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## Article

# Statistical Confrontation of the Evolution of Tourism in the North East Region in Comparison with the other Regions of Romania

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STATISTICAL CONFRONTATION OF THE EVOLUTION OF TOURISM  
IN THE NORTH EAST REGION IN COMPARISON  
WITH THE OTHER REGIONS OF ROMANIA

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**Abstract**

The objective of this paper is the analysis of the tourist activity in the North East region, compared to the other development regions of Romania, throughout the period 1990-2014.. The research was performed through a system of tourism indicators applied in the Romanian regions, obtained from the National Institute of Statistics. This comparative analysis was carried out using the statistical method called ANOVA and the Post Hoc – Games-Howell test. In order to achieve the objective, our study implied the analysis of several relevant indicators for tourism: the accommodation capacity, the number of arrivals, the number of overnight stays, the length of stay and the net use of accommodation capacity index. Processing the data related to a period of twenty-five years, the analysis allowed to draw conclusions about the existence of differences between the values of indicators across regions. The comparative analysis of the available data reflected a number of differences between the North East region and the other regions of Romania, the North East region recording lower values for the analyzed indicators, while South East and Central regions hold significantly higher values than the other regions, for the majority of indicators.

**Keywords:** regions, tourism indicators, ANOVA, comparative analysis, Post Hoc - Games Howell test.

**JEL Classification:** L83, R11, Z32.

**Introduction**

Tourism activity is not a recent phenomenon, as its historical roots are known since the origins of civilization. Tourism has evolved continuously, starting from a specific activity of social classes with free time and material resources to a mass phenomenon, which allowed an international expansion of worldwide travels.

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Nowadays, as a specific phenomenon of the modern world, tourism activity is one of the most dynamic sectors of the global economy, with a major impact on economic, social, cultural and political life, having a decisive role in the overall development of a country or region. As a component of the tertiary sector, tourism has become, on the strength of the dynamism that it experienced, a distinct field of economy with multiple connections and implications.

Since it managed to rapidly develop in recent decades, the study of tourism, under every aspect it entails, has become a necessity in order to assess its proportions and implications, both globally and nationally or regionally.

Regarding the regional policy, it has undergone an extensive development at the European Union level in the last two decades. Its aim was to promote the cohesion of the EU, but also to sustain the under-developed regions, affected by economic decline, to overcome the difficulties they experience. Thus, the current regionalization of Romania (in eight regions: North West, Central, North East, South East, South Muntenia, Bucharest – Ilfov, South-West Oltenia, West) was conducted in 1998, with the adoption of Law no. 151/1998, and represents a mixture between the historical criteria and the functional one. These administrative territorial units have jurisdiction only in terms of attracting European funds and coordinating projects for regional development, but without holding administrative positions. The North East region consists of six counties: Bacau, Botosani, Iasi, Neamt, Suceava and Vaslui.

Returning to the domain of tourism and considering that this sector is in constant metamorphosis, it is required an analysis that we intend to achieve, with regard to the evolution of the tourism activity in the North East development region, relying on a few relevant indicators, as we consider that measuring tourism helps us understand some of the issues that policymakers need to address in tourism planning and in the future development scenarios at the regional level.

Furthermore, other reasons for which the measurement of tourism activity is required are: understanding the magnitude and value of tourists for the respective region, assisting the tourism industry and the governmental and regional authorities in planning and anticipating the types of infrastructure necessary for tourism to grow and prosper, understanding marketing measures and strategies that need to be implemented.

We consider that, at a general level, measuring tourism through the collection, analysis and interpretation of statistical data is crucial for evaluating the volume, the scale, the impact and the value of tourism, in various geographic areas. Thus, the objective of this paper is to analyze the evolution of several indicators that are relevant for tourism and are regionally registered, by the national statistics. Among them, there are: *the accommodation capacity, the number of arrivals, the number of overnight stays, the net use index of capacities in operation and the average length of stay.*

These indicators, through their content, occasion the quantification of some important aspects of tourism activity, being useful, at the same time for the measurement of its effects and for policy development in this sector.

### **1. Review of the scientific literature**

Over time, many researchers who have made important theoretical contributions in the field of regionalization science, stood out. Given the importance of this domain for the purpose

of our work, we intend to emphasize the main theories that have been developed by the regionalization theorists.

Firstly, the representatives of the German school of spatial economy were noted (J. Von Thünen, W. Launhardt – nineteenth century and A. Weber, W. Christaller, A. Lösch – twentieth century), who founded the regional science, and their work was continued by the regionalists of the American, French, Scandinavian, Russian, Dutch schools etc.

The International Regional Science Association (RSAI) of specialists was founded in 1954 and had a major role in shaping regional science ( in the 50s), as well as in its subsequent evolution.

Relying on two elements that have not been addressed by the economic theory (distance and area), regional science deals with developing some methods and some rigorous and systematic techniques for the analysis of the phenomena and processes in which space, distance and location play a central role (Constantin, 1998).

In more than half a century of existence, the regionalization science aimed and, to a great extend, succeeded to combine, in a balanced manner, the theoretical research with the applied one. Since the early years of research in this domain, scientists have analyzed the spatial issues, including regional differentiation. Later, other issues have been tackled, such as regional development initiatives to reduce economic and social disparities, but also the advanced spatial models to improve the efficiency of regional planning (Bailly and Gibson, 2004).

According to David Boyce (2004), the evolution of regional science included several periods, and the basis of this science was set between 1954-1968. Among those who could be considered pioneers of regional science, we can mention William Alonso, who was the first to obtain a PhD degree in regional science. One of the reference books for regional science, *Location and Land Use* was developed by William Alonso (1964), author who performed his activity under the guidance of Walter Isard and Ben Stevens.

