STATISTICAL ANALYSIS OF THE REGIONAL TOURISM DEVELOPMENT IN THE EUROPEAN UNION

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Abstract:

The paper presents, in introduction, a few statistical data which highlight the tourism contribution at the gross domestic product formation, weight of the international tourism exports in the world exports, the growth of the number of international tourists, at the world level, Europe being the main world touristic destination. In paper are presented the conclusions detached from the study of foreign and Romanian specialized literature regarding the approaches of the tourism activity in the Member States of the European Union (EU), the subjects of the greatest interest, the statistical methods used in analysis a.s.o. The paper presents the statistical methods which will be applied in the study of the regional tourism in the EU Member States which are analysis methods of the territorial series and time series. In the study case are used tourism demand and supply indicators for the achievement of some calculations of bi-criteria and multi-criteria ranking of the EU(28) Member States, for the identification of the evolution tendency of the regional touristic demand through analytical methods based on trend functions (linear function and 2nd degree parabola).

Key words: statistical methods, regional development, regional tourism, European Union, Romania.

JEL classification: C22, R11, L83

INTRODUCTION

The concept of *regional development* is associated to the regional science and its introduction was determined by the fact that, in certain periods and in certain world regions was registered economic growth, on activity sectors: industry, agriculture, constructions, tourism, foreign trade a.s.o., which was determined both by endogenous and exogenous region factors. *Tourism* is one of the most widespread activity at the world level, both regarding the offerors and consumers. Statistics of World Tourism Organization (WTO) highlight the fact that, after 1950, a growing number of destinations have entered in the tourist circuit, by investing in tourism and becoming the main engine of economic and social progress regarding the incomes, creation of jobs and enterprises, infrastructure development. In these conditions, at the world level, tourism has become one of the economic sectors found in the fastest growing, conclusion argued by aspects such as: tourism have direct, indirect and induced contributions at the gross domestic product (GDP) of 9%; 1 from 11 jobs are in tourism; volume of the international tourism exports represents about 6% from the world exports; number of the international tourists increased from 25 million in 1950 at 1.035 million in 2012, being forecasted a growth at 1.8 billion international tourists for 2030. Europe records the greatest growth of the international tourists number, with an annual average rate in the period 2005-2012 of 2.5%. In 2012, 51.6% from the number of international tourist arrivals were recorded in Europe, compared with a weight of 40% in 2008 and from these 77% (412.2 million) were international tourist arrivals in the EU Member States. Among the EU(28) countries, in 2012, France occupied the first position in the world, regarding the international tourist arrivals (83.0 million), followed by Spain - the third place in world - with 57.5 million arrivals, Italy - the fifth place in the world - with 46.4 million arrivals, Germany - the seventh place in the world with 30.4 million arrivals, United Kingdom - the eight place in the world - with 29.3 million arrivals a.s.o. Romania recorded 1.7 million international tourist arrivals and 1.5 million USD receipts from the international tourism, in 2012 (1). If one takes into account the sectors adjacent, too it estimated a total contribution to the achievement of EU GDP of about 10%

and of about 12% at the total employment (2). In the theoretical context of the regional science, with its multiple disciplines and the practical one, determined by the economic and social role of tourism at the European and national levels, this work approached the regional tourism development in the EU Member States, giving a greater importance to Romanian tourism.

