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THEMATIC PROCEEDINGS II

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FACULTY OF HOTEL MANAGEMENT AND TOURISM IN VRNJAČKA BANJA

THE ROLE OF FOREIGN TOURISTS' FLOW IN THE SUSTAINABLE DEVELOPMENT OF ROMANIA AND BULGARIA

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Abstract

Tourism is an important branch of sustainable development, and at least three elements go in favour of this assertion: revenue contributors to GDP, significant number of jobs it generates and the positive impact it induces in local communities. Tourism must be supported by a favorable legislative framework through the development of infrastructure, high quality services and incentive pricing policies. Given the fact that the number of overnight stays of foreign tourists in Bulgaria (a country with tourism potential relatively close to that of Romania) in August 2005 was 5 times higher than in Romania and the fact that this gap has continued to grow (in August 2014 the number of foreign overnight stays of tourists in Bulgaria was 8.26 times higher than in Romania), the paper examines the evolution and intensity of the flow of foreign tourists (implicitly of currency flows generated by them) and their impact on processes of convergence and divergence manifested in the transition processes.

Key Words: *sustainable development, foreigner tourist flow, ARIMA models*
JEL classification: *C10, C12, L83, Z30, Z31, Z32*

Introduction

Due to the relatively low investment required to launch a business and to the financial flows that it may attract, tourism is an industry that may involve an upward dynamic of economies in transition. At the same time, through the flows by which it is interconnected, tourism industry

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represents an aggregated social system (Bartelmus, 2003) with implications for both social welfare and sustainable development (Hamilton & Withagen, 2007; Popescu & Andrei, 2011) and the preservation of ecosystems (Common & Stagl, 2005). All this leads to an increasing focus on sustainable tourism (Aall, 2014; Lucchetti & Arcese, 2014) and on the educative ways in the spirit of its sustainable development (Hatipoglu et al., 2014).

On the other hand, the need for a new approach is highlighted (Moscardo & Murphy, 2014), as well as for redimensioning and decentralization in "policy frameworks and practices aiming towards sustainability" (Saarinen, 2014). It should be emphasized that globalization requires cultural and natural heritage for future generations, which makes it impossible to define and implement models in area of tourism, since each country has specific potential on which to base their strategies and methods (Muresan, 2009; Panyik & Zaharia, 2014).

From a practical standpoint, tourism was and is an important direction for action mostly for former communist countries that have adopted liberal economic and political models (Hall, 2004). Although, they gradually became EU28 members, the gap between them and developed countries from Western Europe continues to be significant, especially for Bulgaria and Romania.

Issues of tourism development have been addressed since the 1990s both in Bulgaria (Vodenska, 1992; Bachvarov, 1997) and Romania (Light & Dumbrăveanu, 1999). Also sustainable development aspects are matters of recent approaches with overview references (Stoilova, 2013; Ioneci, 2010) or analyzing various forms of tourism (Marinov, 2012; Andrei et al., 2014).

Although it has been eight years since the accession of Romania and Bulgaria to the EU28, in terms of real GDP (Gross Domestic Product) per capita at market prices, Romania and Bulgaria are on the last two positions in the EU28. In 2013, real GDP per capita in Romania and Bulgaria at market was €7,100 and €5,500, respectively (Eurostat). But on the other hand, the export of goods and services in Bulgaria was €3,900 per inhabitant, while in Romania it was only €3,000, being on the last position in this case. Policies on sustainable development of tourism, their results, and thus their contribution to GDP growth, seem to differentiate

the evolutions of the two countries and their convergence duration towards the average UE28.

Research methodology

In the time series analysis of the number of overnight stays of foreign tourists in Bulgaria and Romania in the period 2005-2014, we start from the general dynamic model applied to BONS time series (Bulgarian overnight series) and RONS (Romanian overnight series), as the achievements of some random processes, as (Oprescu, 2007):

$$y_t = f(y_{t-1}, y_{t-2}, ..., t) + \varepsilon_t \quad (1)$$

where:

ε_t - is a random process of "white noise" type ($M(\varepsilon_t) = 0$ and $D(\varepsilon_t) = \sigma^2$), represented by the residual terms $y_t - f(\bullet)$ between the observed values and regression $f(\bullet)$.

$\Im$ - series of time points($\Im = N$).

