Looking for the evidence of socio-economic convergence within the European Union

Artan QINETI[1], Eva MATEJKOVÁ[2], Miriam PIETRIKOVÁ[2],
Roman SERENČEŠ[1], Marián TÓTH[3], Marek DVOŘAK[4]

[1]Department of Economics, Faculty of Economics and Management,
Slovak University of Agriculture, Nitra, Slovak Republic
[2]Department of Statistics and Operation Research, Faculty of Economics
and Management, Slovak University of Agriculture, Nitra, Slovak Republic
[3]Department of Finance, Faculty of Economics and Management, Slovak
University of Agriculture, Nitra, Slovak Republic
[4]Academy of Public Administration, Prague, Czech Republic

Abstract: The purpose of this paper is to analyze the evidence and impact of the EU integration between 1999 and 2009 on the EU regional economic growth and the socio-economic convergence. A regional convergence analysis is performed in order to examine if the EU overall aim of convergence is reached. The main growth- and convergence theories are used as the theoretical framework and form the study's hypothesis. The results show that an absolute β-convergence exists between the EU member states as well as regions. However, the σ-convergence is not confirmed, meaning that that the disparities between the regions are rather increasing than decreasing. Perhaps a possible reason why the σ-convergence does not occur at the EU level is that it is easier for smaller regions which are more similar to each other to converge than for larger regions which tend to be more dissimilar to each other. This reasoning is in line with the convergence theories which state that smaller regions within a country are more likely to converge towards each other in the absolute sense than countries. On the other hand, the EU countries and regions tend to convergence in the tasks like unemployment rate, showing that they are not successful in resolving this difficult task. One of the main reasons of the high unemployment in all EU member states is their structural problem in the respective economies, consequently reflected in the long-term unemployment. The EU countries tend to convergence in terms of inequality as well, showing that they are egalitarian in character.

Key words: convergence, European Union 27, GDP capita, unemployment, inequality, CEEC

In 2007, the Inner London had the Regional GDP per 1 inhabitant 6 times larger than the Dytiki Ellada region in Greece (Eurostat 2010a). This difference exists even though Greece has been a member of the EU since 1981 and has received funding from the EU Cohesion Policy to reduce the regional disparities for several periods (Eurostat 2010b). If we turn to the newly accessed countries, the disparities in the EU become even clearer. The Severozapaden in Bulgaria has the GDP per inhabitant 13 times smaller than the Inner London. In other CEEC like the Czech and Slovak Republic, the regions around the capitals Prague or Bratislava produce the GDP per capita at the 120% level of the EU-27 average while the rest of the country produces the GDP/capita just above the 50% of the EU average. This illustrates the large regional economic disparities within the Community which the EU seeks to reduce through its Regional Policy (Bielik et al. 2007; Hrabánková et al. 2009; Berlin and Johansson 2010; Eurostat 2010a).

The question is if the persistent, although relatively smaller disparities between, for instance, the Inner London and the Dytiki Ellada indicate a success or a failure of the EU policies. Regional disparities exist in the developed member countries, too (López-Bazo et al. 1999; Giannetti 2002; Rice and Venables 2003; Fu 2004). This paper tries to analyze the evidence of convergence/divergence from the aspect of the selected socio-economic indicators, in the context of the EU that has changed remarkably seven years after its biggest wave of enlargement and in spite of the persistent global economic crisis.

MATERIAL AND METHODS

Economic development is determined by the country's capacity to exploit and organize local resources (environmental, economic, physical and human) and to attract new resources and activities into the country.

The factors that generate this capacity and determine the country's development path and well-being are often built- in to a single indicator – the growth of its per capita output or income. This allows for an analytical modeling of the development path and it is often made through the growth theories. One of the most accepted definition of growth by the present-day theories and models of regional growth state that growth is an increase in a region's real production capacity and its ability to maintain that increase (Capello 2007). The most commonly used measures of the regional growth are the growth of output, the growth of output per 1worker and the growth of output per capita. The most appropriate measure to use depends on the purpose for which the measure is to be used (Armstrong and Taylor 2000). Even though there is no single framework that captures the underlying foundations and reasons of economic growth, there are exogenous and endogenous models considered and applied by most researchers (Howitt and Weil 2008). Policy makers are interested in knowing which factors are the most important determinants of the regional per capita income levels and how the low income regions can be best helped to catch up with the high-income regions, hence the question is how to generate a process of convergence (Armstrong and Taylor 2000). Since one of the primary goals of the EU integration is the convergence of the regional income per capita (as well as other socio-economic indicators) the meanings and outcomes of the underlying economic growth- and convergence theories are of high importance (Ederveen et al. 2003).

