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**Article**

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## EUROPEAN UNION AND ROMANIAN TOURISM – $\beta$ AND $\sigma$ CONVERGENCE IN THE ECONOMIC DEVELOPMENT REGIONS OF ROMANIA

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### Abstract

At present, both in Romania and in Europe, tourism tends to become one of the biggest industries, with great development possibilities in the future. The economic development of Romania including tourism benefits from the support of the European Union, and has the purpose to reduce the gaps in this concern, compared to both the European Union average and more developed countries. The purpose of this paper is to analyse  $\beta$  and  $\sigma$  convergence in the 8 Economic Development Regions of Romania by a tourism approach. The concept of  $\beta$ -convergence represents the process of quicker development of poor regions than the rich ones, and  $\sigma$ -convergence is evaluating the process of decrease of regional economic disparities in time. The analysis based on  $\beta$ -convergence was performed using econometric modelling techniques of linear correlation. For  $\sigma$ -convergence, we measured the dispersion of real GDPT per inhabitant by the use of the variation coefficient  $\sigma_t$ . The purpose is to check the hypothesis according to which the  $\beta$ -convergence approach and the  $\sigma$ -convergence concept can lead to different results for the Economic Development Regions of Romania. The period analysed is between 2007 and 2013.

**Key words:**  $\beta$ -convergence,  $\sigma$ -convergence, Romanian tourism, Economic Development Regions of Romania

**JEL classification:** D00, N90, R19, R39

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### Introduction

Despite the attractive advantages of great diversity, Romania holds nowadays a marginal position in the international tourist circulation, though in the 1970's it was among the first 20 world tourist destinations according to the number of arrivals (Pascariu, 2006). After 1980, in an extremely rigid political climate, and with a recession background, the receiving flows started to decrease, the tendency maintaining after 1990, too. The statistics

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of World Travel & Tourism Council (WTTC) show that in 2006 Romania was one of the countries with the least developed tourism in the world, situated on the 162<sup>nd</sup> place, after the contribution to the realisation of Gross Domestic Product (GDP) (WTTC, 2006) losing constantly to competitors in the region. According to the estimates from the World Tourism Organisation annual report for 2011, tourism is directly responsible for a real growth rate of 5% of GDP globally (UNWTO, 2011), and of 30% of world service exports, as well as for a growth with one workplace to twelve workplaces, most of the times being under estimated by the decision making factors. In this context, it is necessary to create workplaces, thus stimulating very important economic growths. Consequently, the interested parties should accept and confront with economic and social challenges for the development of this activity field.

Nevertheless, tourism industry shows signs of revival, and WTTC estimate that for the following 10 years, tourism and travels in Romania will have a real annual growth rate of 6.7%, expressed by the contribution to the realisation of GDP, and of 1.6% by the contribution to the labour occupation. International tourism will have an essential role in this evolution, WTO previsions offering Romania an average annual growth rate of arrivals of 4.6% up to 2020, superior to both the world average (+4.1%) and to the European average(+3%). Taking into account the European Commission release (Brussels, June 30<sup>th</sup>2010) to the European Parliament, Council, European Social and Economic Committee, and Committee of the Regions, it is desired for Europe to become the favourite tourist destination in the world. Consequently, a new political frame work is proposed, with the development of European tourism as main objective.

According to the Treaty of Lisbon, the main objective of European tourism policy is the stimulation of competitiveness of the field, considering at the same time that, in the long term, competitiveness is strictly related to the *sustainable* character of its way of development. This objective is strictly related to the new economic strategy of the Union, *Europe2020*, and especially to the pilot-initiative: *An industrial policy adapted to the globalisation era*. In addition, tourism may also contribute to other pilot-initiatives, especially to *A Union of Innovation*, *A Digital Agenda for Europe*, and *An Agenda for New Competences and New Workplaces*. Moreover, the development of a more active tourism policy, based especially on the full exercise of the freedoms guaranteed by the treaties, may contribute substantially to the revival of the unique market.

Concerning the economic convergence, Dvoroková (2014) considers that for the economies of the EU member states this is the central point, and it represents one of the basic conditions for the consolidation of EU external competitiveness, being a necessary condition for the increase of cohesion within EU. The real convergence is influenced by several factors both positively and negatively. Consequently, this paper has the purpose to analyse  $\beta$  and  $\sigma$  convergence in the 8 Economic Development Regions of Romania by a tourist approach, using a rigorous documentation.

