average index method) and *the analytical methods* based on the method of least squares (Anghelache, 1999; Bădiţă and Cristache, 2004).

Moving averages method has at the basis the arithmetic average property of compensation the errors and it requires the replacement of real time series terms with the moving averages, operation that removes the influence of factors that determine periodic (cyclical, seasonal) oscillations within the series and it allows the obtaining of a new series, which terms are characterized by a continuous, smooth variation. It is used, especially, where the variation of time series terms presents an aspect of cyclical regularity (Korka, Begu, Tuşa and Manole, 2005; Biji, Lilea and Voineagu, 1994).

Average spore/reduction method (absolute average modification method) is used when the absolute modifications with the basis in chain are approximately equal, which corresponds to an increase of the level of studied characteristic under the form of an arithmetic progression with the ratio equal with the average spore $(\overline{\Delta})$. Adjustment relation of the series terms has the form: $\hat{y}_{t_i} = y_1 \pm t_i \cdot \overline{\Delta}$ (where y_1 is the term-basis of adjustment). As a general procedure of choice for the adjustment basis is recommended a graphical representation of the time series terms and to choose the term that is closest to the line joining the outermost points of the series (Isaic-Maniu, Mitruţ and Voineagu, 1999; Ţarcă, 1998).

Method of the average index of dynamics is used when the series terms have an increasing tendency under the form of a geometric progression in which the ratio is considered equal with the average index of dynamics $(\bar{I})$. Adjustment relation is: $\hat{y}_{t_i} = y_1 \cdot \bar{I}^{\pm t_i}$. Also in the case of this method the choice of the adjustment basis y_1 is based on the graphical representation of the series terms (Anghelache, 1999).

Absolute average modification method and the method of average index of dynamics are based only on the first and the last time series terms and so they can provide useful information concerning with the general tendency of evolution of the analysed variable only to the extent that it is satisfied the homogeneity criterion for the series terms, for the absolute modifications with moving basis and for the index numbers with basis in chain. Comparatively, the moving averages method considers all the series terms, in econometrics standing at the basis of the autoregressive models (AR) generation. Time series is considered as a time function of the form: $y_t = f(t)$, in which the variable y depends on the time evolution, meaning it depends on an assembly of factors whose evolution is synthesized by the growth of variable t in arithmetic progression. At the analysis of the time series of tourist arrivals in Romania, in the period 1997-2011 were used the regression models from the Table 1, column 1 (Baron, Biji, Tövissi, et al., 1996; Levin, 1987.

Table 1. Analytical form of the functions which characterized the time dependence of the time series terms and their parameters determination

Function	Equation of the trend function	Solutions of the trend function*
A	1	2
linear	$\hat{y}_t = a + bt$	$\begin{cases} a = \dfrac{\sum y_t}{T} \\ b = \dfrac{\sum t y_t}{\sum t^2} \end{cases}$

parabola of 2nd degree	$\hat{y}_t = a + bt + ct^2$	$\begin{cases} Ta + c\sum t^2 = \sum y_t \\ b\sum t^2 = \sum ty_t \\ a\sum t^2 + c\sum t^4 = \sum t^2 y_t \end{cases}$

* T represents the number of time series terms.

Tendency obtained under the basis of the model represents an "in average" evolution and the empirical values y_t are situated around the tendency, describing the systematic fluctuations affected by perturbation, in the case of evolutions with seasonality or cyclicity or simple random deviations, determined by the action of some random factors. For all the presented equations, at the parameters estimation can be used the least squares method and it is recommended the respecting of condition $\sum t = 0$. Systems of equations for the calculation of the adjustment equations parameters are presented in the Table 1, column 2 (Biji, Lilea, Rosca and Vătui, 2000; Ivănescu, et al., 1980).

Since at the central tendency calculation, for the same time series they can be used more methods, each ensuring a certain quality of adjustment, for its determination can be used several procedures based on the comparison of the deviations of adjusted terms from the real terms. Procedures used in this analysis are presented in the Table 2 (Korka, Begu, Tuşa and Manole, 2005).