Neoclassical (exogenous) vs. endogenous growth theory

The neoclassical growth theory, developed by Solow and Swan in 1956 (Berlin and Johansson 2010), is one of the most important growth models which are based on the process of capital accumulation. It assumes that the economy is competitive, in the sense that the factors are paid according to their marginal products, and also that the factors are quickly able to be reallocated so that they are employed in their most productive use. The theory is based on the law of diminishing productivity which implies that holding one factor as constant, e.g. capital, then the greater the level of the variable factor, e.g. labor , the lower its the marginal product. The theory consists of three elements: the production function expressed in the per capita terms, the link between savings and growth in capital and the required investments to keep the capital-labor ratio constant given the depreciation rate

and the rate of the population increase (Dornbusch et al. 2008). The economy reaches a steady-state when the savings and the required investments balance with the steady-state capital. In this model, the process of growth occurs when the capital per head is increasing, which occurs when the savings exceed the investments requirements. This implies that the economy moves to the right until it reaches the point of the steady state where the output and capital per head are constant and the aggregate income is growing at the same rate as the population, hence the steady state growth rate is not affected by the savings rate. However, an increase in the savings rate will in the long-run raise the level of output and capital per head. On the contrary, an increase in the population growth reduces the steady state level of capital and the output per head and increases the steady state growth rate of the aggregate output. By allowing technology to improve over time, we can obtain the growth of output and capital per head in the long-run even once the economy has reached its steady state. An exogenous increase in technology causes the production function and the saving curve to rise. Thus the steady state growth rate of the aggregate output is determined by the rate of technological process (Dornbusch et al. 2008).

The endogenous growth theory was developed in the late 1980s, since the dissatisfaction with the neoclassical growth theory had arisen on both theoretical and empirical grounds (Dornbusch et al. 2008). It can be understood as an extension to the neoclassical growth theory, since it argues that the technological process is itself determined by the growth process (Ederveen et al. 2003). While the neoclassical theory leaves out the identification of the causes of technological progress, the endogenous growth theory focuses on the determinants of the technological progress that enhance the long-run growth (Dornbusch et al. 2008). This is done by broadening the concept of capital to include the accumulation of human capital (Mankiw et al. 1992). The endogenous growth theory was developed by Romer (1986) and Lucas (1988), where growth is endogenously generated by the process of knowledge accumulation. The basic idea of the theory is to modify the production function in a way that allows for the self-sustaining (endogenous) growth, so that the function obtains the constant marginal product of capital. This implies that both the savings and the production curve become straight lines and the savings will always be higher than the required investments (Dornbusch et al. 2008). The implication of the endogenous growth model is that the countries or regions that save more will have a higher growth rate and the differences in income between them can

persist indefinitely, even though they have the same saving and population growth rates (Mankiw et al. 1992). In the endogenous growth theory, the engine of growth is the technological progress, therefore the differences in the long-term economic growth can be explained by the differences in the efforts to generate or adapt the knowledge on new technologies (Ederveen et al. 2003; Ciaian et al. 2008). The extended version of the neoclassical model emphasizes the importance of human capital as a critical factor in determining the productive capacity of the economy. Furthermore, it points out that a region's ability to create or absorb technical progress is not simply a matter of investing into the physical or human capital, but it is also determined by its institutional environment. The knowledge-rich regions will be generated in an institutional environment that promotes the creation and transmission of new ideas. These regions will increase their technical knowledge which will be transformed into new products and new methods of production. As a result, regional disparities exist due to the institutional environmental differences. In this sense, some regions are more able to generate their own technical change, hence some regions are able to produce (endogenous) technical progress within the region while others acquire their (exogenous) technical progress through the purchase of new capital equipment from other regions. This difference between the (endogenous) technical progress and the (exogenous) technical progress in determining the labor productivity is translated into an environment investing in human capital and R&D and creating a network where new ideas can easily be created and transmitted. Such an economy will grow faster than an economy that is only relying on the components of the left hand side, i.e. investing into new capital (Armstrong and Taylor 2000).

Convergence vs. divergence

Theories of convergence and divergence are theories which examine the reasons for diminishing or increasing the disparities between rich and poor regions, and theories which, in the case of divergence, explain the persistence of such disparities. Economic growth theories are often associated with the processes of convergence or divergence (Capello 2007). The most important implication of the neoclassical model is that if two countries or regions have the same rate of population growth, the same saving rate, and access to the same production function and technology, they will eventually reach the same level of income. However, if their saving rates differ, they will reach different levels of income but have the same steady-state growth rates (Dornbusch et al. 2008). This means that the neoclassical growth theory predicts that a process of convergence will take place between countries and regions. The process of convergence will occur through a process of the regional factor allocation and migration. Specifically, the law of diminishing productivity implies that if the ratio is high, the quantity of capital will be high relative to the quantity of labor employed, the marginal product of capital will be low and the marginal product of labor will be high. This can be translated into a situation where there is a country consisting of two regions, region A and region B, in which this ratio is higher in the region A than in the region B. Let us assume that the labor abundant region is poorer than the capital abundant region. In such situation, the marginal product of capital will be higher in the region A than the marginal product of capital in the region B; similarly the marginal product of labor will be higher in the region A than in the region B.

