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ESPON action 1.1.3

Particular effects of enlargement of the EU and beyond on the polycentric spatial tissue with special attention on discontinuities and barriers

Second Interim Report

Part I

"Options for spatially balanced developments in the enlargement of the European Union"

(ODEN)

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1. Introduction:

Enlargement of the European Union by the accession of transforming economies and societies will have particular effects on the fibre of the European territory, especially at the internal and external border regions. These effects will require more emphasis on balanced and sustainable spatial development, with special attention to the issues of transitional political and administrative systems, possible geographic polarisation, capricious development of technical infrastructure, environmental stress and a shrinking public sector.

This findings of the research efforts devoted to this SIR has four main emphasis: 1) Analysing and diagnosing the processes and trends of the enlarged spatial tissue of the EU, 2) Borders, border regions and cross-border cooperation in an enlarged Europe, 3) Trends towards polycentric developments with an emphasis on urban systems and 4) Policy options for polycentric development

2. Summary of main preliminary results

According to the Copenhagen Council (2002) ten countries (Latvia, Estonia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Slovenia, Cyprus and Malta) will join the EU in 2004 and two other (Bulgaria and Romania) will join the EU in 2007. The accession demand of Turkey will be examined in 2004. With the two exceptions of the Mediterranean islands Cyprus and Malta these 'Enlargement countries' belong to Central and Eastern Europe and represent certain common economic and social characteristics, that are related more or less to pre-existing socialist development structures as well as problems of transition to the market economy and economic restructuring. This Second Interim Report of ESPON 2006 project 1.1.3 examines options for spatially balanced developments in the enlargement of the European Union.

The problems and the opportunities of the urban systems of these 12 countries of enlargement with regard to their polycentric development are examined in this report. These countries present many resemblances but also important differences. One common problem is the weakness of the urban systems to support polycentric territorial growth. All these urban

systems are found (with important differences between them) away from the single Global Integration Zone of EU –15. The urban systems of the Czech Republic, Slovakia, Hungary and Slovenia are located in axial extensions of this GIZ. These axial extensions present the potential of fast growth and will certainly reinforce the urban system of Poland as well. This urban system has the possibility of strengthening fast its bonds with the wider Baltic region.
In the SIR from ESPON Praoject 1.1.3 several hypotheses are launched regarding the spatial impact of enlargement, particularly on polycentricity and rural-urban relationships:

- We suppose that trade between the Western and Eastern parts of Europe will increasingly show the pattern of the theory of comparative advantages. The free trade results in an adjustment process among the labour-intensive branches and also in the regions where these branches are over-represented. There are, however, still branches and regions where an increased trade within an enlarged EU will have negative effects. Some products and branches, which are labour-intensive but not entirely dependent of low wages will, however, probably be affected by an increased import. This will of course also have regional implications especially with regard to regions that will experience a more intensive competition from the acceding countries. The result will be that at least the industrial expansion in these districts will slow-down or even result in retardation. We expect growing restructuring pressures on the cities, city clusters and city networks located in old industrial regions and rural regions, especially those of the Eastern part of the enlargement area.

- This general reorientation of economic flows from East to West (in case of accession countries) has already taken place during the 90s. What is now expected is growing intensity and in some cases changing composition of flows. However, this leads us to the assumption that analysis of the observed spatial trends of economic restructuring and growth is essential for understanding the future spatial impact of integration.

- Some transport flows will become modified due to elimination of barriers between the present candidate countries. Barriers have several dimensions, from physical to cultural, but are generally lower along established trade and transport corridors. This leads us to the assumption that development will be reinforced of the cities, city clusters and city networks located in corridors that mainly constitute axial extensions of the single Global Integration Zone of EU –15.

- Different feedback processes, including national policy responses, will dominate the regional development in balanced or unbalanced directions: If the unfettered centrifugal forces will dominate a monocentric development, divergent development will be the result and the concentration process will be accentuated. This will enhance the role of the capital cities of the enlargement countries in the network of European metropolises at the expense of the rest of the national urban systems. If the centripetal forces instead dominate, a polycentric and convergent development will be the consequence. This is also more in line with the recommendation from ESDP and in line with the whole ESPON programme. In such, to hamper a monocentric development and stimulate a polycentric one is a political question already is and will still be controversial in may accession countries.

- In the enlargement process, a never before in Europe experienced number of border regions will have the potential to "merge" into dynamic functional relationships with "new" neighbours. Obviously, asymmetries and barriers of cultural, physical and economic character between border regions emerge as both obstacles and options in the political process of introducing free mobility of goods, labour, services and capital.

In **Chapter 2** we focus on processes and trends in the enlargement of the EU spatial tissue. We begin by examining the spatial concentration of the ESPON space from its function as a total entity in comparison to other markets. Our preliminary analysis of spatial trends (1995-2000) in population and economic terms indicates that by understanding the ESPON as a market entity some preliminary conclusions regarding population shares and wealth contribution can be drawn:

- There has been a westward shift in population shares along a dividing range from Trondheim in Norway via Copenhagen, Munich and Rome to Valetta in Malta. This drift has some exceptions, in particular due to depopulation processes in the northwestern Iberian Peninsula, central France, parts of Scotland and Sardinia. The shift from Eastern Europe has several exceptions - in particular most capital regions display an increasing proportion of total ESPON space population.

- Regarding wealth contribution the share of eastern countries is on the rise mainly due to strong contribution from the Polish carpet and the EU10 capital regions. The eastern

areas of Europe have experienced more monolithic growth relative to the ESPON space, especially in the three small Baltic countries and the Czech Republic. However, total shares of EU10 GDP in ESPON are still small compared to that of EU15. Beside the London-Netherland patch, increased contribution in EU15 came from parts outside the core like from the Spanish and Italian carpet, Ireland, Denmark and some Finnish regions. The core of EU15 is subsequently losing its strong contribution in wealth in the ESPON space as is the case for Germany and France. The position of Swedish regions is rapidly shrinking except for the monolithic growth of Stockholm.

Tentatively, we observe that performance in terms of GDP related to population in EU15 is relatively balanced in most regions. Capital regions perform better in GDP but even several other regions hold leading economic postions. The absolute contribution of regions varies widely, more than in other parts of the ESPON space. In Bulgaria and Romania regions perform much better in population than in economy relative to the total ESPON space. In both countries capital regions lead the contribution long before the second largest regions. Burgas is the only region to strengthen its economic position during the latter half of the 1990s. Norwegian and Swiss regions almost entirely perform better in ESPON GDP than in ESPON population. While Norwegian regions strengthen their economic positions, Swiss regions lose it. In border regions of the EU15-accession country border gaps between contribution from regions of the accession country and those of EU15 seems modest. However, there are more EU15 border regions performing economically better; many though being in line with the EU10 border region performance.

This preliminary spatial economic analysis shows that within *EU15,* the rate of change in performance in GDP per capita in the poorest NUTS3 regions - with less than 50 percent of EU15 average in 1995 - varies between – 5 to + 15 percent units, while most other regions and irrespectively of their level GDP per capital in 1995 vary between- 20 and almost + 20 percent units. Within *EU10*, most of the regions have a GDP per head in 1995, which is less than 75 percent of EU15 average. Only one region displays a level of more than 125 percent. Variation in performance in regions below 75 percent of EU15 average is similar to the corresponding regions in EU15.Also the range of variation in the (small) class of regions with 75-100 percent of EU15 per capita GDP is similar in Accession countries as in the current EU space. Within *Bulgaria and Romania*, all except one region is classified below 50 percent of the EU15 average in GDP performance in 1995. Furthermore, GDP per capita performance in

almost all these regions decreased from 1995 to 2000 in relation to the EU15 average respective year. Within *Norway and Switzerland*, all but one region had a GDP per head above the EU average in 1995. However, most regions decreased their position relative to the EU average in 2000, in some cases up to 20 percent units decrease.

ESPON Project 1.1.3 pays special attention to less favoured and regions in industrial decline. In this diagnosis we present a preliminary list of these regions in EU25, i e regions with less than 75 percent of EU15 GDP per capita in 1995 and with a further reduction in this share in 2000. In next phase of the project we will analyse factors behind less well performance in these regions and discuss policy options for overcoming obstacles to rapid growth. It should be noticed that roughly 10 percent of total population in ESPON space live in these regions which altogether contribute to approximately 6 percent of total GDP.
Within the EU15 and with the EU25 the gap between poor and rich regions is declining. However, there is, no obvious change of the spread of wealth. Of course, the time series is rather short (only 6 years), so if we would have had more years the story could be different.

The "Case study" about the Portugese experiences with convergence in the wake of accession shows that integration is not a single track continuous process rather than a complex one, where the implications of integration are only one factor beside others which even may be some time more important. Although the European market encouraged the economic development and the Structural Funds were extremely important, economic cycles in the European economy have been more influent in the convergence growth than European funding. In addition, the European Monetary Union (EMU), Euro and the Stability and Growth Pact have different impacts, and the public expenditure cuts have a strong influence in the growth of Portuguese economy. After all, more than ten years of public (national and community) funding did not change the pattern of regional disparities significantly.

One of the most distinguishing features of the enlargement area is the dominant role and increasing importance of borders and border regions. **Chapter 3** argues that with the consecutive stages of the Eastern enlargement, the dimension and significance of internal and external borders and the problems of border regions will substantially change. Today, the permeability of these borders is fairly high, although in some places natural barriers (mountain ranges; rivers lacking bridges) and administrative shortcomings still inhibit cross-border interaction. Border regions bear the brunt of the tension created by the wide disparities in income levels and benefit from the additional opportunities of efficient factor allocation,

which helps them to achieve above-average positions within their countries in most cases, while at the same time experiencing below-average levels of security and frequently even creating additional ecological strains. The border regions' potential for co-operation is sometimes boosted by ethnic ties and knowledge of each other's languages.

Project 1.1.3 is also in the process of developing a basic typology that will map and analyse of functional border regions in the enlargement of the EU based on the three aspects of Cohesion (cf. hypercube); Integration, Position, Potential. The table below depicts a basic typology of the current state of integration and position/potential in the various border regions. From this typology we can then analyze the current state and potential of border regions in the enlargement process.

The typology will take the dual form of territory into consideration: societal and spatial. It will also include essential elements of scale. Time is also a vital aspect to be reflected in the typology, as cohesion and particularly integration are processes that demand depiction not only in the form of static indicators, but also throughout time.

Polycentricity of the enlargement area is the focus of **Chapter 4**. We begin by noting that polycentrism is a term that risks of becoming vulgarised and empty of sense, as the recurrence of its use has not been followed by an accuracy effort in what concerns the concept. Thus, polycentricity appears in the spatial analysis, diagnosis and planning context, only as a pole opposed to monocentricity, being associated to the idea of the sharing of the "power" – political, administrative, and economical. Polycentricity can be the "instrument" which allows the sharing of power among centres in a given dimension that can consequently play the role that, in other situations, is carried out by one single centre of greater dimensions (monocentricity). In this manner, the concept of complementarities must be associated to polycentricity.

The concept, as an instrument of spatial organisation, started by being applied to meso-scales, to regional spaces where, in the absence of a reliable regional metropolis, its functions might be performed by a group of medium and small cities, duly articulated in a network. Insofar, "promoting polycentric urban development" is one of ESDP's main goals, it is necessary to fix the concept with accuracy, because, as Peter Hall writes in the Policy recommendations chapter of this report (Chapter 5), "The term... is capable of multiple meanings". Peter Hall's

note is a decisive contribution to that elucidation, above all, in what concerns the necessity to fix the approach levels and the pertinent factors.

Chapter 4 also features a discussion regarding Major Urban Systems (MUS). In the majority of the candidate countries, the capital city plays a primary economic and cultural role. Only Poland has some regional centres which "compete" considerably the capital city, Warsaw. Three agglomerations, those of Budapest, Warsaw and Prague, form an integral part of the European metropolises network.

A factor strongly differentiating the urban system of Eastern Europe (EE) from that of Western Europe is the lack of a developed network of small and medium-sized cities (with the exception of the Czech Republic and Slovenia)[1].

The three small Baltic countries have already powerful relationships with the wider Baltic Sea region, which will be strengthened in the future. Poland has established links – with a tendency to become more strengthened - so much with the Baltic region as well as with the Southern Central European space of both EU - 15 and countries of enlargement, as well as the Eastern countries of the Community of Independent States (CIS). Warsaw but also other large cities of Poland have a considerable potential to enhance their role as centres in the EU-27 and wider regions.

The links between the urban systems of the southern Central European accession countries and the western EU – 15 countries already exist to a significant extent. Budapest and Prague already constitute powerful nodes of the Central European urban system and their role will be strengthened fast in the future. Bratislava, even though smaller, presents a powerful degree of integration.

The MUSs (as well as the overall urban systems) of the Balkan countries obviously present a lower degree of integration with the MUSs (and the overall urban systems) of EU -15 countries. As we have already reported, their incorporation in this space advances at a differentiated pace and in relation to different parameters.

The MUSs, as well as the overall urban systems of Cyprus and Malta are very open and present the potential to be incorporated fast in the MUSs (and the overall urban network) of EU-27 and beyond, despite the disadvantage of their island character.

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[1] another factor is linked to the disparities between urban and rural living conditions

The problems and the opportunities of the MUSs (and the overall urban systems) of the 12 accession countries with regard to their polycentric development present many resemblances but also important differences.

The urban systems of the three small Baltic countries have possibilities of quickly enhancing their links with the wider region of Baltic, and to a relatively smaller degree with the countries of CIS and Russia.

The connections of the urban systems of the Balkan countries with the MUSs5 of countries of the EU–15 are rather weak today (with significant differences among the different countries). In condition that there will be a powerful aid intervention, these urban systems have the possibility of developing their interconnections so much with those of countries of the EU – 15 as with those of CEE, Black Sea countries and the Middle East.

Another common problem (that concerns the great majority of countries that have been examined) in the prospect of enlargement, is the case of over promoting the growth of capitals at the expense of the rest of the urban systems. This risk represents the other side of the coin in enhancing the role of capitals in the network of European metropolises.

It is therefore necessary to promote the development of networks between the intermediate and small cities in relation to the rapidly transforming rural space, in order to avoid important economic and social problems of enlargement outside the capitals regions.

In terms of discussing polycentricity, it is desirable to develop an operational concept of polycentricity and operational methods for identifying and measuring the existing polycentricity of the European urban system. The methodology should allow (i) to *measure* the degree of polycentricity of a region, a national urban system or the European urban system at large, (ii) to *evaluate* it with respect to the policy objectives of European Spatial Development Perspective competitiveness, cohesion and environmental sustainability and (iii) to *forecast* the likely impacts of European, national or regional economic, transport and telecommunications policies on the degree of polycentricity and the three policy goals.

The proposed approach measures polycentricity by identifying three dimensions of polycentricity: the *size* or importance of cities (population, economic activity, human capital,

higher education, cultural importance, administrative status etc.), their *distribution in space* or *location* and the *spatial interactions* or *connections* between them.

With these three partial indicators of polycentricity, size, location and connectivity, a comprehensive indicator of polycentricity can be constructed. The indicator will classify each country on a continuous scale of polycentricity and at the same time assign each city a place and level in the national and European urban hierarchy.

In the context of ESPON 1.1.3, the method can also be used to forecast the likely future development of polycentricity in Europe for different scenarios of urban growth and linkages between cities as a consequence of the enlargement of the European Union taking account of macro trends, such as further integration of the world economy and intensification of the competition between regions and cities and the development of energy cost, transport technology and the further diffusion of telecommunications.

It is particularly here where co-operation with ESPON 1.1.1 will be important. ESPON 1.1.1 will provide the database for analysing cities, functional urban areas and polycentric urban regions in the enlarged European Union under different assumptions about the macro trends indicated above to be used in the two enlargement scenarios of ESPON 1.1.3 that will be implemented in Year Two of ESPON.

Accessibility is the main 'product' of a transport system. It determines the locational advantage of an area (i.e. in ESPON a region, a city or a corridor) relative to all areas (including itself). Indicators of accessibility measure the benefits households and firms in an area enjoy from the existence and use of the transport infrastructure relevant for their area.

The important role of transport infrastructure for spatial development in its most simplified form implies that areas with better access to the locations of input materials and markets will, *ceteris paribus*, be more productive, more competitive and hence more successful than more remote and isolated areas.

However, the impact of transport infrastructure on spatial development has been difficult to verify empirically. There seems to be a clear positive correlation between transport infrastructure endowment or the location in interregional networks and the *levels* of economic

indicators such as GDP per capita. However, this correlation may merely reflect historical agglomeration processes rather than causal relationships effective today. Attempts to explain *changes* in economic indicators, i.e. economic growth and decline, by transport investment have been much less successful. The reason for this failure may be that in countries with an already highly developed transport infrastructure further transport network improvements bring only marginal benefits.

Accessibility is one of the indicators calculated in ESPON 1.2.1 for NUTS-3 regions to express the combined effect of geographical position and locational advantage provided by the transport system. The emerging picture of Europe is familiar. It shows the concentration of high-accessibility regions in north-west Europe reaching from the South of England over the Benelux countries and the Rhein-Ruhr metropolis along the Rhine valley to Switzerland and northern Italy (the 'Blue Banana'), with another peak in the Paris region. It can be seen that most candidate countries, with the exception of the Czech Republic and parts of Hungary, belong to the European periphery through the combined effect of their remote geographical location and their underdeveloped transport system.

The contrast in accessibility between the current EU member states and the candidate countries becomes even more obvious if two experimental, contrafactual accessibility maps are drawn. If only destinations in EU countries are considered, it becomes obvious that the candidate countries are disadvantaged even in comparison with the peripheral regions in the European Union, such as Greece, southern Italy, Portugal and rural Spain, Ireland, Scotland and the Nordic countries. If only destinations in the central and east European accession countries are considered, the asymmetry in the relationship between EU and candidate countries becomes obvious. Whereas in the previous map accessibility in the candidate is severely reduced, in this map accessibility in the central European countries is only little affected.

In the future work of ESPON 1.1.3, accessibility analysis will be an important component of the two enlargement scenarios. In particular in Enlargement Scenario 2, accessibility will be the key variable driving the SASI regional economic model used to forecast the spatial impacts of the EU enlargement with particular emphasis on the role of the TEN and TINA network improvements (see Chapter 6).

Chapter 5 provides policy options for polycentric development in the enlarged Europe and details the Spatial Economic Dynamics Enlargement scenario (Scenario Study 1 of the 1.1.3 bid for tender.

The research proposal revolves around the identification and specification of relevant factors, which are capable of affecting the shift between monocentric and polycentric development in enlargement countries and to influence the spatial distribution of economic growth in enlargement countries. Categories of factors are:

- *Economic structure*
- *Economic drivers (investments)*
- *Demographic structure*
- *Geographic structure and scale*
- *Transport infrastructure and technologies*
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Against this background, the research acknowledges the need to analyse the actual impact of different concrete policies – both those originating from the EU, and from member state governments – at previous stages of enlargement of the EEC/EC/EU. Specifically, to relate these impacts to the present position of the accession countries, it is useful to look at cases that are as possible comparable in size with the accession countries such as Ireland, Greece and Portugal. These policies are analysed in terms of their key development factors, their geographical focus and scale, their economic and spatial outputs and impacts.
The research focuses primarily on policies for the generation and redistribution of employment (decentralisation of government employment, creation of new public institutions, encouragement of Foreign Direct Investment); on transport provision policies in selected cities (development of local transport accessibility, new airports, or expansion of airports, in secondary cities, development of regional networks focussing on major cities); and on policies for increasing the importance of culture, leisure-based, tourism and sporting activities to the economy of cities and regions (attraction of major one-off events with longer-term development potential, deliberate development of a cultural or tourist role)

As mentioned, in order to determine the impact of economic change on the spatial structure of urban and rural activity in the accession countries, a clear and unambiguous analysis of the impact of previous change on countries which have joined the EEC/EU is needed. This

analysis is prior to any forecasting and it guides the forecasting model itself in that it will assess the importance of different factors of spatial change in the last 20 years or so.
In the second stage a more aggregate model for futures forecasting is applied which contains the essence of our understanding of past change. This second model is extended to the accession countries. The need for two different but related models – for understanding the past, and then for predicting the future – is solely based on data availability.
In both models, the analysis takes account of the fact that data is available at different spatial scales (with NUTS2 being more complete than NUTS3) and of the fact that the temporal structure of the data for the current EU countries is much more complete than for the enlarged EU. This is one of the main reasons why a two tiers approach to scenario modelling is necessary. To account for the spatial and temporal variations, the models are designed to take account of different levels of detail at different scales and time periods, invoking a multilevel approach reminiscent of shift share analysis wherever appropriate and necessary. The models are both linear in their direct structure, therefore enabling multilevel specifications, and dynamic through the use of lagged variables.

One of the main obstacles for the integration of the candidate countries in eastern Europe is the poor quality of transport infrastructure in these countries and between these countries and western Europe. This problem has already been address by the Transport Infrastructure Needs Assessment (TINA) programme of transport infrastructure corridors for the accession countries (TINA, 1999; 2002). However, the territorial impacts of the TINA projects and the related trans-European transport network (TEN-T) projects are not clear at all. The outcome might be a higher level of cohesion but also an increase in spatial disparities.

Therefore a second scenario study will assess the impacts of the TEN-T and TINA projects on the regions in the accession countries. This is the focus of **Chapter 6**. The method used for this will be the regional economic model SASI already used in ESPON 2.1.1. In ESPON 1.1.3, the SASI model will be used to forecast the socio-economic development of the regions in the accession countries during and after their entry into the European Union taking account of the expected reduction border barriers, such as border waiting times an customs procedures through the accession and of different scenarios of implementation of the TEN-T and TINA projects.

The SASI model is a recursive simulation model of socio-economic development of regions in Europe subject to exogenous assumptions about the economic and demographic development of the ESPON Space as a whole and transport infrastructure investments and transport system improvements, in particular of the trans-European transport networks (TEN-T) and TINA networks . For each region the model forecasts the development of accessibility, GDP per capita and unemployment. In addition cohesion indicators expressing the impact of transport infrastructure investments and transport system improvements on the convergence (or divergence) of socio-economic development in the regions Union are calculated.

The main concept of the SASI model is to explain locational structures and locational change in Europe in combined time-series/cross-section regressions, with accessibility indicators being a subset of a range of explanatory variables. Accessibility is measured by spatially disaggregate accessibility indicators which take into account that accessibility within a region is not homogenous but rapidly decreases with increasing distance from the nodes of the networks. The focus of the regression approach is on long-term spatial distributional effects of transport policies. Factors of production including labour, capital and knowledge are considered as mobile in the long run, and the model incorporates determinants of the redistribution of factor stocks and population. The model is therefore suitable to check whether long-run tendencies in spatial development coincide with development objectives discussed above.

With the calibrated SASI model ten transport policy scenarios defined for ESPON 2.1.1 were simulated. Here the results of one these scenarios, scenario B3, will be briefly summarised. More information can be found in the Third Interim Report of ESPON 2.1.1.

As to be expected, accessibility is improved in all regions, as the scenario assumes infrastructure investments and improvements compared with the respective reference scenario. However, as Figure 3 shows, the relatively large differences in accessibility translate into only very small differences in GDP per capita. Despite the huge transport investments, no region gains more than a few percent in GDP per capita as a consequence of these investments – and this over a period of two decades. And the direction of the effects is not so straightforward as in the case of accessibility. The SASI model takes account of interregional competition, and although it does not assume a zero-sum game, there are winners and losers.

It can be seen that the huge investments for the trans-European transport networks (TEN-T) are not likely to bring much overall economic growth to the regions in the present European Union. In fact many most central regions in north-western Europe even lose in terms of GDP per capita in relative terms compared to the reference scenario. The clear winners are the peripheral countries, including the candidate countries in Eastern Europe. So clearly the TEN-T and TINA projects seem to support the integration of the accession countries into the European Union.

However, one should not take this as a proof that the TEN-T and TINA projects in fact reduce the disparities in wealth between central and peripheral countries. If *absolute* differences in GDP per capita are considered, the peripheral countries, because of their low GDP per capita, gain much less than some of the more central regions and so turn from relative winners into absolute losers.

In **Chapter 7** of the report, several of the special challenges to be addressed in both the enlargement process and even in project 1.1.3's future work include FDI, R&D expenditure, high-tech sectors, physical infrastructure, migration and movements of human capital, and regional specialisation and clustering, institutional capacity, and potential for integration in terms of flows and barriers

3. Short presentation of concepts, methodologies and typologies used and developed

3.1 Spatial concentration

In the section of spatial concentration, we discuss ESPON space from its function as a total entity in comparison to other markets. Hence we consider the ESPON space to represent the total production territory at internal and global markets. This approach focuses on the role of single regions within the total ESPON space and hence favours statements on change in regions position relative to the total of ESPON rather than statements on change of the regions position relative to themselves.

By means of a series of maps and diagrammes of correlation dias, the results show a tentative pattern, even an embryo to a typology, of spatial concentration in terms of population and wealth contribution.

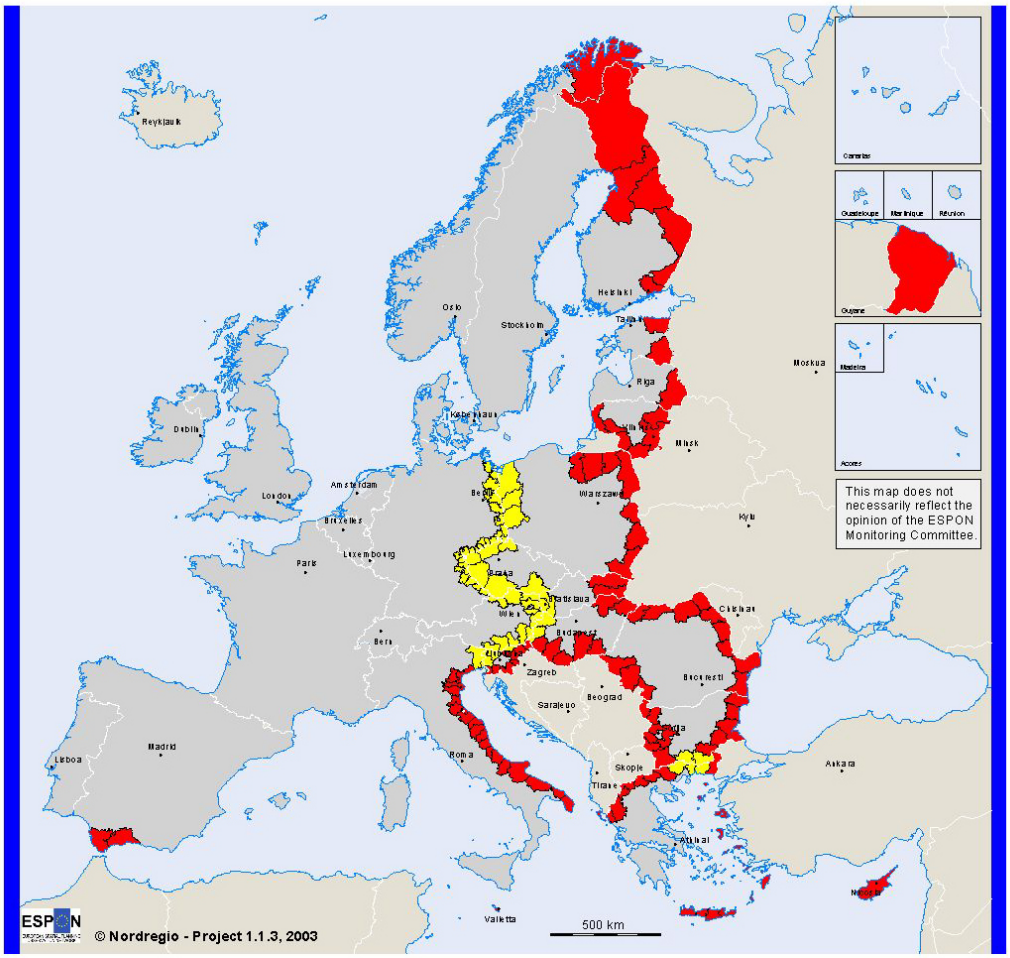
- **patches** characterizing a number of neighbouring regions within a country or in border regions with strongly diverse directions in their contributions to the total in an enlarged EU

- **carpet** of increasing or decreasing contribution, indicating clusters of similar development and in some cases a harmonized polycentric development

- **monoliths** i. e. regions with European or national importance with increasing or decreasing contribution to the total, indicating a changing importance of a monocentric regional system.

Project 1.1.3 uses some slightly different definitions of border regions within the various chapters. The section on spatial concentration takes a broad approach to defining border regions (see Annex 1 for a complete list of border regions as used in this section). Map 1. below depicts these “old” and “new border regions.

Border regions, 1st draft



3.2 Convergence

In examining convergence we look at wealth differentials across the ESPON space to indicate roughly the social dimensions of convergence, and economic performance differentials to discern the economic dimensions of convergence.

When the focus is on dispersion in income and wealth between regions or nations, the **σ-convergence** indicator is perhaps the most useful method. This method is based on the standard deviation, across regions, of the logarithm of real Gross Domestic Product (GDP) per capita. When the standard deviation declines over time σ-convergence applies. For the years 1995-2000, and for most of the NUTS3 regions within the current and future EU member

states[2], we have the possession of GDP data, both in Euros and in Purchasing Power Standards (PPS).

Another well-known convergence concept is called **ß-convergence**, which we use for economic performance differentials. It results from a neo-classical framework and can be split into conditional and unconditional convergence. Under unconditional ß-convergence, we regress the proportionate growth in per capita GDP on the logarithm of initial income. There is unconditional ß-convergence if the coefficient on initial income, denoted ß, is negative and statistically significant. Conditional ß-convergence occurs in case the negative relationship still holds after conditioning for other variables. Here, we only look at unconditional convergence. So from now on, when we mention ß-convergence, unconditional ß-convergence is meant.

3.3 Spatial association

The recent interest in the issue of spatial interaction vis-a-vis regional convergence has stimulated a large number of empirical studies employing various descriptive measures to examine the presence of spatial association. One such approach has been developed by the French team members of the ESPON TPG 3.1. Its focus is on deviations of regions from various reference areas, summarised by dissimilarity indices, which are both practically and analytically relevant. It has been agreed between the TPGs 3.1 and 1.1.3, that this methodology will be developed further, and tested in a co-operative study carried out by the French (CNRS – UMS RIATE, Paris) and Finnish (Karelian Institute, Joensuu) partners of these two research groups. The results of this exercise will be presented at forthcoming ESPON seminars and in TPG-deliverables. All efforts will be put in to pursue the analysis at lowest possible territorial level. The present paper reports the very first tentative results of this joint research.

3.4 Case study I: Convergence/Divergence and Regional Disparities

This SIR features a case study of the Portuguese experience of EU accession, with regard to convergence and divergence trends and regional disparities and highlights some potential

[2] For the EU15, we lack GDP data for the NUTS3 regions Berlin (both West and Ost), Cueta and Melilla (in Spain). For the 10 accession countries, we lack GDP data for both of the Malta NUTS3 regions. Furthermore, there are no GDP data for the NUTS regions of Norway and Switzerland. We do have GDP data for the NUTS3 regions of Bulgaria and Romania.

preliminary lessons for the Candidate Countries. This case study serves as a pilot for further studies of spatial impact of earlier enlargement phases.

3.5 Borders, Border Regions and Cross-border Cooperation

The *borders* of the Enlargement Area can be classified according to:

- geographic;
- ethnic and social;
- economic;
- political characteristics;
- from the point of view of their status in the EU accession process

According to a former definition of the European Commission, *border regions* are NUTS3 level territorial units situated directly at the state's land border.[3] *Cross border cooperation structures and schemes* are examined in terms of top-down structures organised and controlled by central governments and bottom-up structures, initiated and organised by local organisations. Border regions will also be classified according to their degree of symmetry or asymmetry.

3.6 Polycentricity

Polycentricity is a term that risks becoming vulgarised and empty of sense as the recurrence of its use has not been followed by an accuracy effort concerning the concept. Going through several recent studies including those made in the ESPD/SPESP ambit and that are at present occurring in ESPON, one often witnesses the fluidity and polyssemy of the concept. Thus, polycentricity appears in the spatial analysis, diagnosis and planning context, only as a pole opposed to monocentricity, being associated to the idea of the sharing of the "power" – political, administrative, and economical. Polycentricity can be and is, the "instrument" which allows the sharing of power among centres in a given dimension that can consequently play the role that, in other situations, is carried out by one single centre of greater dimensions

[3] Competitiveness and Cohesion: Trends in the Regions: Fifth Periodic Report. European Commission, Brussels, 1994, p.107.

(monocentricity). In this manner, the concept of complementarities must be associated to polycentricity.

Regarding the character of the concept of polycentric spatial development, as distinguished from earlier concepts for spatial development the following features of polycentricity are stressed in this report:

- Polycentricy as a dynamic process
- Cities not only as supplying centres but as driving forces of development
- Polycentricity as not only a model of settlement structure but of functional networks
- Activation of endogenous regional potentials
- Model to be applied at several levels
- Tracing polycentrism should start from the 1990s
- Polycentricity is manifested differently at various levels, the European, Level II (national) and Level II (regional)

3.6.1 Methodology for measuring polycentricity

The approach proposed in this report is to identify and measure polycentricity by three dimensions of polycentricity: *size*, *location* and *connectivity*.

These three dimensions are in line with the distinction made in ESPON 1.1.1 between *morphological* aspects of polycentricity (hierarchy, distribution, number of cities) and *relational* aspects (flows and co-operations bewteen urban areas at different scales): size and location describe morphological aspects, whereas connectivity describes relational aspects. With these three partial indicators of polycentricity, size, location and connectivity, a comprehensive indicator of polycentricity can be constructed.

The proposed method is, in principle, independent of spatial scale. It can be applied both at the national and at the European level; in fact it should be attempted to link the two levels. The proposed method differs from normative approaches to polycentricity in which a system of central places in a country, e.g. taken from a national planning document, is taken as given; instead the polycentric urban system is a *result* of the analysis.

3.7 Major Urban Systems (MUS):

The definition of MUSs include:

a. The FUAs which have a broad ***European role***. We include here (among others) the capital cities of all the countries, even if their European role is relatively restricted
b. The cities which have a ***transnational and / or national role*** (transnational / national FUAs).

At a later stage, we could possibly revise slightly these definitions, according to the eventual change of the definitions of the "European cities", the "Transnational cities" etc in the framework of the ESPON (mainly the ESPON 1.1.1).

To specify which transnational / national FUAs to include in the category of the transnational / national FUAs we have to use the relevant bibliography and sources as well as the actually available data (data provided by ESPON 1.1.1 and by other sources) and the data analyses made by ESPON 1.1.1.

We will analyse FUAs in accordance to the ESPON 111 SIR: criteria / indicators / typologies:

Building blocks

Urban Agglomerations (UA), which refers to contiguous build-up areas.

Functional Urban Areas (FUA): UA/core municipality + adjacent commuting areas (fringe municipalities).

FUA's are the building blocks of the polycentric region. Polycentric regions are established by two or more FUA's reinforcing each other. At two levels we are dealing with

Metropolitan European Growth Areas (MEGAs): cities beyond the pentagon that could function as economic centres and thus that will be capable of competing with the pentagon.

Transnational Regions of Integration (TNRI): if they are successful they might contribute to development beyond the pentagon – thus contributing to greater polycentric development.

3.8 Accessibility

There are numerous definitions and concepts of accessibility. Very simple accessibility indicators take only transport infrastructure in an area itself into account as an endowment factor. More complex accessibility indicators take account of the connectivity of transport

networks by distinguishing between the network itself and the activities or opportunities that can be reached by it. These indicators always include in their formulation a spatial impedance term that describes the ease of reaching other such destinations of interest. Impedance can be measured in terms of travel time, cost or inconvenience and may also include social, economic and political barriers.

In this study, the more complex accessibility indicators will be used. This will be done by following the definitions of ESPON actions 1.2.1 and 2.1.1 in which accessibility as such and its impact on regional development play prominent roles. A close co-operation with both projects is ensured, because S&W, one of the main partners in this project, is also a main partners in both projects mentioned above.

3.9 Enlargement Scenario 1: Spatial economic dynamics

In order to determine the impact of economic change on the spatial structure of urban and rural activity in the accession countries, a clear and unambiguous analysis of the impact of previous change on countries which have joined the EEC/EU is needed. This analysis is prior to any forecasting and it guides the forecasting model itself in that it will assess the importance of different factors of spatial change in the last 20 years or so.
In the second stage a more aggregate model for futures forecasting is applied which contains the essence of our understanding of past change. This second model is extended to the accession countries. The need for two different but related models – for understanding the past, and then for predicting the future – is solely based on data availability.
In both models, the analysis takes account of the fact that data is available at different spatial scales (with NUTS2 being more complete than NUTS3) and of the fact that the temporal structure of the data for the current EU countries is much more complete than for the enlarged EU. This is one of the main reasons why a two tiers approach to scenario modelling is necessary. To account for the spatial and temporal variations, the models are designed to take account of different levels of detail at different scales and time periods, invoking a multilevel approach reminiscent of shift share analysis wherever appropriate and necessary. The models are both linear in their direct structure, therefore enabling multilevel specifications, and dynamic through the use of lagged variables.

Request for data for Enlargement Scenario study 1:

Total population	EU27+2	NUTS 3	2000	1999-1970	Full coverage for NUTS3 is required for population data back to 1970 or 1981 at least. Data do NOT have to be necessarily by yearly steps. Census and intercensus surveys cross sections couldsuffice.
Total employment	EU27+2	NUTS 2	2000	1996-1999 p.a	Full coverage for NUTS2 is required for employment data at least back to 1981
Employment by sector of activity (based on Labour Force Survey classification)	EU27+2	NUTS 2	2000	1996-1999 p.a	Full coverage for NUTS2 is required for employment data at least back to 1981
GDP total	EU27+2	NUTS 3	1996-1999 p.a	1995	Extension of the time coverage for NUTS3 data back to 1981

3.10 Enlargement scenario study 2: The SASI Model

The SASI model is a recursive simulation model of socio-economic development of regions in Europe subject to exogenous assumptions about the economic and demographic development of the ESPON Space as a whole and transport infrastructure investments and transport system improvements, in particular of the trans-European transport networks (TEN-T) and TINA networks . For each region the model forecasts the development of accessibility, GDP per capita and unemployment. In addition cohesion indicators expressing the impact of transport infrastructure investments and transport system improvements on the convergence (or divergence) of socio-economic development in the regions Union are calculated.

The main concept of the SASI model is to explain locational structures and locational change in Europe in combined time-series/cross-section regressions, with accessibility indicators being a subset of a range of explanatory variables. Accessibility is measured by spatially

disaggregate accessibility indicators which take into account that accessibility within a region is not homogenous but rapidly decreases with increasing distance from the nodes of the networks. The focus of the regression approach is on long-term spatial distributional effects of transport policies. Factors of production including labour, capital and knowledge are considered as mobile in the long run, and the model incorporates determinants of the redistribution of factor stocks and population. The model is therefore suitable to check whether long-run tendencies in spatial development coincide with development objectives discussed above.

4. List of indicators developed/provided

GDP and population provided by ESPON Database.

5. List of maps and tables in the report

List of Maps, Tables and Figures for ESPON 1.1.3

Part I:

Map 1: Border regions

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Maps

Chapter 2

Map 2.1: Concentration of population

Map 2.2: Concentration of GDP

Map 2.3: Change in GDP per capita 1995-2000, index EU15=100

Map 2 4 GDP per capita 1995 in PPS (EU average = 100)

Map 2.5 GDP per capita 2000 in PPS (EU average = 100)

Chapter 3

Map 3.1 .Geographic type of borders

Tables

Figures

Appendices:

6. Application of Common Platform, Crete Guidance Paper, and integration of points raised in the Addendum to the Contract and the response to the FIR

According to the **Addendum of the Contract for ESPON project 1.1.3 (version 5.12.2002)** the 2st Interim report in August 2003 should report progress made on:

- *Preliminary analysis of the regional and spatial effects of enlargement on GDP, sectoral structure, trade, investment, unemployment and population density and migration flows on the regions in the candidate countries and in EU regions, in particular, least favoured regions and border regions. Identification of the particular effects of the stepwise integration of the candidate countries on territorial development*. Please see Chapter 2 "Processes, trends and the enlargement of the EU spatial tissue" in Part II where the TPG examines trends in spatial concentration concerning change in share of population and GDP change in the EU 29 as well as regional performance in the ESPON space and in particular border regions (section 2.1) . In order to be able to produce preliminary results at NUTS 3 level for ESPON space already in SIR, we have chosen to give full priority to the GDP and population variables, leaving other indicators to following reports

- *Updated analysis of the spatial and regional effects of enlargement as mentioned in d) and identification of the general discontinuities and barriers at European scale using fundamental indicators such as differences in wealth or unemployment, barriers to residential migration or cross-border commuting*. A diagnosis of the existing European spatial tissue and spatial structure is provided in Chapter 2. Section 2.2 discusses via the concepts of convergence/divergence, wealth performance differentials and economic performance differentials and takes up the preliminary effects of cross-border mobility for future analysis. Section 2.4 looks at deviations among regions and disparities and possible barriers. Chapter 3 identifies and maps border situations and links across Eastern Europe.

- *Analysis of the situation of cities and regions (in particular, rural regions located at the Eastern periphery of an enlarged EU and old industrial regions) in the candidate countries (as the ESDP states) as result of an integrated approach considering policies for the development of "gateway cities", multi-modal infrastructure for the European corridors, equal access to telecommunication facilities and intercontinental accessibility, natural and cultural assets, which could strengthen the role of regions and their cities, in particular at the external borders of the EU (connections with measures 1.1.1 and 1.1.2. need to be carefully considered). Detection of territorial typologies combining regions into revealing risks and potentials for the identified types*. An analysis of the situation of cities is provided in Chapter 4, section 2, which examines the problems and opportunities of MUSs in light of polycentric spatial development. Regions (and rural regions) are discussed in Chapter 4, section 1 in an analysis of polycentric vis-à-vis monocentric development. Links with 1.1.1 are very apparent in Chapter 4 and further linkages with 1.1.2 will be developed.

- *Proposals for increasing co-operation and networking between cities in trans-border networks and on transnational scale contributing to a polycentric spatial development of the whole European territory and a new urban-rural relationship*. (Chapter 3 includes an analysis on cross-border cooperation structures and schemes in the enlargement area, including some preliminary proposals and the impact of enlargement on border areas.

- *List for a collection of (additional) data in the accession countries for the second phase of the study.* . Intensified efforts to include flow data at NUTS 3 level, in particular on labour mobility and FDI . Case study on cross-border interaction to be done in cooperation with our Project 1.1.3 associate partners in Accession countries.

- *Provisional policy conclusions and results*. .Please see Chapter 5 for a developed work on Policy Options for Polycentric Development in an Enlarged Europe.

The **Response on First Interim Report for ESPON project 1.1.3 on Enlargement and Polycentrism (6 June 2003)** noted specific remarks for further work:

- *Necessary efforts should be made to complete the data analysis*. The work for SIR has been entirely devoted to data analysis and map-making on demographic and economic concentration and deconcentration processes across ESPON space as a background to spatial impact analysis of enlargement.

Not only performance differentials between regions should be displayed in the SIR, but also a first analysis of the regional and spatial effects of enlargement on GDP, the territorial and sectoral structure, trade, investment, unemployment, population density and migration follows. Due to a constrained time schedule (as 1.1.3 has only been in operation for eight months) and expressed demand on deliverables covering the whole ESPON space,, so far the team has focused primarily on GDP and population density ,and with an emphasis on the border regions. Sectoral structure trade, investment and migration flows will be the highlighted to a much greater degree in the TIR.

- *Analysis of polycentric developments focus on urban systems. More emphasis on urban-rural relationships and contact with project 1.1.2* . (Polycentric developments, including and emphasis on urban-rural relations is taken up in chapter 4)

In terms of **urgent demands from the EC to ESPON Lead Partners**, the main deliverables to be expected by the end of August are:

- *Priority of border regions, including: a) the functional analysis of flows in cross-border regions; b) the typology and maps of functional/dysfunctional border areas (based on the three aspects of cohesion).* See Chapter 3, which prioritises border regions. Data on flows is very difficult ´to attain or non-existent, as other TPG have attested to (particularly 1.1.2 and 1.1.4). In lieu of data on flows the 1.1.3 group will discuss the profitability of focusing on a few case studies for a functional analysis of flows (migratory, commuting etc) in cross-border regions

- *A characterisation of major urban systems in accession countries* . Chapter 4 provides an analysis of Major Urban Systems in the accession countries.

Contributions of 1.1.3 to these short-term tasks presented in the **Crete Guidance Paper** in this SIR include various maps for the ESPON collection, including maps of regional disparities in GDP. We examine how the structural funds can better aid in increasing cross-border cooperation. We give a first indication of trends and impacts in the enlargement area, and suggest (in the sprit of ESPON 1.1.1) how to measure polycentricity in the accession countries. Throughout the SIR we endeavour to apply a three-level approach, particularly with regard to the analysis of polycentric development in an enlarged EU.

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7. Benefits of networking with other ESPON projects

Project 1.1.3 has benefited by cooperation with several other ESPON projects. Our ties with 1.1.1 are apparent as our TPGs share several members and we apply similar conceptualisations. We are developing a common methodology together with project 3.1 for a cooperative study on spatial association, the results of which are presented in Chapter B. We work closely with project 1.1.4, primarily with regard to the administrative aspects of ESPON, but also in connection with trying to ascertain migratory flows in the accession countries. Thus far our ties to 1.1.2 have been confined to closely following their research results, but we will bind these ties more closely in the future. In assessing impact of enlargement particular on rural areas and relationships, our team has prioritized the dialogue and cooperation with project 2.1.3, since one most important EU policy field is implementation of CAP in Accession countries. This is facilitated by joint partnership

between the two projects. Cooperation with Transport policy team, 2.1.3 has been efficient, also through joint partnership and we are working on the accessibility study also in connection with 1.2.1. In the next phase we will work out a deeper cooperation with project 2.2.1 on Structural fund policy

8. Project Update

Project 1.1.3 has been in operation for eight months now. In addition to our kick-off conference in January 2003 in Stockholm, we had a project meeting in Prague on June 13-14, 2003, which appropriately coincided with the Czech Republic's referendum on EU membership.

In addition to our new Swiss Partner, we are now in the process of signing a partnership agreement with VÁTI, Hungarian Public Nonprofit Company for Regional Development and Town Planning. VÁTI is now seeking "catching up" funds from ESPON in order to join our team as a full partner.

Contacts have been made with potential partners in Slovenia and Malta, who are positive to cooperation in ESPON 1.1.3, but first need to explore funding opportunities.

August 31, 2003

ESPON action 1.1.3

Particular effects of enlargement of the EU and beyond on the polycentric spatial tissue with special attention on discontinuities and barriers

Second Interim Report
Part II

"Options for spatially balanced developments in the enlargement of the European Union"
(ODEN)

Lead Partner:
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Chapter 1: Introduction[1]

According to the Copenhagen Council (2002) ten countries (Latvia, Estonia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Slovenia, Cyprus and Malta) will join the EU in 2004 and two other (Bulgaria and Romania) will join the EU in 2007. The accession demand of Turkey will be examined in 2004.

With the two exceptions of the Mediterranean islands Cyprus and Malta these 'Enlargement countries' belong to Central and Eastern Europe and represent certain common economic and social characteristics, that are related more or less to pre-existing socialist development structures as well as problems of transition to the market economy and economic restructuring.

The current enlargement process of the EU follows up the transition period in Eastern Europe that started more than 15 years ago. There are several obvious characteristics of this transition. The rural sector of the accession countries is shrinking rapidly, however its participation in the economy continues to be important in some countries. This change creates pressures on the countryside and continues to reinforce the immigration to cities. The manufacturing industrial sector is declining in many regions, reflecting on the economy of several larger or smaller industrial centres that are facing recession. Therefore, significant economic restructuring in the wider region is necessary and expected to be reinforced through the enlargement. Foreign direct investments have been relatively intensive, in particular to larger cities in countries as the Czech Republic, Poland and Estonia, but have shown signs of decreasing. The administrative system in general and the mechanisms of spatial planning implementation in particular, continue to present important weaknesses.

One can identify different groups of countries according to their geographic situation, their demographic dynamics and their economic and cultural relationships to each other, as well as to EU – 15 countries. The first group is formed by the three Baltic democracies with their

[1] Written by Friedrich Schindegger and Gabriele Tatzberger
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small size and population but with established relationships to each other. Poland belongs in the same geographic region but it is differentiated, among all enlargement countries by its large population size and the vast rural sector. The Czech Republic, Slovakia, Hungary and Slovenia have a limited population in common and established relations with their neighbours Austria and Germany.

Romania is geographically attached to this macro-region. However its close links with the Balkans make its position as part of this group only peripheral. The Balkan countries present significant demographic differences. Romania has rather high demographic indicators, while the population of Bulgaria and Greece is close to the population standards of small EU – 15 countries. The other Balkan countries are significantly smaller.

Cyprus and Malta present obvious similarities as islands, with small population and their economy considerably based on tourism.

In the majority of CEE countries, the capital city plays a primary economic and cultural role. This is most obviously manifested in the capital's substantially higher income levels and concentration of facilities for higher education. Only Poland has considerable regional centres. Three agglomerations, those of Budapest, and Prague, form an integral part of the European metropolises network. Two other factors differentiate the urban system of Central and Eastern Europe (CEA) from that of Western Europe. The first is the lack of a complete network of small and medium-sized cities (with the exception of Poland, the Czech Republic, Slovakia and Slovenia). The second is linked to the disparities between urban and rural living conditions.

The urban systems of the Balkan countries present many similarities with CEE countries. The capital cities play a primary economic and cultural role as well. Istanbul is an exception, rivalling Ankara, the capital of Turkey, in importance. Among Balkan capital cities, Athens is mostly integrated in the network of European metropolises, due to its size and EU membership since the 1980s.

Istanbul tends to play a significant role in the network of European metropolises, in correspondence to its recent rapid demographic and economic development.

The potential of Bucharest and Sofia to enhance their role is limited today by their small size and growth dynamics. However, their potential to be incorporated in the network of European metropolises will certainly increase considerably in the coming years.

The prospects of capital cities of the rest of the Balkan countries couldn't be clearly appreciated today, because of persisting political problems. It is most likely that the political stability of the region will be consolidated; therefore the role of Zagreb, Sarajevo and Belgrade, the most important cities of the region, will be strengthened considerably.

In all Balkan countries, the rest of the urban network, (excluding the capital cities) is weak. Comparatively, the urban system of Greece is the most developed. Salonica is a powerful centre, which already plays an important role in the Balkans that will be strengthened considerably in the future. The living conditions in most Balkan cities are considerably lower than those of EU -15.

Finally, the urban systems of Cyprus and Malta differ considerably from those of CEE and Balkan countries. The urban system of Cyprus is relatively balanced and powerful taking into consideration the size of the island. The total of Malta constitutes substantially a single urban region. The living conditions in the cities of both islands are comparatively satisfactory.

It is important to focus on the interconnections of the urban systems of the enlargement countries with EU - 15 and beyond EU – 27 regions. The three small Baltic countries have already established powerful relationships with the wider Baltic Sea region, which will be strengthened in the future.

Poland has established links with a tendency to become more strengthened — in addition to the dominant western link with Germany also with the northern part of the the Baltic region as well as with the Southern Central European space of both EU - 15 and countries of enlargement, as well as the Eastern countries of the Community of Independent countries. but also other big cities of Poland have a considerable potential to enhance their role as centres in the EU-27 and wider regions.

The links between the urban systems of the southern Central European enlargement countries and the western EU – 15 countries already exist to a significant extent. Budapest and Prague

already constitute powerful nods of the Central European urban system and their role will be strengthened fast in the future. Bratislava, even though smaller, presents a powerful degree of integration.

The urban systems of Balkan countries present of course a lower degree of integration with the urban system of EU -15 countries. The urban systems of Cyprus and Malta are very open and present the potential to be incorporated fast in the urban network of EU-27 and beyond, despite the disadvantage of their island character.

1.1 Opportunities of the urban systems

The problems and the opportunities of the urban systems of these 12 countries of enlargement with regard to their polycentric development present many resemblances but also important differences. One common problem is the weakness of the urban systems to support polycentric territorial growth. All these urban systems are found (with important differences between them) away from the single Global Integration Zone of EU –15. The urban systems of the Czech Republic, Slovakia, Hungary and Slovenia are located in axial extensions of this GIZ. These axial extensions present the potential of fast growth. The development of these axial extensions will certainly reinforce the urban system of Poland as well. This urban system has the possibility of strengthening fast its bonds with the wider Baltic region.

The urban systems of the three small Baltic countries have possibilities of enhancing relatively rapidly their links with the wider region of Baltic, and to a relatively smaller degree with the countries of CIS and Russia. The connections of the urban systems of the Balkan countries with the urban systems of countries of EU–15 are rather weak today (with significant differences among the different countries). In condition that there will be a powerful aid intervention, these urban systems have the possibility of developing their interconnections so much with those of countries of EU – 15 as with those of CEE , Black Sea countries and the Middle East.

Another common problem that concerns the big majority of countries that have been examined in the process of enlargement, is the case of over promoting the growth of capitals at the expense of the rest of the urban systems. National regional policies have to address this

challenge to a balanced internal development. These policies have to complement the efforts to enhancing the role of capitals in the network of European metropolises.

It is therefore necessary also to promote the development of networks between the intermediate and small cities in relation to the rapidly transforming rural space, in order to avoid important economic and social problems of enlargement outside the capitals regions.

1.2 Increasing importance of borders and border regions

One of the most distinguishing features of the enlargement area is the dominant role and increasing importance of borders and border regions. Today, the permeability of these borders is fairly high, although in some places natural barriers (mountain ranges; rivers lacking bridges) and administrative shortcomings still inhibit cross-border interaction. Border regions bear the brunt of the tension created by the wide disparities in income levels and benefit from the additional opportunities of efficient factor allocation, which helps them to achieve above-average positions within their countries in most cases, while at the same time experiencing below-average levels of security and frequently even creating additional ecological strains. The border regions' potential for co-operation is sometimes boosted by ethnic ties and knowledge of each other's languages.

A great number of cross-border activities and institutions have already been established in the past few years. While some of them have not yet moved beyond mere declarations, in many cases, particularly along the present external EU border, a number of viable projects have been initiated and institutional ties have begun to strengthen. Still, even in the most advanced cases, such for example the Euroregions on the present external borders of the EU, the cross-border impact of the projects implemented is still limited.

There is a clear need to guide and to enhance the local and national opportunities to react to border-related issues. Co-operation is especially apt to provide this help, as most of the border regions encounter very similar basic problems, and best practices have yet to spread fast enough to allow the border regions to perform their cohesive function for the whole region. Cross-border co-operation seems particularly necessary for the enlargement area in which the borders have seen so many massive changes recently: hardly any larger section exists at today's borders that have not experienced changes in the demarcation lines or in the names

given to bordering national territories in the course of the 20th century. Of the countries of the enlargement area more than half of them did not even exist as sovereign states ten years ago.

Attention should be drawn to a particular border-related issue: the impacts of Schengen. During the nineties, free movement of people and commodities within the European Union was achieved by abolishing border control at the internal borders of the EU. Simultaneously, controls at the external borders were strengthened and all member countries taking part in the Schengen Agreement (thirteen, without the UK and Ireland) must apply common immigration policies vis-à-vis third countries. The accession countries will have to take over the Agreement as an integral part of the Acquis. However, this may raise new difficulties for some of them. During the COMECON period, there was no visa obligation between the countries. Although, the borders of the former Soviet Union remained closed for individual travel and travel was free between the other countries from Poland to Bulgaria (Romania was an exception in some periods) for several decades. With the accession of the accession countries to the Union, the new external borders combined with the Schengen-border regime will be perceived as a return to serious restrictions at both sides of the new border, especially where close contacts traditionally exist. Part of the new external border of the European Union will pose a serious challenge for some of these countries. The challenges for the new member countries caused by the implications of the EU's external border regime are not only an issue calling for support from the Community, but also a topic for co-operation between the countries involved.

The countries at the current external borders of the EU face specific challenges, as the borders also demarcate the prosperity edge of the gap in income and economic power to Western Europe. It is unlikely that it will be possible to overcome this situation by the time of accession of the first neighbouring country. This creates a tense situation for the economy and above all labour markets in the border regions. Any regulations that would apply in this context require very precise information at the local level on the spatial situation of the concerned regions.

1.3 Levels of polycentricity

In terms of promoting polycentric urban development in the enlarged EU, several levels can be distinguished in accordance with the general idea of the Common Platform. (See chapter 5, prepared by Peter Hall, Mike Batty and Elena Besussi at ICS and UCL)

1. *Level I: European:* promoting the growth of urban centres outside the "Polygon" in the remoter areas of the EU. Without further elaboration, this may simply concentrate growth in the leading urban centres of the countries in these areas, invariably the capital cities.
2. *Level II: National:* This would seek to promote the growth in each EU nation of second order ("provincial capital") cities as counter-magnets to the first-order capital cities.
3. *Level III: Regional:* This would further seek to promote growth in third/fourth order centres in each region. The problem is that this may be easy to achieve in favoured central regions around the first-order centres, especially along major transport corridors, where it may lead to the development of "Polycentric Mega-City-Regions" (South East England, Randstad Holland), paradoxically frustrating policies for longer-distance dispersion. But, outside such favoured central regions, policies to promote lower-order centres may work against strong economic trends which favour centripetal development and consequent migration into higher-order centres, especially in conditions of rapid economic development such as may occur after EU accession.

Relevant factors for promoting polycentric development in an enlarged Europe include the significance of the economic structure, geographic scale, key economic drivers, transport infrastructure and transport technology.

1.4 The scope of ESPON Project 1.1.3

Against this background, several hypotheses can be launched regarding the spatial impact of enlargement, particularly on polycentricity and rural-urban relationships:

- We suppose that trade between the Western and Eastern parts of Europe will increasingly show the pattern of the theory of comparative advantages. The free trade results in an adjustment process among the labour-intensive branches and also in the regions where these branches are over-represented. There are, however, still branches and regions where an increased trade within an enlarged EU will have negative effects. Some products and branches, which are labour-intensive but not entirely dependent of low wages will, however, probably be affected by an increased import. This will of course also have regional implications especially with regard to regions that will experience a more intensive competition from the acceding countries. The result will be that at least the

industrial expansion in these districts will slow-down or even result in retardation. We expect growing restructuring pressures on the cities, city clusters and city networks located in old industrial regions and rural regions, especially those of the Eastern part of the enlargement area.

- This general reorientation of economic flows from East to West (in case of accession countries) has already taken place during the 90s. What is now expected is growing intensity and in some cases changing composition of flows. However, this leads us to the assumption that analysis of the observed spatial trends of economic restructuring and growth is essential for understanding the future spatial impact of integration.

- Some transport flows will become modified due to elimination of barriers between the present candidate countries. Barriers have several dimensions, from physical to cultural, but are generally lower along established trade and transport corridors. This leads us to the assumption that development will be reinforced of the cities, city clusters and city networks located in corridors that mainly constitute axial extensions of the single Global Integration Zone of EU –15.

- Different feedback processes, including national policy responses, will dominate the regional development in balanced or unbalanced directions: If the unfettered centrifugal forces will dominate a monocentric development, divergent development will be the result and the concentration process will be accentuated. This will enhance the role of the capital cities of the enlargement countries in the network of European metropolises at the expense of the rest of the national urban systems. If the centripetal forces instead dominate, a polycentric and convergent development will be the consequence. This is also more in line with the recommendation from ESDP and in line with the whole ESPON programme. In such, to hamper a monocentric development and stimulate a polycentric one is a political question already is and will still be controversial in may accession countries.

- In the enlargement process, a never before in Europe experienced number of border regions will have the potential to “merge” into dynamic functional relationships with “new” neighbours. Obviously, asymmetries and barriers of cultural, physical and

economic character between border regions emerge as both obstacles and options in the political process of introducing free mobility of goods, labour, services and capital.

1.5 The content of the report:

In **Chapter 2**, the spatial reflections of current trends toward economic integration particularly in Eastern Europe are analysed in a future perspective, based upon the observation that enlargement is following up on previous transition. The trends are largely visualized in maps and diagrammes based on NUTS3 data on GDP and population dynamics. The focus is on spatial concentration and deconcentration processes during the last half of the 1990s. We also present an introduction to convergence analysis to identify general discontinuities and barriers on an European scale with indicators such as differences in wealth or unemployment. Furthermore, a methodology is piloted and suggested for explaining regional growth processes in a spatial association perspective. Chapter 2 also includes a case study on Portugal, explaining the spatial impact of Portugals entrance to EG in the 1980s.

The focus of **Chapter 3** is a descriptive analysis of borders, border regions and options and barriers to new border neighbourhood developments. This includes maps of various border situations and a description and assessment of the potential for cross-border operations and cooperation along both the new internal and the new external borders. The analysis also contains a first analysis of symmetric and asymmetric functional cross border relationships and mapping of spatial trends in border regions.

In **Chapter 4** we present a series of assumptions and analyses on the preconditions for a polycentric development in the enlargement process. Following on the preliminary analysis of Major Urban System (MUS) in Eastern Europe, and discussions on the meaning and measurement of polycentricity in the case of enlargement, and the role of accessibility in promoting polycentric development, we can produce tentative assessments on the requirements and prospects for more balanced developments in ESPON space.

In **Chapter 5** we launch a series of policy options for polycentric development including tentative policy recommendations. This chapter also contains a description of an exploratory data analysis, a presentation of models and methodologies to be used in scenario study 1 on the spatial impacts of enlargement, as well as preliminary results. **Chapter 6** details the

Enlargement scenario 2 on the impacts of the TEN-T and TINA projects on the regions in the accession countries.

The concluding **Chapter 7** briefly presents challenges for further work, both for the enlarged EU and for the tasks for the continued working of the ESPON 1.1.3 TPG.

Chapter 2: Processes trends and the enlargement of the EU Spatial Tissue

2.1 Trends in spatial concentration[2]

In the following section on spatial concentration we discuss the ESPON space from its function as a total entity in comparison to other markets. Hence we consider the ESPON space to represent the total production territory at internal and global markets. This approach focuses on the role of single regions within the total ESPON space and hence favours statements on change in regions' position relative to the total of ESPON rather than statements on change of the regions' position relative to themselves. Since also the total ESPON space is changing continuously this means in practical terms that firstly even if a region may have grown during the respective period it may have been loosing its relative position within the ESPON space if growth did not match the growth of the total ESPON space.

Secondly the change of the position of a region is heavily influenced by its initial size or share in the total of ESPON. Accordingly smaller regions need to grow faster to improve their positions while bigger regions already do this by performing minor growth rates. This also means that the maps hide huge differences both between Eastern and Western parts of Europe and between neighbouring regions just because of differences in size. At this point it should also be emphasized that the delimitation principles of the NUTS system clearly influence the results according to the mechanism described above; in particularly at NUTS 3 level used in this analysis. However, still it means a change in contribution to the performance of the total ESPON space as a single market and hence observations of overall spatial patterns of concentration within the ESPON space are made possible.

The 1990s has witnessed important shifts in the spatial centre of gravity of both the economic and demographic structure across Europe. However, at the moment a sufficient statistical observation of the total ESPON space for our purposes is only available for the years between 1995-2000; a period too short to allow for conclusions within a long-term economic cycle.

[2] Written by Lars Olof Persson, KTH and Jörg Neubauer, Nordregio

Tentatively, we distinguish a number of more or less clear spatial patterns in terms of population and wealth contribution that characterize the spatial tissue of the ESPON space:

1. *patches* characterizing a number of neighbouring regions within a country or in border regions with strongly diverse directions in their contributions to the total in an enlarged EU

2. *carpets* of increasing or decreasing contribution, indicating clusters of similar development and in some cases a harmonized polycentric development

3. *monoliths* i. e. regions with European or national importance with increasing or decreasing contribution to the total, indicating a changing importance of a monocentric regional system.