The next stage, respectively the period 1969-1989, is considered to be what Boyce calls the years of expansion of this domain, when researchers like Peter Nijkamp (Netherlands) și Alan Wilson (England) stood out. Likewise, in Boyce's view, the time interval between 1990-2003 represents the years of maturity for the regional science. An important aspect for the evolution of this science was also the creation of *Papers in Regional Science* magazine, with a major role in improving the informational flow. At the same time, during this period, a new generation of researchers could be noticed, which included the distinguished economist Paul Krugman. He contributed to the creation of the *New Economic Geography* and was involved in the development of the regional science. An emblematic work of this period, opening new horizons for regional science, is *The Spatial Economy* signed by Masahisa Fujita, Paul Krugman and Anthony J. Venables (1999).

Among the emblematic figures present in all three development periods of regional science stands the Dutch researcher Peter Nijkamp. He believes that regional science is not a discipline in itself, as it consists of a set of complementary disciplinary perspectives, centered around the thematic concept of "region" (Nijkamp, 2004).

The key element that lies at the heart of these theoretical and practical concerns is the region. The term "region" has its origin in the Latin word "regionem" and is present in most European languages meaning land, geographical area with borders and features more or less accurate (Platon, 2003, p.43). It can be considered that the region has a material component, the territorial cut, on which the relational component, of the institutional

competencies, is projected, these being in an indissoluble association (Pușcașu, 2000, p.10). In the broadest sense, the term "region" is used to group multiple spatial elementary units provided that any two of them, belonging to the same region, to be similar in one way or another (Behrens and Thisse, 2007). Yet, it must be noted that this notion of "similarity" can be seen from many points of view, each leading to different territorial cuts.

Regarding the demarcation of regions, several criteria can be taken into account: administrative, economic, geographic, social, historical, cultural etc.; however, there are no universally accepted delineation methods, the purpose being largely considered in this process.

Throughout the whole evolution of the regionalization science, a multidisciplinary orientation useful for the research efforts in the field is emphasized. The prospects of regional science are closely related to multidisciplinary, implying that the role of some disciplines (such as economics, tourism, geography, statistics, ecology, political science etc.) will still be decisive, in terms of their contributions.

The differences between the levels of development of some countries, but also of some regions of the EU are considerable. The more prosperous regions, in terms of GDP per capita are urban areas (such as London, Brussels, and Hamburg), and the richest EU country, Luxembourg, is more than seven times more prosperous than Romania and Bulgaria, which are the poorest EU members (Scutariu, 2013, p.36).

Regarding our country, there have been several attempts of territorial division: the organization on historical provinces, the economic-functional organization, each of them bearing advantages and disadvantages. The present territorial structure, on eight development regions, is a mix between the historical and the functional criteria, without respecting, in fact, too much either of the two criteria. The current classification of territorial units for statistics (NUTS) of the European Union is valid from 1 January 2015 and totalizes 98 regions at NUTS 1 level, 276 regions at NUTS 2 level and 1342 regions at NUTS 3 level (Eurostat, 2015).

In relation to the European standard territorial units, the territorial organization of Romania integrates into the standard territorial units of the EU – NUTS, as follows: NUTS 1 level (four macro-regions); NUTS 2 level (eight development regions); NUTS 3 level (41 counties plus Bucharest); NUTS 4 level (not used because there are no recognizable groups of territorial units to be assimilated in this level); NUTS 5 level (265 cities and towns, 2,686 communes with 13,092 villages (Eurostat, 2015).

Given the fact that the North East region is the least developed area of Romania (The National Agency for the North East Regional Development, 2012; Muntean, Nistor, R. and Nistor, C., 2010), tourism may contribute significantly to a sustainable development and, thus, improve the living conditions in areas where no other alternatives for economic development can be seen (Simão and Partidário, 2012).

Tourism, as an economic sector of activity, has a minimal contribution to GDP compared to the situation of other regions or countries, that have managed to draw profit from the implementation of several development strategies and capitalizing the regional specific (Romanian National Institute of Statistics, 2015).

Local authorities play a very important role in tourism development and, at the same time, they must bear in mind that this activity generates both positive and negative effects (Ruhanen, 2012, pp.80-98). Some authors (Stanciu, 2012, p.22; Scutaru, 2013, p.92) cite several benefits

for which tourism can efficiently contribute to the development of regions and tourist destinations: most efficient valorization of existing tourism potential, increasing the annual turnover for the economic agents, increasing the welfare of the local community, relatively small investment, increasing the number of jobs, unlocking the potential of poor areas.

As landmarks in highlighting the level of tourist activity in a specific region, the tourism indicators analyzed in our study have been widely used by numerous authors in their works: Tanguay, Rajaonson and Therrien (2013), Liu, Dong and Wu. (2014), Urban and Melnic (2012), Dash and Tiwari (2015), Mansor and Ishak (2015), Yang and Wong (2013), Minciu (2004), Lozano-Oyola (2012) and others.

## **2. Research methodology**

In order to determine the current state and evolution of the tourism activity in the North East region, compared to the other seven regions of Romania (corresponding to NUTS 2 level EU divisions), we have considered the following statistically representative indicators:

- indicators of the supply, in particular, of the material base (*the existing accommodation capacity*, evidenced in our study through the number of beds).