Since the factors are mobile in the neoclassical growth theory, the capital will migrate from region A to region B, and labor will migrate from region A to region B in order to earn higher factor rewards. This process is illustrated in Figure A2 and will continue until the ratios are the same in both regions. This process implies that the marginal products of both mobile factors will increase and therefore the aggregate national output should increase (McCann 2001). Two types of convergence are identified, firstly the absolute convergence which implies that poorer countries or regions tend to grow faster per capita than the rich ones and conditional convergence which implies that an economy grows faster the further it is from its steady state value, regardless if it is poor or rich (Barro and Sala-i-Martin 2003). The endogenous growth model is not designed to explain why different economies grow at different rates. The model cannot predict convergence between the countries or regions, since a region's production function allows for a self-sustaining endogenous growth (Mankiw et al. 1992). The model can, on the other hand, explain the sources of divergence. Since the model assumes that technology makes technology, a poor economy will stay poor because it lacks the ability to invent and to adapt new technologies while rich countries at the technological forefront find it easier to invent and to adapt new technologies, thus increasing their lead (Ederveen et al. 2003). In the new economic geography approach, a concentration of economic activity facilitates the transmission of knowledge and innovations. This implies that economic centers grow faster than other types of regions and the

disparities between them can increase (Gullstrand and Hammarlund 2007).

EU-integration and convergence

Keeping the economic growth theories and their connection to convergence/divergence in mind, we now examine the effect of the EU – integration on regional disparities and shed light on the question what is its impact on the process of convergence. The original neoclassical regional growth will depend on the changes in the regional factor stocks and the level of regional technology, and since the factors are mobile, there will be no long-run differences in the growth-rates of factors across regions. Since regions are more open to each other than countries are, when it comes to mutual regional trading relationships and factor mobility, areas that are undergoing economic integration, such as the EU, should be experiencing a process of one-sector regional economic integration. This integration allows for one-sector reallocation of factors across the EU, as well as some potential regional trade and capital effects. This implies that in the long-run, all regional production functions will tend to converge and over time the EU should observe a tendency towards regional convergence (McCann 2001). There are, however, theories arguing that a greater integration would rather lead to the regional divergence. Krugman (1993) argues that a larger capital and labor mobility instead leads to divergence in both the economic structure and the growth rates of regions. Bertola (1993) also argues that the capital and labor mobility generates a regional divergence, since capital and labor tend to migrate towards the more prosperous and competitive regions. Irrespective of whether or not the EU-integration does eventually generate a process of convergence without the support of well tailored policies, these forces of convergence will act slowly and will need all the help they can get, possibly through a regional policy such as the EU Cohesion Policy (Armstrong and Taylor 2000). The neoclassical model predicts that if a region spends a continuous stream of cohesion support on public investment, then its steady state level of per capita GDP increases, hence the support can increase the region's level of per capita GDP. In the endogenous growth models, policy interventions can make a difference since they can stimulate the growth of the knowledge intensity of the labor supply and knowledge production in the form of R&D (Karlsson et al. 2001). In the endogenous growth theory, a higher level of knowledge creates new knowledge which enhances higher growth rates. Therefore, it is possible to affect the growth by an intentional investment in R&D, and regional policies that increase the population's level of education could lead to a higher growth performance. According to the endogenous growth theory, an improvement in such areas as the development of SME, infrastructure, human resources and R&D, as well as capacity building, could increase the region's growth rate (Gullstrand and Hammarlund 2007). As for the new economic geography theory, according to Braunerhjelm et al. (2000) specialization and reallocation of economic activity within Europe should not necessarily lead to the geographic concentration or regional inequality. But if there are sufficiently large gains from the agglomeration, more free European markets could lead to the geographic concentration and polarization (Ederveen et al. 2003). The neoclassical growth model leads us to the hypothesis that the policies at the EU or national level would promote economic growth as they increase the rate of investment in physical capital.

In this paper, we examine if there has been any convergence between the EU countries/regions between the years 1999–2009. This analysis is performed at the national NUTS 1 level as well as at the regional NUTS 3 level. Two kinds of convergence theory models are used; the σ-convergence and the absolute β-convergence (Sala-i-Martin 1996). The absolute β-convergence occurs when β is negative. This implies that poor economies tend to grow faster than the rich ones. The σ-convergence occurs if the dispersion of the economies' real per capita GDP levels tend to decrease over time. It is important to note that the existence of β-convergence is a necessary condition for σ-convergence. In the case of similar economies such as regions within a country, it is more likely to find the absolute β-convergence as well as the σ-convergence. This is the reason why this paper is more likely to find the absolute β-convergence rather than the σ-convergence. The σ-convergence has been tested also in analyzing two other socio-economic indicators: unemployment and social inequality (GINI coefficient) at the NUTS 1 level. The observations are collected at the national NUTS 1 level (GDP/capita, unemployment, GINI coefficient 1999–2009), as well as at the regional NUTS 3 level from the EUROSTAT (regional GDP/capita 2001–2008). The quality of the data from the EUROSTAT can be questioned; the alternative data sources could have been used in order to obtain more reliable results. The EU consists of 27 Member States but our analysis has been performed at the NUTS 3 level as well, including the data from 1597 EU regions. Testing if the poorer regions are growing faster than the richer ones, we have used the abso-