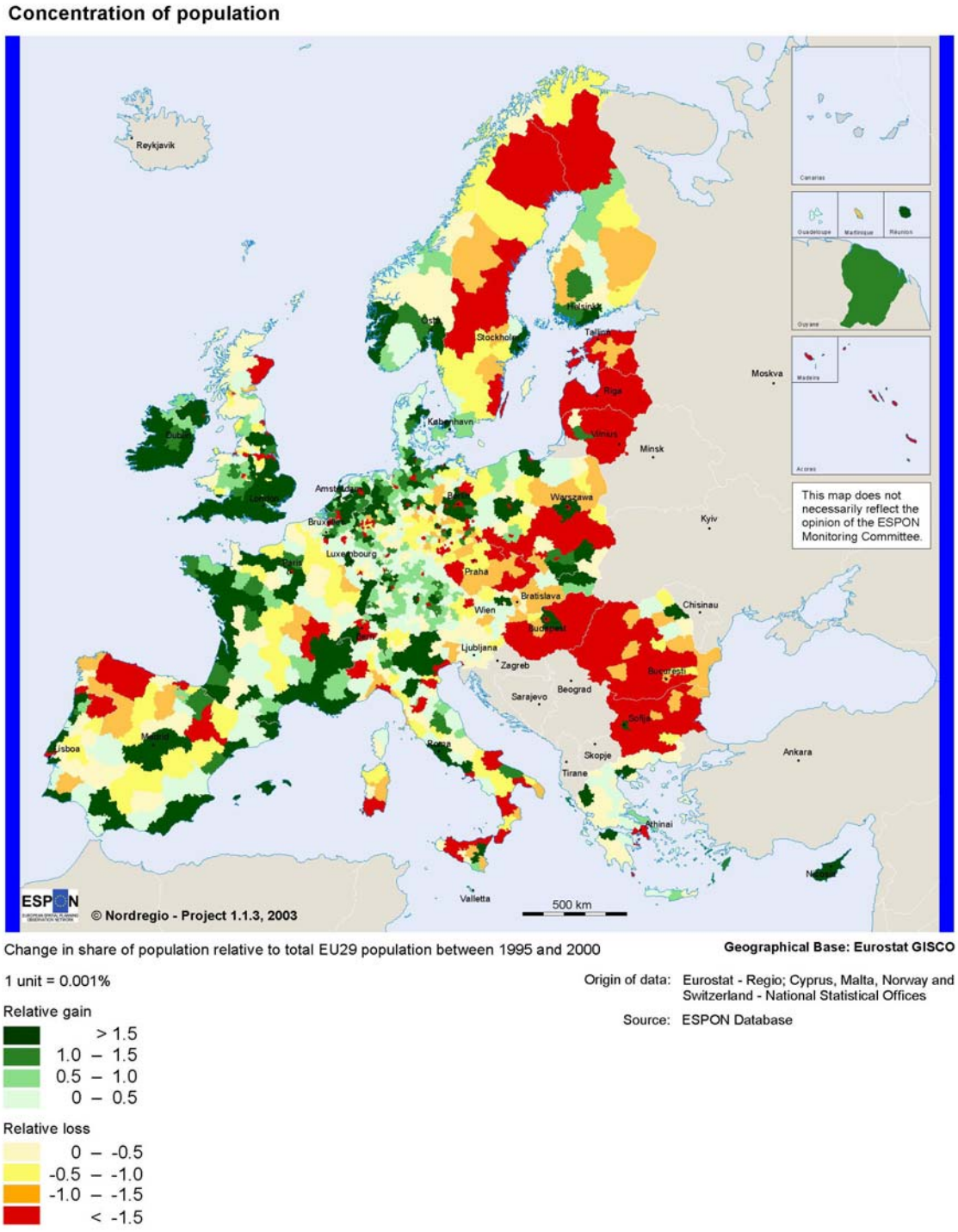
2.1.1 Changing Contributions to total population

Map 2.1 shows the changes in the regional (NUTS 3) contribution to total population in ESPON Space during the last half of the 1990s. There has been an obvious westward shift in population shares along a dividing range from Trondheim in Norway via Copenhagen, Munich and Rome to Valetta in Malta. The westward drift has some exceptions, in particular due to depopulation tendencies in the northwestern Iberian Peninsula, central France, parts of Scotland and Sardinia. Correspondingly the shift from Eastern Europe has several exceptions - in particular most capital regions display an increasing proportion och total ESPON space population.

The spatial tissue formed by demographic change in the Mega regions in the enlargement areas are characterized by the following trends:

The three small *Baltic States* suffer from significant population losses during the last decade. Hence the total carpet contributes subsequently less to the total ESPON population. An exception is found in Taurage county.

Map 2.1: Concentration of population



The contribution of the regions of *Poland* to the total EU29 population is diversified. Regions at the Baltic Sea coast gain in share while many inner/hinterland patches, especially the strokes South of Warszawa down to the Czech border, are losing significantly. Even the patches at the eastern and future external EU25 border to Belarus and Ukraine are following the trend. There are even some monoliths loosing their position, such as Warszawa, Posznan and Gdansk. However the adjacent regions are counterbalancing the trend. The development of several enlarged centres of population seems ongoing.

The *Urban system of the axial extension of the GIZ of EU-15 - i.e. Czech Republic, Slovakia, Hungary and Slovenia l*argely form a carpet of relative loss in general. A Slovakien patch at the Ukrainien border develops revers to this trend stretching over the Polish border regions into the proximity to Krakow. The loss of the monolith of Budapest seems to be counter balanced by its surrounding, a pattern of enlarged popoulation centres already observed in Poland. Slovenia is the only country in the enlargment area enjoing a modest relative population loss in all of its regions. In addition Ljubljana is improving its position in the ESPON space.

Romania and Bulgaria almost entirely losing in population position being part of the southeastern declining carpet stretching up to Hungary. However the patches at the eastern border seem to do better, especially in Romania. Here the only regions with relative population gain can be found, except for the Bulgarien capital of Sofija acting as a rising monolith in population terms.

Malta and Cyprus clearly succeded in gaining population weigth during the latter half of the 90s with Cyprus being in the group of regions heavily improving its postion.

The territory of the EU15, Norway and Switzerland clearly comprising more regions with relative increase in contribution of total ESPON population than the accession and candidate countries. However, one may not forget about the bigger population concentrated here and its influence in this context (see introduction to the chapter). A large carpet of relative population gain is to be found with the Pentagon area. London, the Netherlands and the strokes at the north-western German border and Denmark, as well as the South of Norway form an extended area of growing popoulation contribution. London and its surrounding of course is favoured by its big absolute concentration of population. The whole island of Ireland stands

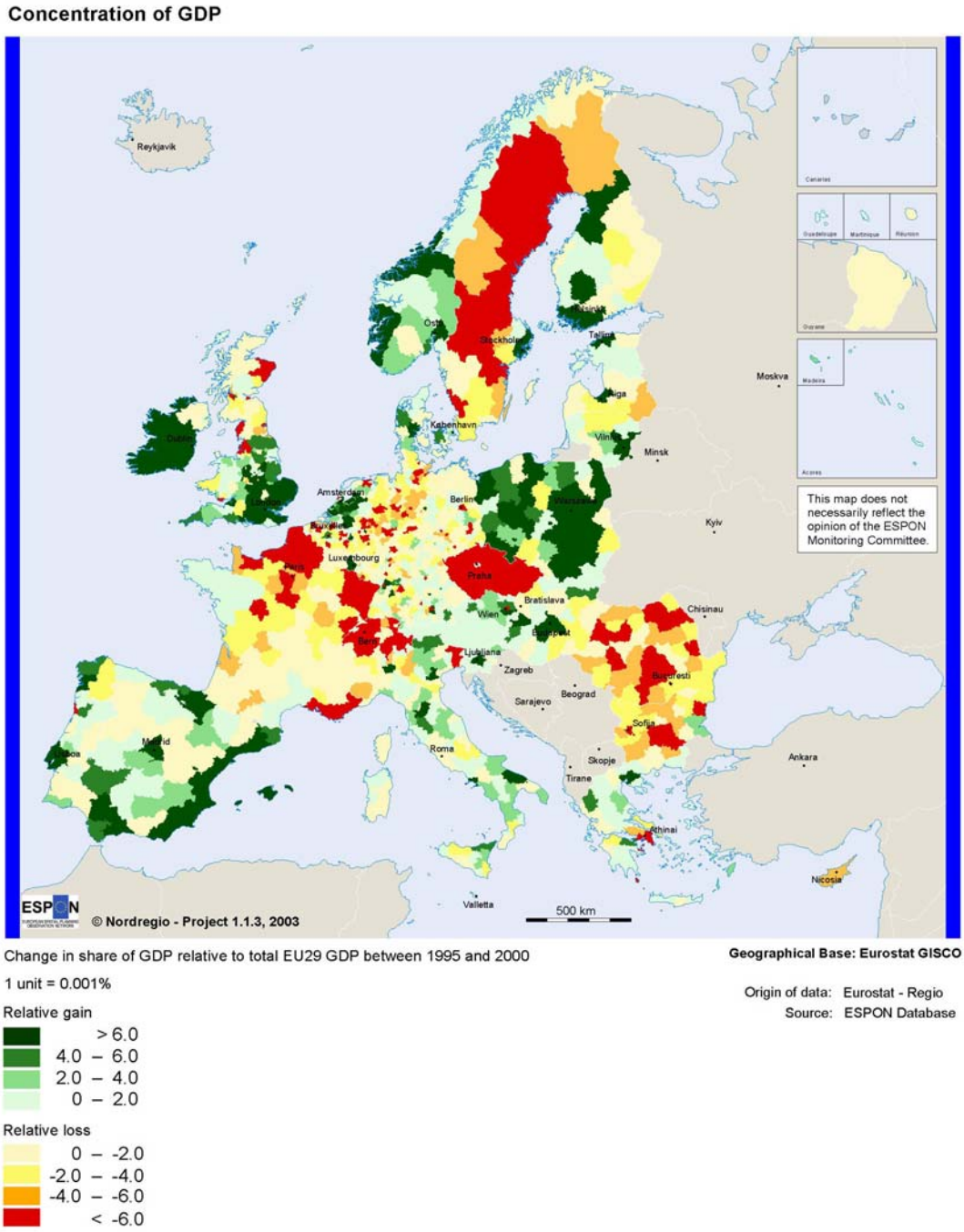
out with exceptional gain of its contribution. Other carpets of growing population contribution are to be found in the coastal areas of the southwestern European countries such as at the entire coast of Portugal, at the southeast coast of Spain (Costa del Sol) and France and the French Atlantic coast. In Spain the larger Madrid area is strengthening its postion. Many other areas are more or less part of carpets with decreasing contribution in population. In Sweden, large swapes of regions follow this trend with a clear monolithic structure by Stockholm's increasing contribution in population terms. Finland's increasing population contribution is steming from several centres being the triangle Helsinki-Tampere-Abo and the Oulu region. In many of the more or less monolithic regions in the centre of Europe the enlargement of population cores can be observed (e.g. Berlin and its surrounding) as also stated for Poland. However, seperate NUTS 3 units for city regions in Germany and Poland may illustrate this trend for those countries only when mapping.

2.1.2 Changing contributions to total GDP

Map 2.2 shows the changes in regional (NUTS 3) contribution to total *GDP* of the ESPON space between 1995 and 2000. As explained in the introduction it should be remembered that regions experiencing growth in terms of GDP between 1995 and 2000 can turn out to lose their relative contribution to total GDP if they did not exceed the growth rate of total ESPON space. The map primarily displays spatial patterns of changing contributions to "total" wealth in the enlarged Europe or total ESPON space respectively.

The three small Baltic States enjoyed strong growth during the period in many regions and hence could improve their contribution to total ESPON GDP significantly. This is remarkable when taking into account the generally small share of those regions in total ESPON GDP. However the success is based on growth in capital regions disfavouring other parts of the countries. This monocentric structure is especially playing out in Latvia with the Latgale area suffering from the strongest relative loss in contribution among all regions of the Baltic States. In Lithuania the growth area is extended around the capital of Vilnius but also the Lithuanian Baltic Sea coast could improve their contribution.

Map 2.2: Concentration of GDP



Poland clearly holds a different position among the countries of the enlargment area. In terms of wealth contribution to the total of the ESPON space it almost entirly comprises a carpet on the rise. Major gains in Polish contribution came not only from the big city regions, but from almost any region, and through many centres, including the ones along the German border and also some at the Belarussian and Ukrainien border. Some minor losses, however, took

place at this border too. Two major Polish wealth growth patches along a North-South axis seem to develop centered around Poznan and Warszawa.

Czech Republic, Slovakia and Hungary play different roles in terms of economic contribution. While the Czech carpet faces dramatic losses in contribution except for the monolithic rise of Prague, this monocentric structure cannot be recognized in Slovakia and Hungary. These patches experienced minor loss and gains, but more balanced over their territories. In Slovakia the gain is connected to the Polish North-South growth axis around Warszawa and hence situated at the Ukrainian border. In contrast, the Hungarian patch gains at its border to Austria. Budapest, however, is strengthening its position in wealth contribution, being the only area with strong relative gains in wealth.

Romania and Bulgaria entirely perform as an economic decreasing carpet in ESPON terms. The spot of Varna, located at the Black Sea coast and being the only exception, managed to gain economic weight in the ESPON space.

The Slovenian patch gains in wealth position almost across the country. The centre of Ljubljana is leading this rise.

Cyprus and Malta move their position in relative GDP contribution contradictionary. Malta slightly gains whereas Cyprus faces a rather strong loss.

The territory of the EU15, Norway and Switzerland shows a reverse trend in GDP concentration for the pentagon patches if compared to the population concentration trends. The strokes at the western border of Germany and Belgium are loosing weight. The carpet of large relative wealth losses continues all over the French territory except for some coastal parts and into Switzerland. Other major carpets of loss are to be found in Scotland especially in the city areas and in Sweden except for the economic monocentre of Stockholm. Lappland and the Finnish patches at the eastern border faced a modest lost in their position standing opposite to strong gains in the Helsinki-Tampere-Abo triangle and Oulu. The South of England, Ireland, the Netherlands and the Spanish coastal patches are strongly on the rise to gain weight in total ESPON GDP similar to the their trend in population concentration. Spain, Portugal, Italy and Norway extend their positions in the overall ESPON economy by a

contribution from almost all regions pointing to a rather polycentric composition of sources for gain in GDP.

Map 2.3: Change in GDP per capita 1995-2000, index EU15=100

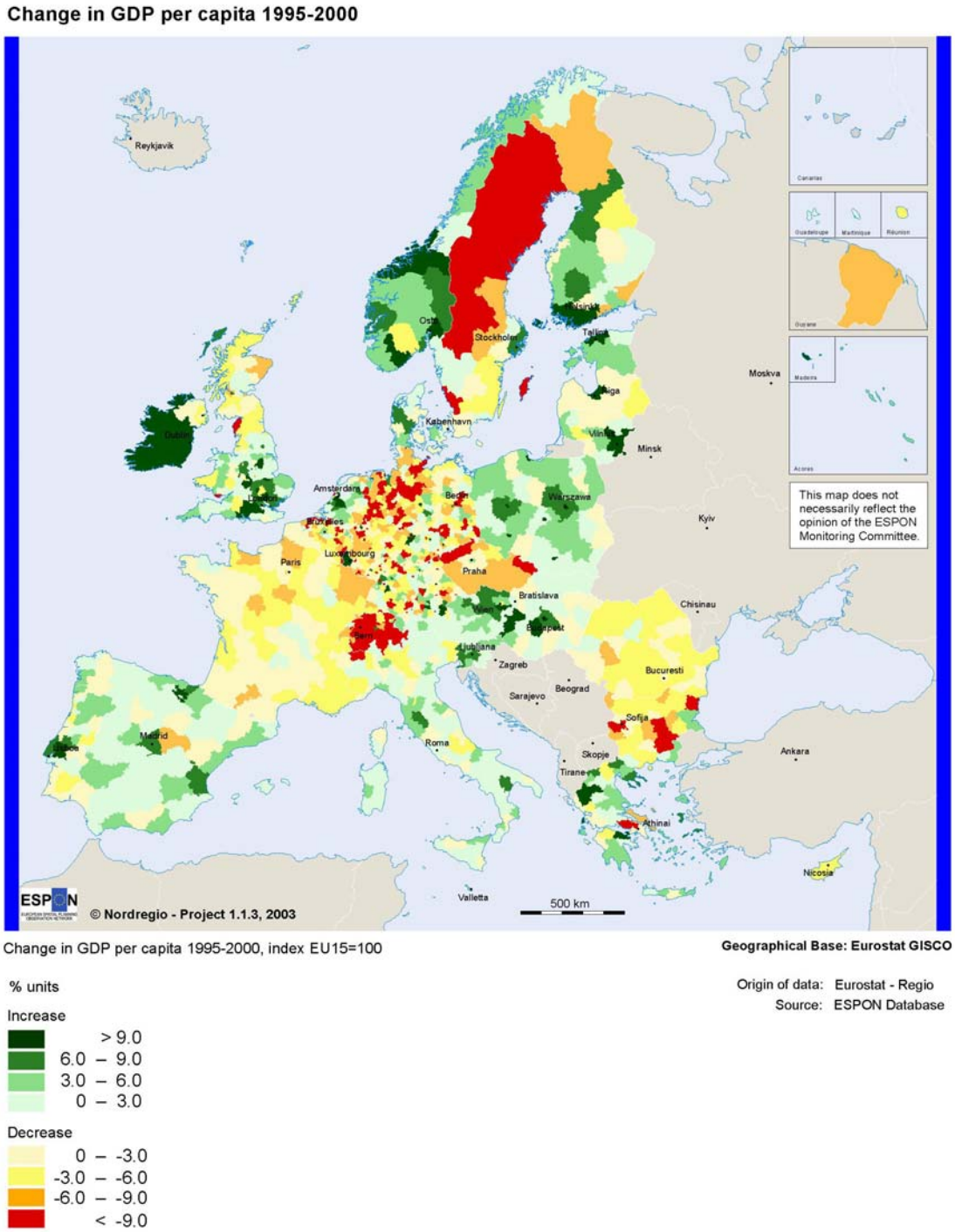


Table 2.1: Change in share relative to total ESPON space by different categories (%), 1995-2000

By GDP/inh. Index EU15 = 100, 1995	Population	GDP
>100	0.16	0.67
75-100	0.09	-0.60
50-75	-0.02	0.15
25-50	-0.16	-0.11
< 25	-0.07	-0.11

By type of border	Population	GDP
INT	-0.03	-0.09
EXT	-0.08	-0.01

By ESPON part	Population	GDP
EU15	0.36	0.04
EU10	-0.23	0.41
CH/NO	0.03	-0.07
BG/RO	-0.16	-0.38

INT = Border regions at EU15-EU10/Candidate country border
EXT = Border regions at external border

In conclusion, this preliminary analysis of spatial trends in population and economic terms indicates that by understanding the ESPON as a market entity:

- There has been a westward shift in population shares along a dividing range from Trondheim in Norway via Copenhagen, Munich and Rome to Valetta in Malta. This drift has some exceptions, in particular due to depopulation processes in the northwestern Iberian Peninsula, central France, parts of Scotland and Sardinia. The shift from Eastern Europe has several exceptions - in particular most capital regions display an increasing proportion of total ESPON space population.

- Regarding wealth contribution the share of eastern countries is on the rise mainly due to strong contribution from the Polish carpet and the EU10 capital regions. The eastern areas of Europe have experienced more monolithic growth relative to the ESPON space, especially in the three small Baltic countries and the Czech Republic. However, total shares of EU10 GDP in ESPON are still small compared to that of EU15. Beside the London-Netherland patch, increased contribution in EU15 came from parts outside the core like from the Spanish and Italian carpet, Ireland, Denmark and some Finnish regions. The core of EU15 is subsequently losing its strong contribution in wealth in the ESPON space as is the case for Germany and France. The position of Swedish regions is rapidly shrinking except for the monolithic growth of Stockholm.

2.2. Trends in performance of regions in ESPON space

2.2.1 Performance of the ESPON space

The performance of each NUTS 3 region in terms of its contribution to the total of (a) the ESPON population and (b) the ESPON GDP is plotted in Figure 1 distinguishing different parts of the ESPON space. Hence each graph illustrates the range of differentiation within the regional structure in respective parts of the ESPON space. Capital regions (NUTS3) are marked distinctively. Following the NUTS 3 classification it means some five additional "capital" regions in the EU15 part since London comprises five NUTS 3 and Berlin two of them (East and West).

The contribution of each of the 1329 NUTS3 regions to the total of ESPON varies widely. Also there are clear differences of regions situated in the different parts of the ESPON space. Generally Swiss and Norwegian regions are stronger in its contribution to GDP than to population. This situation is relatively balanced throughout the EU15 territory but already is the opposite in most EU10 regions. In Bulgarian and Romanian regions contribution ESPON population is much stronger than their economic contribution. This gap seems widening during recent years.

Among *EU15* regions widest variation is found, both in terms of population and GDP. While Milano, Paris, Roma, Madrid and Barcelona contribute with clearly more than 1% to the ESPON GDP, regions like the Scottish Orkney Islands or the Greek regions of Evrytania and Lefkada contribute with just slightly more than 0.002%. This variation is roughly the same in terms of population. Capital regions lead the EU15 contribution but are accompanied by several other strong contributing regions throughout the territory. However, due to their absolute size they will continue to hold a strong position hardly to be questioned.

Among *EU10* regions variation is less pronounced. On the one hand EU10 top regions contribute less than EU15 top regions but the smallest EU10 regions contribute relative more than those of EU15. In 2000 Warszawa and Budapest led the EU10 contribution with somewhat more than 0.4% in GDP with strong increasing trend since 1995 and 0.3% in population decreasing though. This is not even half the contribution of the biggest contributers in EU15. Smallest contribution among ESPON capital regions came from Slovenian Osrednjeslovenska (Ljubljana) increasing though in terms of GDP.

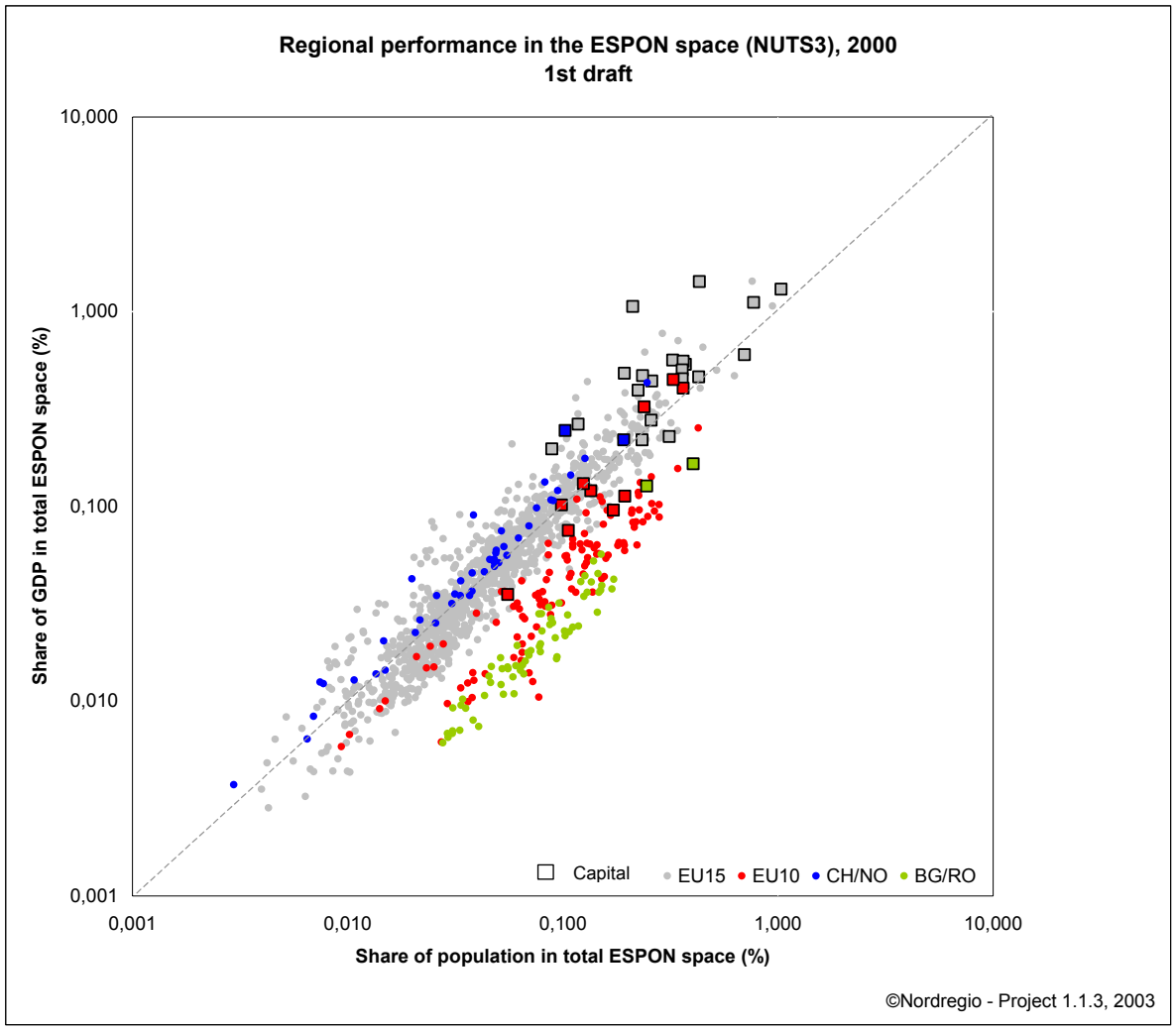
Bulgaria and Romania clearly accentuate their contribution with Sofija and Bukarest both being several times bigger, at least in economic terms, than the second largest region of the country. However, the capital regions faced heavy economic losses during the latter half of the 1990s as did all other region less pronounced though. The Bulgarian region of Burgas stands out by breaking the trend with increasing economic weight in ESPON and hence is strengthing its (small) position among the centres in the area.

The regions of *Norway and Switzerland* are close the constellation of the EU15 ones. However, contribution to total ESPON GDP is over proportional compared to its population. Swiss regions almost entirely loose their position while Norwegian ones strongly strengthen it. Zürich is clearly more important here than the Swiss capital of Bern.

2.2.2 Regional performance constellations

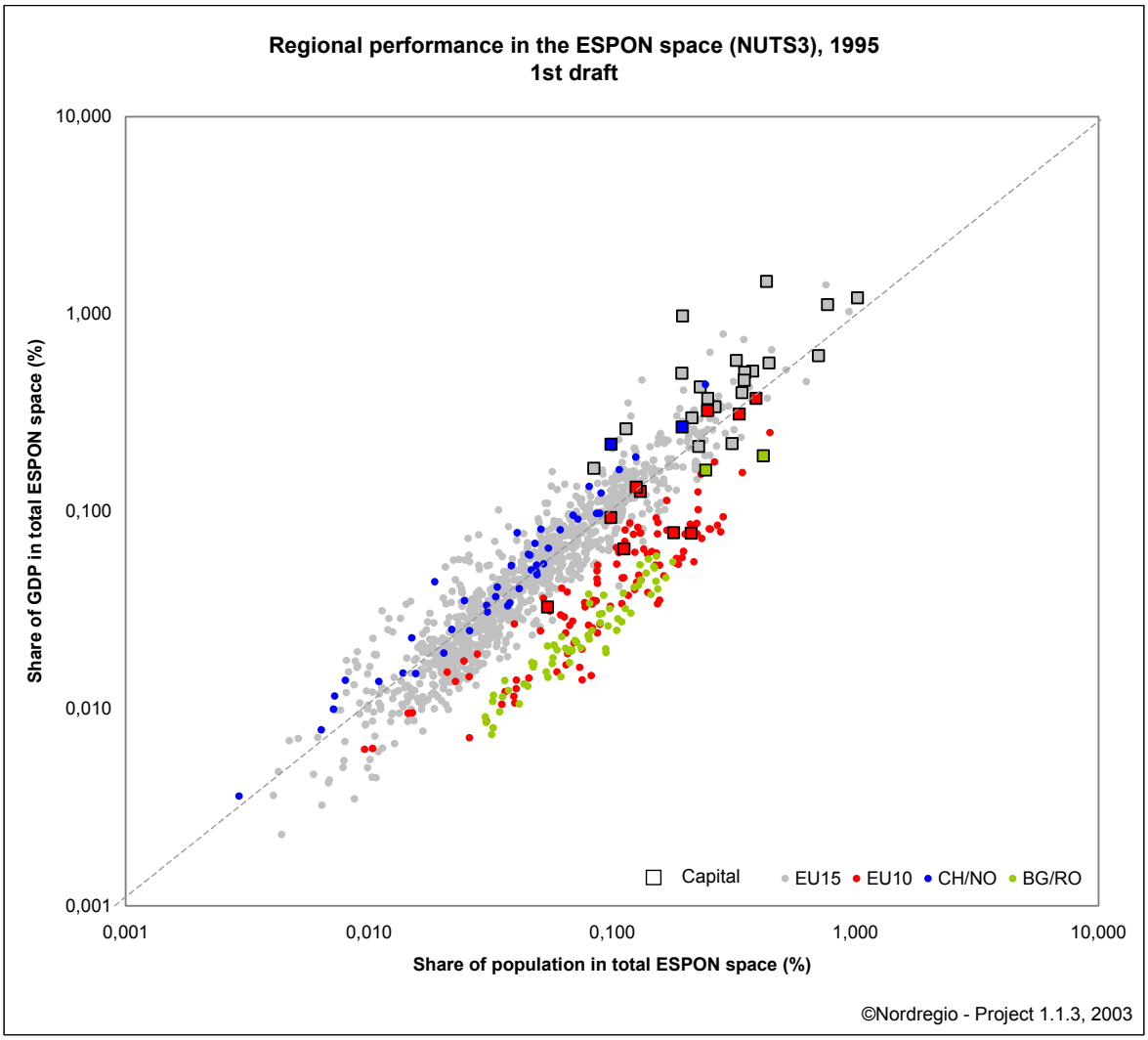
The figures below illustrate the various constellations of regional performance in the ESPON space and in the border regions of the ESPON space 1995-2000.

Figure 2.1: Regional performance in ESPON space 1995-2000



* For data please see APPENDIX Tables A1-3

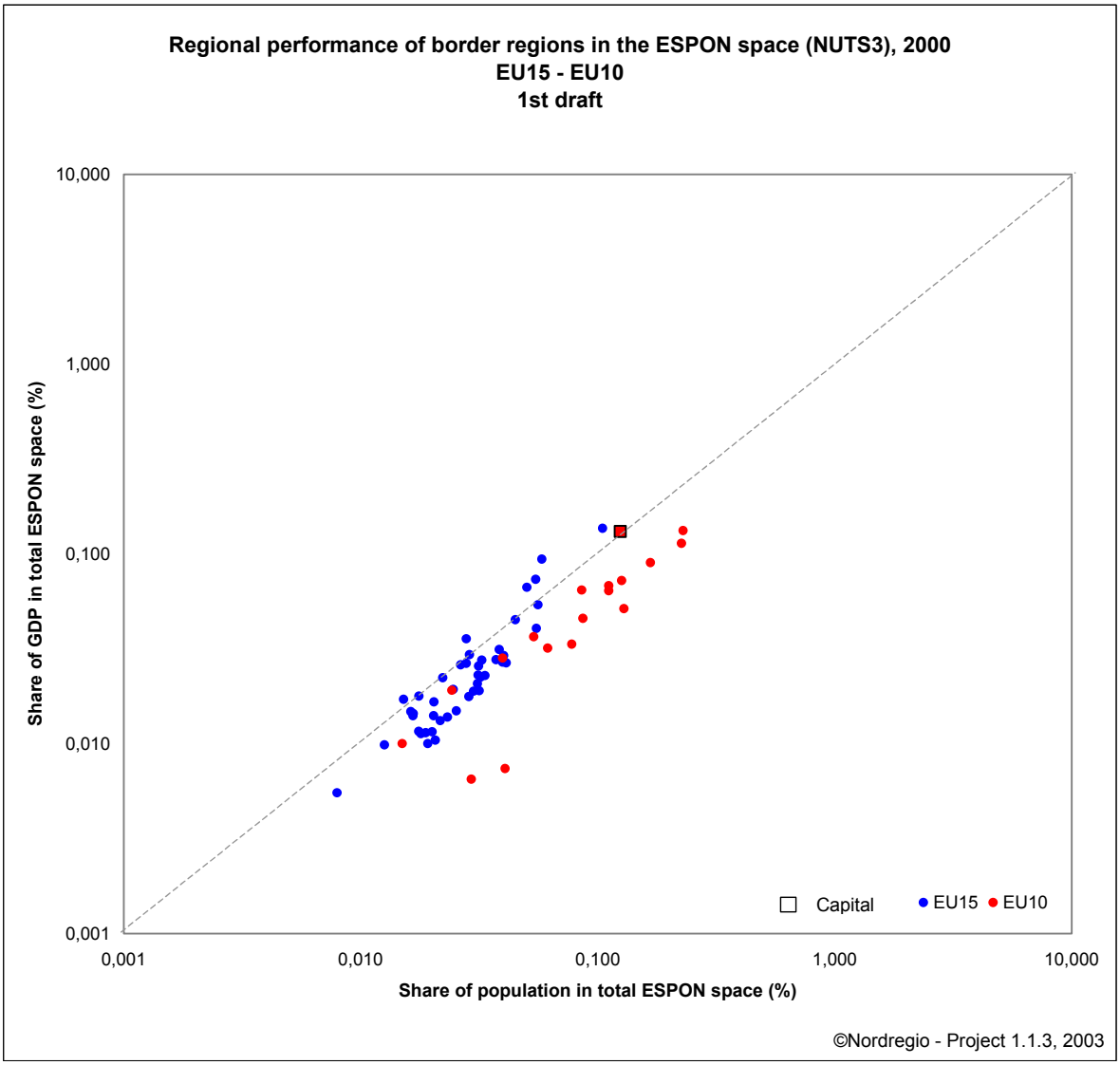
Figure 2.1 (cont.): Regional performance in ESPON space 1995-2000



* For data please see APPENDIX Tables A1-3

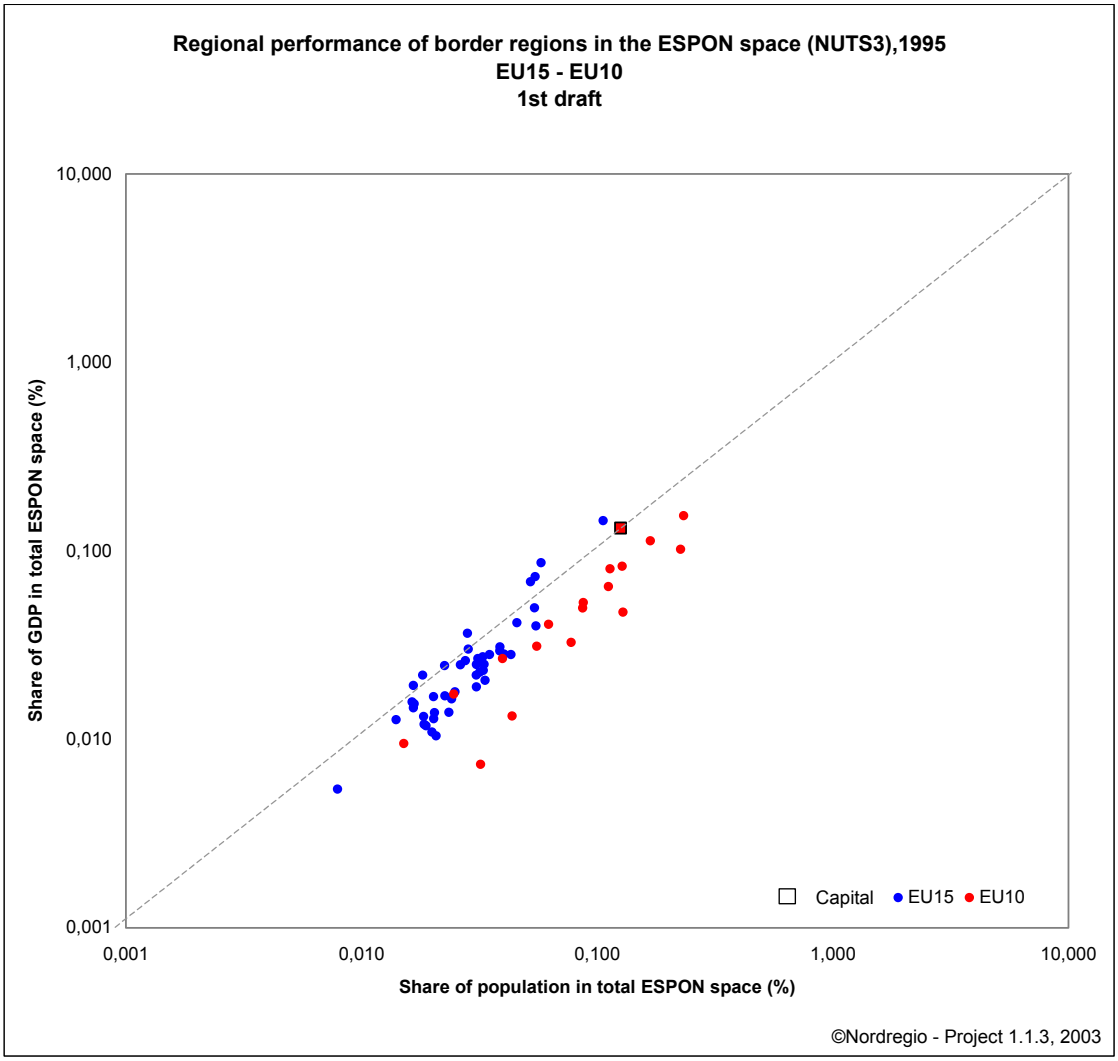
The border regions, portrayed in Figure 2 and 3, generally follow the pattern as introduced above. However, the gap in contribution of GDP per capita seems modest along many parts of the EU15-Accession country border. There are more EU15 border regions performing economically better; many though being in line with the EU10 border regions performance. There are also several regions with high economic contribution at the external border (e.g. Finland and Italy).

Figure 2.2: Regional performance of border regions at the EU15-Accession country border, 1995-2000



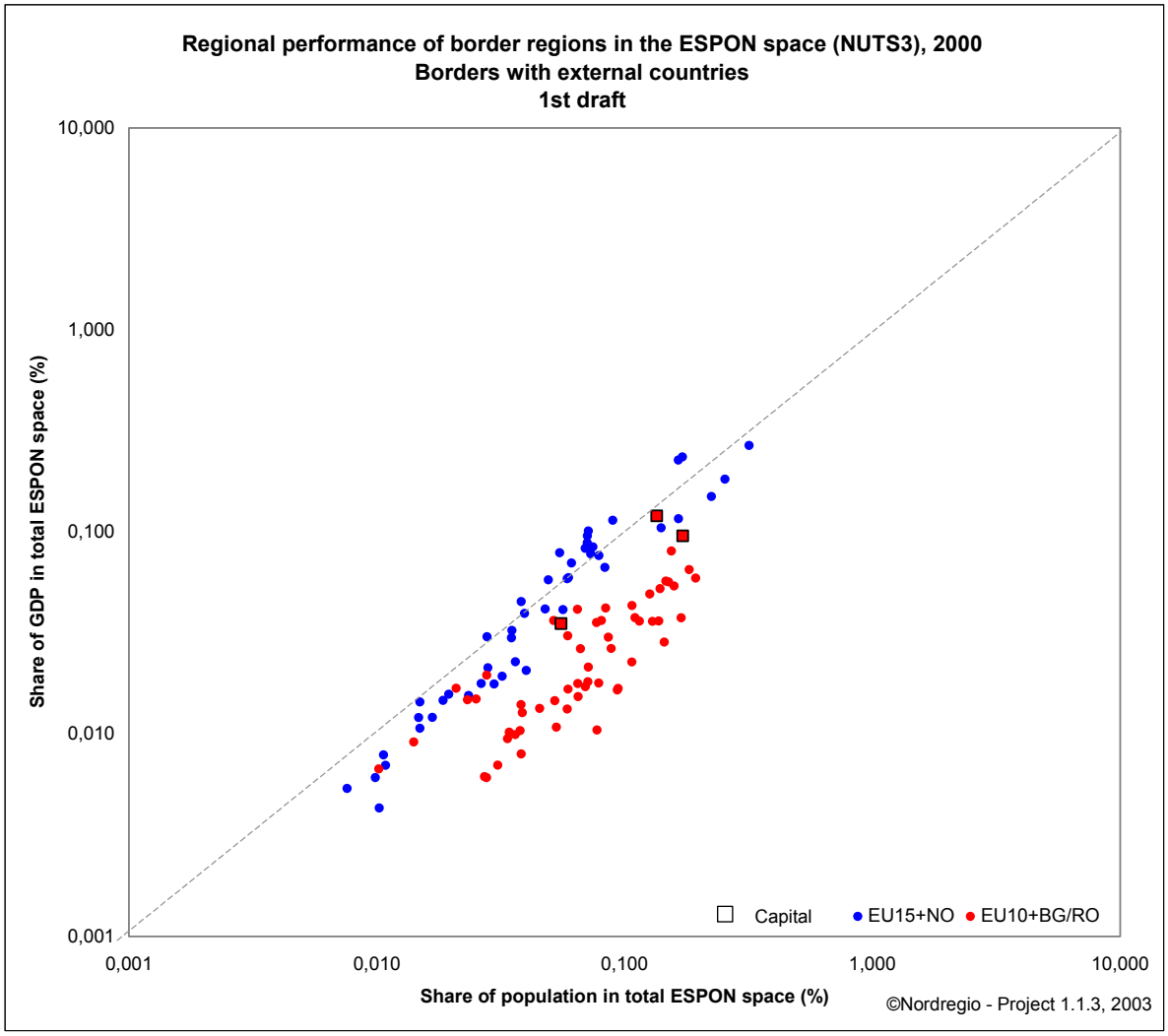
* For data please see APPENDIX 2

Figure 2.2 (cont.): Regional performance of border regions at the EU15-Accession country border, 1995-2000



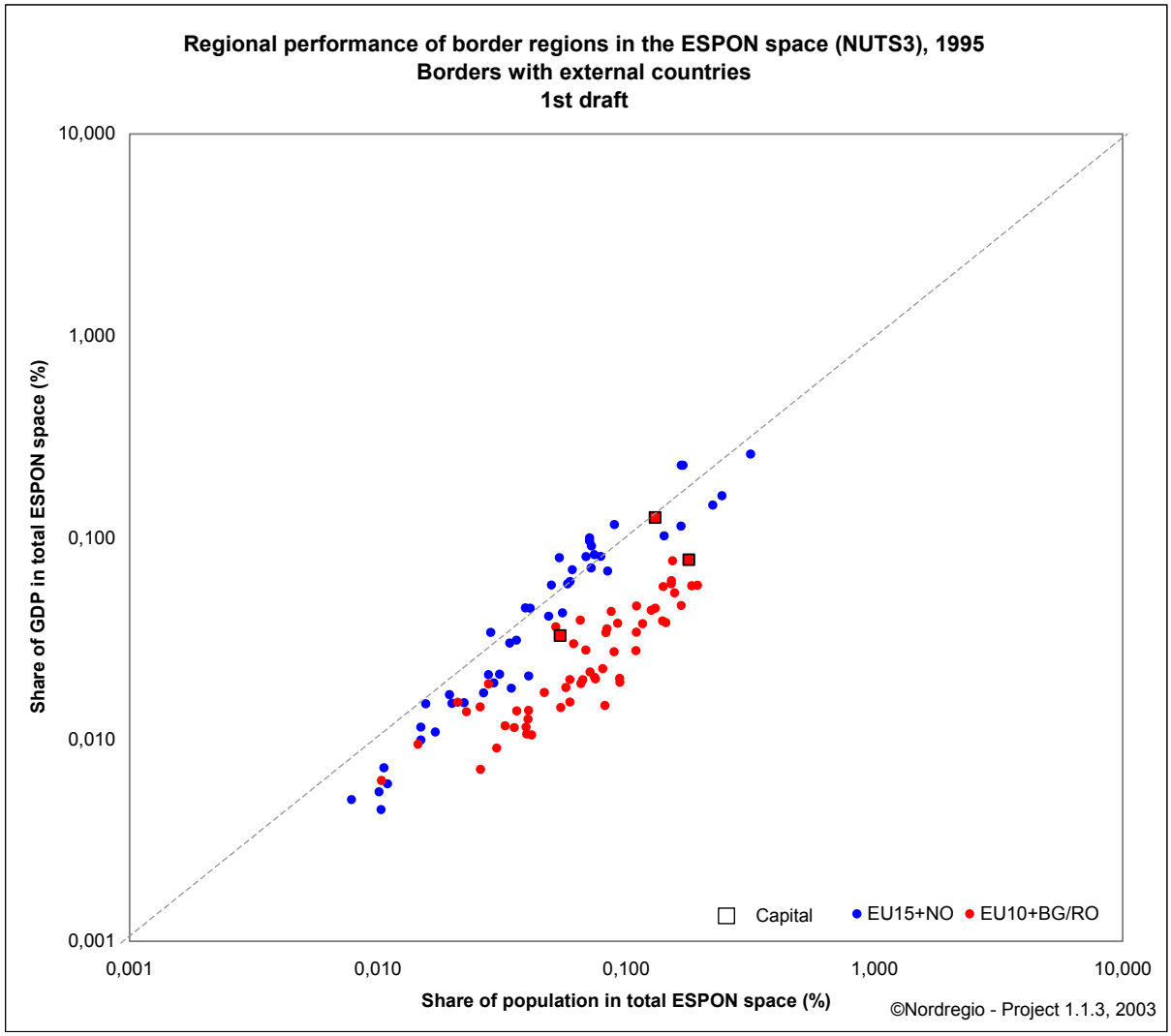
* For data please see APPENDIX 2

Figure 2.3: Regional performance of border regions to external countries 1995-2000



* For data please see APPENDIX 2

Figure 2.3(cont.): Regional performance of border regions to external countries 1995-



2000

Tentatively, we observe that performance in terms of GDP related to population;

- In EU15 is relatively balanced in most regions. Capital regions perform better in GDP but even several other regions hold leading economic postions. The absolute contribution of regions varies widely, more than in other parts of the ESPON space.
- In Bulgaria and Romania regions perform much better in population than in economy relative to the total ESPON space. In both countries capital regions lead the contribution long before the second largest regions. Burgas is the only region to strengthen its economic position during the latter half of the 1990s.

- Norwegian and Swiss regions almost entirely perform better in ESPON GDP than in ESPON population. While Norwegian regions strengthen their economic positions, Swiss regions lose it.
- In border regions of the EU15-accession country border gaps between contribution from regions of the accession country and those of EU15 seems modest. However, there are more EU15 border regions performing economically better; many though being in line with the EU10 border region performance.

2.2.3 Variation of performance in GDP terms across ESPON space, hierarchy of NUTS3

The variation of performance trends in GDP terms across the hierarchy of NUTS3 regions in ESPON space in population terms is shown in a series of Figures. Performance trend is measured in percent units as deviation from EU15 GPD per capita 2000 minus corresponding deviation 1995.

In the following graphs, NUTS3 regions are classified according their proportion och total population in ESPON space 1995. The six classes are

1. <0.02 %
2. 0.02-0.05%
3. 0.05-0.10%
4. 0.10-0.15%
5. 0.15-0.2%
6. >0.2%

NUTS regions are plotted against change in relative performance in terms of GDP per capita relative the EU15 average between 1995-2000 (percent units difference between 1995 and 2000). The tentative free form shape excludes outlyers.

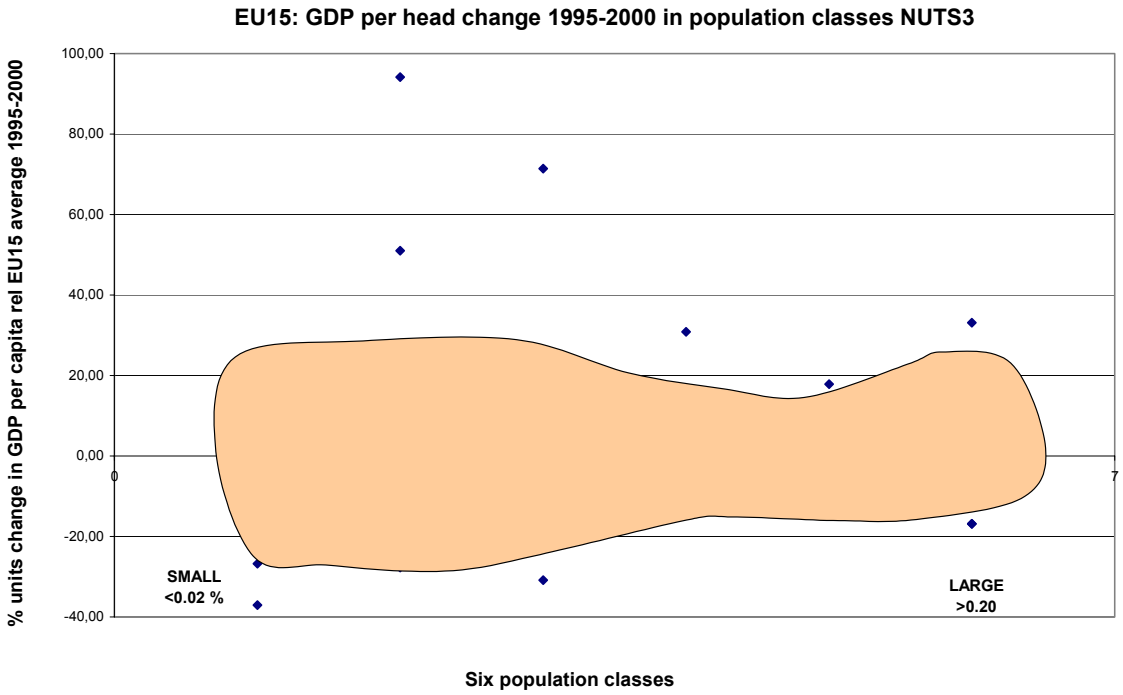


Figure 2.4. EU15: GDP per capita change in percent units1995-2000 in NUTS3 regions by population class. Source: ESPON Database

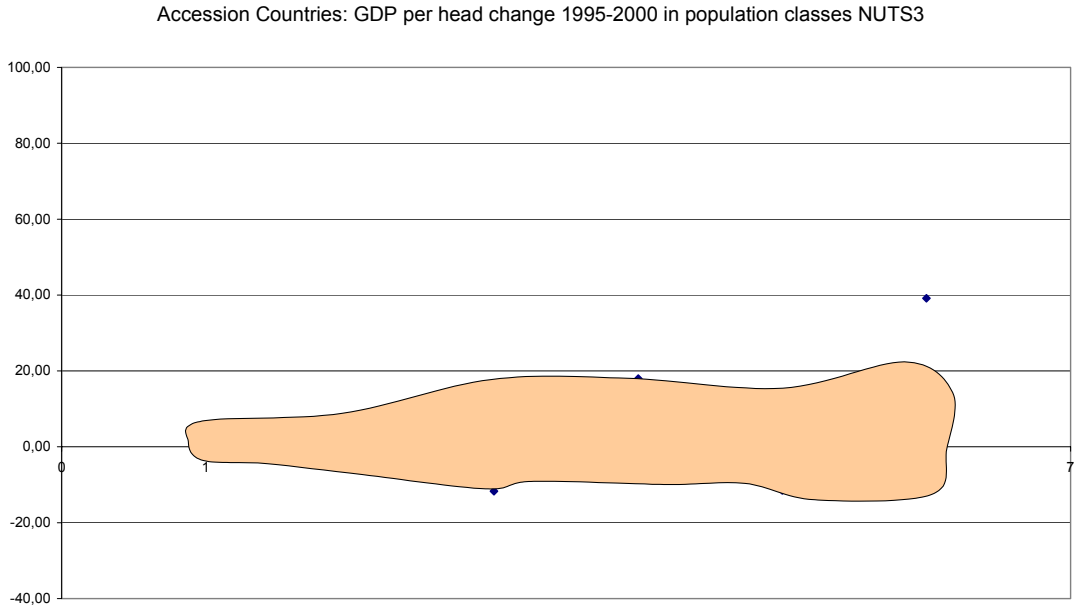


Figure 2.5. Accession countries: GDP per capita change in percent units1995-2000 in NUTS3 regions by population class. Source: ESPON Database

Figure 2.6. Bulgaria and Romania: GDP per capita change in percent units1995-2000 in NUTS3 regions by population class. Source: ESPON Database

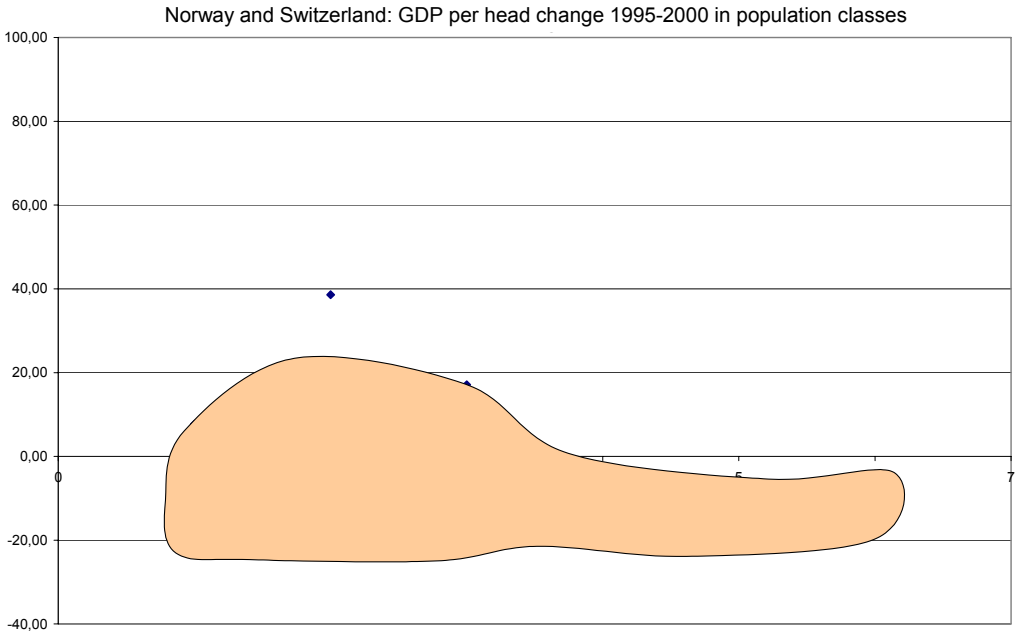


Figure 2.7. Norway and Switzerland: GDP per capita change in percent units1995-2000 in NUTS3 regions by population class. Source: ESPON Database

The descriptive analysis shows that

- Within *EU15,* the rate of change in performance in GDP per capita in the smallest NUTS3 regions typically varies as much as between – 20 to + 20 percent units, while the largest regions show a corresponding variation from – 10 to + 10 percent units.

- Within *EU10*, variation in performance is generally less within the different population size classes and considerably more regions advanced their relative position in Gross Domestic Product per head. The performance change within the smallest NUTS3 regions typically varies between – 5 to + 10 percent units, while the largest regions show a corresponding variation from –10 to + 20 percent units.

- Within *Bulgaria and Romania*, GDP per capita performance in almost all NUTS3 regions decreased from 1995 to 2000 in relation to the EU15 average respective year. Variation width was however relatively small and within the range of 10 percent units.

- Within *Norway and Switzerland*, the range of variation around the EU15 average between the many small regions in population numbers was up to 40 percent units with a general decrease in performance recorded for the largest regions in population size.

2.2. 4 GDP performance differentials

The variation of performance trends in GDP terms across the hierarchy of NUTS3 regions in GDP per capita terms rekative to the EU15 average in 1995 is shown in a following set of diagrams. As in the previous set of diagrammes, performance trend is measured in percent units as deviation from EU15 GPD per capita 2000 minus corresponding deviation 1995.

In the following graphs, NUTS3 regions are classified according their proportion of the EU15 average for GDP per capita 1995. The six classes are

1. <25% of GDP per capita in EU15 1995
2. 25-50%
3. 50-75%
4. 75-100%
5. 100-125%
6. >125%

NUTS regions are plotted against change in relative performance in terms of GDP per capita relative the EU15 average between 1995-2000 (percent units difference between 1995 and 2000).

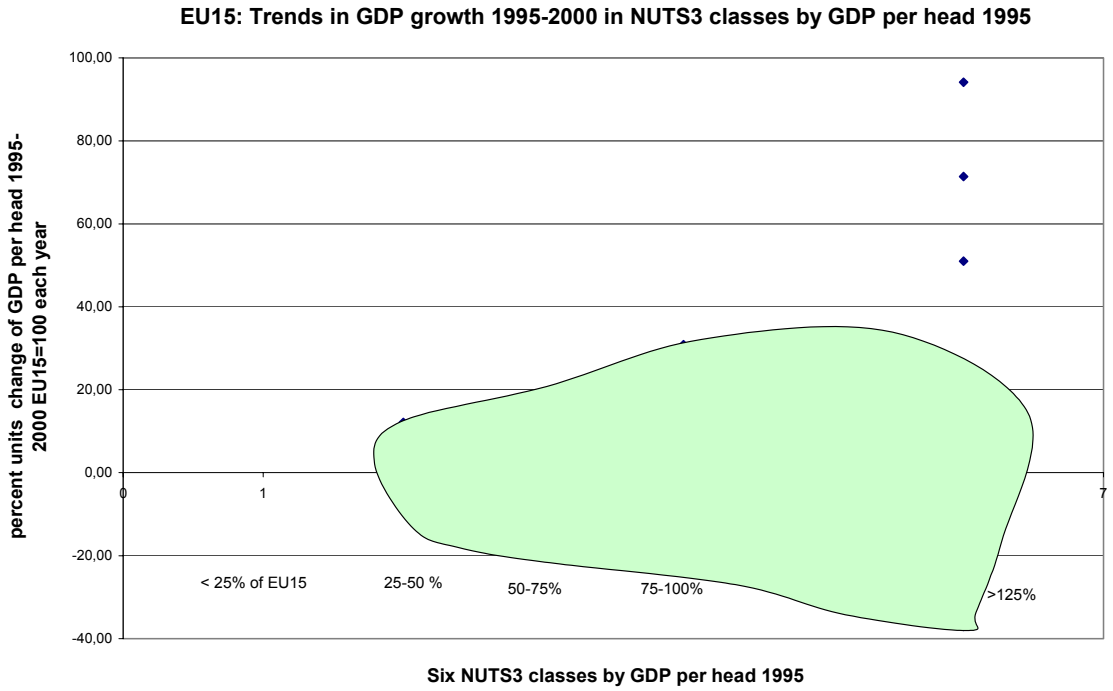


Figure 2.8. EU15: Trends in GDP growth 1995-2000 in NUTS3 classes by GDP per head 1995. Source: ESPON Database

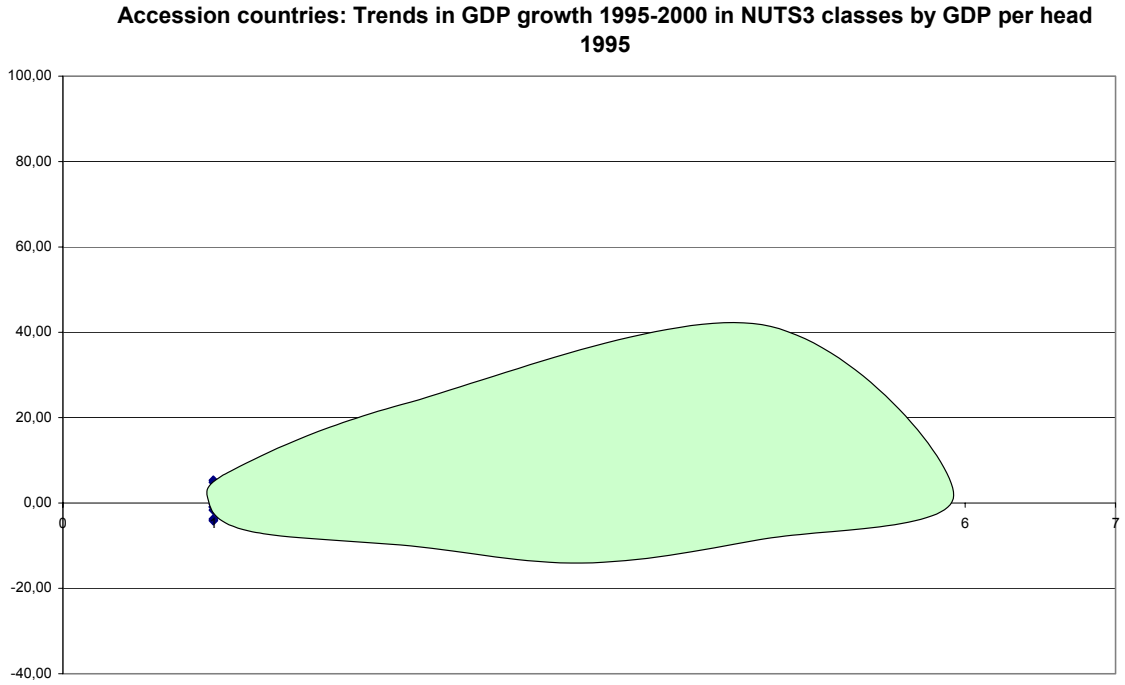


Figure 2.9. Accession countries: Trends in GDP growth 1995-2000 in NUTS3 classes by GDP per head 1995. Source: ESPON Database

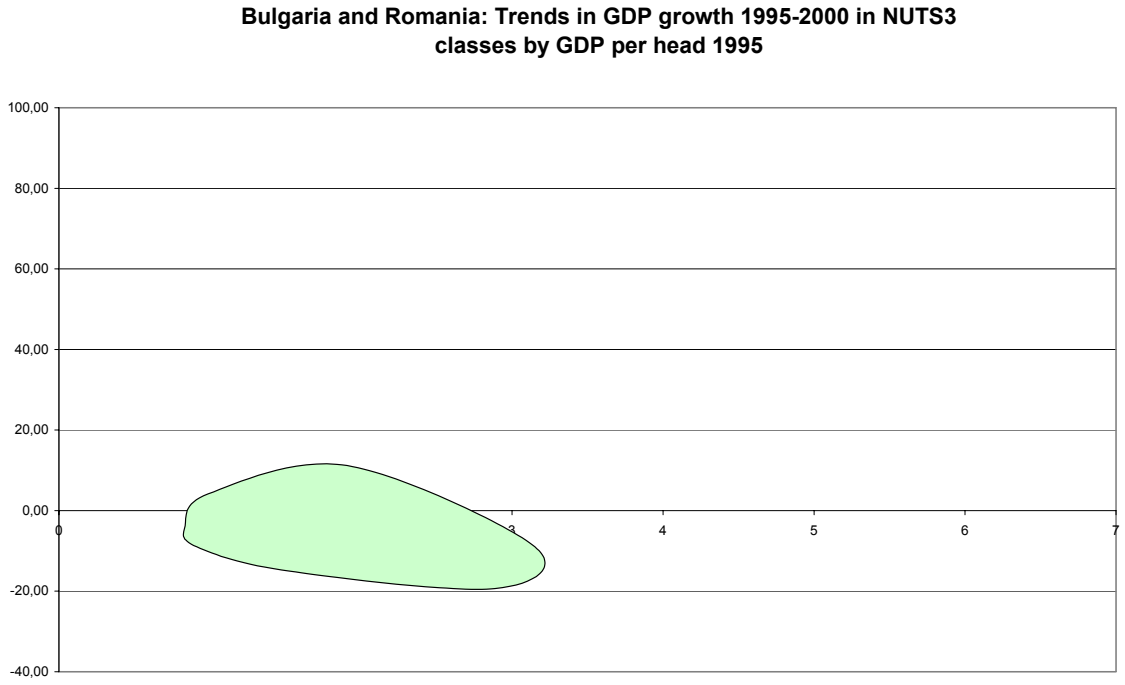


Figure 2.10. Bulgaria and Romania: Trends in GDP growth 1995-2000 in NUTS3 classes by GDP per head 1995. Source: ESPON Database

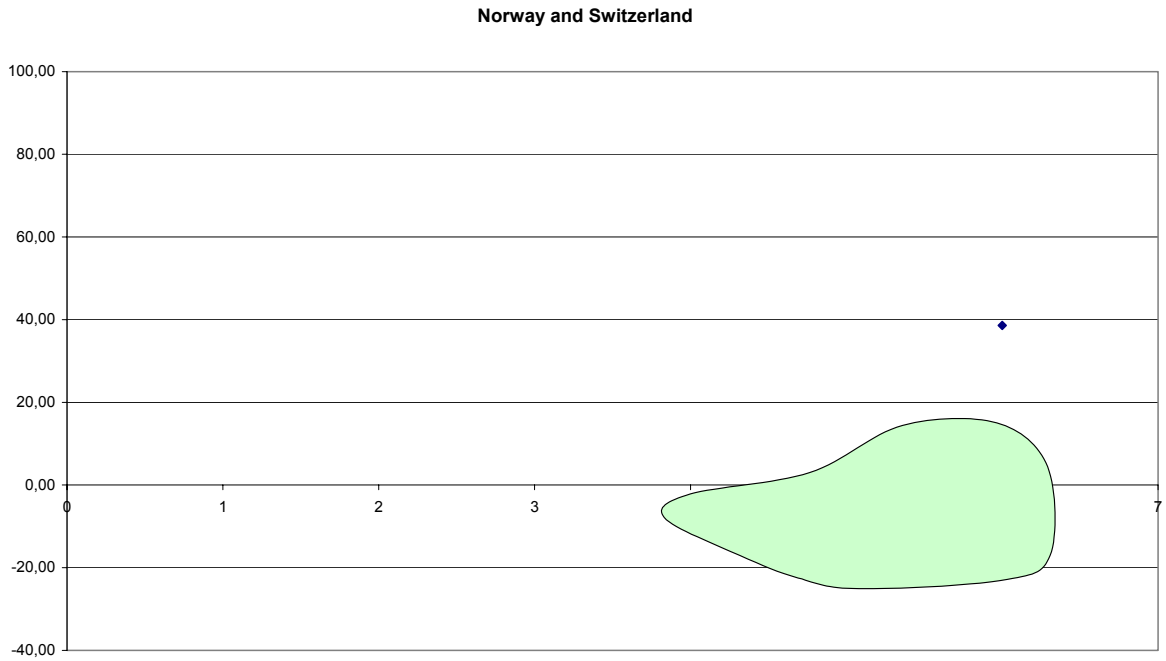


Figure 2.11. Norway and Switzerland: Trends in GDP growth 1995-2000 in NUTS3 classes by GDP per head 1995. Source: ESPON Database

This preliminary spatial economic analysis shows that:

- Within *EU15,* the rate of change in performance in GDP per capita in yhe poorest NUTS3 regions - with less than 50 percent of EU15 average in 1995 - varies between – 5 to + 15 percent units, while most other regions and irrespectively of their level GDP per capital in 1995 vary between- 20 and almost + 20 percent units.

