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REGIONAL DISPARITIES AMONG COUNTRIES AND ANALYSIS OF REASONS OF THEIR CREATION

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Abstract

Regional development and remission of regional disparities belong to the most discussed topics in the European Union. The urgency of solving this question proves the fact, that regional development is one of the key issues of regional policy in the EU. Enormous are especially disparities among the regions of so called old and new EU members as well as among the EU members together. These disparities resulted from activity of several factors. The article is concerned in an analysis and comparison of relevant social economic indicators of chosen countries in the spheres of education, science, research and development, innovations, employment and others, which could influence the living standard of population and sustainable economic growth. The objective of this article is to identify the most serious social economic disparities among the chosen countries and to analyze the main reasons of their creation with help of relevant mathematical and statistical methods.
This article is one of the first results of international project SK-05/06-BA-018, which has been solved by research teams from Slovakia, Austria, Romania and Bulgaria.

Key words: Region, regional disparities, remission, European Union, convergence.

Introduction

Economic and social disparities among member states and their regions weaken the general dynamics of social economic development in the European Union (EU). Because of this reason the EU pays specific attention to them and tries to reach

their remission with aim to improve conditions for economic, social and spatial coherence of Union. European Union invests more than one third of its budget for equalization of these disparities.
In April 2006 the Faculty of Economics, Matej Bel University in Banska Bystrica (Slovakia) submitted an international project aimed at creation of research team consisted of experts and researchers from Slovakia, Austria, Romania and Bulgaria who participate in solving of common project "Remission of social economic disparities among countries in global context of expanding European Union". The selection of countries matches to three main stages in expansion of European Union and enables reciprocal exchange of knowledge between so called old and new member states of EU.

Objective

The aim of this paper is to identify the most serious social economic disparities among regions of Slovakia, Austria, Romania and Bulgaria through chosen mathematic and statistic methods and to analyze the main reasons why they came into existence.

Material and methods

We will use mathematical-statistical methods of ß-convergence and σ-convergence for an examination if poorer regions of four analyzed countries tend to grow faster than the rich regions. In terms of economic growth comparison among countries or regions there are two main concepts of convergence, outgoing from the neoclassic economic growth model, discussed.
The first concept, whose authors are Barro and Baumol, explains that poor countries tend to catch up rich countries at the level of national income per capita. The second concept, by Easterlin and Barro, concentrates on variability of national income among countries. It stands for, that standard deviation of national income logarithms among countries decreases in time, what leads into lowering of disparities at the level of national income.
As estimated, but relevant indicator of economic forwardness of region by the absolute ß-convergence calculation we choose regional GDP per capita. By examination of relationship among other independent variables, as number of employed (E), research and development expenditures (R&D), infrastructure length (I), to the dependent variable we will use conditional ß-convergence, which is significant if there are huge differences in technological and other parameters.

By the definition of absolute ß-convergence we can find out the following regression equation:

$$\frac{1}{T} * \log\left(\frac{y_{i,T}}{y_{i,0}}\right) = \alpha_2 - \beta_2 * \log y_{i,0} + \mu_i , \qquad (1)$$

where the left side of the equation indicates the average growth in period 0 to T (T is number of periods at the same time). Growth dependence is expressed by β_2-coefficient at the initial level of GDP per capita ($y_{i,0}$).

Conditional ß-convergence can be expressed by the equation:

$$\frac{1}{T} * \log\left(\frac{y_{i,T}}{y_{i,0}}\right) = \alpha - \left(\frac{1-e^{-\beta.T}}{T}\right) * \log y_{i,0} + \psi_{i,0} X_{i,0} + \mu_i , \qquad (2)$$

where ψ_i is a vector of parameters, X_i is a variable.

We can use affinity from the equation (2) to succeed in calculation of convergence fastness

where: $\beta = \frac{-\ln(1-\beta_2.T)}{T}$. (3)

One of the disadvantages of the ß-convergence concept is that it analyses situation at the beginning and at the end of investigated period, while the information on development within the investigated period are not utilized.

σ-convergence presents diminution of GDP per capita dispersion rate (as a standard deviation or variance) among economies in certain time period. This type of convergence criterion was constructed for the purpose of additional information acquisition on convergence development. More specifically it concerns the relative and absolute gap residual comparison among compared countries/regions.

