Evaluation of the impact of public support from the point of convergence criterion

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Abstract

The article deals with the ex post evaluation of the impact of drawing funds from operational programmes to achieve convergence in the field of tourism after the Czech Republic became a member of the EU. The evaluation of the achievement of convergence or divergence among regions is based on the beta and sigma convergence indicators which enable the evaluation of the development of time series of relevant indicators (in this case, indicators in the field of tourism). This evaluation was carried out within the regions brought together under NUTS II. The investigation is the result of evaluation indicators showing the achievement of convergence within the regions in only a few cases. Convergence was therefore not proven in all cases. In some cases, there was even a tendency towards divergence among the regions. In addition, the relationship between the aid granted and the annual growth of the chosen indicators was not achieved in all cases. This indicates that relevant local factors carry more weight and have a greater impact on an area than drawing support from EU funds.

Keywords: convergence, divergence, regional operational programme, EU subsidies,

Introduction

Every policy is associated with a specific goal it is trying to achieve. This is no different in the case of the regional policy of the European Union (EU). The objective of this policy is better viewed as a cohesion policy. To achieve cohesion among countries (and regions), it is necessary to set up mechanisms that encourage such cohesion. The EU links the question of cohesiveness with the process of convergence. For the programme period 2007 – 2013, the process of convergence was not only implicitly expected, but was also explicitly mentioned among its main objectives. As was the case in previous years, the effort to achieve convergence is the result of the general objectives of the EU, which is the reduction of regional disparities and disparities among citizens.

The aim of this article is to assess the situation in the Czech Republic in the tourism industry after the Czech Republic became a member of the EU and to assess the impact of subsidies in this area. The results of the assessment should either confirm or reject whether the convergence process among regions is a reality or not. The analysis is performed with the help of statistical indicators that are able to capture basic tendencies in the field of tourism in regions and compare the situation between regions. The state and development of tourism in the individual regions of the Czech Republic is and has not been unitary. It is therefore assumed that the achievement of convergence in this area is possible and that this can be captured and evaluated statistically.

Regional policy and the convergence objective

Since the 1990s, one of the central objectives of the policies of European countries at national and transnational level has been to develop and instigate mechanisms for achieving social cohesion. This cohesion results in the stability of the political system, provides security and generates economic performance. On the contrary, a lack of social cohesion, in other words weak social bonds and low solidarity within communities, may lead to increased pressure on expenditures from public budgets (Tuček et al. 2006).

To achieve convergence cohesion is required in three areas - economic, social and territorial. Two key concepts can be applied to meet this target, namely that of the concept of convergence and that of the concept of integration. These basic concepts are interrelated. Without the implementation of convergence, cohesion would be just a political concept. However, it is only possible to create cohesion through the creation of formal institutions and rules.

This brings us to specific policies, both at European and national levels. In these terms, regional policy has grown in importance with the ongoing process of enlargement. Regional policy generally focuses on the mitigation of the differences in development between regions of the EU member states. This reflects the aforementioned notion of convergence. Valášková (2013) states, that the aim of the implementation of cohesion policy in the regions in the first programme period (1989 – 1993) was economic and social cohesion and the reduction of disparities, which is often interpreted as support for the convergence of the European regions. Monfort (2008) adds, that, in particular, economic convergence is a major factor in the assessment of the effectiveness of the entire cohesion policy of the EU.

The need to achieve convergence among the regions of the EU is also evident from the formulated objective of the regional policy of the EU for the programming period 2007 – 2013, simply entitled “convergence”. This objective arises from a Communication of Commission (COM 2005), according to which the main objective is to promote convergence in order to achieve higher potential economic growth rates. This objective should be seen within the context of the EUs efforts to tackle the large disparities that exist within the Union due to its rapid expansion. The policy is also driven by the expectation that it will contribute to the competitiveness of the Union as the whole.

General approaches to convergence

Prior to evaluating the achievement of convergence it is necessary to define what is meant by convergence. However, this raises a fundamental issue because no specific definition of convergence exists. Nevima and Melecký (2011), state that the term is used in various forms dependent on the type of analysed problem. In general, convergence is associated with the reduction of differences between two or more variables over time. To a certain level it is therefore a process of approximation (differences in variables over time tend towards zero).

Minařík, Borůvková and Vystrčil (2013), highlight the original concept of convergence (late 1980s and 1990s) that was derived only for the area of economic growth. The approach was based on the neoclassical growth model, whereby poorer countries or regions tended towards faster growth than richer countries, which over time automatically led to the convergence of income levels or productivity per head (Barro and Sala-i-Martin 1992). This is the result of the flow of capital from those regions with high wages to regions with low cost labour, with work also moving in the same direction (Armstrong and Taylor 2000).

The process of convergence is very closely associated with the efficiency of economies (in terms of GDP and its evaluation over time). However, the process of convergence is not only bound to the performance of an economy. The concept and the idea of convergence can be transferred to other areas (Minařík, Borůvková and Vystrčil 2013). Some authors, for example, assess price convergence in connection with ongoing regional integration processes (Žďárek 2011), others relate the process to demographic indicators (Minařík, Dufek and Sojková 2009), and others still to food consumption in the tourism sector (Mak, Lumbers and Eves 2012).

Convergence as an indicator can be perceived in many forms. For example, convergence can be seen in both absolute or relative forms (Žďárek 2011). In absolute (unconditional) terms, convergence represents the process whereby economies converge in terms of the value of one (common) analyzed indicator (so-called steady state) regardless of the default status. In contrast, in relative (conditional, weak) terms, convergence represents a situation where countries with different initial indicator values approach each other, but do not achieve a single shared status. Relative convergence can be evaluated in the form of beta-convergence and sigma-convergence (Armstrong and Taylor 2000). The beta-convergence approach follows that of the aforementioned approach by Barra and Sala-i-Martina (1992), whereby poorer regions grow faster than richer regions.