STATISTICAL RESEARCH OF TOURISM IN THE EU MEMBER STATES

The foreign and Romanian specialized literature approaches the tourism in numerous studies, theoretical (Haugland, Ness, Grønseth and Aarstad, 2011; Galani-Moutafi, 2004), applied by the policy and planning initiatives (Baum and Szivas, 2008; Baidal, 2004), applied by modeling and forecasting (Bob, 2008; Coshall, 2009; Coshall and Charlesworth, 2010), in the Member States (Guizzardi and Mazzocchi, 2010; Barros, Botti, Peypoch, Robinot, Solonandrasana and Assaf, 2010; Mayer, Müller, Woltering, Arnegger and Job, 2010; Corfu, Breda and Costa, 2006) or into a group of states (Hughes and Allen, 2005; Roşca, 2004), by touristic flows (Dritsakis, 2004; Muñoz, 2007; Han, Durbarry and Sinclair, 2006), in correlation with the economic development (Holzner, 2010) a.s.o. So, J.A.I. Baidal approached the tourism regional planning in Spain, as a factor which plays an essential role in the establishment of the base for progressive spatial distribution of industry and the diversification of spatial model, near by even the market evolution, which favors the appearance of new products in the geographical environment, the consolidation of the regional and local policies in the context of administrative decentralization, the domestic tourist demand growth, the increasing of the value of underused tourism resources, the improvement of the communications infrastructure, the contributions to the structural policies of the EU. Near by the theoretical approach of the regional tourism planning is remarkable also the identification of the tourism planning phases in Spain, achieved by the author.   J.T. Coshall tried in his study a very interesting analysis of the tourism demand in the United Kingdom (UK) towards the most famous international destinations using the volatility models to quantify the positive or negative effects on the tourism demand. He evaluated these models capacity of forecasting in the tourism domain and he shown that the generation of high precision forecasts becomes optimal when they are combined with the forecasts obtained from the exponential smoothing models of time series. His conclusion was that the dimension and the duration of the volatility periods of the tourism demand vary depending on the nature of the shock on the demand and on the involved destination. For example, the catastrophe from September 11th had a minimal impact on the UK tourism towards Cyprus, but is associated with a distinct period of volatility in the UK tourism towards France and towards United States (US). A. Guizzardi and M. Mazzocchi have used *the structural analysis of time series* (STS) to highlight if the cyclical movements in the touristic demand can be explained by the delayed effect of business cycle in Italy. The usefulness of such a study is special because, if the relation between the touristic cycle and the general business cycle is demonstrated, then the touristic policy can use the advantage of the delay between the two cycles by the adoption of anti-cyclical measures to attenuate the impact of the adverse economic conditions. N. Dritsakis has studied the touristic demand from Germany and Great Britain, two important traditional sources for the tourism of Greece, using a few macroeconomic variables such as: the income in the two countries of origin, the touristic prices in Greece, the cost of transport and the rates of exchange among the three countries. Data covered a 40 years period (1960-2000) and the statistical and econometric used methods were *the univariate analysis*, *the method of cointegration* and *the VAR model of cointegration vectors*. C. Mitrut and D.L. Constantin have approached the Romanian tourism regarding the cultural resources, the most significant heritage values that make from Romania a touristic destination of European interest: monasteries and churches from the Northern Moldova, entered in the UNESCO patrimony, medieval city centers of Braşov and Sibiu from Transylvania, medieval fortress Sighişoara from Transylvania, the capital Bucharest and the its surrounding areas, the Greek, Dacian and Roman archaeological sites from Dobrogea and Transylvania, the neolithic archaeological sites from Moldova and others, most of them located in special natural areas. Into a quantitative approach, it is made a comparative analysis of the Travel and Tourism Competitiveness Index in Romania and in some other countries of the Central and Easten Europe and also an