Table 1. Regression results from OLS estimation of the absolute (β-convergence)

Statistics	EU 27 Member States (1999–2009)	EU 27 Regions – NUTS 3 (2001–2008)	CEEC Regions – NUTS 3 (2001–2008)
α	3.59 (13.5)	2.84 (66.77)	2.66 (15.37)
β	−0.33* (−11.5)	−0.26* (−60.10)	−0.24* (−11.23)
F–value	133.2	3 613.33	126
R^2	0.91	0.83	0.56
N	28	1 597	273

*Statistically significant at 5% level

lute β-convergence model (see equation 1 used to estimate the absolute convergence; Gullstrand and Hammarlund 2007; Berlin and Johansson 2010):

$$\ln\left(\frac{Y_t}{Y_{t-T}}\right)_i = \alpha + \beta \ln(Y_{t-T})_i + \varepsilon_i \qquad (1)$$

where:

$\left(\dfrac{Y_t}{Y_{t-T}}\right)_i$ = GDP per capita growth between 1999–2009 in the EU Member States where Y_t is the GDP per capita in 2009 and Y_{t-T} is the initial GDP per capita in 1999. (Analogically we have performed the convergence analysis for the EU at the NUTS 3 level where indicators like the regional GDP per capita growth between 2001–2008, the regional GDP per capita in 2008 and the initial regional GDP per capita in 2001 were taken in consideration)

α = constant

β = convergence coefficient: indicates the existence and speed of convergence

A negative β indicates β-convergence between the EU states or the EU regions, meaning that the states/regions with an initially lower GDP/capita tend to grow faster than the states / regions with a higher initial GDP/capita

The σ-convergence: testing if the dispersion of the economies' real per capita GDP levels (at the EU NUTS 1 and the NUTS 3 level) tend to decrease over time. Analogically it has been used to test convergence in two other socio-economic indicators unemployment and inequality (GINI coefficient) at NUTS 1 level.

σ = standard deviation of $\ln(Y_{t-T})_i$; the σ-convergence occurs when $\sigma_{t-T} > \sigma$. In other words, if the dispersion of GDP per capita is larger at time $t − T$ than at time, t we have the σ-convergence, meaning that the variance of GDP per capita decreases over the years and the disparities between the regions are decreasing (Sala-i-Martin 1996; Gullstrand and Hammarlund 2007; Berlin and Johansson 2010).

RESULTS AND DISCUSSION

There are two ways of measuring convergence, the β-convergence and the σ-convergence (implemented in this article). The absolute β-convergence occurs when β is negative. This implies that poor economies tend to grow faster than the rich ones. The σ-convergence occurs if the dispersion of the economies' real per capita GDP levels tend to decrease over time. It is important to note that the existence of β-convergence is a necessary condition for the σ-convergence. In the case of similar economies such as regions within a country (or a group of countries), it is more likely to find the absolute β-convergence as well as the σ-convergence. In our paper, we have estimated the absolute β-convergence (Sala-i-Martin 1996). Testing if the poorer regions of the European Union are growing faster than the richer ones (see equation 1 above), we used to estimate the absolute convergence (Gullstrand and Hammarlund 2007; Berlin and Johansson 2010).
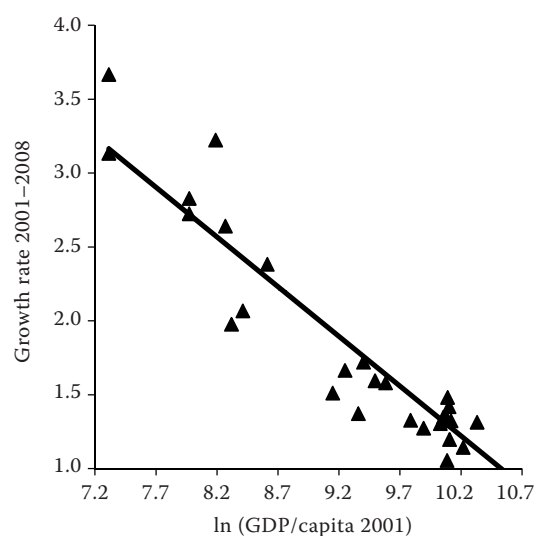

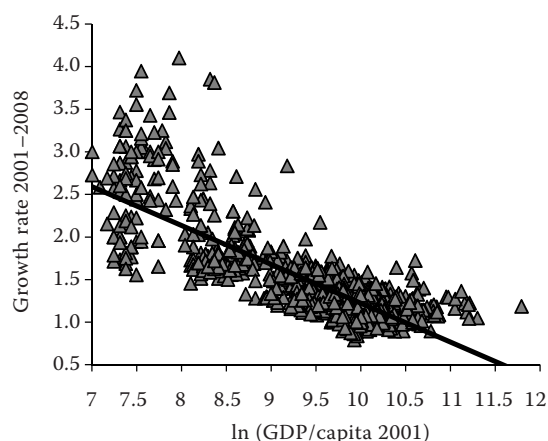Figure 1. Growth rate vs. the initial GDP/capita in EU 27 member states

