Regional convergence and economic development in the EU: the relation between national growth and regional disparities within the old and the new member states

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Abstract - **While European integration has substantially contributed to economic convergence on a national scale, the diverging development of highly developed metropolitan regions and lagging rural areas has become a growing challenge especially for the new member states in Central and Eastern Europe. Although it is widely assumed that economically growing countries are usually confronted with rising inequalities, the question, whether there is a direct relation between total economic growth and regional divergence, has not been sufficiently answered so far. In this context the paper inquires to which degree the process of economic restructuring and catching-up in European countries is accompanied by increasing spatial disparities. The empirical investigation of recent GDP data confirms the trend towards economic convergence on a national scale. On a regional scale, however, the process of convergence was much slower and almost came to an end after the beginning of the global economic crisis in 2008. The reason for these diverging results can be found in the change of disparities within the countries: While regional inequalities largely remained unchanged in the majority of the old member states, the gap between rich and poor regions widened in most countries which accessed the EU since 2004. This trend slowed down or even reversed after 2008, which seems to confirm the assumption that economic growth intensifies spatial divergence. A detailed analysis of the correlation between national growth rates and the change of regional disparities, however, indicates that growing divergence in the new member states can hardly be explained by the speed of total economic growth, but rather by other specific conditions there. A reflection on the mechanisms of agglomeration economies suggests three arguments for the strong diverging effect of the catching-up processes in the new member states, which await to be tested empirically in future research.**

Keywords - *economic growth, regional disparities, convergence, agglomeration economies*

1. Introduction: Economic growth and regional convergence in literature

In regional science and economic geography the debate on the change of regional disparities and on the process of spatial convergence has always moved between two poles: Under the neoclassical paradigm the free play of market forces guarantees the compensation of inequalities in space as a consequence of mobile labor and capital (Richardson 1973) or trade of specialized goods (Ohlin 1933). On the contrary, the approach of regional polarization, which basically goes back to Myrdal's concept of circular cumulative causation (1957), argues that spatial inequalities tend to increase in recursive and self-reinforcing processes. While Myrdal claims that the outflow of labor, capital and resources from the less developed regions ("backwash effects") outperform the positive "spread effects" of economic development in growing regions, Hirschman's model of "unbalanced growth" (1958) argues that negative "polarization effects" produce a temporary increase of inequalities, which tends to be compensated by "trickling-down-effects" and "counter-balancing forces" (e.g. political intervention) in the long run. Schmidt (1966) substantially contributes to a spatially differentiated theory of economic growth analyzing the diffusion of investment effects in space. He argues that the localization of complementary investment effects on other sectors depends on the stage of development of a country claiming that complementary effects in less developed countries tend to be strongly concentrated on the location of investment. Similar to Hirschman, however, Schmidt also expects economic and political counterforces to compensate the short-term agglomerative impact of investment.

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The phenomenon of polarized growth was largely neglected in neoclassical theory until the "New Economic Geography" implemented agglomeration economies into the neoclassical model (Krugman 1991, Venables 1996, Puga 1999). This approach is widely considered as an important step away from the equilibrium principle in economics allowing the explanation of spatial inequalities and unbalanced growth. In Economic Geography and Regional Science, however, the investigation of agglomeration economies has a long tradition, which goes back to the basic works of Weber (1909), Marshall (1920), Hoover (1937) or Isard (1956). Since then, a lot of theoretical and empirical work has been done to explore the driving forces of economic concentration in space. In this context the term "agglomeration economies" is not confined to pecuniary externalities (which, for instance, appear in reduced transport and trade costs for firms), but covers all kinds of advantages and disadvantages, which result from the spatial concentration of economic activities. Authors, who explore the mechanisms of "innovative milieus", stress the importance of human relations and informal networks in a limited geographical area (Camagni 1991, Aydalot and Keeble 1988, Maillat 1995) as the main reason for innovative firms to locate close to related companies. Research on "industrial districts" strongly emphasizes the importance of "collective efficiencies" (Schmitz 1995) in localized industrial clusters (Becanttini 1990, Priore and Sabel 1989, Markusen 1996, Harrison 1992), mainly picking up the concept of Marshallian externalities, which regards knowledge-spillovers, labor market pooling und input sharing as the main agglomeration factors of industries. Porter (1990) emphasizes the importance of local competition, which tends to promote knowledge externalities and therefore accelerates the pursuit and adoption of innovation. Other authors attribute the agglomeration of innovation and growth mainly to localized knowledge spillovers in industrial clusters (Jaffe 1989, Feldman 1994, Feldman and Florida 1994). Most of these approaches agree on the fact that the spatial concentration of economic activities is a necessary, but not a sufficient condition for the emergence of agglomeration economies. Consequently, there is an extensive debate in literature on the specific local conditions, which foster or impede agglomeration economies in different spatial contexts (Breschi and Lissoni 2001, Fritsch 2003) with a strong focus on the role of firm networks, co-operations and institutional frameworks (Camagni 1994, Cappelin 2003, Bathelt 2003). In this context terms like "embeddedness" (Gravovetter 1985, Oerlemans et al. 2001) or "untraded interdependencies" (Storper 1997), which refer to the intensity and quality of relations between economic actors (including informal conventions, habits and rules as well as mutual trust), have been defined as specific local assets, which promote the agglomeration of firms. The question, whether these externalities rather appear within a certain branch (commonly referred to as "localization economies") or between different branches ("urbanization economies") is controversially discussed in respective literature (Glaeser et al. 1992, Audretsch 2003, van der Panne 2004). Despite the heterogeneity of all these approaches, they all argue for the advantages of spatial concentration, which are responsible for higher returns of public and private investment in urban centers than in sparsely populated areas. From that point of view the concept of agglomeration economies suggests that it is not economic development that produces spatial inequalities, but rather the other way round: Assuming the existence of positive agglomeration economies, it is the spatial concentration of economic activity which determines economic growth.