- indicators of the demand-supply relationship (*the index of net use or occupancy of the tourist capacity in operation*); this index is calculated by dividing the number of overnight stays to the accommodation capacity in operation, in the respective period. The accommodation capacity in operation represents the number of places in beds provided by the accommodation units, taking into account the number of days when the respective units are open. It is expressed in places-days. We must mention that we didn't take into consideration the places in rooms or accommodation facilities temporarily closed for renovations, for lack of tourists or for any other reason. For the calculus of the accommodation capacity in operation, one may consider the number of places or the number of rooms. In our research, we took into account the number of accommodation places to calculate the ratio. The importance of this use index is derived from the fact that it influences other indicators of the tourism activity.

The real (of tourist movement) and potential demand indicators (*number of arrivals, number of overnight stays, average length of stay*).

For the number of arrivals, we have considered tourists (Romanian and foreign) accommodated in units for at least 1 night and traveling outside their place of residence for a period smaller than 12 months, with other aim than to carry out a paid activity at the destination.

The overnight stay represents the 24 hours time interval, starting with the hotel hour, for which a tourist is registered in the accommodation structure. We specify that the additional beds are also taken into account.

The average length of stay is calculated by reporting the number of overnight stays to the number of total tourist arrivals.

We considered these indicators to be among the most representative in quantifying the overall tourism activity in Romania and, thus, in the development regions and, also, in highlighting the effects of tourism in order to develop policies in this sector. In order to

emphasize the results of this research, from a regional perspective, we used data from the National Institute of Statistics (INS), for the period 1990-2014, through TEMPO online database: time series and related matrices (National Institute of Statistics, 2015):

- TUR101D – Tourist structures with accommodation functions, by type of establishment, macro-regions, development regions and counties. The number of accommodation structures was determined at the end of each year, in the period 1990-1993, and on 31st of July, for the period 1994-2014. There were excluded from evidence those establishments closed for a longer period of time, in order to be renovated, extended, modernized or other reasons.

- TUR102D – The existing tourist accommodation capacity on types of tourist structures, macro-regions, development regions and counties. The number of available accommodation places was determined at the end of each year, in the period 1990-1993, and on 31st of July, for the period 1994-2014.

- TUR103B – Tourist accommodation capacity in operation by types of tourist structures on macro-regions, development regions and counties. For this indicator, the INS data are available since 1991, without the year 1990.

- TUR104B – Arrivals of tourists in tourist structures with accommodation functions on types of structures, types of tourists, on macro-regions, development regions and counties.

- TUR105D – Overnight stays in accommodation units on the types of structures, types of tourists, macro-regions, development regions and counties.

We mention that the data collected by INS come from the tourist units having an accommodation capacity of at least 5 beds.

The main hypotheses around which this research articulates are:

H1: The North East region has a lower accommodation capacity than the South-East region (the seaside - Danube Delta area) and Bucharest-Ilfov region. In the North East region, the county with the largest accommodation capacity is Suceava, given the large number of guesthouses and agrotourist boarding houses developed in this area.

H2: The North East region recorded a net use of accommodation capacity index higher than the average national level.

H3: The number of arrivals recorded in the North East region is lower than in regions with a strong tourist activity, such as South East (for seaside tourism) and Bucharest-Ilfov (for business or city break tourism).

H4: The number of overnight stays recorded in the North East region is among the lowest at the national level.

H5: The average length of stay recorded in the North East region is lower than the average length of stay recorded at the national level.

For testing the inter-regional differences, in terms of the main tourism indicators, we used the statistical method ANOVA (Analysis of Variances). By using ANOVA, we aim to effect a qualitative, independent variable (with several levels - in our case, the development region, which refers to the eight levels, corresponding to the eight regions), on a

quantitative, numeric variable (the economic indicators in the tourism field). In this research, we considered tourism indicators in sequence, as a dependent variable.

In the case of this method, we established two work hypotheses:

H0 - The analyzed means did not differ (null hypothesis: the analyzed development regions did not differ in terms of proposed tourist indicators).

H1 - At least two means differ significantly (At least, between two development regions, there are significant differences in terms of the most representative tourism indicators taken into account).

We used this method since it presents the advantage that it may compare, at the same time, means of several groups, unlike the t-Student test. The disadvantage of this method relies in the fact that it does not specify which pair of means significantly differs, if the difference between the means is significant (Rutherford, 2001). In the case of our research, since ANOVA test produces the outcome of rejecting the null hypothesis of equality of means, without specifying the regions with differences, it was further required an investigation using a multiple comparison, in the form of Post Hoc-Games-Howell test (GH). The objective of this test was to determine the exact groups (in this case, the regions) that differ in means. The use of this additional method occurred as a result of the known fact that one can not determine among which regions there are differences by the instrumentality of t-test comparisons, since they can not sustain the significant limit at an acceptable value.

In the case of Post Hoc-Games-Howell test, we considered as being significant the difference between means with a significant limit lower than 0.05.

It is worth mentioning that the data obtained were entirely centralized and processed using the informational package SPSS, version 19.0, and Microsoft Excel.