Figure 2. Growth rate vs. the initial GDP/capita in the EU 27 regions (NUTS 3 level)
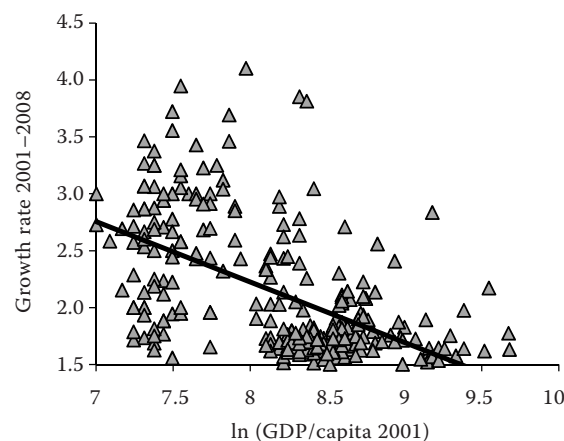

Figure 3. Growth rate vs. the initial GDP/capita in the EU regions from the CEEC (NUTS 3)

As can be observed in Table 1, a negative β is observed at both the country (NUTS1) level and regional (NUTS 3) level. These values are only statistically significant at the urban area level. This implies that we can conclude that there has been a process of convergence between the EU member states during the period 1999–2009, confirmed at the regional level in 2001–2008. The same is observed for the Central and Eastern European regions.

In the Figures 1, 2 and 3, the development of the growth rate versus the GDP per capita is presented. The log of the GDP per capita for 1999 (in the cases of the regions NUTS 3, it is used the period 2001) is depicted on the horizontal axis while the growth rate of the per capita GDP between 1999–2009 (in the cases of the regions NUTS 3, it is used the period 2001–2008) is depicted on the vertical axis. The regression result indicates that the estimated speed of convergence β is negative. Thus the slope of the regression line is negative, both at the country level and the regional area level. From the convergence perspective, this is positive. Since the regions with the initially lower GDP are growing faster than the richer ones, it means that they tend to grow towards equal levels. Therefore, the β-convergence occurs. The value is statistically significant at all levels, meaning that we can only conclude

that the β-convergence occurs at the country and regional level both in EU and the CEEC.

However, this is not such a straightforward story. According to Table 2, the requirements for the σ-convergence does not hold, neither on the EU member states level, nor on the regional level, since σ_{t-T} is smaller than σ_t, meaning that the standard deviations for 1999 are smaller than the standard deviations for 2009 at the EU member states level. The same is observed in the cases of the EU and the CEEC regions at the NUTS 3 level, as the standard deviations for 2001 are smaller than the standard deviations for 2008.

Figures 5 and 6 show the dispersion of the GDP per capita where the years 1999–2009 (in the cases of the regions NUTS 3, it is used the period 2001–2008) is depicted on the horizontal axis, while the growth rate of the per capita GDP between 1999–2009 (in the cases of the regions NUTS 3, it is used the period 2001–2008) is depicted on the vertical axis. It is obvious that the dispersion between both the EU member states and its regions has been increasing during the analyzed period. This means that there is no sign of the σ-convergence and that the disparities between the regions are rather increasing than decreasing. An interesting phenomenon is the cyclical pattern

Table 2. Descriptive statistics of GDP/capita (σ-convergence)

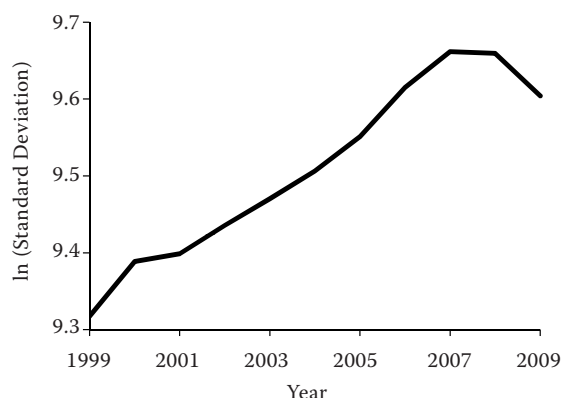|	ln (Mean)	ln (Std. Deviation)	$\sigma_t - \sigma_{t-T}$
EU Member States in 1999	9.65	9.32	
EU Member States in 2009	10.04	9.60	+0.28
EU Regions (NUTS 3 level) in 2001	9.86	9.27	
EU Regions (NUTS 3 level) in 2008	10.07	9.37	+0.10
CEEC Regions (NUTS 3 level) in 2001	8.36	7.87	
CEEC Regions (NUTS 3 level) in 2008	9.03	8.41	+0.54