In the broad scientific debate on the mechanisms behind regional convergence or divergence the influence of national economic growth only plays a minor role. Nevertheless, it was already in the 1950ies, when Kuznets (1955) postulated that economic development comes along with a temporary increase of social and spatial inequalities. The Kuznets curve, which says that growing income first induces rising and then falling disparities, is based on the assumption that industrialization induces a temporary migration from the rural areas to the cities due to higher wages. In a comprehensive empirical study, which demonstrates that spatial inequalities are higher and increase faster in less developed countries over a long period of time, Williamson (1965) comes to rather similar conclusions: "[…] experience suggests that increasing regional inequality is generated during the early development stages, while mature growth has produced regional convergence or a reduction in differentials" (p.44). In a more recent study Petrakos et al. (2005) indicate that disparities tend to increase in growth periods and decrease in times of stagnation or recession. Postulating a procyclical behavior of economic disparities the authors conclude that "[…]

no matter what other factors may affect the evolution of disparities, economic growth will always generate new imbalances" (p. 1853). Barrios and Strobl (2009) attribute the causal relation between economic growth and increasing spatial inequalities to the tendency of knowledge and innovation to agglomerate in space: "[…] although knowledge and technical progress are in this regard seen as the main engines of economic growth in the long run, the latter may inevitably increase rather than decrease regional inequalities, and these two elements are very unlikely to be evenly spread" (p.575). Since the authors assume that technological and structural changes do not appear in all regions at the same time, they expect rising regional inequalities "at least at the beginning of periods of high national growth" (p.582).

In brief, there is a lot of research on polarized growth, which implicitly assumes that economic development is commonly connected with growing regional disparities. Nevertheless, there is a lack of explicit empirical evidence whether the speed of total economic growth has a direct impact on the change of spatial inequalities. Therefore, the relation between national growth and intranational disparities in the EU member states is empirically analyzed in section 3.

2. Regional and national convergence in the European Union

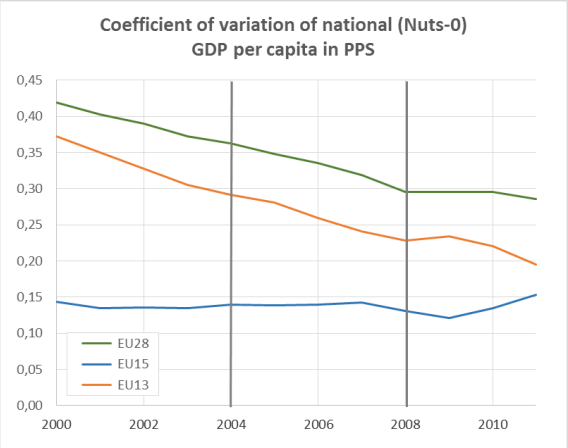
Recent empirical studies on the change of disparities within the European Union show that interregional convergence within the member states clearly lags behind international convergence between them, which especially applies to the new member states in Central and Eastern Europe (Kramar 2006, Brakman and Marrewijk 2013, Monasteriotis 2014, European Union 2014). In the first part of the empirical work these findings are verified and updated for the EU28 between 2000 and 2011. To get a detailed picture of the change of spatial inequalities in the European Union over that period, the analysis distinguishes between:

- 2 spatial levels
  - national level (NUTS-0)
  - regional level (NUTS-3)
- 2 groups of countries
  - national level (NUTS-0)
  - regional level (NUTS-3)
- 3 periods of time
  - before the enlargement of the EU (2000 - 2004)
  - before the outbreak of the global economic crisis (2004 - 2008)
  - during the crisis (2008 - 2011)

The economic output is measured by the Gross Domestic Product (GDP) at current market prices in Purchasing Power Standard (PPS) per inhabitant as provided by Eurostat in April 2015. Economic disparities are expressed by the coefficient of variation of the single (regional or national) GDP levels. Since the coefficient of variation is a standardized measure of dispersion, which is defined as the ratio of the standard deviation to the mean of all values, the results of samples with different ranges can easily be compared. The standard deviation provides "absolute" disparities, which reflect the differences from the mean value, while the coefficient of variation indicates "relative" disparities, which are related to the quotients of regional and national values. This difference is especially important for the comparison of deviations between different countries, but also for the interpretation of changes over time, which can be illustrated by a simple example: If all regional GDP per capita values increased by the same growth rate (e.g. +5%), the standard deviation would rise, while the coefficient of variation would remain unchanged. If the GDP per capita grew by a constant amount in all regions (e.g. +200€), the standard deviation would stay the same, while the coefficient of variation would decrease. For the examination of changing regional inequalities over time the "relative" view of disparities seems to be the appropriate approach, since equal growth rates in all regions are commonly interpreted as an unchanged spatial distribution.

The diagram in figure 1 confirms that the disparities between the 27 of the 28 current member states of the EU (Luxembourg is excluded from the analysis due to the special situation of the country, which causes extraordinary GDP levels) strongly decreased between 2000 and 2011. This development can be interpreted as a typical process of Beta-convergence (see Barro 1991), which is characterized by a dynamic development of the poorest countries with growth rates clearly above the European average: The correlation coefficient between the GDP per capita in the year 2000 and the growth rate in the period 2000 - 2008 is statistically significant (1% level of significance) with a value of -0,714. Evidently, this trend, which is not influenced by the actual accession of the new member states in 2004

and 2007, was harshly stopped in the year 2008 when the global economic crisis reached Europe and threatened economic development there. Economic stagnation in most countries also had an impact on the process of convergence, since the catching-up process of the less developed countries was interrupted.

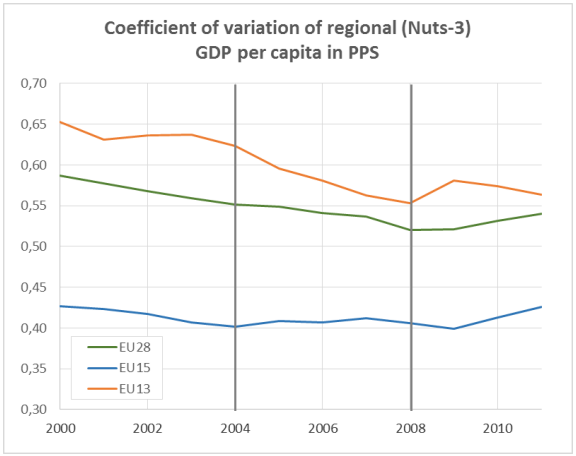


Source: Eurostat, own calculations

Figure 1. Change of economic disparities in the EU28 (differentiated for "old" and "new" member states) on the national level 2000-2011

The separate consideration of the development in the "old" EU15 und the "new" EU13 shows rather different results: The disparities between the old member states remain at a rather low level over a long period. A relatively rapid rise of the curve since 2009, however, might indicate that the crisis affects the lagging countries in Southern Europe most. Differences in national GDP are much higher between the new member states, but there is a clear trend towards equalization. This result proves that the process of national convergence within the EU is mainly caused by a fast growth of the most lagging countries (e.g. Romania, Bulgaria, Lithuania, Latvia), which were able to reduce the gap not only to the richest countries in Northern and Western Europe, but also to the well performing new member states in CEE. The gradient of the function indicates that this trend was not seriously affected by the crisis and essentially continued over the whole period.