analysis of the most important touristic indicators by regions of development in Romania, in 2005 compared to 2000 (Mitruţ and Constantin, 2009). An analysis of the Romanian tourism environment after 1990 is made by D. Andrei, too which identifies two distinct periods, that before 1996 and after 1996, highlighting the factors that driven to the decline of the internal and international tourism demand and the accommodation supply in Romanian tourism (Andrei, 2004). Numerous studies approach the tourism development, generally (Stănciulescu, Ţiţan, Voineagu, Ghiţă and Todose, 2006) and the cultural tourism, in this case at the European level (Cuccia and Rizzo, 2010; Hughes and Allen, 2005). T. Cuccia and I. Rizzo highlight that, at European level, the notion of cultural tourism is identified with the consumption of cultural services during the travel (culture is the main travel motivation) and that the most important form of Europe tourism is the cultural tourism, which covers more than 50% of all touristic services. For Italy, the data provided by the Italian National Institute of Statistics highlight that in 2005 the cultural tourism, defined as the number of tourists registered in the art cities, has the largest market share regarding the tourists arrivals (33.5% from total), more than the seaside tourism (22.8% from total). T. Stylianou-Lambert has studied a specific form of cultural tourism - that in the art museums. Taken in view that the tourists who visit the art museums differ from tourists who perform other cultural activities and visit other categories of museums and that the cultural tourism is an extension of the everyday life, the author has used the semi-structured interviews to study the tourism in the art museums in Cyprus. The most important conclusion of his study was the identification of eight distinct modes to perceive the art museums named the museum perceptual filters, which influence their visiting both at residence and at the tourist destinations which are: professional, art-loving, self-exploration, cultural tourism, social visiting, romantic, rejection and indifference (Stylianou-Lambert, 2011). A study on the international tourism markets of Scotland highlighted even an orientation of the Scotland international tourism demand towards the cultural tourism (in 1985 the typical international tourist in Scotland could be described as American, over 50 years, interested in heritage, while today the typical tourist is European, under 35 years old, interested in culture), orientation that has been explained by the context of world tourism tendencies (Yeoman, Greenwood and McMahon-Beattie, 2009). E.R. Ballesteros and M.H. Ramírez have applied predominantly qualitative research methods to study the development of mining tourism heritage in the Southern of Spain. By consulting the documents and by interviews taken to the participants at the development process, the authors were able to reconstruct, analyze and compare the various initiatives of tourism heritage development. At the same time, they were studied the models of the community identification and the role of the mining activities within them. For studying the contents of the local identity were used: (1) detailed examination of different materials (commercials, official documents, local references, guides a.s.o.) using the content analysis; (2) in-depth interviews (recorded and transcribed later); (3) participatory observation of festive rituals, events, celebrations a.s.o. (Ballesteros and Ramírez, 2007). Most of the presented studies use data resulted from surveys or those provided by national statistical offices, by Eurostat or by some regional organisms, that are analyzed by *statistical methods*. Based on the Eurostat data regarding the Member States tourism, by the following analysis we aim to detach some features of regional tourism evolution in the EU Member States during the period 1998 - 2011 and the evolution tendency until the year 2020.

STUDY METHODOLOGY OF THE REGIONAL TOURISM IN THE EUROPEAN UNION MEMBER STATES

Quantitative analysis of tourism in the EU Member States was done based on the touristic demand indicators which are: tourist arrivals in hotels and similar accommodations by countries, nights spent in hotels and similar establishments and in collective tourist accommodation establishments by regions at the NUTS 2 level and supply touristic indicators which are: hotels and similar accommodation by countries, hotels and similar establishments, collective tourist accommodation establishments by regions at the NUTS 2 level (Cristureanu, 1992; Innocenti, 2008,

Snak, Baron and Neacşu, 2001). It was made a market share forecast of the principal touristic regions in each EU Member State on medium horizon (the years 2015 and 2020), using the time series models (Biji, Lilea, Roşca and Vatui, 2010; Anghelache, 1999). Data taken in analysis are those published by Eurostat, on that were applied statistical methods of territorial and time series analysis. In the territorial series structure they were used data by countries and by regions within each country and the time series data cover the period 1998-2011. In the hierarchy of territorial series terms was used the multi-criteria analysis by the method of ranks and the method of relative distance (Biji, Lilea and Vătui, 2006). In *the ranks statistics*, into a multi-criteria approach for each criterion the corresponding value to each territorial unit is replaced with an order number called rank and the place of unit is established by an arithmetic or geometric average of all ranks assigned to the unit. *Method of relative distance* among units uses the expression of the distance between each collectivity unit and the unit with maximum performance as a relative size of coordination, the result of comparisons being limited to the interval (0, 1) because the comparison base for each criterion is its maximum variant. Multi-criteria aggregation of coordination relative sizes assigned to each territorial unit is made by calculating a synthetic index as a geometric average. Option for this type of average is argued by the fact that an indicators product is less influenced by the extreme variants, compared with an arithmetic average and the possibility to register equal results by a few territorial units is less than the arithmetical averages case, eliminating more from the subjective intervention in the establishing of a final hierarchy. In this study it was applied the ranks statistics using the arithmetic average for a bi-criteria analysis, on the base of indicators: (1) hotels and similar accommodation and (2) arrivals at tourist accommodation establishments in 2012 for the countries hierarchy and the method of relative distance for a multi-criteria analysis, on the basis of indicators: (1) hotels and similar establishments; (2) collective tourist accommodation establishments; (3) nights spent in hotels and similar establishments and (4) nights spent in collective tourist accommodation establishments in 2009 for the regions hierarchy. In the forecasting of time series terms was used *the analytical method* based on the linear function and the parabolic function of 2nd degree (Fleming and Nellis, 1991; Jaba, 1998). For each country was calculated the region market share with the best touristic performance, established in the previous hierarchy, on the base of nights spent known by regions, in the period 1998-2011 $(T = 14)$. Using the linear trend function that analytical form is:

$$\hat{y}_t = a + bt; \quad t = 1 \div T \tag{1}$$

and the 2nd degree parabola, which equation is:

$$\hat{y}_t = a + bt + ct^2; \quad t = 1 \div T \tag{2}$$

were determined the parameters values, a and b, for the linear equation and a, b and c for the parabola, using the method of the smallest squares, for which must be satisfied the condition $\sum (y_t - \hat{y}_t)^2 = \min$, which means that the aim of the method consists in the minimizing of the sum of squares deviations of adjusted values $(\hat{y}_t)$ from the real values (y_t). For both functions, the values $\hat{y}_t$ represent the average evolution tendency of the market share, on the assumption of a linear or a 2nd degree parabolic model, respectively. Using the trend functions was estimated how the market share will evolve in the principal touristic regions of the EU Member States on a medium time horizon (years 2015 and 2020). They were used two criteria for choosing the best adjustment function namely: (1) criterion of equality between the sum of the real values and the sum of the adjusted values, expressed as:

$$\left(\sum_{t=1}^{T} y_t \right) = \left(\sum_{t=1}^{T} \hat{y}_t \right) \tag{3}$$

and (2) criterion of the residual variance analysis in a dynamic population, using *the standard deviation (error)* of adjusted values compared with real values, calculated with the equation:

$$S_{y_t / \hat{y}_t} = \sqrt{\frac{\sum (y_t - \hat{y}_t)^2}{T}} \tag{4}$$

and *the coefficient of error* of the analytical adjustment function, calculated with the relation:

$$e = \frac{S_{y_t / \hat{y}_t}}{\bar{y}} \cdot 100 \qquad\qquad\qquad\qquad (5)$$

As the values of these indicators are lower, adjustment function is much more adequate to synthesize the analyzed variable evolution (Korka, Begu, Tuşa and Manole, 2005; Isaic-Maniu, Mitruţ and Voineagu, 1999). Applying these methods on the touristic indicators by countries/regions of EU were identified several characteristics of the European tourism on regions, in the period 1998-2011 and were estimated the trends for the years 2015 and 2020.

STATISTICAL ANALYSIS OF THE REGIONAL TOURISM DEVELOPMENT IN THE EUROPEAN UNION MEMBER STATES

In the analysis of the regional tourism development in the EU Member States were used indicators concerning the touristic accommodation base (*hotels and similar accommodation by countries*, *hotels and similar establishments* and *collective tourist accommodation establishments* by regions) and concerning the touristic demand (*arrivals in hotels and similar accommodation*, *arrivals in hotels and similar establishments* and *in collective tourist accommodation establishments* by countries and *nights spent in hotels and similar establishments* and *in collective tourist accommodation establishments* by regions). In the period 1998-2011, the EU(27) Member States with the most developed accommodation base were: Germany (about 18% from the hotels and similar establishments and about 9% from the collective tourist accommodation establishments), Spain (8% and respectively 8%), France (9% and 5%), Italy (17% and 45%), Austria (7% and 3%), UK (21% and 19%) a.s.o. In Romania there are about 2% from the hotels and similar establishments existing in the EU(27), with an average annual increase tendency of 5% and about 0.3% from the collective tourist accommodation establishments, with an annual average decrease tendency of 1%. Arrivals in these countries represented about 22% of total arrivals in hotels and similar establishments in the EU(27) and about 24% from the total arrivals in collective touristic accommodation establishments in Germany, 12% and respectively 7% in Spain, 21% and 10% in France, 12% and 8% in Italy, 2% and 2% in Austria, 14% and 17% in UK a.s.o. In Romania the weight of arrivals in the EU(27) total arrivals was about 1% for hotels and similar establishments and about 0.3% for collective touristic accommodation establishments. In the Table 1 is presented the place occupied by each EU(28) Member State, established by a bi-criteria hierarchy using the average ranks method, the two criteria being: (1) hotels and similar accommodation and (2) arrivals in hotels and similar accommodation and the structure of the two indicators in the year 2012, having in view to characterize the position occupied by each Member Stat within the EU(28), regarding the tourism.