In the elaboration of this paper we intended to present in the first part an economic perspective of Romanian tourism, based on the analysis of data obtained from the reports provided by the National Institute of Statistics, Eurostat, European Union, World Tourism Organisation, and World Travel & Tourism Council. In what concerns the second part of the article, we made a presentation of the accession process, followed by the integration of Romania in the EU, with the purpose to identify one of the main objectives of the convergence effort. At the end of the paper we made the linear correlation for Gross Domestic Product from Tourism (GDPT) on the Economic Development Regions of Romania, with the purpose of establishing the convergence or even the divergence, if there is one.

### **1. An economic perspective on Romanian tourism**

Among the countries of Central and Eastern Europe, Romania is endowed with the richest and the most diverse tourist natural and human-created resources, being considered by the Romanian (Nedelea, 2007) and foreign specialists (Hunya, 2011) a country with a tourist potential, which could compete with any other country in the world in what concerns the richness of tourist resources. According to Bedrule and Corodeanu (2007), Romania is divided in three areas: *the high value area*; *the high tourist potential area*, and *the low tourist attractiveness area*. Consequently, 24% of the country area represents areas with high tourist potential and with high value. These areas include: the mountain and sub mountain area of Carpathians and Apuseni Mountains, Maramureş, Danube Delta, and the coast area. 34% of Romanian area has a high tourist potential, this area including the spa resources, museums, memorial houses, and other historical areas, The Someşan Plateau, Târnave, Moldova Central Plateau or Dobrogea Plateau. Erdeli et al. (2003) refers to the fact that on the territory of our country specialised tourist areas appeared and developed, where tourism represents the main economic activity, and also polyvalent tourist areas, where tourist activity is developed in parallel with other activities. There is often an indispensable complementarities of tourist production and consumption among these activities. The Master Plan for National Tourism Development 2007 – 2026 explains that Romania possesses an impressive range of natural, geographical, environmental, patrimonial and ethnographic riches, making necessary a pragmatic approach, based on the key elements which contribute substantially to the field of tourism. In this regard, Nedelea (2007) proposes possible ways to revive the Romanian tourism, which could transform tourism in a successful industry, by elaborating efficient marketing strategies or policies.

An overview of Romania development level requires the analysis of Gross Domestic Product (GDP) presented on Economic Development Regions, because this indicator is important for the analysis of structural transformations and macroeconomic balance (Annex 1). The Gross Domestic Product directly from Tourism is the part of GDP attributed directly to the intern tourist consumption as part of the added value (at basic prices), generated by all the industries as an answer to the internal tourist consumption, to which it is added the sum of net taxes on production and imports included at purchase prices. This part of GDP is called Gross Domestic Product directly from Tourism (GDPT). Although the eight regions of the country, including the ones with a lower development level, have a valuable potential for tourism development, in 2012 GDPT registered the value of 11018.1 billion lei, the percentage of tourism in Romanian GDP being 1.847%, followed by a raise to 1.9% in 2013. (table no. 1)

**Table no. 1. Gross Domestic Product directly from Tourism (GDPT) and GDP**

	2007	2008	2009	2010	1011	2012	2013
GDP (billions lei)	415.9	514.7	501.1	522.6	557.3	587.5	650.6
%tourism of GDP	2.260	1.901	1.832	1.819	1.825	1.847	1.900
GDPT (billions lei)	9.4	9.7	9.2	9.5	10.2	10.9	12.4

*Source: personal calculations based on the statistical data offered by National Institute of Statistics, National Institute of Tourism Research and Development, Tourism Satellite Accounts 2012 for Romania*

## **2. European Union and the revival of Romanian tourism**

### **2.1. Short overview of EU tourism**

Tourism includes a great diversity of products and destinations, and it involves many different interested parties from the public and private sector, with very decentralised fields of competence at regional and local level. According to Pascariu and Țigănașu (2014), tourism is a strategic economic activity in EU, with a tendency to develop in the following years in EU economy. We must mention that tourism has a great potential regarding its contribution to the performance of several major EU objectives, as follows: sustainable development, economic development, and human resources development, economic and social cohesion. The strategic approach of the process is to create conditions and to provide the basis of a sustainable (Nistoreanu, 2005), high quality (Olaru et al., 2010), and competitive (Epuran et al., 2015) tourism in Romania. Năstase (2007) considers that the strategy for the performance of the objectives mentioned above is based on a number of points, among which the most important ones are: the approach based on knowledge, better exploitation of the existing information, know-how acquirement and development, and innovation by the development of new processes. Eurostat reports show that European tourist industry generates over 4% of European Union GDP, with around 2 million companies occupying approximately 4% of the total labour (approximately 8 million workplaces). If we consider the related sectors, the estimated tourism contribution in the creation of GDP is much higher, as tourism indirectly generates approximately 11% of European Union GDP, and includes approximately 12% of the labour. Total labour occupation for tourism in Europe is also estimated by Eurostat to 17 million work places. According to the estimations of the Tourism Satellite Accounts in Europe–2013, the foreign visitors' expenses register over 291 billion € in 2012, i.e. much more than the level of pre-crisis (EU-28) in 2008 (265 billion € for EU-27).