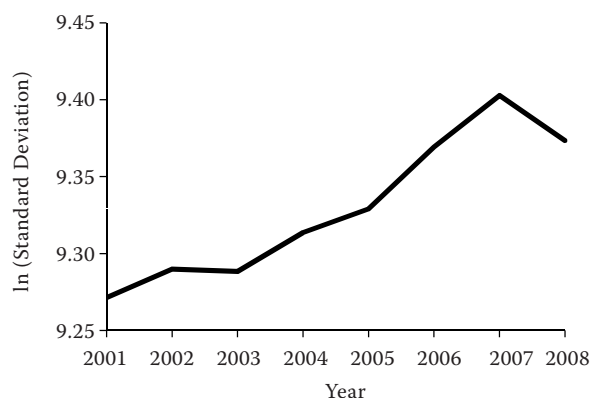Figure 4. Dispersion of GDP/capita in the EU 27 member states

Figure 5. Dispersion of GDP/capita in the EU 27 regions (NUTS 3 level)

in the diagrams which shows that the dispersions increase when the economy is expanding, while the dispersions decrease in recessions. Between 2008 and 2009, the global economy entered the recession due to the crisis in financial market. As a resul, the EU countries experienced a recession, as can be seen in the Figure 4 and 5, the dispersion of the per capita GDP decreased between these years. Meanwhile the dispersion of the per capita GDP increased between the 1999–2007, when the economy was expanding and decreased again in 2007, when the growth rate was slowing down. This indicates that the profits that the economy experience in prosperous business cycles does not reach the most disadvantaged regions. Hence, the distribution of income becomes unequal when the economy as a whole is improving. The same is observed for the EU NUTS 3 regions, as the per capita GDP decreased between years 2007 and 2008, while the dispersion of the per capita GDP increased between 2001 and 2006. The CEEC regions show no sign of decreasing dispersion of growth in the GDP per capita, maybe a sign that they have been affected by the global crisis to a lesser extent and that

the divergence between these regions is increasing (Figure 6).

A possible reason why the σ-convergence does not occur at the EU level is that it is easier for smaller regions which are more similar to each other to converge than for larger regions which tend to be more dissimilar to each other. This reasoning is in line with the Sala-i-Martin's (1996) convergence theory which states that smaller regions within a country are more likely to converge towards each other in the absolute sense than countries. However, one would expect that this hypothesis might be supported by the evidence of a relatively more homogenous region like the CEEC, but this is simply not the case. The opposite is true and the causes might be an issue of the further research.

Divided in prosperity, united in problems

For the purposes of comparison and better understand the economic environment of the EU, we have tried to test the convergence in terms of two other socio-economic indicators: unemployment and inequality (GINI coefficient). All the EU 27 countries have similar problems tackling unemployment, a question that has proved very hard to solve in long run. One of the main reasons of the high unemployment in all EU member states is their structural problem in the respective economies, consequently reflected in the long-term unemployment. Therefore in this aspect, the EU seems to converge – Table 3 (even the CEEC countries with their big progress in reforming their economies tend to converge to the EU unemployment figures, showing that they are not successful in resolving this difficult task). The σ-convergence is confirmed. Figure 7 shows the dispersion of the unemployment, where the years 1999–2009 are depicted on the horizontal axis, while the growth rate
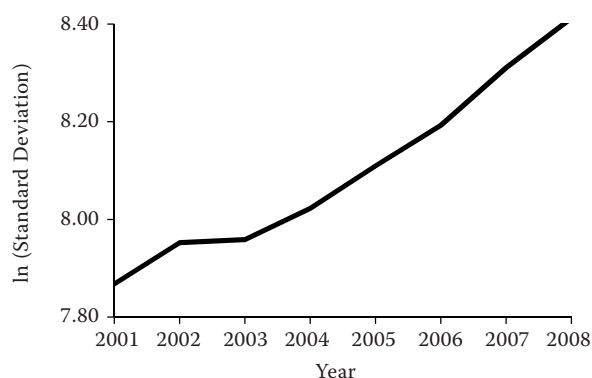

Figure 6. Dispersion of GDP/capita in the EU regions from the CEEC

Table 3. Descriptive statistics of unemployment and the GINI coefficient (σ-convergence)

	ln (Mean)	ln (Std. Deviation)	$\sigma_t - \sigma_{t-T}$
Unemployment rate			
EU Member States in 1999	2.15	1.34	
EU Member States in 2009	2.18	1.25	−0.09
GINI Coefficient			
EU Member States in 1999	3.38	1.46	
EU Member States in 2009	3.38	1.35	−0.11

of unemployment between 1999–2009 is depicted on the vertical axis. It is obvious that the dispersion in unemployment between the EU member states has been decreasing during the analyzed period. This means that σ-convergence occurs and that the disparities between the regions are decreasing. That would have been good news if the unemployment figures would have remained at a relatively low level globally. Unfortunately, the opposite is true. The EU countries tend to convergence in terms of inequality as well, showing that they are egalitarian in character. The condition for the σ-convergence has been met because σ_{t-T} is smaller than σ_t, thus their difference is negative (−0.11). The σ-convergence is confirmed. Figure 8 shows the dispersion of the inequality where the years 1999–2009 are depicted on the horizontal axis while the growth rate of inequality between 1999–2009 is depicted on the vertical axis. It is obvious that the dispersion in inequality between the EU member states has been decreasing during the analyzed period. This means that the σ-convergence occurs and that the disparities between the regions are decreasing, meaning that the EU societies tend to be equally egalitarian.