For identifying and analyzing the data series components and BONS and RONS data series model (1) was written highlighting trend component (Y_t), seasonal component (C_t) and residual component (ε_t):

$$y_t = Y_t + C_t + \varepsilon_t \quad (2)$$

where:

$$\varepsilon_t \xrightarrow{P} N(0, \sigma^2),\ \operatorname{cov}(\varepsilon_t, \varepsilon_{t+\tau}) = 0, (\forall)\, \tau > t.$$

The cyclical component is econometrically represented by:

$$C_t = a \cdot \cos\omega t + b \cdot \sin\omega t, \omega \neq 0 \quad (3)$$

In (3), $a, b \in R$, ω is the oscillation frequency and the oscillation period is $T = \frac{2\pi}{\omega}$. To determine the parameters a and b the least squares method is used (Gogonea & Zaharia, 2008). Their expressions are: $a = \frac{2}{n}\sum_{t=1}^{n} y_t \cos\omega t$ and $b = \frac{2}{n}\sum_{t=1}^{n} y_t \sin\omega t$. Taking them into account, the deseasonalisation series are obtained such as:

$$y_t^{SA} = Y_t + \varepsilon_t \quad (4)$$

The time series given by the model (4) were analyzed using ARIMA(*p, d, q*) models, where *p* is the order of the autoregressive component (AR), *q* is the order of the moving average component (MA), and *d* is the order of differentiation of the deseasonalisation time series.
The use of autoregressive models and mobile average is possible only if the time series analyzed are stationary, y_t^{SA} considering stationary series if the mean $E[y_t^{SA}]$ does not depend on *t*, $Var[y_t^{SA}]$ is a positive number, finite and independent from *t* and covariance $Cov[y_t^{SA}, y_s^{SA}]$ does not depend on *t* and *s* (Gogonea & Zaharia, 2008; Pfaff, 2008). To test the stationarity analysis Augmented Dickey-Fuller statistic test was used (Dickey & Fuller, 1979; Elder & Kennedy, 2001). IF Null Hypothesis: BONS_COR has a unit root is accepted, y_t^{SA} series must be stationarized. One widely used method is differentiation.

$$\nabla^d y_t^{SA} = (1-L)^d y_t^{SA} \quad (5)$$

here $\nabla^d y_t^{SA}$ where is the series of differences of order d of y_t^{SA} series and L is the delay operator ($Ly_t = y_{t-1}$, $L^2 y_t = y_{t-2}, ..., L^p y_t = y_{t-p}$). If the series is stationary (has no unit root) then d=*0*.

The general form of ARMA(p,q) is:

$$y_t = \varphi_0 + \sum_{i=1}^{p} \varphi_i y_{t-i} + \varepsilon_t + \sum_{i=1}^{q} \theta_i \varepsilon_{t-i} \quad (6)$$

where $\varepsilon_t \sim N(0, \sigma_\varepsilon^2)$ is a stationary series, $M(\varepsilon_t) = 0$, $M(\varepsilon_t^2) = \sigma^2$ and $\text{cov}(\varepsilon_t, \varepsilon_i) = 0 \; \forall t \neq i$, $\varphi_i \in R, i = \overline{0, p}$ and $\theta_i \in R, i = \overline{1, q}$ are model parameters.

If time series y_t is not stationary, then it will be transformed according to (5), the model ARMA (p,q) becoming an autoregressive integrated moving average model ARIMA (p,d,q).

The determination of parameters of time series models analyzed was carried by using least squares method. In the obtained model hypotheses of least squares were tested. For this, we used the following tests Jarque-Bera normality test (Jarque & Bera, 1987), Durbin-Watson statistic

(Verbeek, 2012) and ARCH test - autoregressive conditional heteroskedasticity test (Engle, 1982).
The data series used are nights spent at tourism accommodation establishments - monthly data (Eurostat) and initially covering the period January 2005 - August 2014, and in the second part of the paper in the period January 2005 - November 2013. Statistic packages used for data analysis were EViews SPSS (Jaba & Grama, 2004) and Excel (Oprea & Zaharia, 2011).