Table 1. Indicators of localization of the EU(28) Member States, in the year 2012

Country	Place occupied by country	Structure of hotels and similar accommodation by countries - % -	Structure of arrivals in hotels and similar accommodation by countries - % -	Country	Place occupied by country	Structure of hotels and similar accommodation by countries - % -	Structure of arrivals in hotels and similar accommodation by countries - % -
A	1	2	3	A	1	2	3
Belgium	16	0.875	1.51	Lithuania	25	0.20	0.24
Bulgaria	18	0.96	0.76	Luxembourg	27	0.12	0.12
Czech Republic	10	3.14	1.85	Hungary	14 - 15	1.035	1.09
Denmark	21 - 22	0.25	0.61	Malta	28	0.07	0.20
Germany	1	17.55	18.18	Netherlands	7 - 8	1.56	3.06
Estonia	24	0.19	0.37	Austria	6	6.525	4.10

Ireland	13	1.455	1.37	Poland	9	1.687	2.44
Greece	7 - 8	4.78	2.20	Portugal	12	1.002	1.97
Spain	3 - 4 - 5	9.65	12.57	Romania	14 - 15	1.095	0.97
France	3 - 4 - 5	8.50	16.645	Slovenia	23	0.317	0.34
Croatia	19	0.43	0.82	Slovakia	20	0.728	0.44
Italy	3 - 4 - 5	16.67	12.52	Finland	17	0.415	1.43
Cyprus	21 - 22	0.39	0.38	Sweden	11	0.99	2.575
Latvia	26	0.12	0.20	United Kingdom	2	19.27	11.03

Source: processed after Eurostat data, http://www.insse.ro.

Results the fact that, after the application of the average ranks method, Germany occupies the first position, holding around 18% from hotels and similar establishments and an equal from arrivals in hotels and similar accommodation from EU(28); UK occupies the IInd place, with weights of around 19% and respectively 11%; Spain, France and Italy occupy the Vth position a.s.o. Within the EU(28), Romania occupies, together with Hungary, places 14-15, holding around 1% from hotels and similar accommodation and an equal from arrivals in hotels and similar accommodation, in 2012. Structure calculated in the table shows relative high levels of the indicators of accommodation supply and touristic demand in Germany (17.55% from total hotels and similar accommodation and 18.18% from total arrivals in hotels and similar accommodation compared with EU28), in UK (19.27% and respectively 11.03%), in Spain (9.65% and respectively 12.57%), in France (8.50% and respectively 17%), in Italy (17% and respectively 12.52%), in Austria (6.52% and respectively 4.10%) a.s.o. In Romania in 2012 were 1.09% from the EU(28) accommodation establishments and that was visited by around 1% from the arrivals in EU(28). Applying for each Member States the method of relative distance among units (regions) were identify the regions with the best tourism activity, on the base of four criteria (tourism indicators from the year 2009) listed above. In the Table 2 is presented a comparison between the hierarchy results and a top of the first 20 European tourism destinations (regions at the level NUTS 2) realized by Eurostat for 2013, using the number of nights spent indicator, which highlights the similar or still valid results. From comparison result the following conclusions: in the bi-criteria hierarchy of the EU Member States, Germany occupies the first place and in its multi-criteria hierarchy of regions, the Region Oberbayern was the main tourism region of Germany, in 2009, conclusion detached also from Top 20 tourism destination; UK occupies the second place in the bi-criteria hierarchy of the EU Member States and for the Region Inner London the data were not available, to be included in the multi-criteria hierarchy of the UK regions, so that the main tourism region was identified as being the Region West Wales and the Valleys in 2009, while in Top 20 tourism destination this is the Region Inner London; Spain occupies, alongside France and Italy, the third, the fourth and the fifth places in the bi-criteria hierarchy, the first five regions of Spain and respectively France and the first six regions of Italy being the same in the two hierarchies; the Region Tirol from Austria occupies the first place in the two hierarchies; the Region Jadranska Hrvatska occupies the first place in Croatia, as tourism development level, as in the Top 20 tourism destination and also the fifth place in this top regarding the number of nights spent registered in the year 2013 (61.8 million).