σ-convergence refers for:

$s_0^2 \rangle s_t^2$. (4)

The change of variance, eventually the change of standard deviation of GDP per capita we used, will be analyzed by F-test, more concrete by Levenes test. We choose a significance level α = 0,05.

Results and discussion

From analysis of social-economic disparities among regions of Slovakia, Austria, Romania and Bulgaria have arisen following results:

Table 1 Results of convergence of Austrian regions

Type of convergence	No. of regions	Time period	β_2	Sig.	adj.R^2 %	β %	Result
Absolute	9	1995-2003	-0,013	0,035	42,00%	1,382556	β-convergence
Conditional. I+E+R&D	9	1995-2003	-0,021	0,01	77,50%	2,327636	β-convergence

Resources: Self-proceedings

In the case of Austria is the result distinct absolute and conditional convergence among regions with the annual decreasing of space from the steady state of GDP

per capita by 1, 38 % to 2, 33 %. On the basis of that we assume, that less developed regions of Austria grew faster than more developed regions of Austria in the analyzed time period.
Our findings assign σ-convergence, however following the Levenes test we do not reject equation of deviations. From this reason it is not possible distinctly confirm σ-convergence.
Austria has among analyzed countries specific position. Different historical and political development related with the orientation of Austrian economy towards western countries, diversified industry, low unemployment rate in all Austrian regions, steady inflow of foreign investments, strong regional governments and existence of strong partnership between regional and central government are the main reasons of convergence among Austrian regions.

Table 2 Results of convergence of Slovak regions

Type of convergence	No. of regions	Time period	β_2	Sig.	adj.R^2 %	β %	Result
Absolute	8	1997-2003	0,01	0,049966	41,70%	0,966%	β-divergence
Conditional. I+E+R&D	8	1997-2003	0,056	0,014	91,40%	4,725%	β-divergence

Resources: Self-proceedings

As compared with the results of convergence of Austrian regions, we can state on the basis of our research, that for Slovak regions is typical absolute and conditional divergence with the increasing space from the steady state of GDP per capita per one year by 0, 966 % to 4, 725 %.
Our findings assign σ-convergence, however following the Levenes test we do not reject equation of deviations. From this reason we can not distinctly confirm σ-convergence.

Table 3 Results of convergence regions of Bulgaria

Type of convergence	No. of regions	adj.R^2 %	β_2	Sig.	β %	Result
Absolute	6	0	-0,023	0,718	2,541762	multivalent
Conditional E+I+R&D	6	95,8	-0,122	0,111	46,62127	multivalent
Conditional E+R&D	6	97,7	-0,117	0,008	34,3609	β-convergence

Resources: Self-proceedings

Parameter β_2 induces absolute and conditional convergence among Bulgarian regions, however not statistical significant. After removing of parameter of infrastructure the result confirmed conditional β-convergence among Bulgarian regions with the speed of convergence about 34, 4 % annually. This result was

probably caused by high inflation rate in Bulgaria in 1997 as a result of labile political situation and shadiness of used methodology of GDP per capita estimation. In 1997 a new territorial and administration division of Bulgaria took place and from initial 9 regions 6 regions were created. Results of examination of σ-convergence are ambiguous.

Table 4 Results of convergence of Romanian regions

Type of convergence	No. of regions	Time period	β_2	Sig.	adj.R^2 in %	β in %	Result
Absolute	8	1997-2003	0,092	0,011	63%	7,10189	β-divergence
Conditional E+I+R&D	8	1997-2003	-0,005	0,955	62,10%	0,50896	multivalent

Resources: Self-proceedings

Analyzed data assign absolute divergence among regions of Romania with the annual increasing of space from the steady state of GDP per capita per one year by 7, 1 %. The results of analysis show conditional β -convergence, which is not statistically significant. Results of σ-convergence are not distinct. Till 2000 there was a tendency to σ-convergence, in the years 2000-2003 was the development constant.