The diagram in figure 2, which shows the change of economic disparities between the European NUTS-3-regions over the same period of time, indicates that inequalities between the poor and the rich regions are higher in the new member states than in the whole EU. This picture reflects the big gap between the metropolitan regions in Central Europe (e.g. Prague, Bratislava, Budapest, Warsaw) and the rural regions especially in the South-East. Although the deviation decreased before 2008, the process of convergence was much slower on the regional level than between the whole states. Furthermore, the economic crisis has reversed the process since 2008, which is expressed by growing coefficients of variation both for the EU13 and for the whole EU. These numbers clearly reveal that the problem of regional disparities mainly effects the new member states, while inequalities in the EU15 remained on a much lower level over the whole period.



Source: Eurostat, own calculations

Figure 2. Change of economic disparities in the EU28 (differentiated for "old" and "new" member states) on the regional level 2000-2011

To put it in a nutshell, the comparison of national and regional results confirm the initial assumption that economic convergence in the EU is a success story with regard to the reduction of development gaps between the whole countries, but not on a regional scale. Additionally, the ongoing crisis since 2008 has stopped or even reversed the trend towards spatial equality and therefore aggravated the problem of diverging economic development. For a better understanding of these processes it seems helpful to investigate regional convergence within the countries. For that purpose figure 3 and table 1 show the change of coefficients of variation referring to regional GDP per capita separately for the EU15 and the EU13 countries (with the exception of Luxemburg, Malta and Cyprus, which consist of less than 5 Nuts-3 regions) between 2000 and 2011.

The results indicate that the changes of regional disparities within most of the old member states were rather moderate between 2000 and 2011. Only Finland faced a clear constant trend towards convergence (-2,2%), while only the Netherlands (+2,4%) and Ireland (+1,5%) were noticeably confronted by a widening gap between rich and poor

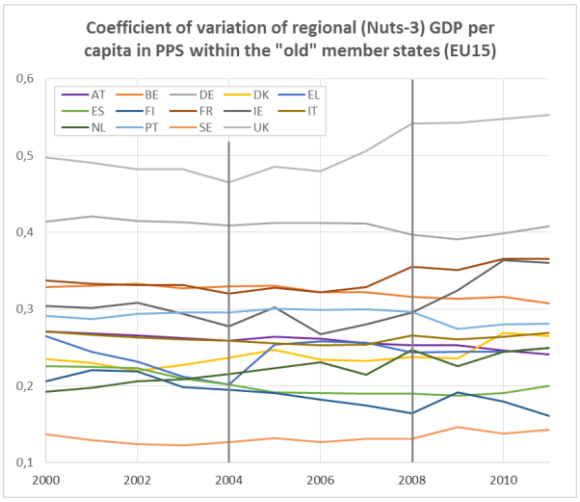
regions. Contrary to most of the accession countries (see figure 4), the poorest countries of the EU 15 (Greece, Portugal, Spain) were not affected by increasing disparities over the whole period. Some countries, however, faced an unsteady development: In Greece, France, Ireland and the UK the period between 2000 and 2004 was characterized by strong regional convergence, which then changed to a process of growing disparities.

Table 1. Average annual change of economic disparities within the "old" member states (EU15) 2000 - 2011 in 3 sub-periods

	sub-periods			whole period 00-11	No. of Nuts-3-regions
	00-04	04-08	08-11		
EU15	**-1,2%**	**+0,7%**	**+1,0%**	**+0,1%**	
AT	-1,1%	-0,6%	-1,6%	-1,0%	36
BE	+0,1%	-1,1%	-0,9%	-0,6%	45
DE	-0,3%	-0,7%	+0,9%	-0,1%	412
DK	+0,2%	+0,1%	+3,6%	+1,1%	12
EL	-6,6%	+4,8%	+0,8%	-0,6%	51
ES	-2,7%	-1,5%	+1,8%	-1,1%	60
FI	-1,5%	-4,1%	-0,6%	-2,2%	20
FR	-1,3%	+2,6%	+1,0%	+0,7%	101
IE	-2,3%	+1,5%	+6,9%	+1,5%	8
IT	-1,1%	+0,6%	+0,5%	-0,1%	111
NL	+2,9%	+3,5%	+0,3%	+2,4%	41
PT	+0,4%	+0,1%	-1,8%	-0,3%	31
SE	-2,0%	+0,9%	+2,9%	+0,4%	22
UK	-1,7%	+3,9%	+0,7%	+1,0%	140