- Within *EU10*, most of the regions have a GDP per head in 1995, which is less than 75 percent of EU15 average. Only one region displays a level of more than 125 percent. Variation in performance in regions below 75 percent of EU15 average is similar to the corresponding regions in EU15.Also the range of variation in the (small) class of regions with 75-100 percent of EU15 per capita GDP is similar in Accession countries as in the current EU space.

- Within *Bulgaria and Romania*, all except one region is classified below 50 percent of the EU15 average in GDP performance in 1995. Furthermore, GDP per capita

performance in almost all these regions decreased from 1995 to 2000 in relation to the EU15 average respective year.

- Within *Norway and Switzerland*, all but one region had a GDP per head above the EU average in 1995. However, most regions decreased their position relative to the EU average in 2000, in some cases up to 20 percent units decrease.

Conclusions:

1. Performance differentials within EU15 in terms of change in relative positions in Gross Product per capita are larger than within the t1n Candidate countries. This is accentuated in the smallest region classes in population terms in EU10. The flat spatial structure of economic growth is most evident in Bulgaria and Romania.

2. The distribution of NUTS3 regions according to position in GDP per capita relative to EU15 average is strtongly biased towards less than 75 percent in the ten Candidate countries. And to less than 50 percent in Bulgaria and Romania. The differences in performance are generally at the same level within EU10 as in EU15. However, the widest variation in relative change in GDP per capita is found in the “richest” regions in EU15.

ESPON Project 1.1.3 pays special atention to less favoured ad regions in industrial decline. In this diagnosis we present a preliminary list of these regions in EU25, i e regions with less than 75 percent of EU15 GDP per capita in 1995 and with a further reduction in this share in 2000. In next phase of the project we will analyse factors behind less well performance in these regions and discuss policy options for overcoming obstacles to rapid growth. It should be noticed that roughly 10 percent of total population in ESPON space live in these regions which altogether contribute to approximately 6 percent of total GDP.

Table 2.2. % of ESPON space population 1995 in lagging regions 1995-2000

	% of ESPON space population 1995
EU15: 25-50 % of EU15 average GDP/capita 1995	0.26
EU15: 50-75 %	6.40
EU10:<25%	0.46
EU10:25-50%	1.82
EU10 50-75%	1.64

Table 2.3. EU15: Poorly performing (25-50 % of GDP/capita in EU15 in 1995) NUTS 3 with increasing GDP gap to EU15 average until 2000.

		Increasing gap % units
GR211	ARTA	-3,85
BE326	THUIN	-3,67
PT144	BAIXO ALENTEJO	-3,63
GR214	PREVEZA	-2,35
DED18	MITTLERER ERZGEBIRGSKREIS	-2,18
DEB3K	SUEDWESTPFALZ	-2,10
GR231	AITOLOAKARNANIA	-1,19
GR212	THESPROTIA	-0,96
GR233	ILEIA	-0,65
PT128	BEIRA INTERIOR NORTE	-0,19

Table 2.4. EU15: NUTS3 regions 50-75 % of GDP/capita in EU15 in 1995 with increasing GDP gap more than 1 percent unit to EU15 average until 2000.

DED34	LEIPZIGER LAND	-16,54
DE40B	OBERSPREEWALD-LAUSITZ	-13,16
DED26	NIEDERSCHLESISCHER OBERLAUSITZKREIS	-12,15
BE342	BASTOGNE	-11,44
DE405	BARNIM	-10,89
DED35	MULDENTALKREIS	-9,23
BE325	SOIGNIES	-8,93
DE40E	POTSDAM-MITTELMARK	-8,84
DE947	AURICH	-8,66
DE80A	LUDWIGSLUST	-7,91
DED2A	WEISSERITZKREIS	-7,86
DEA29	HEINSBERG	-7,61
GR242	EVVOIA	-7,60
DE932	CUXHAVEN	-7,55
DE80C	MUERITZ	-7,26
DE936	OSTERHOLZ	-7,19
DE40C	ODER-SPREE	-7,01
DED29	SAECHSISCHE SCHWEIZ	-6,89
BE252	DIKSMUIDE	-6,89
UKM31	E AND W DUNBARTONSHIRE, HELENSBURGH AND LOMOND	-6,73
DED1C	ZWICKAUER LAND	-6,62
FR93	GUYANE	-6,21
BE351	DINANT	-6,01
DE94D	OLDENBURG (OLD.), LANDKR.	-5,93
BE345	VIRTON	-5,76
DE917	HELMSTEDT	-5,72
BE334	WAREMME	-5,68
UKM43	LOCHABER, SKYE AND LOCHALSH AND ARGYLL AND THE ISLANDS	-5,47

DE933	HARBURG	-5,25
FI134	KAINUU	-5,08
DE409	MAERKISCH-ODERLAND	-5,07
UKC21	NORTHUMBERLAND	-5,02
DE91B	WOLFENBUETTEL	-4,95
DE80I	UECKER-RANDOW	-4,88
DEB1A	RHEIN-LAHN-KREIS	-4,81
BE321	ATH	-4,78
BE323	MONS	-4,73
GR114	DRAMA	-4,72
DEE16	WITTENBERG	-4,71
UKM33	EAST AYRSHIRE AND NORTH AYRSHIRE MAINLAND	-4,70
DED24	BAUTZEN	-4,57
PT129	BEIRA INTERIOR SUL	-4,49
DEB3G	KUSEL	-4,48
DE80E	NORDWESTMECKLENBURG	-4,45
GR124	PELLA	-4,43
GR232	ACHAIA	-4,38
DE914	GIFHORN	-4,33
BE231	AALST	-4,24
BE353	PHILIPPEVILLE	-4,18
GR121	IMATHIA	-4,16
DE408	HAVELLAND	-4,12
DEF0A	PLOEN	-4,12
DE407	ELBE-ELSTER	-4,10
UKN03	EAST OF NORTHERN IRELAND	-4,09
BE223	TONGEREN	-4,08
DED19	MITTWEIDA	-4,04
DED16	FREIBERG	-4,04
PT121	BAIXO VOUGA	-4,03
DE807	BAD DOBERAN	-4,02
FR433	HAUTE-SAONE	-3,76
FR94	REUNION	-3,76

UKM41	CAITHNESS AND SUTHERLAND AND ROSS AND CROMARTY	-3,72
DEE37	STENDAL	-3,71
GR112	XANTHI	-3,68
DEG0G	WEIMARER LAND	-3,63
UKC14	DURHAM CC	-3,51
DEB3C	BAD DUERKHEIM	-3,47
DE40G	SPREE-NEISSE	-3,44
DE80D	NORDVORPOMMERN	-3,37
DEE13	BERNBURG	-3,36
DE22B	STRAUBING-BOGEN	-3,28
DED1A	STOLLBERG	-3,25
UKL14	SOUTH WEST WALES	-3,23
DEE23	MANSFELDER LAND	-3,12
GR115	KAVALA	-3,08
DE219	EICHSTAETT	-2,89
UKN05	WEST AND SOUTH OF NORTHERN IRELAND	-2,86
DE80G	PARCHIM	-2,78
PT123	PINHAL LITORAL	-2,47
DEB3I	LUDWIGSHAFEN, LANDKR.	-2,45
DEE35	JERICHOWER LAND	-2,45
UKM23	EAST LOTHIAN AND MIDLOTHIAN	-2,43
DE809	GUESTROW	-2,41
GR431	IRAKLEIO	-2,35
DEE15	KOETHEN	-2,33
DEB3F	KAISERSLAUTERN, LANDKR.	-2,26
DEB3D	DONNERSBERGKREIS	-2,25
DEE25	SAALKREIS	-2,25
UKL16	GWENT VALLEYS	-2,24
FR302	PAS-DE-CALAIS	-2,20
UKF12	EAST DERBYSHIRE	-2,17
UKN02	OUTER BELFAST	-2,12
DE238	REGENSBURG, LANDKR.	-2,07

DEG09	UNSTRUT-HAINICH-KREIS	-1,96
DE808	DEMMIN	-1,96
DE245	BAMBERG, LANDKR.	-1,95
UKN04	NORTH OF NORTHERN IRELAND	-1,94
FR632	CREUSE	-1,93
DE80B	MECKLENBURG-STRELITZ	-1,88
DEG07	NORDHAUSEN	-1,86
DEC06	SANKT WENDEL	-1,76
ES112	LUGO	-1,70
GR222	KERKYRA	-1,66
FR723	HAUTE-LOIRE	-1,54
PT142	ALTO ALENTEJO	-1,53
DE80H	RUEGEN	-1,45
ES113	ORENSE	-1,41
FR627	TARN	-1,41
DEC02	MERZIG-WADERN	-1,38
DEG0A	KYFFHAEUSERKREIS	-1,37
IT933	CATANZARO	-1,31
DE40F	PRIGNITZ	-1,24
DE237	NEUSTADT A. D. WALDNAAB	-1,22
DED15	CHEMNITZER LAND	-1,16
DED36	TORGAU-OSCHATZ	-1,15
BE233	EEKLO	-1,12
DE234	AMBERG-SULZBACH	-1,10
UKJ22	EAST SUSSEX CC	-1,07
DE26B	SCHWEINFURT, LANDKR.	-1,06

Table 2.5. Accession countries EU10: Poorest performing (<25 % of GDP/capita in EU15 in 1995) NUTS 3 with increasing GDP gap to EU15 average until 2000.

LT007	TAURAGES (APSKRITIS)	-4,11
LV005	LATGALE	-3,72
LV004	ZEMGALE	-1,63
LV002	VIDZEME	-0,92
PL032	CHELMSKO-ZAMOJSKI	-0,91
PL0A2	LOMZYNSKI	-0,27

Table 2.6. Accession countries EU10: Poorly performing (25-50 % of GDP/capita in EU15 in 1995) NUTS 3 with increasing GDP gap to EU15 average until 2000.

CZ02	STREDNÍ CECHY	-2,32
LT005	PANEVEZIO (APSKRITIS)	-2,12
HU062	JASZ-NAGYKUN-SZOLNOK	-1,33
HU072	BEKES	-1,33
HU071	BACS-KISKUN	-0,97
PL022	TORUNSKO_WLOCLAWSKI	-0,95
HU051	BORSOD-ABAÚJ-ZEMPL+N	-0,94
LT006	SIAULIU (APSKRITIS)	-0,91
SK022	TRENCIANSKÝ KRAJ	-0,89
PL0B1	SLUPSKI	-0,81
PL080	OPOLSKI	-0,64
LV003	KURZEME	-0,34
HU063	SZABOLCS-SZATMAR-BEREG	-0,31
HU042	SOMOGY	-0,24

Table 2.7. Accession countries EU10: NUTS3 regions 50-75 % of GDP/capita in EU15 in 1995 with increasing GDP gap more than 1 percent unit to EU15 average until 2000

CZ032	PLZENSKÝ	-8,41
CZ062	BRNENSKY	-7,01
CZ031	BUDEJOVICKY	-6,33
SI005	ZASAVSKA	-1,62
SK021	TRNAVSKÝ KRAJ	-0,12

2.3.1 Introductory Convergence Analysis[3]

Comparative analyses of integration processes between transnational and cross-border regions and their effects on the convergence and divergence processes are very important with regard to the enlargement process. These analyses include cross-border regions becoming inside regions of an enlarged EU, as well as ongoing and potential co-operation between EU regions and future neighbouring regions. The question is which approaches are to be followed towards a better transnational and cross-border integration, taking into consideration even sea borders between two countries. We will try to identify the general discontinuities and barriers at European scale using fundamental indicators such as differences in wealth or unemployment, barriers to residential migration or cross-border commuting. This will be accomplished using specific methods depending on the process that will be described and analysed, and depending on the data available.

Wealth performance differentials should indicate roughly the social dimensions of convergence. Indicators which should be documented and mapped for the neighbouring regions are indicators of demography (population and migration), income (earned by the inhabitants), unemployment (male/female, age, educational level), accessibility (from inside to outside), health care, environment, cultural aspects, etc.

[3] Written by Jos Muskens
TNO Inro, Delft, The Netherlands

Economic performance differentials should say something about the economic dimensions of convergence. Obvious indicators here are GDP per capita, productivity, employment, accessibility (from outside to inside), innovation and R&D expenditures, available land, skilled labour supply, etc.

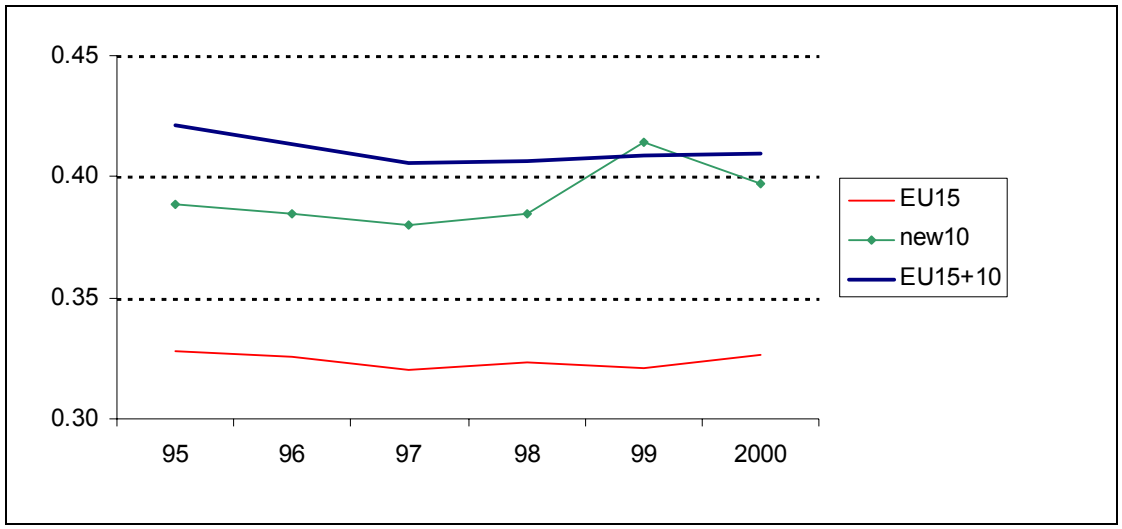
The difference between the two is the difference of focus: on the people who actually live in the region (and maybe work outside the region), or on the people who work in the region (and maybe live outside the region). For example, when a particular region suffers from agricultural decline (in numbers of employment, not necessarily in amounts of production), or industrial decline, economic performance may go down significantly, but social performance may not when new jobs can be found in neighbouring regions. So for some regions, cohesion policies could better be oriented towards neighbouring regions than towards the region itself. This implies a need for horizontal co-ordinated development programmes for improved cohesion. It is crucial to find out what the driving forces are, both economic and social, for convergence. After that, the need for horizontal co-ordinated development programs can be determined, for each type of policy.

2.3.1 Two concepts of convergence

When the focus is on dispersion in income and wealth between regions or nations, the **σ-convergence** indicator is perhaps the most useful method. This method is based on the standard deviation, across regions, of the logarithm of real Gross Domestic Product (GDP) per capita. When the standard deviation declines over time σ-convergence applies. For the years 1995-2000, and for most of the NUTS3 regions within the current and future EU member states[4], we have the possession of GDP data, both in Euros and in Purchasing Power Standards (PPS).

[4] For the EU15, we lack GDP data for the NUTS3 regions Berlin (both West and Ost), Cueta and Melilla (in Spain). For the 10 accession countries, we lack GDP data for both of the Malta NUTS3 regions. Furthermore, there are no GDP data for the NUTS regions of Norway and Switzerland. We do have GDP data for the NUTS3 regions of Bulgaria and Romania.

Figure 2.12 . Standard deviation of log(GDP per capita) in PPS, 1995-2000, for NUTS3 regions in EU15, new accession countries, and the EU25 altogether



Source: TNO Inro, based upon Eurostat data

Figure 2.12 plots the development over time, for (a) the EU15 regions, (b) the regions in the accession countries, and (c) for the EU25 altogether. As we can see, variation among regions is more apparent within the 10 accession countries than within the EU15 member states. However, in the development over time changes of the standard deviation are minor (apart from the 1999 peak in the accession countries). For both the current and the future EU member states, we can say that there has been some convergence up to 1997, but since then a process of slight divergence seems to have started.[5]

Another well-known convergence concept is called **ß-convergence**. It results from a neo-classical framework and can be split into conditional and unconditional convergence. Under unconditional ß-convergence, we regress the proportionate growth in per capita GDP on the logarithm of initial income. There is unconditional ß-convergence if the coefficient on initial income, denoted ß, is negative and statistically significant. Conditional ß-convergence occurs in case the negative relationship still holds after conditioning for other variables. Here, we only look at unconditional convergence. So from now on, when we mention ß-convergence, unconditional ß-convergence is meant.

Table 8 shows the outcome of the regression which we performed for (a) the EU15 regions, (b) the regions in the accession countries, and (c) for the EU25 altogether. The numbers

[5] Obviously, more can be said when more years are available (before 1995 and after 2000).

between bars denote the standard error of the ß estimate. They tell us that the ß-coefficient for the EU15 is significant, as well as for the EU25, while this is not the case for the new accession countries. Therefore, between 1995 and 2000, ß-convergence has taken place within the EU15 and within the EU25, but not within the new member states themselves.

Table 2.8. Estimation results for ß (with standard error between bars)

	Growth rate 1995-2000
Log of 1995 GDP per capita	
EU15	-0.544 (0.129)
Log of 1995 GDP per capita	
New10	-0.592 (0.607)
Log of 1995 GDP per capita	
EU15+10	-0.938 (0.107)

Source: TNO Inro, based upon Eurostat data

Apart from the technical differences, the two types of convergence may tell a different story. In case the speed and extent of the catching up of per capita income of particular regions to the average of a group of regions is of interest, ß-convergence is the appropriate concept. ß-convergence occurs when relatively poor regions grow faster than relatively rich regions. However, in case the interest concerns the development of the distribution of per capita income across regions, σ-convergence matters. Evidently, ß-convergence is a necessary but insufficient condition for σ-convergence. When σ-convergence takes place, there is ß-convergence too. But when there is ß-convergence, this does not automatically imply that σ-convergence takes place. In other words: when there is less deviation in GDP per capita among the regions, poorer regions apparently grow faster than richer regions. However, when poorer regions tend to grow faster than richer regions, variation in GDP per capita among regions does not necessarily have to decline.

Here, both methods are used to get a hint of the transition and convergence/divergence process with regard to regions within the EU, and with regard to the EU and the candidate countries. So what do the outcomes tell us? Within the EU15 and with the EU25 there is ß-convergence, which implies that the gap between poor and rich regions is declining. There is, however, no obvious σ-convergence (or –divergence), which means that the spread of wealth

does not change. Of course, the time series is rather short (only 6 years), so if we would have had more years the story could be different.

2.3.2 Other indicators and what they tell us

By using indicators of convergence and divergence it is possible to assess continuities and discontinuities in transition processes. According to neo-classical economic theory convergence is an indication of integration and better resource allocation. According to centre-periphery models, divergence between regions may be an indicator of increased integration – the 'backwash effect' is larger than the 'spread effect'. It is important to analyse unbiased and explicit the preconditions with regard to these two processes.

By analysing cross-border mobility of different types it is also possible to find alternative or complementary indicators of both integration and barriers. Increased mobility – e.g. labour force or residential migration – is generally a sign of increased integration, especially if it is not a one-way process. Increased symmetric migration patterns in combination with convergence in income and wealth provide indications on a well-functioning integration process without abrupt discontinuities. Increased one-way migration in combination with divergence in incomes is instead a sign of an integrative process that is likely to result in spatial polarisation.

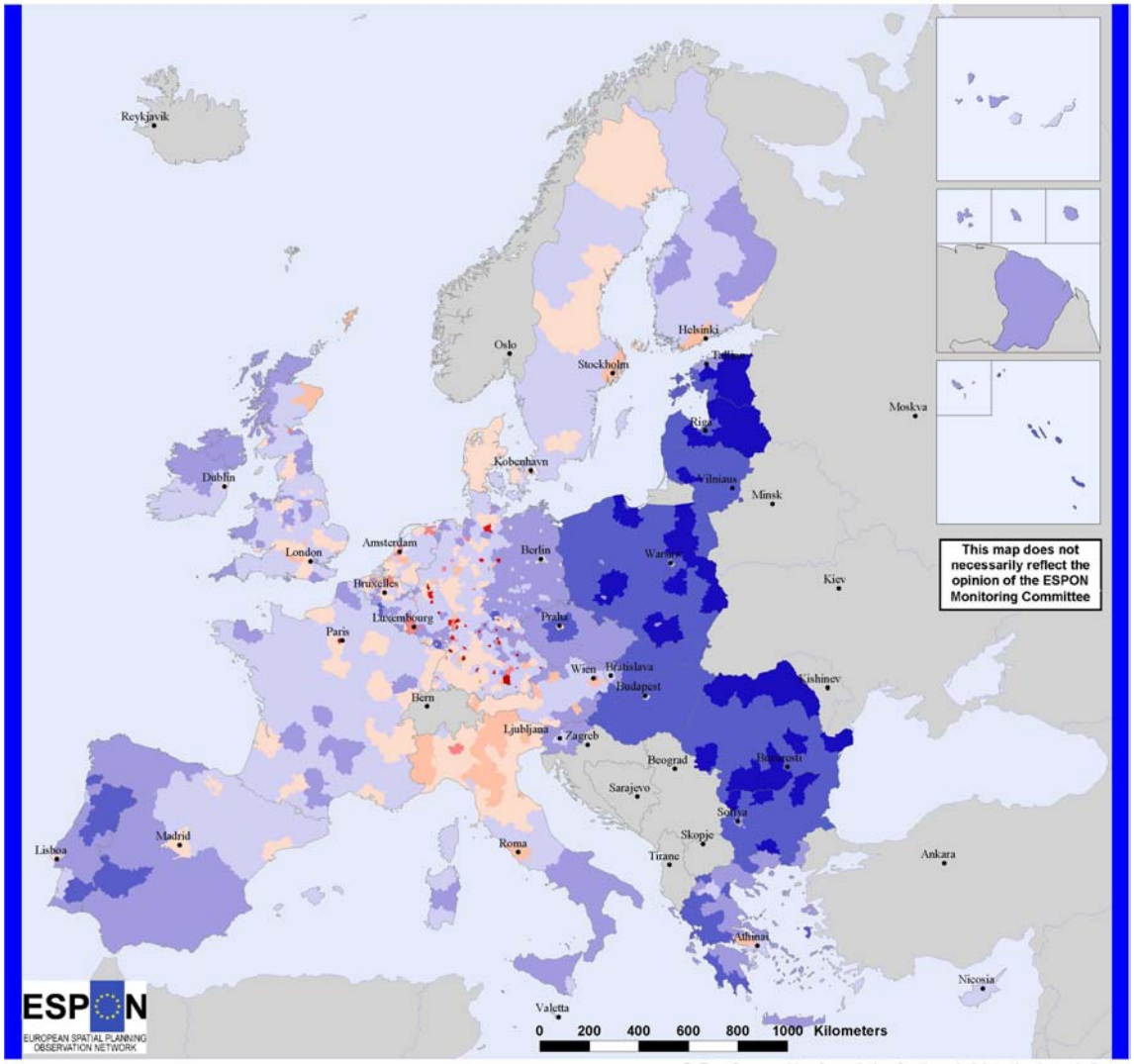
Decreased one-way migration in combination with convergence in incomes may be an indication of increased cross-border barriers but it can also be an effect of the integrative process. Asymmetric migration patterns are often a consequence of differences in incomes and job opportunities. Convergence in income and wealth hampers the push and pull factors and in turn, one-way migration.

By using these typologies it is possible to analyse the integrative process and hampering barriers with regard to transnational and cross-border regions in a simple and illustrative way. Here it is of utmost importance to analyse gross flows and not only net flows. The latter can be a sign of diminished integration as well as an indication of an increased one.

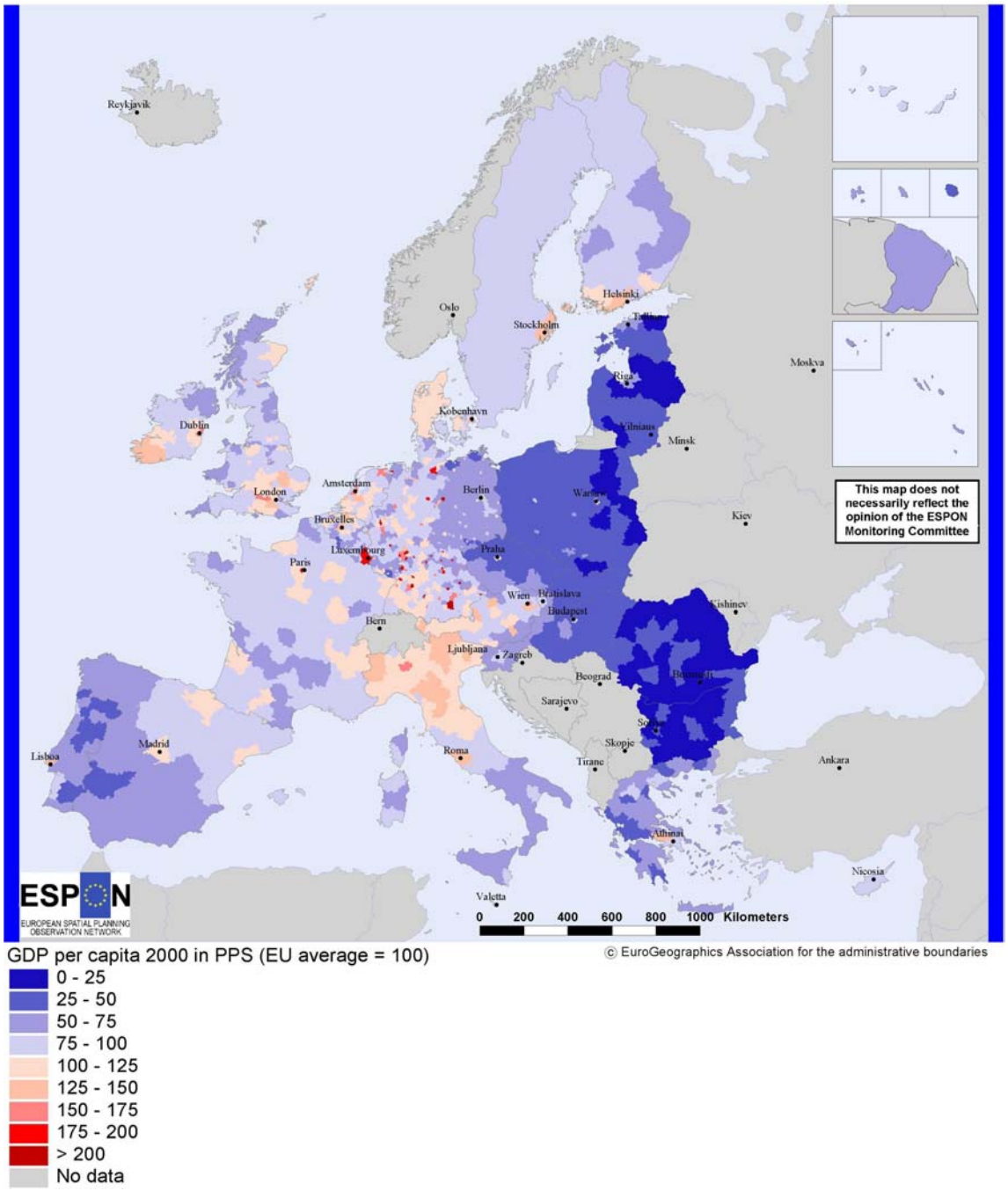
Unfortunately, for most of the indicators mentioned here we are lacking data. Maybe in the near future of the ESPON process we are able to extend our analyses with more data (and longer time series!). Furthermore, presenting indicators of convergence is one thing, finding

driving forces for convergence is another and maybe even more important issue. We hope to be able to say more about this when we progress within ESPON.

Map 2.4 GDP per capita 1995 in PPS (EU average = 100)



Map 2.5 GDP per capita 2000 in PPS (EU average = 100)



From both maps, it follows clearly that GDP per capita in the accession countries is far behind the EU average. Between 1995 and 2000, there is some slight improvement in the Baltic States, in Poland (especially in the regions around the big cities; please, Tomasz, verify!), and in Hungary. No significant developments can be discovered in Slovakia, Slovenia or Cyprus. According to the Eurostat data, situation is (slightly) getting worse in the Czech Republic. More significant is the widening of the gap between the EU average and the regions of Bulgaria and Romania.

In the member states of the EU15, the most striking improvement can be found in Ireland. This corresponds with the high rate of economic growth in Ireland in those years.

Some regions in Austria, Finland, Greece and Spain also appear to have had a GDP growth between 1995 and 2000 above EU average. The same can be said about the South of the UK, while the North developed the opposite way, resulting in a widening of the traditional gap between the North and the South of the UK. Such a traditional gap also exists in Italy. At the end of last century, though, the situation there has not changed significantly. In Germany, there have not been significant changes either, which means that the East is still clearly behind the West. In the Benelux countries, as well as in Portugal, no significant changes between EU development and national development can be traced. Finally, GDP per capita in Sweden seems to have grown at a lower rate than on average in the EU. According to the map for 2000, the whole of Sweden (except for Stockholm) is below EU average.

2.3.3 Excursion: Portugal European Integration: is it an example for Candidate Countries?[6]

Portugal joined the EU in 1986 with Spain and since then the regional development in Europe is clearly a critical issue. In fact, these two Iberian countries and Greece and Ireland were lagging behind European economic and social standards. Therefore, Structural Funds and Cohesion Fund were powerful financial instruments to promote development in these countries and to achieve real and nominal convergence with Europe. Clearly, there were changes in economic, social and environmental domains, some very important and very positive, along with some drawbacks and failures. In the present section we briefly present

[6] Written by Mário Vale, CEDRU, Portugal

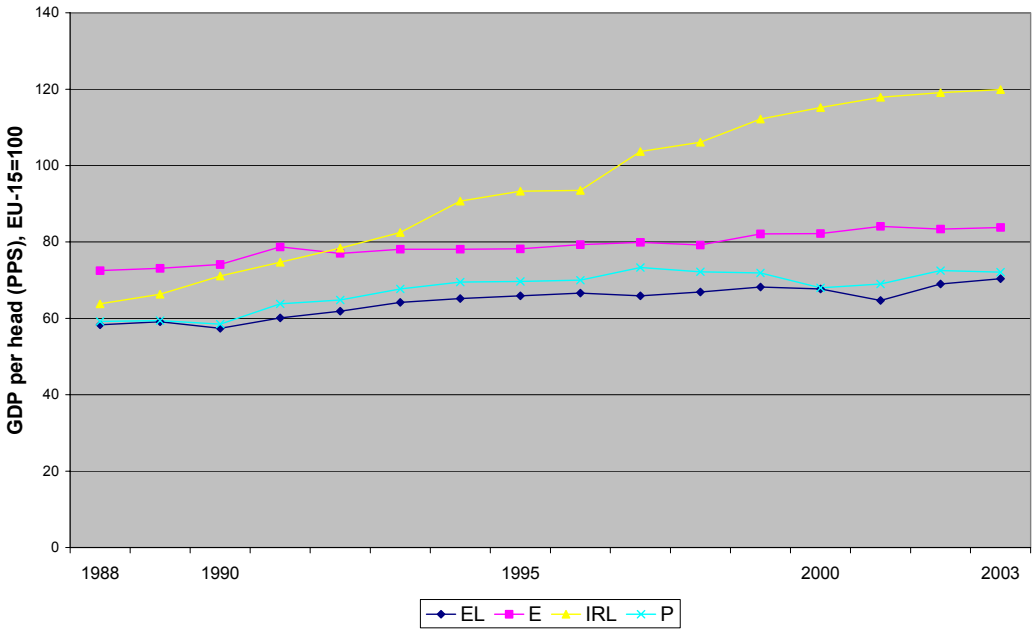
and examine some changes in Portugal since European integration and discuss some implications for the candidate countries in the light of European enlargement.

2.3.1 Convergence/Divergence Trends

Since 1986 the Portuguese economy is apparently in a cycle of convergence with European economy, however not always with a good performance. We can identify four periods in the economic convergence process with Europe:

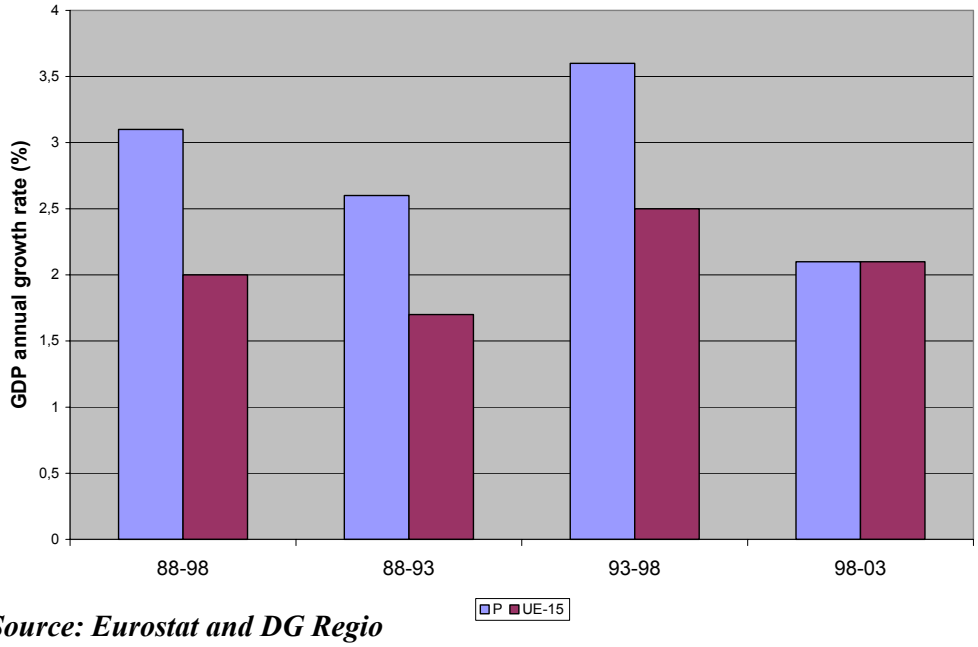
- Period of real convergence with EU economy between 1986 and 1992, as a result of large inflows of inward investment in manufacturing, finance and real estate, the Structural Funds available under the I Community Support Framework (CSF) (1989-1993) mostly used in the infrastructure modernisation and the exports dynamic stimulated by the demand of larger and developed economies of the UE.
- Economic slowdown and halt to real convergence process between 1992 and 1993 due to the economic recession in the most important European markets and to a lack of public funding associated with the transition from the I CSF to the II CSF (1994-1999).

Figure 2.13. Real Convergence in the Cohesion Countries, 1988-2003



Source: Eurostat

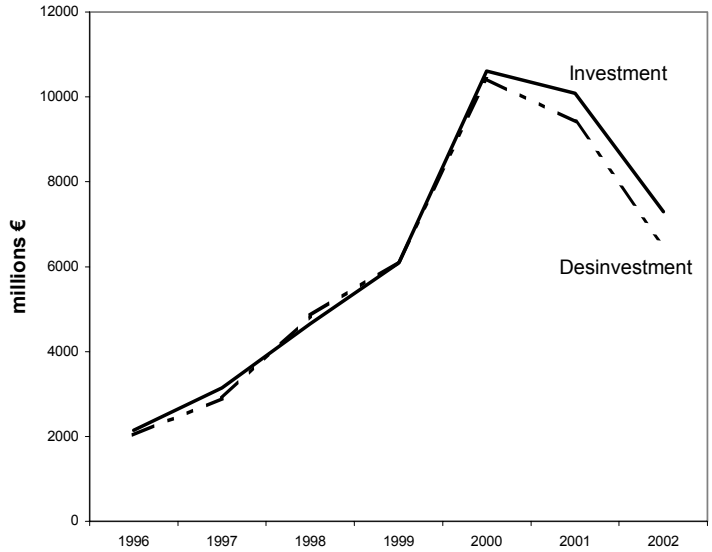
Figure 2.14. GDP Annual Growth in UE-15 and Portugal, 1988-2003



Source: Eurostat and DG Regio

- Real convergence between 1994 and 1999 and nominal convergence until 1997 achieved with exports growth and control of imports, growth of productivity, decrease of inflation rate and interest rate, change rate stability and EMU and EURO member.

Figure 2.15. Foreign Direct Investment in the manufacturing industry in Portugal, 1996-2002



Source: Bank of Portugal

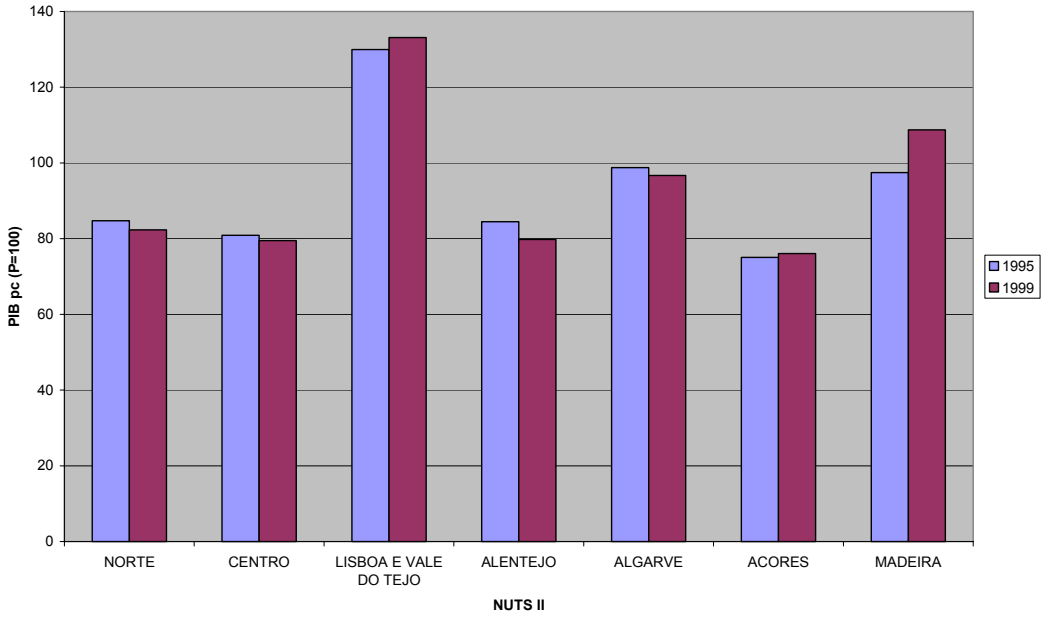
- Deceleration on the real and nominal convergence after 2000 with divergence growth (end of a long period of catching-up) in a context of European enlargement to East (candidate countries became more important inward investment locations). Theo public and private investment delays associated with the transition from the II CSF to the III CSF (2000-2006) also put at risk the Portuguese economic convergence. Recently, the Stability and Growth Pact render more difficult the public investment particularly as a result of the inflation and unemployment growth, and the need to cut public expenditure.

Regional Disparities in Portugal

Regional unbalances in Portugal are quite strong and in general can be described as a coastal/interior area divide. The coastal area is a narrow strip between roughly Lisbon and Porto highly urbanised with a dynamic productive fabric. The interior area of Portugal is more rural and cities are smaller. Besides this strong spatial unbalance, there is a certain contrast between North and South of Portugal, due to physical and cultural factors. Nevertheless, the coastal area of Portugal is more developed than the Interior.

The coastal/interior divide is a stable trend of regional performance, even if after European integration one witnessed a period of slow convergence growth in the Portuguese regions. However, regional disparities increased in the 1995-99 period basically as a result of a very good performance of Lisboa e Vale do Tejo (LVT) and Madeira regions. The capital-city region has been clearly the most developed region of Portugal and is a phasing-out period regarding Objective 1 of European regional policy.

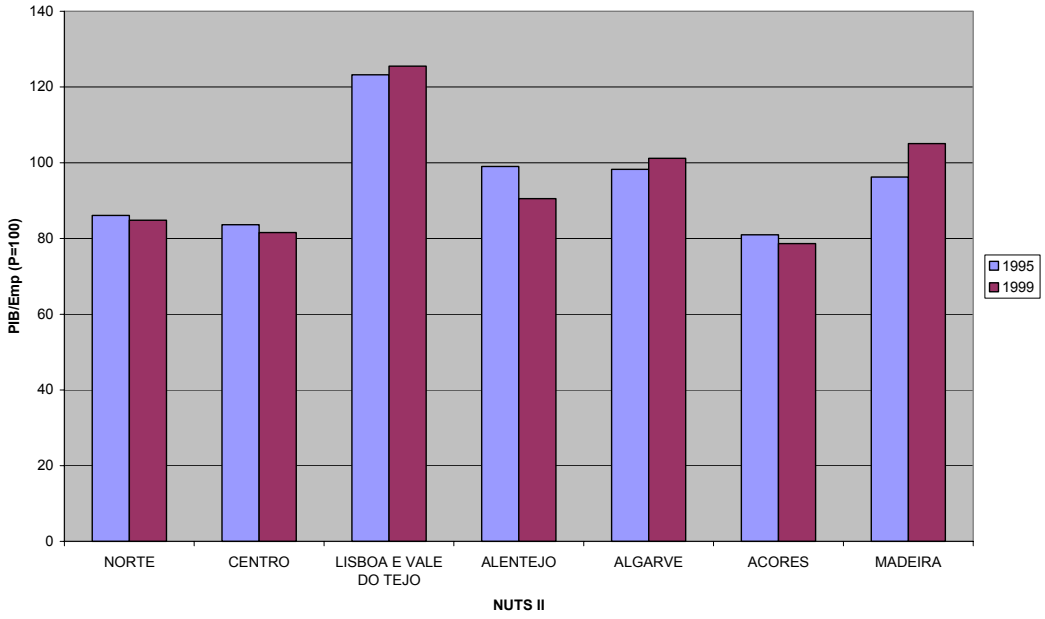
Figure 2.16. GDP per head by region in Portugal, 1995-1999



Source: INE

In fact, the more advanced competitive factors of this region and the concentration of public funding (including Structural Funds) in 1996-98 in projects like Lisbon International Exhibition (EXPO 98) and the new bridge Vasco da Gama may have been responsible for a better economic performance of Lisbon region. In Madeira and Algarve regions productivity growth was higher than Portuguese average, although GDP per head growth was inferior the Portuguese average in Algarve, precisely the opposite of Azores. Norte, Centro and Alentejo experienced divergence growth between 1995 and 1999.

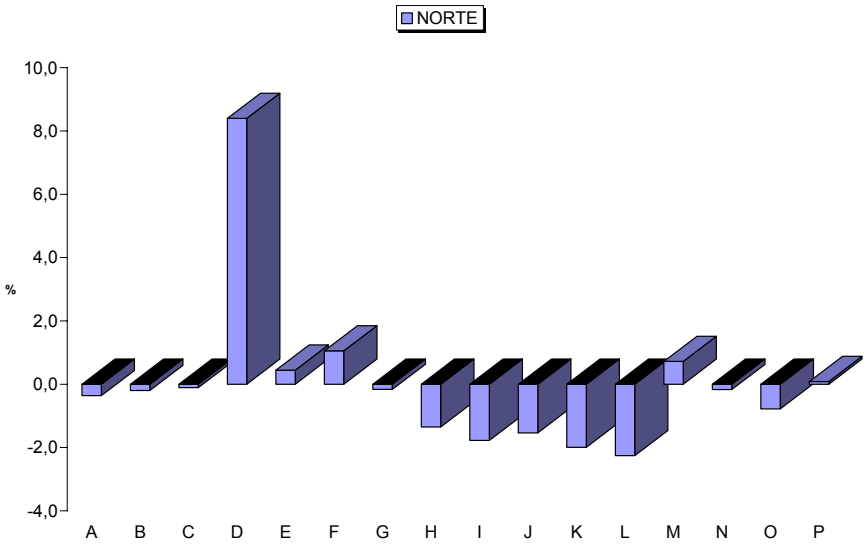
Figure 2.17 GDP per person employed by region in Portugal, 1995-1999

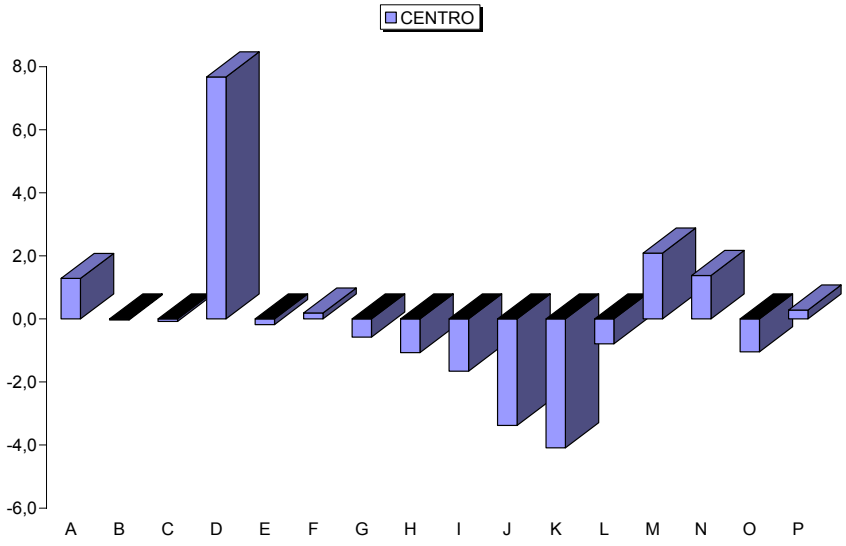


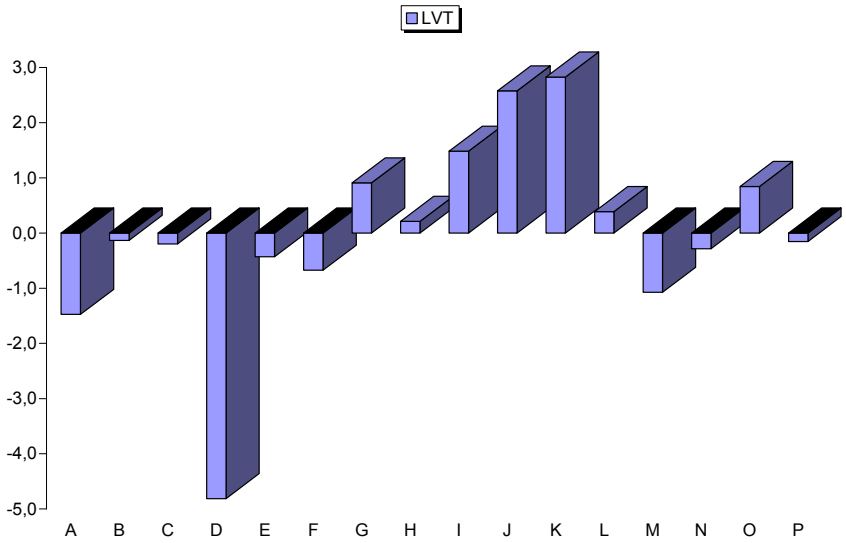
Source: INE

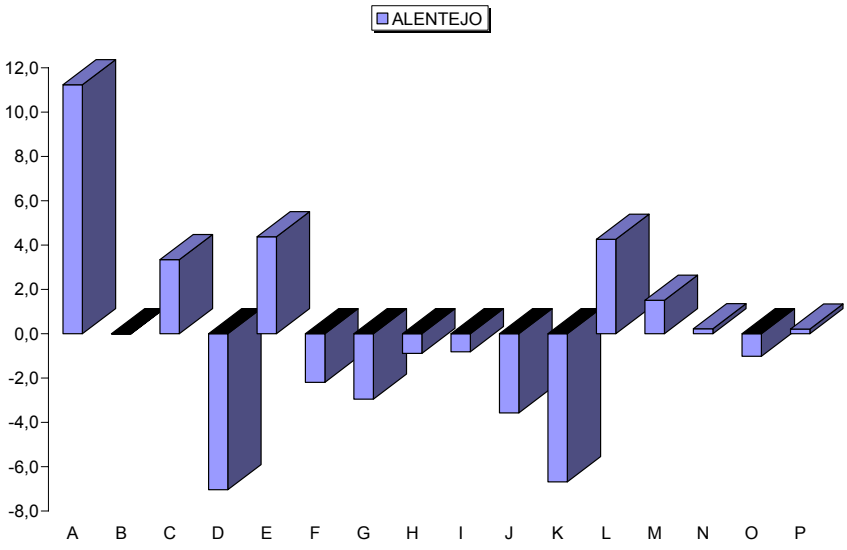
The next figures compare the structure of Gross Value Added in each region with the national structure in 1999. The Centro and especially Norte regions have a strong specialisation in the manufacturing activities translating the relevance of several traditional clusters very dynamic in the international markets. Centro region is also specialised in education and health services. The structure of value added in Lisboa e Vale do Tejo is rather different from the national breakdown, namely because the role specialisation in finance, business services and real estate. Alentejo is specialised in agriculture and extraction, besides some public services. The tourism development in Algarve explains the relevance of hotels and restaurants and real estate in the regional product of the region. The economy of Açores is very dependent of agriculture activities and public administration as well as transports. Although public administration and transports also generate an important share of regional product in Madeira, the service activities related with tourism specialisation are also strategic for economic growth.

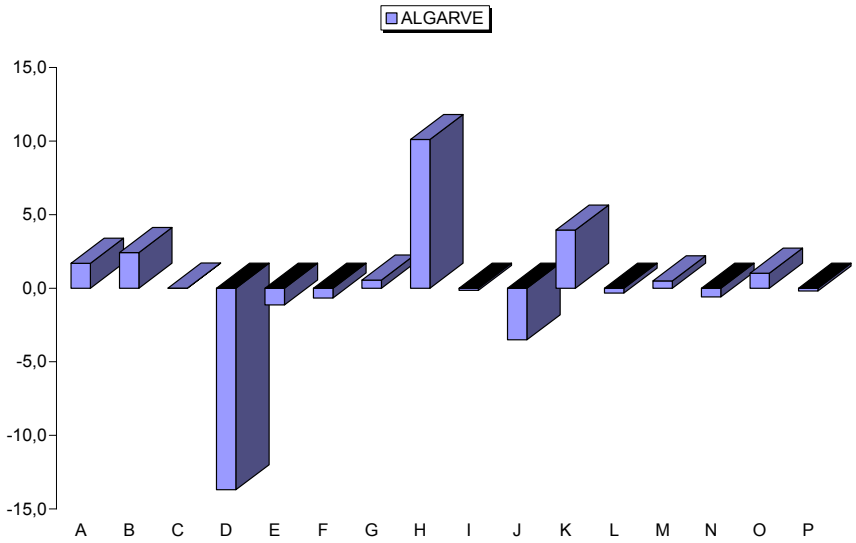
Figure 2.18. Gross Value Added Structure by region (compared with National Structure),
1999

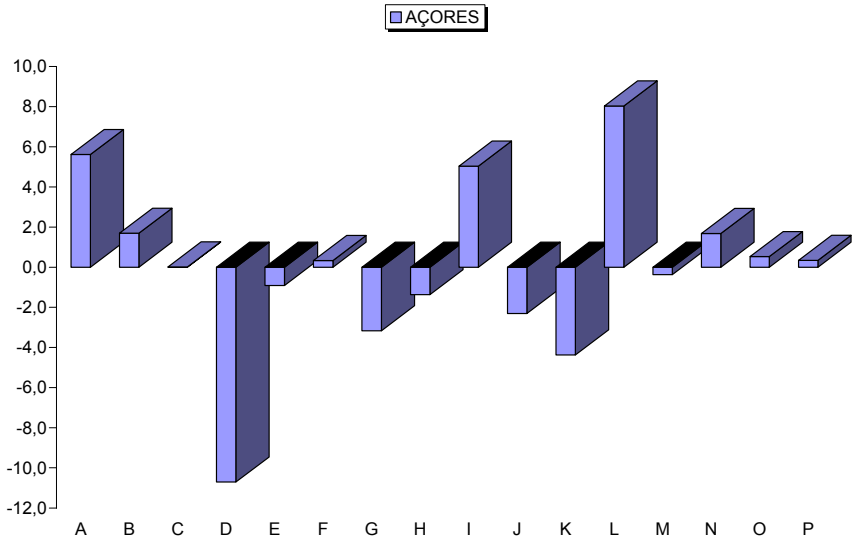


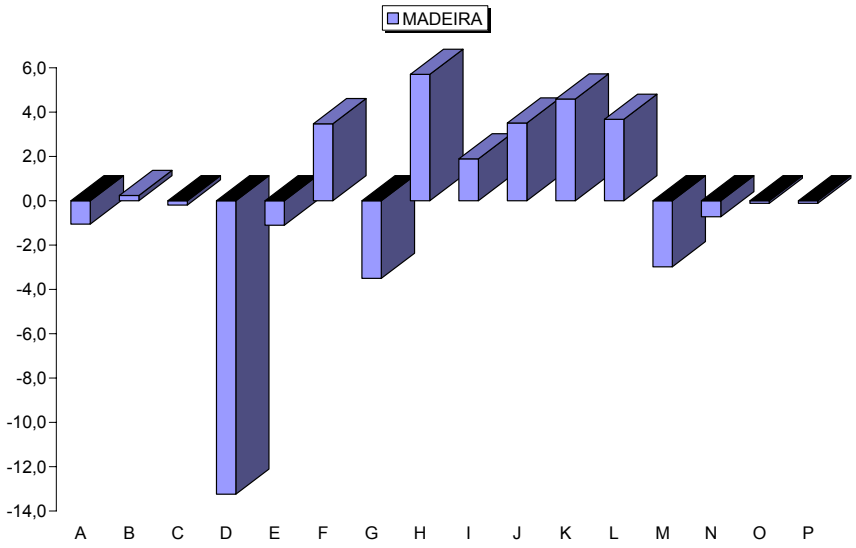



LVT
3,0
2,0
1,0
0,0
-1,0
-2,0
-3,0
-4,0
-5,0
A B C D E F G H I J K L M N O P


ALENTEJO
12,0
10,0
8,0
6,0
4,0
2,0
0,0
-2,0
-4,0
-6,0
-8,0
A B C D E F G H I J K L M N O P


ALGARVE
15,0
10,0
5,0
0,0
-5,0
-10,0
-15,0
A B C D E F G H I J K L M N O P


AÇORES
10,0
8,0
6,0
4,0
2,0
0,0
-2,0
-4,0
-6,0
-8,0
-10,0
-12,0
A B C D E F G H I J K L M N O P



A	Agriculture and forestry	I	Transport and communication
B	Fishing	J	Finance
C	Mining and quarrying	K	Real Estate and business services
D	Manufacturing industries	L	Public administration and defence
E	Electricity, gas and water	M	Education
F	Construction	N	Health
G	Retail and distribution	O	Social and personnel Services
H	Hotels and restaurants	P	Other services

Source: INE

The regional disparities are also quite dramatic at NUTS III level in Portugal, where coastal and interior divide is much more visible. The coefficient of variation of GDP per head change from 0,293 to 0,305 between 1995 and 1999, which indicates a slight increase of regional disparities.

Figure 2.19. GDP per head by region in Portugal, 1999

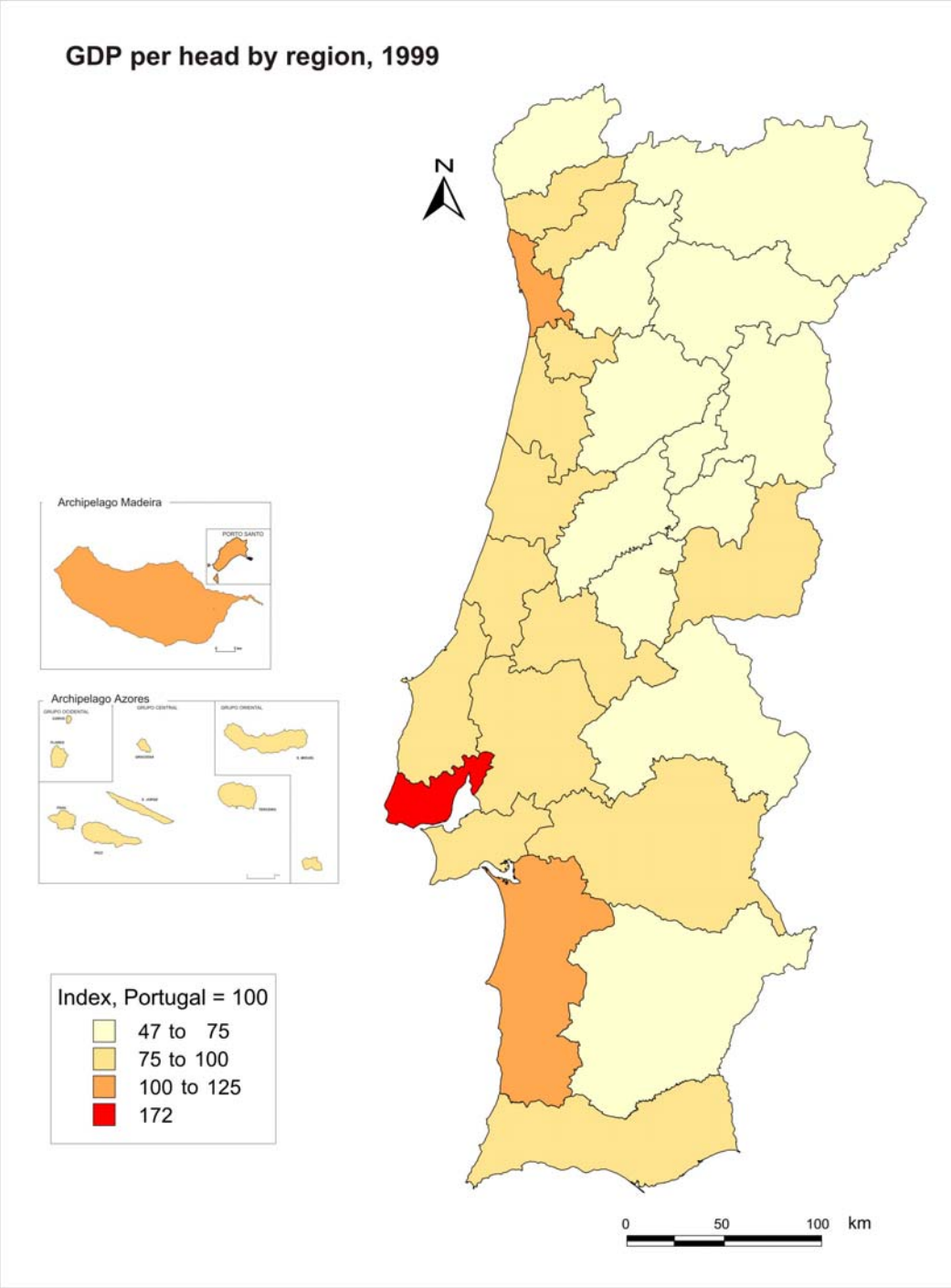
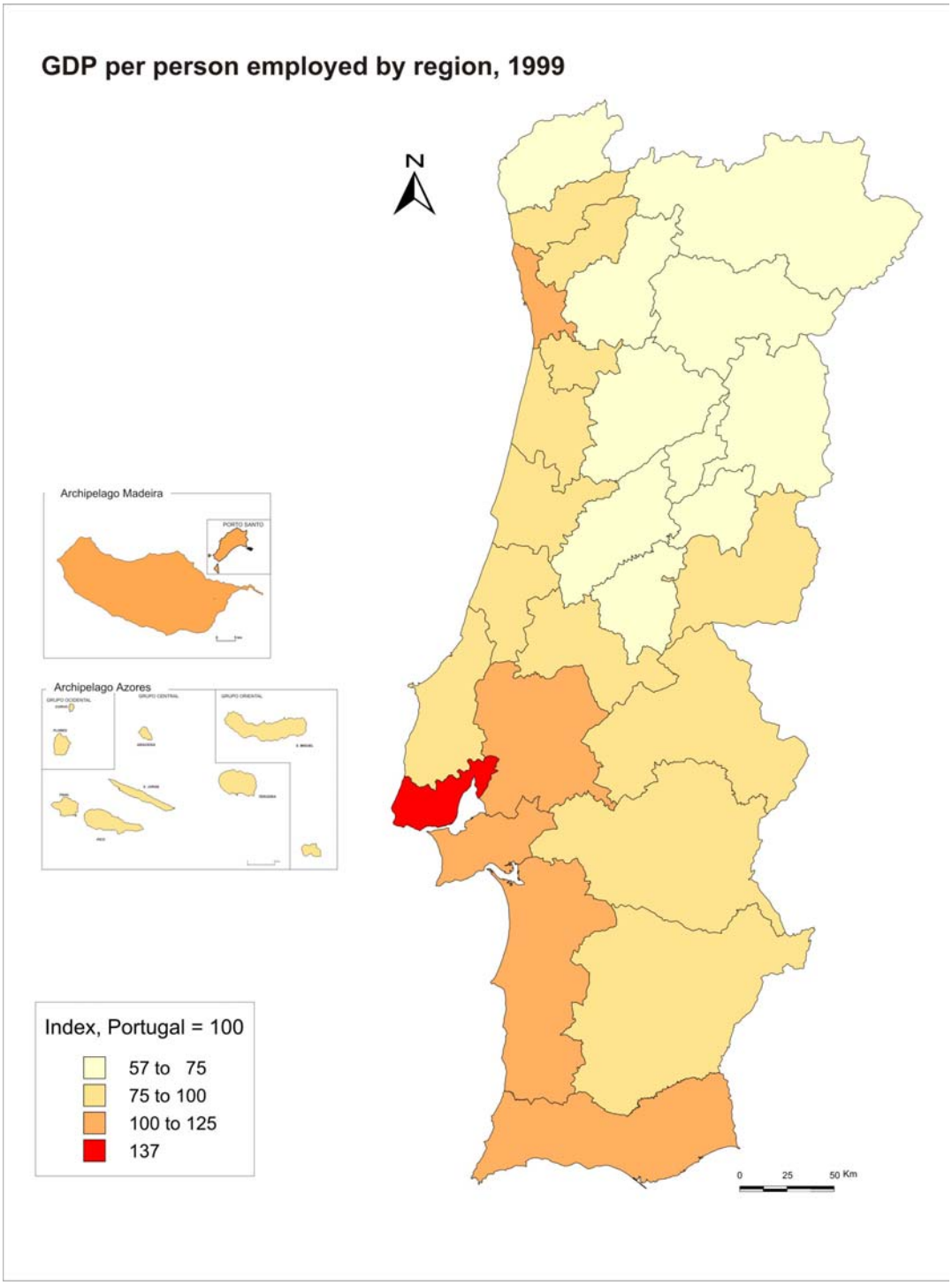


Figure 2.20. GDP per person employed by region in Portugal, 1999



At NUTS III level the regions with a better economic performance are in the coastal area, although some interior areas performed well in that period. Nevertheless, the spatial unbalance is so pronounced that public regional policy has been unable, if not reckless, to overcome such strong regional unbalance.