Table 2. Comparison between the multi-criteria hierarchy results realized on the data from year 2009 and Top 20 tourism destination 2013 realized by Eurostat

Country	Region	place occupied in	
		multi-criteria hierarchy	Top 20 Eurostat*
A	B	1	2
Germany	Oberbayern	1	1
United Kingdom	Inner London	data are not available	1
Spain	Canarias	3	1

	Cataluña	1	2
	Illes Balears	2	3
	Andalucia	4	4
	Comunidad Valenciana	5	5
France	Île de France	1	1
	Provence-Alpes-Côte d'Azur	2	2
	Rhône-Alpes	3	3
	Languedoc-Roussillon	4-5	4
	Aquitaine	4-5	5
Italy	Veneto	1	1
	Toscana	3	2
	Emilia-Romagna	2	3
	Lombardia	6	4
	Lazio	4	5
	Provincia Autonoma di Bolzano/Bozen	5	6
Austria	Tirol	1	1
Croatia	Jadranska Hrvatska	1	1

* Source: Top_20_tourism_destination_(NUTS 2 regions), http://www.ec.europa.eurostat.

From the trend determination of the time series formed from data of the period 1998-2011 on the market share of tourist demand, expressed through the number of nights spent of the main tourism region compared to the total country, using the linear function and the 2nd degree parabola, from the Table 3 is observed that both functions indicate increasing trends for the regions Hovedstaden (Denmark), Cataluña (Spain), Latvia (Latvia), Lithuania (Lithuania) and Noord-Holland (Netherlands), decreasing trends for the regions Prov. West-Vlaanderen (Belgium), Yugoiztochen (Bulgaria), Cyprus (Cyprus), Luxembourg (Luxembourg), Malta (Malta), Tirol (Austria), Algarve (Portugal), South-East (Romania), Zahodna Slovenija (Slovenia), Etelä-Suomi (Finland) and West Wales and the Valleys (United Kingdom) and opposite tendancies, with increasing linear function the regions Praha (Czech Republic), Estonia (Estonia), Île de France (France), Veneto (Italy), Közep-Magyarország (Hungary), Malopolskie (Poland), Stredné Slovensko (Slovakia) and Västsverige (Sweden) and with increasing second degree parabola the regions Oberbayen (Germany), Notio Aigaio (Greece) and Jadranska Hrvatska (Croatia). They were obtained forecasted values quite close with the two functions for the regions Cataluña (Spain), Veneto (Italy), Malta (Malta), Malopolskie (Poland), Stredné Slovensko (Slovakia), West Wales and the Valleys (United Kingdom) and other.

In the Table 4 are presented two indicators of analysis of the analytical function quality namely the standard deviation and the coefficient of error of the adjustment function. For the all regions the 2nd degree parabola has smaller values of the two indicators, highlighting a greater adjustment accuracy with this function, exception making regions Malta (Malta) and Sud-Est (Romania), for that the two indicators values are almost equal.