Table 2. Criteria for assessing the quality of the adjustment procedures of the time series terms

Common criteria for the mechanical and analytical adjustment methods	Indicators for assessing the quality of the analytical adjustment function
$\sum_{t=1}^{T} y_t = \sum_{t=1}^{T} \hat{y}_t$ (1)	$\sum \lvert y_t - \hat{y}_t \rvert = \min$ (3)
$\sum_{t=1}^{T} (y_t - \hat{y}_t)^2 = \min$ (2)	Coefficient of variation [%]: $v_t = \frac{\bar{d}_{y_t}}{\bar{y}} \cdot 100$ (4)

As the coefficient of variation has a lower value, with so is more adequate the selected adjustment function to characterize the real movement of the analyzed variable. Using the results of the adjustments for the time series of the tourist arrivals in the accommodation establishments in Romania, in the years 1997-2011, on the basis of the 4 criteria, it was selected the most adequate adjustment method, which was used also at the forecasting of time series terms until 2015.

STATISTICAL ANALYSIS OF THE TOURISM ACTIVITY EVOLUTION IN THE YEARS 1997-2011 AND THE TENDENCY ESTIMATION UNTIL 2015

From the application of the average rank method for the bi-criteria hierarchy of the territorial units it was concluded that Romania occupied the 12th place, from the total of whose 27 Member States of the European Union, in the year 2007, being surpassed, regarding the two criteria taken in study, namely: number of hotels and similar establishments and collective tourist accommodation establishments and tourist arrivals, by countries as: Germany (rank 1), Italy and United kingdom (ranks 2-3), France and Spain (ranks 4-5) a.s.o. (data source: http://www.epp.eurostat.ec.europa.eu)

In this analysis are considered as representative indicators for the tourism activity of Romania the tourist arrivals in the accommodation establishments and the number of overnight stays, in the period 1997-2011. Most of the tourist demand is formed from Romanian tourists, whose share exceeds 75% from the Romanian tourist arrivals and 11% from the overnight stays, in all years from the period, 2005 being the year of minimum tourism activity for the Romanian tourists, if they have in view the relative level of the two indicators. Total number of the tourist arrivals in the period 1997-2011 has an oscillatory evolution, being registered a minimum in the

year 2002 and a maximum of the period, in 2008. In the Table 3 are presented the average indicators (average level, absolute average modification, average index of dynamics, average ratio of dynamics) of the tourism activity (tourist arrivals and overnight stays on total country and for foreign and Romanian tourists) in Romania, in the period 1997-2011. In the case of the total tourist arrivals and the overnights of the foreign tourists the average levels are situated over the registered levels at the beginning of period, which highlight annual average growths of the indicators in the analyzed period. Absolute annual average growth of the foreign tourist arrivals was 49 thousand and for the Romanian tourists was 44 thousand, while the overnight stays have registered an average growth in the period of 40 thousand for the foreign tourists, but a reduction of -157 thousand, in annual average, for the Romanian tourists.

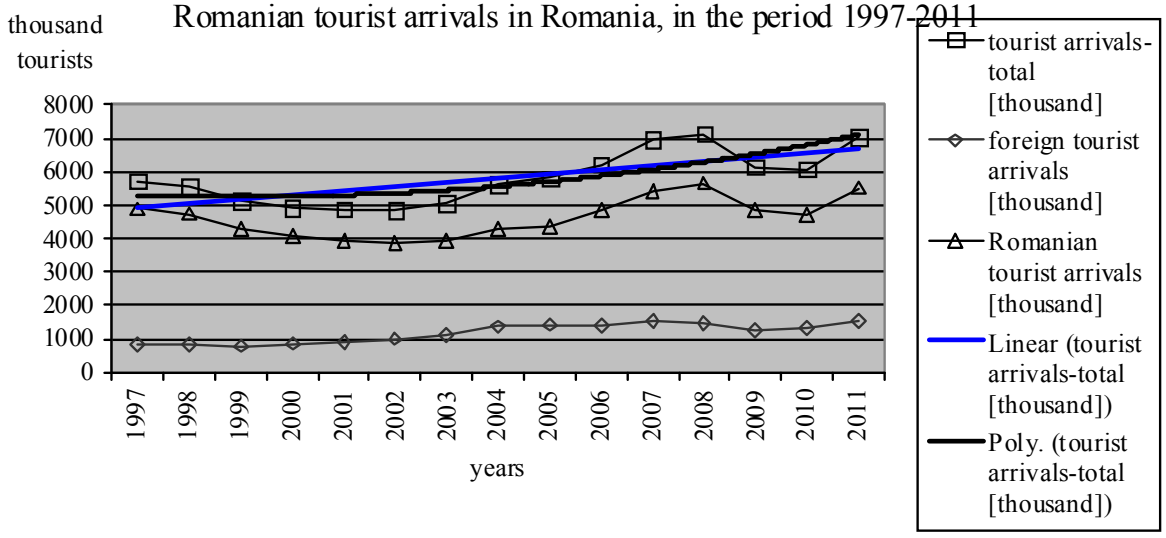
Table 3. Average indicators of the tourism activity in Romania, in the period 1997-2011