The concept of beta-convergence is directly related to the neoclassical growth theory (Solow 1956), which makes two basic assumptions associated with productivity, in particular that capital is subjected to declining profitability. The growth process, which leads to improved economic standing, which is characterized by the growth rate, does not though only depend on the exogenous rate of technological development and the growth rate of labour. Diminishing returns implies that the growth rate of poor

countries should be higher and that their income (or GDP) per capita should catch up with that of the richer economies. This approach shows that there is a negative relationship between the growth in income per capita (over several decades) due to the level of income per capita in the base period (Armstrong and Taylor 2000).

This approach can be generalized on the basis of the assumption that the referenced units within a certain time interval approach each other when the units with low values in the initial period show faster growth than those units that have higher values in the initial period. The opposite of this process is divergence (Armstrong and Taylor 2000).

In contrast, sigma-convergence represents the more conventional approach to the measurement of inequalities. While beta-convergence focuses on capturing the potential catch-up processes, sigma-convergence works only with the appearance of disparities between individual searched subjects over the course of time. Both of these concepts are closely related. It is possible to conclude that beta-convergence is a necessity, but not an insufficient condition for the realization of sigma-convergence (Monfort 2008).

Armstrong and Taylor (2000) describe sigma-convergence as a simple measure of the variance in income per capita between regions at a specific time. It is possible to talk about convergence if the size of the scattering of income per capita between regions decreases over time. The approach can be expressed in general terms, whereby convergence is determined if the variability of the values of the searched variable (usually after logarithmic transformation), measured by standard deviation, systematically decreases over time. If this is not the case, there is talk of divergence (Minařík, Borůvková and Vystrčil 2013).

For both methods it is necessary to take into consideration that the results can be influenced by, for example, outlying units, which can skew the results. Another characteristic feature is the existence of a relationship between the two approaches. If the conditions for beta-convergence are met, then sigma-convergence applies. However, this does not apply vice versa; sigma-convergence can exist even without beta-convergence.

Methods of convergence evaluation

The concept of beta-convergence requires the verification of the initial and final values of selected variables. As a rule it is recommended to conduct a logarithmic step for the values, which can subsequently be used to eliminate asymmetric divisions and for the zooming in of outliers. For the selected variables, the geometric mean had to be determined according to the following relation:

$$\log \bar{k} = \frac{1}{n}(\log y_n - \log y_0), \qquad (1)$$

where:

$\bar{k}$ – the average growth coefficient of the variable unit over the reference period

y – the variable

n – the number of periods.

Part of the analysis was the construction of a plane graph where the x axis included the values $log\ y_0$ and the y axis corresponded to the values $log\ \bar{k}$. Once completed, it was possible to perform a linear regression to determine the convergence or divergence of the values.

The equation of linear regression with a dependent and independent variable was as follows:

$$log\ \bar{k} = \alpha + \beta\ log\ y_0, \qquad (2)$$

where:

α, β – parameters of the regression line

The equation was determined on the basis of the method of least squares. The essential tendency to convergence or divergence could be derived from the direction of the function. If the slope was negative ($\beta < 0$), the tendency was towards convergence, whereas a positive regression line ($\beta > 0$) showed a tendency towards divergence.

The regression line was then added to the index of determination in order to determine the significance of the convergence or divergence.

In the case of sigma-convergence the detection comes from all partial periods of the interval. Once again, it is recommended to take logarithms of the variables. On the basis of the prepared data, the standard deviation for each partial period could be specified. After the construction of the plane graph (the x-axis measured the time interval analysis, y-axis contained the calculated standard deviation over time) it was possible, on the basis of the progress of the generated curve, to determine convergence or divergence of the given indicators. If the curve showed a declining trend it could be concluded that the analyzed variables had converged. The opposite reflected the divergence of the variables.

Analysis of selected development indicators in the field of tourism

Analysis of drawing subsidies for the promotion of tourism

The analysis was focused on the evaluation of the impacts of investment in the area of tourism within the cohesion regions that fall under NUTS III and which could draw EU funds after acceptance by the Member States. Each of the cohesion regions support the area of tourism as well, but to differing degrees. On the whole it can be said that the investments focused on the development of tourism infrastructure and on marketing activities.

Analysis of convergence

The evaluation of the process of convergence or divergence in the regions after drawing down funds to support projects in the field of tourism can be performed through the evaluation of the development of selected indicators. The choice of indicators for this analysis took into account the partial goals relevant to the area of support targeted by the EU funds. These indicators are monitored by the Czech Statistical Office.

Another reason for selecting the chosen indicators was that they in essence describe the state of tourism infrastructure, including accommodation, across the various regions, as well as the success of a region in promoting tourism activities. The selected indicators were the:

- number of beds – the total number of beds for guests only; only beds serving tourists are included, occasional beds are not included;
- number of establishments – the number of collective accommodation facilities (an establishment must have at least five rooms and ten beds used for the purpose of tourism and which offers temporary accommodation to guests (including children) for the purpose of a holiday, trip, spa treatment, business trip, training, course, congress, symposium, children's school in nature, summer and winter children camps, etc.);
- number of guests - a guest in an accommodation establishment is a person (the owner/personnel living on site are not included) who uses the services of an accommodation establishment for their temporary stay.

All the regions of the Czech Republic were included in the analysis (with the exception of the capital, Prague) because they were all able to draw grants in support of tourism. The evaluation of convergence was performed on the basis of a comparison of development indicators for two periods – the situation prior to the Czech Republic joining the EU and after its entry in 2004. The process of convergence (divergence) was therefore studied for the time series 2004 - 2013 (or 2012, where the Czech Statistical Office was not able to provide newer data due to the transition to a new methodology for calculating the relevant indicator). This time series includes two operational programme planning periods, namely 2000 – 2006 and 2007 – 2013.