Lessons to Candidate Countries

There are some lessons to be learned by candidate countries with the case study of Portugal integration. Preliminary findings are drafted below:

- The European integration stimulated economic growth and social well-being in Portugal
- European market and specially the demand of more developed countries in EU encouraged innovation and expansion in the manufacturing activities
- Structural Funds were extremely important to infrastructure modernisation namely to reduce time and cost distance to the centre of Europe and to improve inter and intra-regional accessibility
- Apparently, economic cycles in the European economy have been more influent in the convergence growth than European funding
- The EMU, Euro and the Stability and Growth Pact have different impacts, and the public expenditure cuts have a strong influence in the growth of Portuguese economy
- Enlargement of European Union is render more difficult the catching-up process in Portugal and it seems that the specialisation model of the Portuguese economy (based on intensive labour and low wages) is no longer viable in an Europe with other countries with even lower wages
- EU integration precipitated the decline of traditional sectors (like agriculture and fishing) along with other more intensive in capital (shipbuilding, steelworks,) and knowledge (pharmaceuticals) and create new opportunities (automobile, moulds, ceramics, wine, tourism,)
- After more than ten years of public (national and community) funding, the pattern of regional disparities did not change significantly in Portugal.

2. 4. Pilot Study of Disparities and spatial dependence[7]

2.4.1 Introduction – spatial association perspective

In recent years, new economic geography has led to new insights in explaining regional growth processes. In applying these in the EU context, the first emphasis concerns spatial scale: even if some empirical evidence for the cohesion among EU member states is found, a similar analysis at lower spatial scales may give different results. The second insight – which is closely linked to the first one – addresses the role of geographical proximity, and spatial externalities as determinants of overall growth, and as causes of spatial distribution of economic activities. This is illustrated in following two lines of argumentation of spatial economic processes with reference to the cohesion and convergence among the regions in the enlarging EU.

1. The existence of agglomeration economies means that economic growth is stimulated by a geographical concentration of economic activities, and intra-industry economies of localisation, such as access to specialised inputs, and benefits derived from a pooled labour supply. Given the fact that firms may benefit from these endogenous factors only by co-locating in the same region, there is a tendency towards a path-dependent concentration of activities in a few regions. This cumulative concentration may be further strengthened by the so called shadow effect: since agglomerations economies can be derived only on-site, agglomerations attract workers and firms from their surroundings. This may lead to a hierarchical, but spatially smooth pattern, so that agglomerations are surrounded by regions with a lower economic performance, and separated from each other by some minimum distance.

2. The extent, implications, and causes of R&D spillovers and other forms of (localised) knowledge transfers have received increasing attention in recent regional research and policy. While they are seen as key factors for firms' and regions' competitiveness, it is less clear to which extent they differ in terms of their spatial scale as causes of industrial concentration. However, if the spatial range of positive effects of these knowledge externalities is local, i.e. only firms located in a certain region or close to it benefit from its innovative capacity, knowledge flows are likely to contribute to regional divergence in growth benefiting most innovative localities. But if these knowledge transfers tend to

[7] Written by Timo Hirvonen, University of Joensuu - Karelian Institute, Finland

be more global than local, i.e. productivity improvements of firms do not that much depend on their geographical proximity and location, these flows may contribute to a more even and spatially balanced distribution of rich and poor regions.

While the two lines of argumentation outlined above are only illustrative, they help to understand the causes and implications of spatial dependence in regional development. Due to mechanisms of technology diffusion, factor mobility, and accumulation of capital, regional growth and convergence have explicit spatial patterns of dynamics. Regions with similar development patterns, either positive or negative, tend to locate close to each other: the clustering of economic activities is widespread and more distinctive than what would be observed if spatial distributions were caused by random process. This is the framework for the following tentative analysis describing GDP per capita differentials among the regions of the enlarging European Union, and their dependence on different spatial scales.

2.4.2 Analysis of spatial association

The recent interest in the issue of spatial interaction vis-a-vis regional convergence has stimulated a large number of empirical studies employing various descriptive measures to examine the presence of spatial association. One such approach has been developed by the French team members of the ESPON TPG 3.1. Its focus is on deviations of regions from various reference areas, summarised by dissimilarity indices, which are both practically and analytically relevant. It has been agreed between the TPGs 3.1 and 1.1.3, that this methodology will be developed further, and tested in a co-operative study carried out by the French (CNRS – UMS RIATE, Paris) and Finnish (Karelian Institute, Joensuu) partners of these two research groups. The results of this exercise will be presented at forthcoming ESPON seminars and in TPG-deliverables. The present paper reports the very first tentative results of this joint research.

According to the methodology presented by the French ESPON 3.1 team, the following set of deviation indices (I)[8] are used to test the existence of spatial association:

1. Dev_EUnn = Relative deviation from the mean of EU25, EU15 (current members) or EU10 (candidate countries).
2. Dev_National = Relative deviation from the national mean.

[8] $I = 100 - \left| \; 100 * b_i / s_j \; \right|$, where b is GDP per capita in region i, and s GDP per capita in reference area j.

3. Dev_Local = Relative deviation from the neighbourhood mean. Neighbourhoods were defined by using binary contiguity between regions (i.e. regions have a common border).

4. Dev_Local_Inter = Relative deviation from the international neighbourhood mean (i.e. regions have a common international border)

5. Dev_Local_Intra = Relative deviation from the national neighbourhood mean (i.e. regions have a common intranational border)

All deviations are reported in absolute values. GPD per capita in Euro and pps in 1999 is used as a test variable, at the spatial scale of NUTS2 in EU25+2.

The focus of this exercise is on overall level of spatial association at different spatial scales. The question concerns whether GDP per capita disparities are dependent on a geographical reference area, and if such a relationship exists, how it is affected by national borders. Since deviation indices are measures of the similarity of objects within an area, the existence of positive spatial association implies that GDP disparities – as well as the mean values derived from the deviation indices – should increase as the reference area increases. Correspondingly, in the case of negative spatial association, regions which are close together in space tend to be less similar than those which are further apart. Instead of listing and mapping of region-specific index values, the results are summarised in Tables 9, 10, 11, and 12.

In Tables 9 and 10, the deviations are divided into two groups. The results indicate significant differences in spatial pattern of convergence between the EU15 and EU10. Not surprisingly, dissimilarities between regions are highest at the European level in both groups, and deviations within the countries are lower than those in international neighbourhoods. However, the main hypothesis of "the smaller the reference area, the more similarity", has to be rejected. Deviations within the local national neighbourhoods (i.e. means and medians of Dev_Local_Intra) seem to be smaller than within the nations only among the group of EU15-regions. As can been seen in Table 11, the only exception is Czech Republic, and if median is used instead of the mean, a positive local spatial association is found also in Slovakia and Norway. In turn, among the EU15 countries the national effect is observed to be dominant only in Belgium, Greece, Ireland, and Portugal.

Table 2.9. Deviations at seven spatial scales in EU15 and candidate countries (EU10), GDP per capita (Euro) 1999

	EU15			EU10			EU25+2		
	N	**Mean**	**Med.**	**N**	**Mean**	**Med.**	**N**	**Mean**	**Med.**
Dev_EU25	211	27,7	21,7	41	76,2	79,6	280	40,1	31,2
Dev_EU15	211	23,6	16,7	41	79,4	82,3	280	36,3	24,6
Dev_EU10	211	383,2	382,9	41	32,9	21,6	280	329,0	351,8
Dev_National	211	18,0	15,2	41	19,4	14,2	280	18,1	15,0
Dev_Local	194	17,7	11,2	39	32,9	24,4	261	20,7	13,9
Dev_Local_Inter	84	59,8	16,4	28	40,4	30,5	133	51,9	19,2
Dev_Local_Intra	191	16,4	11,5	35	28,8	19,9	254	18,9	12,7

Table 2.10. Deviations at seven spatial scales in EU15 and candidate countries (EU10), GDP per capita (PPS) 1999

	EU15			EU10			EU25+2		
	N	**Mean**	**Med.**	**N**	**Mean**	**Med.**	**N**	**Mean**	**Med.**
Dev_EU25	211	21,3	15,8	41	51,3	55,8	280	28,7	21,5
Dev_EU15	211	20,8	17,2	41	55,0	59,5	280	28,6	22,2
Dev_EU10	211	112,8	106,4	41	29,0	21,6	280	99,5	95,8
Dev_National	211	18,0	15,2	41	19,4	14,2	280	18,1	15,0
Dev_Local	194	16,6	11,3	39	27,4	21,9	261	18,6	13,7
Dev_Local_Inter	84	23,4	16,5	28	25,4	24,0	133	23,9	17,4
Dev_Local_Intra	191	16,4	11,5	35	28,8	19,9	254	18,9	12,7

This suggests that regions in the EU15 area may benefit from a high GDP level, and changes in their neighbouring regions, and may also suffer from low economic performance in their adjacent areas. In the candidate countries, this local dependence is significantly lower, and the dominant geographical regime there seems to be the nation. This result indicates that a more random, or perhaps a more checkboard-like spatial pattern than observed is emerging in the EU-15 area. The data do not reveal reasons for this; it is impossible to say, whether this spatial pattern can be explained by properties of the NUTS division, or, for example, by some

specific economic or functional factors, such as the dominant roles of capitals, or a scattered geographical pattern of a few leading administrative and industrial centres. These will be analysed in future research.

Table 2.11. Deviations of regions at three spatial scales by country, GDP per capita (Euro) 1999.

	Dev_EU25			Dev_National			Dev_Local_Intra		
	N	**Mean**	**Med.**	**N**	**Mean**	**Med.**	**N**	**Mean**	**Med.**
AT	9	30,8	26,5	9	45,6	14,6	9	17,5	10,8
BE	11	29,0	15,9	11	25,6	16,1	11	21,8	17,6
BG	6	92,2	93,1	6	16,2	14,7	6	26,3	24,2
CH	7	82,5	80,5	7	12,2	11,2	7	15,5	15,6
CY	1	38,3	38,3	1	0,0	0,0	-	-	-
CZ	8	72,5	76,8	8	26,9	15,8	8	26,2	6,3
DE	40	30,8	23,8	40	18,4	15,1	40	17,5	14,3
DK	1	66,5	66,5	1	0,0	0,0	-	-	-
EE	1	81,6	81,6	1	0,0	0,0	-	-	-
ES	18	24,4	26,1	18	17,6	19,6	15	13,3	11,5
FI	6	30,4	12,3	6	23,6	22,2	5	19,1	14,3
FR	26	14,8	8,4	26	19,3	15,8	21	16,6	10,4
GR	13	42,3	41,4	13	12,8	12,9	9	14,1	14,0
HU	7	77,7	81,1	7	27,1	25,5	7	42,1	33,3
IE	2	23,8	23,8	2	18,4	18,4	2	42,1	42,1
IT	20	23,3	22,1	20	21,7	24,7	18	11,6	9,9
LT	1	85,5	85,3	1	0,0	0,0	-	-	-
LU	1	130,7	130,7	1	0,0	0,0	-	-	-
LV	1	86,1	86,1	1	0,0	0,0	-	-	-
MT	1	51,2	51,2	1	0,0	0,0	-	-	-
NL	12	22,3	12,9	12	14,6	14,2	12	12,6	12,1

NO	7	54,5	32,6	7	26,7	20,7	7	32,4	12,9
PL	16	81,1	81,6	16	15,8	10,9	16	22,5	19,6
PT	7	47,5	52,4	7	19,2	21,3	5	31,6	26,9
RO	8	91,7	92,1	8	14,9	11,5	8	20,8	17,5
SE	8	34,9	28,9	8	11,4	9,4	8	11,3	5,3
SI	1	48,7	48,7	1	0,0	0,0	-	-	-
SK	4	78,1	82,9	4	34,4	16,2	4	35,9	14,4
UK	37	23,5	15,7	37	17,2	11,8	36	16,0	10,3
EU25+2	280	40,1	31,2	280	18,1	15,0	254	18,9	12,7

Overall – as it is verified in the analysis of convergence elsewhere in this deliverable – it appears that in addition to the fact that GDP per capita in candidate countries is far from the EU15 average, the deviations among the regions in EU15 are significantly lower than those in candidate countries at all spatial scales. Deviation from the EU10 mean, of course, is an expected exception. The local international mean includes the cross-border regions around the present eastern EU-border, which is reflected in relatively high mean values in both groups of countries.

This deep gap at the border between the EU15 and EU10 is further illustrated in Table 16 which presents mean values of relative differences between contiguous regions. These values are not directly comparable to those presented in the previous tables, because the table is based on percentage differences between two neighbouring regions, not deviations from the means of reference areas. Moreover, Table 12 is not symmetric as relative differences are calculated with respect to GDP per capita levels of countries in their rows. However, the diagonal elements in Table 12 describe the variation at the local national level, whereas the others variations within the cross-border regions. Table 12 shows clearly how the highest differences, or cross-border discontinuities, are concentrated on the EU15-EU10 borderline; such as borders between Bulgaria and Greece, Czech Republic and Austria, Czech Republic and Germany, Poland and Germany, and Hungary and Austria.

Table 2.12 Mean values of relative differences (A)9 between contiguous regions by country, GDP per capita (Euro) 1999

	A	B	B	C	C	D	D	E	ES	FI	F	G	H	IE	IT	L	L	L	N	N	PL	PT	R	SE	SI	S	U
AT	19			21	79	18							67		7										49	69	
BE		23				30					25						147		11								
BG			23									489											9				
CH	17			17		30					33				20												
CZ	371				14	368															13					25	
DE	13	21		48	77	19	38				11						106		13		77						
DK						27																					
EE																		24									
ES									17		18											20					
FI										17										14				15			
FR		20		52		13			15		15				5		125										
GR			82									20															
HU	204												40										53		84	20	
IE														42													3
IT	7			28							4				13										56		
LT																		5			1						

9 $A = 100 * c/k$, where $c = \sum_k \left| x_i - x_j \right| / x_i$, k number of contiguous regions between countries in rows and columns, and x GDP per capita in regions i in countries in rows and regions j in countries in columns. For example, the mean value of relative differences between the three contagious regions of AT and SK (AT11 and SK01, AT12 and SK01, and AT12 and SK02) is 69%.

$c = (|15645 - 6959| / 15645) + (|20447 - 6959| / 20447) + (|20447 - 3267| / 20447) \approx 2{,}055.$

$A = 100 * 2{,}055 / 3 \approx 68{,}5 \approx 69.$

LU		**59**				**51**					**56**															
LV								**32**								**6**										
NL		**10**				**15**													**15**							
NO										**12**										**30**				**12**		
PL					**17**	**34 6**										**1**					**23**				**14**	
PT									**27**													**28**				
RO			**8**										**11 6**										**21**			
SE										**13**										**21**				**8**		
SI	**10 1**												**46**		**12 8**											
SK	**28 1**				**33**								**29**								**17**				**32**	
UK														**3**												**17**

2.4.3 Conclusions

Some industries and firms, as also, for example, venture capital, may cluster in areas or functional regions much smaller than NUTS2 regions. Moreover, the NUTS2-borders are drawn in a way that mismatch of "legal" and "functional" borders, centres and peripheries etc., is likely. In general, data on this level may average out existing spatial dependences and discontinuities, and therefore, NUTS2 regions are a very poor proxy for the geographical units in terms of what spatial clusters evolve, and positive spatial association prevails.

However, the results of this tentative analysis suggest that some positive spatial dynamics occur within relatively large regions, such as NUTS2, and dependence on local neighbourhoods seem to have effects on the economic performance of regions in EU15 area. If this local spatial dependency increases, geographical location and economic surroundings grow in importance as determinants of regional growth, and growth pattern in Europe is increasingly characterised by clusters with different growth rates. This may indicate that due to the integration process in Europe, spatial pattern in regional developments is changing from

a “mosaic” or “checkboard-like” towards a clustered pattern with decreasing local discontinuities.

The implications for the policy targets are not very clear. If , for example, i) convergence among the regions at EU level proceeds at a slower pace, or not at all, and ii) local spatial dependence keeps increasing, the prospects in lagging remote and border areas are not very promising. This would challenge the EU cohesion policy. In contrast, the same vision – implying the existence and strengthening of spatial clusters of rich and poor regions, and club convergence – can be seen as a much more positive outcome from the perspective of polycentric development.

To sum up, it can be concluded that the spatial association among the EU15 regions seems to be more dependent on geographical proximity, whereas the country effects, natural and cultural barriers reflected by national borders, seems to be dominating spatial patterns of GDP per capita among the regions of the candidate countries. The different spatial patterns among the EU15 on the one hand, and among the EU10 on the other, also provides some empirical support for the view that the EU integration process and decreasing importance of national borders may result in local spatial spillover effects and knowledge transfers, so that the per capita GDP of a region is conditioned more by the level of economic activities of neighbouring regions, and less by the mean levels of countries and EU. This suggests that EU integration and cohesion policies can be considered as catalysts to reduce barriers to factor mobility, which can be critical in increasing the speed of convergence also among the cross-border regions, as well as among the regions of new EU entrants.

2.5. Summarised Conclusions[10]

On the whole, there has been a westward shift in population shares along a longitudinal range from Trondheim to Valetta. This drift has exceptions due to depopulation e g in northwestern Spain and Portugal and central France, The shift from Eastern Europe have several exceptions - most capital regions display an increasing proportion of total ESPON space population.

[10] Written by Friedrich Schindegger, Gabriele Tatzberger

The three Baltic States enjoyed strong growth during the period in many regions and hence could improve their contribution to total ESPON GDP significantly. However the success is based on growth in capital regions disfavouring other parts of the countries. In terms of wealth contribution to the total of the ESPON space Poland it almost entirly comprises a carpet on the rise. Major gains came not only from the big city regions but from almost any region, and though many centres. Two major Polish wealth growth patches along a North-South axis seem to develop centered around Poznan and Warszawa.

While the Czech carpet faces dramatic losses in contribution except for the monolithic rise of Prague, this monocentric structure can not be recognized in Slovakia and Hungary. Romania and Bulgaria entirely perform as an economic decreasing carpet in ESPON terms. Varna, located at the Black Sea coast is the only one exception by gaining economic weight in the ESPON space. The Slovenian patch gains in wealth position almost across the country. Cyprus and Malta move their position in relative GDP contribution contradictionary. Malta slightly gains whereas Cyprus faces loss.

Performance differentials within EU15 in terms of change in relative positions in Gross Product per capita are larger than within the ten Candidate countries. This is accentuated in the smallest region classes in population terms in EU10. A comparatively flat spatial structure of economic growth is evident in Bulgaria and Romania.

The distribution of NUTS3 regions according to position in GDP per capita relative to EU15 average is strongly biased towards less than 75 percent in the ten Candidate countries and to less than 50 percent in Bulgaria and Romania. Performance differentials between NUTS 3 regions are generally at the same level within EU10 as in EU15. However, the widest variation in relative change in GDP per capita is found in the richest regions in EU15.

Analysis of the factors behind relatively poor performance of regions in different classes will be analysed and subject to policyrecommendations in the next phase of ESPON Project 1.1.3. Roughly 10 percent of NUTS regions in ESPON space, with equally some 10 percent of the total population are identified as economically lagging, i e with less than ¾ of EU15 per capita GDP in 1995 and an even lower share in 2000. In particular, these and other less favoured areas and declining industrial regions will be subject to intensive studies.

When the focus is on dispersion in income and wealth between regions or nations, we can see ,variation among regions is more apparent within the 10 accession countries than within the EU15 member states. However, in the development over time changes of the standard deviation are minor (apart from the 1999 peak in the accession countries). For both the current and the future EU member states, we can say that there has been some convergence up to 1997, but since then a process of slight divergence seems to have started.[11]

Within the EU15 and with the EU25 the gap between poor and rich regions is declining. However, there is, no obvious change of the spread of wealth. Of course, the time series is rather short (only 6 years), so if we would have had more years the story could be different.

The "Case study" about the Portugese experiences with convergence in the wake of accession shows that integration is not a single track continuous process rather than a complex one, where the implications of integration are only one factor beside others which even may be some time more important. Although the European market encouraged the economic development and the Structural Funds were extremely important, economic cycles in the European economy have been more influent in the convergence growth than European funding. In addition, the European Monetary Union (EMU), Euro and the Stability and Growth Pact have different impacts, and the public expenditure cuts have a strong influence in the growth of Portuguese economy. After all, more than ten years of public (national and community) funding did not change the pattern of regional disparities significantly.

[11] Obviously, more can be said when more years are available (before 1995 and after 2000).

Chapter 3: Borders, Border Regions and Cross-Border Cooperation in the Enlargement Countries

3.1 Changing structure of Borders[12]

"Borders are scars on the face of the Earth." If this statement is true then the area of the Enlargement Countries is an especially scar-faced part of our Planet. Most part of the area is covered by small countries with long continental borders. While 81,5 % of all borders in the European Union are coastlines and only 18,5 % land borders, the respective figures for the Enlargement Area are 41 and 59 percent. Out of the almost 30000 km European land borders more than 16500, more than 50 percent, can be found in the Enlargement Area. The length of borders per 1 million inhabitants is 36 km in the present European Union. The same figure for the Enlargement Area is 136 km per 1 million inhabitants.

With the Eastern enlargement, the structure of European borders will change substantially. Table 1 is showing the change of length and structure of borders during the subsequent enlargements:

- The area of the present European Union will increase by enlargement to EU 25 by 23 %, to EU 27 by 34 % and in case of a future West Balkans enlargement by 42 %. The respective figures for the population increases are 20 %, 28 %, and 34 %. In the same process, the length of the land borders of the EU will increase by 42 %, 60 % and 75 %. The length of internal land borders will increase even by 174 %, that means it will almost triple during enlargement. At the same time, coast line borders will increase only by 12-13 %. The share of coast line borders will decrease from 81,5, to 73,9 percent. Through enlargement the EU will become a more compact geographical area: the share of external borders will decrease from 56,9 to 32,5 percent.
- The length of land borders will increase both in relation to the area and to the population. The importance of border regions, of cross border co-operation and of the permeability of these borders will certainly increase.

[12] Austrian Institute for Regional Studies and Spatial Planning (ÖIR), Vienna
Iván Illés , Centre for Regional Studies Hungarian Academy of Sciences, Budapest

This increasing importance is underlined by the fact that these new EU internal borders are not only long, but they also changed a lot during the 20th century. There is only one border in length of 420 km where neither the border line nor the name of the neighbouring countries did change during the 20th century: this is a part of the Danube border between Romania and Bulgaria, which is 2,6 % (!) of the total length of borders in the Enlargement Area.

The borders of the Enlargement Area can be classified according to:

- geographic;
- ethnic and social;
- economic;
- political characteristics;
- from the point of view of their status in the EU accession process
- and from the point of view of permeability, by the analysis of the physical objects and administrative arrangements which facilitate crossing these borders.

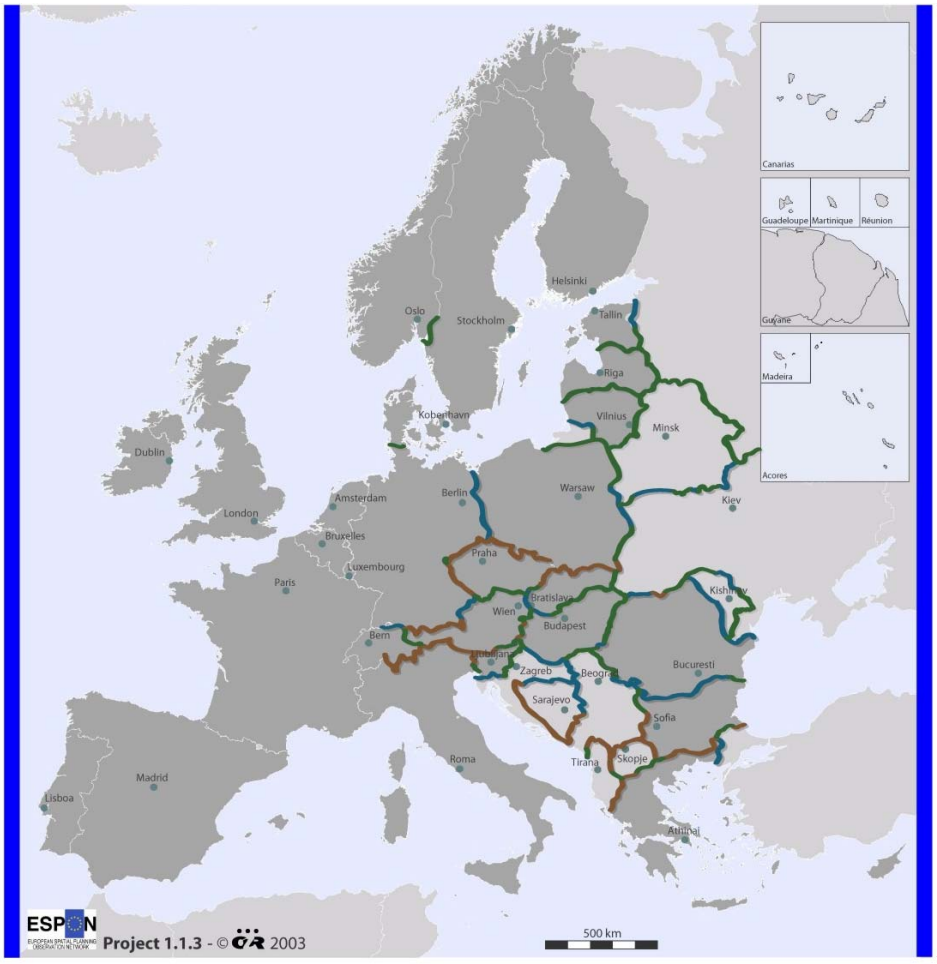
Table 3.1 . The change of the length and structure of the borders of the European Union after subsequent enlargement phases

			EU 12		Enlargement to EU15		Enlargement to EU25		Enlargement to EU27		Enlargement West Balkans	
			Sum of member states	EU 12 borders	Sum of 15 member states	EU 15 borders	Sum of 25 member states	EU 25 borders	Sum of 27 member states	EU 27 borders	Sum of 32 member states	EU 32 borders
Coast lines				64013		68357		74164		74743		77101
	Total	km	14863	9955	22254	15546	35008	22019	39334	24797	46722	27189
Land borders	Internal	km	9814	4907	13414	6707	23626	11813	26716	13358	36724	18362
	External	km	5048	5048	8839	8839	10206	10206	11432	11439	8827	8827
Coast lines		%		83		6		7		1		3
	Total	of	32	36	16	21	27	24	9	10	16	9
Land borders	Internal	EU	27	27	10	10	28	28	12	8	23	27
	External	32										
Share of land borders %				13,5		18,5		22,9		24,9		26,1
Share of internal land borders %				49,3		43,1		53,6		53,9		67,5
Area	km2			2353310		3225272		3963823		4312317		4576618
Population	thousands			356757		378914		453769		484374		508983
Coast lines per 1000 km2				27,2		21,2		18,7		17,3		16,8
Coast lines per 1 million inhabitants				179,4		180,4		163,4		154,3		151,5
Land borders per 1000 km2	total			4,2		4,8		5,6		5,8		5,9
	internal			2,1		2,1		3,0		3,1		4,0
	external			2,1		2,7		2,6		2,7		1,9
Land borders per 1 million inh.	total			27,9		41,0		48,5		51,2		53,4
	internal			13,8		17,7		26,0		27,6		36,1
	external			14,1		23,3		22,5		23,6		17,3

Source: own calculations based on national statistical data.

From the **geographical point of view** 3900 km, about 27 % of the continental borders are constituted by rivers, which are dividing and simultaneously connecting neighbouring regions, depending on the number and type of bridges and ferry connections. 2700 km, 18 % of the continental borders are constituted by mountain ridges. These borders, however, can be further subdivided into more passable mountain ranges of older geologic origin and geologically newer, sparsely populated, only in few places passable mountain ranges, like the Alps, Dinarics and Carpathians. Finally, 55 % of the borders do not constitute any substantial natural obstacle of cross-border transportation and contacts. These are the open so-called "green" borders.

Map 3.1 .Geographic type of borders

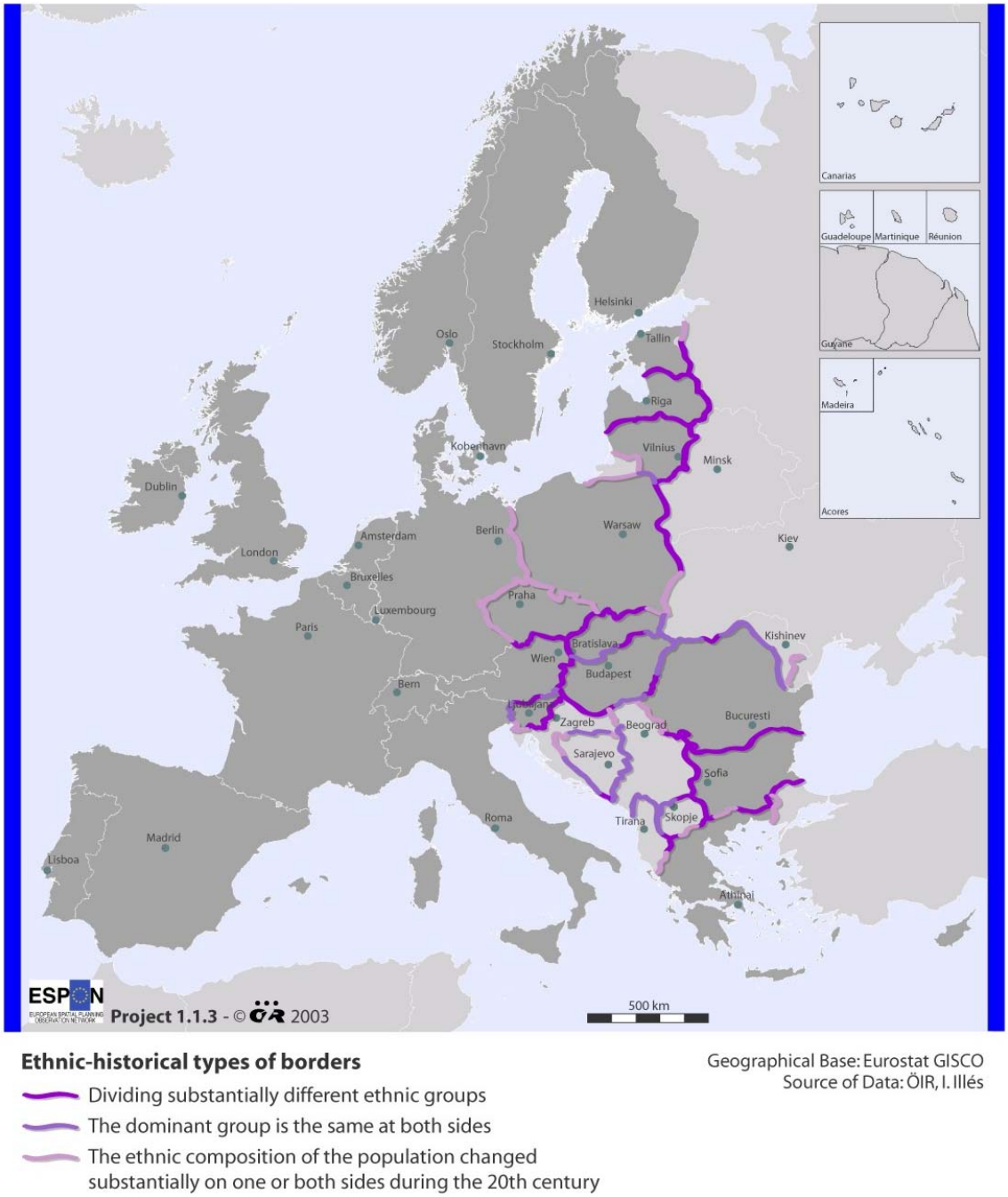


Paradoxically, open borders with no natural barriers can be found mostly along the future external borders of the European Union, along the Eastern borders of the Baltic states and Poland and along the Eastern and Southern borders of Hungary. At the same time, substantial natural barriers are to be found mostly along the future internal borders. Both represent some difficulties and require serious efforts. On the one hand, new roads, motorways, tunnels, bridges, viaducts are to be constructed on the future internal borders, where costly projects are to be implemented in order to overcome the natural barriers. On the other hand, costly investments are also required to protect the new open external borders from undesired cross-border movements.

From the **ethnic and historical point of view** we can again distinguish three types of borders:

- The first type of borders is constituted by historical ethnical and language borders. These are borders where the people on the two sides of the border belong to different ethnic communities, speak different languages, but they live beside each other since centuries and they developed traditional linkages and relations with each other. The share of these borders is rather modest: the larger part of the Slovak-Polish, the Hungarian-Croatian, Croatian- Slovenian, Bulgarian-Romanian borders represent – among others – this type of borders.
- There are borders, where the people in neighbouring border areas belong to the same ethnic group and divisions – due to the changing borders – are of relatively recent origin. In many cases, close family links connect the two groups of people, relatives live on both sides of the border, borders constitute only political, not ethnic, linguistic or social dividing line.
- Finally, there are several and long border sectors in this part of Europe, where, due to historic, political events, the composition of the population changed radically on one or both sides of the border during the 20th century. The present inhabitants came to this area through organised or spontaneous migration movements, they hadn't any traditional contacts, personal or family linkages with their new neighbours before. The Polish, the Czech and the Eastern German borders belong to this type, but substantial changes in the composition of the population took place also on the borders in Istria, Trakia, Macedonia, Epirus, in the Banat and on the South of Bessarabia. Quite recent political events have changed the ethnic composition of the Croatian borders in Krajina and Slavonia, and also in many regions of Bosnia-Herzegovina.

Map 3.2 .Ethnic-historical types of borders



Ethnic-historical types of borders

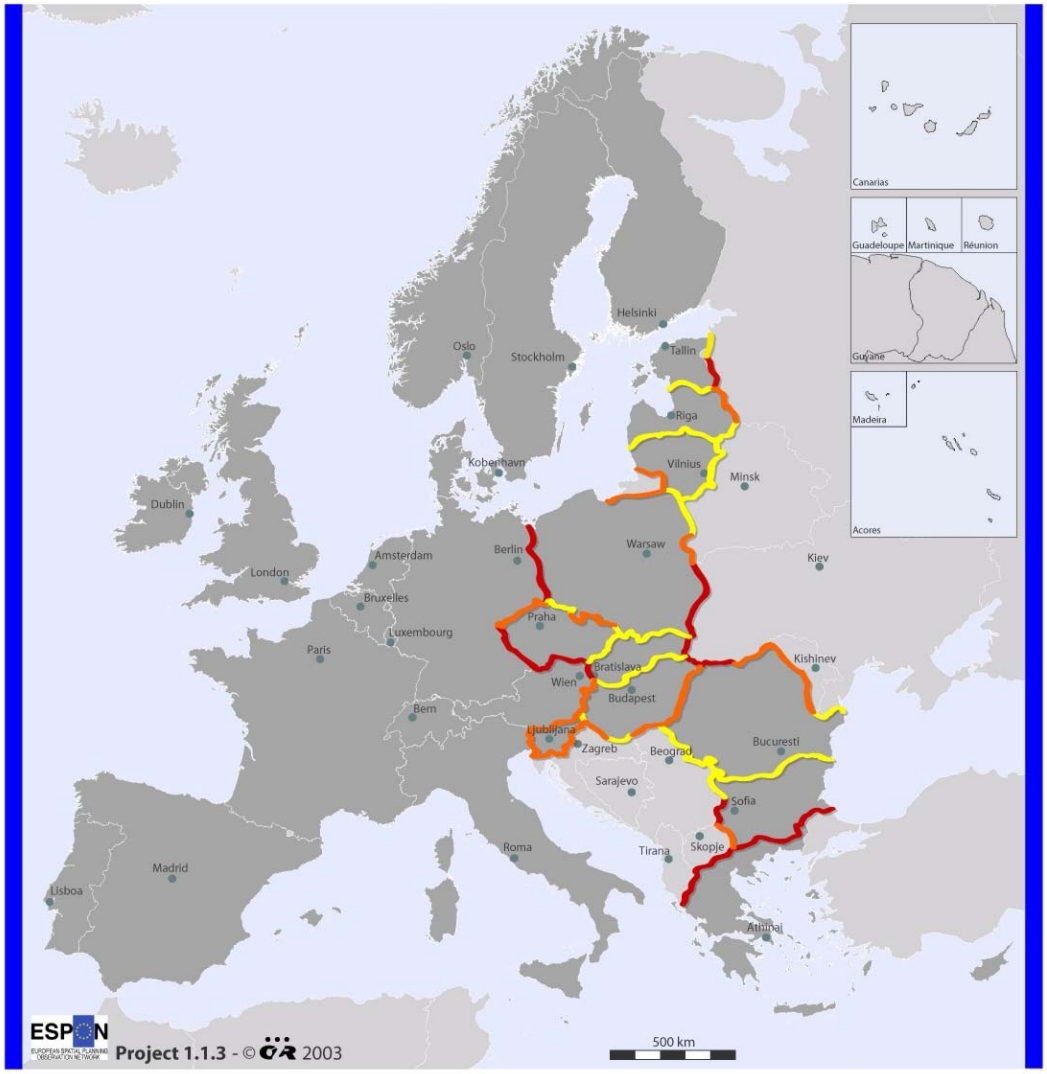
- Dividing substantially different ethnic groups
- The dominant group is the same at both sides
- The ethnic composition of the population changed substantially on one or both sides during the 20th century

Geographical Base: Eurostat GISCO
Source of Data: ÖIR, I. Illés

From the **economic point of view**, the decisive criterion is the size of the gap in economic welfare and development level between the two sides of the border. Previously, the largest gap existed on the external EU border. The income gap between the respective countries was 2:1 as an average: in the case of Poland, Hungary and Slovakia larger, in the case of Slovenia and the Czech Republic smaller. In the case of Hungary and Slovakia, however, the gap at regional level is substantially smaller, because the most developed regions of Hungary and

Slovakia and the least developed region of Austria, Burgenland meet at the border.[13] Undoubtedly, the large development and income gap along these borders gave rise to various semi-legal or illegal activities, which might be a cause of some tensions. At the same time, the gap is also a source of quite legal extra entrepreneurial income on both sides of the border.

Map 3.3 Dimensions of economic disparities



[13] Based on regional GDP data of EUROSTAT

Table 3.2. Development disparities on the borders of the Enlargement Area

Border sections				Development level as a percentage of EU15 average		Quotient
Dytikí Makedonia	GR	Albania	AL	67	15	4,47
Ipeiros	GR	Albania	AL	47,1	15	3,14
Kentriki Makedonia	GR	FYR Macedonia	MK	67,9	21,7	3,13
Dytiki Makedonia	GR	FYR Macedonia	MK	67	21,7	3,09
Anatoliki Makedonia	GR	Yuzhe Centralen	BG	54,6	21,2	2,58
Východné Slovensko	SK	Zakarpatie	UK	35,5	14,6	2,43
Niederösterreich	AT	Západné Slovensko	SK	96,8	42,6	2,27
Yugozapaden	BG	South Serbia	YU	33,6	15,3	2,20
Észak Alföld	HU	Zakarpatie	UK	31,5	14,6	2,16
Oberösterreich	DE	Jihozápad	CZ	109,4	52,4	2,09
FYR Macedonia	MK	Kosovo Metohija	YU	21,7	10,4	2,09
Oberpfalz	DE	Jihozápad	CZ	107,8	52,4	2,06
Kentriki Makedonia	GR	Yugozapaden	BG	67,9	33,6	2,02
Brandenburg	DE	Lubuskie	PL	69,4	34,9	1,99
Niederösterreich	AT	Jihovýchod	CZ	96,8	48,9	1,98
Turkey Europe	TR	Yugoiztochen	BG	44,3	23	1,93
Niederbayern	DE	Jihozápad	CZ	97,3	52,4	1,86
Podkarpackie	PL	L'viv	UK	27,8	15,2	1,83
Mecklenburg-Vorpommern	DE	Zachodniopomorskie	PL	69,4	38,3	1,81
Dolnoslaskie	PO	Dresden	DE	40,2	71,6	1,78
Közép Magyarország	HU	Západné Slovensko	SK	75,6	42,6	1,77
Sud-Est	RO	Moldova	MD	20,7	12,1	1,71
Friuli-Venezia-Giulia	IT	Slovenia	SI	114,1	67,2	1,70
Slovenia	SI	Central Croatia	CR	67,2	39,8	1,69
Anatoliki Makedonia	GR	Yugozapaden	BG	54,6	33,6	1,63

Lubelskie	PL	Volin	UK	26,6	16,4	1,62
Dresden	DE	Severozápad	CZ	71,6	45,8	1,56
Yugozapaden	BG	FYR Macedonia	MK	33,6	21,7	1,55
Lithuania	LV	Grodno, Belarus	BL	35,7	23,6	1,51
Dél Alföld	HU	Vest	RO	35,7	24	1,49
Nord-Vest	RO	Zakarpatie	UK	21,7	14,6	1,49
Latvia	LT	Vitebsk, Belarus	BL	30,9	21,1	1,46
Észak Alföld	HU	Nord-Vest	RO	31,5	21,7	1,45
FYR Macedonia	MK	Albania	AL	21,7	15	1,45
Albania	AL	Kosovo Metohija	YU	15	10,4	1,44
Chemnitz	DE	Severozápad	CZ	65,9	45,8	1,44
Slovenia	SI	Adriatic Croatia	CR	67,2	47	1,43
Kärnten	AT	Slovenia	SI	96	67,2	1,43
Steiermark	AT	Slovenia	SI	95,9	67,2	1,43
Nyugat Dunántúl	HU	Central Croatia	CR	56,6	39,8	1,42
FYR Macedonia	MK	South Serbia	YU	21,7	15,3	1,42
Ostravsko	CZ	Opolskie	PL	46,6	33,2	1,40
Střední Morava	CZ	Opolskie	PL	45	33,2	1,36
Nord-Est	RO	Moldova	MD	16,3	12,1	1,35
St. Petersburg obl.	RU	Estonia	EE	53,5	40,1	1,33
Nyugat-Dunántúl	HU	Západné Slovensko	SK	56,6	42,6	1,33
Dél Alföld	HU	Vojvodina	YU	35,7	27,5	1,30

Border sections				Development level as a percentage of EU15 average		Quotient
Burgenland	AT	Nyugat Dunántúl	HU	73,2	56,6	1,29
Východné Slovensko	SK	Podkarpackie	PL	35,5	27,6	1,29
Severozapaden	BG	East Serbia	YU	24	19,1	1,26
Lithuania	LV	Podlaskie	PL	35,7	28,9	1,24
Podlaskie	PL	Grodno, Belarus	BL	28,9	23,6	1,22
Warminsko-Mazurskie	PL	Kaliningrad obl.	RU	29	35,1	1,21
Estonia	EE	Pskov obl.	RU	40,1	33,2	1,21
Stredné Slovensko	SK	Észak Magyarország	HU	38,7	32,1	1,21
Ostravsko	CZ	Stredné Slovensko	SK	46,6	38,7	1,20
Severovýchod	CZ	Dolnoslaskie	PL	48,1	40,2	1,20
Slovenia	SI	Nyugat Dunántúl	HU	67,2	56,6	1,19
Sud	RO	Severen Centralen	BG	19,1	22,5	1,18
Közép Dunántúl	HU	Západné Slovensko	SK	49,9	42,8	1,17
Strední Morava	CZ	Stredné Slovensko	SK	45	38,7	1,16
Sud-Vest	RO	Severozapaden	BG	20,7	24	1,16
Jihovýchod	CZ	Západné Slovensko	SK	48,9	42,6	1,15
Vest	RO	Vojvodina	YU	24	27,5	1,15
Sud-Est	RO	Odesa obl.	UK	20,7	18,2	1,14
Stredné Slovensko	SK	Malopolskie	PL	38,7	34,7	1,12
Sud-Est	RO	Severoiztochen	BG	20,7	23	1,11
Nord-Est	RO	Černivci	UK	16,3	14,7	1,11
Východné Slovensko	SK	Észak Magyarország	HU	35,5	32,1	1,11
Dél Dunántúl	HU	Danubian Croatia	CR	37,2	33,7	1,10
Ostravsko	CZ	Slaskie	PL	46,6	42,8	1,09

Crna Gora	YU	Albania	AL	16,2	15	1,08
Pskov obl.	RU	Latvia	LT	33,2	30,9	1,07
Střední Morava	CZ	Západné Slovensko	SK	45	42,6	1,06
Sud-Vest	RO	East Serbia	YU	19,7	19,1	1,03
Lithuania	LV	Kaliningrad obl.	RU	35,7	35,1	1,02
Bratislavský kraj	SK	Niederösterreich	AT	97,9	96,8	1,01

Source: For EU 27 regions: European Commission: The second progress report on economic and social cohesion. Brussels, January 2003. For other regions: own calculations, based on national statistical yearbooks.

In recent years, as a consequence of diverging developments, a new gap has emerged along the eastern borders of the accession countries. Today, the former Iron Curtain is not any more the single largest relative income gap in Europe. (Table 3.2) Large gaps are to be found in two border sections (Map 3.2):

- Between Greece on the one side and Bulgaria, Macedonia, Albania on the other;
- Between Poland, Slovakia, Hungary and Romania on the one side and the Ukraine and Moldova on the other. This gap is even larger than what could be expected on the basis of the respective national GDP figures, being the Western regions the poorest ones in the Ukraine, in contrast to the spatial pattern of development level in the other countries. Along these borders, one can observe the emergence of the same phenomena, as along the former Iron Curtain and their further intensification is to be expected.

Though of minor importance, the other aspect of cross-border regional disparity is the employment (or rather unemployment) disparity. These disparities have a pattern, different from income disparities. The largest gaps are in the Balkans between the very high unemployment levels of Bulgaria, Serbia and Macedonia and the substantially lower levels of Greece, Romania and Hungary. Statistically, there is a large gap between the relatively high unemployment levels of Poland, Slovakia and the Baltic states on the one hand and the very low levels in the CIS countries Russia, Belarus and Ukraine. This gap is, however, only a "statistical gap". The low unemployment figures in CIS countries are the results of keeping former employees on the payroll even if they are not any more practically employed and they receive no wages. The reason is that only this arrangement enables for unemployed people the access to some social allowances and amenities. (Table 3.3.)

Table 3.3. Unemployment level disparities on the borders of the Enlargement Area

Border sections				Unemployment 2001		Difference
Sud-Vest	RO	Severozapaden	BG	6,4	32,8	26,40
Albania	AL	Kosovo Metohija	YU	15	40	25,00
Dél Alföld	HU	Vojvodina	YU	6,5	27,5	21,00
Vest	RO	Vojvodina	YU	6,7	27,5	20,80
Warminsko-Mazurskie	PL	Kaliningrad obl.	RU	22,3	3,4	18,90
Sud-Est	RO	Severoiztochen	BG	8	26,5	18,50
Severovýchod	CZ	Dolnoslaskie	PL	6,4	24,1	17,70
Közép Magyarország	HU	Západné Slovensko	SK	2	18,6	16,60
Sud	RO	Severen Centralen	BG	6,9	23,3	16,40
Niederösterreich	AT	Západné Slovensko	SK	3,2	18,6	15,40
Nyugat-Dunántúl	HU	Západné Slovensko	SK	3,2	18,6	15,40
Közép Dunántúl	HU	Západné Slovensko	SK	4,3	18,6	14,30
Lithuania	LV	Grodno, Belarus	BL	16,5	2,4	14,10
Severozapaden	BG	East Serbia	YU	32,8	19,1	13,70
Podlaskie	PL	Grodno, Belarus	BL	15,7	2,4	13,30

Lithuania	LV	Kaliningrad obl.	RU	16,5	3,4	13,10
Sud-Vest	RO	East Serbia	YU	6,4	19,1	12,70
Východné Slovensko	SK	Észak Magyarország	HU	23,9	11,3	12,60
Slovenia	SI	Adriatic Croatia	CR	5,7	18	12,30
Východné Slovensko	SK	Zakarpatie	UK	23,9	11,6	12,30
Yugozapaden	BG	FYR Macedonia	MK	9,7	21,7	12,00
Střední Morava	CZ	Stredné Slovensko	SK	9,2	21,1	11,90
Nyugat Dunántúl	HU	Central Croatia	CR	3,2	15	11,80
Anatoliki Makedonia	GR	Yuzhe Centralen	BG	9	20,6	11,60
Slovenia	SI	Central Croatia	CR	5,7	17	11,30
Kentriki Makedonia	GR	FYR Macedonia	MK	10,8	21,7	10,90
Jihovýchod	CZ	Západné Slovensko	SK	8	18,6	10,60
Dolnoslaskie	PO	Dresden	DE	24,1	13,6	10,50
Nord-Est	RO	Černivci	UK	7	17,3	10,30
Latvia	LT	Vitebsk, Belarus	BL	13,1	3,1	10,00
Střední Morava	CZ	Opolskie	PL	9,2	19,1	9,90
Brandenburg	DE	Lubuskie	PL	13,8	23,6	9,80

Észak Alföld	HU	Nord-Vest	RO	31,5	21,7	9,80
Stredné Slovensko	SK	Észak Magyarország	HU	21,1	11,3	9,80
Střední Morava	CZ	Západné Slovensko	SK	9,2	18,6	9,40
FYR Macedonia	MK	South Serbia	YU	21,7	31	9,30
Lithuania	LV	Podlaskie	PL	16,5	25,7	9,20
Stredné Slovensko	SK	Malopolskie	PL	21,1	12,8	8,30
Ostravsko	CZ	Stredné Slovensko	SK	13,6	21,1	7,50
Pskov obl.	RU	Latvia	LT	5,7	13,1	7,40
St. Petersburg obl.	RU	Estonia	EE	5,3	12,4	7,10
Nord-Vest	RO	Zakarpatie	UK	4,8	11,6	6,80
Ostravsko	CZ	Slaskie	PL	13,6	20,4	6,80

Border sections				Unemployment 2001		Difference
Estonia	EE	Pskov obl.	RU	12,4	5,7	6,70
FYR Macedonia	MK	Albania	AL	21,7	15	6,70
Mecklenburg-Vorpommern	DE	Zachodniopomorskie	PL	15	21,5	6,50
Východné Slovensko	SK	Podkarpackie	PL	23,9	17,5	6,40
Dytiki Makedonia	GR	FYR Macedonia	MK	15,8	21,7	5,90
Yugozapaden	BG	South Serbia	YU	9,7	15,3	5,60
Bratislavský kraj	SK	Niederösterreich	AT	8,4	2,8	5,60
Ostravsko	CZ	Opolskie	PL	13,6	19,1	5,50
Nord-Est	RO	Moldova	MD	7	12,1	5,10
Niederösterreich	AT	Jihovýchod	CZ	3,2	8	4,80
Podkarpackie	PL	L'viv	UK	17,5	13,4	4,10
Sud-Est	RO	Moldova	MD	8	12,1	4,10
Sud-Est	RO	Odesa obl.	UK	8	11,8	3,80
Oberösterreich	DE	Jihozápad	CZ	2,1	5,7	3,60
FYR Macedonia	MK	Kosovo Metohija	YU	21,7	25	3,30
Ipeiros	GR	Albania	AL	11,9	15	3,10
Slovenia	SI	Nyugat Dunántúl	HU	5,7	3,2	2,50
Steiermark	AT	Slovenia	SI	3,5	5,7	2,20
Dél Dunántúl	HU	Danubian Croatia	CR	7,6	5,5	2,10
Friuli-Venezia-Giulia	IT	Slovenia	SI	3,8	5,7	1,90
Lubelskie	PL	Volin	UK	14,7	16,4	1,70
Niederbayern	DE	Jihozápad	CZ	4,3	5,7	1,40
Kärnten	AT	Slovenia	SI	4,3	5,7	1,40
Észak Alföld	HU	Zakarpatie	UK	10,3	11,6	1,30
Crna Gora	YU	Albania	AL	16,2	15	1,20

Kentriki Makedonia	GR	Yugozapaden	BG	10,8	9,7	1,10
Dresden	DE	Severozápad	CZ	13,6	12,7	0,90
Chemnitz	DE	Severozápad	CZ	13,6	12,7	0,90
Dytikí Makedonia	GR	Albania	AL	15,8	15	0,80
Oberpfalz	DE	Jihozápad	CZ	5	5,7	0,70
Anatoliki Makedonia	GR	Yugozapaden	BG	9	9,7	0,70
Dél Alföld	HU	Vest	RO	6,5	6,7	0,20
Turkey Europe	TR	Yugoiztochen	BG	23	22,9	0,10
Burgenland	AT	Nyugat Dunántúl	HU	3,2	3,2	0,00

Source: For EU 27 regions: European Commission: The second progress report on economic and social cohesion. Brussels, January 2003. For other regions: own calculations, based on national statistical yearbooks.

Different types of borders can be identified also from **the point of view of access to EU funding.** The first type is the border between EU member states and accession countries (2997 km). In principle, INTERREG instruments are available for common development programmes on the EU side and PHARE-CBC instruments in the candidate countries. Here, the basic problem is not even the unequal amount of resources on the two sides (in many cases, the PHARE CBC support is larger than the INTERREG appropriation), rather the different procedures, programming methods and time schedules in respect to INTERREG and PHAR-CBC. Another problem is that borders to EU member states enjoy a privileged position in PHARE-CBC financing, while this privileged and priority treatment does not always coincide with the priorities of national regional policies in the accession countries.

4022 km of all borders in the region are borders between accession countries. Since 1995, it is in principle possible, to utilise PHARE-CBC resources not only on the borders to the EU, but also on borders between accession countries. This facility, however, has been utilised differently, depending on the political relations between the respective countries. Slovak-Hungarian PHARE-CBC programmes, for example, started substantially later than other programmes, due to the unfriendly relations in the period of the Mečiar government. Common programmes and EU financing is sometimes facilitated, if an EU member state is also taking part in the framework of trilateral arrangements (Table 3.4.).

Table 3.4. Borders in the Enlargement Area according to the type of available EU support.

Border section	Length in kilometres	Border section	Length in kilometres
1. INTERREG III A – PHARE CBC support		**4. PHARE CBC- PHARE CBC support**	
Bulgaria-Greece	494	Bulgaria – Romania	608
Czech R. – Austria	382	Czech R. – Poland	650
Czech R. – Germany	646	Czech Rep. – Slovakia	215
Slovakia – Austria	91	Slovakia – Hungary	677
Poland – Germany	456	Slovakia – Poland	444
Hungary – Austria	366	Poland – Lithuania	91
Slovenia – Austria	330	Hungary – Romania	443
Slovenia – Italy	232	Hungary – Slovenia	102
Albania – Greece	282	Estonia – Latvia	339
Macedonia-Greece	246	Lithuania – Latvia	453
Albania – Italy	362 c.l.	**Total**	**4022**
Poland – Baltic	491 c.l.		
Estonia-Baltic	3794 c.l.	**5. INTERREG III A – TACIS CBC support**	
Latvia – Baltic	531 c.l.	**Finland – Russia**	**1313**
Lithuania-Baltic	99 c.l.		
Total			
		6. PHARE CBC – TACIS CBC	97
2. PHARE CBC – CARDS CBC support		Poland – Belarus	Slovakia – Ukraine
Bulgaria – Macedonia	148	Poland – Belarus	206
Bulgaria-Serbia -Mont.	318	Poland – Russia	526
Hungary-Croatia	329	Poland – Ukraine	103

Hungary- Serbia-Mont.	151	Hungary – Ukraine	450
Romania- Serbia-Mont.	476	Romania – Moldova	531
Slovenia – Croatia	670	Romania – Ukraine	294
Total	**2092**	Estonia – Russia	502
		Lithuania – Belarus	227
3. CARDS CBC – CARDS CBC support		Latvia – Belarus	Lithuania – Russia
Bosnia-H. – Croatia	932	Latvia – Belarus	217
Bosnia H. – Serbia-Mont.	527	Latvia – Russia	**3701**
Croatia – Serbia-Mont.	266	**Total**	
Serbia-Mont. – Albania	287	**7. Other combination**	
Serbia-Mont. -Macedonia	221	Greece – Turkey	205
Albania-Macedonia	151	Bulgaria – Turkey	240
Total	**2384**	**Total**	**445**
TOTAL 16954			

Source: Own calculations

Unfortunately, the largest part, 8622 km of the borders in the region are borders between accession countries and other countries or between third countries not yet taking part in the accession process. On these borders, so far, no EU support to cross-border co-operation was available. Though some EU support existed to all countries of the region (TACIS or CARDS) and there are already TACIS CBC and CARDS CBC arrangement as well, cross-border co-operation belongs not to the priority areas. Notwithstanding, there are several cross-border co-operation initiatives also along these borders, having no financial means, or financed from other resources. But there are other border sectors, where even elementary communication is missing between the two sides of the borders (Like the Croatian-Serb, the Albanian-Montenegrin border, the Croatian- Republika Srbska border in Bosnia-Herzegovina, or the Dnestr border between Moldova and the Ukraine).

Nevertheless, the large variety of support schemes, and their combinations, and the even larger variety of their respective regulations makes cross-border co-operation a rather complicated enterprise. 16952 kilometres borders included into 52 cross-border programmes

in 7 different combinations, controlled by 3 different directorates of the European Commission (Interreg: DG Regio; PHARE CBC: DG Enlargement; CARDS and TACIS: DG International Relations).

Finally, borders can be classified according to **their permeability, according to the frequency of border crossings** and the administrative arrangements which facilitate to cross these borders. Borders within the European Union do not represent any obstacles of movements, border-crossing points, in the traditional meaning, do not exist any more. The borders of France, for example, can be crossed on more than 40000 (!) roads, streets, bridges, paths, and passages. In contrast, Bulgaria's borders can be crossed altogether in 15, Yugoslavia's borders in 19 places. As an average, there is an international road border-crossing on each 60 km of the border in the Enlargement Area. But this density is largely differentiated: There are 3 crossing points per 100 km border between EU member states and accession states, 1,5 crossing points per 100 km border among accession countries, 0,75 crossing points per 100 km border on borders to and between third countries. But there are extreme cases. On the borders between Greece and Bulgaria, between Romania and the Ukraine the density is only 0,4 crossing per 100 km (Table 3.5).

Table 3.5 Density of international road border- crossing points in the Enlargement Area

Border section	Length of border in km	Number of international road border crossings	Border length per one crossing point in km
Czech R.-Slovakia	215	13	17
Slovenia-Italy	232	12	19
Slovenia-Austria	330	12	28
Czech R. – Germany	646	21	31
Poland- Germany	456	12	38
Slovenia-Croatia	670	16	42
Czech R.- Austria	382	9	42
Poland-Lithuania	91	2	46
Bulgaria-Macedonia	148	3	49
Czech R.-Poland	650	13	50
Hungary-Slovenia	102	2	51
Hungary – Austria	366	7	52
Hungary-Romania	443	7	63
Slovakia-Poland	444	7	63
Bulgaria-Serbia-Mont.	318	5	64
Hungary-Croatia	329	5	66
Slovakia-Hungary	677	10	68
Estonia-Latvia	339	5	68
Latvia-Belarus	141	2	71
Latvia-Russia	217	3	72

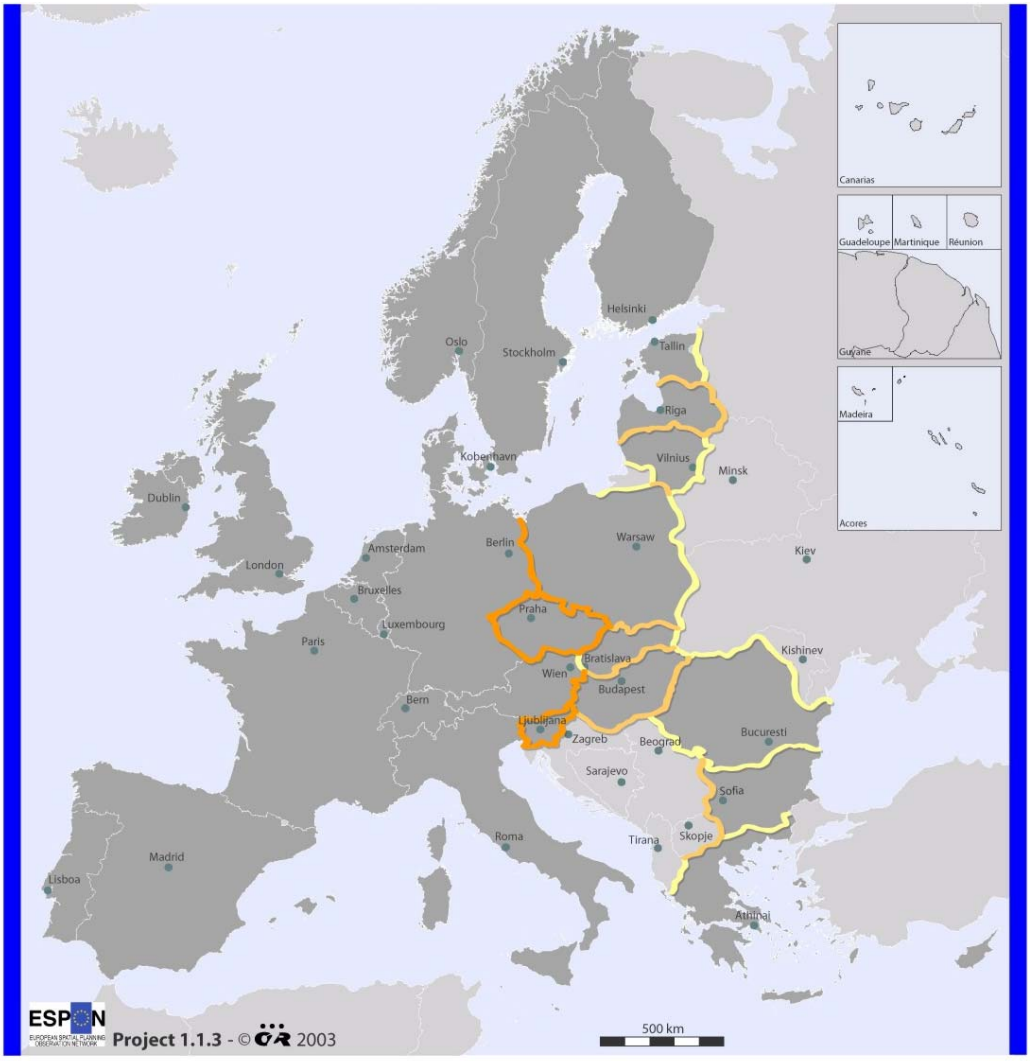
Border section	Length of border in km	Number of international road border crossings	Border length per one crossing point in km
Hungary- Serbia-Mont.	151	2	76
Lithuania-Latvia	453	6	76
Macedonia-Greece	246	3	82
Romania-Moldova	450	5	90
Slovakia – Austria	91	1	91
Slovakia-Ukraine	97	1	97
Bulgaria-Romania	608	6	101
Hungary-Ukraine	103	1	103
Lithuania-Russia	227	2	114
Romania-Serbia-Mont.	476	4	119
Bulgaria-Turkey	240	2	120
Lithuania-Belarus	502	4	126
Poland-Belarus	407	3	136
Albania-Greece	282	2	141
Estonia-Russia	294	2	147
Poland-Ukraine	526	3	175
Poland-Russia	206	1	206
Bulgaria-Greece	494	2	247
Romania-Ukraine	531	2	266
Total Enlargement Area	13134	215	61

Source: Own calculations based on the newest European auto route maps

This situation is rather strange, considering the fact that a large part of the present borders did not exist before World War I, World War II, or some of them even before 1992. In this part of Europe, the length of state borders was 9146 km at the beginning of the 20th century. It increased to 12620 to 1950 and it was 16952 (together with the Moldovan, Ukrainian and Byelorussian borders 21319) km in 2000. 1992-94 the length of international borders increased in this region by 8700 km (70 percent), due to the dismembering of Czechoslovakia, Yugoslavia and the Soviet Union. In the past, a relatively dense network of roads and railways connected the areas, which are now on the two sides of the borders. According to estimations, only 40 percent of built roads, and 50 percent of built railway lines crossing the borders are used presently as international border crossings.[14] Some other roads can be used only by citizens of the two neighbouring countries or regions, some are open only for a couple of hours daily, some are open only on holidays or during some extraordinary events, others are never crossbar, even the rails have been removed. (see Map 4)

[14] Based on the maps of T. Lijewski, Institute of Geography of the Polish Academy of Sciences. In: Kosta Mihailović: Regional Development Experiences and Prospects in Eastern Europe, Mouton &Co. The Hague, 1972.