Indicators	Tourist arrivals -total-	Foreign tourist arrivals	Romanian tourist arrivals	Overnights -total-	Foreign tourists overnights	Romanian tourists overnights
Average level - thousand -	5,806	1,177	4,629	18,393	2,801	15,592
Absolute average modification - thousand -	93	49	44	-117	40	-157
Average index of dynamics -%-	101.48	104.37	100.86	99.38	101.45	99.02
Average ratio of dynamics -%-	1.48	4.37	0.86	-0.62	1.45	-0.98

Source: processed by *Anuarul statistic al României*, Edition 2001, 514-515, Edition 2007, 745-746, Edition 2012, 588-589.

Tourist arrivals and overnights for foreign tourists registered an annual relative growth with 4.4% and respective 1.5%. Graphical, a parabolic evolution appears as most probable, as it is illustrated in the Figure no. 1, where it is presented the tourist arrivals dynamics in the accommodation establishments, on total country, for foreign and Romanian tourists, the Romanian tourist arrivals evolution being the one that gives tendency this oscillatory form, with a minimum point in the year 2002 and a maximum one in 2008.

Figure no. 1. Evolution of the total tourist arrivals, foreign and Romanian tourist arrivals in Romania, in the period 1997-2011



Average length of stay, greater for the Romanian tourists compared to the foreign tourists, starting with the year 2001 has a decreasing tendency, for both categories of tourists. For the foreign tourists, the indicator declined from 3.01 days in the year 1997 to 2.02 days in 2011, due to the more accentuated dynamics of the Romanian tourist arrivals (104.4%), compared with the

overnights dynamics (101.5%), while for the Romanian tourists the indicator evolved between 3.5 days in the year 1997 and 2.70 days in 2011, due to the reduction of the number of overnights (99.02%), while the tourist arrivals registered a slight growth (100.86%), as they result from the indicators presented in the Table 3.

At the determination of the evolution tendency of the total tourist arrivals in the accommodation establishments have been used more methods, namely: moving averages method, average spore method, average index method and analytical methods based on linear function and parabola of 2nd degree. In the Table 4 are presented the calculated values for the criteria which characterized the quality of the time series adjustment methods.

Table 4. Verification of the adjustment methods quality

Criterion of assessment of the method quality	obtained value for:				
	moving averages method	**average spore method**	**average index method**	**linear function**	**parabola of 2nd degree**
$\sum_{t=1}^{15} y_t - \sum_{t=1}^{15} \hat{y}_t = 0$	-378*	-8,602.05	-8,311.71	-0.4	0.14
$\sum_{t=1}^{15} (y_t - \hat{y}_t)^2 = \min$	472,736.8512*	9,322,113.195	8,921,997.645	4,037,698.14	3,338,212.268
$\sum \lvert y_t - \hat{y}_t \rvert = \min$	x	x	x	6,804.20	5,967.79
coefficient of variation [%]	x	x	x	7.81	6.85

* in the case of the moving averages method it must have in view the fact that, by adjustment, are lost two terms, so are verified the relations: $\sum_{t=1}^{13} y_t - \sum_{t=1}^{13} \hat{y}_t = 0$; $\sum_{t=1}^{13} (y_t - \hat{y}_t)^2 = \min$.

