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COMPARATIVE ANALYSIS OF THE EU-27 COUNTRIES LABOUR MARKETS' CONVERGENCE

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Abstract

Convergence is one of the most developing research fields in the frameworks of economic growth's theory. The degree of real convergence has impact on projecting and management of relevant economic and regional policy in the EU. The empirical researches conducted by authors demonstrate that the speed of δ-convergence is low. In 1999-2007 we found δ-convergence in unemployment rates between EU regions NUTS 2, but in 2008-2009 data indicated divergence in regional unemployment rates in EU–27. In conducted analysis only the β-convergence of regional unemployment rates is significant and negative. This shows a convergence process where regions NUTS 2 in EU-27 with higher unemployment rates catch-up on the other ones with lower unemployment rates. Analysies of β-convergence indicate that within the period 1999–2009 the dispersion of labour productivity, labour force participation rates, employment rates between regions NUTS 2 in EU-27 was reduced. However, this relationship was not statistically significant.

Keywords: real convergence, real divergence, CEECs (Central-Eastern European Countries), EU-27, labour markets.

JEL Classification: J21, J31, J64, O47, R23.

1. Introduction

The main goal of the paper is to present basic tendency in the scope of labour markets convergence in the EU-27 countries and their regions. These issues are very important for determining possibilities of equalizing differences in the scope of their socio-economic development. In the 2-nd chapter was presented convergence of regional income per capita and labour markets in the aspect of the economic growth theory. Chapter 3 presents regional labour markets' convergence in the EU countries in 1990-2010 on the basis of empirical evidence from literature. Chapter 4 includes the results of convergence process analysis conducted by authors of the article. It includes estimates of coefficient of variation δ-convergence for five variables: labour productivity, real wages, regional unemployment rate, regional labour force participation rate and regional employment rate in EU-27 (271 regions NUTS 2) within 1999–2007. There are also included results of β-convergence analysis. In the last chapter there were formulated conclusions from conducted analysies.

2. Convergence of regional income per capita and labour markets in the aspect of the economic growth theory

As Martin (2001) outlines, conventional neoclassical growth theory predicts that a reduction of barriers to trade will lead to an increase in allocative efficiency across regions, and hence in income per capita. Endogenous growth theories incorporate various processes, such as localised collective learning, accumulation of skills, and technological innovation, which are not diminishing in their returns and can contribute to a higher long run growth rate. However, it is also possible for regions to converge to economy-specific steady states due to differences in these various growth processes (conditional convergence) where similar types of regional economies may converge (club convergence). Martin (2001) goes on to note that theories emanating from new economic geography, such as that of Krugman (1991), argue that the reduction of trade barriers leads to divergence, as reductions in transport and transaction costs encourage greater spatial agglomeration and specialization of economic activity. It is very important to determine the impact of changes in production per capita on changes of basic labour market's variables like for example: level and structure of: employment, unemployment, occupation activity and level and rate of growth of labour productivity and labour costs. According to the Okun's law every decrease of production amount 1% lower its potential level causes increasing of unemployment rate about 2-3 percentage points higher that its natural. The impact of this effect can be differentiated depending on microeconomics and macroeconomics conditions, but in the majority of economies we can observe evident influence of production's volume changes on changes of the level of employment and unemployment, at least from one assumed level of the GDP growth's rate. Exception are situations in which there is so called jobless growth.

Recent decades have seen a wealth of research emerge documenting the process of economic growth across European Union regions, much of which has aimed to establish the presence (or absence) of convergence in regional growth rates. While the presence of a convergence process in European per capita income in the 1980s has been a prevalent finding of this stream of research, a number of studies have reported a slowdown of convergence thereafter (Neven and Gouyette (1995), Fagerberg and Verspagen (1996), Tondl (1999), Martin (2001), Gardiner et al. (2004), and Pittau (2005). It is still disputed whether the convergence process has regained momentum since the 1980s. Methodological differences, as well as differences regarding the geographical unit under consideration, have contributed to emergence of conflicting findings. Geppert and Stephan (2008) point out that while evidence of convergence has forthcoming at a national level, regional disparities within EU member states appear to persist or indeed widen. They posit that these regional disparities are largely due to the persistent strength of agglomeration economies attracting high-income activities to urban areas. What is more, it has been argued that what convergence has occurred across EU regions is most appropriately characterized in terms of regions converging into different clubs (Quah (1996) and Corrado et al. (2005). This depiction of neighbouring regions growing at similar speeds serves to emphasize the role of spatial effects in the process of regional growth.