Results and Discussion

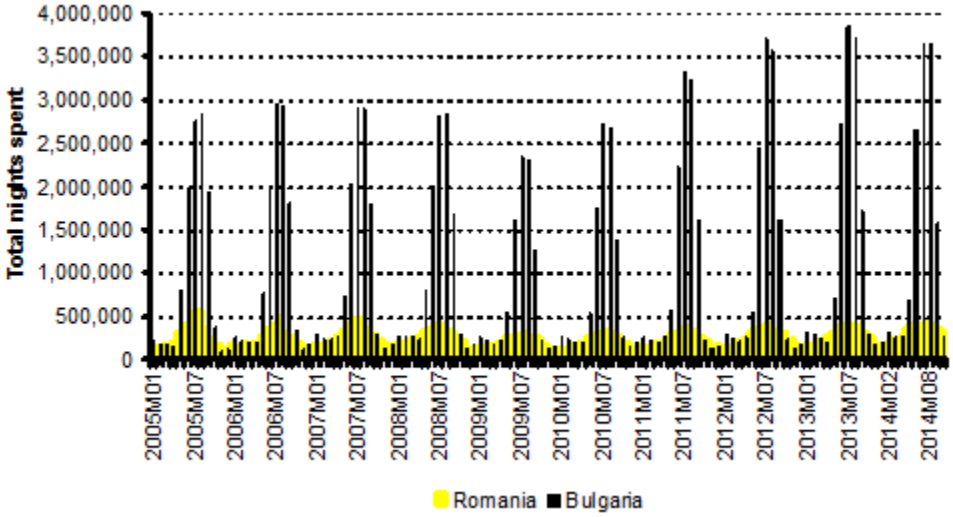
General characteristics of foreign tourists flows

Both in Romania and Bulgaria, the flows of foreign tourists are characterized by high seasonality with annual periodicity, with peaks in July and August and minimum number of visits in November (Bulgaria) or in winter months (Romania). However, the amplitudes of the oscillations recorded by the number of overnight stays of foreign tourists from the two countries significantly differ (Fig. 1).

The ratio between the minimum and maximum number of foreign tourists in Bulgaria in 2005 was 28.23, extremes recorded in August and November respectively, and in 2013 was 22.19, extremes recorded in July and November. In Romania in 2005 the ratio between the minimum and maximum number of foreign tourists was 3.87, extremes recorded in August and December respectively, and in 2013 this ratio was 2.36 extremes recorded in August and February respectively. Seasonality of overnight stays of foreign tourists in Romania is much less obvious than that in Bulgaria.

Although apparently it can be considered a positive aspect in that there is a continuity that does not put a particular strain on their activities in the tourism industry, there is a low annual average level of overnight stays of foreign tourists in Romania, which in 2013 was approximately 289 thousand overnights, while in Bulgaria the average was of 1.197 thousand overnight stays (by 4.14 times more).

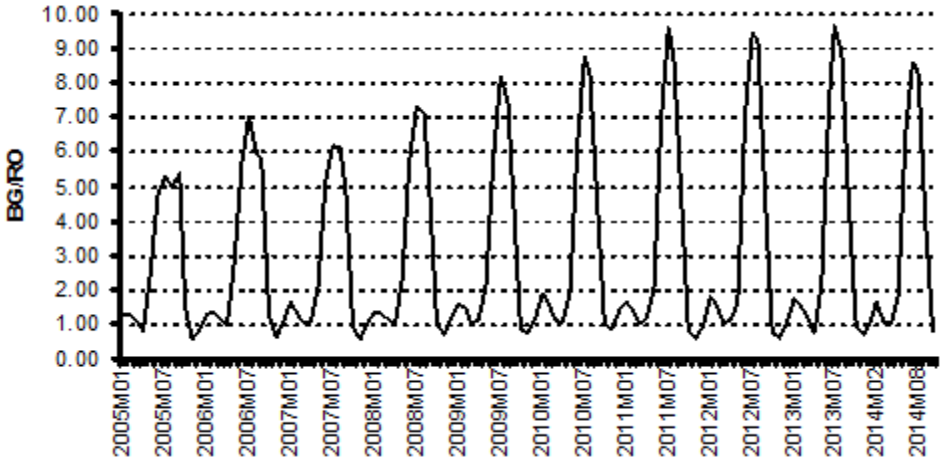
Figure 1: *Dynamics of foreign tourists flows in Bulgaria and Romania, 2005 – 2014*



Source: *own construction based on (Eurostat)*

An image that highlights the difference between the two countries in terms of the number of overnight stays of foreign tourists is given by the ratio between the number of overnight stays of foreign tourists in Bulgaria and Romania during 2005 - 2014, shown in Fig. 2. As can be seen, the number of overnight stays of foreigner tourists in Bulgaria, in the summer months starts from 5.37 times higher in September 2005, reaching 9.65 times higher in July 2013. It is true that in July 2014 the ratio between the number of overnight stays of foreign tourists in the two countries dropped to 8.63 times but this decrease is caused primarily by reduction of around 194,000 overnight stays in Bulgaria, and to a lesser extent by the increase of approximately 25 thousand of overnight stays in Romania in the same month of 2014 as compared to 2013.