### **2.2. Aspects concerning regional development in Romania**

The year 2007 was very important for Romania, because it was then when it became EU member state. As a result of EU accession, Romania benefits from irredeemable economic support. In the official EU documents there are concepts as: irredeemable economic support, or irredeemable economic assistance. This aspect is deeply analysed by some specialists (Hunya, 2011, Pociovălișteanu and Dobrescu, 2009, Ștefura, 2006), who consider that Irredeemable Economic Assistance (IEA) is an important, significant and contemporary economic reality, which, under research, shows a multitude of issues. IEA also represents a phenomenon of resource transfer, which develops from issuers to receiver-beneficiaries with different national locations. As a result of integration processes from the last years, which had in view countries with an economy in transition from command economy to free exchange economy, IEA practice suffered a series of modifications. IEA demand and offer modified and adapted both in the sense of these historical transformations (Lianu, 2004).

In Romania eight regions were formed, established by Law no. 151/1998 (regarding the regional development in Romania) modified by the Law no. 315/2004 (regarding the regional development in Romania), with observance of the EC Regulation no. 1059/2003, regarding the establishment of a mutual system of statistic classification of territorial units.

In agreement with the Regional Operational Programme 2007-2013, the 8 Development Regions are: the 1<sup>st</sup> Region: North - East (Bacău, Botoșani, Iași, Neamț, Suceava, Vaslui);

the 2<sup>nd</sup> Region: South-East (Brăila, Buzău, Constanța, Galați, Tulcea, Vrancea); the 3<sup>rd</sup> Region: South (Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova, Teleorman); the 4<sup>th</sup> Region: South-West (Dolj, Gorj, Mehedinți, Olt, Vâlcea); the 5<sup>th</sup> Region: West (Arad, Caraș-Severin, Hunedoara, Timiș); the 6<sup>th</sup> Region: North – West (Bihor, Bistrița-Năsăud, Cluj, Maramureș, Satu-Mare, Sălaj); the 7<sup>th</sup> Region: Centre (Alba, Brașov, Covasna, Harghita, Mureș, Sibiu); the 8<sup>th</sup> Region: Bucharest-Ilfov (Bucharest and Ilfov County).

The instruments used for the implementation of the objectives of regional development policy are: planning instruments and financial instruments. Planning instruments include: national and regional strategies, formulated based on the diagnose of economic and social situation; plans which elaborate based on national and regional strategies, in a period of minimum a year; national and regional programmes with annual and multi annual covering, and projects which are specific actions fitting coherently into the elaborated programmes. From the category of financial instruments are: National Regional Development Fund, Regional Development Fund, and Instruments for Pre-accession Assistance (mainly PHARE). *Tourism is one of the activities financed through ERDF* (European Regional Development Fund). At the end of 2007-2013, the purpose is to *reduce the gap between the most developed region and the less developed region*, with the necessity of an analysis of development indicators of infrastructure and business environment. This led to a differential allocation of funds on regions according to their degree of development, in close connection with the other operational programmes. POR 2007-2013 includes all the Development Regions of Romania. The strategy was elaborated in agreement with the European principle of subsidiary, i.e. it is based on the Regional Development Strategies, elaborated regionally in large partner work groups. POR strategy was in agreement with the objectives of National Plan of Development 2007-2013 (NPD) and of National Reference Strategic Framework 2007-2013 (NRSF), contributing to reaching the global objective and NRSF specific objectives concerning the reduction of the development disparities between Romania and the other EU member states. In the category of POR specific objectives, the objective *Development of tourism contribution to regional development* is also included-Priority Axis 5: Sustainable development and tourism promotion (15% of POR allocated budget) - Support for the restoration of the cultural historical patrimony, modernisation of tourist infrastructure; improvement of infrastructure quality in the natural areas which could attract tourists. The other priority axes also had important contributions, indirectly supporting tourism development in the 8 Economic Development Regions of Romania, as follows: support of sustainable development of towns, improvement of regional and local transport infrastructure, rehabilitation and modernisation of county road network, of urban streets and ring roads, improvement of social infrastructure of health and public safety in emergency situations, modernisation of educational infrastructure, support of development of regional and local business environment, rehabilitation of unused industrial centres, support of microenterprises and technical assistance.