Table 5 Results of convergence among region of Austria, Slovakia, Bulgaria and Romania

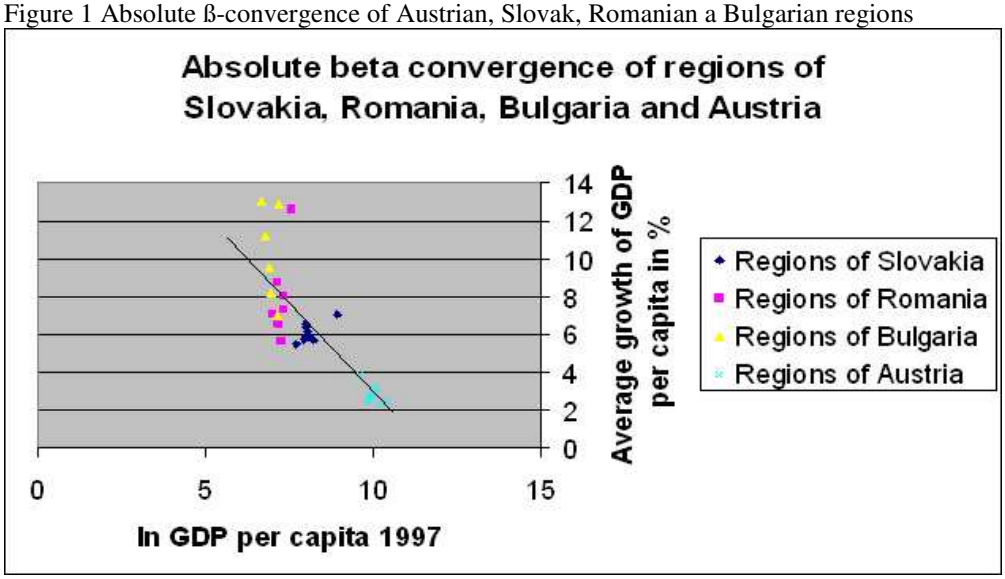
Type of convergence	AdjR2 in %	DW	β_2	Sig. β_2	β in %	Result
Absolute	65,9	1,178	-0,02	0	2,154613	β - convergence
Conditional E+I+R&D	76,5	1,261	-0,023	0	2,50778	β-convergence

Resources: Self-proceedings

By the examination of convergence among regions in all investigated countries we attained to the results of absolute and conditional ß-convergence, where the initial level of income (GDP per capita) can explain 76, 5 % of GDP per capita growth rate variability among investigated regions conditioned by R&D expenditures, employment and infrastructure length. The distance from steady state in GDP per capita is decreasing annually by 2, 5 %. Figure 1 presents results of absolute ß-convergence for all analyzed countries. Regression line stands for an expected steady state (where the GDP growth per capita is zero), to which all regional economies should tend. The best situation is in Austrian regions, we can say they closely approached this steady state in 1997-2003 in the group of investigated regions. Generally we can see that regions of Slovakia, Austria, Romania and

Bulgaria converge to each other in the indicator GDP per capita. Regions below the line have positive growth of GDP per capita and regions under the line (i.e. under expected steady state) have negative growth of GDP per capita.

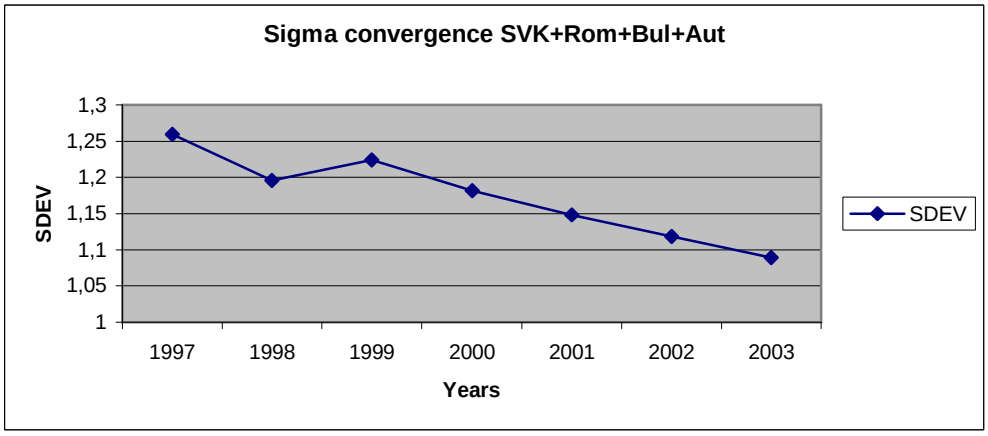
Figure 1 Absolute ß-convergence of Austrian, Slovak, Romanian a Bulgarian regions



Source: Self-processing.

Figure 2 points out at σ-convergence, but according to the Levens test we do not reject the equality of deviations and so we cannot unequivocally approve the σ-convergence.