The aim was to compare basic development trends prior to the Czech Republic´s entry to the EU when there was no aid, and after its entry to the EU when subsidies to promote tourism were implemented. To evaluate the impact of aid, it was not sufficient to simply observe the current trend because this would only prove the actual situation (the actual convergence or divergence) and would not prove whether the current situation had arisen as a result of drawing down funds.

The basic requirement for the assessment of the impact of aid on the convergence/divergence of regions is a long enough time series that would enable the development trends for the selected indicators to be captured. A number of factors made it difficult to meet this requirement and therefore to perform and interpret the analysis. In 2013, the Czech Statistical Office carried out an extensive review of its data and decided to discontinue its continuous time series for any given year. Another sticking

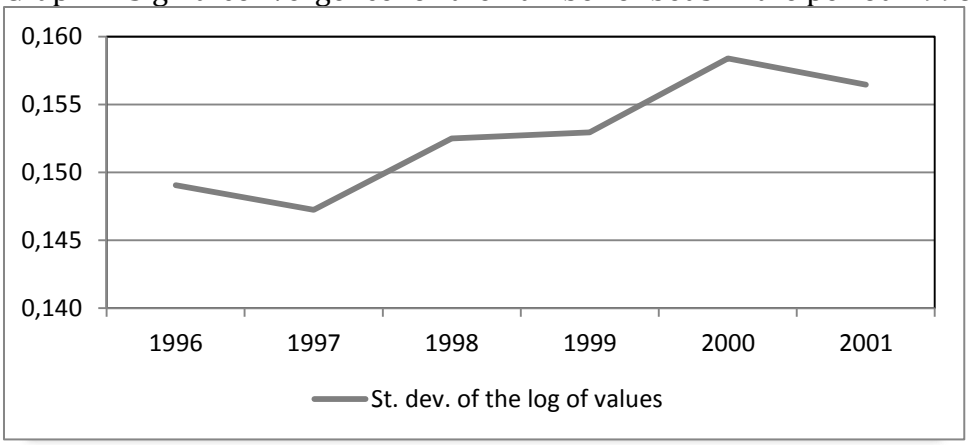
point was the short time series of values for indicators at regional level for the period prior to the Czech Republic´s entry to the EU. The regions in the Czech Republic, as they are today, were only formed in 2000, which reduced the comparative period prior to the country´s entry to the EU to a period of four years. In this context, the analysis of this period was considered for information purposes only and did not significantly interfere with the analysis and interpretation of the results.

For the analysis of the convergence/divergence process, data on the selected indicators were used that were retroactively generated by the Czech Statistical Office for the period 1996 – 2001. For the trend analysis of the selected indicators, outputs from statistical databases were used. The analysis results were further supported by an analysis of quarterly time series for the number of stays at accommodation facilities.

The data for the analysis were generated on the basis of both approaches for convergence measurement, namely beta-convergence and sigma-convergence. However, the interpretation and the conclusions drawn, taking into consideration the methods´ approaches to data analysis, were based on the analysis of sigma-convergence. The values of the examined data for the individual indicators revealed that during the course of the time series the process of convergence was not singular, i.e. during a particular reporting period there were tendencies towards convergence and divergence (see Minařík, Borůvková and Vystrčil 2013). The analysis of sigma-convergence reveals this development because the listed processes are evaluated throughout the entire reference period, whereas beta-convergence only uses the initial and final values of the explored data.

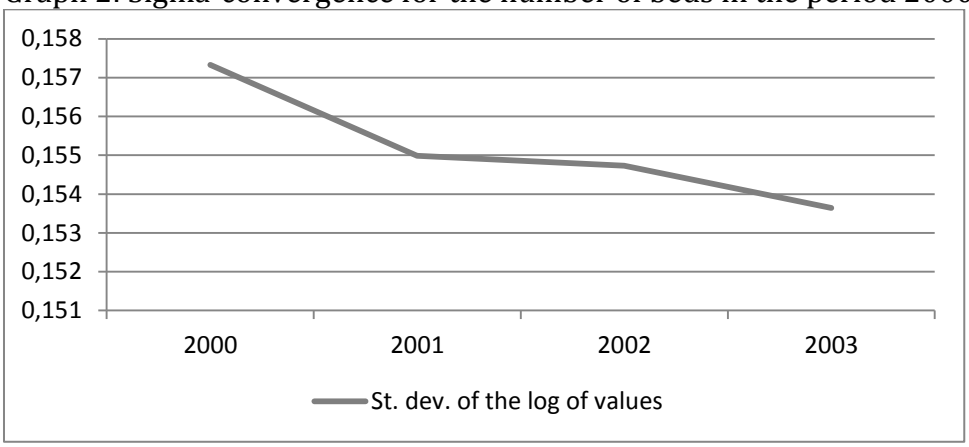
It is on the basis of the above stated problem with regards to the evaluation of beta-convergence, that it was decided to evaluate sigma-convergence. The individual results of sigma-convergence, based on the logarithmic calculations of the individual values of the selected indicators and the subsequent evaluation of the development of the standard deviations of the parameters, are presented in the following graphs. Graphs 1, 2 and 3 depict the development of the number of beds in accommodation facilities across individual regions.