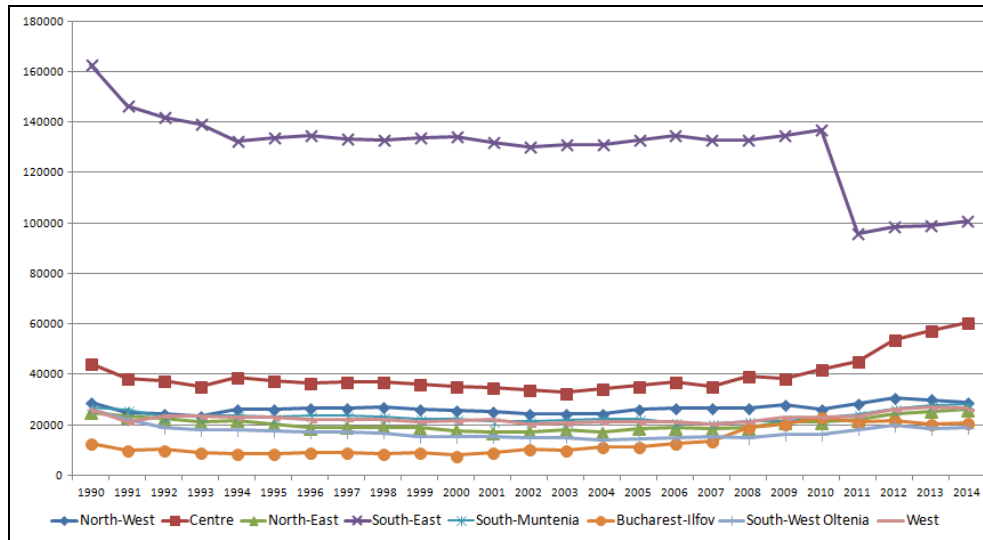
### **3. Results and discussions**

#### **3.1. Quantitative approach of tourism in the North East region, in relation to tourism at a national level**

*The existing accommodation capacity*, evidenced through the number of beds, has suffered declines in a steady pace during the period 1991-2002, and since 2003 we observed an increase, both at the country level, and in the North East region. The main causes which led to a decrease in the number of beds, both nationally and regionally, were: liquidation of some accommodation units that no longer met the requirements; change of use of some locations that passed into private ownership; the low concerns regarding maintenance and upgrading of tourist facilities and, not ultimately, defective management. After year 2002, the increase of the number of beds naturally occurs in the context of increasing investment values that have contributed to modernize the existing capacities and to create new ones.

From the data available at the moment, we can ascertain that, in recent years, the number of accommodations has come to be significantly lower than in 1991. For example, in 1990, the South East region had 162,799 beds, in 2000 it had 134,081 beds, and in 2014 it only had 100,888 beds, the decline within 25 years being of 61.97 percent (figure no. 1).





**Figure no. 1: Evolution of the accommodation capacity in Romania's regions, in the period 1990-2014**

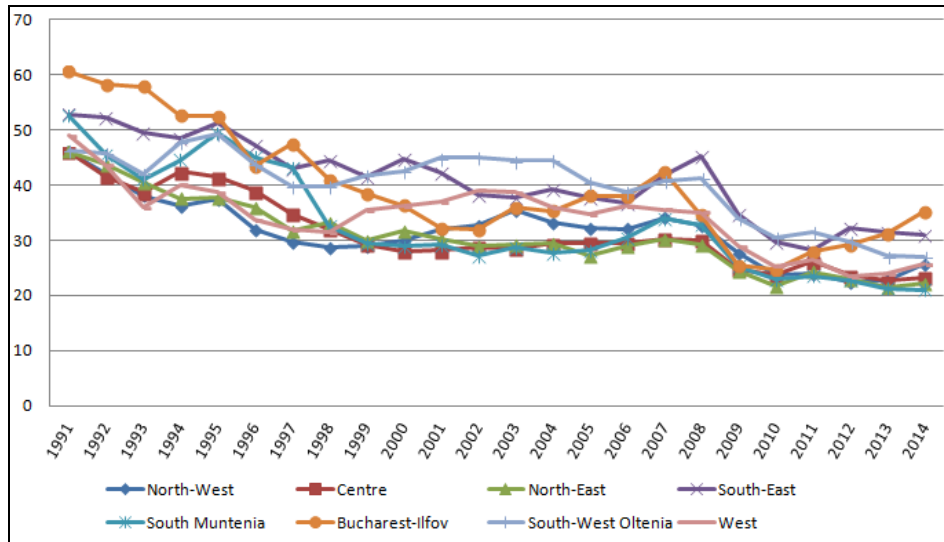
Source: authors' processing on INS data, 2015

Bucharest-Ilfov region has a number of accommodation places more than double in 2014 compared to 1990, as a basis for reporting, while the West and North West regions have remained at about the same number of units.

The North East region had, in 1990, a total of 24,986 beds that were significantly reduced by the year 2000, when the accommodation capacity included 17,745 beds, yet the situation has improved between 2010-2014, reaching a total of 26,055 beds, and outnumbering the South-West Oltenia and Bucharest-Ilfov regions. At the level of 2014, the counties that have the largest share in this region are: Suceava (37%), Neamt (25.8%) and Iasi (15.4%), the last being Vaslui with only 3.5 percent. According to the results presented, the hypothesis H1 is confirmed.

Measuring the efficiency of the accommodation services can be achieved by using one of the most representative *indicators of the relationship supply-demand, namely the index of net use of accommodation capacity or occupancy of tourist capacity in operation*. The net use index of the operational capacity suffered declines nationally, from 49.8% in 1991 to 34.5% in 1999, and after this period it had a fluctuant evolution, reaching a peak of 36% in 2007. The crisis years have brought a decrease in this indicator, to 28.4% in 2009, the index reaching a value of 26.2% in 2014.

Figure no. 2 shows a comparative evolution of the utilization of the functional accommodation capacity index values in the regions of Romania, between 1991-2014. We found out that, on a time horizon of 25 years, the same ranking of regions was maintained, without any major structural changes in the regional rankings of the usage index.