Figure 2 σ-convergence of Austrian, Slovak, Romanian a Bulgarian regions



Source: Self-processing.
Legend: SDEV – standard deviation

Analysis of regional disparities reasons origin

Regional development of Slovakia, Romania and Bulgaria, as countries of former socialist block, was significantly determined by the transformation process, i.e. by transition to market economy. Transformation processes, which became new system changes holders, drew up not only new political, but especially new economic and administrative situation which affected regional development in these countries. Different starting positions at the beginning of the transformation process became a remarkable activator of regional disparities origin.

The second factor, that contributed deepening of interregional disparities, were economic changes in structure of economies connected with pointing up of differences in technical and social infrastructure equipment strengthen by specific geographic conditions of individual countries, which led to clear profiling of marginal and developing regions and so definitely to generation of social economic problems at certain areas. However, regional disparities emergence did not depend just on adaptive abilities of existed economic subjects, but also massively on localization factors for new investments, on qualitative characteristics and adaptive abilities of human potential and on infrastructure background being available in the region as well.

Reasons of origin and following deepening of regional disparities among regions are in Slovak Republic, Romania and Bulgaria, due to the common historical political starting point, very similar. The most developed regions in these countries are regions at capital cities surroundings, which steadily achieve the highest economic growth rates, lowest unemployment, biggest share of foreign direct investments and they reach the highest percentage of transport and technical infrastructure facilities.

The common threat for mentioned countries and their regions is becoming reversion to monostructural orientation of national economies with one economically strong centre, as a result of improper economic diversification. The reason of regional disparities origin lies also in uneven inflow of foreign direct investments to individual regions. At this place we would like to highlight that foreign direct investments could be an appropriate impulse for the economic development initiation, but they are not able to ensure its long-lasting sustainability. The take-off (initiative) impulses in order to become a long-term accelerator of regional development and so to lead towards diminution of regional disparities must come out of internal environment of individual regions. Priorities have impulses to human resources, education and R&D development, to civic society support, to development of various kinds of public-private partnership and cooperation, to the development of regional responsibility and cultural sources. So it is inevitable thus the less developed regions activate their own development potential and do not rely exclusively on help from state, European Union or other institutions.

Other group of factors, which led to the origin and deepening of regional disparities among investigated countries, is represented by so-called political factors. They

include first of all an instable political situation at the end of the last century 90ths in Romania and Bulgaria, a negative impact of political cycles concerned to blind short term decision-making of political representatives at all levels of public administration, without any linkage in accepted decisions and without any guarantee for their continuation after every government garniture changeover, and a low political awareness and responsibility of citizens as well.
Very important from the view of regional disparities origination in EU countries became last years especially migration of qualified workforce from less developed to highly developed regions. So-called brain drain has sharply weaken the development potential of individual regions and leads to deepening of back up enormous disparities among marginal and developed EU regions.

Conclusion

At the basis of analysis realized in the investigated countries by the means of selected social-economic indicators we identified the following main reasons of regional disparities origination and deepening among regions in Slovakia, Romania and Bulgaria: the transformation process from central planned economies to market economies, the monostructural orientation of economies which is unable to adapt at changing market environment, uneven inflow of foreign direct investments that could be an appropriate impulse for the economic development initiation, but they are no table to ensure its long-lasting sustainability, unstable political environment connected with blind short term decision-making of political representatives at all levels of public administration, without any linkage in accepted decisions and without any guarantee for their continuation after government garniture changeover, the low political awareness and responsibility of citizens, migration of qualified workforce from less developed to highly developed regions what sharply weaken their development potential and leads to deepening of regional disparities.

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Resume

Remission of social economic disparities among countries in global context of expanding European Union

On the basis of our analysis we identified the mean reasons leading to creation and deepening of regional disparities in Slovakia, Romania and Bulgaria. To those reasons belong: transformation of economy from central planned economy to market economy, monostructural orientation of the national economy, which do not allow the adaptability to changing market conditions, uneven inflow of foreign direct investment, which are suitable impulse for economic development off the region/country, but they do not enable its sustainable development, unstable political environment linked with short-sighted decision making process without continuity of political decision, low political awareness and responsibility of citizens, migration of qualified labor force from stagnant to developed region, what weakens development potential of regions and causes deepening of regional disparities