Source: Eurostat, own calculations

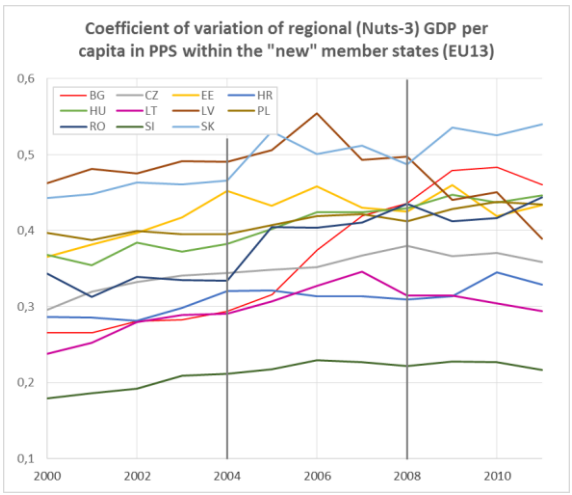
In Denmark, Ireland and Sweden the global economic crisis strongly enhanced spatial inequalities after 2008, while in Belgium, Austria, Portugal and Finland it rather reduced the economic gap between regions. In spite of these singular and short-term exceptions, the distribution of economic performance remains rather balanced in the EU15 countries (+0,1%), with a slight trend towards growing divergence over the last years.



Source: Eurostat, own calculations

Figure 3. Change of economic disparities within the "old" member states of the EU 2000 - 2011

The results shown in figure 4 and in table 2 present a totally different picture for the new member states in CEE. All countries faced growing regional disparities between 2000 and 2008 with very strong increases in Bulgaria, Lithuania, Czech Republic, Romania and Slovenia. A possible explanation for this striking trend can be found in the increasing competitive pressure, which forces both economic actors and governments to make use of agglomeration economies and to concentrate their activities on the few competitive economic centers.



Source: Eurostat, own calculations

Figure 4. Change of economic disparities within the "new" member states of the EU 2000 - 2011

A substantial argument for increasing inequalities in the EU during 1990ies is prepared by Gianetti (2002), who attributes the diverging development of economically advanced and traditional regions to growing economic integration, which she expects to foster international knowledge spillovers at the expense of diffusion processes

within the countries. In a similar way, Monfort and Nicolini (2000) argue that economic integration and liberalization of markets enhances spatial divergence within countries. Investigating the effects of interregional and international transaction costs on convergence, they conclude that a reduction of transaction costs tends to favor the spatial clustering of economic activities: "In this perspective, movements towards integration and international trade liberalization could be considered as factors possibly favoring the emergence of regional economic agglomeration inside countries." (p. 304)

Table 2. Average annual change of economic disparities within the "new" member states 2000 - 2011 in 3 sub-periods

	sub-periods			whole period 00-11	No. of Nuts-3-regions
	00-04	04-08	08-11		
EU accession in 2004					
mean	**+2,8%**	**+1,2%**	**-0,7%**	**+1,2%**	
CZ	+3,9%	+2,5%	-1,9%	+1,8%	14
EE	+5,5%	-1,6%	+0,7%	+1,6%	5
HU	+1,0%	+3,0%	+1,3%	+1,8%	20
LT	+5,1%	+1,9%	-2,2%	+1,9%	10
LV	+1,5%	+0,4%	-7,9%	-1,6%	6
PL	-0,1%	+1,0%	+1,7%	+0,8%	66
SI	+4,2%	+1,2%	-0,8%	+1,7%	12
SK	+1,3%	+1,1%	+3,5%	+1,8%	8
EU accession in 2007					
mean	**+0,9%**	**+8,6%**	**+1,3%**	**+3,7%**	
BG	+2,6%	+10,4%	+1,9%	+5,1%	28
RO	-0,7%	+6,8%	+0,7%	+2,4%	42
EU accession in 2013					
HR	+2,9%	-0,9%	+2,1%	+1,3%	21

Source: Eurostat, own calculations

Surprisingly, this argumentation cannot applied to explain to the situation in most of the accession countries of the year 2004, where the speed of divergence rather slowed down after formal accession. Only Poland and Hungary had a slight acceleration of divergence after their accession in 2004, starting from a comparatively low increase of disparities between 2000 and 2004. The comparison with the development in the EU15 countries reveals that the change of disparities after the EU-integration does not significantly deviate anymore from the values of the old-established EU-members in the same period. The rapid increase of regional disparities between 2004 and 2008 in Bulgaria and Romania suggests that divergence tends to speed up during the accession process the just before the factual EU-integration.