Graph 1: Sigma-convergence for the number of beds in the period 1996 - 2001



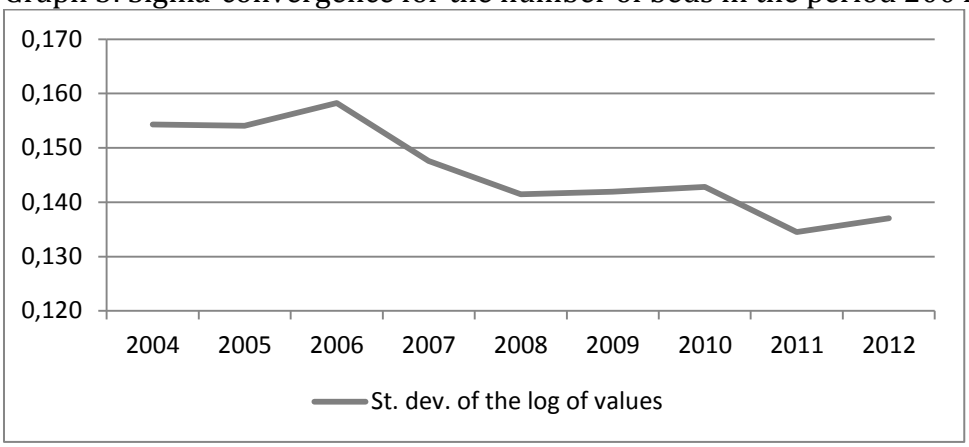
Source: Authors; Czech Statistical Office

Graph 2: Sigma-convergence for the number of beds in the period 2000 - 2003



Source: Authors; Czech Statistical Office

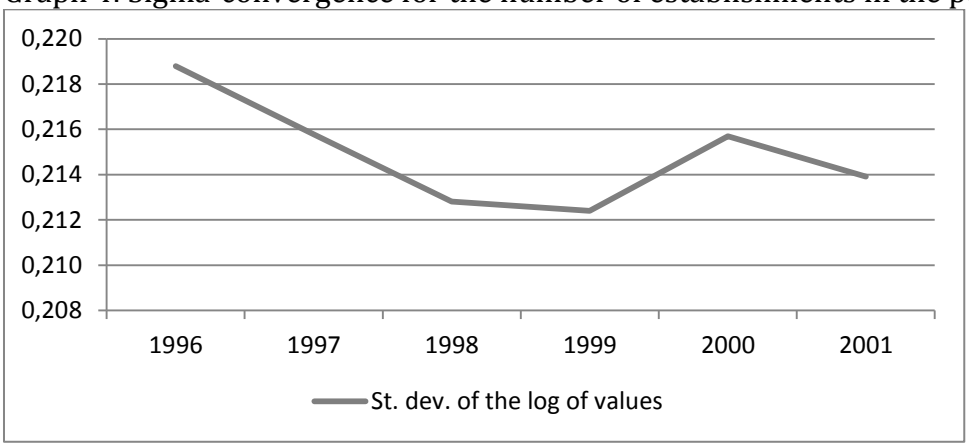
Graph 3: Sigma-convergence for the number of beds in the period 2004 - 2012



Source: Authors; Czech Statistical Office

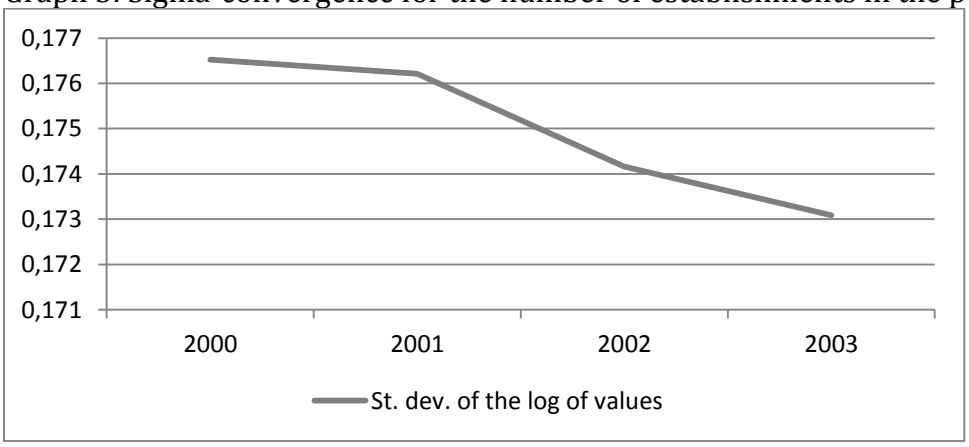
The analysis of the number of beds in the regions reveals through sigma-convergence that in the period 1996 – 2001 there was a tendency towards divergence (see Graph 1). After entry to the EU it is evident that the Czech regions began to promote themselves, resulting in the analyzed indicator showing a predominant tendency to converge (see Graph 3). On the basis of the development of this indicator (the number of beds) it could be concluded that European subsidies had a positive impact on the convergence of the regions in terms of the of the tourism industry (as mentioned above, Graph 2 is only for illustrative purposes to overcome the slack between the monitored periods). It is not possible to draw a similar for conclusion for the number of tourist facilities in the regions (see Graphs 4, 5 and 6).

Graph 4: Sigma-convergence for the number of establishments in the period 1996 - 2001



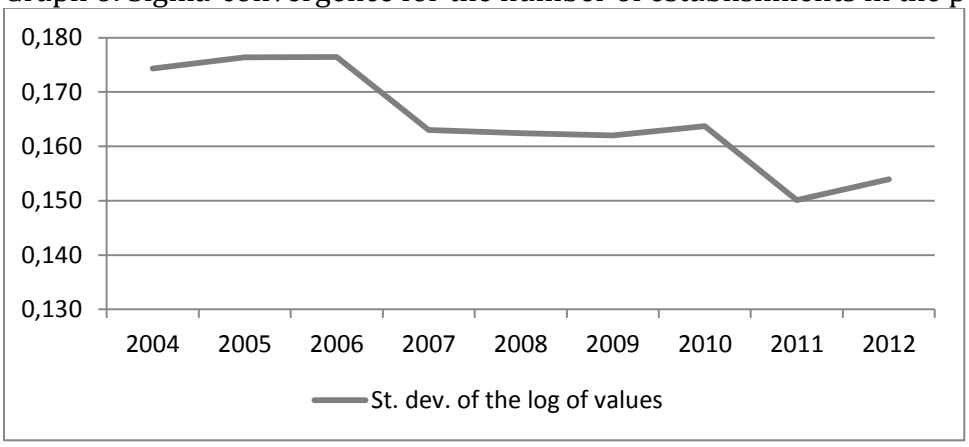
Source: Authors; Czech Statistical Office