3. Regional labour markets' convergence in the EU countries in 1990-2010: empirical evidence from literature

Given the conditional convergence estimates for the period 1991-2002, we can see parallels to the development of EU regions. As in the EU-15, low labour participation, high unemployment and traditional sectoral structures negatively affect per capita income levels and growth. Looking at income dispersion, CEEC regions shows a similar degree of heterogeneity as the NUTS 2 regions in the EU-15. The results for the period 1991-2002 are in line with Badinger, Tondl (1999) who find a positive effect of labour participation and a negative influence of the employment share in agriculture on regional growth in Southern Europe. The sectoral structure of employment can be considered as a proxy or determinant of regional TFP. For the EU-15, Boldrin, Canova (2001) claim that most of the regional differences in average labour productivity cannot be explained by regional differences in the capital stock per worker. Analyses made by Herz and Vogel (2003) do not suggest a strong univariate relation between the level of investment per employee and labour productivity growth. The apparent role of TFP is compatible with the concept that the productivity catch-up heavily depends on the reallocation of factors of production from less productive sectors to more productive activities and more efficient production processes. However, the level of sectoral disaggregation in our data set is too crude for a closer investigation on this aspect. In general, their findings suggest that the EU does not need to develop a completely different approach for dealing with regional disparities in Central and Eastern Europe. New regions and more disparity do not necessarily require new instruments. On the other hand, the criticism on present EU regional policy would also apply in the context of enlargement. The analysis suggests that regional policy should concentrate on the reduction of unemployment and on promoting the modernization of the economy's sector structure. Researches conducted in the frameworks of Assess Lab Project (ASSESSLAB Final Report, March 2005) show regional disparities in unemployment rates, employment rates and GDP per capita levels are comparable to those in many of the high unemployment countries in the EU. Differences between the regions with the highest and the lowest unemployment rate exceeded a factor of 3 in the year 2003 in all but the smallest transition countries (Slovenia, Latvia, Lithuania and Romania. GDP per capital levels ranged from 70 – 80% to up to over 200% of the national average in the majority of transition economies. Rates of employment also indicate a substantial differentiation of regions with differences between maximum and minimum employment rates ranging from over 10 percentage points to over 25 percentage points at the NUTS III level of regional aggregation. The development of these disparities is closely linked to the process of transition. In socialist times regional disparities in wage and employment rates tended to be small. For instance as shown by Huber and Palme (2001) the ratio of regions with the highest wages relative to that to the lowest ranged at about 1.3 in the Czech Republic and at around 1.2 in Slovakia in the 1980s, once market oriented reforms were undertaken regional disparities quickly increased.

The divergence of regions was particularly pronounced in the early transition period in terms of wage levels which, when measured by the coefficient of variation, increased by over 50% in countries such as Slovakia, Poland, the Czech Republic and Bulgaria and somewhat more modestly in Hungary, Slovenia and Estonia. The only exception is Romania, where regional wage disparities in 1991 were about the same as in

1998. Furthermore, regional disparities in per capita GDP levels are still increasing in many of the transition countries for which we have data. Romania and Latvia were the only countries which had lower GDP disparities in 2001 than in 1999. In all other countries regional disparities increased or stagnated (Hungary, Slovakia, and Poland) in the last three years. Divergence of regional unemployment rates by contrast was somewhat less pronounced, but once more in the majority of the countries analysed the coefficient of variation increased in the 1990 to 1998 period. The notable exceptions to this are the Czech Republic and Romania. In both these countries regional disparities in unemployment rates decreased after some oscillation. In particular in the Czech Republic this is due to the statistical effect of extremely low average unemployment rates in the beginning of transition on the coefficient of variation. Furthermore, in those countries where unemployment rate disparities have increased in the last decade this process has almost come to a stop and increases have been modest in all countries but Slovakia. Regional unemployment is also positively correlated with regional non-participation in all countries, but Lithuania and Romania, indicating that at least some of the labour force is discouraged from searching for employment (EBRD, 2003). This suggests that the actual amount of labour which could become available on markets when unemployment rates reduce could be underestimated by only focusing on unemployment rates and thus that disparities in the degree of under – utilization of labour are even higher than implied by the registered unemployment data. In summary divergence was the general tendency during the early transition period, magnitudes and timing of this divergence process differed among countries. In particular in some of the early starters to market oriented reforms such as Hungary or Slovenia divergence proceeded somewhat more slowly. Furthermore, divergence in general was more pronounced in income indicators such as wages than in regional unemployment and has preceded less slowly in many of the more advanced transition economies in recent years.