The total reversal of this trend happened after the year 2008, when decelerated growth retarded the increase of regional disparities or even reduced them in countries like Latvia, Lithuania, Czech Republic and Slovenia. From the present state of available data it is not possible to predict whether this trend has continued until today and how it will proceed in future. The results, however, suggest that accelerating growth in the CEE countries would probably bring the problem of growing disparities back on stage.

3. The relation between national growth and intranational disparities

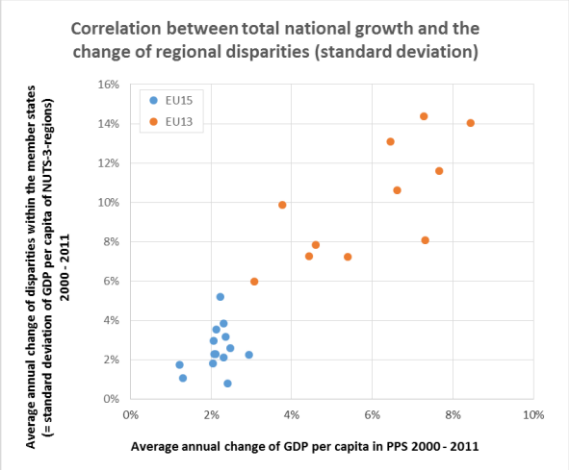
The results presented in the previous section clearly indicate that the catching-up process of the new member states of the EU is accompanied by growing regional divergence between booming urban centres and lagging rural areas, while spatial disparities in most of the well-established states in Western and Central Europe largely remained unchanged or even decreased. Furthermore, the sudden slump of economic growth in 2009 and the decelerated development in the following years, were associated with a slowdown of divergence in most of the new member states. These findings might lead to the hypothesis that the speed of total economic growth is empirically connected with the change of disparities within a country.

This assumption is tested by a simple correlation analysis, which opposes the average annual GDP growth rates of the member states to the average annual change of disparities within the member states from 2000 to 2011. In spite of the methodological problems mentioned in section 2, regional disparities are measured both by the standard deviation and by the coefficient of variation of GDP per capita of NUTS-3-regions within the countries. First, the relation between total national growth and the change of regional disparities in the member states of the EU28 is graphically presented in two scatter plots.

Then, the correlation coefficients are shown in a methodological, spatial and temporal differentiation: Table 3 presents separate coefficients for

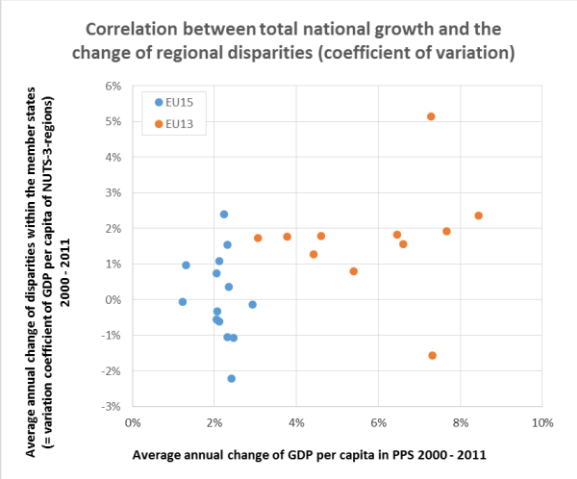
- 2 indicators of regional disparity
  - standard deviation
  - coefficient of variation
- 3 groups of countries (whole EU and 2 sub-groups)
  - whole EU (EU28)
  - old member states (EU15)
  - accession countries of 2004, 2007, 2013 (EU13)
- 4 periods of time (whole period and 3 sub-periods)
  - whole period (2000 - 2011)
  - before the enlargement of the EU (2000 - 2004)
  - before the outbreak of the global economic crisis (2004 - 2008)
  - during the crisis (2008 - 2011)

The scatterplot in figure 5 provides a striking picture for the relation between the average annual national growth rate and the change of regional disparities measured by the standard deviation of GDP per capita in the Nuts-3-regions of a country. The obviously positive correlation in the scatterplot is confirmed by a highly significant (at the 0.01 level) correlation coefficient (+0,918), which is also significant for the two periods before the crisis, but not for the time after 2008 (see table 3). These results clearly indicate that the absolute deviations of regional GDP per capita from the national average rise with the national growth rates of a country, which can, however, be partly explained by a statistical size effect. In this approach constant regional differences from a growing mean of the sample (national GDP) would provide unchanged disparity levels, whereas in a relative consideration they would rather be interpreted as a sign of convergence (see section 2).