Figure 2: *Developments of the ratio between the number of overnight stays of foreign tourists in Bulgaria and Romania, 2005 - 2014*



Source: *own construction based on (Eurostat)*

Finally, a comparative analysis of developments presented in Fig. 1 and 2 leads to the conclusion that the economic crisis triggered in 2009 influenced the number of overnight stays of foreign tourists both in Bulgaria in July 2009 where it fell by 17% as compared to the same period of 2008 and in Romania where in August 2009 the number of overnight stays of foreign tourists decreased by 10% compared to August 2008.

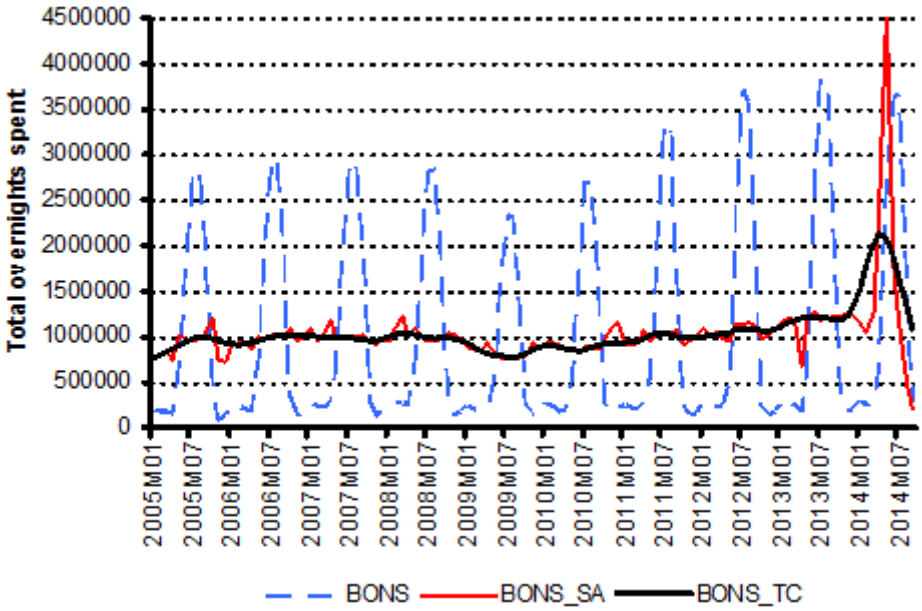
Time series analysis

In order to highlight the significant differences between the developments in the number of overnight stays of foreign tourists in Bulgaria and Romania during 2005 – 2014, we analyzed BONS (Bulgarian overnight series) and RONS (Romanian overnight series) time series represented in Fig. 1. Based on them, their corresponding dynamic models were identified and their characteristics were analyzed.

BONS time series corresponding to the evolution in the number of overnight stays of foreign tourists in Bulgaria in the period analyzed (Fig. 3) is the result of the composition of at least three components: seasonality component, trend component and irregular component.

The features of seasonal component have been highlighted above. After its elimination, BONS_SA series (final seasonality Adjusted series) was obtained. However, as can be seen from Fig. 3, BONS_SA series in May 2014 recorded a significant irregularity. While attempting to remove it by adjusting BONS_SA with BONS_IR (final irregular component), BONS_TC (final cycle trend) was obtained where the irregularity, although reduced, continues to be important. To avoid its influence on the analysis of the evolution of overnight stays of foreigners in Bulgaria BONS_COR subseries (overnights spent corrected) was selected comprising the period between January 2005 and November 2013.

Figure 3: *The final trend cycle (BONS_TC) of Bulgarian overnights spent series (BONS) by eliminating seasonality and irregular component*



Source: *author`s own computation*

To test the stationarity of BONS_COR series Augmented Dickey-Fuller statistic test was used. The results of the testing are presented in Table 1.