The European societies are more oriented toward equity and egalitarianism, and often this goes at the expense of the efficient allocation of resources. This is in return translated into the long term structural economic problems and unemployment. This is the price that the EU society must pay for lower differences between different income groups and the large scale income redistribution.

One of the main reasons of high unemployment in all EU member states is their structural problem in the respective economies, consequently reflected in the long-term unemployment. Therefore, in this indicator the EU countries show similar values and especially the V4 countries, even though they have made a big progress in reforming their economies, the convergence of the EU unemployment figures shows that they are not successful in resolving this difficult task. Europe has always shown strong egalitarian tendencies, so from the aspect of the GINI coefficient, all of the countries in the EU 27 were on the similar terms. The population was equally poor or rich. The EU has been trying to solve the problem of disparities by the various social programs and by minimizing the gap between the member countries. So from the aspect of unemployment and inequality the EU countries (V4 included) show similar tendencies translated in convergence. Literally speaking, the EU is united in their problems rather than in prosperity or advantages. European societies are more biased toward equity and egalitarianism, and often
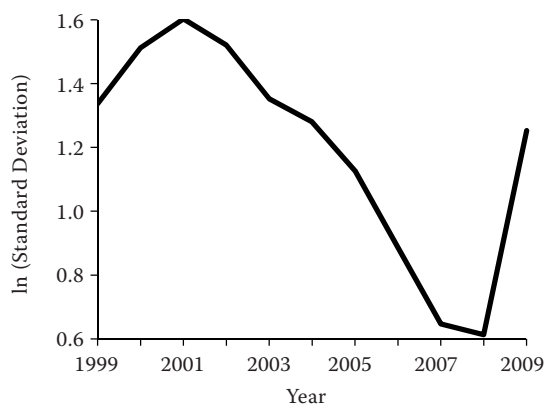

Figure 7. Dispersion of unemployment rate in the EU 27 member states
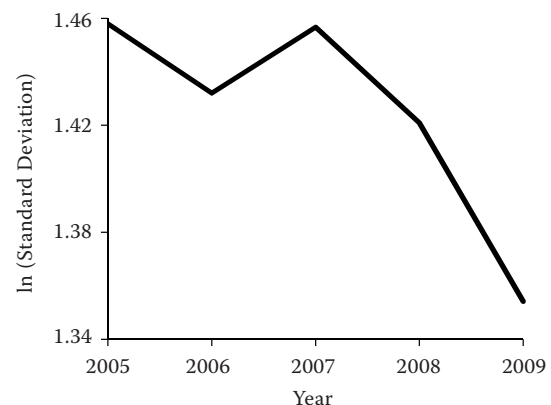

Figure 8. Dispersion of inequality (GINI) in the EU 27 member states

this goes at the expense of the efficient allocation of resources. This is in return translated into the long term structural economic problems and unemployment. This is the price that the EU society must pay for lower differences between different income groups and the large scale income redistribution. Another apparent problem that the EU countries face is decreasing competitiveness. Relatively higher labor costs, a complicated regulation, the protection of domestic labour market and long-term structural problems accompanied with aging population make this problem even more pressing. In top of it, the EU governments do not allocate sufficient resources in the field of research and development. Lower investments in human capital are immediately reflected in lower competitiveness, structural unemployment and leading the Europe's best and brightest to leave their domestic countries to other places like the US, etc. The path toward sustainable growth, development and convergence is tricky, but not impossible. As some EU member countries has shown (like Finland, Ireland – despite the current crisis, or even the V4 countries in some aspects) sound economic reforms, a reduced regulation and an increasing and efficient investment in human capital can make sure that the above is reachable. This is a task that the policymakers should fulfill and they are obliged to do it for their citizens, if they want to have a bright perspective for them and their countries. The alternative is gloomy and leads to a permanent economic decline and other socially related problems. One might only hope that the latter will not happen and the people will not have to say that there was once a prosperous place called Europe...

CONCLUSIONS

The purpose of this paper has been to analyze the evidence and impact of the EU integration between 1999 and 2009 on the EU regional economic growth and the socio-economic convergence. A regional convergence analysis has been performed in order to examine if the EU's overall aim of convergence is reached. The main growth- and convergence theories are used as the theoretical framework and form the study's hypothesis.

(1) The results show that the absolute β-convergence in the terms of GDP/capita exists between the EU member states (for the period 1999–2009) as well as regions (or the period 2001–2008).

(2) The σ-convergence is not confirmed, meaning that that the disparities between the regions are rather increasing than decreasing. Perhaps a pos-

sible reason why the σ-convergence does not occur at the EU level is that it is easier for smaller regions, which are more similar to each other, to converge than for larger regions which tend to be more dissimilar to each other.

(3) The EU countries and regions tend to convergence in tasks like the unemployment rates, showing that they are not successful in resolving this difficult task. One of the main reasons of the high unemployment in all EU member states is their structural problem in the respective economies, consequently reflected in the long-term unemployment.