**Figure no. 2: Evolution of the net use of operating accommodation capacities indices in Romania's regions, in the period 1990-2014**

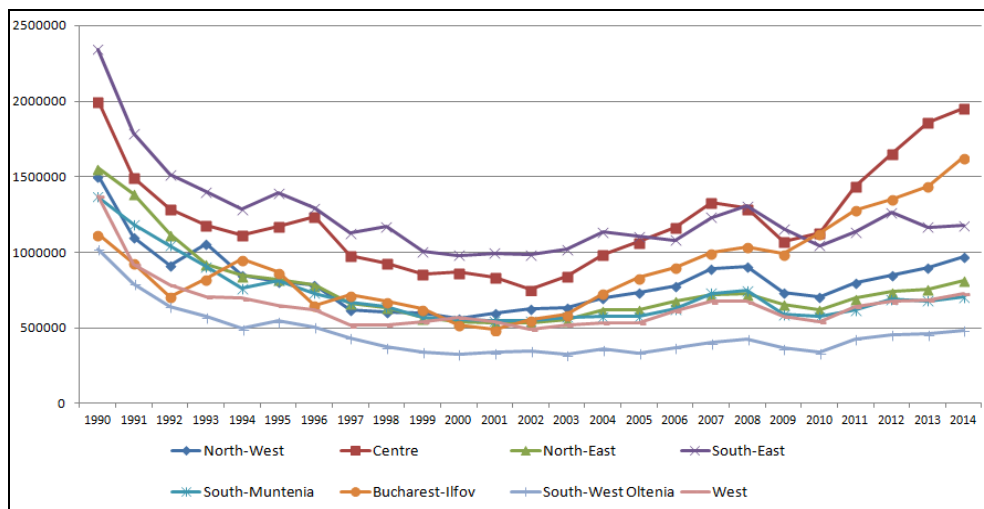
Source: authors' processing on INS data, 2015

Despite some negative fluctuations during the period 1991-2014, Bucharest-Ilfov region presents, in the year 2014, the highest index value of net use of accommodation capacities in operation (35.2%). Also, the South East region occupies an important place in this classification, registering, in the year 2014, a value of 30.9 of the analyzed index, and this is due, mainly, to the seaside tourism. For the year 2014, figure no. 2 indicates that only the North West (25.6%), West (25.6%) North East (22.2%) and South Muntenia (21%) regions have a lower index of use than the one recorded nationally (26.2%). In these conditions, the hypothesis H2 is infirmed.

*The indicators of tourist movement* are significant because they express the real tourist demand. The first indicator that will be analyzed is *the number of tourist arrivals*. The decrease of this indicator between 1991 and 2002 was due both to the lower living standards and the lower quality tourism services throughout the country. Along with 2003, the number of tourist arrivals began to rise, both at national and regional level, except for the years 2009 and 2010, when there were turbulences due to the economic-financial crisis. While we have noted progress in recent years, however, the number of arrivals has failed to reach the threshold of 1991. Graphically, this is shown in figure no. 3 according to which only two regions have recorded impressive changes in the shares which regions occupy in total arrivals (Centre and Bucharest-Ilfov Regions).

Regarding the tourists' preferences for certain areas, we found out that most arrivals (1,953,022) were recorded, in 2014, in the Central region (figure no. 3), because this is an area where the mountain, historical and cultural tourism are especially practiced. The second place is occupied by Bucharest-Ilfov region, with a total of 1,630,262 arrivals, the region representing the main pole of deployment of business tourism. The South East region, which includes the seaside, with a total of 1,178,132 arrivals, ranks third in the ranking. The fact that the South East region has lost its percentage during the 25 years in favor of the Centre and Bucharest-Ilfov region, can be explained by the seasonality of

seaside tourism and, especially, by low investments compared to region Centre, for example. A percentage of 9.6 of the number of arrivals at a national level (812,880) belong to the North East region and this is due to the mountain tourism, the cultural tourism, and especially the religious one. Thereby, we can affirm the Hypothesis H3 is confirmed.



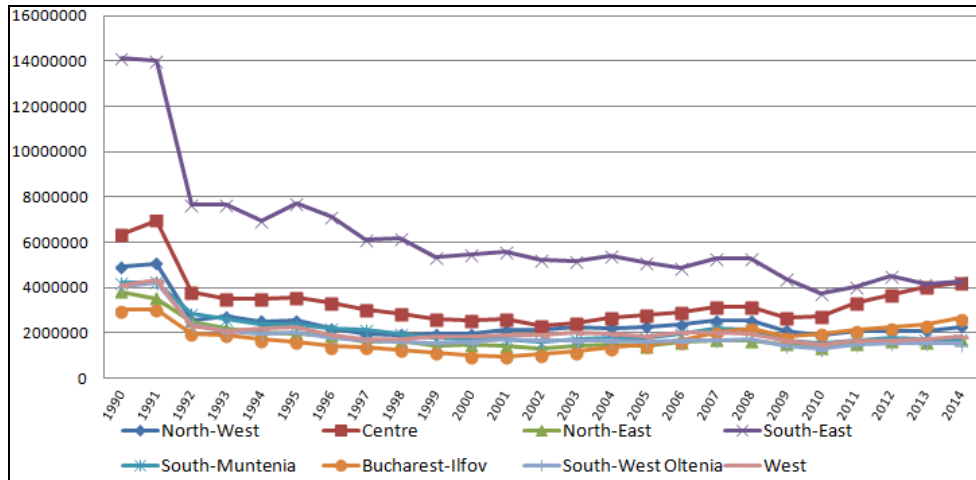
**Figure no. 3: Evolution of the number of arrivals, at the regional level, in the period 1991-2014**

Source: authors' processing on INS data, 2015

We ascertained that *the number of overnight stays* increased after 2002 at a regional level (figure no. 4). However, the values recorded for 2008 meant two-thirds of those recorded in 1991. For 2009 and 2010, the indicator signals a decrease in the number of overnight stays amid the same financial crisis. For this indicator, we find that the South East region had a large share of the *total of overnight stays*, due to the seaside tourism, and the North East remained at a modest value, although it registered growths after the year 2002. With a percentage of 8.43% of the total of overnight stays, the North East region is situated on the penultimate place, fact which fully confirms the hypothesis H4, previously stated. Since the indicator *arrivals* shows that this region has a higher share, we estimate that tourists coming here have a relatively short stay and, in order to extend the stay, a diversification of recreational activities offered to tourists would be required.