Table 1: *Testing the stationarity of BONS_COR series*

Null Hypothesis: BONS_COR has a unit root		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.079729	0.9479
Test critical values:	1% level	-3.496346	
	5% level	-2.890327	

Source: *author`s own computation*

Since Prob. = 0.9479 is much higher than the chosen threshold of significance it results that the null hypothesis is accepted: BONS_COR series is not stationary. Consequently, D_ONS_COR series was built which is 1st difference of BONS_COR. In its case Prob. = 0.007 (Table 2), the null hypothesis being rejected.

Table 2: *Testing the stationarity of BONS_COR series*

Null Hypothesis: D_BONS_COR has a unit root		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.322172	0.0007
Test critical values:	1% level	-3.496346	
	5% level	-2.890327	

Source: *author`s own computation*

Among the tested models for analysis of D_BONS_COR series ARIMA (2,1,1) autoregression model was chosen. Its characteristics are shown in Table 3. Given that Prob (F-statistic) = 0.00 <0.05, it results that the model is valid. Also, given that the values probabilities corresponding to T-Statistical are less than 0.05, it follows that the coefficients of the variables AR (1), AR (2) and MA (1) are statistically significant. Constant C is not statistically significant (Prob. = 0.1398> 0.05). But this does not influence the dynamic characteristics of the model.

Table 3: *Testing the validity of ARIMA(2,1,1) for D_BONS_COR series*

Dependent Variable: D_BONS_COR		Method: Least Squares		
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3424.724	2300.529	1.488668	0.1398
AR(1)	1.482289	0.065570	22.60616	0.0000
AR(2)	-0.755462	0.065176	-11.59102	0.0000

MA(1)	0.975998	0.009879	98.79241	0.0000
R-squared	0.967544	Akaike info criterion		19.03272
Adjusted R-squared	0.966560	F-statistic		983.7482
Durbin-Watson stat	1.949703	Prob(F-statistic)		0.000000

Source: *author`s own computation*

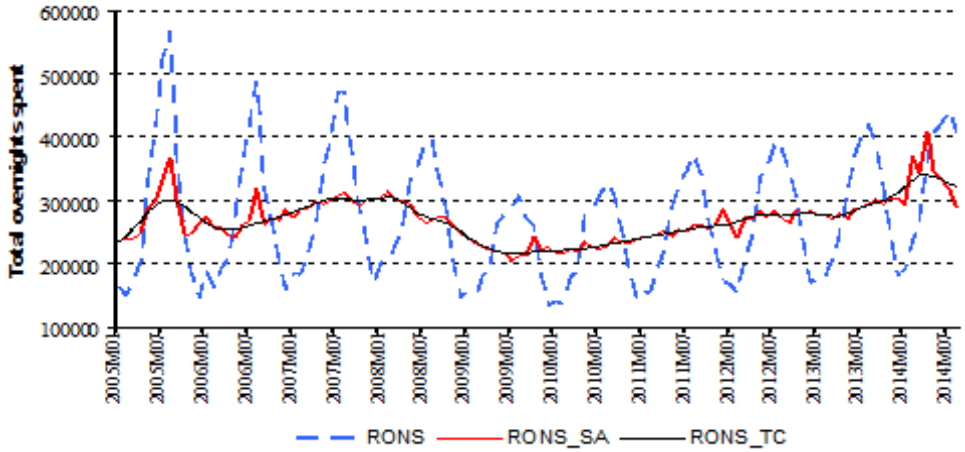
In order to decide whether to accept or reject the obtained model, the hypotheses of least squares were tested. The assumption of the normal distribution of residuals was checked by Jarque-Bera test normality test that is equivalent to 1.528182 and which corresponds to a probability of 0.465757 much higher than the chosen threshold of significance ($\alpha = 0.05$). Therefore, the null hypothesis is accepted: residuals have a normal distribution.

Testing the hypothesis regarding autocorrelation of residues was performed with Durbin-Watson statistic. Considering that the Durbin-Watson statistic is 1.949703, a value belonging to the interval (1.74, 2.26) corresponding to the chosen significance threshold and the number of independent variables in the model, it results that the null hypothesis is accepted: the residual variable is not autocorrelated.

Finally, after applying ARCH test, it resulted F-statistic = 1.219286, value corresponding to probability 0.272151 greater than the significance threshold. It follows that in this case the null hypothesis is accepted Residues series is: homoscedastic.

In Romania RONS time series, corresponding to the evolution in the number of overnight stays of foreign tourists in the period analyzed (Figure 4), is also the result of the composition of the three main components: seasonality component, trend component and irregular component. Fig. 4 presents together the RONS series RONS_SA series (final seasonality adjusted series), as well as RONS_TC series (final trend cycle) obtained from it after removing the irregular component.