Map 3.4. Density of border crossing points



3.2 Border Regions

The subjects and actors of regional cross-border co-operations are regions. Therefore, the political and legal status of these regions is a key factor in the development of cross-border co-operation.

Long land borders and small country territories imply that a very large part of the area can be regarded as border region. According to a former definition of the European Commission,

border regions are NUTS3 level territorial units situated directly at the state's land border.[15] According to this definition, 21,5 percent of the area of the European Union can be regarded as border region and 15 percent of the EU population is living in these regions. The respective figure for the Enlargement Area are 66,1 percent and 57,8 percent respectively. Several small states, like Slovakia and Slovenia can be regarded wholly as border region.

Table 3.6. Indicators of border regions of the candidate countries

The 12 candidate countries						
	Total	**Non-border regions**	**Border regions**			
			Total	on EU borders	on other candidate's borders	on other borders
Population, in thousands	105940	44733	61206	11816	32177	17213
as a % of the total population	100	42,2	57,8	11,2	30,4	16,2
Area 1000 km2	1086075	368713	717362	155976	364751	196635
as a % of the total area	100	33,9	66,1	14,4	33,6	18,1
GDP per head, 1998 EU27=100	44	43	44	37	42	53

Source: Unity, solidarity, diversity for Europe, its people and its territory. Second Report on Economic and Social Cohesion. Volume 2. January 2001. 39.p.

Cross-border co-operation schemes and co-operations existed already before the political change in 1989-90, overwhelmingly on the East-East borders. The most popular forms were city and region partnerships, meaning the mutual visits of local leaders, the exchange of folkloric dance groups and similar events. The competencies of regions and cities concerning the conduct of foreign relations were very widely and vaguely defined, like in any other

[15] Competitiveness and Cohesion: Trends in the Regions: Fifth Periodic Report. European Commission, Brussels, 1994, p.107.

sphere of life. Communist countries were governed not by laws, rather by decrees and orders, but decisively by informal means and controls. Considering the monolithic structure of state and administration, the danger of local leaders acting differently from central policies did not exist. It was the reason why foreign policy competencies of regions under communism could be, seemingly, wide and liberal.

Table 3.7. Border regions in the European Union and in the Enlargement Area

Country	**Length of continental borders km**	**Border regions area km²**	**In % of national area**	**Border regions population 1000s**	**In % of national population**
Slovakia	1354	48985	100,0	5275	100,0
Bulgaria	1867	79780	71,9	5810	71,3
Slovenia	1334	19988	98,68	1919	97,61
Romania	2508	164858	58,1	9987	43,8
Hungary	2008	71070	76,39	8440	82,37
Czech Republic	2290	60450	76,6	7407	72,1
Poland	3054	123742	39,6	11744	30,6
Lithuania	823	57240	87,7	2776	79,9
Latvia	1150	47013	72,9	1990	84,8
Estonia	633	39761	87,9	1460	95,5
Enlargement Countries	**152221**	**712887**	**66,1**	**56808**	**57,8**
Belgium	1199	19019	62,3	5031	50,5
Austria	2378	58199	69,4	5837	74,9
Portugal	1094	50300	54,7	2068	21,0
Poland	3054	120266	38,46	14149	36,7
Netherlands	946	14408	35,1	5136	34,4
Greece	1073	37498	28,4	2359	23,1
Spain	1731	132282	26,2	5378	14,7

Germany	3758	81044	22,7	13366	16,3
France	2534	115511	21,2	12637	22,3
Ireland	427	12516	17,6	407	11,6
Italy	1713	47872	15,9	7390	12,8
Denmark	64	3930	9,1	251	4,9
United Kingdom	427	14120	5,8	1589	2,8
Luxembourg	298	2586	100,0	381	100,0
EU countries	**9955**	**507236**	**21,5**	**52865**	**15,2**

Source: For EU member countries: European Commission: Competitiveness and Cohesion: trends in the regions. Fifth periodic report Brussels, 1994. p.105. For accession countries: own calculations.

The situation substantially changed after the political change in 1989-90. The roots of these changes can be traced back to the past. Regional administrative units played a very important role in the one-party-state. They represented a very important centre or focal point of the central planning system. Central planning determined and allocated resources and planning targets only down to regional level. Regional state and party organs, on the other hand, redistributed and allocated these resources and planning targets among the cities, municipalities. This allocation and redistribution power of the regional level was perceived by municipalities and by their inhabitants as a means of arbitrariness, misuse and corruption. Consequently, one of the first acts of the new democratic legislators after the political change was to divest regional administrations of their former redistributive and commanding power. Sometimes, this divestment went too far by depriving regions from all of their competencies or by abolishing them totally. All, not centralised competencies were allocated to the lowest level of government and administration: to the municipalities. Medium level, regional governments were abolished (in the case of the Czech Republic and Slovakia) or weakened substantially (in Poland, Hungary, Romania and Bulgaria).

This was the situation, when, after the opening of the borders, the regions of western EU member countries turned to the East and looked for partners in cross border co-operation. They have found very week regions, with hardly any competencies, or no regions at all. They regarded it as a legacy of communism and of the central planning system. This belief was,

however, wrong. The weakening of the regions was a reaction to the former excessive redistributive and commanding power of medium level party and government organisations.

Foreign policy competencies of regions in the Enlargement Area were ambiguous, vague and undefined. They were never defined clearly, not even after the political change. The new laws on local governments were enacted in 1990 in all countries. At this time, foreign policy competency of regions was not an important issue, so this problem was not included into the laws. Interventions by central governments, preventing the formation of cross-border agreements, were not based on any foreign policy competency arguments, but simply on the argument, that medium level organisations are not entitled to act and sign anything on behalf of local municipalities. This ambiguous legal situation enabled central governments to act in specific cases rather arbitrarily, depending on their interests. They enabled regional authorities in certain cases to sign such agreements, while prevented it in others.

Central governments could pursue this policy, because for a long time, these countries did not join any international convention which would hamper them to do so. The Council of Europe formulated as early as 1980 the Convention on cross border co-operation of territorial authorities and communities in Madrid, but until 1991 no present accession country became member of this organisation. Now, with the exception of Serbia and Montenegro, all countries of the region are members of the Council of Europe, but the ratification of the Madrid convention proved to be a slow process. As late as 1996 only 3 countries (Hungary, Poland and the Ukraine) out of the 18 Central and Eastern European member states of the Council of Europe ratified the convention. Since 1996 the ratification process accelerated but it is not completed so far. Out of the 40 members of the Council of Europe, 19 ratified so far the convention. For the regions of those countries, which ratified the convention, it became an extremely important point of reference, in many countries the only legal basis for the activities of the regions in international context.

Because of the non-existence or of the lack of competencies at the regional level, cross-border cooperation started with difficulties, the only competent level for co-operation was that of the municipalities. As a consequence, the first cross-border co-operation organisations on the German-Polish border were based on agreements on municipality level, and took strange spatial configurations. Nevertheless, this arrangement was facilitated by the fact that Polish municipalities are relatively large, especially on the Western borders. This solution could not be followed at the Czech-German or at Hungarian borders, being the municipalities there are

very small. On the Czech-German border they have experimented initially with the co-operation of districts (Kreise and okresy). These agreements, however, were declared first null and void by the then Czech government, referring – otherwise correctly – to the fact that districts, being merely the locations of some central government branch offices, are not entitled to sign any binding document in the name of the municipalities. The same happened in the first Euroregion established exclusively by regions of Eastern countries, the so called Carpathian Euroregion. Neighbouring regions of 5 countries (Hungary, Poland, Romania, Slovakia and the Ukraine) formed it in 1993. Here, the central authorities of three countries (Hungary, Slovakia, and Romania) intervened simultaneously, with the same argumentation. Later, a modus vivendi had been found in both cases, so that the newly established Euroregions could, after all, survive.

Certainly, the political, legal and economic conditions for cross-border co-operation improved substantially since 1996 in the region. In several countries, an administrative-territorial reform was implemented (Poland, the Czech Republic, Slovakia, Bulgaria, and Croatia). New regions were established; their competencies were substantially strengthened and enlarged. These developments are partly the results of the pressure from the side of the European Commission, to establish planning, programming and implementing capacities in the so called NUTS2 regions, which would be the beneficiaries of the Structural Funds, more specifically of the support for the less developed Objective 1 regions. Paradoxically, the newly established regions in the countries – with the exception of Poland – do not coincide with the defined NUTS2 regions.

Because of these facts, international competencies are even now not satisfactorily clarified in most countries. NUTS2 regions have no regional government, only planning, programme management and paying authorities, which – from legal point of view – are not entitled to enter into contractual agreements and take on obligations in the name of the municipalities of the region. Euroregions anyway used to comprise smaller areas than NUTS2 regions, the latter having 800 thousands to 3 million inhabitants. Smaller regions – on the other hand – do not have the necessary experience and they do not have the financial resources to enter into binding contractual obligations nor are they encouraged by the government agencies. Regrettably and quite independently from the above described administrative reforms – the European Commission decided in 2001, to entrust not the regions but one central agency with the management and control of structural funds in the new member countries until 2007. The

argument for that decision was that the regional institutions and structures are not yet sufficiently prepared for the management of structural funds.

3.3. Cross-Border Co-operation Structures and Schemes

Basically, there are two types of cross-border co-operation structures: top-down structures, organised and controlled by central governments and bottom-up structures, initiated and organised by local organisations.

The main type of top-down structures is represented by **INTERREG and PHARE-CBC Programmes.**

INTERREG is one of the Community Initiatives which were established in the framework of the general reform of EU structural policy in 1988-89. In the first programming period after the reform, there were 18 Community Initiative programmes with 5,6 billion ECU budget. In 1994-99 the budget of Community Initiatives amounted to 13,45 billion ECU for 13 programmes. In 2000-2006, the number of programmes was reduced radically: 4 programmes remained with 10,4 billion € budget. But the INTERREG programme was a stable part of Community Initiatives and its budget increased in each programming period. In 1989-93 it was 1,08 billion ECU, in 1994-99 2,56 billion, in 2000-2006 4,875 billion Euro.

The PHARE programme, to assist and support the accession countries was established in1989 (Council regulation 3906/1989). The PHARE CBC (Cross-Border Co-operation) programme was established within PHARE. It was decided by the European Parliament, the European Council and the European Commission in June 1993. The regulation was issued in 1994 (Commission decree 1628/1994.). This financial facility enabled the co-financing of projects in the accession countries in border areas neighbouring the external borders of the European Union. For the period 1994-98, 820 million ECU was approved for this programme, it was 18 percent of the total PHARE programme. In this period, 13 programmes were supported and the first beneficiary accession countries were Poland, Czech Republic, Slovenia, Bulgaria, Macedonia and Albania. In 1995, Austria joined the EU, consequently 2 additional countries: Hungary and Slovakia benefited from the PHARE CBC facility.

The Commission's regulation made a provision for the establishment of Joint Programming and Controlling Committees (JPMC) in every supported border section. The task of JPMCs was to ensure coordination between neighbouring countries and neighbouring regions, as well

as to care for the proper implementation of the programme, according to the rules. In order to ensure the fulfilment of these tasks, the members of JPMC represented the respective regions the national governments and the European Commission.

INTERREG and PHARE-CBC programmes refer to the whole border sector between two countries, except special (e.g. trilateral) programmes aiming at the development of the border regions where the borders of three countries meet. Unfortunately, no programmes were initiated on the borders to non-accession countries. Theoretically, the support programmes to these countries – TACIS, CARDS, MEDA – could be utilised also for cross-border programmes. The small amount of support, the preference given to other objectives did not enable so far any significant use of these assistance programmes for this purpose.

There are many reasons why most of these INTERREG- PHARE-CBC programmes could not become really "common" programmes. One reason for it is certainly of organisational and procedural nature:

The regulations of INTERREG and PHARE CBC differ substantially in respect to decision-making and financing.

- INTERREG was a decentralised initiative, while PHARE CBC was operated in a strongly centralised system. According to the IX. point of the General Financial Regulations, assistance to non-member countries has fundamentally different rules than appropriations allocated to member states. In case of INTERREG, plans are agreed only on strategic level, while the selection and implementation of the projects is the competency of the final beneficiaries using ex-post settlement of accounts. In case of PHARE CBC, the final beneficiaries (PHARE national PMUs) are obliged to obtain the ex-ante approval of the commission by every phase of the implementation (from the selection of projects through the public procurement procedure) which means an extraordinary complicated and lengthy procedure of decision-making.
- INTERREG programmes are approved as six-seven year programmes, while in the case of PHARE CBC, appropriations were decided by the Commission in an annual procedure. So,, there was no guarantee for the continuation of multi-year projects in the following years. The situation was aggravated by the fact that the Commission decided on the financial appropriations usually at the end of the year concerned, while JPMC decided on the approved projects already at the beginning of the year. So, the implementation of the

projects started only 1-2 years after the approval. It was one reason why final beneficiaries were permanently in delay in tendering public procurements.

- The EU support programmes for cross-border co-operation in the Enlargement Area and in the neighbouring countries are managed by three different General Directorates of the European Commission. INTERREG is managed by DG Regio, PHARE-CBC is managed by DG Enlargement, while TACIS, CARDS and MEDA are managed by DG International Relations. Each of these Directorates issued different guidelines, each has different procedures, accounting and control methods, timetables, and different monitoring and evaluation techniques.

Therefore that the implementation of PHARE CBC programmes faced in the first period serious difficulties.

Table 3.8. PHARE CBC financial resources and their utilisation in 1994-98 (million ECU)

Supported sectors	**Resource appropriations**		**Committed by contracts**		**Disbursements**	
	Sum	% of total	Sum	% of appropriations	Sum	% of appropriations
Transport and communication	400,8	48,9	192,9	48,1	109,9	27,4
Protection of the environment	194,1	23,7	80,5	41,5	56,6	29,2
Economic and human resources	119,9	14,6	39	32,5	19,1	15,9
Small Project Funds	35,2	4,3	28,6	81,3	10,5	29,8
Other sectors	23,1	2,8	10,5	45,3	3,5	15,1
Project management	47,2	5,8	33,1	70,1	21,2	44,9
Total	**820,4**	**100**	**384,6**	**47**	**220,8**	**27**

Source: Court of Auditors: Special Report no. 5/99 concerning Phare cross-border co-operation. Official Journal of the European Communities. Volume 43, 21 February, 2000.2.p.

The figures in the table demonstrate that in the 5 years between 1994 and 1998 only 47 percent of the allocated resources could be committed by contracts and only 27 percent could be disbursed.

Under these conditions INTERREG-PHARE-CBC programmes could be hardly any else as parallel programmes on the two sides of the border.

There are, however not only procedural difficulties, but substantial differences also in the contents of the programmes. Most of the EU regions on the EU external borders are Objective 1 or at least Objective 2 regions, where there are other, substantially larger financial sources of development support than INTERREG. Therefore, INTERREG resources are used not for investments serving the provision of basic needs and services, but for development projects of secondary needs, aiming at cultural, recreation, leisure time and tourist developments, like riding paths, so called "vine routes", cultural centres an so on On the other side of the border, PHARE-CBC is frequently the only source of external support, which would be used for the solution of basic infrastructure problems, like feeding roads, water supply and sewage and waste disposal facilities. Therefore, the possibilities for common projects are rather restricted.

And it is still the better case, when each side is developing and submitting projects, according to its specific needs, in contrast to cases, when preferences and priorities of one partner are imposed on the other. One can cite as an example for this case a project on the Greek-Bulgarian border: In 1997-98, the EU and Greece initiated a project, to enlarge the living space of brown bears in the mountains along the Greek-Bulgarian border. No doubt, it is an important issue of sustainable development to prevent the extinction of this endangered animal species. According to this plan, passages and bridges were to be built over the roads on both sides of the border. On the Bulgarian side, it would be financed out of the PHARE-CBC resources. But it was the time of the deepest recession in Bulgaria, when a large part of the population suffered from poverty and, literally, from hunger. In the Bulgarian press, there were sharp protests against this project.

The new PHARE CBC regulation was issued by the Commission on the 18th of December 1998 (2760/98. decree), in accordance wit the "New Orientation of Phare" issued in January 1998. The main changes were the following.

- PHARE CBC programmes were extended to all border areas, not only to those neighbouring present member countries. Romania became also beneficiary of PHARE CBC.
- the new steering committee became the JCC (Joint Co-operation Committee), with similar functions as former JPMC.
- 2/3 of the allocated resources should be used in areas bordering present member states, 1/3 can be used in other border areas.
- because of the lack of programme and project management capacities in the candidate countries, the Commission has given preference to big projects over 2 million Euro development costs. Small Project Fund would be retained but lower limits would be increased from 50 thousand to 300 thousand Euro.
- the annual PHARE CBC appropriation in the years 2001-2003 would be 163 million Euro (10 percent of the PHARE budget). The INTERREG allocation for the neighbouring present EU member countries amounts to 146 million Euro annually. It is less than the PHARE CBC budget, but the present 23 EU border regions would receive 16 billion Euro in Objective 1 and 2 regions and they are benefiting also from LEADER+, EQUAL and URBAN Community Initiatives as well. For them a special programme was prepared to compensate the eventual adverse effects of enlargement[16].

After the first wave of enlargement, supposedly taking place in 2004, 24 new INTERREG programmes are to be established on the new internal and 14 on the new external border sections. It is an open question, to what extent the EU directorates are prepared to implement this task. Inter- directorate co-ordination should be certainly improved. The insufficient level of co-ordination is demonstrated by the fact that in the period 2000-2006 the amount of INTERREG appropriations is increasing substantially, its counterpart in the PHARE appropriations remains constant during the whole seven-year period.

Euroregions

The main types of bottom-up structures are the Euregions or Euroregions. The prototype of these regions was established as early as 1958 on the German-Dutch border. Its organisational structures served as a model for all later established similar regions, at least formally. They emerged first along the Western borders of Germany, after the political change in 1990 they appeared also along the Eastern borders of Germany and later there was a diffusion to other Eastern borders. Now the German-Polish, the German-Czech, the Polish-Czech, Polish-Slovak and the Bulgarian-Greek borders are fully covered by Euroregions and the coverage will be soon full also on the Slovak-Hungarian and Bulgarian-Romanian border. On other border sections there are very few Euroregions and they are also of quite recent origin.

Members of Euroregions are municipalities on the German-Polish border, and regional authorities in most of the other cases. The similarity to the model of the Dutch-German Euregion is, however, only the appearance, being their competencies and powers radically different from the original model. Their common boards do not dispose over any decision-making competencies; they can adopt only recommendations. Even these recommendations are mostly of general and vague character. The partner regions pay a membership fee which is enough to pay one or two employees in a secretariat, and to host the rotating meetings of the board. The members can apply, as any other juristic or natural person for INTERREG and PHARE-CBC project in their respective countries. Of course, some co-ordination of these project proposals and applications can be carried out in the board or in the sectoral committees, and therefore Euroregions offer a favourable organisational framework for project preparation. The establishing of a Euroregion is of political significance, signalising the intention to co-operate.

Nowadays, there are 58 Euroregions or "Euroregion type" organisations with the participation of accession countries. (see Table 3.9.) It is more than 50 percent of all such organisations (113).

Organisational consolidation, however, did not follow the quantitative increase. In many cases, even the organisational form is not yet cleared. Are they associations, or corporations or interest groups? Sometimes national governments do not know, how many Euroregions are on their borders, because Euroregions are not subjects of Association Law, they are not

[16] "Community action for border regions". Communication from the COMMISSION on the impact of enlargement upon regions bordering candidate countries. COM (2001) 437

subjects of Corporation Law and otherwise there is no reporting obligation of establishing a Euroregion. The degree of organisation is also reflected in the fact, how many Euroregions are members of the Association of European Border Regions (AEBR):

Table 3.9. Euroregions and „Euroregion type" institutionalised cross-border co-operations in the Enlargement Area

Number	Name of the euroregion	Countries	NUTS2 level regions, where the cooperation takes place	Remarks
1.	Euroregion "Tatry"	PL, SK	Podkarpackie, Východné Slovensko	Member of AEBR
2.	Euroregion "Beskidy"	Pl, SK	Malopolskie, Stredné Slovensko	Non member
3.	Euroregion "Tešínské Slezsko – Šląsk Cieszynski"	PL,CZ	Šląskie, Moravskoslezsko	Member of AEBR
4.	Euroregion "Praděd-Pradziad"	PL,CZ	Opolskie, Severovýchod	Non member
5.	Euroregion "Silesia"	PL,CZ	Šląskie, Moravskoslezsko	Non member
6.	Euroregion "Glacensis"	PL, CZ	Dolnošląskie, Severovýchod	Member of AEBR
7.	Euroregion "Neisse – Nysa – Nisa"	PL, CZ, D	Dolnošląskie, Severovýchod, Dresden	Member of AEBR
8.	Euroregion "Spree-Neisse-Bober"	PL,D	Lubuskie, Brandenburg	Member of AEBR
9.	Euroregion "Pro Europa Viadrina"	PL, D	Lubuskie, Brandenburg	Non Member
10.	Euroregion "Pomerania"	PL, D, SE	Zachodniopomorskie, Mecklenburg-Vorpommern, Sydsverige	Member of AEBR
11.	Euroregion "Elbe-Labe"	D,CZ	Dresden, Severozápad	Member of AEBR
12.	Euroregion "Krušnohory	D, CZ	Chemnitz, Severozápad	Member of

	– Erzgebirge”			AEBR
13.	Euroregion “Egrensis”	D, CZ	Chemnitz, Thüringen, Oberpfalz, Jihozápad	Member of AEBR
14.	Euroregion “Bayerischer Wald – Šumava - Mühlviertel”	D, CZ, A	Niederbayern, Jihozápad, Oberösterreich	Member of AEBR
15.	Waldviertel- Budowa-Jihočehy	CZ, A	Jihovýchod, Niederösterreich	Planned region

Number	**Name of the euroregion**	**Countries**	**NUTS2 level regions, where the cooperation takes place**	**Remarks**
16.	Waldviertel-Pomoravie-Záhorie	CZ,A,SK	Jihovýchod, Niederösterreich, Západné Slovensko	Partly member
17.	Bilé- Biele Karpaty	CZ, SK	Střední Morava, Západné Slovensko	Member of AEBR
18.	Bratislava-Wien-Győr-Sopron	SK, A, HU	Bratislavský, Wien, Niederösterreich, Nyugat-Dunántúl	Planned region
19.	Váh-Danube-Ipol	SK,HU	Közép-Dunántúl, Západné Slovensko	Non member
20.	Ipoly-Ipeľ	SK, HU	Észak Magyarország, Západné Slovensko, Stredné Slovensko	Non member
21.	Euroregion „Neogradiensis“	SK, HU	Észak-Magyarország, Stredné Slovensko	Non member
22.	Euroregion „Sajó-Rima – Slaná Rimava“	SK, HU	Észak-Magyarország, Stredné Slovensko, Východné Slovensko	Non member

23.	Euroregion „Košice-Miskolc“	SK, HU	Észak-Magyarország, Východné Slovensko	Non member
24.	Euroregion „Kras“	SK, HU	Észak-Magyarország, Východné Slovensko	Non member
25.	Euroregion „Bug“	BY, PL, UA	Podlaskie, Lubelskie, Brest, Volin	Member of AEBR
26.	Euroregion „Nemanus-Nieme-Njemen“	PL, BY, LT, RU	Warminsko-Mazurskie, Lithuania, Grodno, Kaliningrad obl.	Member of AEBR
27.	Euroregion „Baltica“	PL, RU, SE, LT, LV	Pomorskie, Warminsko-Mazurskie, Latvia, Lithuania, Kaliningrad obl. Sydsverige	Member of AEBR
28.	Euroregion “West Pannonia”	A, HU	Burgenland, Nyugat Dunántúl	Non member
29.	Euroregion “Bihar-Bihor”	RO, HU	Nord-Vest, Észak-Alföld	Partly member
30.	Euroregion “Upper Prut”	MD, RO, UA	Moldova, Nord-Est, Černivtsi	Non member
31.	Euroregion “Middle Prut”	MD, RO	Nord-Est, Moldova	Non member
32.	Euroregion “Lower Danube”	MD, RO, UA	Sud-Est, Moldova, Odessa obl.	Member of AEBR
33.	Euroregion « Danube-Maros-Tisa »	HU, RO, YU	Dél-Alföld, Vest, Vojvodina	Partly member
34.	Euroregion « Danube-Drava.- Sava »	HU, HR, BA	Dél-Dunántúl, Danubian Croatia, Tuzla	Non member
35.	Euroregion « Drava-Mura »	SI, HU, HR	Slovenia, Central Croatia, Nyugat-Dunántúl	Planned region partially member
36.	South Slovenia – Croatia West	SI, HR	Slovenia, Cenntral Croatia	Planned region,

				partially member
37.	Euroregion « Istria »	SI, HR	Slovenia, Adriatic Croatia	Planned region, partially member
38.	Euroregion « Danube 21. century » (Iron Gate)	BG,RO, YU	Severozapaden, Sud-Vest, East Serbia	Non member
39.	Euroregion Danube South	RO, BG	Sud, Severen Tsentralen	Non member
40.	Euroregion Danube East	RO, BG	Sud, Sud-Est, Severoiztochen	Non member
41.	Euroregion “Evros-Meric-Maritsa”	GR, TR, BG	Anatoliki Makedonia, Thraki, Edirne, Yuzhen Tsentralen, Yugoiztochen	Member of AEBR
42.	Euroregion Network Polis, Kent	GR,TR	Anatoliki Makedonia, Thraki, Edirne	Member of AEBR
43.	Euroregion Delta-Rhodopi	GR, BR	Anatoliki Makedonia, Thraki, Yuzhen Tsentralen	Member of AEBR
44.	Euroregion “Nestos-Mesta”	GR, BG	Anatoliki Makedonia, Thraki, Kentriki Makedonia, Yugozapaden	Member of AEBR

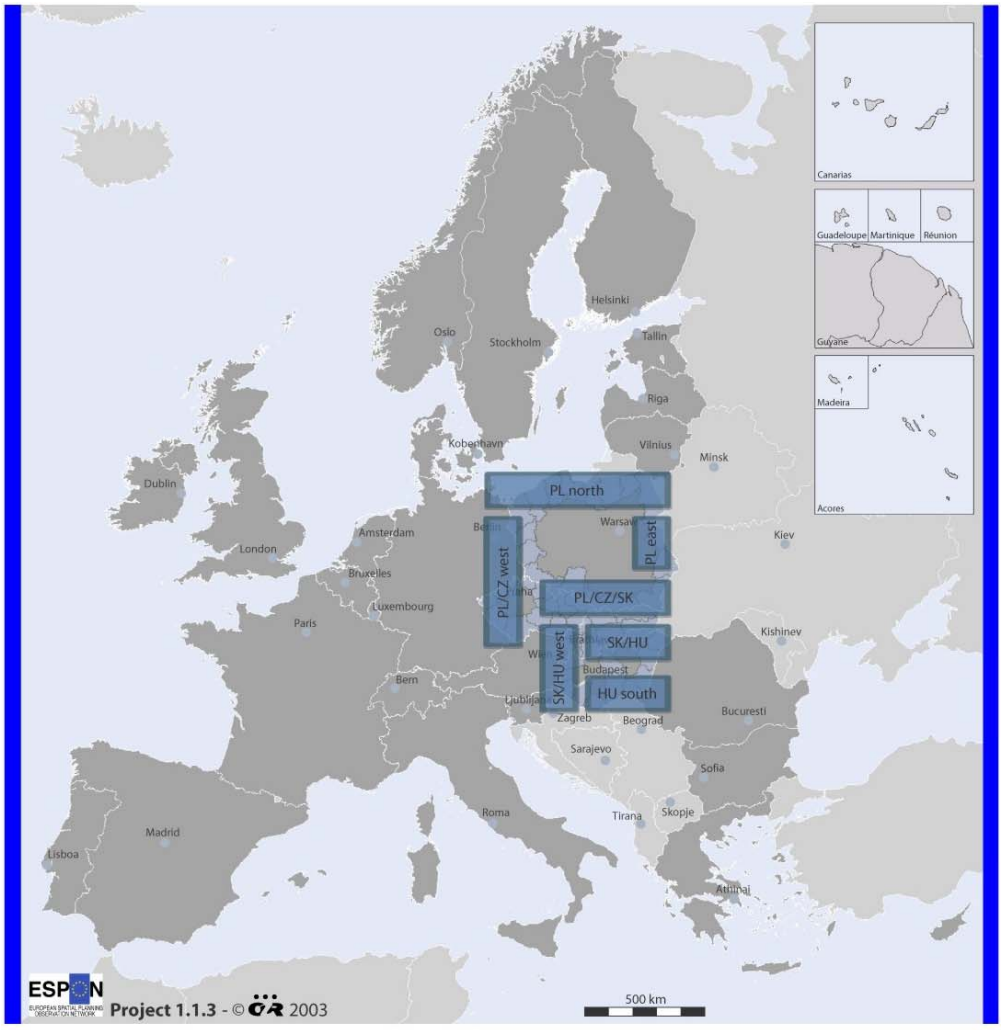
Number	Name of the euroregion	Countries	NUTS2 level regions, where the cooperation takes place	Remarks
45.	Euroregion "Kentriki Makedonia- Blagoevgrad"	GR, BG	Kentriki Makedonia, Yugozapaden	Partially member
46	Euroregion "Kentriki Makedonia-FYROM"	GR, MK	Kentriki Makedonia, FYROM	Partially member
47.	Euroregion "Dytiki Makedonia-Albania"	GR, MK, AL	Dytiki Makedonia, Albania, Macedonia	Partially member
48.	Euroregion "Ipeiros-South Albania"	GR, AL	Ipeiros, South Albania	Partially member
49.	Euroregion "Otranto"	I, GR, AL	Puglia, Albania, Ionia Nisia, Ipeiros	Partially member
50.	Friuli-Venezia-Giulia-South Slovenia	I, SI	Friuli-Venezia-Giulia, Slovenia	Member of AEBR
51.	Estonia-Finland 3+3 Regional Cities	EE, FI, RU	Etelä Suomi, Estonia St Petersburg	Non member
52.	Euroregio Helsinki-Tallin	EE, FI	Etelä Suomi, Estonia	Non member
53.	CBC Latvia-Estonia	EE, LV	Latvia, Estonia	Planned region
54.	Council of Cooperation of Border Regions Võru-Alüksnes-Pskov	EE, LV, RU	Estonia, Latvia, Pskov obl.	Non member
55.	European County of Lakes Ezem-Zeme	LT, LV, BY	Latvia, Lithuania, Vitjebsk obl.	Member of AEBR
56.	Euroregion SAULE	LT, LV, RU	Latvia, Lithuania, Kaliningrad obl.	Member of AEBR
57.	Etelä-Karjala-Kymenlaas.	FI, RU	Etelä Suomi, St. Petersburg, Leningrad obl.	Partially member
58.	Euroregion Karjala-Karelia	FI, RU	Itä Suomi, Karelian AR	Member of AEBR

Table 3.10. The number of Euroregions in the Enlargement area, and their membership in AEBR

County	Number of Euroregions on the borders	Of which: member of AEBR	Non-member
Bulgaria	7	3	4
Czech Republic	12	9	3
Estonia	4	-	4
Hungary	12	-	12
Latvia	5	3	2
Lithuania	4	4	-
Poland	12	9	3
Romania	8	1	7
Slovakia	11	3	8
Slovenia	4	3	1
Candidate countries	**79**	**35**	**44**
Albania	2	-	2
Belarus	3	3	-
Bosnia-Herzegovina	1	-	1
Croatia	4	-	4
Macedonia	2	-	2
Moldova	3	1	2
Russia	6	4	2
Ukraine	3	2	1
Other countries	**24**	**10**	**14**

Source: AEBR home page: www.aebr.net

Map 3.5. Euroregions in Central Europe



Euroregions in Central Europe

PL north Pomerania, Amber, Nemanus-Nieme, Njemen
PL east Bug
PL/CZ west Spree-Neisse-Bober, Pro Europa Viadrina, Neisse-Nysa-Nisa, Elbe-Labe, Erzgebirge-Krusnohory, Egrensis, Sumava-Bayrischer Wald-Mühlviertel, Waldviertel-Jihocechy
PL/CZ/SK Glacensis, Praded-Pradziad, Silesia, Tesin-Cieszyn, Beskidy, Tatry, Bilé-Biele Karpaty
SK/HU west Bratislava-Wien-Györ Sopron, Waldviertel-Pomoravie, West Pannonia, Drava-Mura
SK/HU Váh-Danube-Ipel, Ipoly-Ipel, Neogradiensis, Sajó-Rima-Slaná-Rimava, Kras-Karszt, Kosice-Miskolc
HU south Danube-Drava-Sava, Danube-Maros-Tisa, Bihar-Bihor

Geographical Base: Eurostat GISCO
Source of Data: ÖIR, I. Illés

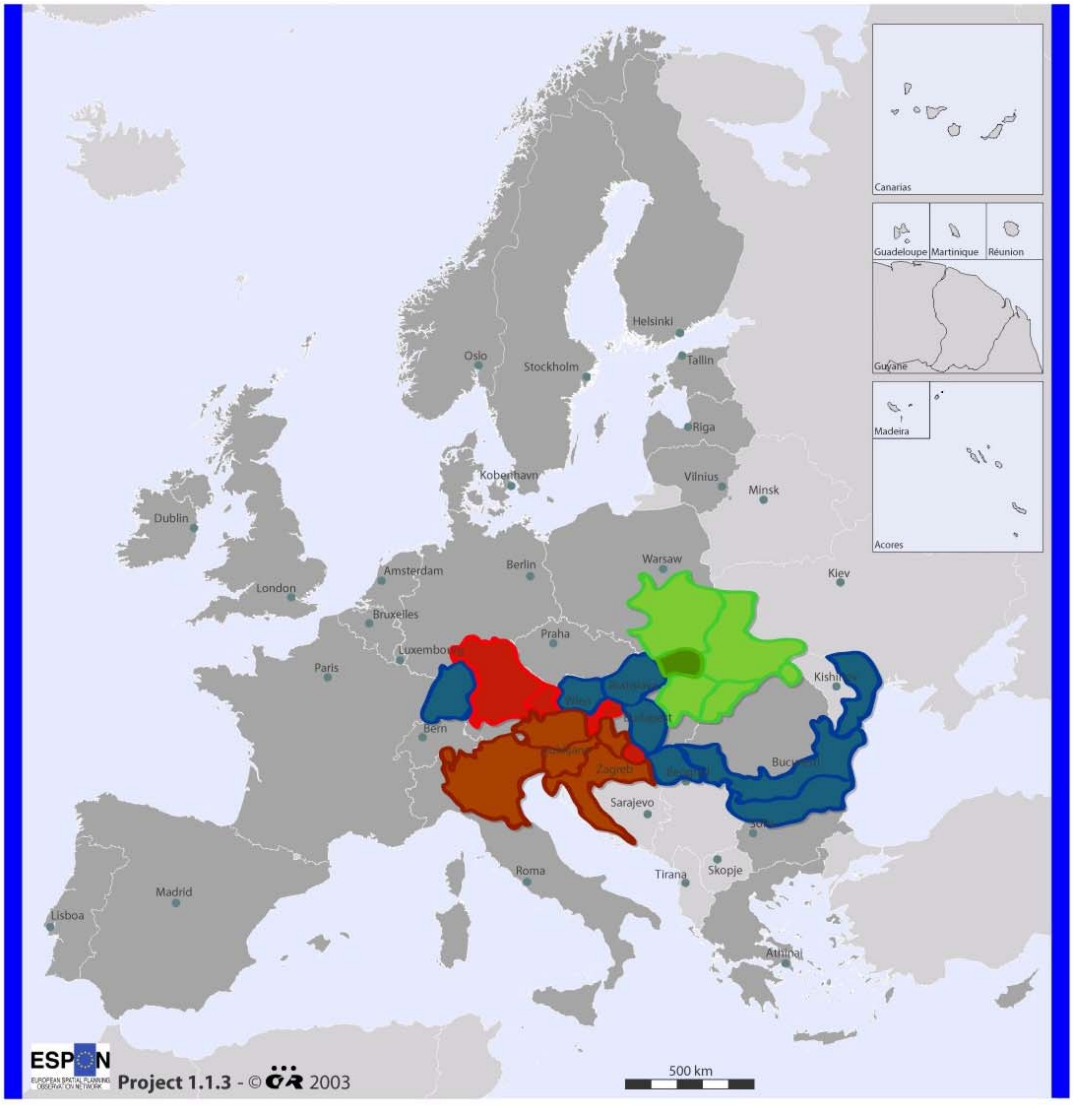
While in the Czech Republic and Poland most Euroregions are members of this organisation, that means, they comply with some basic organisational requirements, in the other countries the majority of these regions are non-members (in Hungary, none of the 12 Euroregions is

member of AEBR). In the Baltic area, Scandinavian and German organising activity achieved a higher level of organisation, while in the West Balkans there is no member of AEBR.

Working Communities

The other forms of bottom up cross-border co-operation initiative are the so-called working communities.

Map 3.6. Members of Working Communities



Working communities have usually much larger spatial dimension than Euroregions. They cover parts of several countries and many regions. Consequently, their function is also different from that of Euroregions. Working communities are engaged in more general problems of regional co-operation. Some really large projects might become subjects of their activities, but they are more interested in topics like co-operation in the field of press and mass communication, research & development, spatial planning, a common language of development planning, culture, environmental policy, preservation of the natural and cultural heritage, small- and medium enterprises and so on. They are rather forums of collection, systematisation, dissemination and exchange of information. Shortly, working communities are rather specialised in the "soft" aspects of cross-border co-operation.

There are three major co-operation structures of "working community type in the Enlargement Area. The oldest one is the Alps-Adriatic Working Community. Founded as early as the seventies, initially it has been the framework for co-operation of Italian, Austrian and South German regions (Bavaria). During the late eighties it was enlarged by Eastern (Yugoslav and Hungarian) and Swiss regions. The Alps-Adriatic Working Community played a really pioneering role in the establishment of East-West co-operation structures on regional level. It comprised regions from NATO (Italy, Germany), neutral (Austria, Switzerland), non-aligned (Yugoslavia) and Pact (Hungary) countries at a time, when this type of co-operation at higher, government levels was totally missing. Regions – nor burdened by problems like national security, debt, exchange rate – were able to establish relations in the fields, which they were more interested in, like environment, culture and spatial planning. In the nineties, through the emergence of national level co-operation structures in the same space, like Quadragonale, Pentagonale, Central European Initiative, the importance of the regional level co-operation faded out to a certain extent, but, nevertheless, it survived.

The second Working Community to be mentioned in the region is the Working Community of Danubian Regions (ARGE Donauländer). It is comprising all regions along the Danube. At the same time, it is exposing all the weaknesses of this type of regional – especially of East-West – regional co-operation structures:

The first problem is the dramatic difference, one can say gap, between the political, economic and legal power and competencies of the Western and Eastern participating regions. Members of this Working Community are Bavaria and Baden-Württemberg with a population of 10-11

million and with a total GDP of 250-300 billion Euro each. And members with the same rights are the Slovak, Hungarian and Romanian counties with an average population of half million, and with a GDP of 1,5-2 billion euro each. The gap in the population size is 1 to 20, the gap in the GDP size is 1 to 150. Alone Bavaria or Baden-Württemberg have a larger volume of GDP, than all the other Danubian regions together. How can be decisions taken in a so diverse community? Bavaria and Baden-Württemberg are sometimes frustrated by the impotence of such type of co-operation schemes.

Finally, the third organisation of Working Community size and functions is the so-called Carpathian Euroregion, comprising several regions of Poland, Slovakia, Hungary, Romania and of the Ukraine. Its name is Euroregion but just because its founders did not know, by the time of the foundation, what an Euroregion meant and how it looked like. Its area is larger than that of Slovakia and Hungary and its population is more than 12 million.

By the time of the establishment in 1993, it was the first institutionalised cross-border co-operation comprising exclusively non-EU-member countries. At the foundation ceremony, the then Secretary General of the Council of Europe, Mme Catherine Lalumiére held the opening speech followed by the Polish, Ukrainian and Hungarian foreign ministers. It turned out, however, soon, that no organisation is ready and willing to finance any activities of this organisation. The Council of Europe regarded it as one of its outstanding achievements but they were not in the position to offer any financial support. Finally extra-European organisations, a New York institute and American and Japanese foundations took over the responsibility of partial financing. Ukrainian, Slovak and Romanian regions were not in a position to pay any membership fee, so the rest of the financing had to be taken over by the participating Polish and Hungarian regions. Thus, it was a substantial burden and regions, which regarded the balance of costs and benefits as not favourable, gradually left the organisation, so a vicious circle began to have an effect. The Americans and the Japanese became also disappointed with the activities of the organisation, so they did not support the Euroregion any more. It is a sad story, but it might still turn to be useful, if it draws the attention of Europe to these poor and critical spots of the continent. Starting from 2004, the region will have finally access to EU support.

Summarising the developments, cross-border co-operation is a "quantitative" success story so far in the Enlargement Area.. Its institutional structures are, however, of ad hoc character and weak. They do not dispose over the competencies of decision making and over finances. Their establishment is, however of symbolic, political importance. It signifies the intention and will to work together. It can be taken for granted that this intention will bring also tangible results in the years to come.

3.3.1 Conclusions

1. With the consecutive stages of the Eastern enlargement, the dimension and significance of internal and external borders and the problems of border regions will substantially change. While population of EU 27 compared to EU 15 will increase only by 27 percent, the length of internal state borders will double (from 6,7 thousand to 13,4 thousand kilometres) and the population of border regions will also double (from 62 to 124 million). Additionally, more than 90 percent of the new borders emerged in the 20th century (some only 10 years ago). During the last half century, these borders represented hindrances for the movement of people, goods, and information much more "effectively" than state borders in the Western half of Europe. To make them transparent and permeable, will require significant physical, spiritual and financial effort.

By analysing cross-border mobility of different types it would be also possible to find alternative or complementary indicators of both integration and barriers. Unfortunately, for most of the indicators mentioned here we are lacking data so far.

Regarding deviations at different spatial scales in EU15 member states and accession countries the results indicate significant differences in spatial pattern of convergence between EU15 and EU10 accession countries – deviations among the regions in EU15 are significantly lower than those in new member states. The first results of the tentative analysis show deep gaps at the border between the EU15 and EU10. The highest differences, or cross-border discontinuities, are concentrated on the EU15 to EU10 borderline, such as borders between Bulgaria/Greece, Czech Republic/Austria, Czech Republic/Germany, Poland/Germany and Hungary/Austria. EU enlargement will have significant impact primarily on the economy of border regions, because hindrances like borders (at the moment, market area is reduced by borders), tariff barriers,... will be removed. On the other hand new European Union with 25 member states will face new challenges and problems along the new external borders. The EU

will have, as neighbours four former Soviet republics (Russia, Belarus, the Ukraine and Moldova) and three former Yugoslav republics (Croatia, Serbia-Montenegro, Macedonia). Furthermore, the EU will face the also problem of the Kaliningrad enclave.

2. EU enlargement will have a significant impact primarily on the economy of border regions. At present, their market area is reduced by the borders. Most of them are in peripheral situation in their respective countries, they are cut off with tariff barriers from close, neighbouring areas. These hindrances will be removed through enlargement. At the same time, they will be most directly exposed to a keener competition after enlargement. They will profit from intensifying cross border shopping and visits, at the same time they will suffer from the intensifying illegal and semi-legal cross-border activities and from the negative environmental consequences.

3. There are substantial physical obstacles of intensifying cross border relations and contacts in the Enlargement Area. Obstacles are, first of all the low density of border-crossings and the rigidity of the communication systems. The average distance between border crossings is 61 kilometre, but some border sectors it is 250 km. In extreme cases, the inhabitants of neighbouring settlements on the two sides of the border have to travel more than 250 kilometres to meet each other. In several cases it is not even the matter of costs, because border crossing roads and railway lines exist, but they are not utilised for border crossing. In other cases, however, significant investments are needed to overcome the hindrances of border crossing. Especially bridges across the 3900 km river borders are missing. The Danube constitutes the border of Enlargement Countries in a length of 875 km, and there are only 5 border bridges on it (one bridge for 175 km river border). The situation is not better on the border sectors of the rivers Bug, Morava (March), Tisa, Prut and Drava (Drau). Concerning communication: there are unified telephone tariffs in every accession country, leaving out of consideration the situation of border areas. To make a call to the neighbouring settlement on the other side of the border costs the same as a call to 1000 km distance. Not only investments but flexible and adaptive regulation is also required to facilitate cross border contacts. In several present EU member countries, there are special tariffs applied to border regions.

4. After enlargement, the European Union will face new problems along the new external borders. The EU will have, as neighbours four former Soviet republics (Russia, Belarus, the Ukraine and Moldova) and three former Yugoslav republics (Croatia, Serbia-

Montenegro, Macedonia). The EU will have to face the problem of the Kaliningrad enclave. The conditions of cross border co-operation along the external borders will become more complicated, but – in many respects – even more important, than in the preceding period. In many cases the gap in economic development level is even larger than along the present external borders and institutions for managing and controlling cross-border co-operation are even weaker than in the present accession countries. TACIS and CARDS appropriations serving cross-border co-operation should be substantially increased. TACIS and CARDS management and regulations within the European Commission should be revised in order to enable the implementation of co-ordinated and synchronised development programmes on the two sides of the borders. Especially the new members attach specific importance to the cross-border co-operation with their Eastern and Southern external neighbours.

5. Many of the new member countries are extremely exposed to environmental impacts stemming from the other side of the border. 96 percent of available surface water in Hungary stems from beyond the border, the respective figures for Bulgaria is 91 percent, for Romania 82 percent, for Slovakia 88 percent. Latvia and Lithuania is also seriously exposed to water supplies stemming from outside the own territory. This involves not only the increased risk of pollution, but that of floods, the control of which is beyond the action radius of the respective countries. The utilisation of rivers like Narva, Western Dvina (Daugava), Niemen (Neumas), Bug, Tisa, Seret – all of them flowing from outside into the enlarged EU – would require agreements with external neighbours.

6. 80 percent of the most valuable natural protection areas of the new member countries are to be found in the border areas. The EU should promote the common management, control and protection of these areas. This co-ordinated effort would be much more efficient than launching separate programmes and projects on the two (three) sides of the borders.

7. If cross-border co-operation efforts should be concentrated, selections and priorities should be set, then it is recommendable, to focus on the so-called “Three Countries’ Corners”, where the borders of three or more countries meet. Three Countries' Corners (in the following abbreviated as 3CCs) can be found also elsewhere in Europe (and in the World). Nevertheless, due to the continental situation and to the relative small size of the countries, it is very specific to the Enlargement Area. There are altogether 39

3CCs in Europe. Out of this number, 27 are within the Enlargement Area, and on its external borders, and only 12 are outside of it. Three Countries' Corners as a priority would not be chosen by chance or by simple mechanical criteria. The experiences of former planning work clearly demonstrated that the overwhelming part of cross-border spatial planning and development issues are concentrated in those particular regions where the borders of three or more countries meet. The TEN (Trans-European Networks) and the TINA (Transport Infrastructure Needs Assessment) networks are parts of a Trans-European road and railway network. 31 out of 53 road border crossings, and 26 out of 46 railway border crossings of the TEN and TINA networks in the Enlargement Area can be found in the 3CCs. Finally, experience proved, that mutual tensions and conflicts can be more easily solved in tri- or multilateral, than in bilateral context, especially when a present member state is also participating (the trilateral Austrian- Slovak-Hungarian INTERREG-PHARE CBC programme could be started earlier and implemented more smoothly than its bilateral Slovak-Hungarian counterpart).

8. The establishment of Euroregions is a useful and progressive instrument both for grassroot cooperation initiatives and for efficient delivery of EU and national programmes. There are, however, several misunderstandings and illusions concerning Euroregions in the Enlargement Area. It is a general belief that the establishment of Euroregions is a precondition for the access to Pre-accession and Structural Funds' instruments, and that a Euroregion would be automatically entitled to Phare-CBC or Structural Funds support. However, Euroregions are, in general, not created for this purpose. It could be a disappointment, when it turns out, that they have no privileged access to EU funds. More important is, that there is a confusion concerning the organisational structure, legal form and decision-making procedure of Euroregions in the Enlargement Area. Sometimes even responsible central government officials do not know: what it is, and what it is for? Euroregions are not registered, there is no organised government care for them and there arose overlapping, competitive structures (sometimes according to party sympathies). The immediate task is now not the quantitative increase in the number of Euroregions, but their organisational consolidation and strengthening and to find the adequate – and internationally compatible – legal form for their functioning.

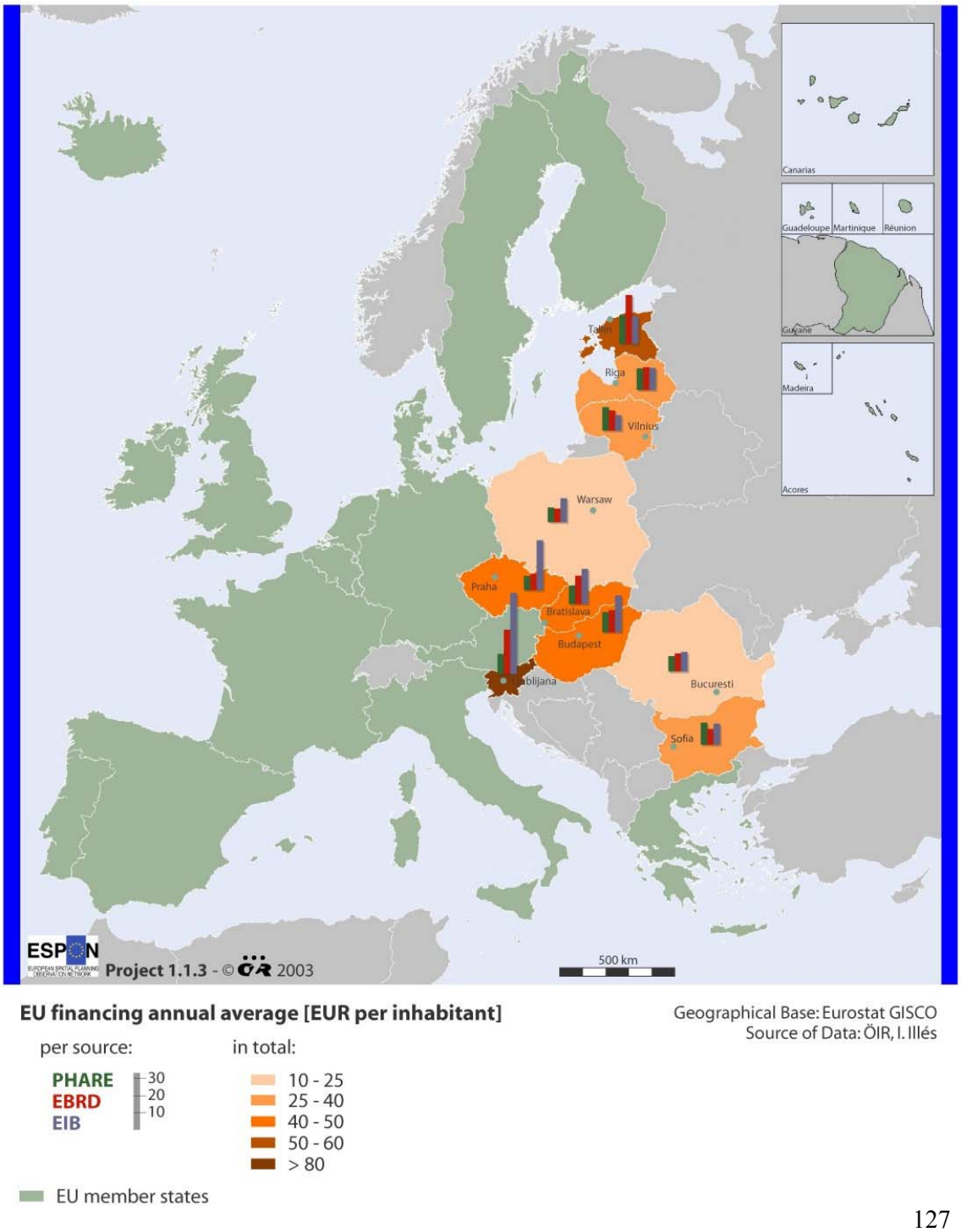
By analysing cross-border mobility of different types it would be also possible to find alternative or complementary indicators of both integration and barriers. Unfortunately, for most of the indicators mentioned here we are lacking data so far.

Regarding deviations at different spatial scales in EU15 member states and accession countries the results indicate significant differences in spatial pattern of convergence between EU15 and EU10 accession countries – deviations among the regions in EU15 are significantly lower than those in new member states. The first results of the tentative analysis show deep gaps at the border between the EU15 and EU10. The highest differences, or cross-border discontinuities, are concentrated on the EU15 to EU10 borderline, such as borders between Bulgaria/Greece, Czech Republic/Austria, Czech Republic/Germany, Poland/Germany and Hungary/Austria. EU enlargement will have significant impact primarily on the economy of border regions, because hindrances like borders (at the moment, market area is reduced by borders), tariff barriers,... will be removed. On the other hand new European Union with 25 member states will face new challenges and problems along the new external borders. The EU will have, as neighbours four former Soviet republics (Russia, Belarus, the Ukraine and Moldova) and three former Yugoslav republics (Croatia, Serbia-Montenegro, Macedonia). Furthermore, the EU will face the also problem of the Kaliningrad enclave.

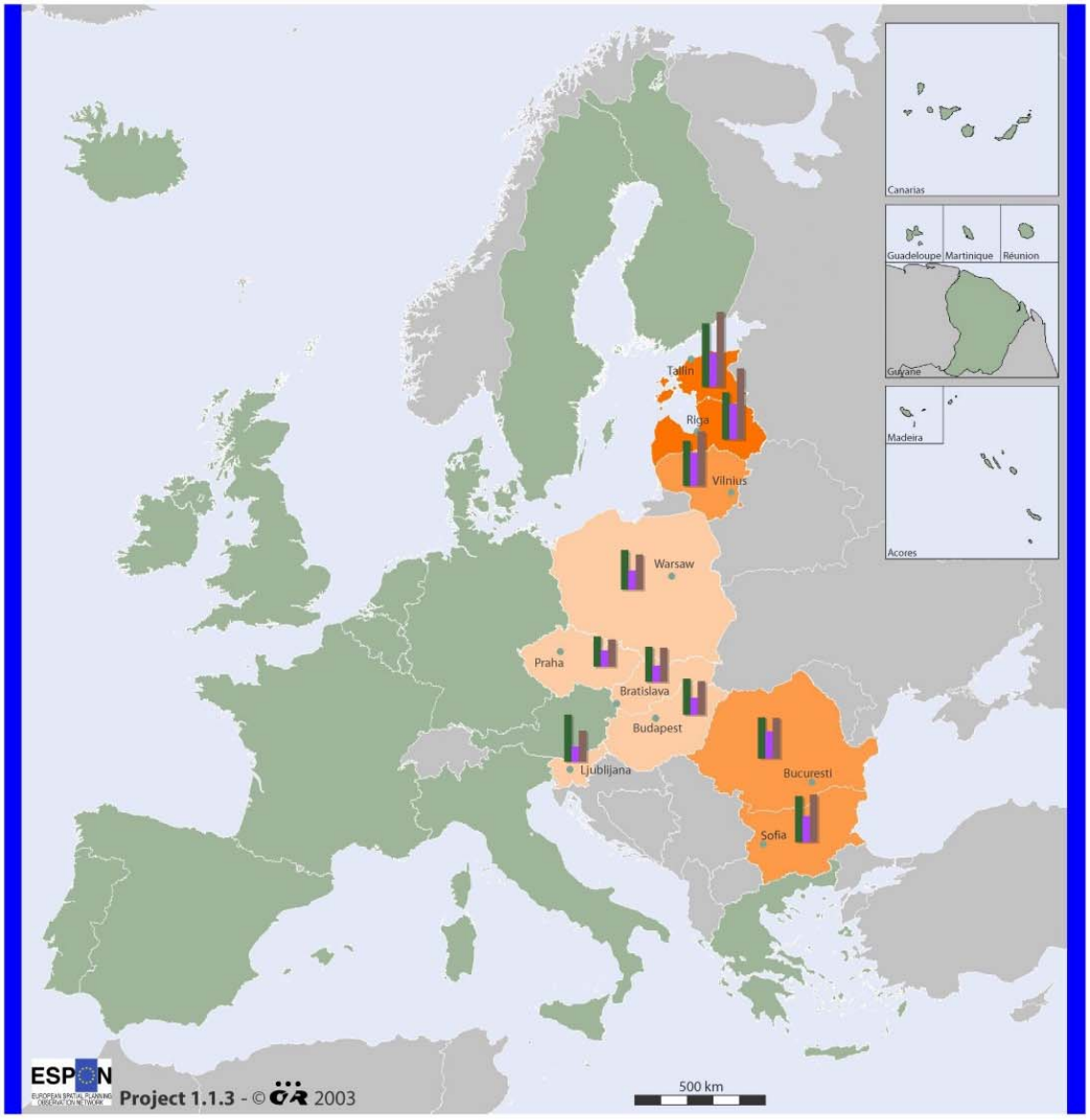
3.3.2. Integration into the EU funding system

The integration of the Accession Countries into the EU funding system my be considered an indicator for integration into the policy system so far. Unfortunately there are no regional data available. However, also the comparison between the standardised figures for the whole country gives a first idea of the differences.

Map 3.7 EU Finance in Candidate Countries 1990-2002



Map 3.8 EU Finance in Candidate Countries 2000-2006



EU financing annual average [EUR per inhabitant]

Geographical Base: Eurostat GISCO
Source of Data: ÖIR, I. Illés

per source:

PHARE
SAPARD
ISPA

15
10
5

in total:

10 - 25
25 - 40
40 - 50
50 - 60
> 80

EU member states

Table 3.11. EU Pre-Accession fundings 1990-2002

		PHARE annual average allocation	EBRD finance annual average	EIB loans annual average	Total EU financing annual average
	Population thousands	annual average per inhabitant EUR 1990-2002			
Bulgaria	8170	10,71	6,80	10,13	27,64
Czech Republic	10272	6,09	7,32	28,15	41,56
Estonia	1372	14,83	27,08	14,02	55,93
Hungary	10211	9,54	10,82	19,89	40,25
Latvia	2373	10,68	11,25	10,72	32,65
Lithuania	3506	11,50	9,67	6,51	27,68
Poland	38646	6,35	5,58	11,92	23,86
Romania	22435	6,58	8,36	9,34	24,28
Slovakia	5401	8,64	14,69	19,04	42,37
Slovenia	1990	9,61	24,63	47,35	81,59
National programmes	104376	7,70	8,43	14,47	30,59

Sources: For Phare: PHARE Annual Reports. Brussels January 2003

For EBRD: EBRD investments. EBRD, London May 2003. pp.96

For EIB: www.eib.org/Attachments/county/loans_en.pdf

Table 3.11-b . EU Pre-Accession fundings 2000-2006

	PHARE average annual indicative allocation	SAPARD average annual indicative allocation	ISPA average annual indicative allocation	Total average annual pre-accession funds
	per inhabitant EUR 2000-2006			
Bulgaria	12,24	6,38	12,73	31,35
Czech Republic	7,69	2,15	6,83	16,68
Estonia	17,49	8,82	20,85	47,16
Hungary	9,40	3,73	8,66	21,79
Latvia	12,64	9,18	19,72	41,54
Lithuania	11,97	8,50	14,83	35,30
Poland	10,30	4,37	9,02	23,68
Romania	10,79	6,71	10,66	28,16
Slovakia	9,07	3,39	8,67	21,13
Slovenia	12,56	3,17	7,84	23,57
National programmes	10,40	4,98	9,96	25,34

Source: European Commission: Second Progress Report on Economic and Social Cohesion. , Brussels. January 2003.

3.4. Symmetry and Asymmertry of Border regions

"A border is not merely a line in space, it is a process, contingent on continuous re-imagination and re-interepretation" (van Houtum et al 2002). This[17] study also aims at considering the impact of recent and upcoming European integration on four functions or ways of understanding borders: as barriers, bridges, resources and symbols of identity (Regional and Federal Studies Vol 12 Nr 4 2002 Special Issue New Bordres for a Changing Europe). In practice these four analytical distinctions are both interrelated and sometimes contradictory.

Concerning the first function, borders as barriers, the introduction of the single market made more obvious than before the limitations of seeing state borders merely as economic barriers to the working of an abstract market. The implementation of the SEM measures revealed the complex ways in which the economy was embedded in arrangements and practices of state administrations. Borders were more than economic barriers, since they were also administrative, legal, political, cultural as well as psychological barriers. Removing the obstacles to free mobility of labour, capital, goods and services did not mean the end of regulation or the end of border – rather it involved different forms of regulation and re-regulation at both EU and global levels. It also implied the need for new ways of managing borders in Europe.(O'Dowd 2002)

Concerning *borders as bridges*, the fall of the Iron curtain meant a rapid increase in cross-border networking also along the EUs external border. The number of operational cross-border regions in Europe almost doubled during the course of the 1990s. However, cooperation between borders with huge structural disparities, such at the eastern external border is prone to generate unintended consequences. New political and economic circumstances interact with the reactivation of old historical and ethnic linkages to establish a new *buffer zone* between East and West. This zone is a shifting bridge between East and West. Asymmetric structures sometimes interact with antagonistic ethnic relationships in the border region. The EU and the member states increasingly attempt to create a zone of stability in Eastern Europe by supporting the buffer states in controlling immigration and crime and by seeking to moderate ethnic conflicts further east and in the Balkans.

Crosss-border regions, whether internal to the EU or external, involve a number of strategic alliances between local political, administrative and business actors. New funding options stimulate new voluntary bodies and encourages existing agencies to initiate projects. Hence and ideally, cross border contexts create arenas for peaceful negotiation and learning, not least of participatory democracy, across the border.

However, cooperation bridging borders also have the weaknesses of being under bureaucratic supervision and getting limited popular identification with the common

[17] Written by Lars Olof Persson and Lisa Van Well, KTH

projects. In general, CBC controls very small resources in relation to their often grandiose objectives.

The *typical aims* for CBC can be quoted from a Euroregio development strategy as ”Konzept Viadrina 2000”, which states the overarching aim as the improvement of living standards and strengthening of economic factors through the creation of a cross-border, integrated, economic region. Two principal goals are outlined:

1.Strengthening economic potential and reducing unemployment, whilst preserving and developing nature and the countryside
a. economic cooperation
b. infrastructure
c. communal and regional development
d. environmental protection

2. promoting good relations between neighbours
a. developing a regional identity
b. promotion of the European idea.

Ad Borders as Resources

We have stressed that borders are both bridges and barriers. But borders are also places of economic and political opportunity for nations as well as for a host of other interest groups and agencies Removal of internal border controls reveals conflicting interest between those who vested interest in maintaining barriers and those who want more bridges. The borders of current EU states still distinguish different political economies, welfare regimes, legal, political and cultural traditions (Crouch 1999). In border regions with large differences in these senses there is a good opportunity for border –dependent arbitrage. Legal and illegal activities range from cb-shoppping to illegal trafficking of all sorts. The eastern and southern borders of the EU – the current and after enlargement - reflect a large structural asymmetry which juxtaposes different economies with different *histories*. We are not talking just of the form of shopping bazaars found in some more or less asymmetric border regions, but rather and more important of the large transnational investors which are

looking for optimal location according to labour costs, environmental regulations and subsidies available.

Ad borders as *symbols of Identity*

The expansion of CBC has enhanced the symbolic role of a number of border regions which are asymmetric in language and cultural sense. “Good” examples are reported from Dutch-German-Belgian border, the Adriatic region of Italy, Slovenia and Croatia. Cross border projects as the Channel Tunnel and the Öresund fixed link do not seem to have substantial material effects in the short run, but they do have large symbolic value which may show effects in the long term. The way of creating a *visionary cartography* which is common in European Spatial Planning is probably important in creating a typology of border regions.

Towards a typology of neighbouring functional border regions

Project 1.1.3 is in the process of developing a basic typology that will map and analyse of functional border regions in the enlargement of the EU based on the three aspects of Cohesion (cf. hypercube); Integration, Position, Potential. The table below depicts a basic typology of the current state of integration and position/potential in the various border regions. From this typology we can then analyze the current state and potential of border regions in the enlargement process.