Source: Eurostat, own calculations

Figure 5. Correlation between total national growth and the change of regional disparities (measured by standard deviation of regional GDP per capita)



Source: Eurostat, own calculations

Figure 6. Correlation between total national growth and the change of regional disparities (measured by coefficient of variation of regional GDP per capita)

In order to eliminate the size effect caused by national growth and to consider relative deviations from national GDP levels, a second correlation analysis uses the coefficient of variation instead. The scatterplot in figure 6, which presents the relation between average annual growth of GDP and the average annual change of the coefficient of variation of regional (Nuts-3) GDP per capita values between 2000 and 2011, provides a less impressive but still a distinct result: In spite of higher unexplained deviations the clearly positive correlation coefficient (+0,462) is still sufficiently significant at the 0.05 level. Again, the first two sub-periods also provide positive (but only party significant) results, while there is no evidence for any relation between growth and changing spatial inequalities after 2008.

Nevertheless, the empirical findings for the whole sample (25 member states of the EU 28) confirm a statistical relation between national economic growth and increasing relative deviations of regional GDP per capita at least for the period before the economic crisis.

Table 3. Correlation coefficients between total national growth and the average annual change of regional disparities on the NUTS-3-level in different periods and groups of EU member states

	2000-2011	2000-2004	2004-2008	2008-2011
Disparities measured by standard deviation				
EU28	+0,918**	+0,789**	+0,896**	+0,333
EU15	+0,281	-0,177	+0,146	+0,630*
EU13	+0,740**	+0,539	+0,807**	+0,324
Disparities measured by coefficient of variation				
EU28	+0,462*	+0,425*	+0,314	-0,023
EU15	-0,209	-0,731*	-0,335	-0,077
EU13	+0,106	+0,120	+0,328	+0,199

** significant at the 0.01 level * significant at the 0.05 level

Source: Eurostat, own calculations

The differentiated graphic presentation of the "old" EU15-countries and the new member states ("EU13") in both scatterplots, however, disclose two strongly diverging paths of development. While the EU15 countries show relatively low growth rates and (with some exceptions) stagnating or decreasing variation coefficients, most of the new member states in CEE face a catching-up process, which is characterized by fast economic growth and growing regional divergence. Whereas the figure 5 indicates that there is still some explaining power of national GDP growth rates, the scatterplot in figure 6 shows no pattern of correlation within the two groups of countries and therefore suggests that the change of regional economic disparities is less determined by national growth rates but rather by the type of country considered. Even though the correlation coefficients separately calculated for the two groups of member states have to be interpreted with caution due to the small sample (only countries with at least 5 Nuts-3 regions were included in the analysis), they basically confirm the graphic impression: Referring to the change of relative disparities (as measured by the coefficient of variation) there is no statistical evidence of a significant relation between national growth and the change of disparities within the two country groups (see table 3).

Although the coefficients for the new member states ("EU13") show positive values for all periods, the deviation of different national development paths seems to be too big to provide significant results. The totally different ways of convergence in Bulgaria and Latvia, where similar annual growth rates (+7%) were connected with exploding disparities in the first case and with spatial equalization in the other, or the special situation of Poland, where prosperous economic development did not seriously increase regional inequalities, suggest that there must be other driving forces of spatial divergence. The analysis for the group of old member states ("EU15") yet provides negative correlation coefficients. Even though the results are not significant for most periods, they slightly indicate that the faster growing countries of the EU15 tend to overcome their spatial inequalities more easily. The clearly positive correlation results for the EU13 when using the standard deviation for measuring regional disparities, confirm that the high growths rates in the new member states are strongly connected with increasing absolute deviations of regional GDP per capita from the national average. This result, however, can mainly be attributed to the statistical size effect in growing economies and not to a relative intensification of economic inequalities between the Nuts-3-regions of the countries.