While regional income has been the variable of interest in many of these studies, Enflo and Hjertstrand (2009) note that recent studies have also focused on labor productivity as a driver of regional growth. Gardiner et al. (2004), for example report that the degree of convergence in labor productivity has been relatively slow and that much of it seems to have taken place in the boom years of the 1980s. Labour productivity has been found to exhibit significant and persistent differences across most countries and at different regional definitions (Basile (2008), Byrne et al. (2009), Enflo and Hjertstrand (2009), and Webber (2009)). However, it is reasonable to question the notion that labour productivity should possess a spatial dimension and to wonder how this spatial aspect might manifest itself. Gardiner et al. (2004) note that both endogenous growth and new economic geography models give strong grounds for expecting productivity to display geographical contiguity, and that such spatial clustering may reflect a range of factors and processes. Contiguous regions may have similar degrees of access to transport and other modes of communication; they may have similar proximity to major markets; they may share similar socio-institutional set-ups that influence firm performance and entrepreneurship; there may be localised spillovers of knowledge and technology, through inter-firm networking, employee movement and technology sharing, local trading relationships, access to common technology centres, and universities. Contiguous regions may share similar industrial structures and thereby similar responses to common external demand, technology and policy shocks. In the regional context, labour productivity is the outcome of a variety of regional determinants such as superior technological, social, infrastructural or institutional assets (Gardiner et al. (2004). (Curran, Sensier, 2011) uses gross value added (GVA) per employee hour at the NUTS 2 and NUTS 3 level to capture regional labour productivity. While this proxy of labour productivity may be somewhat crude, its data availability facilitates the tracking of regional labour productivity over a prolonged period of time. The crucial determinants of convergence of the economic growth and labour markets during globalization are: (a) technology diffusion, R&D and innovation investments, (b) human resource development and (c) ICT investments and infrastructure. In the first group of studies, cross-country empirics investigate the link between R&D, innovation and international differences in growth rates. These studies indicate that high-income and high-productivity countries tend to be intensive in the use of knowledge and technology and their output is often characterized by innovative high-technology products and services (OECD, 1996, 2000, 2001). Also Porter (1999) argues that economies that have been more innovative have tended to achieve higher levels of GDP per capita. Many other cross-country empirics have showed that technological differences are the prime cause for differences in GDP per capita (i.e. Mankiw, Romer, Weil, 1992), indicating that the potential for catching-up exist for countries that have "social capability" and manage to mobilize the resources such as investments, education and R&D (Fagerberg, 1994). Additionally, Total Factor Productivity (TFP) studies also confirm the importance of capital-embodied technical change for

productivity growth (Hulten, 1992; Wolff, 1996; Gera et al. 1999). Concentrating on the relation between R&D and economic performance, a consensus has emerged that innovation has a significant effect on output at the level of the firm, industry and country.

4. Empirical analysis

Table 1 includes estimates of coefficient of variation for five variables: labour productivity, real wages, regional unemployment rate, regional labour force participation rate and regional employment rate in EU-27 (271 regions NUTS 2) within 1999–2007. The coefficient of variation is a normalized measure of dispersion of a probability distribution. As expected, the results indicate that the speed of σ-convergence is low. In 1999-2007 we found σ-convergence in unemployment rates between EU regions NUTS 2, but in 2008-2009 data indicated divergence in regional unemployment rates in EU–27. Its fluctuations possibly reflecting some temporary influence of the business cycle on the extent of disparities. From 1999 to 2009, the evolution of disparities in other analyzed variables among EU-27 regions NUTS 2 does not indeed feature a clear trend, the coefficient of variation – decreasing from 0.31 to 0.30 for labour productivity, from 0.17 to 0.16 for real wages, and remaining on the same level for regional labour force participation rate (0.18) and regional employment rate (0.22).

Table 1. Estimates of coefficient of variation – analysis of σ-convergence

Variable	Years					
	1999	2001	2003	2005	2007	2009
labour productivity	0,31	0,32	0,32	0,31	0,31	0,30
real wages	0,17	0,17	0,16	0,16	0,16	0,16
regional unemployment rate	0,43	0,42	0,39	0,36	0,36	0,44
regional labour force participation rate	0,18	0,18	0,17	0,18	0,18	0,18
regional employment rate	0,22	0,22	0,21	0,20	0,21	0,22

Source: author's own calculations

The seminal papers by Barro and Sala-i-Martin (1992) and Mankiw et al. (1992) have launched a huge literature attempting to empirically detect and measure the extent of β-convergence in various contexts. β-convergence refers to a process in which poor regions grow faster than rich ones and therefore catch-up on them. The methodology used to measure β-convergence generally amounts to estimate an equation of the following form:

$$\ln(\Delta y_{i,t}) = \alpha + \beta \ln(\Delta y_{i,t-1}) + u_{i,t}$$

where:

- $y_{i,t}$ and $\Delta y_{i,t}$ are respectively the level and the growth rate of labour productivity and real wages in region i at time t, and the level and the percentage change of unemployment rate, labour force participation rate and real employment rate in region i at time t,
- $u_{i,t}$ is the standard error term,
- α and β are the parameters to be estimated.