The typology takes the dual form of territory into consideration: societal and spatial. It will also include essential elements of scale. Time is also a vital aspect to be reflected in the typology, as cohesion and particularly integration are processes that demand depiction not only in the form of static indicators, but also throughout time.

Basic typology reflecting Integration potential		Cross-border relations, integration	
		Symmetric, i e small differences between neighbouring border regions in social and economic structure and dynamics.	*Asymmetric* i e large differences …
Current cross-border barriers and flows, Relative position, potential	Social and technical infrastructure available/suitable for cross border integration	**1**	**2**
	Important barriers and discontinuities; natural, cultural, governance	**3**	**4**

Suggested Symmetry Core Indicators

- education level
- population density
- GDP/c
- industrial structure and change
- Scope of marketization (old vs new market economies)
- regional administrative capacity (possible indicators: admin. size, scope, sector integration
- Population change
- Land use/ Land use change (LULUC), urbanity vs rurality
- Environmental quality
- Language, society and professional culture
- Historical ties

Suggested Flows & Barriers Core Indicators:

- Goods flows
- Participation in C-B co-op schemes
- Commuting flows
- Currency flows
- Currency barriers
- Political conflict/ historical barriers
- Natural barriers
- Technical infrastructure flows/barriers

3.5 Summary of Border region chapter[18]

With the consecutive stages of the Eastern enlargement, the dimension and significance of internal and external borders and the problems of border regions will substantially change.

The majority of the area is covered by small countries with long continental borders. More than half of the land borders and an almost four times longer length of border per 1 million inhabitants can be found in the Enlargement Area. In addition, the increasing importance of the border issue is underlined by the fact that these new EU internal borders are not only long, but they also changed a lot during the 20th century. There is only one border in length of 420 km where neither the border line nor the name of the neighbouring countries did change during the 20th century (Danube border between Romania and Bulgaria, which is 2,6 % of the total length of borders in the Enlargement Area).

There are substantial physical obstacles of intensifying cross border relations and contacts in the Enlargement Area. Obstacles are, first of all the low density of border- crossings and the rigidity of the communication systems. The average distance between border crossings is 61 kilometre, but some border sectors it is 250 km. In extreme cases, the inhabitants of neighbouring settlements on the two sides of the border have to travel more than 250 kilometres to meet each other (see Map 3.4).

[18] Written by Friedrich Schindegger, Gabriele Tatzberger
Austrian Institute for Regional studies and Spatial Planning (ÖIR), Vienna

There are to be distinguished future ‘inside regions’ and ‘future neighbour regions’. The analysis tries to identify the general discontinuities and barriers at European scale using fundamental indicators such as differences in wealth or unemployment, barriers to residential migration or cross-border commuting.

Besides the economic situation in EU and accession countries the environment protection may be considered an issue strongly associated to borders: 80 percent of the most valuable natural protection areas of the new member countries are to be found in the border areas. Many of the new member countries are extremely exposed to environmental impacts stemming from the other side of the border. This involves not only the increased risk of pollution, but that of floods, the control of which is beyond the action radius of the respective countries. The utilisation of important rivers – flowing from outside into the enlarged EU – would require agreements with external neighbours.

The conditions of cross border co-operation along the external borders will become more complicated, but – in many respects – even more important, than in the preceding period. In many cases the gap in economic development level is even larger than along the present external borders and institutions for managing and controlling cross-border co-operation are even weaker than in the present accession countries.

The establishment of Euroregions is a useful and progressive instrument both for grassroot cooperation initiatives and for efficient delivery of EU and national programmes. However, there exists some confusion concerning the organisational structure, legal form and decision-making procedure of Euroregions in the Enlargement Area. Therefore, an immediate task should be less the quantitative increase in number of Euroregions, rather than their organisational consolidation and strengthening and legal form for their functioning.

As an indicator for integration into the system of EU policies so far, there has been made a review of the integration of the accession countries into the EU funding system my be considered. Although there are unfortunately no regional data available, also the comparison between the standardised figures for the whole country gives a first idea of the considerable differences (see Map 3.7 and 3.8).

Chapter 4: Towards Polycentric development in the enlarged Europe

4.1 Polycentricity and monocentricity: Threats and opportunities in the East Enlargement[19]

Polycentricity is a term that risks of becoming vulgarised and empty of sense, as the recurrence of its use has not been followed by an accuracy effort in what concerns the concept.

Going through several recent studies including those made in the ESPD/SPESP ambit and that are at present occurring in ESPON, one often witnesses the fluidity and polyssemy of the concept. Polycentricity is often condensed (although not explicitly) in a distribution of agglomerations framed in the Theory of Central Places (Christaller, 1933) postulates, or Rank-size Rule (Zipf, 1929), which, besides, are converging.

Thus, polycentricity appears in the spatial analysis, diagnosis and planning context, only as a pole opposed to monocentricity, being associated to the idea of the sharing of the "power" – political, administrative, and economical. Polycentricity can be the "instrument" which allows the sharing of power among centres in a given dimension that can consequently play the role that, in other situations, is carried out by one single centre of greater dimensions (monocentricity). In this manner, the concept of complementarities must be associated to polycentricity.

The concept, as an instrument of spatial organisation, started by being applied to meso-scales, to regional spaces where, in the absence of a reliable regional metropolis, its functions might be performed by a group of medium and small cities, duly articulated in a network.

Insofar, "promoting polycentric urban development" is one of ESDP's main goals, it is necessary to fix the concept with accuracy, because, as Peter Hall writes in the Policy recommendations chapter of this report (Chapter 5), "The term... is capable of multiple meanings". Peter Hall's note is a decisive contribution to that elucidation, above all, in what concerns the necessity to fix the approach levels and the pertinent factors.

[19] Written by Jorge Gaspar, CEDRU

It is also necessary to distinguish the concept when it is applied in analytic/descriptive contexts, and when it is used as a land use-planning instrument. Which means polycentricity is both an urban system form, and a model for which is meant to lead an urban system.

As demonstrated in several studies on the successive enlargements of the European Communities/ European Union, the enlargement process gave rise to the reinforcement of the Centre *(the Pentagon*). On the other hand, in the periphery countries it contributed to an increase in competitiveness and attraction of the larger cities and particularly of the state capitals.

Such process means, thus, that as it "grows", the Union causes – although at different scales – the reinforcement of polycentricity and monocentricity. The advantages that the European core achieves, with an enlargement are accompanied by a general increase of "capitality" as a result of an expanding political, economic and social reality. This increment on capitality, by the own nature of the Union (a union of independent states); will be distributed between the "Centre" and the periphery capitals, which means a display of polycentricity.

However, within each country, a more or less slow evolution (that depends of multiple factors), leads to the reinforcement of the state capital, which means a tendency to monocentricity. Meanwhile, at the sub-national levels, caused by the policies impelled by the Union and implemented so that it responds to the European Union's objectives on economic and social cohesion some polycentric development may take place in the local urban systems, translated in a more sustainable development of small and medium size cities.

On the other hand, in the main urban/metropolitan agglomerations of the peripheral countries – Dublin, Lisbon, Madrid, Barcelona, Milan, Rome, Athens, Helsinki, Stockholm….-, as a result of the economical restructuring, and social and cultural changes, in which one of the most tangible displays is the configuration of new urban forms. The enlargement of the urban/metropolitan areas and the growing affirmation of new centralities is witnessed – planned and exurban, or a result of peripheral historic settlements expansion. Which means that the reinforcement of the great agglomerations of the Union's periphery has been translated in the inward and outward growth of the urban phenomenon, in which once more polycentricity and monocentricity may be conciliated: in the urban/metropolitan context and in the national context, respectively.

An enlargement process generates thus, in what concerns the urban system and, particularly, related to the dichotomy polycentricity/monocentricity, opportunities for the conciliation between the equity and efficacy reinforcement objectives, at all spatial scales. The main centres, specially the capital–cities, reinforce its competitiveness, chiefly at a macroregional level; the cities at the frontier zone where there is often a *duplication* resulting from the historical barrier effect, will have the opportunity to take advantage of complementarities and synergies, promoting a new polycentricity in the transfrontier areas. To the medium and small dimension cities, opportunity windows are open, once they have specializations susceptible of seizing the integration in transnational networks.

The reorganisation and modernisation of accessibilities, in particular, from the high-speed highways and railways system, will establish a greater hierarchy, valuing also the main urban centres.

This improvement, accomplished by the main urban areas, chiefly the capitals, in the sequence of the EU enlargement, shall foment a population growth but mostly a physical growth of these urban areas, which may be profited to promote the implementation (or consolidation) of polycentric metropolitan areas, hindering the tendency for the main cities to be founded in monocentricity models.

The major challenges raised by the enlargement in the urban system are at multiple levels:

- *The reinforcement of capitals*

The draining of more resources to the most competitive cities, namely the national capitals, might generate unbearable instabilities, in the infrastructure, human resources and environmental conditions chapters.

The competitive reinforcement of the main cities will privilege the external accessibilities to the internal, regional and interregional accessibilities disadvantage.

The already initiated outbreak of the private car will give rise to a dispersive peri-urbanisation, emphasised by the increase of the second residence.

The growth, the valorisation and modernisation of the main cities might cause the abandonment of large areas of the "consolidated city", in favour of the appearing of suburbs, of disperse habitat and "edge cities", with new centralities based on the functional fragmentation: shopping malls, retail outlets, business parks. Moreover, correlatively, new residential areas, of low density, will develop supported by the personal vehicle.

- *The frontier areas*

If, on the one hand, the abolition of frontiers between countries has facilitated new urban dynamics, whenever there are cities with the appropriate dimension in order to seize the increment of interactions; on the other hand, the less densely urbanized areas will hardly be able to seize the opportunities of the enlargement, being predictable in many cases a demographic emptying.

- *At the regional level*, where polycentricity can contribute the most to counter-balance the erosion provoked by the reinforcement of the national/international centres, the lack of incentive to the co-operation among small and medium cities, can "help" the decline of these centres, to the regional manipulation and to the economical and social cohesion's rupture.
- The *transport* networks renovation options that do not consider the articulation between the different levels, might promote the monocentric spatial development at national, regional and metropolitan levels.

Obviously the four major challenges elucidated above have to be met by spatial planning action at EU, national and region levels. At the EU level, challenges lead to a focus on the cohesion policy, and on transport policy and the CAP in particular. At the national level, strategic regional policy in a broad sense, i.e. including decentralisation reforms, has to be activated. At the regional level in the accession countries, active partnerships for cross-regional and cross-border cooperation must be empowered and made operative.

It is the purpose for ESPON 1.1.3 project to outline well-founded policy recommendations for encountering these major challenges to polycentric and balanced development.

4.1.1 Challenges to urban-rural relations at various levels

As the 1.1.3 project intends to study the entire European spatial tissue, including both urban and rural areas, the concept of polycentric development is intimately related to the urban-rural relationship.

The FIR of ESPON 1.1.2 on urban-rural relations states that the distinction between conceptualisations of urban and rural is becoming increasingly ambiguous. Possibilities for distinguishing the urban-rural relationship include population size/settlement size, population density, land-use, economic activity criteria, accessibility and administrative status.

At the same time there is a need to overcome the duality between the city and the countryside in terms of policy recommendations. As both the ESDP and project 1.1.2 state, there is a need for greater linkage between policies addressing rural and urban areas respectively.

The ESPD has elaborated a 6 category typology for the regional types of urban rural spatial patterns:

- Regions dominated by a large metropolis.
- Polycentric regions with high urban and rural densities.
- Rural areas under metropolitan influence.
- Polycentric regions with high urban densities.
- Rural areas with small and medium sized towns.
- Remote rural areas.

The cartography of these types, on which NUTS 3 is concerned, covers the enlargement countries on the East, with the exception of the three Baltic countries.

At NUTS 3 level the rural areas potentially benefit from polycentricism.

In the ***great metropolitan areas***, polycentricity grants a better improvement of the rural areas, in its various functionalities, from urban and periurban agriculture, to the multiple leisure activities afforded by the rural spaces near the several metropolitan poles. In a polycentric metropolitan space, there are greater conditions for the landscape valorisation, agricultural production – to sustainability.

In ***spaces with high urban and rural densities***, such as Slovenia and some regions in Poland, Czech Republic and Slovakia, polycentricity allows the maintenance and developmentg the pluri-functionality of rural spaces: agricultural function, country-town residential articulation, leisure time practice. In such situations, polycentricism is a good principle for a sustainable land use planning in terms of equity and efficacy, as is the case in Germany, the Netherlands and Belgium.

In ***polycentric regions where the rural areas have lost population***, becoming demographically empty, the city system becomes the main resource. This is the case for large part of England and in the enlargement countries, where the best example corresponds to Upper Silesia. In this

group, there are various types of situations: For instance, the older industrial areas that are dealing with difficulties in the reconversion of their economic bases as compared to the areas that went from rural areas to urban areas, based on the modern economy. In the enlargement countries, one comes mostly across with the first cases. In these countries, the urban density, structured in polycentricism, constitutes the basis for the social and economic demographic recovery, relying on the recovery of healthy rural-urban relations.

Finally, the regions that correspond to the greater part of the enlargement countries' territory on the East, from the Baltic to Poland, Czech Republic, Slovenia, Hungary and Bulgaria, are ***the rural areas with small and medium sized cities.*** It is here where the implementation of the principle of polycentric urban development is important, as a pillar to the deepening of the urban process. In this context, proximity, equity and sustainability are key concepts.

In the analysis carried out in the ESPD's ambit, the NUTS 3 considered ***"remote rural areas***" are quite few and occur mostly in Romania.

4.2. Major Urban Systems and the effects of economic changes[20]

4.2.1 Introduction

Our main goals concerning the definition of the content of this chapter of the SIR are:

a. *To define the* **«Major Urban Systems" (MUSs)** in a way which will be based on the ESPON approach on polycentricity (mainly that of ESPON 1.1.1.). This way should be simple and easily understandable, therefore necessarily preliminary in this stage of the project. It will be finalised in the TIR (Third Interim Report).

b. To *describe the main characteristics of the MUSs* of the accession countries per "mega-region" (groups of countries) and country and to *give some first evaluations of the strengths / weaknesses, links / discontinuities of the national urban systems.*

c. Based on b, to advance to a synthetic / overall appraisal of the Strengths and opportunities, links and flows, barriers and discontinuities that need to be bridged in the MUSs in E. Europe.

Therefore, we need to discuss on how to define the MUS and which basic criteria to use for a first evaluation of the MUSs dynamics.

We also need to explain, with a simple preliminary way, what we understand as "barriers and discontinuities".

4.2.2 . The definition and analysis of the Major Urban Systems (MUS)

In the MUSs we include:

a. The FUAs which have a broad ***European role***. We include here (among others) the capital cities of all the countries, even if their European role is relatively restricted

b. The cities which have a ***transnational and / or national role*** (transnational / national FUAs).

[20] Written by Minas Angelidis, NTUA, Greece

Later on, we could possibly revise slightly these definitions, according to the eventual change of the definitions of the "European cities", the "Transnational cities" etc in the framework of the ESPON (mainly the ESPON 1.1.1).

To precise which transnational / national FUAs to include in the category of the transnational / national FUAs we used the relevant bibliography and sources as well as the actually available data (data provided by ESPON 1.1.1 and by other sources) and the data analyses made by ESPON 1.1.1. We present a summary of the criteria / indicators / typologies used by the ESPON 111 SIR for the analysis of FUAs. For the other sources used see in Bibliography – Sources.

4.2.3 The analysis of FUAs by the ESPON 111 SIR: criteria / indicators / typologies

Building blocks

Urban Agglomerations (UA), which refers to contiguous build-up areas.

Functional Urban Areas (FUA): UA/core municipality + adjacent commuting areas (fringe municipalities).

FUA's are the building blocks of the polycentric region. Polycentric regions are established by two or more FUA's reinforcing each other. At two levels we are dealing with

Metropolitan European Growth Areas (MEGAs): cities beyond the pentagon that could function as economic centres and thus that will be capable of competing with the pentagon.

Transnational Regions of Integration (TNRI): if they are successful they might contribute to development beyond the pentagon – thus contributing to greater polycentric development.

Information used to classify the different functions of the FUAs

The 'criteria column' describes the information used

Function	**Criteria**
FUA population	- Units used nationally signifying FUAs with population over 20.000 inhabitants. Statistical proxies.
Industry	Gross value added in industry 2000.
Tourism	Number of bed places in hotels or similar establishments 2001. NUTS 3 level
Transport	Airport with more than 50 000 passengers (2000) or port with more than 20 000 TEU container traffic (2001)
University	Location of universities (only main location) and number of university students. ISCED classification 5A and 6.
Decision-making centres	The location of the headquarters of the top 500 companies in each country. Rated by turnover. 2001
Administrative status	Based on the national administrative system, cities that are the administrative seat of the different levels, national capitals, province centres, regional centres etc.

The relevant information was coded according to a coding key, corresponding to the ***importance (of the FUA) in the European urban network (Global, European, National, Regional, Local)*** per function – see in detail in ESPON 111.

Using this method, ESPON 111 produced seven maps which present the classification of the FUAs according to their importance (Global, European, National, Regional, Local) – one map per function (Population, Industry, Tourism, Transport, University, Decision-making centres, Administrative status) and one Map presenting the Specialisation of the economic base of the FUAs. It also produced a listing of FUAs according to a synthetic indicator in three categories:

European cities, Transnational cities and Interregional cities.

See mainly the Map: Functional classification of FUAs: population in ESPON 1.1.1 SIR.

Our approach: some necessary clarifications

As we have already mentioned, we used for the present report data and concepts / definitions of the SIR of the ESPON 111 as well as estimations and data from other sources. We also made several additional analyses necessary to better understand the dynamics of the European Major Urban System (population, PPS etc of the European and national / transnational level cities, main transport links between them etc). We analysed

data of ESPON 1.1.1, Eurostat, ONU, ESRI etc. Data are presented in Appendix Table A4-A8.

We tried to present in the Figure 4.1 the main aspects of the locational pattern of the MUSs of accession and some neighbouring countries.

We especially tried to assess whether the MUSs and the entire urban systems of accession and neighbouring countries are "polycentric" or "monocentric".

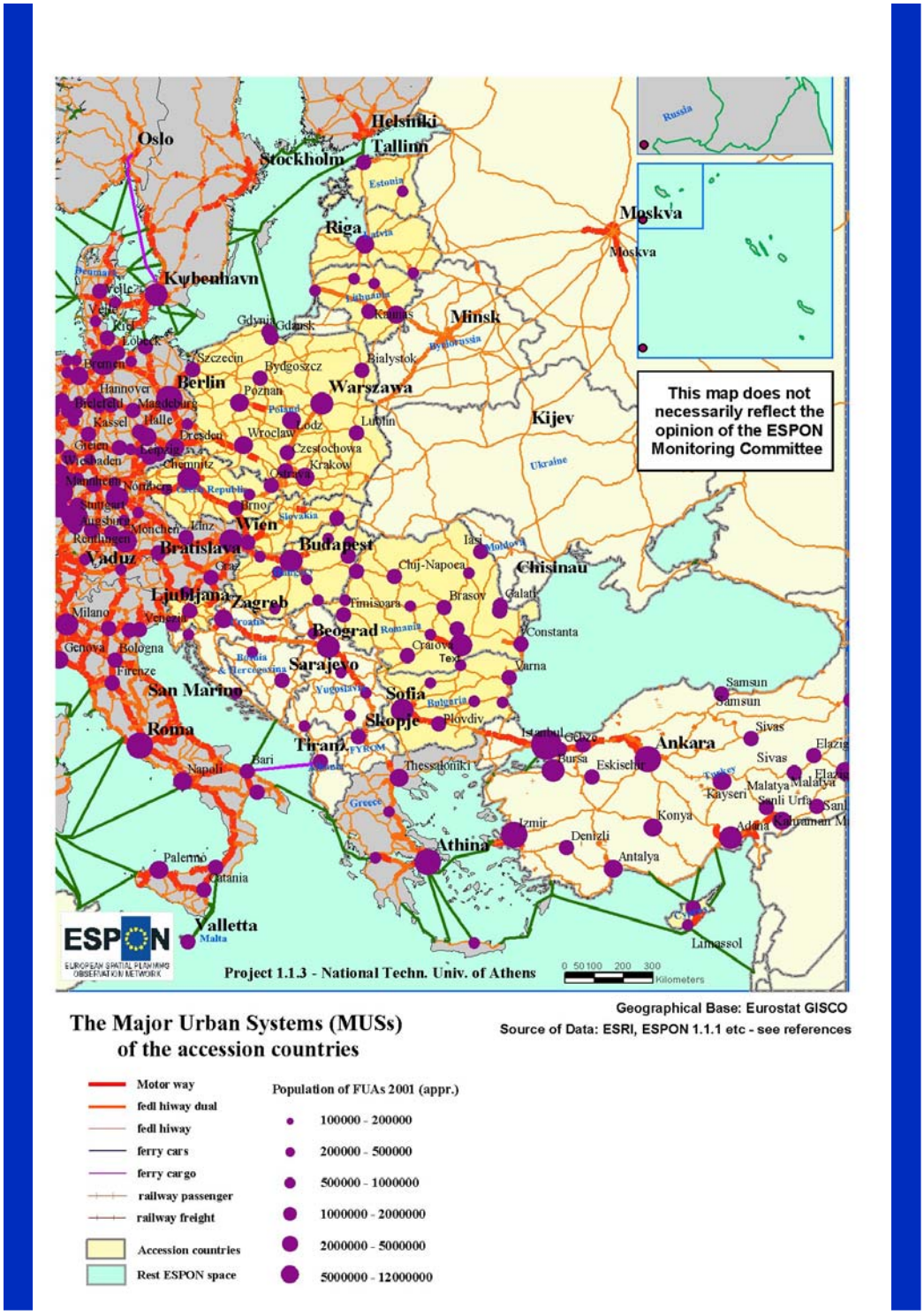
It is obvious that these terms should be used carefully. As it is stressed in other parts of this report (especially in 4.1., 4.3. and Chapter 5), we have to discern several "levels of polycentricity" (European, National and Regional or European/ Transnational, National and Regional/ Local) as well as several levels of "centres". It is also well known that promoting polycentricity at a given level may make urban systems at a different level less polycentric e.g. make the European urban system more polycentric by strengthening by priority capital cities of some countries may make the urban systems of these countries less polycentric.

The key concept is to "promote polycentricity in all levels" (ESDP), in other words to promote those divisions of labour and complementarities/ synergies between urban nodes at the same level and between urban systems of different levels which could support competitive, balanced and sustainable development of the urban systems and the regions in which they are embedded.

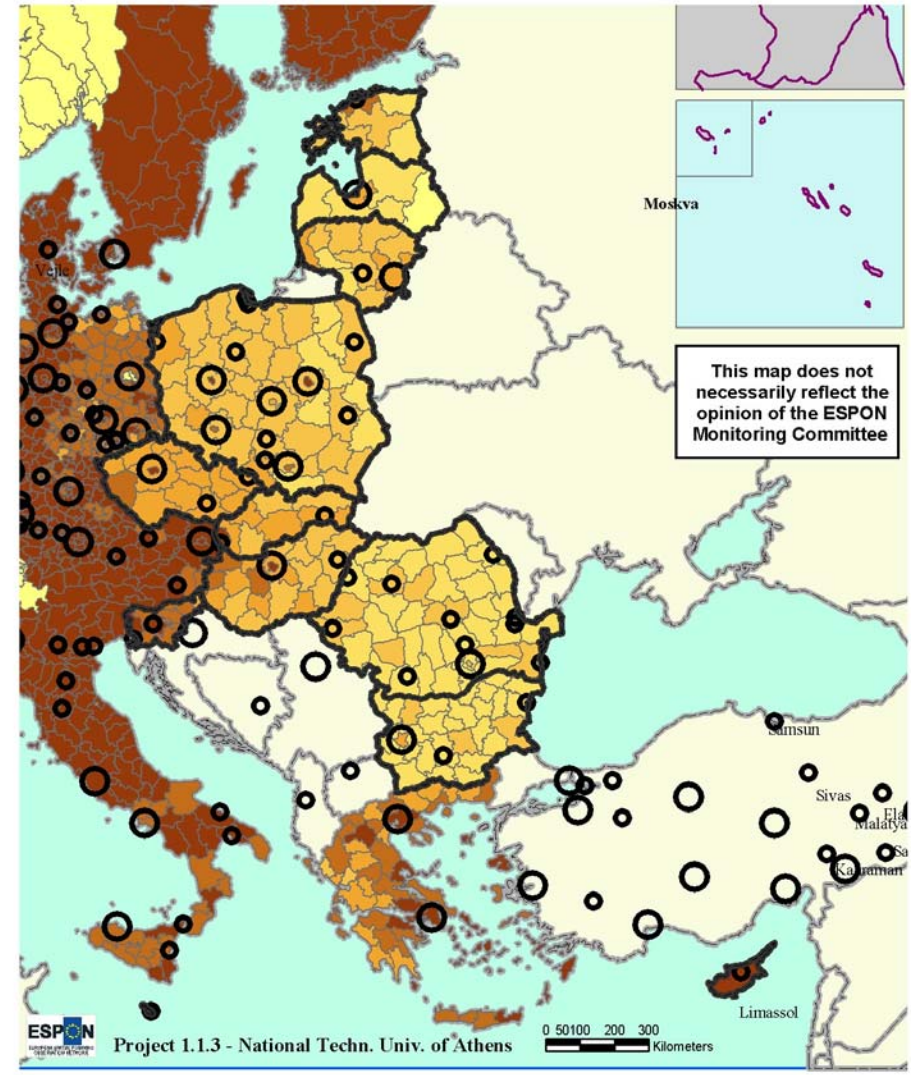
The "urban systems' polycentrism" analysis driven by this policy option is difficult and complicated. It should be carried out (and presented/ explained) at the national/ transnational level, in order to take into account the different national/ transnational contexts. Simultaneously, we should approach the European urban system and its relationships with the lower level urban systems.

We tried to implement this conceptual / methodological framework in our work. For example, we characterise a national urban system as monocentric in case the capital city plays a very important role in it. But, at the same time we explain the role of the 2nd/ 3rd level cities in the national context to give a comprehensive idea of the "polycentrism" in the given context. The estimate of the "polycentrism" in this country is complemented by the analysis at the relevant transnational context and at the European level. Therefore, the conclusions of these analyses could directly be used to make policy recommendations, which should necessarily be made at European, transnational, national and regional levels.

Map 4.1. The Major Urban Systems (MUSs) of the accession countries



Map 4.2 Accession countries Purchasing Power Parity per inhabitant (2000)



Accession countries
Purchasing Power Parities per inhabitant (2000)
and cities with more than 200.000 inh.

Geographical Base: Eurostat GISCO

Source of Data:
ESRI, ESPON 1.1.1 etc - see references

Purchasing Power Parities per inhabitant (2000)

- 0 - 3000
- 3001 - 6000
- 6001 - 9000
- 9001 - 12000
- 12001 - 15000
- 15001 - 99000

Population of FUAs 2001 (appr.)

- 2000000 - 5000000
- 5000000 - 12000000

4.2.4 Sectoral economic changes

The majority of the enlargement countries belong in Central and Eastern Europe and present certain common economic and social characteristics that are related more or less to pre-existing socialist development structures as well as problems of transition to the market economy and economic restructuring.

There are three fundamental characteristics of this transition:

- The rural sector of these countries is shrinking rapidly, however its participation in the economy continues to be very important, when compared with EU – 15 standards (especially in the case of Poland). This change creates pressures on the countryside and reinforces the immigration to cities.

- The industrial sector is also declining, reflecting on the economy of several larger or smaller industrial centres that are facing recession. Therefore, significant economic restructuring in the wider region is necessary.

- The administrative system in general and the mechanisms of spatial planning implementation in particular, continue to present important weaknesses.

4.2. 5 The geographic situation and the demographic potential

We can identify different groups of countries according to their geographic situation, their demographic dynamics and their relationships to each other, as well as to the EU – 15 countries.

The first group is formed by the three Baltic democracies with their small size and population. Poland belongs in the same geographic region but it is strongly differentiated by its large population size and the vast rural sector.

The four countries in the heart of Central Europe (Czech Republic, Slovakia, Hungary and Slovenia) have rather small populations and close relationships with their neighbouring EU – 15 countries. Romania is attached to this macro-region. However its close links with the Balkans make its position as part of this group only peripheral.

The Balkan countries present significant demographic differences. Romania has a rather large population, while Bulgaria, and Greece are close to the population standards of small EU – 15 countries.

The Balkan countries present strong and differentiated relationships to each other. The links between Greece, Bulgaria and Romania have strengthened considerably. The relationships of these three countries with the rest of the Balkan countries have strengthened more slowly. However it is very likely that they will be reinforced considerably in the coming years.

Cyprus and Malta present many similarities. Both are island regions, that have relatively small demographic potential and their economy is supported considerably by tourism.

In the beginning of 1950s, the majority of the population of the Central and Eastern European countries (CEE) was rural, (60 % in Hungary, 65 % in Slovakia, 70 % in Poland and in Romania) (DATAR 2000).

Equally and even higher were the corresponding figures in the Balkan countries.

The situation was reversed during the last fifty years: two thirds of the population of Central and Eastern European (CEE) countries are now urban, with a maximum rate in the Czech Republic (75 %) and a minimum rate in Slovenia (50 %) and Romania (55 %).

4.2.6 Structures, strengths and discontinuities of the MUS – per "mega-region" and MUS

We discern four groups of MUSs which belong to corresponding «mega-regions" and one fifth group of MUSs, that of the islands / countries of Cyprus and Malta.

a. The MUSs of the three small Baltic countries (Latvia, Estonia, Lithuania)

b. The MUS of Poland

c. The MUSs of the axial extension of the GIZ of EU-15 (Czech Republic, Slovakia, Hungary and Slovenia)

d. The MUSs of the Balkan countries (Bulgaria, Romania, other Balkan countries)

e. The MUSs of Cyprus and Malta

4.2.7 The MUSs of the three small Baltic countries

Estonia

The urban system is very monocentric in Estonia. The population of the capital city, **Tallinn** (400.000), amounts to 29 % of the total population of the country. One city, Tartu (100.000), has a national role.

Latvia

The urban system is also very monocentric in Latvia. The population of the capital city, **Riga** (760.000), amounts to 32 % of the total population of the country. One city, Daugavpils (110.000), has a national role.

Lithuania

The urban system is rather monocentric. The population of the capital city, **Vilnius** (540.000), amounts to 16 % of the total population of the country. One city, Kaunas (380.000), has transnational / national role, while three cities (Klaipeda, Šiauliai, Panevezys) have a mainly national role (pop. 100.000 – 200.000).

The "mega-region"

The three capital cities have a relatively small population and economic potential, but, taking into account their potentials in other sectors (transport, higher education etc), they could be classified as "European cities". They play nowadays a mainly national and limited transnational role.

The other cities of the respective MUSs have nowadays a mainly national role, except Kaunas, which have a moderate transnational role.

Levels of spatial integration, strengths / opportunities, links - discontinuities

It is obvious that a first level of integration is that of the three countries and their MUSs. The links between the three capitals, which are currently quite moderate, as well as between the capitals and the rest of the MUSs have to be strengthened.

On the other hand, while the three countries in question belong to the wider region of Baltic, there are nowadays discontinuities between their MUSs and that of the Baltic countries of the EU-15, due mainly to:

- the present institutional and economic exchange barriers

- the missing links of infrastructures (transport etc)

- the great divergence of the respective economic structures and levels of competitiveness.

There are also exchange barriers and missing infrastructure links, concerning the relationships of the MUSs of the three countries with that of Poland.

All these discontinuities will be restricted to a certain degree by reason of the accession of Latvia – Estonia – Lithuania and Poland to the EU.

Contrarily, this accession will strengthen the barriers / discontinuities, mainly the institutional and economic exchange ones, between the MUSs of the three countries and those of CIS and Russia.

4.2.8 The MUS of Poland

The urban system of Poland is very polycentric in all levels.

As a first indication of the degree of polycentrism: the part of the population of the capital city, Warsaw (1.610.000), amounts only to 4 % of the total population of the country.

In addition: there are many important cities at the subsequent levels of the urban hierarchy.

We can assume that all or the majority of eleven cities with a population of 250.000 – 800.000 inhabitants, constitute (added to Warsaw) the MUS of Poland.

All these cities have an important national role. Eight of them have an important transnational role (Katowice (FUR), Wroclaw, Lódz, Gdansk, Kraków, Poznan and Szczecin), while the other three as well as some other less populated cities have a relatively less important transnational role, taking into account their potentials in the economy, transport, high level education etc.

The fact that the MUS of Poland is polycentric does not mean that it is powerful. Many of the poles of the MUS are industrial cities undergoing a restructuring not finished yet. On the other hand, the transport and other links / relationships to each other and to the neighbouring MUS remain weak.

Levels of spatial integration, strengths / opportunities, links - discontinuities

Poland constitutes by itself an important spatial entity, a "mega-region". It could have, by its geographical position and its historical background, important links so much with the Baltic region as well as with the western and southern Central European space of both EU - 15 and countries of enlargement, as well as the eastern countries of the Community of Independent states (CIS). It could be (more or less) the same for the links of the Polish MUS with the other respective MUS.

The *links* of the Polish MUS with the MUSs of the EU-15 space are nowadays weak. As for the case of the three small Baltic countries, there are discontinuities due to the present institutional and economic exchange barriers, the missing links of infrastructures and the divergence of the respective economic structures. There are also *weak links / discontinuities* between the Polish MUS and that of the MUSs of the accession and neighbour countries. The first discontinuities will be restricted to a certain degree by reason of the enlargement of the EU; the second ones will be strengthened. There is a need to bridge discontinuities in both cases.

4.2.9 The MUSs of the axial extension of the GIZ of EU-15

Czech Republic

The urban system is rather polycentric. If we use only the criterion of the share of the population of the capital city, **Prague** (1.180.000), to the total population of the country (11 %) we could conclude that the Czech Republic is 'neither monocentric nor polycentric"

(see in Figure 1). But, due to the fact that there are many medium sized cities, we can characterise the Czech urban system as “rather polycentric”.

We can assume that four cities with a population of 100.000 – 380.000 inhabitants, constitute (added to Prague) the MUS of Czech Republic. Brno (380.000) and Ostrava (320.000) have an important national and transnational (nearly “European”) role, while Plzen (170.000) and Olomouc (100.000) have a national role and a comparatively less important transnational role.

Slovakia

The urban system is polycentric. The share of the population of the capital city, **Bratislava** (430.000), to the total population of the country (8 %) is relatively small. We can assume that, except Bratislava, one city, Košice (240.000), has a relatively important transnational / national role.

Hungary

The urban system is rather monocentric. The share of the population of the capital city, **Budapest** (1.780.000), to the total population of the country (17 %) is important.

We can preliminary assume that eight cities (Debrecen, Miskolc, Szeged, Pécs, Győr, Nyíregyháza, Kecskemét and Székesfehérvár) with a population of 100.000 – 210.000 inhabitants, constitute (added to Budapest) the MUS of Hungary. These cities have a national role and a more or less important transnational role. There are possibly some other cities having a national and a less important transnational role.

Slovenia

The urban system is neither monocentric nor polycentric”. The share of the population of the capital city, **Ljubljana** (260.000), to the total population of the country (13 %) is relatively important. There is only one city, Maribor (90.000) which could have a considerable transnational role.

The "mega-region"

Taking into account their potentials in several sectors (economy, transport, higher education etc), Budapest and Prague have undoubtedly a considerable international role ("European cities"), Bratislava and Ljubljana have a considerable transnational role, while the other poles of the respective MUSs have a more or less important transnational role.

The four MUSs in question are stronger and more integrated (internally) than that of the three small Baltic countries, Poland, Bulgaria and Romania.

Levels of spatial integration, strengths / opportunities, links - discontinuities

The *links* between the MUSs of these four countries and those of the western EU – 15 countries are already important. Especially, Budapest and Prague already constitute powerful nodes of the Central European urban system and their role could be strengthened rapidly in the future. Bratislava and Lubljana, even though smaller, present a considerable degree of integration to the Central European urban system. However, there are, relatively less important, *discontinuities*, due mainly to the present institutional and economic exchange barriers (and less to the missing links of infrastructures and the divergence of the respective economic structures).

The economic exchange and transport links to the MUSs of the neighbouring accession countries as well as to Croatia, Serbia and Bosnia-Herzegovina are (more or less) important, but there are important discontinuities due mainly to the divergence of the respective economic structures.

Probably, the enlargement process will soon restrict fast the discontinuities between the MUSs of this "mega-region" and those of the neighbouring EU-15 countries. But the discontinuities to the MUS of Romania and Poland would diminish slower, if there is not an important EU spatial intervention. Even more, in this case (non intervention), the discontinuities to the MUSs of Croatia, Serbia, Bosnia-Herzegovina and Ukraine would be strengthened.

4.2.10 The MUSs of the Balkan countries

Romania

The urban system is polycentric. The share of the population of the capital city, **Bucharest** (1.920.000), to the total population of the country (9 %) is moderate. But, as in Poland, there are many important cities at the subsequent levels of the urban hierarchy.

We can assume that all or the majority of thirteen cities with a population of 150.000 – 320.000 inhabitants, constitute (added to Bucharest) the MUS of Romania. These cities have a national role and, in most cases, a more or less important transnational role. There are possibly some other cities having a national and a less important transnational role.

Bulgaria

The urban system is polycentric. The share of the population of the capital city, **Sofia** (1.100.000), to the total population of the country (14 %) is relatively high, but there are many important cities at the subsequent levels of the urban hierarchy.

We can assume that six cities with a population of 120.000 – 340.000 inhabitants, constitute (added to Sofia) the MUS of Bulgaria. Plovdiv (340.000) and Varna (310.000) have an important national and a moderate transnational role, while Burgas, Russe, Stara and Pleven (120.000 – 190.000) have a national role and a comparatively less important transnational role.

The countries of the western Balkan Peninsula and Turkey

The structures of the urban systems of *the countries of the western Balkan* couldn't be clearly appreciated today, because of persisting political problems. However, we present some estimates.

The share of the population of the capital city to the total population of the country is high in the cases of FYROM (Skopje – 22 %) and Croatia (Zagreb – 16 %), while it is medium in the cases of Yugoslavia (Belgrad – 11 %) and Bosnia & Herzegovina (Serajevo – 11 % ?) and low in the case of Albania (Tirana – 7 %).

Taking also into account the rest of the cities of these countries, we could assume that except FYROM, their urban systems are rather polycentric.

We can preliminarily assume that the cities with more than 100.000 inhab., constitute (added to the capital cities) the respective MUS.

The MUS of Croatia, Yugoslavia and Bosnia & Herzegovina are weak, while those of FYROM and Albania are very weak.

The urban system of Turkey is "not monocentric, nor polycentric". The share of the population of the capital city, **Ankara** (3.200.000), to the total population of the country (5 %) is low, but that of the population of **Istanbul** (8.800.000) is much higher (13 %).

Except Istanbul, the MUS of Turkey is weak.

The "mega-region"

The urban systems of the **Balkan countries** present many similarities with those of the other EE countries. The **capital cities** play a primary economic (and cultural) role as well. Istanbul is an exception, rivalling Ankara, the capital of Turkey, in importance.

In all Balkan countries and Turkey, the rest of the urban networks (excluding the capital cities) are weak~~1~~. The MUSs of these countries are weak as well.
The living conditions in most Balkan cities are considerably lower than those of EU -15

Levels of spatial integration, strengths / opportunities, links - discontinuities

Taking into account their potentials in several sectors (see above), we could estimate that *Bucharest* and *Sofia* have an international role of medium importance, a rather transnational role. However, their potential to be incorporated in the network of European metropolises will certainly increase considerably in the coming years.

The other poles of the MUSs of Romania and Bulgaria have a more or less limited transnational role.

The MUSs of the countries of the western Balkan and Turkey certainly present a lower degree of integration with the urban system of EU -15 countries. Their incorporation in this space advances at a differentiated pace and in relation to different parameters.

It is most likely that the political stability of the region will be consolidated; therefore the role of *Zagreb, Serajevo and Belgrade*, the most important cities of the region, will be strengthened considerably.

Istanbul tends to play a significant role in the network of European metropolises, in correspondence to its recent rapid demographic and economic development.

Spatial integration in the Balkans could not be appreciated without taking into account *Greece*. The urban system of Greece is the most developed in the Balkans. Among Balkan capital cities, **Athens** is mostly integrated in the network of European metropolises, due to its size and EU membership. **Salonica** is a powerful centre, which already plays an important role in the Balkans that will be strengthened considerably in the future.

4.2.11 The MUSs of Cyprus and Malta

The urban systems of Cyprus and Malta differ considerably from those of the other accession and neighbouring countries. Both are small countries, islandic and densely populated countries[2]. The living conditions in the cities of both islands are comparatively satisfactory

Cyprus

The urban system of Cyprus is relatively balanced and powerful taking into consideration the size of the island. We must not appreciate the degree of polycentrism of the urban system of Cyprus with the criteria already used. The share of the population of the capital city, **Nicosia** (200.000), to the total population of the country (29 %) is high, but there are three other relatively important cities on the island: Limassol, Larnaka and Paphos.

Malta

The total of Malta constitutes substantially a single urban region.

Cyprus and Malta

Levels of spatial integration, strengths / opportunities, links - discontinuities

Both islands are important centres of the central Mediterranean for Malta and the Eastern Mediterranean for Cyprus. This role could be strengthening after the accession of these countries in EU.

4.2.12 Structures, strengths and discontinuities of the MUSs - General conclusions

In the majority of the **EE countries**, the **capital city** plays a primary economic and cultural role. Only Poland has some regional centres which "compete" considerably the capital city, Warsaw.

Three agglomerations, those of Budapest, Warsaw and Prague, form an integral part of the European metropolises network.

A factor strongly differentiating the urban system of Eastern Europe (EE) from that of Western Europe is the lack of a developed network of small and medium-sized cities (with the exception of the Czech Republic and Slovenia)[21]

Connections of the EE countries' MUSs with those of EU-15 and neighbouring countries. MUSs and Transnational Regions of Integration (TNRI)

The three small Baltic countries have already powerful relationships with the wider Baltic Sea region, which will be strengthened in the future.

Poland has established links – with a tendency to become more strengthened - so much with the Baltic region as well as with the Southern Central European space of both EU - 15 and countries of enlargement, as well as the Eastern countries of the Community of Independent States (CIS). Warsaw but also other large cities of Poland have a considerable potential to enhance their role as centres in the EU-27 and wider regions.

The links between the urban systems of the southern Central European accession countries and the western EU – 15 countries already exist to a significant extent. Budapest and

[21] another factor is linked to the disparities between urban and rural living conditions

Prague already constitute powerful nodes of the Central European urban system and their role will be strengthened fast in the future. Bratislava, even though smaller, presents a powerful degree of integration.

The MUSs (as well as the overall urban systems) of the Balkan countries obviously present a lower degree of integration with the MUSs (and the overall urban systems) of EU -15 countries. As we have already reported, their incorporation in this space advances at a differentiated pace and in relation to different parameters.

The MUSs, as well as the overall urban systems of Cyprus and Malta are very open and present the potential to be incorporated fast in the MUSs (and the overall urban network) of EU-27 and beyond, despite the disadvantage of their island character.

Problems and opportunities of the MUSs –
MUSs and TNRI

The problems and the opportunities of the MUSs (and the overall urban systems) of the 12 accession countries with regard to their polycentric development present many resemblances but also important differences.

The first common problem is *the weakness of the MUSs to support polycentric territorial growth.*

A second common problem is that *all these urban systems are found (with important differences between them) away from the single Global Integration Zone (GIZ) of the EU – 15.*

The urban systems of the Czech Republic, Slovakia, Hungary and Slovenia are located in axial extensions of this GIZ. These axial extensions present the potential of rapid growth.

The development of these axial extensions will certainly encourage the urban system of Poland as well. This urban system has the possibility of quickly strengthening its bonds with the wider Baltic region.

The urban systems of the three small Baltic countries have possibilities of quickly enhancing their links with the wider region of Baltic, and to a relatively smaller degree with the countries of CIS and Russia.

The connections of the urban systems of the Balkan countries with the MUSs5 of countries of the EU–15 are rather weak today (with significant differences among the different countries). In condition that there will be a powerful aid intervention, these urban systems have the possibility of developing their interconnections so much with those of countries of the EU – 15 as with those of CEE, Black Sea countries and the Middle East.

Another common problem (that concerns the great majority of countries that have been examined) in the prospect of enlargement, is the case of over promoting the growth of capitals at the expense of the rest of the urban systems. This risk represents the other side of the coin in enhancing the role of capitals in the network of European metropolises.

It is therefore necessary to promote the development of networks between the intermediate and small cities in relation to the rapidly transforming rural space, in order to avoid important economic and social problems of enlargement outside the capitals regions.

Selected references and sources

- ESPON 1.1.1, ESPON 3.1, other ESPON project reports

- DATAR (sous la direction d' A. Bailly et d' A. Frémont) (2000), *L' Europe et ses États: une géographie*, La Documentation Française, Paris.

- ESTIA / INTERREG IIC (2000), *Spatial Planning Priorities In Southeast Europe*, Aristotle Univ. of Thessaloniki, Thessaloniki.

- Data from Eurostat, ONU, ESRI etc.

4.3. How to Measure Polycentricity in the Enlarged Europe[22]

Polycentricity is the main topic of ESPON 1.1.1 "The Role, Specific Situation and Potentials of Urban Areas as Nodes of Polycentric Development". However, as polycentric development is one of the major goals of the European Spatial Development Perspective (ESDP), polycentricity is also of great importance for ESPON 1.1.3. Therefore it is a primary area of co-operation between ESPON 1.1.1 and ESPON 1.1.3.

The general approach of ESPON 1.1.1 to conceptualise polycentricity is summarised to in part I of this report. This section summarises a methodology that will be used in ESPON 1.1.1 to identify centres in the European urban system and to measure the degree of polycentricity of urban areas, the urban systems of individual countries and the European urban system at large. The summary is illustrated by examples from accession countries. The planned methodology is presented in more detail in the Third Interim Report of ESPON 1.1.1. The actual implementation of the methodology is planned for Year Two of ESPON.

Polycentricity is one of the core concepts of ESPON. Following the European Spatial Development Perspective (ESDP), the promotion of a 'balanced polycentric urban system' is one of the most frequently cited policy objectives of the programme. The interest in polycentric development is fuelled by the hypothesis put forward in the ESDP that polycentric urban systems are more efficient, more sustainable and more equitable than both monocentric urban systems and dispersed small settlements.

However, until today the concept of polycentricity has remained largely at the level of rhetoric without a precise operational definition (which puts it into a class with similarly vague concepts such as 'city networks' or 'industrial clusters'). There exists neither a method to *identify* or *measure* polycentricity at different spatial scales nor a method to *assess* the impacts of polycentricity (or the lack of it) with respect to policy goals such as efficiency (competitiveness), equity (cohesion) and sustainability. It is therefore not possible to determine an *optimal* degree of polycentricity between centralisation and decentralisation or, in other words, between the extremes of monocentricity and dispersal.

[22] Written by Michael Wegener, Speikermann & Wegener

This makes it difficult to formulate well-founded policy recommendations as to which cities should be developed with priority.

It is therefore necessary to develop an operational concept of polycentricity and operational methods for identifying and measuring the existing polycentricity of the European urban system. The methodology should allow (i) to *measure* the degree of polycentricity of a region, a national urban system or the European urban system at large, (ii) to *evaluate* it with respect to the policy objectives of European Spatial Development Perspective competitiveness, cohesion and environmental sustainability and (iii) to *forecast* the likely impacts of European, national or regional economic, transport and telecommunications policies on the degree of polycentricity and the three policy goals.

The Method

The proposed approach measures polycentricity by identifying three dimensions of polycentricity: the *size* or importance of cities (population, economic activity, human capital, higher education, cultural importance, administrative status etc.), their *distribution in space* or *location* and the *spatial interactions* or *connections* between them.

Size

The first and most straightforward prerequisite of polycentricity is that there is a distribution of large and small cities. It can be shown empirically and postulated normatively that the ideal rank-size distribution in a territory is loglinear. Rank-size distributions of cities in European countries differ significantly. Figure 4.1 shows the rank-size distribution of cities with a population of more than 50,000 in selected accession countries. It can be seen that Poland has relatively polycentric urban system, whereas Hungary and Romania have historically grown dominant capital cities, with Bulgaria and the Czech Republic somewhere in between.

A first step in analysing polycentricity of an urban system is therefore to derive its population rank-size distribution. A possible indicator of the size dimension of

polycentricity is the squared residuals of the rank-size distribution from the regression line of the logarithmic transformed population values: the smaller the residuals, the more polycentric is the urban system. Alternatively, a combined indicator of city size and importance may be used, such as economic activity, human capital, higher education, cultural importance, administrative status etc.

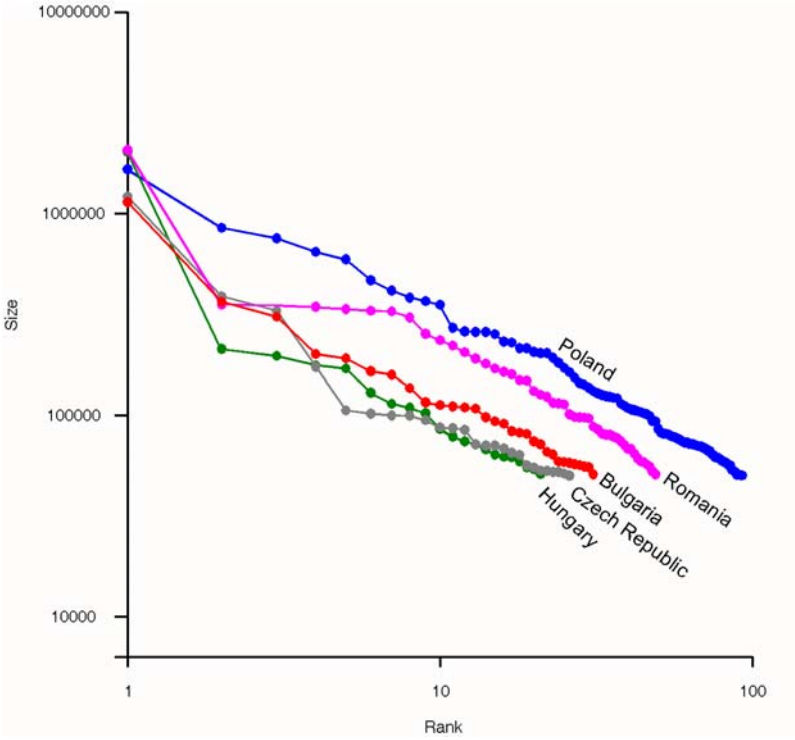


Figure 4.1. Rank-size distribution of cities in selected accession countries

Location

The second prerequisite of a polycentric urban system is that its centres of equal size or rank are equally spaced from each other – this prerequisite is derived from the optimal size of the catchment area or market area of centrally provided goods and services. Therefore a uniform distribution of cities across a territory is more appropriate for a polycentric urban system than a highly polarised one where all major cities are clustered in one part of the territory.

A second step in the analysis of polycentricity is therefore to analyse the distribution of cities of equal size or rank over the territory. One possible approach is to subdivide the territory of each country into catchment areas (Thiessen polygons) of each centre. The indicator of the location dimension of polycentricity is then the squared sum of deviations of the areas or populations served by each centre from the average area or population served by a centre in the whole country. The smaller the squared sum of deviations, the more polycentric is the urban system. Instead of airline distance also the logsum of the travel times and/or travel costs by road and rail (and at higher levels of the hierarchy also by air) could be used. Figure 4.2 shows the subdivision so derived for Poland.

Figure 4.2. Catchment areas of cities over 50,000 population in Poland

Connectivity

A third property of polycentric urban systems is that there is functional division of labour between cities, both between higher-level centres and the lower-level centres in their

territory and between cities at equal levels in the urban hierarchy. This implies that the channels of interaction between cities of equal size and rank but in particular between lower-level and higher-level cities are short and efficient. It is obvious that this requirement may be in conflict with the postulate that cities of equal size and rank should be equally spaced on the territory.

There principally two ways to measure connectivity. One is to measure actual interactions, such as flows of goods or services, travel flows, telephone calls or e-mails. The second possibility is to measure the potential for interactions. Measures of interaction potential could be infrastructure supply, i.e. the level of road connections (motorways, roads) or the level of service of rail (number of trains) or air (number of flights) connections. Another way is to simply measure proximity between centres, because if two centres are close to each other, the probability and feasibility that functional division of labour is implemented is higher than if the two centres are distant from each other.

Figure 4.3 is a very simple analysis of connectivity as proximity. The map shows the same cities in Poland with a population of more than 50,000 population used for Figure 1. Each city is represented by a circle the area of which is proportional to its population and connected by a line to the nearest city with larger population. Here airline distance was used. However, the analysis could also be repeated with travel time and/or travel cost via networks and so measure not only geographical proximity but also the quality of the infrastructure.

In a further step, the travel times and/ travel costs between cities could be used to calculate hypothetical interactions, such as commuter flows, business trips or tourist visits. If the same behavioural parameters are applied all over Europe, countries and regions could be compared with respect to the efficiency and ease of spatial interactions, for instance in terms of average speed.

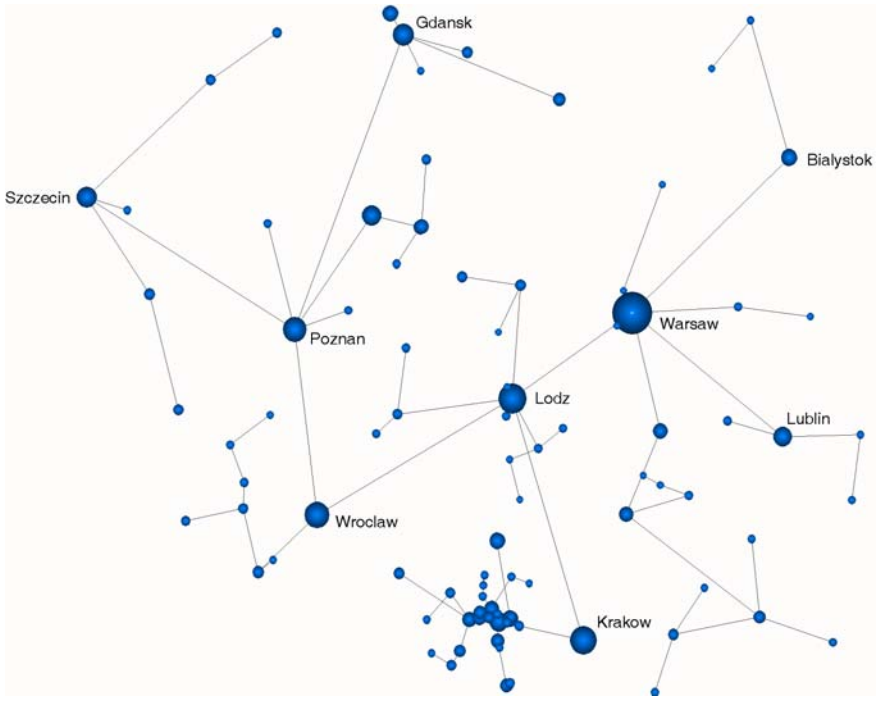


Figure 4.3. Cities in Poland connected to the nearest large city.

What could be an appropriate indicator of connectivity derived from these results? Simply to give a premium to high speeds and large volumes of traffic between cities would be misleading as it would ignore equity and sustainability objectives. It will be necessary to develop a connectivity indicator which recognises the need for a balance between efficiency, equity and sustainability.

Policy Applications

With these three partial indicators of polycentricity, size, location and connectivity, a comprehensive indicator of polycentricity can be constructed. The indicator will classify each country on a continuous scale of polycentricity and at the same time assign each city a place and level in the national and European urban hierarchy.

In the context of ESPON 1.1.3, the method can also be used to forecast the likely future development of polycentricity in Europe for different scenarios of urban growth and

linkages between cities as a consequence of the enlargement of the European Union taking account of macro trends, such as further integration of the world economy and intensification of the competition between regions and cities and the development of energy cost, transport technology and the further diffusion of telecommunications.

It is particularly here where co-operation with ESPON 1.1.1 will be important. ESPON 1.1.1 will provide the database for analysing cities, functional urban areas and polycentric urban regions in the enlarged European Union under different assumptions about the macro trends indicated above to be used in the two enlargement scenarios of ESPON 1.1.3 that will be implemented in Year Two of ESPON.

4.4 Accessibility[23]

Accessibility is the main 'product' of a transport system. It determines the locational advantage of an area (i.e. in ESPON a region, a city or a corridor) relative to all areas (including itself). Indicators of accessibility measure the benefits households and firms in an area enjoy from the existence and use of the transport infrastructure relevant for their area.

Why Accessibility?

The important role of transport infrastructure for spatial development in its most simplified form implies that areas with better access to the locations of input materials and markets will, *ceteris paribus*, be more productive, more competitive and hence more successful than more remote and isolated areas.

However, the impact of transport infrastructure on spatial development has been difficult to verify empirically. There seems to be a clear positive correlation between transport infrastructure endowment or the location in interregional networks and the *levels* of economic indicators such as GDP per capita. However, this correlation may merely reflect historical agglomeration processes rather than causal relationships effective today. Attempts to explain *changes* in economic indicators, i.e. economic growth and decline, by transport investment have been much less successful. The reason for this failure may be that in countries with an already highly developed transport infrastructure further transport network improvements bring only marginal benefits.

While there is uncertainty about the magnitude of the impact of transport infrastructure on spatial development, there is even less agreement on its direction. It is debated whether transport infrastructure contributes to spatial polarisation or decentralisation. Some analysts argue that regional development policies based on the creation of infrastructure in lagging regions have not succeeded in reducing regional disparities in Europe, whereas others point out that it has yet to be ascertained that the reduction of barriers between regions has advantaged peripheral regions. From a theoretical point of view, both effects can occur. A

[23] Written by Klaus Speikermann, S&W

new motorway or high-speed rail connection between a peripheral and a central region, for instance, makes it easier for producers in the peripheral region to market their products in the large cities, however, it may also expose the region to the competition of more advanced products from the centre and so endanger formerly secure regional monopolies.

The conclusion is that the relationship between transport infrastructure and spatial development has become more complex than ever. There are successful regions in the European core confirming the theoretical expectation that location matters. However, there are also centrally located regions suffering from industrial decline and high unemployment. On the other side of the spectrum the poorest regions, as theory would predict, are at the periphery, but there are also prosperous peripheral regions such as the Nordic countries. To make things even more difficult, some of the economically fastest growing regions are among the most peripheral ones. In the context of ESPON 1.1.3 the issues is whether the reduction of barriers at the present EU borders, such as border waiting times or customs, after the enlargement of the European Union, will effectively benefit the accession countries.

Forms of Accessibility

In general terms, accessibility is a construct of two functions, one representing the activities or opportunities to be reached and one representing the effort, time, distance or cost needed to reach them:

$$A_i = \sum_j \mathrm{g}(W_j)\,\mathrm{f}(c_{ij})$$

where A_i is the accessibility of region i, W_j is the activity W to be reached in region j, and c_{ij} is the generalised cost of reaching region j from region i. The functions g(W_{ij}) and f(c_{ij}) are called *activity functions* and *impedance functions*, respectively. They are associated multiplicatively, i.e. are weights to each other. That is, both are necessary elements of accessibility. A_i is the total of the activities reachable at j weighted by the ease of getting from i to j.

It is easily seen that this is a general form of potential, a concept dating back to Newton's Law of Gravitation. According to the Law of Gravitation the attraction of a distant body is

equal to its mass weighted by a decreasing function of its distance. Here the attractors are the activities or opportunities in regions *j* (including region *i* itself), and the distance term is the spatial impedance c_{ij}. The interpretation here is that the greater the number of attractive destinations in regions *j* is and the more accessible regions *j* are from region *i*, the greater is the accessibility of region *i*.

However, the equation is more general than the gravity model. Different types of accessibility indicators can be generated by specifying different forms of functions g(W_j) and f(c_{ij}):

- *Travel cost*. If only destinations of a certain kind, e.g. cities beyond a certain size, are considered, and the impedance function is travel time or travel cost itself, the accessibility indicator is total or average travel cost to a predefined set of destinations.

- *Daily accessibility*. If only destinations within a certain travel time are considered, and the destinations are taken as is, the accessibility indicator measures the number of potential destinations (customers, business contacts, tourist attractions, etc.) that can be reached in a given time, e.g. a day.

- *Potential*. If the impedance function takes travel behaviour into account, i.e. the diminishing inclination to travel long distances, the accessibility indicator is a potential indicator. The activity function may take account of agglomeration effects or economies of scale.

Here, the potential accessibility is selected. Potential accessibility is based on the assumption that the attraction of a destination increases with size *and* declines with distance or travel time or cost. Therefore both size and distance of destinations are taken into account. The size of the destination is usually represented by population or some economic indicator such as total regional GDP or total regional income. The activity function may be linear or nonlinear. Occasionally the attraction term W_j is weighted by an exponent α greater than one to take account of agglomeration effects, i.e. the fact that larger facilities may be disproportionally more attractive than smaller ones. One example is the attractiveness of large shopping centres which attract more customers than several

smaller ones that together match the large centre in size. The impedance function is nonlinear. Generally a negative exponential function is used in which a large parameter β indicates that nearby destinations are given greater weight than remote ones.

$$A_{im} = \sum_j W_j^{\alpha} \exp(-\beta c_{ijm})$$

A_{im} is then the potential accessibility of region i by transport mode m to activities W_j in regions j with c_{ijm} being the generalised transport cost between regions i and j by mode m. Aggregation over modes is done by replacing the generalised cost c_{ij} by the 'composite' or logsum generalised cost

$$\bar{c}_{ij} = -\frac{1}{\lambda} \ln \sum_m \exp(-\lambda c_{ijm})$$

where c_{ijm} is the generalised cost of travel by mode m between i and j and λ is a parameter indicating the sensitivity to travel cost.

Potential accessibility indicators are superior to travel time accessibility indicators and daily accessibility indicators in that they are founded on sound behavioural principles of stochastic utility maximisation. Their disadvantage is that they contain parameters that need to be calibrated and that their values cannot be easily interpreted in familiar units such as travel time or number of people. Therefore potential indicators are frequently expressed in percent of average accessibility of all regions.