In the National Sustainable Development Strategy Romania Horizons 2013-2020-2030, the existing strategies and programmes regarding the Development Regions do not include projections beyond the budgetary exercise EU 2007-2013, except for a few specific targets programmed for 2015, with the following objectives: implementation of 400 projects in the field of tourism infrastructure, direct or indirect support for 350 tourist companies, development of at least 10 promotion campaigns for tourist brand at national and international level, and creation of 10 national centres of tourist information and promotion, with the result of creation of 1,000 new workplaces, among others.

### 2.3. Romania in EU – comparative analysis of regional convergence

#### 2.3.1. A few approaches of the concept of $\beta$ and $\sigma$ -convergence

After analysing the literature, we could establish that there was a very rich specified literature analysing the issues related to the regional convergence, treated both theoretically and practically. According to Young et al. (2008), there are two types of growth convergence analysed empirically:  $\sigma$ -convergence and  $\beta$ -convergence. The concept of  $\beta$ -convergence is the process of faster development of poorer regions as compared to richer ones, and  $\sigma$ -convergence assesses the process of decreasing the regional economic disparities in time, creating only the necessary, but not sufficient condition for its existence. Therefore,  $\beta$ -convergence is a necessary condition for  $\sigma$ -convergence (Young et al., 2008). For the elaboration of empirical studies and scientific research, the most often used indicator is GDP in real terms, in conversion per inhabitant or per worker. The economies with a lower GDP per inhabitant grow faster as compared to the economies of developed states, which register a higher GDP per inhabitant. Based on these observations, a condition of homogeneity was necessary for the economies analysed, measuring the convergence not being possible in other conditions – for example for Germany and Bulgaria, or Germany and Romania, countries with different economies, with big gaps of development. Dvoroková (2014) states that in general poorer countries register a more dynamic growth. The increase of GDP per inhabitant is a negative indicator depending on the initial economic level,  $\beta$ -convergence being characterised by a negative slope of the linear function. Regarding the concept of  $\sigma$ -convergence, the literature proposes studies conducted by Marques and Soukiazis (1998), Baumol (1986), Young et al. (2008), Dvoroková (2014). They consider that all the countries converge towards the same level of development, aiming to obtain the same result, like the economic production development. Therefore,  $\sigma$ -convergence may be defined as a decrease of real GDP variation per inhabitant among the economies analysed in a certain time interval.

As we saw, convergence is one of the objectives of the process of integration of Romania in EU. Therefore, it is known that, according to the priorities of the cohesion policy and the regulations regarding the objective of convergence, tourism is financed by ERDF. In the period 2007 – 2013, the purpose was to reduce the gap between the most developed region and the least developed region in Romania. Thus, for tourism a high degree of convergence leads to a lower level of support for attenuating the economic differences, while a low degree of convergence leads to the justification of high costs of support.

#### 2.3.2. Methodology

According to Dvoroková (2014), the methodology to study  $\beta$ -convergence originated in 1986, when William Baumol studied the real convergence among economies. We can measure  $\beta$ -convergence in tourism based on the value of GDPT/in inhabitant. The method of calculation for  $\beta$ -convergence used in this paper has in view the equation proposed by Baumol:

$$\frac{1}{T} [\ln(y_{i,T}) - \ln(y_{i,t_0})] = \alpha + \beta \ln(y_{i,t_0}) + \varepsilon_t \quad (1)$$

where  $T$  is the time interval,  $y_T$  is real GDPT per worker at the end of the period of time,  $t_0$  is the initial period of time,  $y_{t_0}$  is real GDPT per worker at the beginning of the period of time,  $\beta$  is the slope parameter,  $\varepsilon$  is the statistical error.

The theoretical model proposed by Baumol's equation was modified in 1986, therefore in the study proposed by Dvoroková (2014) the following model was used:

$$\frac{1}{T} \ln \left( \frac{y_{iT}}{y_{i,0}} \right) = \alpha + \beta \ln(y_{i,0}) + \varepsilon_i \quad (2)$$

where  $\alpha$  is a constant level.

Sigma or  $\sigma$ -convergence emphasises the decrease of differences, and the dispersion of the phenomenon compared to the mean, or the gradual decrease of differences between two or several chronological series.

According to Iancu (2005), the indicator frequently used in measuring sigma convergence is the one regarding the variation coefficient of GDPT level per inhabitant noted with  $\sigma$ , and calculated according to the formula:

$$\sigma_t = \sqrt{\frac{\sum_i [\ln(y_{i,t}) - \ln(\bar{y}_t)]^2}{(N-1)}} \quad (3)$$

where  $N$  represents the number of regions.

This indicator is also known as sigma convergence, term used for the first time by Sala-i-Martin, along with  $\beta$  convergence.