(4) The EU countries tend to convergence in the terms of inequality as well, showing that they are egalitarian in character. European societies are more biased toward equity and egalitarianism, and often this goes at the expense of the efficient allocation of resources. This is in return translated into the long term structural economic problems and unemployment and it is the price that the EU society must pay for lower differences between different income groups and the large scale income redistribution.

REFERENCES

Armstrong H., Taylor J. (2000): Regional Economics and Policy. 3rd ed. Blackwell Publishers, Oxford.

Barro R.J., Sala-i-Martin X. (2003): Economic Growth. MIT Press, Cambridge, MA.

Berlin E., Johansson C. (2010): Decreasing the Regional Disparities through the EU's Structural Fund Policy. Jönköping International Business School, Jönköping University, June 2010.

Bertola G. (1993). Models of economic integration and localized growth. In: Torres F., Giavazzi F. (eds.): Adjustment and Growth in the European Monetary Union. Cambridge University Press, Cambridge, pp.156–179.

Bielik P., Juríček P., Kunová D. (2007): The comparison of agricultural support in the OECD and the EU countries from the perspective of economic globalization processes. Agricultural Economics – Czech, 53: 339–349.

Braunerhjelm P., Faini R., Norman V., Raune F., Seabright P. (2000): Integration and the Regions of Europe: How the Right Policies can Prevent Polarization. Monitoring European Integration 10. Centre for Economic Policy Research, London.

Capello R. (2007). Regional Economics. Routledge, London and New York.

Ciaian P., Pokrivcak J., Drabik D. (2008): Why some sectors of transition economies are less reformed than others? The case of economic research and education. Politická ekonomie, 56: 819–836.

Dornbusch R., Fischer S., Startz R. (2008): Macroeconomics. McGraw-Hill/Irwin, New York.

Ederveen S., Gorter J., De Mooij R., Nahuis R. (2003): Funds and Games: The Economics of European Cohesion Policy. Occasional Paper No. 3, European Network of Economic Policy Research Institutes, Brussels.

Eurostat (2010a). Available at http://epp.eurostat.ec.europa.eu/tgm/mapToolClosed.do?tab=map&init=1&plugin=1&language=en&pcode=tgs00005&toolbox=types

Eurostat (2010b). Available at http://europa.eu/abc/european_countries/eu_members/portugal/index_en.htm

Fu X. (2004): Limited linkages from growth engines and regional disparities in China. Journal of Comparative Economics, *32*: 148–164.

Giannetti M. (2002): The effects of integration on regional disparities: Convergence, divergence or both? European Economic Review, *46*: 539–567.

Gullstrand J., Hammarlund C. (2007): Plats för tillväxt? Bilaga 2 till Långtidsutredningen 2008. Statens Offentliga Utredningar 2007: 25. Edita Sverige AB, Stockholm.

Howitt P., Weil D.N. (2008): Economic Growth. In: Durlauf S.N., Blume L.E. (eds.): New Palgrave Dictionary of Economics. 2nd ed., Palgrave Macmillan.

Hrabánková M., Svatošová L., Boháčková I. (2009): The conditions of sustainable development in the Czech republic in compliance with the recommendation of the European commission. Agricultural Economics – Czech, *55*: 156–160.

Karlsson Ch., Johansson B., Stough R. (2001): Theories of Endogenous Regional Growth-Lessons for Regional Policies. Germany: Springer, Berlin, pp. 406–414.

Krugman P. (1993): Lessons of Massachusetts for EMU. In: Torres F., Torres F.S., Giavazzi F.: Adjustment and Growth in the European Monetary Union. Cambridge University Press, Cambridge, pp. 241–269.

López-Bazo E., Vayá E., Mora A.J., Suriñach J. (1999): Regional economic dynamics and convergence in the European Union. The Annals of Regional Science, *33*: 343–370.

Lucas R.E. (1988): On the mechanics of economic development. Journal of Monetary Economics, *22*: 3–42.

Mankiw G.N., Romer D., Weil D.N. (1992): Contribution to the empirics of economic growth. The Quarterly Journal of Economics, *107*: 407–437.

McCann P. (2001): Urban and Regional Economics. Oxford University Press, New York.

North C.D. (1955). Location theory and regional economic growth. The Journal of Political Economy, 63: 243–258.

Rice P., Venables A. (2003): Equilibrium regional disparities: theory and British evidence. Regional Studies: Journal of the Regional Studies Association, *37*: 675–686.

Romer P.M. (1986): Increasing returns and long-run growth. Journal of Political Economy, *94*: 1002–1037.

Sala-i-Martin X. (1996). The classical approach to convergence analysis. Economic Journal, *106*: 1019–1036.

Arrived on 24th May 2011

Contact address:

Artan Qineti, Eva Matejková, Miriam Pietiková, Roman Serenčéš, Marek Dvořak, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 94 976 Nitra, Slovak Republic
e-mail: Artan.Qineti@ fem.uniag.sk, Eva.Matejkova@fem.uniag.sk, Miriam.Pietrikova@fem.uniag.sk, Roman.Serences@fem.uniag.sk, dvorak72@gmail.com