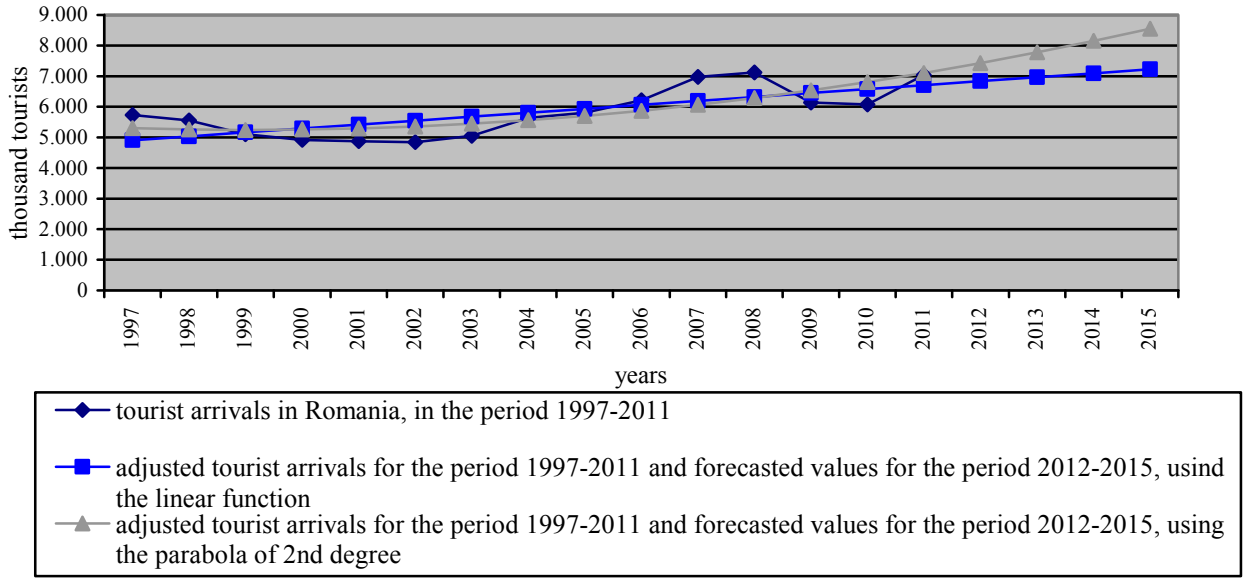
According to the criterion $\sum_{t=1}^{15} y_t = \sum_{t=1}^{15} \hat{y}_t$, the best adjustments are given by the analytical method, the difference between the sum of the real values and the sum of the adjusted values being smaller for the two used functions: linear function and parabola of 2nd degree, for the last obtaining the minimum value. It was verified the adjustment quality for the five used methods, after the criterion $\sum_{t=1}^{15} (y_t - \hat{y}_t)^2 = \min$ and it was found that the best adjustment is given also by the analytical method, for the two functions obtaining smaller values and for the parabola of 2nd degree the minimum value. At the verification of the analytical adjustment quality was applied the criterion of minimum value of the sum of the deviations of real values from the adjusted values, taken in absolute value, for the two functions and the conclusion was that, using the parabola of 2nd degree is obtained the best adjustment and also, the criterion of minimum value of the coefficient of variation indicates the parabolic function as the most adequate to be used in adjustment, too. However, in the specialised literature is considered that an economic variable not support long-term parabolic increases, no matter how well is exogenous supported its dynamics and the use of this function in the economic calculations must be done with maximum caution (Korka, Begu, Tuşa and Manole, 2005). As a consequence, we considered that for the statistical analysis of the tourist arrivals in Romania, in the period 1997-2011 and the forecasting until the year 2015 can be used both functions. In the Table 5 is presented the analytical form of the equations for the two adjustment and forecasting models and the predicted values until the year 2015.

Table 5. Analytical adjustment and forecasting models and the tourist arrivals predicted values in Romania

Horizon of forecasting	model	
	linear function	parabola of 2nd degree
	$\hat{y}_t = 5.806 + 128{,}635t$	$\hat{y}_t = 5.562{,}932 + 128{,}635t + 13{,}021t^2$
2013	6.963,715	7.775,348
2014	7.092,350	8.151,382
2015	7.220,985	8.553,458

In the case of linear function, the parameter $a = 5{,}806$ has sense of average size and highlights at what value would be attained the tourist arrivals in Romania, if all the factors would have had a constant influence during the whole period. The parameter $b = 128.635$ synthesizes the influence of the factorial characteristic t and, in geometric sense, highlights the degree of slope of the regression line and the positive value highlights an objective tendency of continuous growth of the tourist arrivals. Also, this parameter highlights how much is amended the tourist arrivals, at the increase with an year of the variable t. In the case of the parabola of 2nd degree, the adjusted values highlight a minimum point, in the year 1999 and the positive values of the parameters a, b şi c highlighs an increase tendency of the tourist arrivals in Romania, in the period 1997-2011. After both functions, they are observed from the predicted values presented in the Table 5, that the trend is increasing until the year 2015. Correlating the conclusions drawn from the Figure no. 1, where it is presented the tourist arrivals evolution in Romania on total country and by the origin of tourist, for the foreign tourists and for the Romanian tourists, related to the fact that the trend described by the Romanian tourist arrivals follows enough closely the trend of total tourist arrivals, with the conclusions drawn from the Figure no. 2, where they are presented the total tourist arrivals, adjusted values and forecasted values until the year 2015, it can be concluded that, if the conditions remain those from the period 1997-2011, mean that Romanian tourist arrivals will have an increasing trend until the year 2015.