The model may be used in order to characterise the convergence level by measuring GDPT dispersion per inhabitant per one year using for this purpose the transversal series (for our paper, Economic Development Regions). In this case, the relevance of convergence indicator appears only when there are comparisons. In order to characterise the convergence evolution (trend) chronological series are used (a discrete time interval,  $t$  and  $t+T$ ). When the phenomenon dispersion is decreasing in a certain period of time (when the indicator value decreases in time) it means that there is a convergence process,  $\sigma_{t+T} < \sigma_t$ , and when the dispersion is increasing, it means that there is a divergence process,  $\sigma_{t+T} > \sigma_t$ .

### **2.3.3. The analysed sample**

Statistical data used were taken from the database offered by the National Institute of Statistics, for GDP values per inhabitant for the Economic Development Regions of Romania. For GDPT we used the data provided by the Tourism Satellite Accounts in Romania in 2012 (TSA), and the reports provided by World Tourism Organisation, World Travel & Tourism Council, and Eurostat (Annex 2).

The criteria of choosing the period 2007-2013 were the year 2007, when Romania became EU member state, and the year 2013, when the objectives of the National Plan of Development 2007-2013 were finalised. As we mentioned before, at the end of the period 2007 – 2013, the purpose was to reduce the gap between the most developed region and the least developed region. The data were organised and processed numerically with Excel



programmes. For this particular research we chose the 8 Economic Development Regions of Romania. For the evaluation of  $\beta$ -convergence we used the equation proposed by Baumol in 1986, as modified in the study proposed by Dvoroková (2014). For each region we calculated  $\ln(PIBT_{2007})$ , i.e.  $\ln(y_{i,0})$ , and  $\ln(\frac{PIBT_{2013}}{PIBT_{2007}})$ , i.e.  $\ln(\frac{y_{iT}}{y_{i,0}})$ . The time interval  $T$  is 7 years for the period analysed from 2007 to 2013. For  $\sigma$ -convergence we used the variation coefficient of GDPT level per inhabitant noted with  $\sigma$ . According to this model, it was necessary to calculate  $\ln(\bar{y}_i)$ , and  $N$  received the value 8, corresponding to the number of regions.

#### 2.3.4. The estimation of econometric model for $\beta$ -convergence and $\sigma$ -convergence, and interpretation of results

Mathematically, the estimation of  $\beta$ -convergence model may be written as follows:

$$\frac{1}{T} \ln \left( \frac{PIBT_{2013}}{PIBT_{2007}} \right) = \alpha + \beta \ln(PIBT_{2007}) + \varepsilon_i \quad (4)$$

Where  $\alpha$  is a constant,  $\beta$  is the slope,  $\varepsilon$  is the error,  $T$  is the number of years for the time interval 2007-2013.

The results of the calculations are synthetically presented in table no. 2 for the GDPT values corresponding to the period 2007-2013, for the 8 Economic Development Regions of Romania.

**Table no. 2: Values for calculating natural logarithms**

	$\ln(PIBT_{2007})$	$\frac{1}{7} \ln \left( \frac{PIBT_{2013}}{PIBT_{2007}} \right)$
North - East Region	5.630868856	0.031424046
South -East Region	5.867896724	0.034301791
South Region - Muntenia	5.875285387	0.037611672
South - West - Oltenia Region	5.832465826	0.038452149
West Region	6.224413746	0.032856187
North - West Region	6.041675844	0.015091959
Central Region	6.092433007	0.030357058
Bucharest - Ilfov Region	6.880017088	0.043458476

As we can see in figure no. 1, the linear equation with the form  $y = a + bx$  is  $y = 0.0071x - 0.0099$ , and  $R^2 = 0.1024$ . In table no. 3 we present the estimated values for  $\alpha$  constant and  $\beta$  slope.