Application

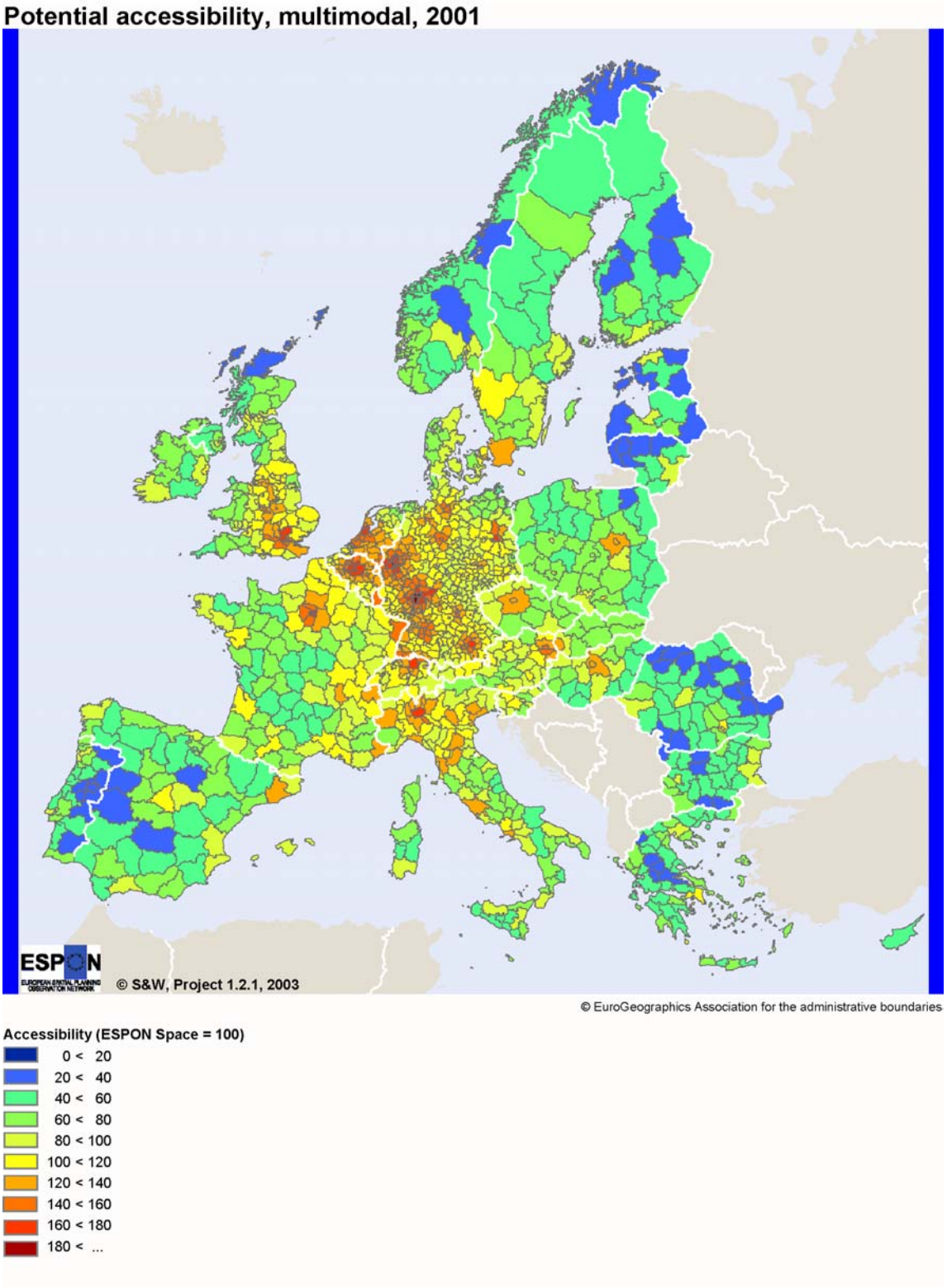
Accessibility is one of the indicators calculated in ESPON 1.2.1 for NUTS-3 regions to express the combined effect of geographical position and locational advantage provided by the transport system. Map 4.3, taken from the ESPON 1.2.1 Third Interim Report, shows potential accessibility of NUTS-3 regions in the ESPON Space in 2001, standardised to the average potential accessibility of all NUTS-3 regions in the ESPON Space. Population was

used as destination activity and weights for the averaging. The accessibility presented is multimodal representing the combined effect of the road, rail and air network.

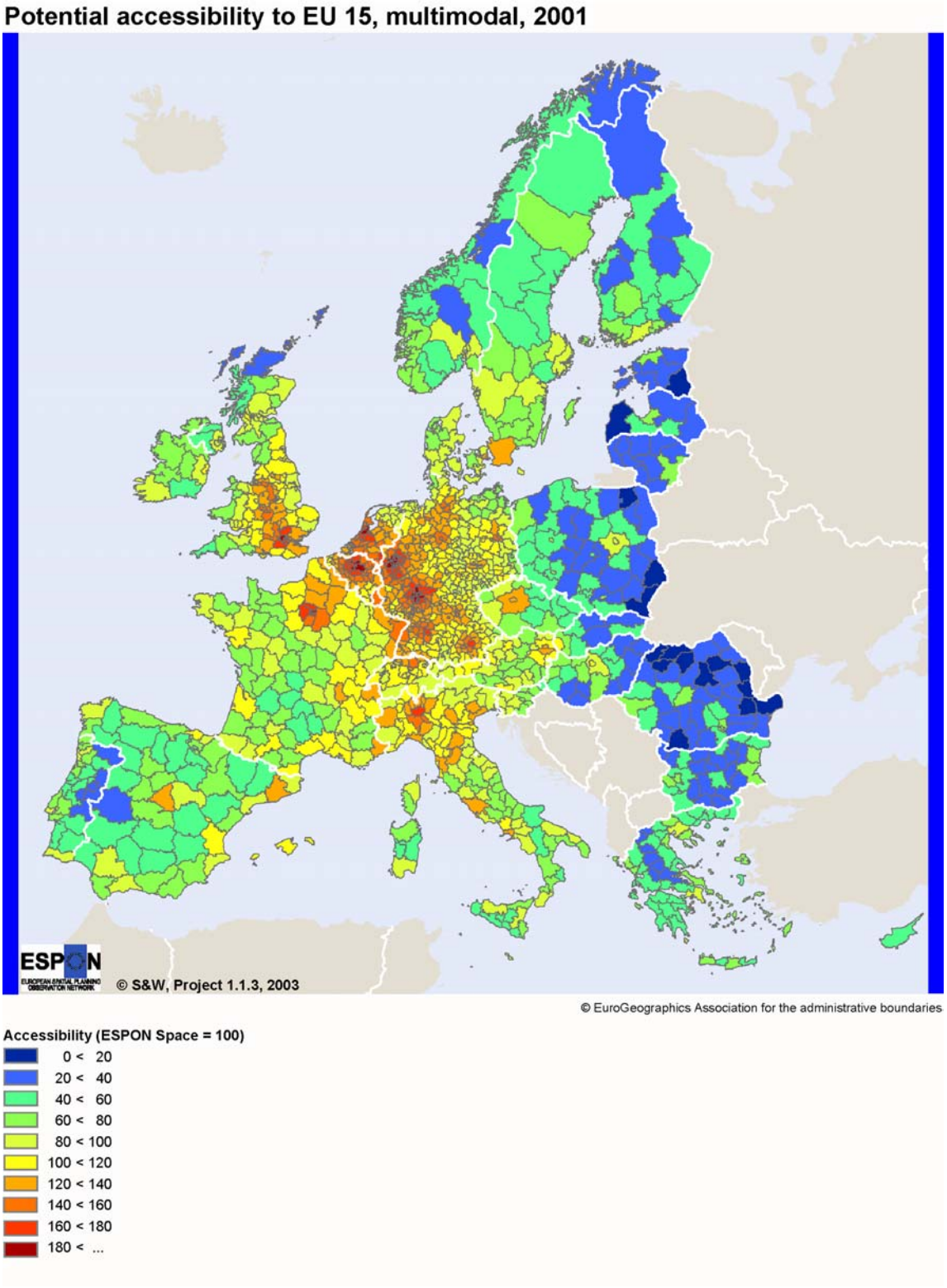
The emerging picture of Europe is familiar. It shows the concentration of high-accessibility regions in north-west Europe reaching from the South of England over the Benelux countries and the Rhein-Ruhr metropolis along the Rhine valley to Switzerland and northern Italy (the 'Blue Banana'), with another peak in the Paris region. It can be seen that most candidate countries, with the exception of the Czech Republic and parts of Hungary, belong to the European periphery through the combined effect of their remote geographical location and their underdeveloped transport system.

The contrast in accessibility between the current EU member states and the candidate countries becomes even more obvious if two experimental, contrafactual accessibility maps are drawn. Map 4.4 shows the same potential accessibility indicator if only destinations in EU countries are considered. Now it becomes obvious that the candidate countries are disadvantaged even in comparison with the peripheral regions in the European Union, such as Greece, southern Italy, Portugal and rural Spain, Ireland, Scotland and the Nordic countries. Map 4.5 , in contrast, shows the same accessibility indicator if only destinations in the central and east European accession countries are considered. Now the asymmetry in the relationship between EU and candidate countries becomes obvious. Whereas in the previous map accessibility in the candidate is severely reduced, in this map accessibility in the central European countries is only little affected.

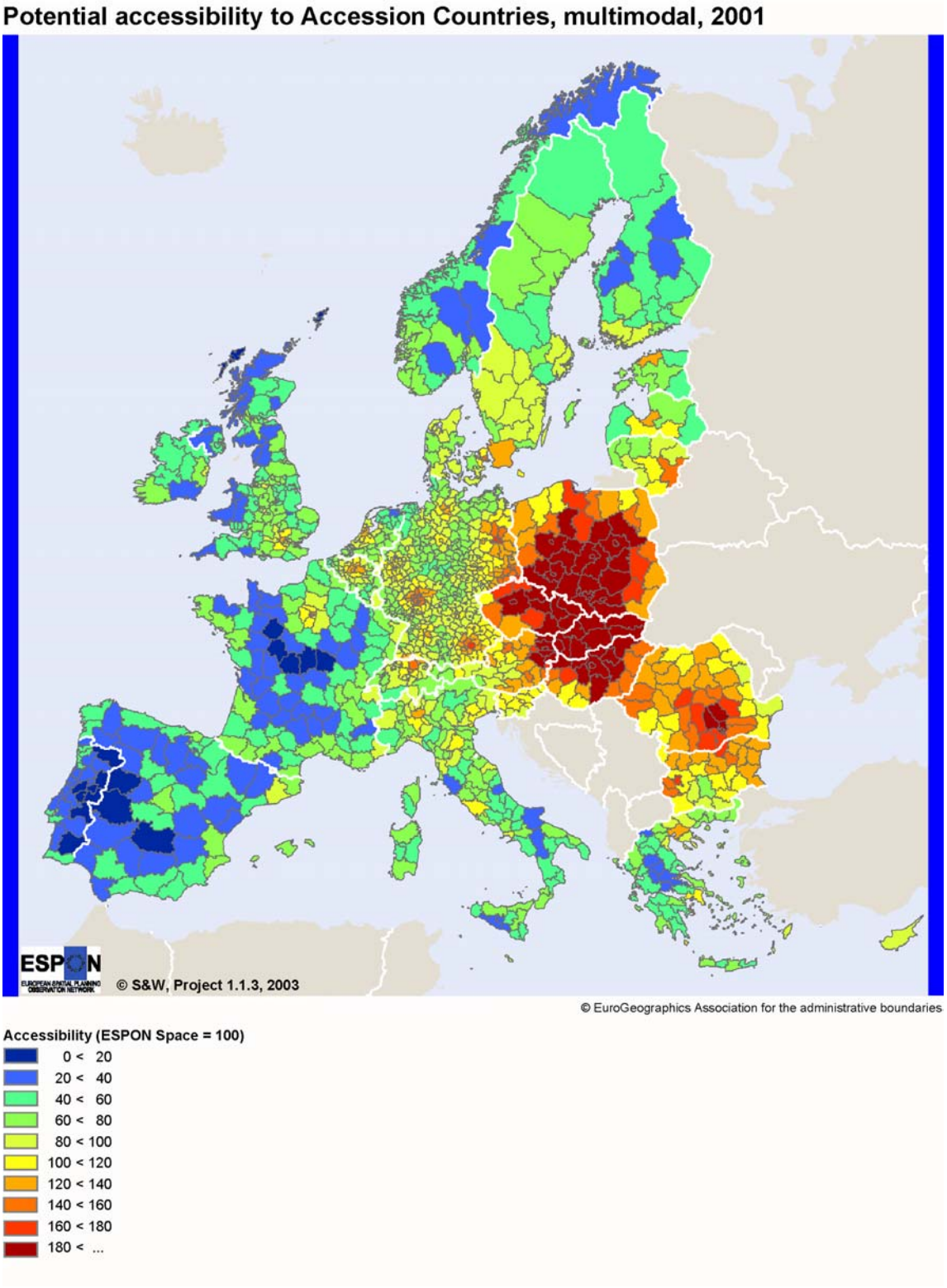
In the future work of ESPON 1.1.3, accessibility analysis will be an important component of the two enlargement scenarios. In particular in Enlargement Scenario 2, accessibility will be the key variable driving the SASI regional economic model used to forecast the spatial impacts of the EU enlargement with particular emphasis on the role of the TEN and TINA network improvements (see Chapter 6).



Map 4.3. Potential accessibility, multimodal, all destinations, in 2001 (ESPON 1.2.1)



Map 4.4. Potential accessibility, multimodal, only EU 15 destinations, in 2001



Map 4.5 Potential accessibility, multimodal, only CEC destinations, in 2001

Chapter 5: Enlargement Scenario: Spatial Economic Dynamics[24]

5.1. Policy Options for Polycentric Development

5.1.1 Levels of Polycentricity

The term "promoting polycentric urban development" in the ESDP is capable of multiple meanings. These need to be carefully distinguished, especially in the context of the accession countries.

Level I: European: promoting the growth of urban centres outside the "Polygon" in the remoter areas of the EU. Without further elaboration, this may simply concentrate growth in the leading urban centres of the countries in these areas, invariably the capital cities. This was suggested long ago in the literature on development (Myrdal 1957, Hirschman 1958) and appears to be confirmed by abundant empirical evidence, including the experience of recent enlargements (since 1970) of the European Community/Union.

Level II: National: This would seek to promote the growth in each EU nation of second order ("provincial capital") cities as counter-magnets to the first-order capital cities. There are several examples of such policies, reviewed below.

Level III: Regional: This would further seek to promote growth in third/fourth order centres in each region. The problem is that this may be easy to achieve in favoured central regions around the first-order centres, especially along major transport corridors, where it may lead to the development of "Polycentric Mega-City-Regions" (South East England, Randstad Holland), paradoxically frustrating policies for longer-distance dispersion. But, outside such favoured central regions, policies to promote lower-order centres may work against strong economic trends which favour centripetal development and consequent migration into higher-order centres, especially in conditions of rapid economic development such as may occur after EU accession.

[24] Written by Peter Hall, Mike Batty and Elena Besussi

5.1.2 Relevant Factors

Significance of Economic Structure: much older development theory, particularly related to growth pole complexes (Isard et al 1959, Perroux 1960), was developed in and for a world where manufacturing played a predominant development role. This may continue to be true in some cases for the accession countries, which may be successful in attracting Foreign Direct Investment (FDI) for the establishment of new branch factories by established multinational firms. But its significance may be weakening, because

(1) there is extremely strong competition from newly-industrialising countries with much lower labour costs (in particular, China);

(2) modern automated production methods may mean that such investment generates relatively few jobs, though the contribution to GDP/GRP may be significantly higher.

Generally, the EU economy is increasingly driven by advanced service jobs, and it is the location pattern of these producer and consumer services that will be most significant for policy. Unfortunately, as the "new economic geography" suggests, they are very subject to the principle of clustering or agglomeration, which again further strengthens the competitive position of a dominant central location (Krugman 1991, 1995).

Significance of Geographical Scale: Most of the accession countries are relatively small in area and population, and this favours a monocentric pattern of urban development. Fig. 1 in Chapter 3 showed this relationship clearly.

Significance of Key Economic Drivers: In a service-based economy, investment in higher-level public services – those capable of serving a market beyond the immediately local level, such as higher education or advanced health services – may play a crucial role in

Level 2 decentralisation from the highest-level city to second-level cities. Many provincial cities, including second-order "provincial capitals" and third level "county towns", illustrate this principle in the EU-12; public policy can play a major role in steering the process, as suggested below.

Significance of Transport Infrastructure: As pointed out long ago by Lösch (1954), national ground transport systems (road, rail) concentrate on the highest-order city in a national system of cities, invariably the capital. Additionally, the highest-level national airport or airports are invariably found here, offering the highest level of accessibility to other European cities and, in the leading cases, also inter-continentally. The analysis of accessibility in Chapter 4.4 has already demonstrated this. If a second airport is established, it too will tend to be located in the leading city, on the principle of the "Hotelling ice-cream seller" theorem (Hotelling 1929) – and, on the same principle, a new low-cost airline will seek to find a secondary airport as close as possible to this city (Bowley 2003), as illustrated by Ryanair's attempt to buy an old Soviet airfield at Milovice in Central Bohemia, approximately 25 kilometres directly east of Prague.

Significance of Transport Technologies: Transport technologies are significant because of their role in transforming space/time accessibilities. Motorways operating at speeds up to 130km./h. can cut travel times by 50-75% compared with older two-lane highways with average speeds as low as 40km/h. Likewise, new high-speed rail lines operating at speeds up to 300km/h. can cut journey times even more radically compared with some of the slow classical tracks found in some accession countries; few trains here achieve average start-to-stop speeds of over 100 km/hr., significantly slower than the best times achieved in the EU-15 *(Table 5.1)*. But time accessibility can be affected by the planning of new networks:

> *Road:* Motorway interchange spacing can significantly affect accessibility: spacing can be increased to reduce accessibility to areas which it is desired to protect against development, and/or to increase average speeds (as in the UK: M11, Junctions 8-9, 24km.; M20, Junctions 8-9, 21km.; inside "express lanes" can be created with fewer interchanges than outside "local lanes" (as in Italy and the Netherlands; now being considered as a tolled option for the UK).

Table 5.1 Fastest Train Tines (weekday mornings)

Route	Distance km.	Fastest time hrs/min.	Average speed km/h.
London-York	302	1:51	163.2
Paris-Marseille	750	3:10	236.6
Frankfurt-Munich	603	3:23	178.4
Frankfurt-Berlin	560	3:29	160.9
Berlin-Munich	685	6:42	75.1
Munich-Vienna	399	4:42	84.9
Berlin-Prague	383	5:00	76.6
Berlin-	572	5:46	99.1
Vienna-Budapest	273	2:33	107.1
Vienna-	754	7:35	99.4

Source: Euro Railways Website; Cook's Continental Timetable

Rail: Important distinctions can be made, in terms of new investment, between different configurations:

- *Metro:* traditional frequent-stopping services with average speeds as low as 25 km./h. and a typical radius of 10-20 km.; this supports continuous medium-density urbanisation, as in London and New York in the 1920s and 1930s;

- *Regional Express Metro:* German S-Bahn services, Paris RER, Thameslink 2000 (London), Mälarbana (Stockholm): serving a significantly wider range (up to 130 km.) at speeds up to 100 km./h.; this supports a more punctiform

type of urbanisation, with wide intervening green spaces, along a few preferred corridors;

Table 5.2 High-Speed Trains: Alternative Approaches

	Distance from Origin (km)		Distance from Origin (km)
UK Model		**French Model**	
Great Western		**TGV-Mediterranée**	
Reading	58	Le Creusot	303
Didcot Parkway	85	Lyon Part-Dieu	427
Swindon	124	**TGV Atlantique**	
GNER		Le Mans	211
Stevenage	46	Vendôme	178
Peterborough	123	St-Pierre-des Corps	232
Grantham	169	Tours	235
Doncaster	251		
Channel Tunnel Rail Link			
Stratford	10		
Ebbsfleet	37		
Ashford International	90		

Source: British Railway Main Line Gradient Profiles (Ian Allen Publishing); Union Railways, *The Channel Tunnel Rail Link*; Cook's Continental Timetable.

- *High-Speed Trains:* Here there is a significant difference between the UK model (frequently-stopping services, operating at 200 km./h.) and the French/Spanish model (infrequent stops, speeds of 270-350 km/h.). Interestingly, the UK's new Channel Tunnel Rail Link (Stage 1, 2003; Stage 2, 2007) tries to combine both models (Table 2). The French model can help

significantly promote the growth of secondary cities, though the evidence (reviewed below) is inconclusive; the British model can serve as a further development of the Regional Metro, assisting a pattern of "concentrated deconcentration" into a polycentric mega-city-region with a radius of up to 140 km.

5.1.3 Policy Instruments

Against this background, the research proposal fir the TIR is that it would be useful to analyse the actual impact of different concrete policies – both those originating from the EU, and from member state governments – at previous stages of enlargement of the EEC/EC/EU. Specifically, to relate these impacts to the present position of the accession countries, it would be most useful to look at cases that are as possible comparable in size with the accession countries. This is however not easy, because – as already noted – several of the accession countries are relatively very small. *Table 5.3* tries to make comparisons.

Table 5.3 Comparison between Accession Countries (EU-10) and Present Member Countries (EU-12)

Accession Country	Area Sq. km.	Popn. Mill.	Comparison Country	Year of Entry	Area Sq. km.	Popn. Mill.
Cyprus	9250	767.3	Luxembourg	1957	2586	448.6
Czech Republic	78866	10256.8	Greece	1981	131940	10645.3
Estonia	45226	1415.7	**None**			
Hungary	93030	10075.0	Portugal	1986	92391	10084.2
Latvia	64589	2366.5	**None**			
Lithuania	65200	3601.1	Ireland	1973	70280	3883.2
Malta	316	397.5	**None**			
Poland	312685	38625.5	Spain	1986	504782	40077.1
Slovakia	48845	5422.4	Denmark	1973	43094	5368.9
Slovenia	20273	1932.9	**None**			

Source: CIA World Factbook; EU Website.

Direct Employment Generation

A first group of policies aims *directly to generate employment* in second- and lower-order cities and towns.

Policy: Decentralise government employment
Example: UK 1965-
Details: The UK government has made several large-scale movements of employment, especially in government agencies. Examples include the Driver and Vehicle Licensing Centre (Swansea, South Wales), the Benefits Agency (Glasgow, Scotland), National Insurance (Newcastle upon Tyne), the Inland Revenue (Nottingham) and the Research Councils (Swindon, Wiltshire).
Apparent Results: Considerable employment has been generated in the recipient cities and there are clear income multiplier effects. Shorter-distance moves may be partly reduced in impact by reverse commuting (as with some Research Council staff, who make the 2 x 124 km. commute daily).

Policy: Create new public institutions
Example: UK, France, Germany, 1965-
Details: Most European countries have created new universities in new locations since the mid-1960s, while existing universities have been expanded. In France this was part of the *métropoles d'equilibre* policy, designed deliberately to provide major provincial counterweights to Paris. Likewise, major hospitals were created or expanded, and employment in local government expanded.
Apparent Results: Education and health services are now among the major employers in provincial capital cities and in county-level towns.

Policy: Encourage Foreign Direct Investment (FDI)
Example: UK 1970-, Spain 1985-, German New Länder 1991
Details: Regional selective assistance has been used to attract overseas investment, especially in "growth manufacturing industries" such as vehicles and electronics.

Apparent Results: Extremely mixed: many investments proved very sensitive to economic downturns and to structural changes including globalisation, and a remarkably high proportion of the newly-built factories actually closed or substantially contracted soon after they opened. A recent study in the UK concluded that regional assistance had generated relatively few jobs at high cost.

New Transport Infrastructure

A second group of policies *deliberately focuses new transport infrastructure* on selected cities.

Policy: Intensively develop regional highway networks focussing on major cities
Example: Spain, Andalucia, 1992; Germany, New Länder, 1991-
Details: In conjunction with Expo '92, the regional government (*Junta de Andalucia*) rebuilt some 2000 km. of roads to motorway standard. Focussing particularly on Seville, the regional capital, this created one of the highest-quality networks in Europe. After 1991, the German Federal Government invested considerable sums to update the Autobahn network, which had been substantially unaltered since construction in the 1930s, widening most of the system from dual-2 to dual-3-lane standard and thus producing a network considerably superior to the West German equivalent.
Apparent Results: There appears to be little evidence of convergence in either case.

Policy: Route new high-speed rail lines to serve selected cities and regions
Example: Spain 1992 and 2003-, France 1994
Details: Spain's first AVE (*Alta Velocidad Española*) line, opened in conjunction with the 1992 International Expo, served Seville; the French TGV Nord (1994) was deliberately bent to serve Lille; RENFE, the Spanish state railways, are now constructing new lines to Barcelona/French frontier, Valencia, Valladolid/Bilbao and Lisbon, to be completed 2007.
Apparent Results: The Seville line boosted the position of Seville, but this was in conjunction with Expo '92, a one-off event. TGV Nord was used as the basis for major commercial development in Lille, including a World Trade Centre and a new hypermarket; evidence so far suggests that the results may not have been spectacular.

Policy: Build new airports, or expand airports, in secondary cities

Example: Sweden, Umeå, Luleå, 1970s; Spain, Seville, 1992; France, Lyon-Satolas, 1990s; UK, Manchester, 1990-; Germany, Leipzig-Halle, 2003

Details: In the 1960s and 1970s Sweden invested in new airports to help develop cuties in the remote north of the country. Spain rebuilt and expanded Seville airport in 1992 in association with Expo '92. Manchester Airport, owned by a consortium of local authorities, has steadily expanded and added a new runway in 2001. The new Leipzig-Halle airport, built by agreement between the Länder

Apparent Results: The new Swedish airports appear to have been of some assistance in regional development. The rebuilding of Seville airport in 1992 was associated with Expo '92, a one-off event. The steady expansion of Manchester Airport, including the second runway opened in 2001, has boosted it to 12th position among European airports in traffic terms, and has strongly helped Manchester assert its position as the first commercial city of Northern England.

Policy: Intensively develop local transport accessibility
Example: Spain, Madrid, 1998-

Details: Madrid is currently completing one of the largest programmes of local transport investment in Europe, including construction of 3 orbital highways and half a fourth, together with doubling the size of the Metro system from 126 to 233 km. during the eight-year period 1995-2003.

Apparent Results: Too early to assess, but Madrid has continued to grow very rapidly (to a population, within the Communal area, of 5.4 million) and has pulled away from other Spanish cities in key economic indices, attracting some 73% of FDI and generating a GDP per head 35% above the national average.

Culture, Leisure, Tourism and Sports Policies

A third group of policies builds on the *increasing importance of culture, leisure-based, tourism and sporting activities* to the economy of cities and regions.

Policy: Attract major one-off events with longer-term development potential
Examples: UK, Glasgow 1990; Spain, Barcelona and Seville 1992; Portugal, Lisbon 1998; UK, Manchester 2002; Greece, Athens 2004; UK, Liverpool 2008

Details: Olympics or smaller-scale sporting events have provided the trigger for large-scale urban regeneration in Barcelona, Manchester and Athens. Large expositions have

done the same for Seville and Lisbon. The European Capital of Culture title proved a major factor in changing the image of Glasgow, generating a new tourist economy, in 1990; the same is hoped for Liverpool in 2008.

Apparent Results: Some long-term effects are evident in Barcelona and Glasgow. These events are however very expensive to stage. Generally, they have benefited second-order cities, but may equally be established in national capitals (Lisbon, Athens).

Policy: Deliberately develop a cultural or tourist role

Example: Germany, Leipzig 1996; Spain, Bilbao 1997; UK, Newcastle-Gateshead 2000-

Details: As part of its regeneration efforts Leipzig built a spectacular new complex of buildings to help revive its historic fair, redeveloping the old site near the city centre as a business park and media centre. Bilbao, a former heavy industrial city in northern Spain, opened its Guggenheim Museum – designed by the Californian architect Frank Gehry – in 1997; it conveyed an instant image, and almost immediately made Bilbao a major tourist centre. Newcastle-Gateshead prepared its bid for the European Capital of Culture competition with the aid of a new art gallery in a converted flour mill and a new musical and concert complex next door; though the bid was unsuccessful, these facilities will help develop a new cultural image in an old industrial urban area. Such initiatives can benefit any level or kind of city, but have often been employed to regenerate old industrial cities.

Apparent Results: Too soon yet to say, except for Bilbao where the new gallery created a tourist trade.

Policy: Restore historic tourist quarters

Example: Czech Republic, Prague 1990-; Germany, Berlin 1992-; Germany, Dresden 1995-; Portugal, Evora 1985-

Details: Historic city centres and other quarters have been restored, often for new tourist uses, through a combination of public and private investment. Generally these efforts are ongoing.

Apparent Results: successful development of an urban tourist industry, sometimes spectacularly so; needs “city marketing”.

General

A final group is of a very general nature.

Policy: Develop policies of exchange of information and experience between cities.
Example: Almost universal, through twinning, development of specialist international conferences and seminars.
Details: Cities have undoubtedly learned a great deal about relevant international experience and best practice. There is clear evidence of diffusion.
Apparent results: appears to have speeded diffusion of best practice, especially n certain key areas (e.g. sustainable cities).

5.1.4 Impacts on Border Areas

One principal remit of ESPON 1.1.3 is to consider the spatial effects of enlargement on border areas. There are two such: (1) the present (pre-accession) border areas; (2) the post-accession areas.

The Present (Pre-Accession) Border Areas

An important fact here is that the two principal cities of East Central Europe, Berlin and Vienna, are currently (until 1 May 2004) very close to the EU borders: it is a mere 90 km. from Berlin to Frankfurt/Oder (Polish border) and 80 km. from Vienna to Bratislava (Slovak border). In 1914, both were capitals of extensive land empires, the Hohenzollern and Hapsburg empires, which extended very far to the east and south-east: 550 km. east-north-east from Berlin to Königsberg (Kaliningrad) in the case of Germany, 350 km. south-east from Vienna to the Serbian border just before Belgrade in the case of Austro-Hungary *(Fig. 1)*. Effectively, as the map shows, they were then close to the geographical centres of their respective empires. Since then, of course, huge geographical changes have occurred: Germany has lost much of its former eastern territories in the post-1918 and post-1945 settlements, while the Austro-Hungarian empire has been dissolved into a series of small or medium-sized nation states, four of which (Czech Republic, Hungary, Slovakia and Slovenia) will join the EU in 2004, while another large territory now forms part of a fifth, Poland. The

question nevertheless remains: given the size and centrality of these cities, including the fact that road and rail routes still converge on them in a way that reflects their past history, could they recover at least part of their former roles as high-order central places after accession?

This seems somewhat unlikely. In the case of Berlin, the German population of the former territories (Westpreussen, Ostpreussen, Schlesien) was forcibly removed and replaced by Polish peoples deported from the eastern side of Poland, then transferred to the former USSR, in 1945; hardly any element of the former German population lives in these territories. In the case of Vienna, the former ties of language and culture that united the territories – in particular the use of German as the common Imperial language, co-existing with the vernacular languages – disappeared after 1919, and most young people now speak English, not German, as a second language. Thus, apart from a common historical and cultural heritage which is European as much as Austrian, there are no obvious ties linking cities such as Prague, Bratislava, Kraków, Budapest or Ljubljana with Vienna.

Figure 5.1 Central European Empires and Capitals, 1914

More likely, perhaps, is the development of trading and recreational links. Some of the adjacent territories – the Sudety mountains, the Iron Gorge – are scenically attractive and are already much visited on weekends; Budapest and Prague are accessible for day trips, and will be even more so after the improvement of road and rail links which are now variable in standard but often quite poor. This in turn could lead to the acquisition of second homes as soon as restrictions on purchase are lifted – a particularly sensitive point in the Polish negotiations for accession, culminating in a compromise that preserved restrictions on foreign purchase of land close to the borders for seven years after accession. This in turn may stimulate local rural economies within easy reach (about 100 km.) of the borders.

Relevant here is the pattern of road and rail corridors. Essentially, these reflect the 19th-century geography, radiating from the former Imperial capitals of Berlin and Vienna, and going back even pre-1860 to the Hapsburg lands in northern Italy:

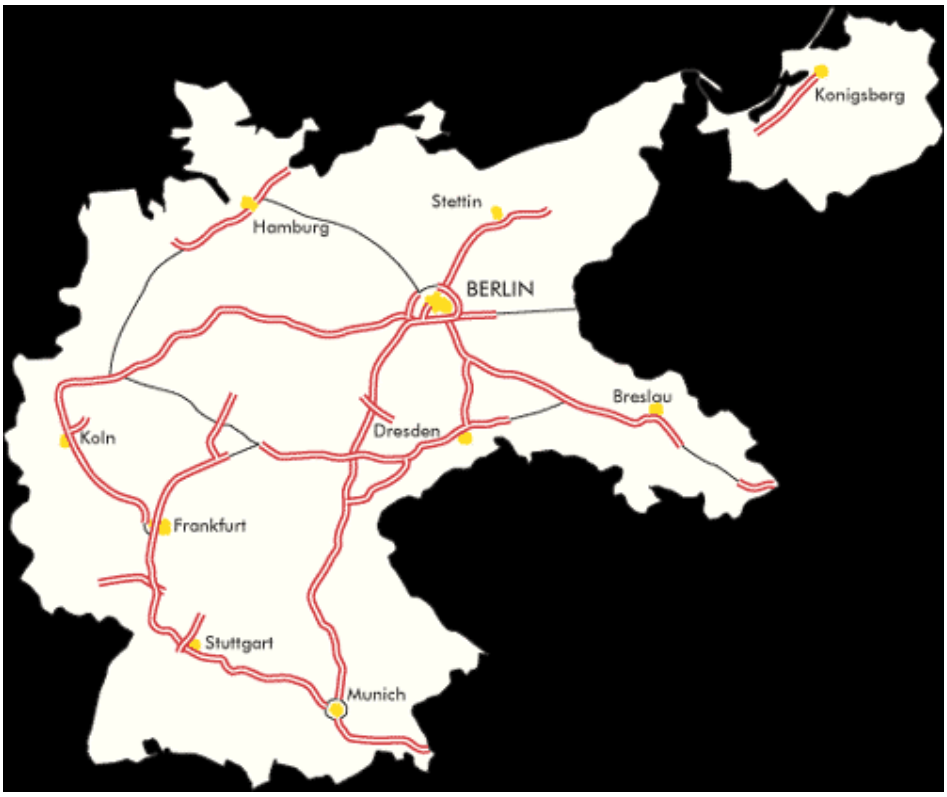
- *Berlin:* E28 Szczecin (Stettin) - Gdańsk (Danzig) – Kaliningrad (Königsberg); E30 Poznań (Posen) -Warszawa; E36 Wrocław (Breslau) - Katowice (Kattowitz) - Kraków; E55 Dresden - Praha (Prag);

- *Wien:* E60 Salzburg - München; E59/E55 Praha (Prag) – Dresden - Berlin; E50/E48 Praha (Prag) - Karlovy Vary (Carlsbad) – Bayreuth - Würzburg; E50 Praha (Prag) - Plzen (Pilsen) – Nürnberg – Mannheim - Paris; E50-E55 E55 Praha (Prag) – Dresden - Berlin; E58/E75 Bratislava (Pressburg) - Katowice (Kattowitz) - Warszawa; E60/E75 Budapest; E66 Graz – Klagenfurt -Venezia (Venedig).

There are additional corridors radiating from Prague, notably the E67 Wrocław-Warszawa.

The quality of these routes varies very greatly. Those radiating from Berlin are partially of motorway standard, reflecting Nazi construction for military purposes in the late 1930s *(Fig. 2)*; in some cases these were only part-completed (and/or suffered wartime destruction) but the right of way is established (e.g. the E36); some missing sections and extensions in Poland (Wrocław – Katowice and Katowice - Kraków) have been completed by the Polish government have been completed; the section Gdańsk– Kaliningrad is being restored by the Polish and Russian governments; and there are plans for upgrades under the TINA programme. Vienna is well-connected by motorways along most of the corridors listed above, but links through Slovakia and Poland are still to be constructed. However, there are some serious gaps where heavy traffic passes over sub-standard two-lane roads, notably the E 48 and E55 corridors between Prague and the German border.

Figure 5. 2 The German Motorway Network, 1940, inside the 1919-45 borders



Likewise, the quality of the rail system varies greatly. The Polish system is generally good and capable of high average speeds between major cities, with plans for a high-speed line between Berlin and ; the Czech and Slovak systems are however very sub-standard, with average speeds much lower than on the parallel road systems. These are reflected in the relatively low levels of accessibility away from the capital cities, already demonstrated in the analysis in Chapter 4.

A further relevant fact is that these corridors in general traverse thinly-populated rural areas with low development potential – across the north European plain in the case of Berlin, across mountain barriers in the case of Vienna. There are very few major cities close to the borders; the major exception, Szczecin (Stettin), is a major Baltic port and former member of the Hanseatic League, while Karlovy Vary (Carlsbad) and Mariánské Lázně (Marienbad), close to the Czech-German border, are spa towns. The major exception is the

Danube Valley between Vienna and Budapest, a distance of only 242 km., with the major intermediate cities of Bratislava and Győr, which carries a major motorway (the E60) and parallel railway; additionally, the Vienna International Airport is located on the corridor some 12 km. south-east of Vienna, with direct motorway and rail access. This corridor may well become a favoured destination for inward investment after enlargement.

The Post-Accession Border Areas

The post-accession border areas comprise at least four distinct groups:

- *Borders with Romania and Bulgaria*, due to join the EU in a second stage of accession sometime in the present decade, probably in 2007. The only common borders comprise a relatively short one between Hungary and Romania and a rather longer one between Greece and Bulgaria.

- *Borders with countries likely to join the EU after 2010.* These comprise countries constituting the former Yugoslavia (except for Slovenia, which declared independence in 1991 and will join the EU in 2004): Croatia, Bosnia and Herzegovina, Serbia, Kosovo and Montenegro. They share boundaries with Hungary, Romania, Bulgaria, Greece and Albania; after 2004, together with Albania, they will form an "enclave" within EU territory. Their representatives were invited to the EU Thessalonica summit in June 2003 to begin preliminary discussions on membership. It seems unlikely however that they will be able to satisfy all the conditions for membership before 2010.

- *Albania and Turkey.* Albania, still a country in an early stage of economic development, borders Montenegro, Kosovo and Greece. It is unlikely to be able to qualify for membership for the foreseeable future. Turkey has several times sought to apply for membership, but has so far not been able to proceed. Its small European section borders Bulgaria and Greece.

- *Territories of the former USSR.* These comprise Russia, Byelorussia, Ukraine and Moldova, which have a long land border with Estonia, Latvia, Lithuania, Poland, Slovakia, Hungary and Romania. None of these has plans for formal negotiations

on membership at present, and they seem likely to form an eastern border of the EU at least until 2015. In addition, the Russian territory of the Kaliningrad *Oblast* will form yet another "enclave" within EU territory after May 2004, and special visa arrangements have had to be made to deal with traffic (together with reconstruction of the former German *Autobahn* across the territory, scheduled for opening 2004).

All these four groups of countries (except Russia) may well negotiate to join the EU before 2020, but - with the exception of the first group – the outcome is not at all certain or clear. The most likely scenario therefore is that for some time throughout this decade and on into the next, the eastern border of the EU will be formed by Russia, Byelorussia, Ukraine and Moldova, with Albania and former Yugoslavia constituting an enclave within EU territory, bordered by Slovenia, Hungary, Romania, Bulgaria and Greece, and Kaliningrad forming another enclave, bordered by Poland and Lithuania.

All the eastern border is relatively thinly-populated, with long distances separating major cities; the capital cities of Minsk and Kiev are some 300 – 500 km. east of the border. It is therefore difficult to conceive that significant urban development will occur in this zone. The former Yugoslavian enclave is in contrast much more densely populated, with an important European transit route (E70/E75/E80 Venice - Trieste – Ljubljana - Zagreb – Belgrade – Sofia – Bucharest/Istanbul) crossing it, and with major cities – Zagreb, Skopje – close to the EU border. It seems likely therefore that there will be fairly intensive exchanges across this "enclave", particularly if peace is maintained and normal development processes resume.

It would be possible to try to simulate the effects of policy options for the border zones in the same way as for the accession countries generally. For the border of the EU-15 this could readily be done as part of the main exercise for the accession countries generally. For the new external border (post-May 2004) the key question concerns the range and quality of available data at a NUTS 3 level. This will need further examination.

5.1.5 Impacts on the EU Generally

A final question is whether the exercise implies consideration of effects across the EU generally, i.e. within the EU-15 as well as the accession countries. This is for further consideration and discussion.

5.1.6 Developing a Research Strategy

We think that the most promising approach to the measurement of impacts will be to develop a predictive model of the shift-share type, in which we seek to differentiate the spatial impacts of specified policies while holding other elements constant. The dependent variables would be indices of competitive performance such as inward migration, employment growth and GRP growth. The independent variables would be those listed above, after discussion and amendment with the ESPON 1.1.3 team.

Since by definition this would be a predictive model, it would be necessary to calibrate it by observation of actual past experience. As suggested above, we think that this could be done by reference to the experience of EU-15 nations in the period after their accession. The values this obtained would be used to model the likely impacts on accession countries.

There will be problems of data availability. Any model of this kind requires time series of key variables, desirably over several decades: 1973, the date of first enlargement of the-then EEC, would be an appropriate starting point. But the data base from EUROSTAT is presently quite deficient in this respect. We believe that much of the data can be quite easily obtained from national statistical sources.

A parallel problem concerns the spatial framework. NUTS 3, the framework for ESPON, is only just acceptable for the analysis of urban systems: especially in more densely-populated regions, the problem is that a single NUTS 3 region may contain more than one Functional Urban Area, performing in very different ways

which may cancel out at overall NUTS 3. We think that this may not be such a serious problem in analysing the accession countries, since (with a few exceptions, as mentioned above) they are fairly sparsely populated with relatively few significant cities and towns. However, a key question – for discussion at the Team's next meeting – is to what extent we shall have to take regard of the impact of enlargement not only on the accession countries, but also on the EU-15 urban system. Our argument is that we must, because only by looking at the past experience of EU-15 countries can we obtain any hard data about the actual spatial effects of entry.

5.2 Exploratory data analysis

Given the paramount importance of population distribution and population changes in determining the spatial structure of the enlarged Europe we provide here the results of an exploratory analysis performed on population data for the entire ESPON space. These results are presented both in tabular and map formats.

The analysis focuses on some simple indicators of population change, which have been computed for each NUTS3 region and goes one step further by investigating the spatial structure of population distribution according to three trend scenarios: two of them are based on growth rates adjusted according to the population scenario provided by the Eurostat Regio dataset and a third one is based on actual growth rates.

In the first section we provide a summary description of the indicators at the aggregate national level for all Cecc; in the second sections the analysis of the spatial distribution of population and the trend scenario are discussed. Finally in the third section we present the analysis of shifts in long term population growth as predicted in the trend scenario.

5.2.1 Population structure and change in Cecc

Total population at each point in time can be defined as P_t, population change as $P_{t+1} - P_t$, and population growth rate as $\lambda = P_{t+1} / P_t$. In this case λ represents a single step (1 year) growth rate and can be applied to the population data, which are available at NUTS3 in yearly steps from 1995 to 2000.

Through a recursion in time which links population at time $t+n$ as $P_{t+n} = \lambda^n P_t$ it is possible to define single step growth rates also for time lags of more than one year. This is defined as $\lambda = \sqrt[n]{P_{t+n} / P_n}$. Using this approach we have calculated the growth rate presented in *Fig. 3*.

Additionally, the performance of NUTS region growth rates against, respectively, the national and the EU15 growth rates can be computed as $\lambda_{N3} / \lambda_{N0}$ and $\lambda_{N3} / \lambda_{EU15}$. These indicators are plotted in terms of standard deviation from the mean values in *Figs. 4a and 4b*.

These growth rates as well as population percentage change for each Cecc country and the EU15 average are presented in *Table 4*. The intensity of population development and distribution is also described by a simple density indicator of the form $\rho = P_{t+1} / A$ where A is the area of each NUTS3 region. These densities are calculated for two time steps and absolute changes between the two densities are provided.

For each indicator the average values and the regional (NUTS3) minimum and maximum are provided. These overall data give an easy comparison of the scale of change occurring in each country but also of the variability of these changes each country and among the NUTS3 regions.

To get an overall sense of changes in population concentration in Cecc countries, relative differences in population densities $\left[(\rho_{t+1} - \rho_t) / \rho_t\right]$ scaled by 100 are plotted in Fig. 5.3.

These data confirm the general trend of population decline in enlargement countries described in the literature[25] and particularly the loss of population of urban areas in favour of their hinterland as in the cases of Prague, and Budapest, the only clear exception in this case being Sofiya.

We will use this type of indicators and exploratory analysis also when processing the result of the models and methodology discussed in the following sections.

Table 5.4 Summary of population indicators for Enlargement Countries

Bulgaria (1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-7.8292	-3.7950	2.0973
Pop Growth Rate t → t+1	0.9827	0.9920	1.0042
Population Density 1995	39.7651	95.5814	886.4431
Population Density 2000	36.6518	93.8127	905.0346
Pop Density Change t → t+n[26]	-4.1889	-1.7687	18.5915

Ceská Republika (1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-2.3908	-0.4363	0.4513
Pop Growth Rate t → t+1	0.9952	0.9991	1.0010
Population Density 1995	62.3539	288.8459	2446.0577
Population Density 2000	62.2545	284.2872	2387.5781
Pop Density Change t → t+n	-58.4795	-4.5586	0.4540

[25] IPTS, (2002), *IPTS/ESTO Studies on reforms of Agriculture, Education and Social Systems within the Context of Enlargement and Demographic Change in the EU, Final Report*, EC-JRC, http://www.jrc.es/projects/enlargement/

[26] The minimum value must be interpreted as the highest negative change and the maximum as the highest positive change.

Eesti			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-7.6923	-4.7216	-3.3557
Pop Growth Rate t → t+1	0.9836	0.9903	0.9930
Population Density 1995	15.5362	71.1177	126.6991
Population Density 2000	14.9075	68.1493	121.3912
Pop Density Change t → t+n	-5.3080	-2.9683	-0.6286

Magyarország			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-6.3087	-1.8719	6.3330
Pop Growth Rate t → t+1	0.9871	0.9961	1.0122
Population Density 1995	55.9973	269.2376	3653.3333
Population Density 2000	54.6720	256.6545	3422.8571
Pop Density Change t → t+n	-230.4762	-12.5831	9.6981

Lietuva			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-3.1250	0.3180	9.2308
Pop Growth Rate t → t+1	0.9955	1.0000	1.0127
Population Density 1995	28.1905	53.5593	93.9206
Population Density 2000	27.7739	53.4093	93.0521
Pop Density Change t → t+n	-2.4957	-0.1500	2.7205

Latvija			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-7.1360	5.1787	--2.9730
Pop Growth Rate t → t+1	0.9870	0.9902	0.9945
Population Density 1995	18.7086	79.6644	299.1922
Population Density 2000	18.1524	74.4422	277.8419
Pop Density Change t → t+n	-21.3503	-5.2222	-0.5562

Polska			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-3.5109	0.2706	3.2573
Pop Growth Rate t → t+1	0.9927	1.0006	1.0064
Population Density 1995	46.0132	461.4472	3315.7895
Population Density 2000	46.1708	455.6034	3267.2065
Pop Density Change t → t+n	-98.3051	-5.8438	4.5466

România			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-4.2125	-1.1073	2.5672
Pop Growth Rate t → t+1	0.9906	0.9980	1.0035
Population Density 1995	31.5339	302.2125	9000.8764
Population Density 2000	30.9455	296.0723	8777.3883
Pop Density Change t → t+n	-223.4882	-6.1402	3.8352

Slovenija			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-2.1277	-0.1751	1.0309
Pop Growth Rate t → t+1	0.9968	0.9994	1.0017
Population Density 1995	35.0275	99.8048	189.8239
Population Density 2000	35.0275	99.5830	191.7808
Pop Density Change t → t+n	-3.7879	-0.2217	1.9569

Slovenska Republika			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-0.3231	0.4131	1.9455
Pop Growth Rate t → t+1	0.9992	1.0009	1.0042
Population Density 1995	70.2274	131.4579	301.5100
Population Density 2000	70.0159	131.7884	300.5358
Pop Density Change t → t+n	-0.9742	0.3305	1.6680

EU15 (average)			
(1995-2000)	**MIN**	**AVG**	**MAX**
Population Change (%) t → t+n	-6.0309	1.7479	10.8558
Pop Growth Rate t → t+1	0.9862	1.0032	1.0187
Population Density 1995	37.3468	350.7899	4266.8522
Population Density 2000	38.2469	357.5913	4387.3566
Pop Density Change t → t+n	-33.7582	6.8014	143.6373

Cecc (average) (1995-2000)	MIN	AVG	MAX
Population Change (%) t → t+n	-7.9749	-1.3267	2.8065
Pop Growth Rate t → t+1	0.9837	0.9973	1.0048
Population Density 1995	35.9262	197.9314	2222.9016
Population Density 2000	35.3556	194.4851	2161.9222
Pop Density Change t → t+n	-75.6884	-3.4463	10.4033

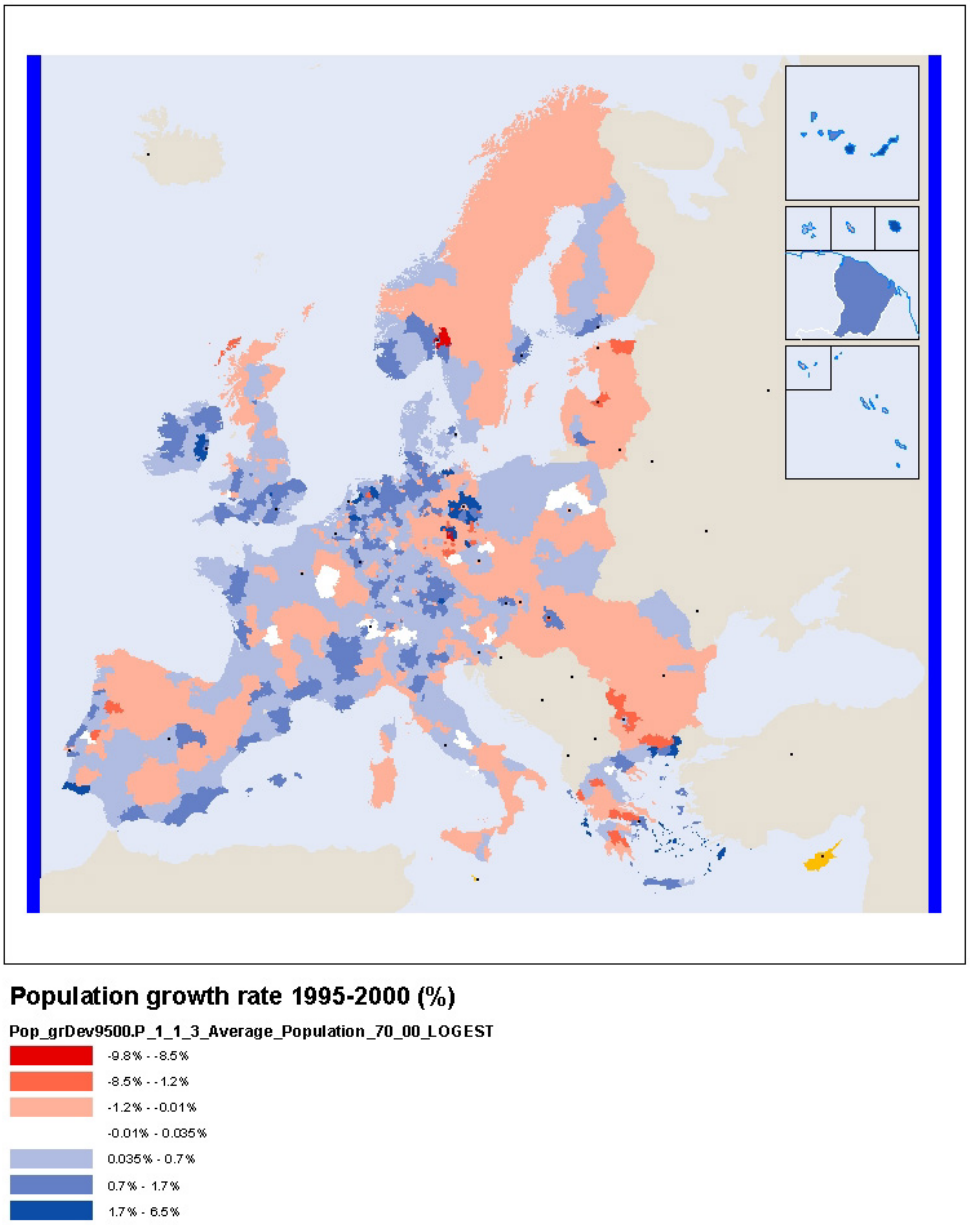
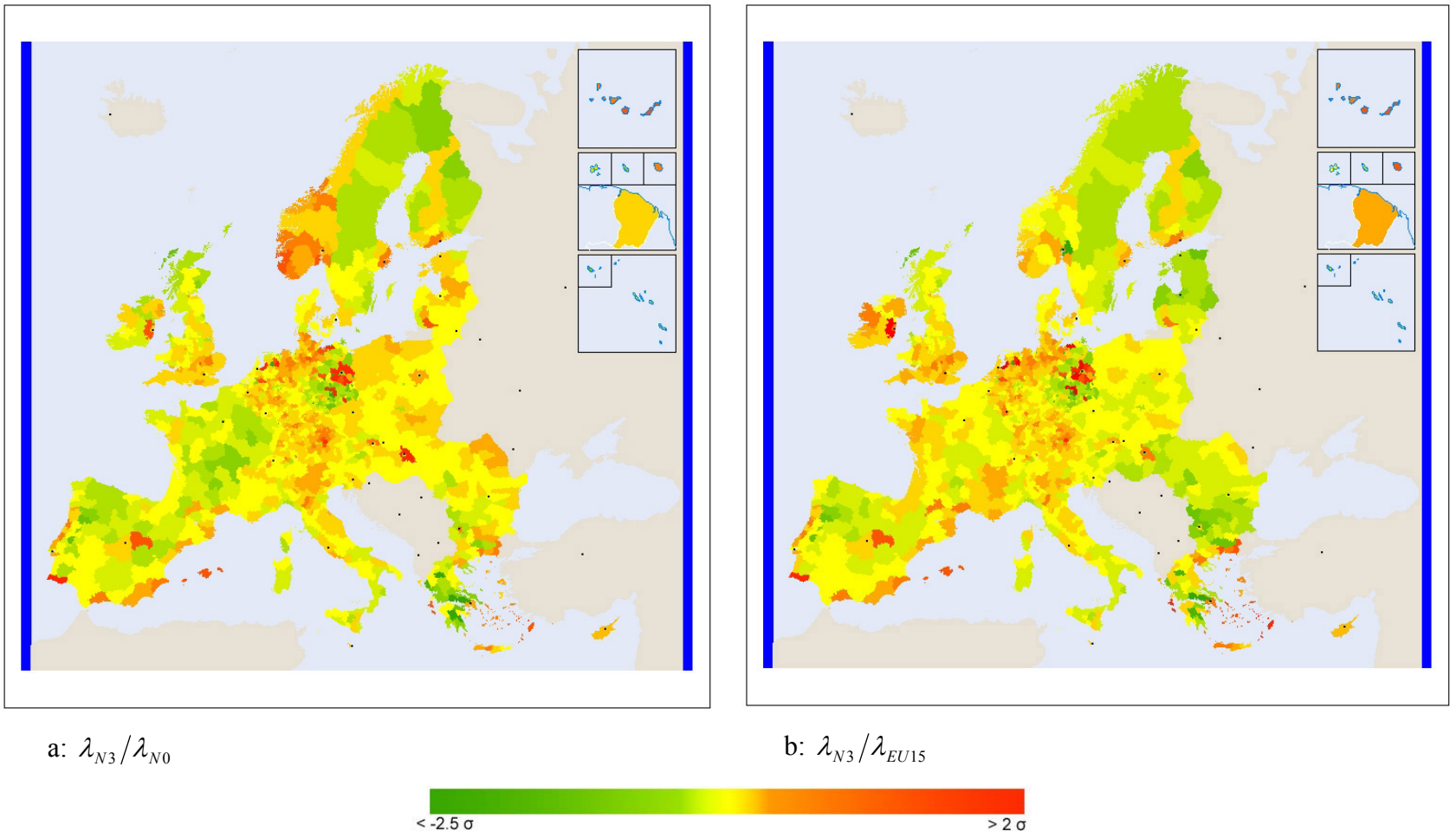


Figure 5.3: Population annual growth rate (1995 - 2000)



a: $\lambda_{N3}/\lambda_{N0}$

b: $\lambda_{N3}/\lambda_{EU15}$

Figure 5.4. Deviation of regional growth rates from national and EU15 rates

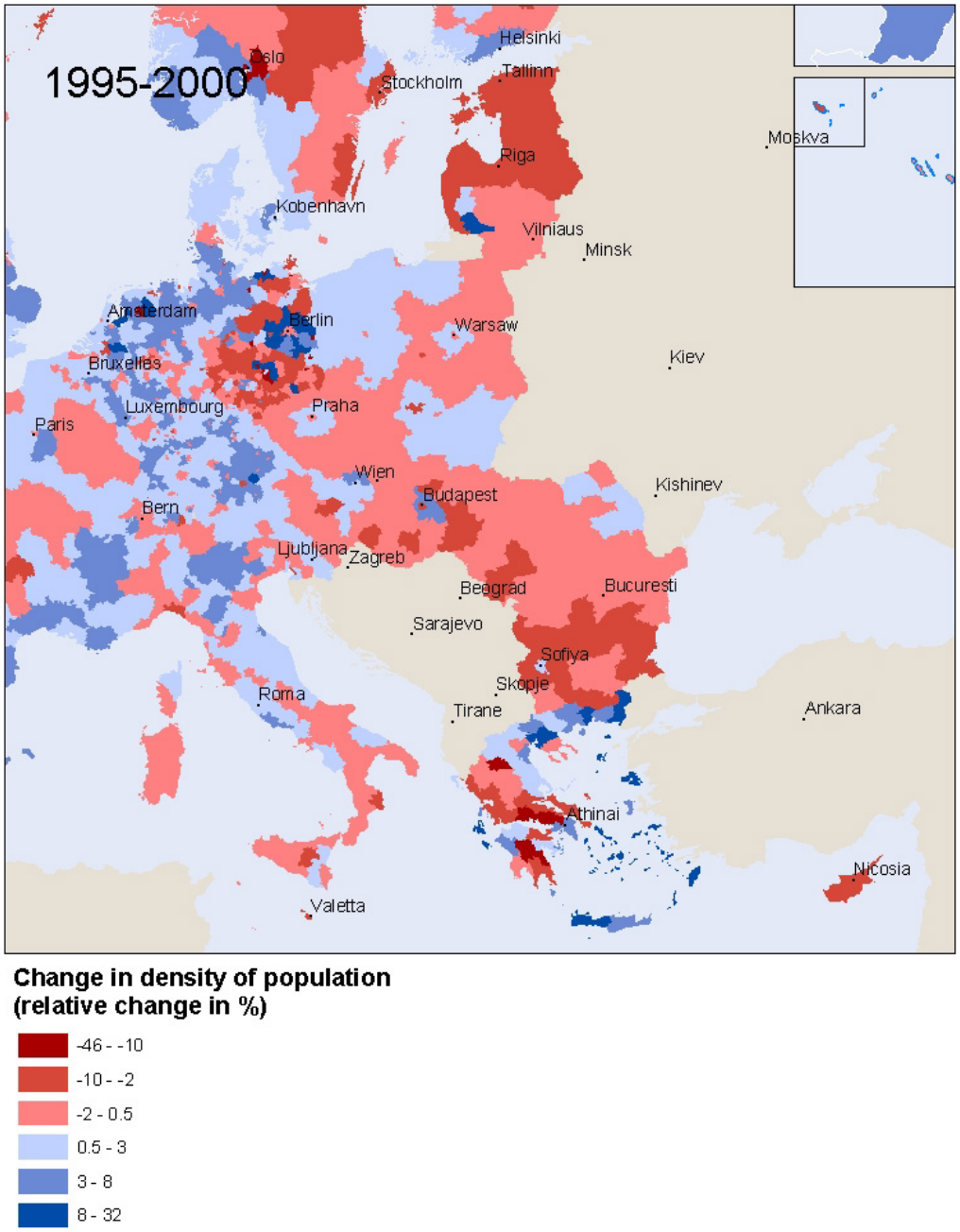


Figure 5.5: Relative change in population densities for Cecc

5.2.2 Population trends in the Enlarged Europe

We have approached the design and analysis of scenarios for the enlarged Europe by investigating the outcomes and implications of long-term projections of population trends. This approach isolates population trends from all other events and changes. By so doing it provides a background for preliminary qualitative and quantitative reasoning on the future spatial structure of Europe in an "all other things being equal" fashion.

Three different long term projection or scenario have been compared which are based on different growth rates applied at NUTS3 level. The first of these scenarios, (BASELINE) is based on actual growth rates computed as described above. For the other two scenarios (HIGH and LOW) the actual growth rates have been adjusted to fit Eurostat's population projections.

Eurostat provides population counts at NUTS2 (V6) level for the EU15 area, for medium term projections (1995 to 2025). Projections are based on three different assumptions for population growth: high, low and baseline growth.

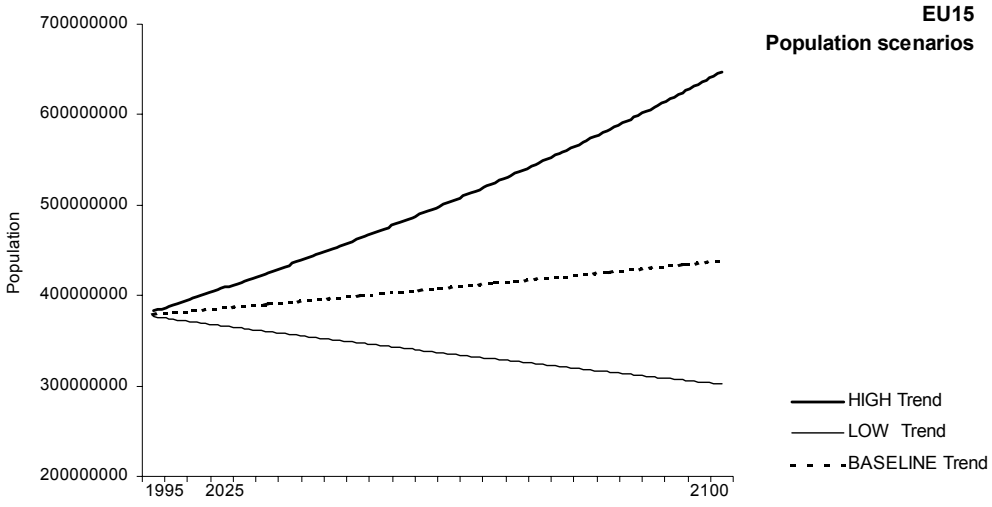


Figure 5.6. Eurostat population projections for the high, low and baseline scenarios

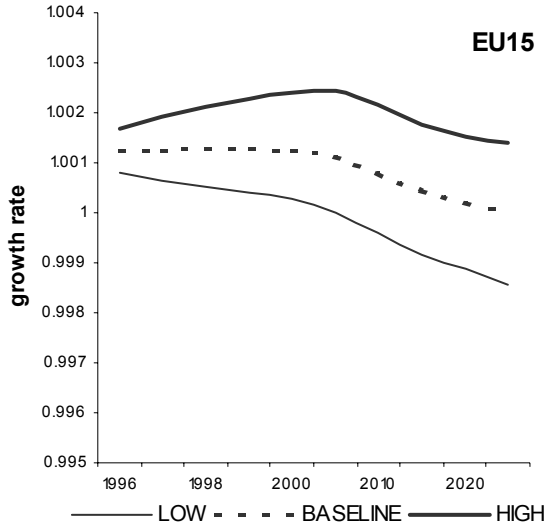
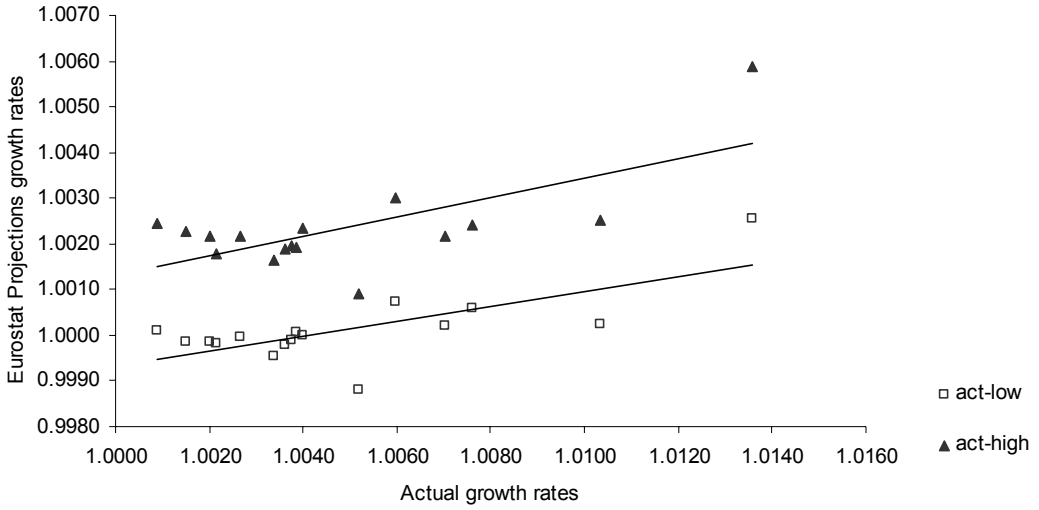


Figure 5.7. Growth rates computed on Eurostat Population projections for the high, low and baseline scenarios

The Eurostat's scenario data are only available at NUTS2(V6) and therefore the growth rates computed on the basis of these data cannot be directly applied to NUTS3 regions in order to project future population trends. Several approaches to data adjustment could be performed in order to overcome this barrier. In this case we have decided to use national average growth rates from the two different sources (growth rates computed on raw population counts and growth rates computed on Eurostat's projections) as the data series to compare. Our goal therefore was to find the best fitting function that would adjust our data to the Eurostat's.