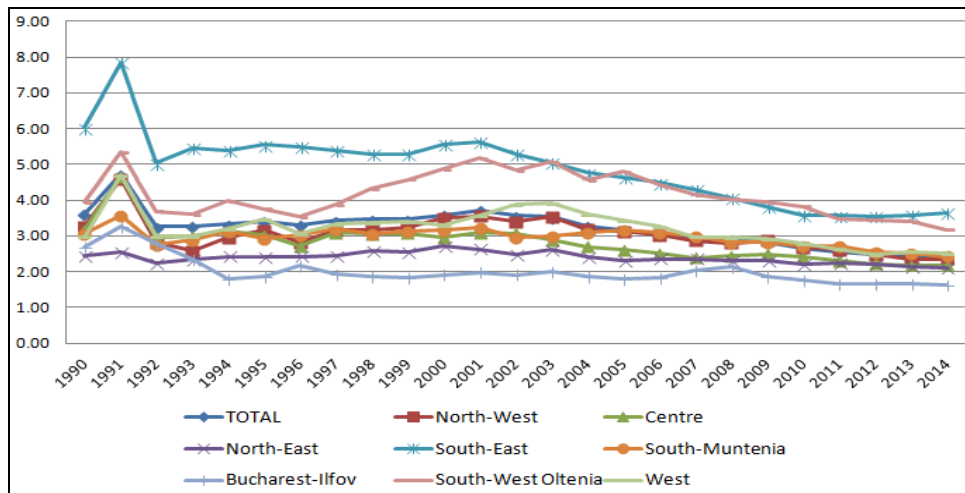
Given the differences we noted between the shares of the regions in terms of arrivals and the overnight stays, we tried to achieve below an analysis of the average length of stay of tourists (figure no. 5).

In the proposed period of analysis, the average length of stay had a decreasing trend, hovering around three days. From the information gathered, we can see that mainly the South East and South-West Oltenia regions were those with higher values than the national average and the values registered in the North East region were among the lowest in the country. In these conditions, the hypothesis according to which the average length of stay in the North East region is inferior to the national average length of stay is confirmed.



**Figure no. 4: Evolution of the number of overnight stays, at the regional level, in the period 1991-2014**

Source: authors' processing on INS data, 2015



**Figure no. 5: Evolution of the average length of stay, at the regional level, in the period 1991-2014**

Source: authors' processing on INS data, 2015

Overall, the average length of stay of tourists in Romania registered a large decrease over 25 years, from 4.74 days, a value recorded in 1991, at a value of 2.40 days, for the year of 2014. In order to remedy these deficiencies it would be necessary to create and offer the foreign and the Romanian tourists more complex and varied tourism packages to prolong their stay. Although in 1990, the lowest average length of stay was registered in the North East region (2.45 days), at the level of 2014, the lowest value was registered in the region of Bucharest-Ilfov (1.63 days).

### 3.2. Inter-regional Differences in Terms of the Main Tourism Indicators

In this subchapter, we will continue with the comparative analysis of the North East development region with other regions of Romania, by testing for differences between regions, in terms of the main tourism indicators. For the study we are going to use the statistical method ANOVA (Analysis of Variances), using the SPSS package and we will highlight the noticed differences along the way. The ANOVA test is significant for all five variables, which means that there are significant differences between regions regarding: the accommodation capacity, number of arrivals, number of overnight stays, the average length of stay and the indices of net use of accommodation capacities in function (table no. 1).

**Table no. 1: The ANOVA test used to highlight the existence of differences between regions**

| ANOVA                                     |                |                     |     |                    |         |      |
|---|----------------|---------------------|-----|--------------------|---------|------|
|   |                | Sum of Squares      | df  | Mean Square        | F       | Sig. |
| Accommodation capacity                    | Between Groups | 259285810378,995    | 7   | 37040830054,142    | 851,483 | ,000 |
|   | Within Groups  | 8352293381,360      | 192 | 43501528,028       |         |      |
|   | Total          | 267638103760,355    | 199 |                    |         |      |
| Arrivals                                  | Between Groups | 12781558063462,475  | 7   | 1825936866208,925  | 28,808  | ,000 |
|   | Within Groups  | 12169396884815,040  | 192 | 63382275441,745    |         |      |
|   | Total          | 24950954948277,516  | 199 |                    |         |      |
| Overnight stays                           | Between Groups | 396451238069970,400 | 7   | 56635891152852,914 | 41,328  | ,000 |
|   | Within Groups  | 263119115609687,620 | 192 | 1370412060467,123  |         |      |
|   | Total          | 659570353679658,100 | 199 |                    |         |      |
| Length of stay                            | Between Groups | 152,102             | 7   | 21,729             | 73,658  | ,000 |
|   | Within Groups  | 56,639              | 192 | ,295               |         |      |
|   | Total          | 208,741             | 199 |                    |         |      |
| Net use of accommodation capacity indices | Between Groups | 3082,929            | 7   | 440,418            | 7,673   | ,000 |
|   | Within Groups  | 10561,072           | 184 | 57,397             |         |      |
|   | Total          | 13644,001           | 191 |                    |         |      |

Source: Calculations were carried out by authors, using SPSS package, on INS data, 2015

The ANOVA test does not specify between which regions these differences exist so that further investigation using a Post Hoc – Games-Howell test is required. It is worth mentioning that the difference between the means is considered significant at a significance limit of less than 0.05. The variable *accommodation capacity* is expressed in the number of beds and the analysis will be conducted using data for the period between 1990-2014 (table no. 2).