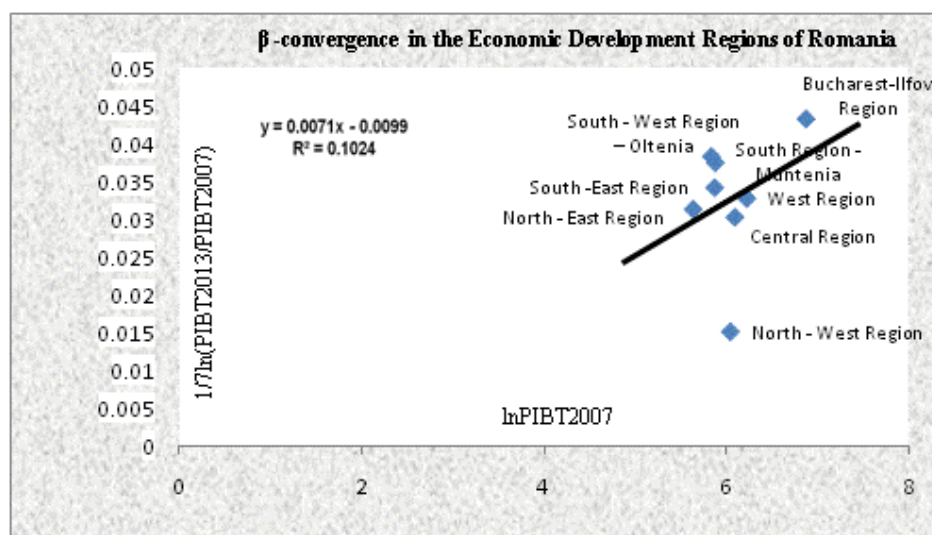


Figure no. 1. The linear correlation for the values calculated in table no.4 and graphical representation of Economic Development Regions of Romania according to the value of each point

Table no. 3. The estimated values for  $\alpha$  constant and  $\beta$  slope

Period	$\alpha$	$\beta$
2007-2013	-0.0099	0.0071

The mathematical model can be written as follows:

$$\frac{1}{7} \ln \left( \frac{PIBT_{2013}}{PIBT_{2007}} \right) = -0,0099 + 0,0071 \ln(PIBT_{2007}) \quad (5)$$

Due to the positive value of  $\beta$  slope (+0.0071), we consider that for the period 2007-2013,  $\beta$ -convergence becomes  $\beta$ -divergence for the 8 Economic Development Regions from a tourist point of view. Specifically,  $\beta$ -convergence model may be used to analyse the development of tourism economy level only retrospectively (i.e. in the past), without including the future explicative values for GDPT. The positions of certain regions on the graphic (figure 1) show that the less developed regions have the tendency to grow faster (North-East Region and South-East Region) than the more developed regions (Bucharest-Ilfov Region), whose growth is slower. Taking into account that for the period analysed the results obtained indicate a  $\beta$ -divergence, we ask ourselves if for future periods a GDPT growth could determine a modification for  $\beta$ -convergence model. The answer to this question can be obtained by analysing GDPT values presented in table no. 4.

Table no. 4. Estimation for  $\alpha$  and  $\beta$

	GDPT (lei/inhabitant) 2007	GDPT (lei/inhabitant) 2013	Modification	Convergence
North - East Region	279	348	69	Divergence
South -East Region	354	449	96	Upper convergence
South Region - Muntenia	356	463	107	Upper convergence
South - West - Oltenia Region	341	447	105	Upper convergence
West Region	505	635	131	Lower convergence
North - West Region	421	467	47	Divergence
Central Region	442	547	105	Lower convergence
Bucharest - Ilfov Region	973	1318	346	Divergence

In the following we present the  $\sigma$ -convergence model by the use of variation coefficient  $\sigma_t$  value which will indicate the convergence level by measuring GDPT dispersion.

The mathematical model can be written as follows:

$$\sigma_t = \sqrt{\frac{\sum_i [\ln(PIBT 2013) - \ln(\bar{y}_t)]^2}{(8-1)}} \quad (6)$$

In table no. 5 we present the estimated values for  $\bar{y}_t$ ,  $\ln(\bar{y}_t)$ ,  $[\ln(PIBT 2013) - \ln(\bar{y}_t)]^2$  and  $\sigma_t$ :

Table no. 5. The estimated values for  $\sigma_t$

	$\bar{y}_t$ $y = 0.0071x - 0.0099$	$\ln(\bar{y}_t)$	$[\ln(PIBT 2013) - \ln(\bar{y}_t)]^2$	$\sigma_t$
North - East Region	0.030079169	-3.503922411	87.51152701	3.535766779
South -East Region	0.031762067	-3.449482571	91.34565011	3.612392363
South Region - Muntenia	0.031814526	-3.447832293	91.89905313	3.623318391
South - West - Oltenia Region	0.031510507	-3.457434222	91.37572545	3.612987000
West Region	0.034293338	-3.372804183	96.57408072	3.714336717
North - West Region	0.032995898	-3.411372013	91.36858458	3.612845823
Central Region	0.033356274	-3.400509388	94.19560059	3.668312196
Bucharest - Ilfov Region	0.038948121	-3.245524741	108.7797092	3.942075400
				<b>29.32203467</b>

The high value obtained for sigma convergence shows that for the period 2007-2013, there is a high degree of GDPT dispersion in the Economic Development Regions of Romania. In these conditions it is necessary to perform a much more detailed analysis, with the purpose to measure the convergence process or the divergence process, according to the values

obtained for  $\sigma_t$ , calculated this time for the following pairs of time intervals: (2007-2008); (2008-2009); (2009-2010); (2010-2011); (2011-2012); (2012-2013), (2007-2013).