Figure 4: *The final trend cycle (RONS_TC) of overnights spent Romanian series (BONS) by eliminating seasonality and irregular component.*



Source: *author`s own computation*

Since none of RONS_TC series is stationary, D_RONS_TC was generated which is 1st difference of RONS_TC. With this prob. = 0.0004 <0.05, null hypothesis is rejected. D_RONS_TC series is stationary which permits the continuation of the process for producing a new ARIMA(n,1,p) model, where *n* and *p* are to be identified.

Table 4: *Testing the stationarity of D_RONS_TC series*

Null Hypothesis: D_BONS_COR has a unit root		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.501951	0.0004
Test critical values:	1% level	-3.490210	
	5% level	-2.887665	

Source: *author`s own computation*

Among the tested models, for the analysis of D_RONS series ARIMA(3,1,1) autoregressive model was chosen. Its characteristics are shown in Table 5. Since Prob (F-statistic) = 0.00 <0.05, it follows that the model is valid. Also, given that the values of probabilities corresponding to t-Statistical are less than 0.05, it follows that the coefficients of the variables AR (1), AR (2) AR (3) and MA (1) are statistically significant. Constant C is not statistically significant (Prob. = 0.9168> 0.05), not influencing the dynamic characteristics of the model obtained.

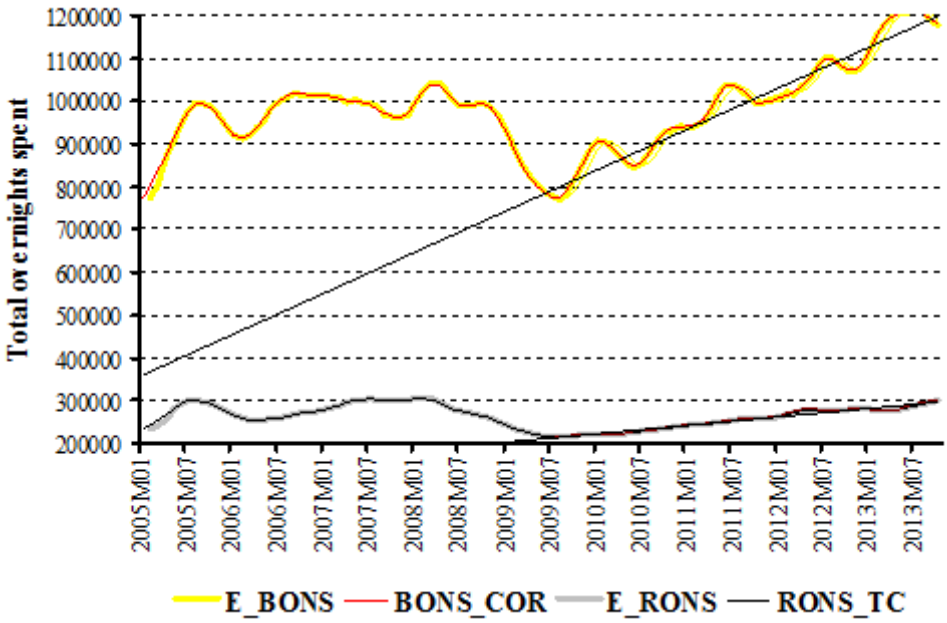
Table 5: *Testing the validity of ARIMA (3,1,1) model for D_RONS_COR series*

Dependent Variable: D_BONS_COR		Method: Least Squares		
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-112.5904	1074.637	-0.104771	0.9168
AR(1)	2.198029	0.090010	24.41994	0.0000
AR(2)	-1.842025	0.160385	-11.48502	0.0000
AR(3)	0.580380	0.087188	6.656678	0.0000
MA(1)	0.530637	0.096542	5.496434	0.0000
R-squared	0.989209	Akaike info criterion		15.14051
Adjusted R-squared	0.988806	F-statistic		2452.225
Durbin-Watson stat	1.901495	Prob(F-statistic)		0.000000

Source: *author`s own computation*

Regarding the checking of the hypotheses of the least squares, the assumption of the normal distribution of residuals was also checked with Jarque-Bera test that is equivalent to 1.110926, which corresponds to a probability of 0.573806 greater than the chosen threshold of significance. Therefore, the null hypothesis is accepted: residues have a normal repartition. The value of 1.901495 of Durbin-Watson statistic test leads to the conclusion of accepting the null hypothesis: the residual variable is not autocorrelated. Also, after applying ARCH test resulted F-statistic = 0.028903, a value corresponding to the probability of 0.865319 more than threshold of significance. It follows that even in this case the null hypothesis is accepted: the residues series is homoscedastic.