Graph 5: Sigma-convergence for the number of establishments in the period 2000 - 2003



Source: Authors; Czech Statistical Office

Graph 6: Sigma-convergence for the number of establishments in the period 2004 - 2012



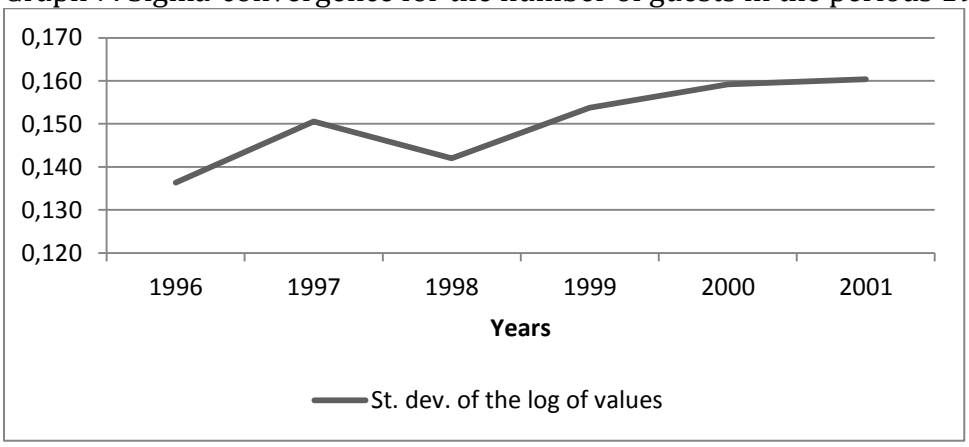
Source: Authors; Czech Statistical Office

According to the results, the sigma-convergence process confirmed the ongoing convergence among regions after the Czech Republic joined the EU; the regions started drawing funds from operational programmes targeting tourism (see Graph 6). However,

the strength of the convergence or divergence cannot be clearly established for the period prior to joining the EU (see Graph 4). Once again, it is important to point out that the period 2000 - 2003 (see Graph 5) is presented only for informative purposes because the values span a time discrepancy between the monitored periods.

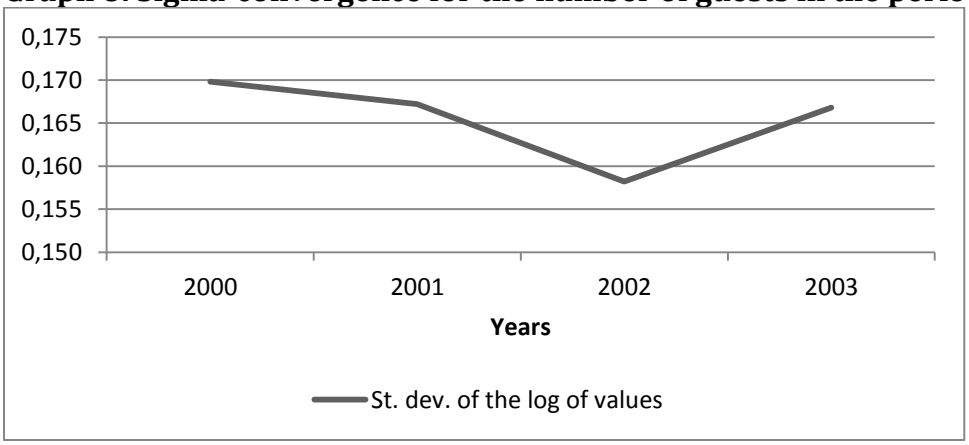
The evaluation was completed with an analysis of the last indicator i.e. the number of guests in the individual regions (see Graphs 7, 8 and 9).

Graph 7: Sigma-convergence for the number of guests in the periods 1996 - 2001



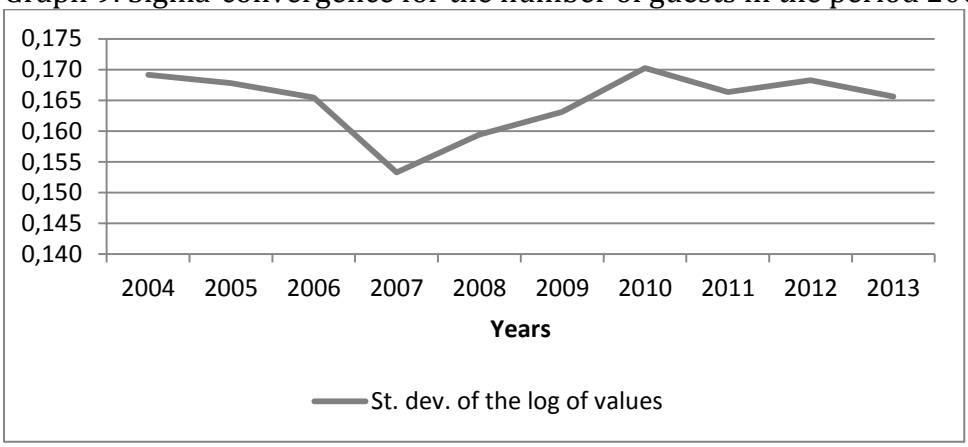
Source: Authors; Czech Statistical Office