In table no. 6 we present the values estimated for  $\sigma_t$ , for the 7 time intervals:

**Table no. 6. Estimated values for  $\sigma_t$**

	$\sigma_t$ 2007-2008	$\sigma_t$ 2008-2009	$\sigma_t$ 2009-2010	$\sigma_t$ 2010-2011	$\sigma_t$ 2011-2012	$\sigma_t$ 2012-2013	$\sigma_t$ 2007-2013
North - East Region	4.229855931	4.190520598	4.412310024	3.806527832	4.078667460	3.745530462	3.535766779
South - East Region	5.399007018	4.135737091	4.431595719	3.948059967	4.134686335	3.849473176	3.612392363
South Region - Muntenia	5.672274860	4.132857825	4.438383447	3.953213924	4.135583972	3.858301300	3.623318391
South - West - Oltenia Region	4.917454164	4.144888483	4.426175860	3.914120398	4.118955007	3.838077244	3.612987000
West Region	4.337929614	4.125761835	4.472929732	4.107185067	4.201275835	3.999976757	3.714336717
North - West Region	4.557647027	4.126605898	4.446649876	3.989298088	4.142781090	3.868927256	3.612845823
Central Region	4.472303184	4.124887841	4.454689806	4.024416481	4.166143092	3.902631066	3.668312196
Bucharest - Ilfov Region	4.181140562	4.224334978	4.621926049	4.495923392	4.379274044	4.319251026	3.942075400
	<b>37.76761236</b>	<b>33.20559455</b>	<b>35.70466051</b>	<b>32.23874515</b>	<b>33.35736683</b>	<b>31.38216829</b>	<b>29.32203467</b>

As we can see in table no. 6 and in figure no. 2, the values obtained for  $\sigma_t$  register a slight decrease between 2007 and 2013. Consequently, we consider that there was a convergence process between 2007-2013 for the Economic Development Regions of Romania, which contradicts the value of  $\beta = (+0.0071)$ , indicating that for the same period of time there was a divergence process.

Therefore, we will analyse  $\sigma_t$  on time intervals. Consequently, we can see that between 2007 and 2008 there was a convergence process, due to the fact that  $\sigma_{2008} < \sigma_{2007}$ , between 2008 and 2009 there was a divergence process, due to the fact that  $\sigma_{2009} > \sigma_{2008}$ , between 2009 and 2010 there was a convergence process, due to the fact that  $\sigma_{2010} < \sigma_{2009}$ , between 2010 and 2011 there was a divergence process, due to the fact that  $\sigma_{2011} > \sigma_{2010}$ , between 2011 and 2012 and 2012 and 2013 there was a convergence process, due to the fact that  $\sigma_{2013} < \sigma_{2012} < \sigma_{2011}$ . The convergence process could occur in a very slow rhythm.

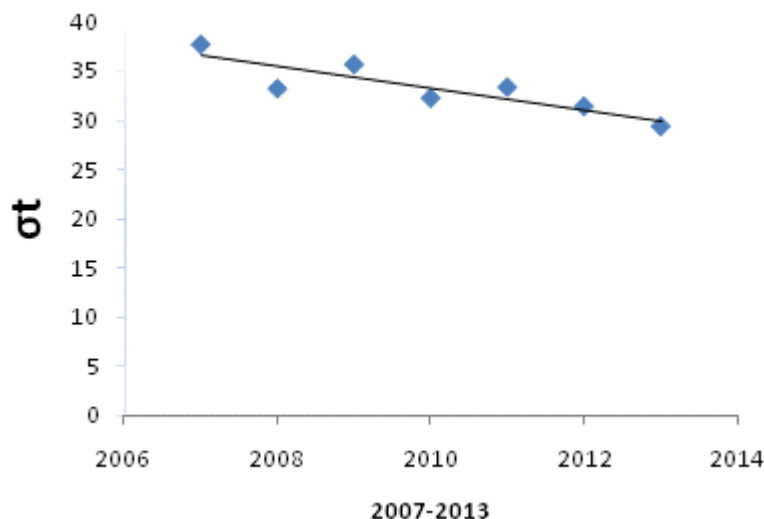


Figure no. 2. Graphical representation of the total values obtained for  $\sigma_t$