Table 3. Market share forecast of the principal tourism regions from the European Union Member States in the years 2015 and 2020

Country/Region	Market share forecast using:				Country/Region	Market share forecast using:			
	linear function		second degree parabola			linear function		second degree parabola	
	2015	2020	2015	2020		2015	2020	2015	2020
A	1	2	3	4	A	1	2	3	4
Belgium/Prov. West-Vlaanderen	22.69	21.13	22.38	20.39	Lithuania[2]/Lietuva	7.09	8.45	7.35	9.06
Bulgaria/Yugoiztochen	22.33	15.67	28.44	5.78	Luxembourg[2]/ Luxembourg	3.83	3.81	2.72	1.45
Czech	45.25	52.44	38.43	35.58	Hungary/Közép-	39.45	41.14	35.03	29.58

Country/Region					Country/Region				
Republic/Praha					Magyarország				
Denmark/Hovedstaden	36.83	38.73	38.63	43.18	Malta[2]/Malta	14.63	14.35	14.67	14.47
Germany[1]/Oberbayern	9.15	9.04	10.42	12.00	Netherlands/Noord-Holland	29.60	30.95	31.80	36.40
Estonia[2]/Eesti	11.01	12.84	8.42	6.00	Austria/Tirol	32.44	31.73	30.38	26.92
Ireland/Southern and Eastern	...	...	...	...	Poland/Malopolskie	15.21	15.37	14.59	13.93
Greece[3]/Notio Aigaio	19.97	17.45	21.97	22.12	Portugal[4]/Algarve	30.49	26.89	32.99	33.01
Spain/Cataluña	17.47	17.90	17.42	17.77	Romania/Sud-Est	19.58	15.74	19.43	15.34
France/Île de France	25.99	26.38	22.65	18.57	Slovenia/Zahodna Slovenija	54.66	52.74	52.58	47.30
Croatia/Jadranska Hrvatska	92.40	91.49	93.68	94.66	Slovakia/Stredné Slovensko	34.13	35.02	33.40	33.13
Italy/Veneto	14.70	14.97	13.92	13.14	Finland/Etelä-Suomi	15.68	15.17	14.68	12.31
Cyprus[2]/Kypros	24.84	22.36	24.44	21.42	Sweden/Västsverige	21.04	21.38	19.50	17.78
Latvia[2]/Latvija	7.35	8.70	6.47	6.65	United Kingdom[5]/West Wales and the Valleys	4.47	4.25	4.62	4.59

… data are not availlabe;

[1] in the years 2000, 2001 and 2002 data are not available for the regions Koblenz, Trier and Rheinhessen-Pfalz, values being established by interpolation using the average spore method;

[2] country has a single region at the level NUTS 2, being predicted the indicator number of overnights, expressed in millions;

[3] in the period 2005-2009 data are not available for the region Voreio Aigaio, values being established by interpolation using the average spore method;

[4] in the years 1999, 2000, 2001 and 2010 data are not available for Região Autónoma dos Açores and Região Autónoma da Madeira, values being established by interpolation using the average spore method;

[5] in some years from the period 2000-2003 data are not available for the regions West Midlands, Devon, Yorkshire, values being established by interpolation using the average spore method;

Source: processed after the Eurostat data, http://www.epp.eurostat.ec.europa.eu.

Since it is considered that in the economic practice a few phenomena follows an objective evolution of parabolic type, the linear function can estimate quite well the market share evolution of tourism demand in the main tourist regions of the EU countries, in the years 2015 and 2020.

Table 4. Quality analysis of the analytic forecasting functions

Country/Region	linear function		second degree parabola		Country/Region	linear function		second degree parabola	
	$S_{y_t/\hat{y}_t}$	$e\%$	$S_{y_t/\hat{y}_t}$	$e\%$		$S_{y_t/\hat{y}_t}$	$e\%$	$S_{y_t/\hat{y}_t}$	$e\%$
A	1	2	3	4	A	1	2	3	4
Belgium/Prov. West-Vlaanderen	0.38	1.46	0.37	1.44	Lithuania/Lietuva	0.60	14.83	0.60	14.80
Bulgaria/Yugoiztochen	9.44	27.52	2.51	7.33	Luxembourg/Luxembourg	0.13	3.40	0.08	2.06
Czech Republic/Praha	1.86	6.04	1.58	5.13	Hungary/Közép Magyarország	1.53	4.20	1.43	3.92
Denmark/Hovedstaden	0.79	2.39	0.75	2.26	Malta/Malta	0.64	4.30	0.64	4.30
Germany/Oberbayern	0.25	2.70	0.15	1.58	Netherlands/Noord-Holland	0.64	2.40	0.56	2.08
Estonia/Eesti	0.67	8.76	0.59	7.71	Austria/Tirol	0.41	1.20	0.24	0.69
Ireland/Southern and Eastern	data are not available				Poland/Malopolskie	0.31	2.06	0.29	1.94