**Table no. 2: The Post Hoc - Games-Howell Test for Accommodation Capacity**

| (I) Region        | (J) Region         | Mean Difference (I-J)    | Std. Error | Sig. |
|-------------------|--------------------|--------------------------|------------|------|
| North East region | North West         | -6021,560 <sup>a</sup>   | 657,957    | ,000 |
|                   | Centre             | -19282,760 <sup>a</sup>  | 1559,750   | ,000 |
|                   | South East         | -109413,280 <sup>a</sup> | 3151,256   | ,000 |
|                   | South Muntenia     | -2908,440 <sup>a</sup>   | 690,507    | ,003 |
|                   | Bucharest-Ilfov    | 7358,280 <sup>a</sup>    | 1174,578   | ,000 |
|                   | South West Oltenia | 3308,080 <sup>a</sup>    | 770,664    | ,002 |
|                   | West               | -2236,840 <sup>a</sup>   | 665,091    | ,032 |

Source: Calculations were carried out by authors, using SPSS package, on INS data, 2015

The applied Post Hoc-Games-Howell test indicates a significant differentiation of the accommodation capacity in the North East region compared to the all other regions of the country. Based on the table no. 2, we emphasize the fact that the North East region has a much larger accommodation capacity than the South-West Oltenia and Bucharest-Ilfov regions, and, compared to South Muntenia, South East, North West and Centre regions, has a much smaller accommodation capacity.

The result of the Post Hoc test shows that the value of the arrivals in the North East region significantly differs from: Centre, South East and South-West Oltenia regions. Compared to the regions: North West, South Muntenia, Bucharest-Ilfov and West regions, the applied test did not reflect major differences (table no. 3).

**Table no. 3: The Post Hoc - Games-Howell Test for Arrivals**

| (I) Region        | (J) Region         | Mean Difference (I-J) | Std. Error | Sig. |
|-------------------|--------------------|-----------------------|------------|------|
| North East region | North West         | -44241,080            | 65338,100  | ,997 |
|                   | Centre             | -454858,760           | 86265,215  | ,000 |
|                   | South East         | -479832,680           | 77763,373  | ,000 |
|                   | South Muntenia     | 43744,560             | 65478,497  | ,997 |
|                   | Bucharest-Ilfov    | -136802,080           | 78347,517  | ,658 |
|                   | South-West Oltenia | 304682,800            | 60217,653  | ,000 |
|                   | West               | 111596,360            | 62256,864  | ,628 |

*Source: Calculations were carried out by authors, using SPSS package, on INS data, 2015*

Regarding the number of overnight stays in the North East regions, it significantly differs from the South East and Central regions. On the other hand, we could not highlight significant discrepancies, in terms of the magnitude of this indicator between the North East region and North West, South Muntenia, Bucuresti-Ilfov, South-West Oltenia and West regions (table no. 4). Considering the number of overnight stays, the North East is situated on a lower position compared to other regions, which means that, in this part of the country, tourists have relatively short stays.

**Table no. 4: The Post Hoc - Games-Howell Test for Overnight stays**

| (I) Region        | (J) Region         | Mean Difference (I-J) | Std. Error | Sig.  |
|-------------------|--------------------|-----------------------|------------|-------|
| North East region | North West         | -627171,120           | 202444,064 | ,061  |
|                   | Centrr             | -1565051,760          | 255069,840 | ,000  |
|                   | South East         | -4393614,360          | 539680,525 | ,000  |
|                   | South Muntenia     | -317549,480           | 188814,360 | ,699  |
|                   | Bucharest-Ilfov    | 38937,920             | 171595,219 | 1,000 |
|                   | South-West Oltenia | -65057,480            | 189582,956 | 1,000 |
|                   | West               | -261245,400           | 183104,888 | ,840  |

*Source: Calculations were carried out by authors, using SPSS package, on INS data, 2015*

The average length of stay is expressed in days, and, in order to calculate the values, we used data for the period 1990-2014. By applying the Post Hoc test, we obtained a significant limit Sig <0.05 for all regions, fact which means that, in this respect, the North East recorded big differences from all other regions of Romania (table no. 5). We can unequivocally say that the length of stay associated to the North East region is significantly lower than in the North West, Central, South East, South Muntenia, South-West Oltenia and West, and higher than in the Bucharest-Ilfov region where the value recorded in 2014 is 1.63 days.

**Table no. 5: The Post Hoc - Games-Howell Test for the Average Length of stay**

| (I) Region        | (J) Region         | Mean Difference (I-J) | Std. Error | Sig. |
|-------------------|--------------------|-----------------------|------------|------|
| North-East region | North West         | -,64800*              | ,10021     | ,000 |
|                   | Centre             | -,41840*              | ,10730     | ,011 |
|                   | South East         | -2,50280*             | ,20289     | ,000 |
|                   | South Muntenia     | -,56680*              | ,05962     | ,000 |
|                   | Bucharest-Ilfov    | ,38400                | ,08409     | ,002 |
|                   | South-West Oltenia | -1,75920*             | ,12611     | ,000 |
|                   | West               | -,81440*              | ,10474     | ,000 |

Source: Calculations were carried out by authors, using SPSS package, on INS data, 2015

The net use index refers to the used percentage of the accommodation capacity provided by the tourist units for the period 1991-2014. The Post Hoc-Games-Howell test shows that, from a statistic point of view, there are major differences between the means of this index values for the period of 24 years taken into account. Therefore, the net use index in the North East region presents significant differences compared to the South East, Bucharest-Ilfov and South-West Oltenia regions, this indicator being much lower in the North East region. At the opposite pole, in comparison to the North West, Central, South Muntenia and West regions, we could highlight major differences (table no. 6).