A negative relationship between the changes of analyzed variables ($\Delta y_{i,t}$) and the initial level of this variables ($y_{i,t}$) is the sign of a convergence process. The estimated value of β indicates the rate at which regions approach their steady state and hence the speed of convergence.

In conducted analysis only the β-convergence of regional unemployment rates is significant and negative. This shows a convergence process where regions NUTS 2 in EU-27 with higher unemployment rates catch-up on the other ones with lower unemployment rates. The speed of convergence is 12,1% per year. Based on this value, we computed the so-called half-life – 5.7 years for regional unemployment rates – the time span which is necessary for current disparities to be halved. The value of long-term regional unemployment rate (8,6%) for regions NUTS 2 in EU-27 is quite high. This shows the level of the so-called natural unemployment rate in analyzed regions.

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Table 2. GMM estimates of β-convergence

Estimates	Variables				
	labour productivity	**real wages**	**regional unemployment rate**	**regional labour force participation rate**	**regional employment rate**
α	**0,059** (0,223)	**-0,129** (0,311)	**0,014** (0,028)	**0,007** (0,492)	**0,006** (0,271)
β	**-0,013** (0,612)	**0,047** (0,168)	**-0,121** (0,000)	**-0,014** (0,625)	**-0,023** (0,321)
Speed (%)	-	-	12,1	1,4	2,3
HL – half life (years)	-	-	5,7	49,5	30,1
long-term value (%)	-	-	8,6	-	-
J-statistic	0,003	0,151	0,112	0,001	0,002
Durbin-Watson	1,760	1,750	1,454	1,455	1,552
S.E.	0,04	0,05	0,03	0,04	0,004
Number of instrumental variables	3	3	3	3	3
R^2	0,231	0,201	0,324	0,443	0,222
n	2420	2420	2710	2710	2710

Notes: GMM – Generalized Method of Moments; J-statistic – J-Sargan's statistic, S.E – standard error
Source: author's own calculations

Table 2 shows estimations of β also for other variables, such as: labour productivity, regional labour force participation rate and regional employment rate. These results indicate that within the period 1999–2009 the dispersion of labour productivity, labour force participation rates, employment rates between regions NUTS 2 in EU-27 was reduced. However, this relationship was not statistically significant.

5. Conclusions

In the paper it was analysed the convergence process in regions NUTS 2 of EU-27. One of the main objectives of the EU Cohesion policy is to reduce the disparities between the levels of development of EU regions, which has often been translated as the promotion of convergence between EU regions, especially in labour markets.

Conventional neoclassical growth theory predicts that a reduction of barriers to trade will lead to an increase in allocative efficiency across regions, and hence in income per capita. Endogenous growth theories incorporate various processes, such as localised collective learning, accumulation of skills, and technological innovation, which are not diminishing in their returns and can contribute to a higher long run growth rate. It is very important to determine the impact of changes in production per capita on changes of basic labour market's variables. Some researches show regional disparities in unemployment rates, employment rates and GDP per capita levels are comparable to those in many of the high unemployment countries in the EU. The divergence of regions was particularly pronounced in the early transition period in terms of wage levels. that recent studies have also focused on labor productivity as a driver of regional growth. Some researchers report that the degree of convergence in labor productivity has been relatively slow and that much of it seems to have taken place in the boom years of the 1980s. Labour productivity has been found to exhibit significant and persistent differences across most countries and at different regional definitions. The crucial determinants of convergence of the economic growth and labour markets during globalization are: (a) technology diffusion, R&D and innovation investments, (b) human resource development and (c) ICT investments and infrastructure.

Remarkable progress towards the achievement of a high degree of sustainable convergence on the regional level has been made in all EU countries and regions since 1999. However, the estimated speed of convergence is rather low in labour markets. These results also underline that the analysis of convergence is in fact complex.

We identified that the speed of σ-convergence of analyzed variables in labour markets is low. In 1999–2007 we found σ-convergence in unemployment rates between EU regions NUTS 2, but in 2008-2009

data indicated divergence in regional unemployment rates in EU–27. From 1999 to 2009, the evolution of disparities in other analyzed variables among EU-27 regions NUTS 2 does not indeed feature a clear trend.

The β-convergence of regional unemployment rates is significant and negative. This shows a convergence process where regions NUTS 2 in EU-27 with higher unemployment rates catch-up on the other ones with lower unemployment rates. The value of long-term regional unemployment rate for regions NUTS 2 in EU-27 is quite high. Other estimations of β for labour productivity, regional labour force participation rate and regional employment rate indicate that within the period 1999–2009 the dispersion of labour productivity, labour force participation rates, employment rates between regions NUTS 2 in EU-27 was reduced, but it was not statistically significant.

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