GreeceNotio Aigaio	1.32	5.16	1.28	5.00	Portugal/Algarve	0.57	1.52	0.45	1.19
Spain/Cataluña	0.38	2.29	0.35	2.09	Romania/Sud-Est	0.59	2.22	0.59	2.22
France/Île de France	0.96	3.80	0.79	3.13	Slovenia/Zahodna Slovenija	0.45	0.78	0.37	0.64
Croatia/Jadranska Hrvatska	0.37	0.40	0.32	0.34	Slovakia/Stredné Slovensko	0.40	1.24	0.39	1.21
Italy/Veneto	0.28	1.98	0.25	1.76	Finland/Etelä-Suomi	0.23	1.40	0.21	1.26
Cyprus/Kypros	2.10	6.94	2.10	6.93	Sweden/Västsverige	0.41	2.00	0.32	1.58
Latvia/Latvija	0.55	12.65	0.53	12.22	United Kingdom/West Wales and the Valleys	1.13	22.99	1.13	22.98

The smallest adjustment errors with the linear function were obtained for the regions Prov. West-Vlaanderen (Belgium), Hovedstaden (Denmark), Oberbayern (Germany), Cataluña (Spain), Jadranska Hrvatsk (Croatia), Veneto (Italy), Noord-Holland (Netherlands), Tirol (Austria), Malopolskie (Poland), Algarve (Portugal), Sud-Est (Romania), Zahodna Slovenija (Slovenia), Stredné Slovensko (Slovakia), Etelä-Suomi (Finland), Västsverige (Sweden). In these regions case, the applying in the forecast calculations of the linear trend function leads to forecasted values closer to the real values of the market share, compared with the same deviations registered for the rest of regions.

CONCLUSIONS

From the study of the specialized literature in the tourism domain results that the approach of the tourism development in the European Union enjoys much interest from researchers, from multiple points of view: theoretical and applicative, under the aspects of regional tourism development politics and planning, quantitative by modelling and forecasting, qualitative by structural analysis, as historic, dynamics, evolution and tendencies, on tourism flows, on destinations, on tourism forms a.s.o. In the paper was made a synthesis of the methods used in the European regional tourism research, the majority being statistical and econometric methods namely: time series methods, univariate, bivariate, multidimensional statistical analysis, factorial analysis of the principal components, Cluster analysis, index numbers method, ranks method for the units hierarchy, ANOVA method, statistical testing a.s.o. In the study of the regional tourism development in the European Union Member States were used also statistics methods namely: methods of the territorial units hierarchy, methods of time series adjustment and forecasting. Most important conclusions of the study, above presented, relate to the identification of the countries/regions with more intensive tourist activity, after the two/four enunciated criteria and the characterization of the tourism supply and demand in the EU Member States and on regions using the indicators: hotels and similar accommodation by countries, hotels and similar establishments and collective tourist accommodation establishments by regions, arrivals in hotels and similar accommodation, arrivals in hotels and similar establishments and in collective tourist accommodation establishments by countries and nights spent in hotels and similar establishments and in collective tourist accommodation establishments by regions, characterization of the market share tendency of the tourism demand in the years 1998-2011 and that of future on the medium term (years 2015 and 2020) in the principal European tourism regions. Conclusions detached from the study case, above presented, refer at the evolution level and tendency of some regional tourism indicators or at the accuracy of the methods used for forecasting. The work creates some openings for a European regional tourism future research, by a diversification of the indicators, for example by the inclusion in the analysis of the arrivals by regions, differentiated analysis of arrivals on residents and non-residents, through a diversification of the regional data analysis methods a.s.o.

ENDNOTES

(1) *** *UNWTO Tourism Highlights*, World Tourism Organization, 2014 Edition, http://www.mkt.unwho.org.
(2) data source: *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, European Commission, Bruxelles, 30.6.2010, http://www.europa.eu.

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