Figure 5: *Initial data series and series of data obtained by static estimation, 2005-2013*



Source: *author`s own computation*

The data series obtained after removing seasonality and components and of irregular component BONS_COR (Bulgarian overnight spent series - Corrected series) and RONS_TC (overnight spent Romanian series - trend cycle), and E_BONS series (Estimate Bulgarian overnight spent series) and E_RONS (Estimate Romanian overnight spent series), estimates using identified models are shown in Fig.5.

After the shock of the crisis triggered in 2009, in both countries there is a process of reviving the tourism industry in terms of overnight stays of foreign tourists. Although the trends are positive, there are significant differences between the expected developments, as evidenced by their graphs (Figure 5). Thus, while the number of overnight stays of foreign tourists in accommodation establishments in Bulgaria increases by about 7,950 nights per month, in Romania the average monthly increase of overnight stays is of only 1,670, which is 4.76 times lower. From this point of view, the two countries have divergent evolutions.

Although, in 2014, Bulgaria recorded a slight decline in the number of overnight stays of foreign tourists, Romania continued to remain on an upward trend. Romanian tourism, in terms of overnight stays of foreign tourists would need a few decades to reach the level of Bulgaria.

On the other hand, compared with the average rate of increase in the number of overnight stays of foreign tourists at UE28 level, there is a convergence process. Thus, during 2010 – 2014, the number of overnight stays of foreign tourists recorded in August of each year at the UE28 increased by an average rate of 5.46%. In Romania, in August, the average rate recorded during the same period was 7.46% and 9.70% in Bulgaria. If we consider that the average rate of overnight stays of domestic tourists recorded in August, during the analyzed period in Romania (2.50%) and Bulgaria (6.89%) also recorded higher values than the UE28 average values of August (0.5%) it follows that tourism in the two countries is a factor of their convergence to the European average.

Conclusions

Between sustainable development and tourism development there are significant connections, tourism being both a factor of social, economic and multicultural development, but also an industry with environmental implications.

In the context of sustainable development and environmental protection policies adopted at European level, these two issues are not only conflicting but can even have mutual support leading to a harmonious development, to the enhancement of natural and human heritage of each region of development, but preserving their specificity.

In the extensive processes of social and economic development and of convergence processes in UE28, Romania and Bulgaria have started on a relatively similar position and unfortunately still continue to be in the second half of the rankings in the EU28. The policies implemented by their governments in tourism development and necessary infrastructure determined different developments, Bulgaria is significantly outpacing Romania.

Although both countries border the Black Sea and have both natural and human similar patrimonies allowing all forms of tourism development, from the point of view of foreign tourists flows who have benefited from

accommodation in the past decade there are significant differences. This is emphasized by the econometric models analyzed and which, although describe upward trends, highlight divergent developments. Both average increases and average rates in the number of overnight stays of foreign tourists in these countries show that, at least in the near future, Bulgaria will continue to depart from Romania.

Flows of foreign exchange inflows that came to Bulgaria, determined by flows of foreign tourists in August of the period analyzed were 8 times higher. It should be also pointed out that, except in April and November, and sometimes October in all other months foreign exchange inflows are falling due to the number of foreign tourists in Bulgaria being higher than that in Romania. The contribution of tourism to national income and domestic product is significantly higher in Bulgaria than in Romania, and therefore the contribution of tourism to their sustainable development.

Analyzing foreign tourists flow developments in the two countries compared to their average evolutions in UE28, the emphasized fact is that their growth rates are higher than the European average. This highlights the convergence processes to the European average in both countries with the observation that the process is faster in the case of Bulgaria. On the other hand, taking into account that the average rate recorded by domestic tourists' overnight stays are also higher than the European average, it can be concluded that tourism is a lever for sustainable development.

Flows of foreign tourists and foreign exchange inflows generated by them, flows entering the economy of any country are considered to be important levers of economic and social growth. The way of attracting and their flow depend not only on the natural and anthropogenic heritage, but also on the policies adopted especially by developing countries. Their efficiency are factors that accelerate or slow the transition processes.

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