4. Conclusions

The empirical investigation of changing spatial disparities in the European Union between 2000 and 2011 indicates that economic convergence between the whole countries was much faster than on the Nuts-3 level until the year 2008 and almost came to a stop after the begin of the worldwide economic crisis. The gap between national and regional convergence can mainly be explained by growing regional inequalities within the majority of the new member states. Surprisingly, the diverging development of booming urban centers and lagging rural areas seems to be fastest during the final phase of the accession process and to slow down in most cases after the formal accession. This phenomenon indicates that the radical conversion of economic, social and political structures as a pre-condition for EU membership tends to increase regional disparities before EU-integration, while the actual accession and the subsequent access to EU structural funds helps to reduce the economic gap between "rich" and "poor" regions.

The results presented in section 3 suggest that the apparent correlation between the speed of national economic growth and the intensity of regional divergence can mainly be traced back to the specific development paths of the EU15 on the one hand and the new member states on the other. In other words, it seems to be the particular situation in the CEE countries which is responsible for growing spatial inequalities and not the actual speed of national economic growth there. It can be confirmed that the catching-up process in the new member states goes hand in hand with increasing disparities between growing economic centers and lagging rural areas, but there is no clear evidence that the degree of divergence is higher in the fastest growing countries. The question remains, which of the specific conditions in the new member states are responsible for the strong disintegrative effect of economic development there. Based on various arguments from literature on polarized growth and on empirical evidence given in this paper there are three possible hypotheses, which might make a good case for explaining the phenomenon of increasing spatial inequalities in catching-up CEE countries:

First, it can be argued that the intensity of agglomeration economies depends on the distribution of relevant production factors in space. Since the productivity of private investment tends to increase with capital endowment, infrastructure supply and labor skills in a region, big regional differences in relevant production conditions promote growing inequalities in GDP. In other words, agglomeration effects need a minimum amount of basic facilities and amenities to unfold and to amplify economic activities: "economic growth has a tendency to be associated with some sort of agglomeration and requires a minimum threshold of resources and activities in order to take place." (Petrakos et al. 2005, p.1838). Assuming that regional differences in basic location factors are more pronounced in less developed countries, the highly uneven distribution of relevant production factors between well-equipped urban centers and poorly resourced rural regions seems to be a possible reason for growing disparities in the new member states in CEE.

Secondly, it is well plausible to claim that the emergence of positive trickling-down effects depends on the degree of integration of the economic system. Since the main handicap of the new member states can be attributed to the "adverse legacy effects of these earlier non-democratic governance systems", which include "the use of outdated technologies, insufficient updated infrastructure, contaminated land, and institutional and governance systems with limited capacities and capabilities" (McCann 2015, p.19), they seem to be strongly disadvantaged in this dimension. Assuming that the quality of built facilities (e.g. cross-linked infrastructure networks), the interconnectedness of economic actors (often referred to as "social capital", "embeddedness", "institutional thickness" or "untraded interdependencies": e.g. firm networks, co-operations, linkages) and the efficiency of the governance system clearly lag behind the well-integrated countries in Northern and Western Europe, this line of argumentation suggests that growing disparities in the new member states are a consequence of less integrated economic systems, which impede the diffusion of positive spread effects from the booming growth poles to the lagging regions.

Thirdly, the drastic conversion of economic, social and political structures in the new member states may account for a widening economic gap between "rich" and "poor" regions. Economic structural change, social and demographic transformation and the restructuring of the political system seem to benefit especially established centers, which are able to adopt new trends and innovations and to take economic advantage from them. On the contrary, these processes can be a serious threat for less developed regions, which often do not have the flexibility and the facilities to make use of changing conditions. The strong increase of regional disparities before the actual EU-integration (see section 2) might indicate that this effect mainly appears in the pre-accession period, when the countries face the most radical changes to approach EU standards.

The insight that it is not the speed of economic growth but the particular conditions in the CEE countries, which are responsible for fast spatial divergence in their catching-up process, leads to the conclusion that additional research is needed for assessing the driving forces of increasing spatial disparities thoroughly. In order to meet this challenge, the three hypotheses given above might give an indication to the causes of regional divergence within countries. For that purpose, it will be necessary to define suitable indicators for (a) the uneven distribution of endowment, (b) the integration of the economic system and (c) the conversion of economic, social and political structures and to test

their impact on changing regional disparities in a multivariate analysis.

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