**Table no. 6: The Post Hoc - Games-Howell test for Net use indices**

| (I) Region        | (J) Region         | Mean Difference (I-J) | Std. Error | Sig.  |
|-------------------|--------------------|-----------------------|------------|-------|
| North-East region | North West         | -,8833                | 1,8212     | 1,000 |
|                   | Centre             | -,5167                | 1,9435     | 1,000 |
|                   | South East         | -10,1333*             | 2,0318     | ,000  |
|                   | South Muntenia     | -2,0333               | 2,3656     | ,988  |
|                   | Bucharest-Ilfov    | -8,8292*              | 2,5281     | ,024  |
|                   | South-West Oltenia | -9,1667*              | 1,9098     | ,000  |
|                   | West               | -3,4833               | 1,8743     | ,585  |

Source: Calculations were carried out by authors, using SPSS package, on INS data, 2015

The Post Hoc Games-Howell test allowed us to further investigate the tourism phenomenon through multiple comparisons of registered means at the level of each development region. Thus, considering a significance limit lower than 0.05 for significant differences, we can say that, for the five analyzed indicators, the North East region differs from most other seven regions of the country, especially from the South-East, in this case the noted differences being the most significant.

## Conclusions

In this research, we conducted a comparative analysis of the evolution of tourism activity in the eight development regions of Romania, relying on a few relevant indicators: the accommodation capacity, the number of arrivals, the number of overnight stays, the average length of stay, as well as the indices of net use of the accommodation capacity in operation. The statistical analysis performed on a time horizon of twenty-five years reveals the fact that there were a number of differences between the North East region and other regions of Romania.

Firstly, through the analysis of the evolution of the existing accommodation capacity, we found out that the number of accommodation places has suffered declines in a steady pace

during 1991-2002, and, since 2003, there was an increase both at national and regional level. The North East region had, in 1990, a total of 24,986 accommodation places which was reduced significantly until 2000 (when it reached 17,745 places), yet the situation was rectified until 2014, when it reached a total of 26,055 places. The North East region has a much larger accommodation capacity than the South West, Oltenia and the Bucharest-Ilfov regions, and, compared to the South Muntenia, South East, North West and Centre regions, it has a much lower accommodation capacity.

Regarding the evolution of the indices of net use of accommodation capacity in operation, we pointed out that the same ranking of the regions was kept, with no major changes, in the regional rankings of the use index, in the analyzed period. Despite some slight negative fluctuations, the Bucharest-Ilfov region and the South East regions occupy the top two positions in this classification and this is due to the seaside and business tourism. At the opposite pole, with the lowest values of this indicator, the North East and the South Muntenia regions are situated.

Another conclusion refers to the number of arrivals, which, according to our analysis, is much lower than in Central and South East regions and higher compared to South-West Oltenia. Although we have noted progress in recent years, the number of arrivals failed to reach the threshold of 1991, only two regions managing to record impressive changes regarding the weights employed in total arrivals (Centre and Bucharest-Ilfov regions).

Regarding the number of overnight stays in the North East region, we stated that, at the regional level, it increased after the year 2002, and decreased in the period 2009-2010, in the background of economic-financial crisis. The test applied in SPSS indicates the differentiation of the values of this indicator in the North East region, compared to the regions: Centre and South East (which recorded maximum values throughout the analyzed period).

As for the average length of stay in the North East region, this is significantly lower than the one in the North West, Centre, South East, South Muntenia, South-West Oltenia and West regions, and much higher than the one in Bucharest-Ilfov region which, at the level of year 2014, had the minimum recorded value (1.63 days). The South East region stood out with maximum recorded values of this indicator, on the entire time horizon. To balance the situation, measures that will contribute to an increased length of stay are necessary and, thus, to obtain higher income from tourism.

The North East region is not distinguished by an intense tourist activity and, therefore, any measures for expanding the tourism sector would be favourable. This fact constitutes a premise for the overall development of some areas where there is potential for tourism. A first measure should be directed towards stimulating the increase of the values of those indicators that have the lowest levels. As we are talking about more indicators, we consider that studies on the correlation between the regional tourism indicators are always opportune. As a consequence of knowing correlations between tourism indicators, we can forecast any possible future developments in case some of the variables change; thus, in order to achieve certain effects, we can stimulate increase in indicators through various strategies set out in this direction. For example, stimulating investment in tourism might contribute to increasing the welfare of those involved in this sector and the level of employment. Highlighting these correlations, confirms that tourism development has a positive influence on the area (income growth, lower unemployment etc.).



The importance of this work lies in the analysis of the evolution of tourism activity in terms of relevant indicators and comparing the North East region of Romania with the other regions of development, on a time horizon of twenty-five years. We used appropriate instruments for achieving this scientific approach: the Post Hoc - Games - Howell test, as well as the ANOVA procedure for revealing the significant differences between the values of the tourism indicators.

Inevitably, the research presents some limitations related to the fact that tourism statistics are often only an estimate of the total tourism model, these statistics sometimes being dated when published, because there is a significant time gap in their generation, analysis, presentation and dissemination. As a future direction of research, we plan to further compare the development of the tourism indicators, that have been analyzed in our research, to the values registered in the regions of other EU countries, former communist countries (eg. Bulgaria, Poland and the Czech Republic), in order to observe, comparatively, to what extent they succeeded to reduce the disparities against other developed countries of the European Union.

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