### Conclusions

The purpose of this article was an analysis of  $\beta$  and  $\sigma$ -convergence on the 8 Economic Development Regions of Romania using a tourism approach. For  $\beta$ -convergence we used the econometric modelling technique of linear correlation type. For  $\sigma$ -convergence we measured real PIBT dispersion per inhabitant by using the variation coefficient  $\sigma_t$ . The period analysed was the time interval 2007-2013, when the European Union financed some investments in the field of tourism through the European Regional Development Fund. The positive value of  $\beta$  slope (+0.0071) for the period 2007-2013 indicates that there is no  $\beta$ -convergence for the 8 Economic Development Regions from a tourist point of view. In this case we consider that it is  $\beta$ -divergence, especially for 3 of the 8 Regions: North-East Region and North-West Region, compared with Bucharest-Ilfov Region. As a result, we also calculated  $\sigma$ -convergence. The high values obtained for  $\sigma$ -convergence indicate a high degree of PIBT dispersion for the period 2007-2013. Eventually, we calculated  $\sigma$ -convergence for 6 time intervals from 2007 to 2013, obtaining also very high values, however in a slight decrease. Therefore, the phenomenon registers a decrease, which means that for the 8 Development Regions of Romania a convergence process could occur.

The initial differences among regions are in connection with PIBT level/inhabitant mentioned above, also with the human capital stock and its quality, and with the scientific, technological, and cultural stock. In the study of the convergence process it is necessary to consider also these differences of factors, which for some regions need special and costing investment efforts.

Therefore, this analysis is based on real statistic results, and it tests the possibility of using  $\beta$  and  $\sigma$  convergence at national level, by comparing the Development Regions of Romania.

However, we should consider the existence of convergence conditioning. Therefore: is the level of endowment (potential, in our case) identical for all these regions? Even before answering this question, we should answer another one: how do we measure the level of *tourist endowment* of the regions in order to obtain comparable values?

From this perspective, there are gaps among the Development Regions even from *the start*. If this gap is also favourable to the more developed region, the convergence will never be reached. The preponderance of the activities related to tourism in certain areas which are more endowed from a natural point of view or in what concerns the cultural and artistic patrimony, or even general infrastructure, can be also seen as a phenomenon of specialisation, which is not necessarily bad. It is known that several research studies demonstrated that due to their potential, some areas in Romania have a growing demand of tourists, becoming true *poles* of tourist attraction: Valea Prahovei, Bucharest, Braşov, Bucovina, etc. Polarisation can also make convergence impossible.

In conclusion, beta and sigma convergence model applied to the 8 Economic Development Regions of Romania could be irrelevant, because the conditions imposed by the application of this model do not correspond to the realities mentioned above. In this case, it is necessary to apply convergence models which take into account the new realities, and which are adequate for the particular development rhythm of Romania.

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## Annex 1

### GDP per inhabitant per regions (lei/inhabitant)

	2007	2008	2009	2010	2011	2012	2013
North - East Region	12340.9	14794.5	14649.3	15014.8	16315.1	17289.7	18290.8
South-East Region	15641.8	19098.9	18738.2	20076.8	21772.9	22063.1	23654.9
South Region - Muntenia	15757.8	19648.1	19913.7	20288.2	21867.7	22523.8	24388.9
South - West - Oltenia Region	15097.3	17831.8	17752.8	18735.1	20152.1	21482.1	23504.5
West Region	22341.9	26173.2	25602.4	27640.0	29577.6	31353.5	33447.2
North - West Region	18610.5	21542.1	21297.4	21827.2	22637.2	23090.9	24603.3
Central Region	19579.5	22707.7	22618.8	23428.3	25256.1	24984.3	28803.4
Bucharest - Ilfov Region	43037.3	59680.2	55079.3	58137.0	61042.5	65625.3	69393.1
Total country	19315.4	23934.6	23341.4	24435.9	27696.5	29197.4	32333.4

Source: data processed from: Muntenia Regional Development Agency, National Institute of Statistics, National Institute of Tourism Research and Development, North-East Regional Development Agency, Oltenia Regional Development Agency, REGIO, Programul operațional regional 2007-2013, Regional Development, POR 2014-2020, Vrancea County Council

## Annex 2

### GDPT per inhabitant per regions (lei/inhabitant)

	2007	2008	2009	2010	2011	2012	2013
North - East Region	278.9	281.2	268.4	273.1	297.8	319.34	347.5
South -East Region	353.5	363.1	343.3	365.2	397.4	407.51	449.4
South Region - Muntenia	356.1	373.5	364.8	369.0	399.1	416.01	463.4
South - West - Oltenia Region	341.2	339.0	325.2	340.8	367.8	396.77	446.6
West Region	504.9	497.6	469.0	502.8	539.8	579.10	635.5
North - West Region	420.6	409.5	390.2	397.0	413.1	426.49	467.5
Central Region	442.5	431.7	414.4	426.2	460.9	461.46	547.3
Bucharest - Ilfov Region	972.6	1134.5	1009.1	1057.5	1114.0	1212.10	1318.5

Source: data processed from: National Institute of Statistics, National Institute of Tourism Research and Development, Tourism Satellite Accounts 2012 for Romania