Graph 8: Sigma-convergence for the number of guests in the period 2000 - 2003



Source: Authors; Czech Statistical Office

Graph 9: Sigma-convergence for the number of guests in the period 2004 - 2013



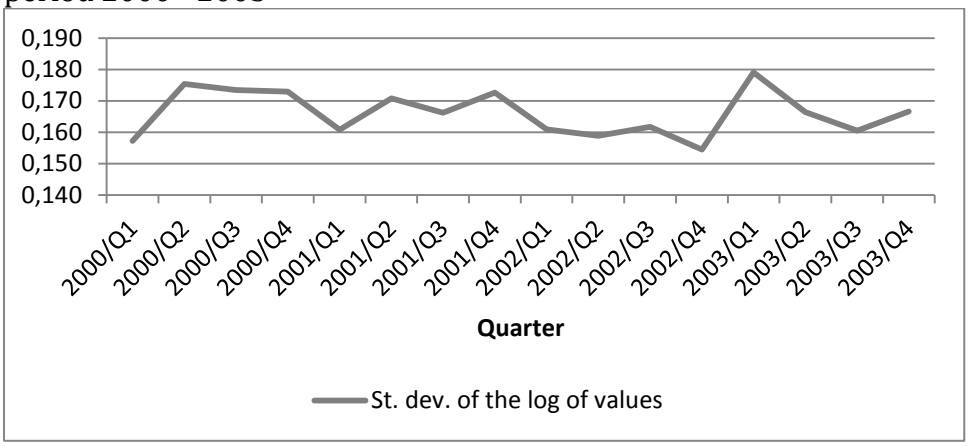
Source: Authors; Czech Statistical Office

In the case of the number of guests, the development trend for the period 1996 – 2001 shows a tendency towards divergence among the regions. After 2004 (see Graph 9), the indicator appears to show a tendency towards both convergence and divergence. It was therefore not possible to draw a conclusion about the two processes over the whole period under examination.

The annual data analysis showed only a limited convergence or divergence process among the regions of the Czech Republic in the field of tourism (see, for example, the ambiguous progress in the case of the number of guests in accommodation facilities). In order to provide further clarification, and in the knowledge that the Czech Statistical Office also provides data on a quarterly basis on bulk traffic accommodation and therefore the number of guests, an additional analysis was carried out. Two time periods were evaluated on the basis of these data, namely the period prior to the Czech Republic joining the EU (2000 – 2003), and the period after its entry (2004 – 2013).

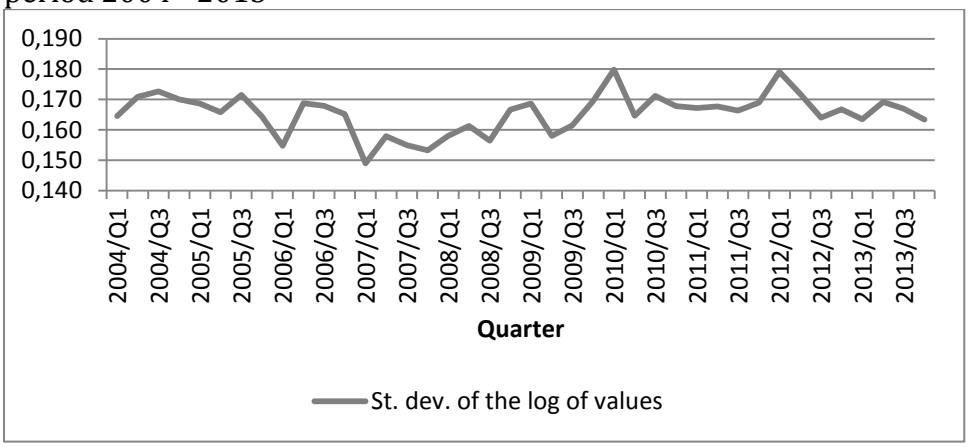
The data indicators for bulk traffic accommodation facilities were first examined in terms of the basic characteristics of the time series. The data showed strong seasonal fluctuations. For this reason the time series was adjusted to compensate for the seasonal variations. The indicators were then subjected to the analysis of convergence. The outputs of the sigma-convergence analysis for the quarterly data on the number of guests is presented in Graphs 10 and 11.

Graph 10: Sigma-convergence for the number of guests – quarterly time series for the period 2000 - 2003



Source: Authors; Czech Statistical Office

Graph 11: Sigma-convergence for the number of guests – quarterly time series for the period 2004 - 2013



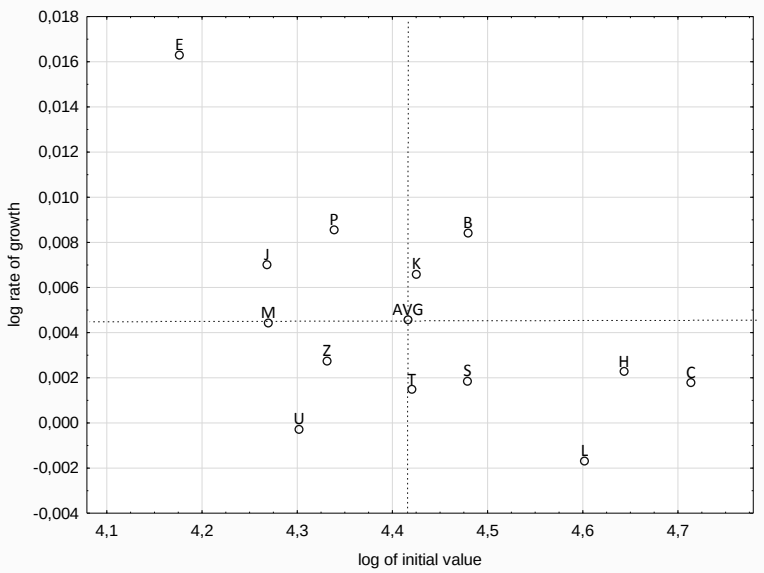
Source: Authors; Czech Statistical Office

The inclusion of the quarterly data allows comparisons to be made between the two consecutive periods. When comparing the graphs for the number of guests in accommodation facilities in the regions, it is possible to conclude that after the Czech Republic joined the EU, the disparities between regions stabilized over the course of time. In terms of convergence or divergence between the regions, the situation essentially remained unchanged. The standard deviation fluctuated at approximately constant values. The variability between the regions was therefore also constant.