Figure no. 2. Evolution of the tourist arrivals in Romania, in the period 1997-2011 and the predicted values until 2015, using the linear function and the parabola of 2nd degree



Also, if we correlate the trend lines of the total tourist arrivals and the foreign tourist arrivals in Romania, in the period 1997-2011, from the Figure no. 1, are found that both are increasing, conclusion at which is reached also if they are compared the values of the average indicators calculated for the tourist arrivals, presented in the Table 3, from where result that the absolute

average modification, the average index of dynamics and the average ratio of dynamics corresponding to the foreign tourist arrivals highlight increases upper to those of total tourist arrivals. Statistical analysis performed on the tourism indicators, more thorough on the tourist arrivals, leads to the conclusion that there is an increasing tendency of the tourism activity in Romania, in the period 1997-2011, which is kept until the year 2015, forecasting horizon taken into consideration in this study.

CONCLUSIONS

In the paper are presented the conclusions detached from the study of the specialized literature related to the application of the statistical methodology for calculation and analysis of time series components. It is found that statistics and econometrics developed an assembly of methods for time series calculation, analysis and forecasting, frequently used for the study of the activity from various economic and social domains, permanently enriched with new theoretical and methodological approaches. In order to analyze the indicators of tourism activity in Romania, in the paper are presented the time series adjustment methods, some of the assessment criteria for the quality of adjustment by mechanical and analytical statistical methods and the forecasting methodology of a statistical variable. Applying these methods on the Romanian tourism indicators namely: tourist arrivals and overnights, on total country and for foreign and Romanian tourists they can be detached some conclusions which characterize the tourism activity in our country namely: approached in European context, Romania occupied, in the year 2007, the 12th place into a bi-criteria hierarchy of the Member States, by the number of hotels and similar establishments and collective touristic accommodation establishments, being outrun by countries with recognized traditions in tourism, at the European level; in the period 1997-2011, the total tourist arrivals in Romania have had an oscillatory evolution, being registered a minimum in the year 2002 and a maximum in 2008; the Romanian tourist arrivals formed at least 75% from the Romanian tourist demand, in the analyzed period and the number of overnights has represented at least 11% of total overnights; the total tourist arrivals, foreign and Romanian tourist arrivals have registered annual average growths, expressed by the indicators: absolute average modification, average index of dynamics, average ratio of dynamics; the total overnights and those of the Romanian tourists have registered a slight annual average reduction (with -0.62% and respective with -0.93%), while the foreign tourist overnights have increased, with 1.45%; the average length of stay was higher for the Romanian tourists, compared to the foreign tourists; among the adjustment methods applied on the total tourist arrivals indicator (mechanical methods: moving average method, average spore method, average index method and analytical methods: linear function and parabola of 2nd degree), the criteria of verification the adjustment quality have highlighted the 2nd degree parabola as the most adequate function for the realization the adjustment and the forecasting calculations; the time series terms adjustment using the linear function and the parabola of 2nd degree has highlighted an increasing tendency of the total tourist arrivals in Romania, in the period 1997-2011, tendency that is maintained over the forecasting horizon (until the year 2015); since, from the graphical representations of the total tourist arrivals and the Romanian tourist arrivals time series result similar trends, it can hypothesize that also the evolution of the Romanian tourist arrivals follows an increasing tendency; since from the analysis of the average indicators of time series for the total tourist arrivals and the foreign tourist arrivals results annual average growths, absolute and relative, in the period 1997-2011, it can hypothesize that the foreign tourist arrivals follows an increasing trend. The achieved study of the Romanian tourism creates also some openings regarding the continuation and development of this analysis, through the utilization of other tourism activity indicators, whose analysis allow to highlight new sides of the Romanian tourism phenomenon, through the methodology diversification, which would allow the detachment of new conclusions regarding the Romanian tourism, through the verification of the previously issued hypotheses a.s.o.

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