The sigma-convergence only demonstrated the convergence process among regions for the indicator that reflects the capacity of the accommodation facilities after the Czech Republic joined the EU. The analysis was therefore supplemented with a beta-convergence analysis. The goal was to determine which regions had convergence or divergence tendencies. Beta-convergence in this case provided a broader view of the issue because it depends only on the initial and final values of the monitored indicators.

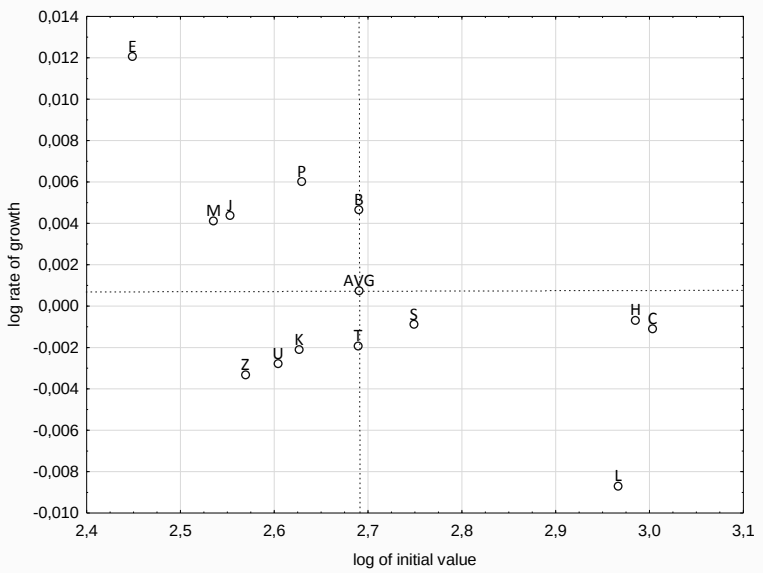
In this case, it is helpful to graphically represent the regions in a correlation diagram, whereby the area is divided on the basis of the average reference values (the initial values and the growth rate of the indicator over time). This gives rise to four quadrants. Those regions with a tendency towards convergence are situated in the second and fourth quadrants. These are the regions with a lower initial indicator value, but high growth over time, as well as those regions with a higher initial indicator value and slow growth over time. In contrast, those regions with a tendency towards divergence are situated in the first and third quadrants. If there is no evidence of either tendency, the monitored regions are more scattered across all four quadrants. Graphs 12 and 13 demonstrate the allocation of the regions with regards to the average values observed in the form of the geometric mean.

Graph 12: Correlation diagram for the number of beds in the period 2007 – 2013



where: B – South-Moravian Region; C – South-Bohemian Region; E – Pardubice Region; H – Hradec Kralové Region; J – Vysočina Region; K – Karlovy Vary Region; L – Liberec Region; M – Olomouc Region; P – Plzeň Region; S – Central Bohemia Region; T – Moravian-Silesian Region; U – Ústí Region; Z - Zlín Region; AVG – average value.
Source: Authors; Czech Statistical Office

Graph 13: Correlation diagram for the number of establishments in the period 2007 – 2013

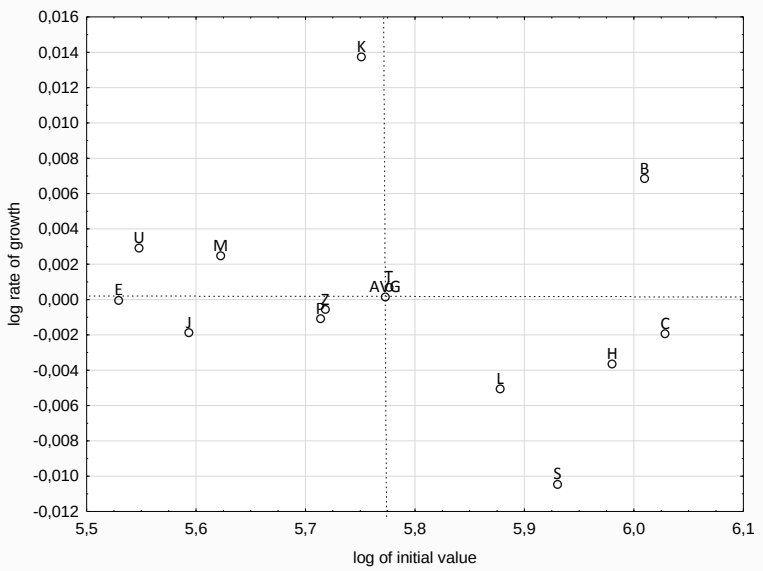


Source: Authors; Czech Statistical Office

The deployment of the regions in the correlation diagrams is similar in both cases (see Graphs 12 and 13). The convergence tendencies are associated with the predominant representation of the regions in the second and fourth quadrants. In this case, the deployment of the regions confirms the general characteristics of the individual regions. For example, the Pardubice Region (in the second quadrant) is struggling with a low level of tourism, however with the high annual increase in values it can be expected that this situation will gradually improve. Similarly, for example, in the programme document of the Moravian-Silesian Region for the period 2007 – 2013 it states that the tourism sector is insufficiently utilized, even though the potential of the region is considerable. The reasons for this are the low level of traffic and information infrastructure for tourism (especially in the border areas), the lack of supply of good quality services and products, and last but not least, the uncoordinated marketing efforts. The programme document also states that there are sufficient numbers of cultural, industrial and technical attractions, but that the funds are missing to modernize and increase the attractiveness of these monuments (see Office of the RC MS 2011).

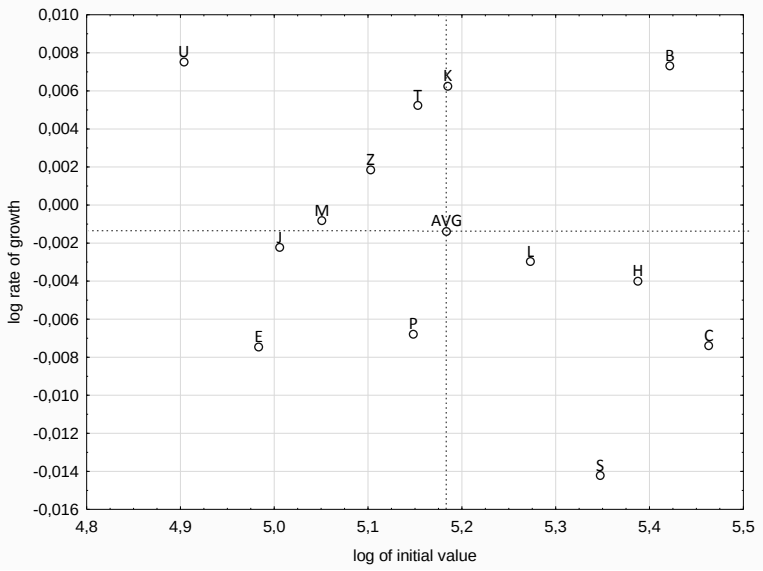
Graphs 14 and 15 are correlation diagrams which show the deployment of the regions with regards to the number of guests in accommodation facilities during the period 2007 – 2013 on the basis of an annual and quarterly time series.

Graph 14: Correlation diagram for the number of guests in the period 2007 – 2013 – annual time series



Source: Authors; Czech Statistical Office

Graph 15: Correlation diagram for the number of guests in the period 2007 – 2013 – quarterly time series



Source: Authors; Czech Statistical Office

In both cases, the ambiguity of the tendency towards convergence or divergence was demonstrated by the high dispersion of each region around the average value of the reference indicator. The diagrams also allow us to track those regions that have a tendency to contribute towards convergence in the field of tourism and those regions with the opposite tendency.

Evaluation of convergence at regional level

Achieving convergence among the regions (or even in certain areas) is not automatic. Nevima and Melecký (2011) conducted research to determine whether convergence had been achieved under NUTS II in the Czech Republic, Hungary, Poland and Slovakia. According to their findings, convergence between many of the regions was confirmed. However, they also found evidence that a process of divergence had also been initiated.

The analysis in this article was made on the basis of the assessment of statistical indicators which describe the developments in the Czech Republic (with the exception of the capital, Prague) in the field of tourism after the country joined the EU. After 2004, each of the given regions drew funds for support for various areas of tourism. The goal of these subsidies was to directly fulfil the defined objective of "convergence".

The evaluation through sigma-convergence showed a tendency towards building the infrastructure for tourism. With regards to the attendance of the regions, there was little evidence to show whether there was a process of convergence or divergence.

The evaluation also set out to determine what the direct impact of drawing down funds from operational programmes has had in the area of tourism. The situation was therefore examined in the periods both prior to, and after, aid programmes were initiated. The evidence shows that a change in the trend was only recorded in selected cases.

Smrčková, Vlček and Cvengroš (2008) asked the question: What actually determines the success of convergence? They suggest that the source of failure to converge may lie in a certain inefficiency in national cohesion policies (e.g. interconnection of incentives, the absence of regional policy with clearly defined objectives, etc.). The failure at regional level can also be associated with the inadequate restructuring of the local economy or with the inability to effectively draw and make use of structural funds. Investments in infrastructure are an essential condition for development, however this may not be sufficient for the development of more distant regions. Successful convergence does not depend on the volume of released funds, but more significantly on the environment into which these resources flow.

The impact on convergence from the findings depends on the period for which the convergence was proven. Within this context we can refer to the findings of Rodrígues-Pose (2000), who notes that regional development is a process, which is reflected, in particular, over the long term. However, the level of economic development of regions is all too often assessed over the short term. For this reason, it is not therefore possible to uncover all the possible future impacts on local economic activities or economic growth. It is therefore necessary to be careful when drawing conclusions with regards to the evaluation of the achievement of convergence.

Conclusion

The aim of this article was to analyse the process of convergence i.e. the process through which the EU seeks to achieve coherence among individual states and regions. The process of convergence requires cohesion three areas - social, economic and territorial. For analysis purposes the situation surrounding tourism was chosen because it was supported by means of subsidies from EU operational programmes under NUTS II which were focused on developing cohesion among regions.

The convergence of the regions was only recognized in particular cases. For example, in the Pardubice, Plzeň and Vysočina regions it was not possible to enumerate according to the number of beds or the number of establishments, which is an indication of the high increment in the searched variables. In contrast, the South-Bohemian, Liberec, Hradec Králové and Central Bohemia regions, which can be considered as developed, showed slow-downs in growth and the same trend in the number of guests (the Ústí and Olomouc regions indicated rapid growth in this case).

In some cases the analysis did not clearly confirm the achievement of convergence. For example, on the basis of all three chosen indicators, the South-Moravian Region overtook the other regions due to its high initial value and high growth. In contrast, the Zlín and Ústí regions fell behind in terms of the number of beds and the number of establishments, as did the Pardubice Region in terms of the number of guests.

These conclusions confirm the results of other authors, i.e. it is not possible to empirically connect the instruments (subsidies) with the aim (convergence). On this basis, it is therefore necessary to establish which factors can start the process of convergence. If the answer to convergence is linked to drawing funds from EU programmes, it is necessary to take this into consideration.

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