A simple linear regression can provide a reasonable approximation of this function and at this stage of our investigation we are likely to accept the inherent levels of error. The parameters α and β of the linear function $\lambda_{eurN0} = \alpha\lambda_{actN0} + \beta$ have been estimated, where λ_{eurN0} is the Eurostat's growth rates at the national level for the high and low scenario and λ_{actN0} is the actual growth rate at national level. The same linear function and parameters have subsequently been used to adjust all growth rates at NUTS3 level in

our dataset so that $\lambda_{adjN3} = \alpha\lambda_{actN3} + \beta$ where λ_{adjN3} is the NUTS3 level growth rate adjusted to the low or high growth scenarios.



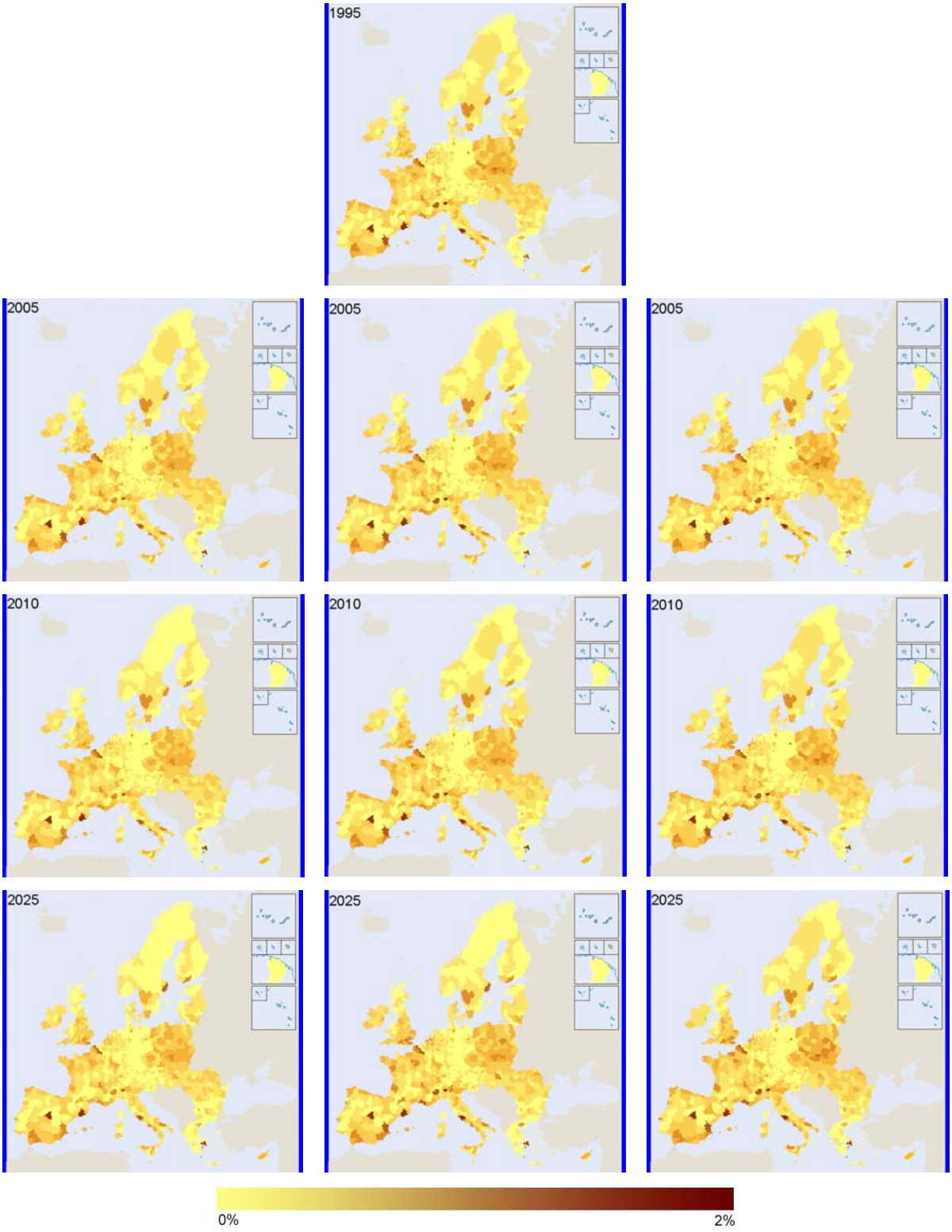
The adjusted growth for NUTS3 regions have been used for our HIGH growth and LOW growth trend projections that we have compared with population projections based on actual growth rates. For all three scenarios we have assumed $P_{t+n} = \lambda^n P_t$, using population data for 1995 as the starting point.

In the following section data from the baseline scenario projections are examined in terms of their rank-size distribution. Here the analysis of results from the three population projections are examined with the support of maps that plot the relative share of population at time *t* in NUTS3 *i*, $p_{it} = P_{it}/P_t$, where P_{it} is the total population at time t in NUTS I and $P_t = \sum_i P_{ti}$.

The maps displayed in Fig. 4 represent this relative share for the three scenarios and for key years. These maps are also available as digital animation at URL http://www.casa.ucl.ac.uk/espon/index.html. The differences in the spatial structures of population distribution among the three scenarios are clear at the year 2100 but they can already be identified at the year 2025.

All three scenarios generate intensive growth in South East England outside London (the so-called English Sunbelt), along the coasts of France and Spain, coastal areas in southern Italy, and major metropolitan areas in Scandinavia. There is also an intensification along the transport corridors London-Lille-Brussels and Rhine Valley. Interior regions are generally the losers with the exception of Paris, Lyon and Madrid. There is extensive growth in the accession countries, focused especially on the leading metropolitan areas, especially in Poland where Warszawa and Katowice-Kraków are major gainers.

However, there are also significant differences. High growth does not necessarily mean high growth everywhere. Dublin emerges as stronger in the low and medium growth scenarios than in the high growth one. So do Berlin and Budapest. South East England shows a greater extent of high growth in the medium scenario than in the other two.



Low growth scenario Baseline scenario High growth scenario

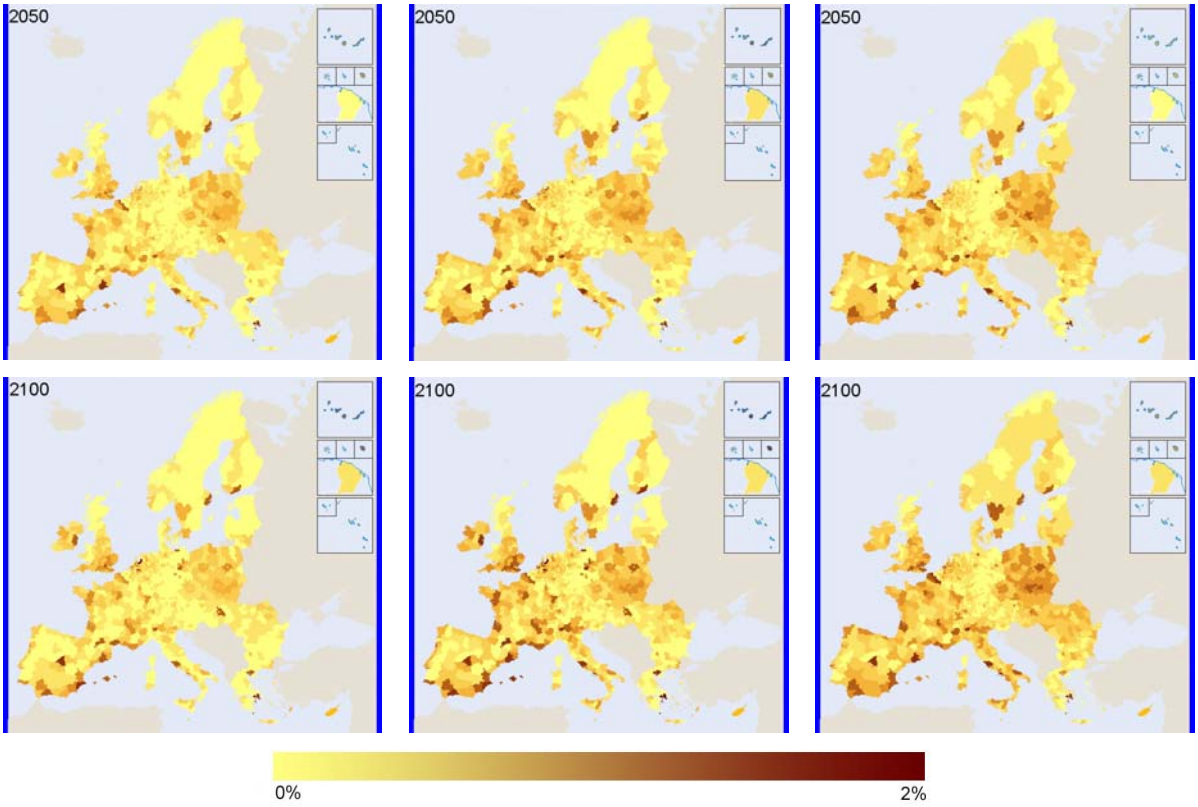


Figure 5.8. Relative share of population for the three scenarios.

5.2.3 Exploring Shifts in Long Term Population Growth

We have begun an analysis of city size distributions from our simple trend based population distributions. Such size distributions are lognormally distributed. A popular way of analyzing them is to take the long tail of largest sizes and to fit straight lines to these on the assumption that this part of the distribution is approximated by a power law. This is usually accomplished using the counter cumulative distribution of city sizes, which is the so-called rank size rule where city size is graphed against rank. If the system is concentrating then what happens is that the slope of this curve gets steeper, that is the power of the distribution falls.

We do not have city sizes per se but this analysis is theoretically applicable perhaps more so to partitions of the urban space than it is to single free standing cities from quite well established arguments in social and statistical physics. Without going into these we

simply state the relationship that we have fitted for several populations distributions predicted form the simple analysis above for 6 time periods. The relationship is

$$P_r(t) = K(t)r^{-\lambda(t)}$$

where $P_r(t)$ is population of rank r in NUTS3 at time t, $K(t)$ is a scaling constant at time t, and $\lambda(t)$ is the exponent which will fall if the system is becoming more concentrated over time. Usually we fit this straight line using the log linear form which is

$$\log P_r(t) = \log K(t) - \lambda(t) \log r$$

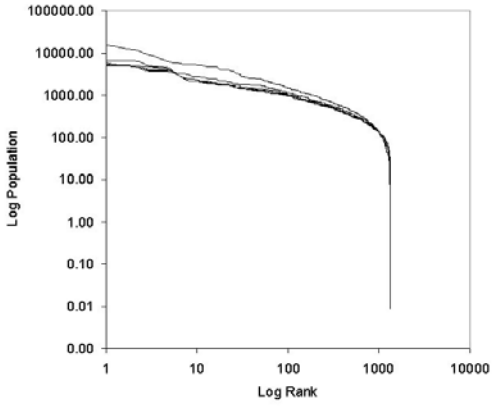
We have fitted this curve to population at 1995, our base date used for the computation of the growth rates between 1995 and 2000, 2005, 2010, 2025, 2050, and 2100. We show the size distributions below in logarithmic form where is quite clear that if we cut off the short tail leaving the top 500 NUTS3s which imply populations greater than around 300K, then we can approximate these by the rank size relation. We show the truncated relationships alongside the full data. The fitted relationships are shown below in the table where it is clear that significant concentration takes place over the next 100 years from these projections, the parameter $\lambda(t)$ falling from –0.51 to –0.65.

	1995	2005	2010	2025	2050	2100
R Square	0.967247	0.963592	0.962053	0.959943	0.967446	0.98185
Intercept	3.945106	3.963315	3.974485	4.014916	4.103619	4.441162
Slope	-0.51138	-0.51522	-0.5178	-0.52751	-0.54868	-0.65112

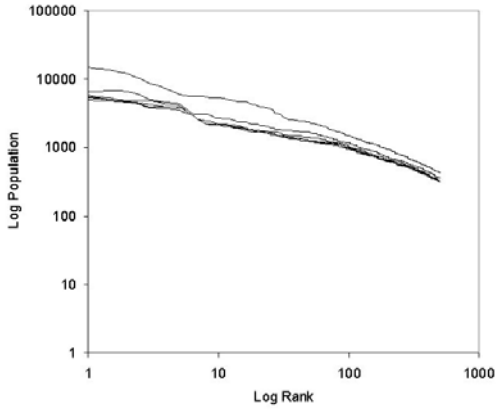
Note that these exponents are lower than those for free standing city systems which tend to be around unity and this is entirely explicable in terms of the relevant growth theory[27]

[27] M. Batty and N. Shiode (2003) Population Growth Dynamics in Cities, Countries and Communication Systems, in P. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 327-343)

Ranked Populations 1995 - 2100



Top 500 Ranked Populations 1995 - 2100



What is of more significance is the shift in particular places notwithstanding the possibility of substantial errors or idiosyncrasies in the computed 1995-2000 growth rates. What we can do is compare the existing 1995 and long term 2100 size distributions and see what places have shifted the most. If we graph the population sizes at 2100 against their ranks in 1995, this gives a very dramatic picture of the shift. We show this below. What it says is that some places such as Akerhus and Leipzig are really losing out; they fall dramatically down the hierarchy. Even places like Budapest fall quite significantly whereas Felovland and Attiki gain substantially and rise towards the top of the hierarchy.

What this shows is the shift in populations over a 100 year period. The biggest changes tend to be at the bottom of the hierarchy although there are substantial shifts towards the top as we note in the text. The grey curve is a plot of the 2100 population but using the 1995 ranks which is a way of showing shift between the lower smooth curve which is the distribution of the 1995 population and the upper curve, the 2100 population.

This simply gives a taste of what we are likely to do in the work that will follow. We will of course produce better forecasts and iron out errors and this will make our analysis more robust but we consider cit size distributions to be a good way of examining shifts in the hierarchies and already from the preliminary analysis we see substantial implications for cities and regions in the accession countries. The map analysis above also shows the peripheralization of growth in Europe as the heartland

decants and this too we will relate to size analysis in our work which follows this preliminary statement.

5.3 Methodologies, Models and Forecasting

5.3.1 The General Approach

In determining the impact of economic change on the spatial structure of urban and rural activity in the accession countries, we need a clear and unambiguous analysis of the impact of previous change on countries which have joined the EEC/EU since the 1970s. This analysis would be prior to any forecasting and we consider it would guide the forecasting model in that we will assess the importance of different determinants of spatial change from this analysis of the last 20 years or so. We would then develop a somewhat more aggregate model for futures forecasting which would contain the essence of our understanding of past change but would be also extend to the accession countries. The need for two different but related models – for understanding the past, and then for predicting the future – is solely based on data availability which is patchy to say the least.

In both models, we would configure the analysis to take account of the fact that data is available at different spatial scales with NUTS2 being more complete than NUTS3. The temporal structure of the data for the current EU countries is much more complete than for the enlarged EU with the accession countries, data being available at a number of points in time since 1979 for the current EU but only being available at 1995 and 2000 for the enlarged system. This is one of the main reasons why we consider two models are necessary. To account for the spatial and temporal variations, we will configure our models to take account of different levels of detail at different scales and time periods, invoking a multilevel approach reminiscent of shift share analysis wherever appropriate and necessary. The fact that our models will be linear in their direct structure enables such multilevel specifications to be developed.

The Initial Model: Analysis of Spatial Change from 1980 to 2000

We will structure the model in linear form attempting to assess the impact of a series of independent variables which we consider drivers of spatial change on a much smaller number of key dependent variables. All variables measuring spatial activity and its change at the level at which we have data for, combine both demand and supply factors which condition how urban and regional systems evolve. This means that the outcomes we observe through data are always some balance of demand with supply although it is important to consider how we might separate out these factors.

The choice of variables must therefore be based on:

1. Demand Factors: The dependent variables must express the outcomes of the input variables, and so should measure rates of (differential) change, particularly of population and/or the economy. The independent variables must best express the key policy variables (e.g. kilometres of road) and/or their influence (e.g. accessibility). These could be state variables (at start of time period) and/or change variables (during time period).

2. Supply Factors: the variables must be available for all countries at the right spatial resolution (preferably NUTS 3) for long time spans (desirably 20 years and more). It is particularly important if possible to measure effects before and after accession to the EEC/EU. These prove to be crucial because there is a severe lack of relevant data that meet the criteria.

Currently from the data that we have available for the last 20 years we can identify three key dependent variables:

- Population
- Employment and
- GRP.

We can measure these variables as increments or decrements of change or as rates of change. As we have not yet constructed these models, we have not decided in what form we will specify them but in our analysis, change either be estimated directly from time period to time period or will be a derivative variable from comparison of total activity

predictions at different points in time. Our model will of course involve lagged variables and in this sense will be truly dynamic.

The independent variables we will choose from comprise a much wider set of data, typically involving:

- Labour force in terms of the active population
- Employment in agriculture, industry, and services
- Accessibility: in terms of kilometres of motorway, railway, high-speed railway, airport daily direct connections
- Accessibility: in terms of accessible population within 50 km, 100 km, and 200km (and possible variants thereof)
- Indices of the knowledge economy in terms of workers in R&D, patents, tertiary programmes with occupation orientation, and tertiary education leading to an advanced research qualifications

To give an idea of how this model will be set up, then for each dependent variable we are likely to develop the following generic form:

$$Y_i^j(t) = \alpha + \sum_{k \neq j} \beta_k Y_i^k(t) + \sum_k \psi_k Y_i^k(t-1) + \sum_\lambda \psi_\lambda X_i^\lambda(t-1) + \varepsilon_i^j(t)$$

where $Y_i^j(t)$ is the j'th dependent variable associated with region or zone (NUTS) i, $Y_i^k(t-1)$ is the k'th dependent variable lagged one time period and associated with zone i, and $X_i^\lambda(t)$ is the λ'th independent variable. $\varepsilon_i^j(t)$ is the appropriate error term.

In this structure there are three classes of independent variable, the first two being functions of the dependent variables. The first class is the same as the dependent variable set and all this means is that we consider that dependent variables other than the one being predicted have an influence on each other. The second class are those variables that are lagged forms of the same dependent variable which we might refer to as trend variables. The third class are the truly independent variables such as those in

the above list which we would need to estimate were we to use this model in forecasting. In fact one of the reasons why we are suggesting a second model after this one has been fitted is that it is most unlikely that we will be able to forecast the set of independent variables used here and thus the second model will be a much simplified version of the first. Nevertheless this first model will be used to engage in qualitative analysis of spatial change over the last twenty years which should tell us how important these various independent variables are.

The Second Model: Forecasting Until 2025

We think that a much stripped down form for the forecasting model based on the data we know is available for the accession countries as well as the current EU suggests that our model predict just two rather than three dependent variables – population and employment. We consider that these variables will act on each other simultaneously as in the first model, and that they would be lagged through time to reflect the absolute stock and the trend. The variables we consider necessary for forecasting are entirely accessibility-based variables as we can compute these easily enough for many different scenarios and trends. These also relate directly to other parts of the ESPON programme and this work package which we consider will be able to provide us with estimates. We will state these equations directly for population $P_i(t)$ and employment $E_i(t)$. Then

$$P_i(t) = \alpha + \beta_1 E_i(t) + \psi_1 P_i(t-1) + \psi_2 E_i(t-1) + \sum_k pA_i^k(t) + \varepsilon_i^p(t)$$

$$E_i(t) = \alpha + \beta_2 P_i(t) + \psi_{31} P_i(t-1) + \psi_4 E_i(t-1) + \sum_k eA_i^k(t) + \varepsilon_i^e(t)$$

where $pA_i^k(t)$ and $eA_i^k(t)$ are appropriate population and employment orientated accessibilities, and $\varepsilon_i^p(t)$ and $\varepsilon_i^e(t)$ the relevant error terms.

We are also thinking of adding to this model some kind of dummy variable which represents 'policy'. What this would do is to enable us to switch a place up or down by turning this dummy on or off and giving it different values. It represents a way of adding very large lumps or subtracting very large lumps of activity to the forecasting

procedure. All it means is that the model structure would be augmented in the following way $P_i(t) = \alpha + \beta_1 E_i(t) + \psi_1 P_i(t-1) + \psi_2 E_i(t-1) + \sum_k pA_i^k(t) + \varepsilon_i^p(t) + \delta_i^p(t)$

$$E_i(t) = \alpha + \beta_2 P_i(t) + \psi_{31} P_i(t-1) + \psi_4 E_i(t-1) + \sum_k eA_i^k(t) + \varepsilon_i^e(t) + \delta_i^e(t)$$

where $\delta_i^p(t)$ and $\delta_i^e(t)$ are the appropriate policy switch dummies.

This model would, like the first, be fitted to past periods of time in the sense that we see it as being a way of collapsing the initial model. We would use this model to predict populations and employments in yearly periods (as all our models would be discounted to the standard period of one year no matter what time periods they were initially fitted to). The forecasting would be taken much further than 2025, probably to 2100 or 2200, to examine the very long term where we can assess the structural changes that are implied in the forecasting. We would develop similar techniques to those we are already using – noted above for working directly with the raw data in our trend-based analysis.

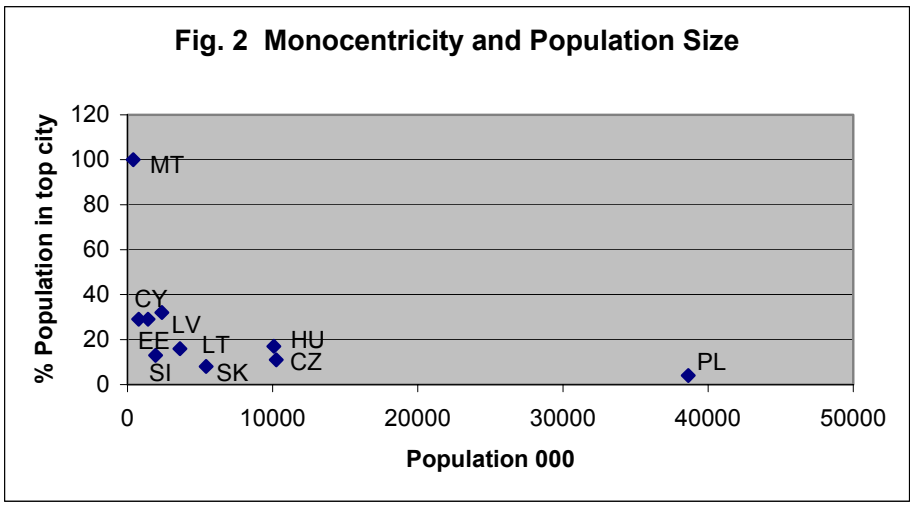
The Multilevel Structure

Depending upon data availability at different spatial scales, it is likely we will build the same model at more than one scale. These would give different predictions which we should examine and which would inform our discussion, However we have the possibilities of reconciling these in iterative form. For example, if we had two models predicting population at two spatial scales, say NUTS2 and NUTS3 where we call the population in each NUTS2 $P_k(t)$ and in each NUTS3 $P_i(t)$, then after a prediction with each, we would sum the populations at the lower level NUTS3 $\sum_{i \in \Omega_k} P_i(t)$ and compare with NUTS2 $P_k(t)$. Note that we define a NUTS2 zone as comprising zones *i* which are part of Ω_k. If these were different, we would then engage in some iterative process depending upon the confidence we had in each prediction. We are more likely to get better predictions at the NUTS2 level and thus what we might do is scale the NUTS3 estimates to reflect the aggregates in NUTS2. If these models were recursive in that the dependent variables appeared on both sides of the equations, then we would reiterate the model forecasts with these new population values until convergence.

There are many different schemes we might employ but this is simply to flag the fact that we are likely to engage in such massaging of the predictions so that we can gain the most likely outcomes from our forecasting. A related development would be to structure the models themselves at different levels in the manner of shift and share analysis, and we will also consider this in a couple of months when we come to specify and estimate the appropriate models. In terms of the development of these models, then we would also derive new indicators from the dependent variables once we have finalised the indicator set. In short what we would do is to use scaling coefficients for difference places and countries which would turn the basic estimates of population and employment, and the implicit migration which is associated with these projections into indicators of wealth and prosperity, disadvantage and so on. It is not likely to be possible to predict these directly and thus we will resort to using population and employment as the key determinants of future spatial structures and features that flow from these.

5.4 Conclusion: Polycentricity and Geographical Scale

Most of the accession countries are relatively small in area and population, and this appears to favour a monocentric pattern of urban development. Fig. 2 shows this relationship clearly. In the extreme case (Malta), most of the country consists of a single city state. In others (Estonia, Slovenia), there are essentially no significant second-order centres, and any third-order centres are within easy commuting distance of the first-order capital, making it likely that they will effectively become suburbs within a single small “mega-city region” covering the entire country or a very large part of it.



Source: **Data from this chapter; Population (2002 estimates) from CIA *World Factbook***

Figure 5.2 Monocentricity and Population Size

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Chapter 6: Enlargement Scenario 2

One of the main obstacles for the integration of the candidate countries in eastern Europe is the poor quality of transport infrastructure in these countries and between these countries and western Europe. This problem has already been address by the Transport Infrastructure Needs Assessment (TINA) programme of transport infrastructure corridors for the accession countries (TINA, 1999; 2002). However, the territorial impacts of the TINA projects and the related trans-European transport network (TEN-T) projects are not clear at all. The outcome might be a higher level of cohesion but also an increase in spatial disparities.

Therefore a second scenario study will assess the impacts of the TEN-T and TINA projects on the regions in the accession countries. The method used for this will be the regional economic model SASI already used in ESPON 2.1.1. In ESPON 1.1.3, the SASI model will be used to forecast the socio-economic development of the regions in the accession countries during and after their entry into the European Union taking account of the expected reduction border barriers, such as border waiting times an customs procedures through the accession and of different scenarios of implementation of the TEN-T and TINA projects.

6.1 The SASI Model

The SASI model is a recursive simulation model of socio-economic development of regions in Europe subject to exogenous assumptions about the economic and demographic development of the ESPON Space as a whole and transport infrastructure investments and transport system improvements, in particular of the trans-European transport networks (TEN-T) and TINA networks . For each region the model forecasts the development of accessibility, GDP per capita and unemployment. In addition cohesion indicators expressing the impact of transport infrastructure investments and transport system improvements on the convergence (or divergence) of socio-economic development in the regions Union are calculated.

The main concept of the SASI model is to explain locational structures and locational change in Europe in combined time-series/cross-section regressions, with accessibility indicators being a subset of a range of explanatory variables. Accessibility is measured by spatially disaggregate accessibility indicators which take into account that accessibility within a region is not homogenous but rapidly decreases with increasing distance from the nodes of the networks. The focus of the regression approach is on long-term spatial distributional effects of transport policies. Factors of production including labour, capital and knowledge are considered as mobile in the long run, and the model incorporates determinants of the redistribution of factor stocks and population. The model is therefore suitable to check whether long-run tendencies in spatial development coincide with development objectives discussed above.

The SASI model differs from other approaches to model the impacts of transport on regional development by modelling not only production (the demand side of regional labour markets) but also population (the supply side of regional labour markets), which makes it possible to model regional unemployment. A second distinct feature is its dynamic network database based on a 'strategic' subset of highly detailed pan-European road, rail and air networks including major historical network changes as far back as 1981 and forecasting expected network changes according to the most recent EU documents on the future evolution of the TEN-T and TINA networks.

The SASI model has six forecasting submodels: *European Developments*, *Regional Accessibility*, *Regional GDP*, *Regional Employment*, *Regional Population* and *Regional Labour Force*. A seventh submodel calculates *Socio-Economic Indicators* with respect to efficiency and equity. Figure 6.1 visualises the interactions between these submodels.

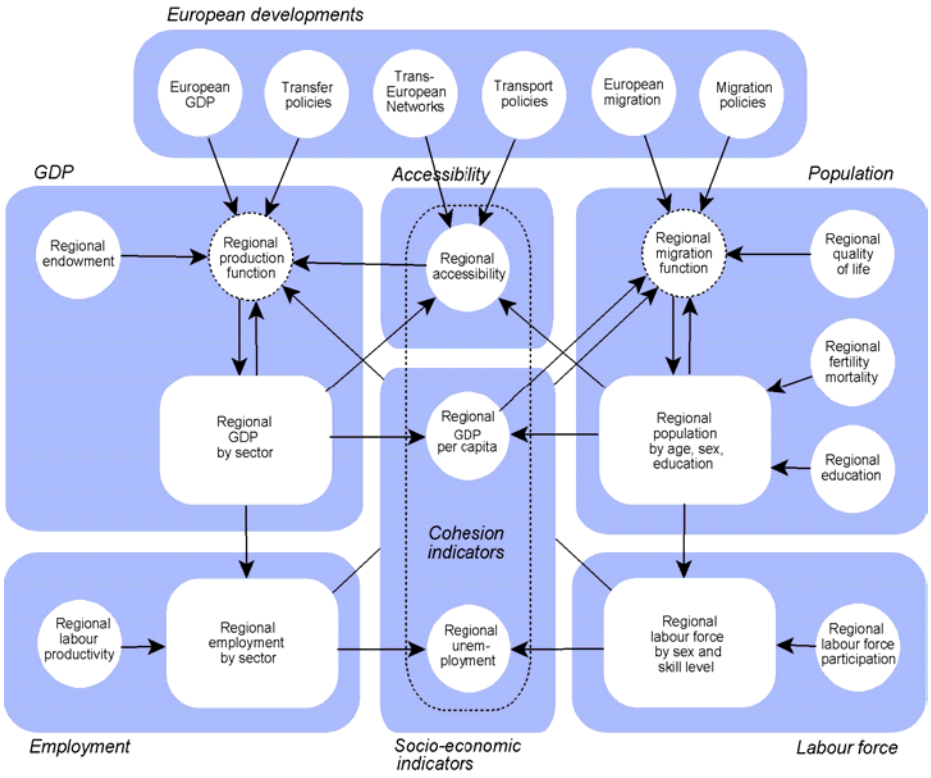


Figure 6.1. The SASI model

The *spatial* dimension of the model is established by the subdivision of the European Union and the 12 candidate countries in eastern Europe plus Norway and Switzerland in 1,321 regions and by connecting these regions by road, rail and air networks. For each region the model forecasts the development of accessibility, GDP per capita, employment, population and labour force. In addition cohesion indicators expressing the impact of transport infrastructure investments and transport system improvements on the convergence (or divergence) of socio-economic development in the regions of the ESPON Space are calculated. The *temporal* dimension of the model is established by dividing time into periods of one year duration. In each simulation year the seven submodels of the SASI model are processed in a recursive way, i.e. sequentially one after another. This implies that within one simulation period no equilibrium between model variables is established; in other words, all endogenous effects in the model are lagged by one or more years.

More detailed information on the SASI model and its implementation and preliminary calibration for ESPON can be found in the Third Interim Report of ESPON 2.1.1.

6.2 Preliminary Model Results

With the calibrated SASI model ten transport policy scenarios defined for ESPON 2.1.1 were simulated. Here the results of one these scenarios, scenario B3, will be briefly summarised. More information can be found in the Third Interim Report of ESPON 2.1.1.

Scenario B3 assumes that in the period 2001-2001 all designated TEN-T and TINA transport infrastructure projects will be implemented as documented in the latest revisions of the TEN-T and TINA programmes (European Commission, 1999; 2002 and TINA, 1999,2002).

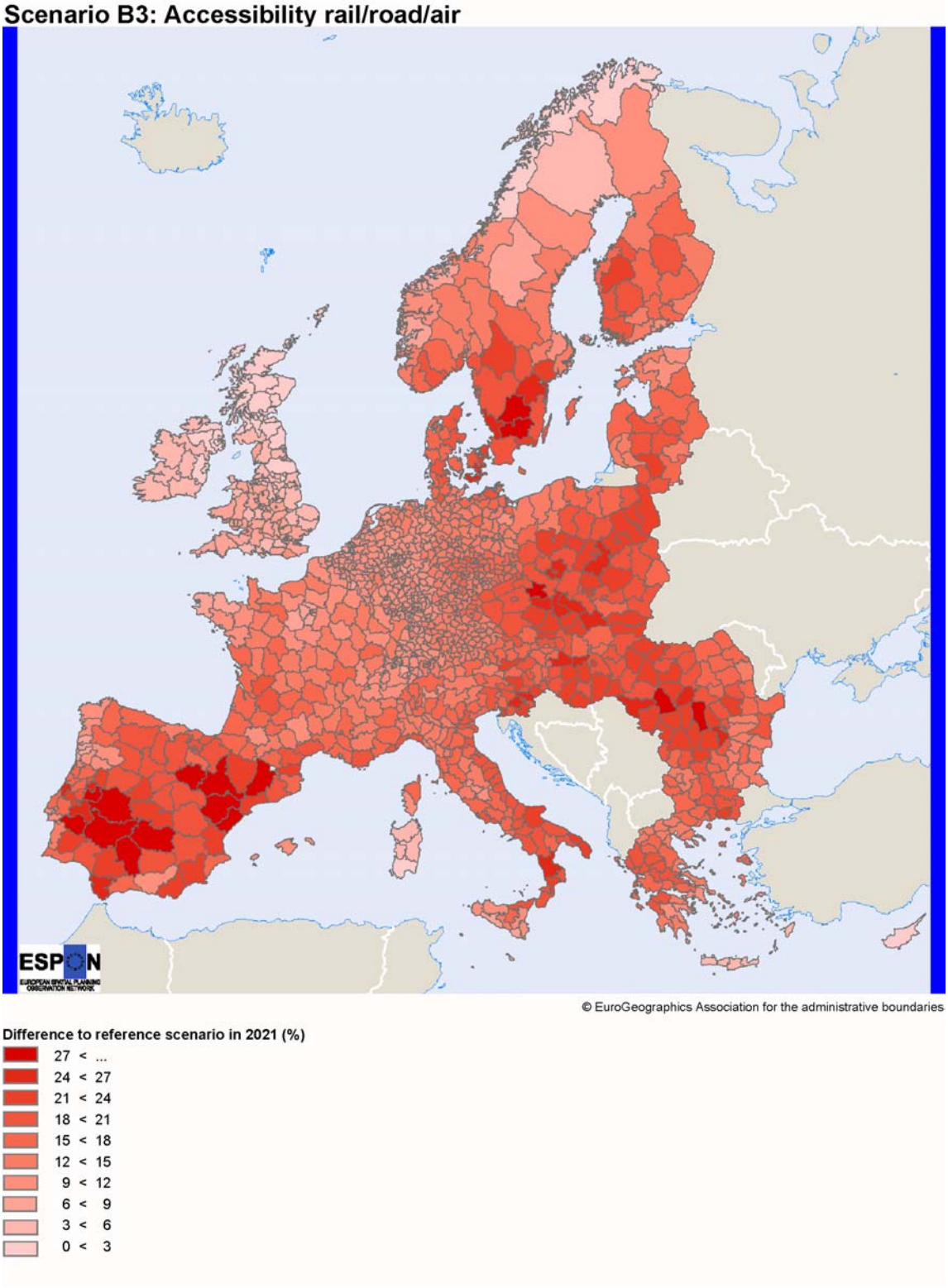
Map 6.1 and 6.2 show differences in accessibility and GDP per capita compared with a reference scenario, in which no transport infrastructure projects are implemented after 2001, for the NUTS-3 regions in the present European Union, Norway and Switzerland and the candidate countries in eastern Europe in the year 2021.

As to be expected, accessibility is improved in all regions, as the scenario assumes infrastructure investments and improvements compared with the respective reference scenario. However, as Figure 6.2 shows, the relatively large differences in accessibility translate into only very small differences in GDP per capita. Despite the huge transport investments, no region gains more than a few percent in GDP per capita as a consequence of these investments – and this over a period of two decades. And the direction of the effects is not so straightforward as in the case of accessibility. The SASI model takes account of interregional competition, and although it does not assume a zero-sum game, there are winners and losers.

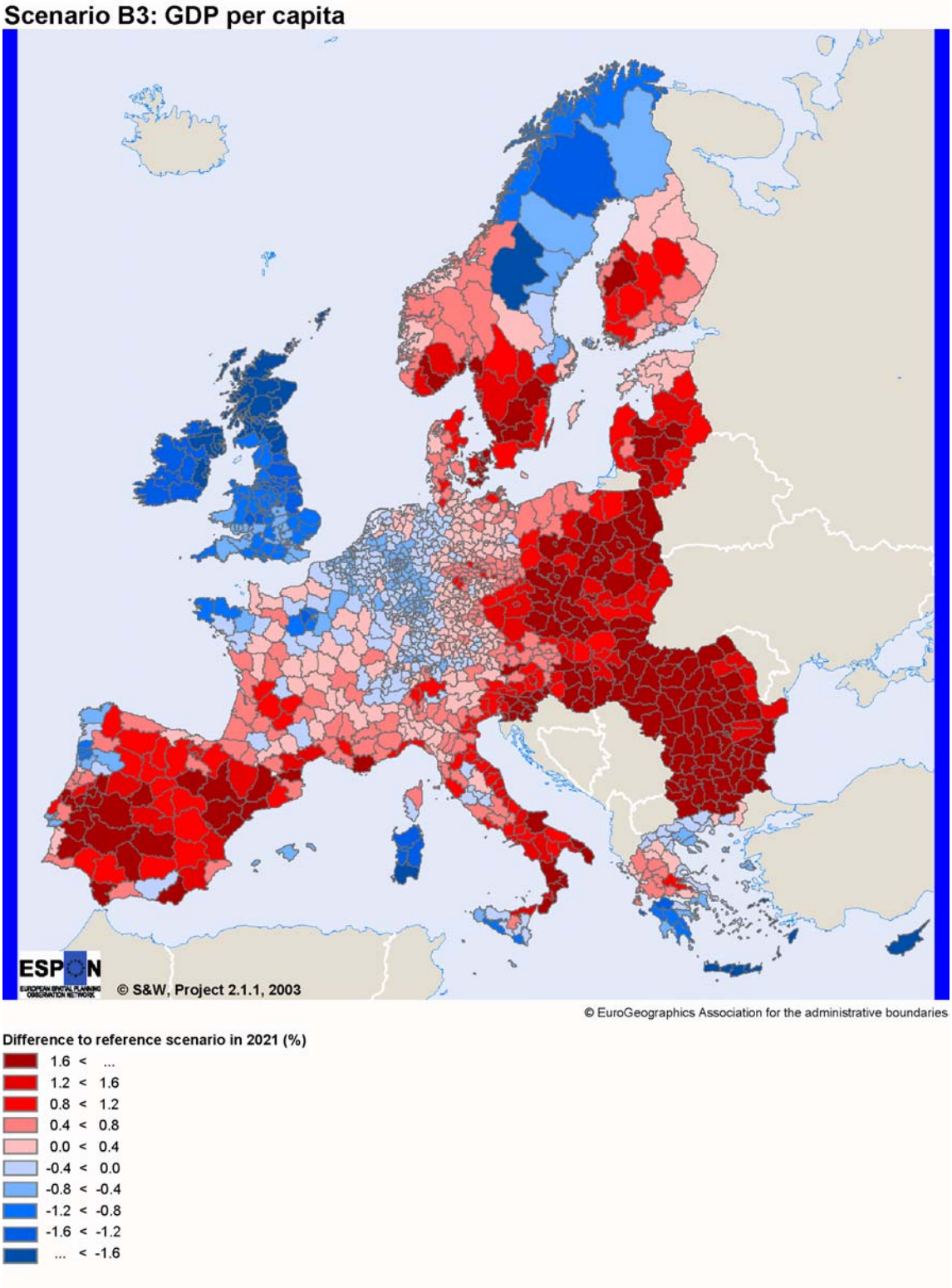
It can be seen that the huge investments for the trans-European transport networks (TEN-T) are not likely to bring much overall economic growth to the regions in the present European Union. In fact many most central regions in north-western Europe even lose in terms of GDP per capita in relative terms compared to the reference

scenario. The clear winners are the peripheral countries, including the candidate countries in eastern Europe. So clearly the TEN-T and TINA projects seem to support the integration of the accession countries into the European Union.

However, one should not take this as a proof that the TEN-T and TINA projects in fact reduce the disparities in wealth between central and peripheral countries. If *absolute* differences in GDP per capita are considered, the peripheral countries, because of their low GDP per capita, gain much less than some of the more central regions and so turn from relative winners into absolute losers.



Map 6.1 Scenario B3: accessibility difference (%) compared to reference scenario in 2021



Map 6.2 Scenario B3: GDP per capita difference (%) compared to reference scenario in 2001

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Chapter 7: Future challenges and next steps[28]

Several of the special challenges to be addressed in both the enlargement process and even in project 1.1.3's future work include FDI, R&D expenditure, high-tech sectors, physical infrastructure, migration and movements of human capital, and regional specialisation and clustering, as well as some of the specific aspects mentioned below.

7.1 Enlargement – towards spatial impact assessment

The most important spatial effects of EU enlargement can be envisaged in terms of GDP, changing sectoral structure, trade and regional specialization, public and private investments, social costs e g unemployment, population density and migration flows on the regions in the accession and candidate countries and in EU15 regions[29]. Given the large differences in industrial structure, physical capital, socioeconomic conditions and accessibility within Accession and Candidate countries, it is obvious that least favoured regions and border regions should be in the focus of the spatial impact analysis.

Although a number of studies exist on possible economic implications of enlargement (e.g. European Commission, 2001c; Boeri *et al.,* 2002; Baldwin *et al.,* 1997; Breuss, 2001; Sapir 2003), few studies have so far been concerned with the expected spatial pattern of economic benefits from the enlargement, neither within the accession countries nor in the EU15 Member states. In the studies referred, it is argued that enlargement as such is likely to produce economic benefits, to both current members and the accession countries. The outcome within each new Member state, however, is expected to depend also on how national and regional policies are pursued. Estimates of economic gains - both static and dynamic effects - from enlargement in GDP vary up to 0.7% for EU15 and up to as much as 19% for the new Member States for the period 2000-2010. It is important that part of those gains have already materialised with the development of integration between the accession countries and the current members. In spatial terms, it is also important to recall that the pattern of economic growth in all accession countries during recent years is that the larger urban areas and capital regions

[28] Written by Lars Olof Persson and Lisa Van Well, KTH

[29] Cf. Addendum to the contract for ESPON 1.1.3 concerning the SIR in August 2003.

in particular are gaining more than other regions and that national peripheries generally gain much less.

As the studies above studies address, there are a number of risks and potentials involved in the enlargement process. Among those is the potential (but rather unlikely) for mass migration after opening up borders, involving risks of depopulation in parts of accession countries, but also increasing labour supplies in EU15 member states approaching labour shortage in a near future. A more likely risk and potential is industrial relocation to new members, which may move jobs from old industrial regions in EU15 to low-cost regions in the enlarged EU. This could add to regional problems in current Objective 1 and 2 areas in EU15 in the expected reduction of structural fund transfers.

Several of these potential spatial effects – which already are visible - arise logically as a consequence of the elimination of remaining barriers to the free flow of goods, services, and production factors. As important as these market led effects, are the inclusion of new members in CAP and EU structural policies. Eventually the single monetary policy will emphasize the market led effects.

7.2 Income disparities as a driving force

The differential economic performance within both the EU15 and the Accession and Candidate countries is substantial. The range starts at 36 % of EU15 average in 2000 in the poorest performing NUTS3 in EU15, at less than 20 % in the least performing regions in the new Member states.

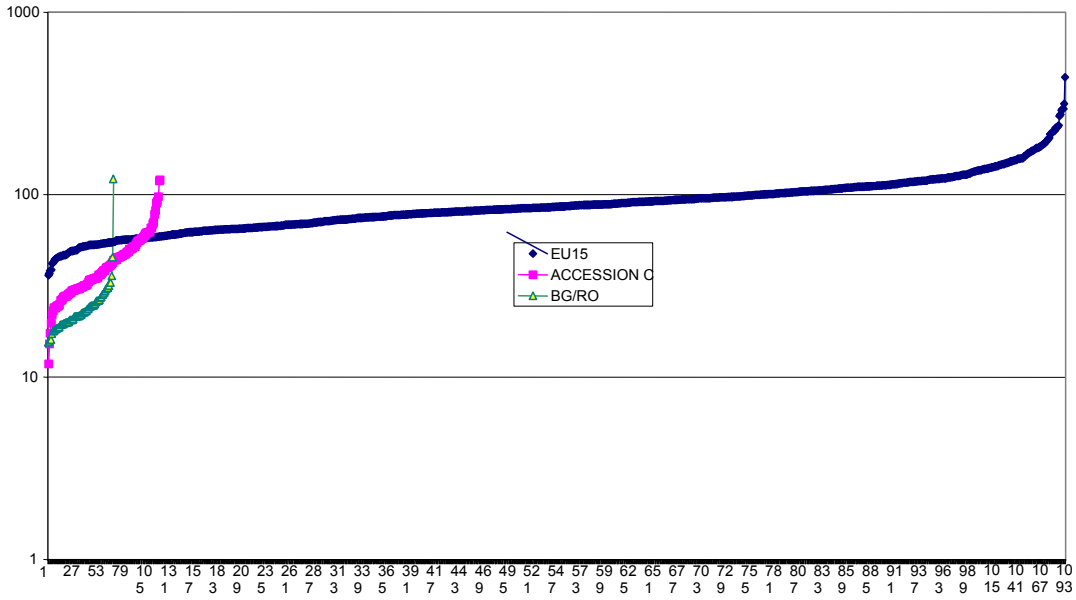

Figure 7.1. GPD per capita 2000 in NUTS3 regions in EU15, Accession countries and Romania and Bulgaria. Source. ESPON Database EU 15 average=100

Correspondingly, the existing income disparities between current and new members are substantial. At purchasing power parities, the average *per-capita* income in the ten candidate states in 2001 was at 45% of the EU15 level. This average masks important differences between individual countries, with income levels varying from 34% of the EU average in Latvia to around 70% in Slovenia and Cyprus. These disparities are larger than those for the Greece, Portugal and Spain whose income levels were around 65% of the old EU10 average when they joined in the 1980s.

The potential spatial impact of enlargement in terms of convergence of economic performance could be analysed by looking at previous enlargement schemes. This SIR has presented an excursion into the enlargement process of Portugal and has drawn some preliminary lessons for the new member states.

7.3 Employment and unemployment

There are still pronounced disparities in employment and unemployment in the European regions, ranging in 2001 from average unemployment rates of 2.3% at the

lowest and 19.7% at the peak[30]. All of the candidate countries, with the exception of Cyprus and Slovenia had higher unemployment rates in 2001 than the EU 15 average. Regional disparities in employment were most pronounced in Slovakia and Bulgaria.

Project 1.1.3 will address employment and unemployment challenges in the TIR by means of assessing trends in the spatial tissue and proposing policy options such as how to increase flexibility in labour markets.

7.4 Human capital as location factor

The spatial pattern of labour with modern education is one of the most important factors to explain spatial impact of enlargement. Human capital contributes directly and indirectly to economic growth. How do the new member states and the different regional labour markets fare in this respect? Official statistics suggest that their human capital is relatively well developed - these countries register high levels of elementary and secondary education (much higher than Mediterranean countries in the 1980s). The scope of tertiary education is generally narrower than in most of western Europe. The lack of life-long learning and re-training systems makes the supply of labour less flexible, less mobile and less productive. The distribution of human capital is geographically biased, which to a large extent is a reflection of the quite centralized system of higher education in the new member states.

7.5 Regional specialisation

An area of further research for the 1.1.3 group will be to analyse the current degree of regional specialisation in the candidate countries, the EU 15+2 and the new neighbouring countries in order to determine trends such as clusters and networking between firms. The spatial impact of enlargement depends to a large extent on the rate of regional specialisation as a consequence of the increasing trade which will occur as trade barriers are removed. From experience we know that European regions have become more specialised in the course of economic integration, reflecting both their comparative advantages and agglomeration effects.

[30] Second Progress Report on Economic and Social Cohesion (COM (2003) 34 Final, Brussels 30.1.2003

7.6 Potential for integration in terms of flows and barriers

The purpose is to examine the barriers and options for increased flows across borders, ranking from hard to soft barriers. This will be done for the TIR, primarily based on case studies and process evaluation of emerging cross-border programmes.

	Barriers				
Flows of	Road infrastructure, crossings	ICT network	Administrative capacity	Language	Cultural history
People					
Goods					
Services					
Capacity for c/b cooperation					

7.7 Institutional capacity

The implementation of convergence policy is at heart a national policy matter, although countries may choose to delegate the implementation and monitoring of EU convergence policy to the regional levels. Therefore continuous institution building at the national, regional and local levels in the accession countries is of utmost importance for successful convergence during the enlargement process. Recent evaluations of EU structural policy support that it has been more effective in countries with official institutions.

While convergence appears to be happening *between* countries in Europe, there seems to be a decrease in convergence *within* countries.[31] In order to decrease interpersonal inequality within national boundaries and encourage polycentric development at the national level and below, central governments must have the institutional capacity for making and implementing spatial and convergence policy. This call is also echoed in the Second Progress Report on Economic and Social Cohesion (COM (2003) 34 Final, Brussels 30.1.2003.

Institutional capacity building is a process that involves value added instruction, the training of trainers, activities with multiplier effects, and networking. It ensures the creation of an enabling environment with appropriate policy and legal frameworks; institutional development, including community participation and human resources development, strengthening of managerial systems, and fostering of partnerships.

The need of boosted institutional or administrative capacity is most valuable in two phases: 1) to meet the stringent EU requirements of using funding for convergence purposes, and 2) at the regional and local level, to be better able to evaluate policies and engage in policy dialogues with EU officials. Many candidate countries have already begun the process of institutional assimilation in order to be able to implement the *acquis* in several areas such as environmental policy. But there is still room for increased research efforts with regard to policy analysis of the various factors leading to institutional capacity and a survey of the capacity in the EU 27+2 and new neighbouring statese.

There have been calls from the international and EU levels for new forms of governance to meet the challenges of sustainable economic, ecological and social development (the Johannesburg principles, EU white paper on Governance). This form of governance includes integration of policy sectors and new forms of partnerships. One of the next goals for project 1.1.3 is to determine what new types of governance constellations may be appropriate for achieving cohesion at all levels in an enlarged Europe.

[31] Sapir et al (2003) An agenda for growing Europe: Making the EU economic system deliver. Report of an Independent High-level Study Group established on the initiative of the President of the European Commission. July 2003

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7.8 Towards TIR

The TIR of ESPON project 1.1.3 to be submitted in August 2004, four months after the current Accession countries have become new Member States, will include the following items:

1. Provisional final results concerning
   - the existing structure of urban nodes in the eastern parts of the ESPON space
   - measurement of the degree of polycentrism in the Accession countries
   - problems and dynamics primarily in eastner parts of the European territory, including: a profile of the economic base, accessibility to transport and knowledge, potential complementarities with neighbouring metropolitan regions, capitals and regional cities, potential increase of attractiveness through urban qualities, natural and cultural assets

2. This will lead to a provisional final diagnose of the spatial tissue and structure in Accession countries:

- relation to polycentrism and territorial balance and the policy orientation for cities, accessibility and natural and cultural heritage adopted by the ESDP

3. Detection and use of territorial typologies revealing risks and potentials, development poles, networks of urban areas, rural – urban relations

4. Further analysis of spatial discontinuities and barriers as well as potentials, focusing on assessment of future external and internal borders

5. Identification of the particular territorial effects of the ongoing transformation process as well as problems and potential for stepwise spatial integration of accession countries in a wider European polycentric and balanced spatial tissue

7.9 Work plan September 2003 – August 2004

Approach and co-operation with ESPON Projects	**1.1.3 division of labour between WPs**	**Contribution to 1.1.3TIR**
Data collection	WP2 Data Inventory	Intensified efforts to include flow data at NUTS 3 level, in particular on labour mobility and FDI .
Data analysis and mapping (close cooperation with Projects 1.1.1, 1.1.2, 1.1.4 and 3.1 on spaital association)	WP 3 Diagnosis: Spatial tissue and interaction, Polycentrism, Discontinuities	Further results concerning the existing structure of urban nodes and the degree of polycentrism at different levels. Problems and dynamics in all parts of the European territory Deepened and broadened diagnosis of the spatial tissue and structure in Accession countries: relation to territorial balance and the policy orientation for cities, accessibility Territorial typologies reflecting risks and potentials, development poles, networks of urban areas, rural – urban partnerships
Case study on cross-border interaction (cooperation with	WP 3 Diagnosis, border regions, Spatial	Analysis of spatial discontinuities and potentials, assessment of future external and internal borders.

Project 1.1.3 associate partners in Accession counntries)	Co-operation	Case study results on cross-border flows and best practices in capacity building
Enlargement scenarios: - spatial economic dynamics - Assessment of Infrastructure scenarios - Provisional TIA	WP 4 Spatial impact of enlargement	Territorial effects of the ongoing transformation process, problems and potential for spatial integration of Accession countries in a wider European polycentric context. Spatial impact analysis of policy options suggested in Chapter 4 of ESPON 1.1.3 SIR
Policy orientations (close cooperation with ESPON 1.1.1 on polycentricity, 1.1.2 on urban-rural relations, 2.1.1 on Transport policy, 2.1.3 on CAP and Rural development and 2.2.1 on Structural fund policy)	WP 5 Policy recommendations	Suggestions for policy actions at EU, national and regional level for spatial integration of candidate countries in a wider European polycentric context and at different levels. Proposals for institutional capacity

APPENDIX Table A.1: Regional performance in different parts of the ESPON space, 2000

GDP/inh. Index(2000) EU15 = 100	Number of regions					Share in population (%)					Share in GDP PPS (%)				
	Total	**EU10**	**CH/NO**	**INT**	**EXT**	**Total**	**EU10**	**CH/NO**	**INT**	**EXT**	**Total**	**EU10**	**CH/NO**	**INT**	**EXT**
>100	354	2	26	5	11	31.6	0.6	1.5	0.3	0.9	48.1	0.8	2.2	0.4	1.2
75-100	449	5	19	11	11	30.8	0.9	0.8	0.4	0.6	31.0	0.9	0.9	0.4	0.6
50-75	337	27	-	37	32	19.3	2.5	-	1.6	1.9	14.1	1.6	-	1.0	1.4
25-50	126	74	-	8	26	13.2	10.0	-	0.8	2.6	5.6	4.1	-	0.4	1.0
< 25	63	13	-	2	24	5.1	1.2	-	< 0.1	1.8	1.2	0.3	-	< 0.1	0.4
Total	**1329**	**121**	**45**	**63**	**104**	**100.0**	**15.2**	**2.3**	**3.1**	**7.8**	**100.0**	**7.7**	**3.1**	**2.2**	**4.6**

INT = Border regions at EU15-EU10/Candidate country border
EXT = Border regions at external border

APPENDIX Table A.2: Regional performance in different parts of the ESPON space, 1995

GDP/inh. Index(1995) EU15 = 100	Number of regions					Share in population (%)					Share in GDP PPS (%)				
	Total	**EU10**	**CH/NO**	**INT**	**EXT**	**Total**	**EU10**	**CH/NO**	**INT**	**EXT**	**Total**	**EU10**	**CH/NO**	**INT**	**EXT**
>100	376	1	27	7	10	32.3	0.2	1.6	0.3	0.8	49.0	0.3	2.5	0.5	1.1
75-100	439	5	18	11	11	29.3	1.1	0.7	0.4	0.7	29.7	1.0	0.8	0.4	0.7
50-75	324	29	-	36	29	19.8	2.6	-	1.7	1.8	14.5	1.7	-	1.2	1.3
25-50	151	70	-	8	39	14.9	9.6	-	0.7	3.2	5.8	3.8	-	0.3	1.2
< 25	39	16	-	1	15	3.7	1.7	-	< 0.1	1.3	1.0	0.4	-	< 0.1	0.3
Total	**1329**	**121**	**45**	**63**	**104**	**100.0**	**15.2**	**2.3**	**3.1**	**7.8**	**100.0**	**7.2**	**3.3**	**2.4**	**4.6**

INT = Border regions at EU15-EU10/Candidate country border
EXT = Border regions at external border

APPENDIX Table A3. Border regions in the ESPON space

a) EU15 - EU10 border

Border regions in EU15

AT111	MITTELBURGENLAND
AT112	NORDBURGENLAND
AT113	SUEDBURGENLAND
AT124	WALDVIERTEL
AT125	WEINVIERTEL
AT126	WIENER UMLAND/NORDTEIL
AT127	WIENER UMLAND/SUEDTEIL
AT211	KLAGENFURT-VILLACH
AT213	UNTERKAERNTEN
AT224	OSTSTEIERMARK
AT225	WEST-UND SUEDSTEIERMARK
AT313	MUEHLVIERTEL
DE225	FREYUNG-GRAFENAU
DE229	REGEN
DE235	CHAM
DE237	NEUSTADT A. D. WALDNAAB
DE239	SCHWANDORF
DE23A	TIRSCHENREUTH
DE249	HOF, LANDKR.
DE24D	WUNSIEDEL IM FICHTELGEBIRGE
DE403	FRANKFURT/ODER, KRFR.ST.
DE405	BARNIM
DE409	MAERKISCH-ODERLAND
DE40C	ODER-SPREE

DE40G	SPREE-NEISSE
DE40I	UCKERMARK
DE80F	OSTVORPOMMERN
DE80I	UECKER-RANDOW
DED14	ANNABERG
DED16	FREIBERG
DED17	VOGTLANDKREIS
DED18	MITTLERER ERZGEBIRGSKREIS
DED1B	AUE-SCHWARZENBERG
DED22	GOERLITZ, KRFR.ST.
DED24	BAUTZEN
DED26	NIEDERSCHLESISCHER OBERLAUSITZKREIS
DED28	LOEBAU-ZITTAU
DED29	SAECHSISCHE SCHWEIZ
DED2A	WEISSERITZKREIS
GR112	XANTHI
GR113	RODOPI
GR114	DRAMA
IT332	UDINE
IT333	GORIZIA
IT334	TRIESTE

Border regions in EU10

BG055	SMOLYAN
BG056	KARDZHALI
CZ031	BUDEJOVICKY
CZ032	PLZENSKÝ
CZ041	KARLOVARSKÝ
CZ042	USTECKY
CZ051	LIBERECKY
CZ062	BRNENSKY

HU031	GYOR-MOSON-SOPRON
HU032	VAS
PL041	GORZOWSKI
PL042	ZIELONOGÓRSKI
PL0G1	SZCZECINSKI
SI003	KOROSKA
SI009	GORENJSKA
SI00B	GORISKA
SK01	BRATISLAVSKÝ
SK021	TRNAVSKÝ KRAJ

b) External borders

Border regions in EU15 and Norway

ES612	CADIZ
ES617	MALAGA
FI133	POHJOIS-KARJALA
FI134	KAINUU
FI151	POHJOIS-POHJANMAA
FI152	LAPPI
FI176	KYMENLAAKSO
FI177	ETELA-KARJALA
FR93	GUYANE
GR111	EVROS
GR123	KILKIS
GR124	PELLA
GR126	SERRES
GR132	KASTORIA
GR134	FLORINA
GR212	THESPROTIA

GR213	IOANNINA
GR222	KERKYRA
GR411	LESVOS
GR412	SAMOS
GR413	CHIOS
GR421	DODEKANISOS
GR431	IRAKLEIO
GR432	LASITHI
GR433	RETHYMNI
GR434	CHANIA
IT325	VENEZIA
IT326	PADOVA
IT327	ROVIGO
IT406	FERRARA
IT407	RAVENNA
IT408	FORLI-CESENA
IT409	RIMINI
IT531	PESARO E URBINO
IT532	ANCONA
IT533	MACERATA
IT534	ASCOLI PICENO
IT712	TERAMO
IT713	PESCARA
IT714	CHIETI
IT722	CAMPOBASSO
IT911	FOGGIA
IT912	BARI
IT914	BRINDISI
IT915	LECCE
NO073	FINNMARK

Border regions in EU10, Bulgaria and Romania

BG011	VIDIN
BG012	MONTANA
BG031	VARNA
BG032	DOBRICH
BG042	SOFIA
BG043	BLAGOEVGRAD
BG044	PEMIK
BG045	KYUSTENDIL
BG053	HASKOVO
BG061	BURGAS
BG063	YAMBOL
CY	KIBRIS
EE003	KIRDE-EESTI
EE005	LOUNA-EESTI
HU033	ZALA
HU041	BARANYA
HU042	SOMOGY
HU051	BORSOD-ABAÚJ-ZEMPL+N
HU063	SZABOLCS-SZATMAR-BEREG
HU071	BACS-KISKUN
HU073	CSONGRAD
LT001	ALYTAUS (APSKRITIS)
LT003	KLAIPEDOS (APSKRITIS)
LT004	MARIJAMPOLES (APSKRITIS)
LT007	TAURAGES (APSKRITIS)
LT009	UTENOS (APSKRITIS)
LT00A	VILNIAUS (APSKRITIS)
LV005	LATGALE
MT001	MALTA
MT002	GOZO AND COMINO

PL031	BIALSKOPODLASKI
PL032	CHELMSKO-ZAMOJSKI
PL092	KRÓSNIENSKO-PRZEMYSKI
PL0A1	BIALOSTOCKO-SUWALSKI
PL0E1	ELBLASKI
PL0E2	OLSZTYNSKI
PL0E3	ELCKI
RO012	BOTOSANI
RO013	IASI
RO015	SUCEAVA
RO016	VASLUI
RO023	CONSTANTA
RO024	GALATI
RO025	TULCEA
RO043	MEHEDINTI
RO052	CARAS-SEVERIN
RO054	TIMIS
RO064	MARAMURES
RO065	SATU MARE
SI001	POMURSKA
SI002	PODRAVSKA
SI004	SAVINJSKA
SI006	SPODNJEPOSAVSKA
SI00A	NOTRANJSKO-KRASKA
SI00C	OBALNO-KRASKA
SI00D	JUGOVZHODNA SLOVENIJA
SK041	PRESOVSKÝ KRAJ
SK042	KOSICKÝ KRAJ

APPENDIX Table A.4. Enlargement countries*: share (%) of the population of the capital city in the total population

Code	Country	Pop. Country (PC)	Capital city	Pop. Capital City	% PCC/PC	Census / Estimate
BG	Bulgaria	7 973 671	Sofia	1 096 389	13,8	C C 01.03.2001
CY	Cyprus	689 471	Nicosia	200 459	29,1	C C 01.10.2001
CZ	Czech Republic	10 292 933	Prague	1 178 576	11,5	C Cp 01.03.2001
EE	Estonia	1 376 743	Tallinn	403 981	29,3	Cp 31.01.2000
HU	Hungary	10 197 119	Budapest	1 775 203	17,4	C C 2001-02-01
LT	Lithuania	3 483 972	Vilnius	542 287	15,6	C C 06.04.2001
LV	Latvia	2 375 339	Riga	764 328	32,2	C Cp 31.03.2000
MT	Malta	378 518	Malta	378 518	100,0	E 31.12.1998
PL	Poland	38 644 211	Warsaw	1 610 471	4,2	C E 31.12.2000
RO	Romania	21 698 181	Bucharest	1 921 751	8,9	C C 18.03.2002
SI	Slovenia	1 948 250	Ljubljana	257 338	13,2	Cp 31.03.2002
SK	Slovak Republic	5 379 455	Bratislava	428 672	8,0	Cp 26.05.2001
	Total	104 437 863		10 557 973	10,1	
	Countries of western Balkan and Turkey					
	Croatia	4 437 460	Zagreb	691 724	15,6	
	Bosnia & Herzegovina	3 482 000	Serajevo	416 497	12,0	
	Yugoslavia	10 576 292	Belgrad	1 194 878	11,3	
	Albania	3 510 500	Tirana	243 000	6,9	
	FYROM	2 023 000	Skopje	444 299	22,0	
	Turkey	67 803 927	İstanbul	8 803 468	13,0	
	Turkey	67 803 927	Ankara	3 203 362	4,7	

*** + Countries of western Balkan and Turkey**

Sources

For the population:

Thomas Brinkhoff: City Population, http://www.citypopulation.de.

Notes

C census
Cp census (provisional)
E estimate

APPENDIX Table A.5. FUAs of the accession countries, the countries of western Balkan and Turkey per level

Country	International level FUA	National/transnational level FUA	Regional FUA	Population	Census / Estimate
Bulgaria	**Sofia**			1 096 389	C C 01.03.2001
		Varna		314 539	
		Burgas		193 316	
		Plovdiv		340 638	
		Russe		162 128	
Cyprus	**Nicosia**			200 459	C C 01.10.2001
		Limassol		154 694	
Czech	**Prague**			1 178 576	C Cp 01.03.2001
Republic	Brno			379 185	
	Ostrava			319 293	
		Plzen		166 274	
		Olomouc		103 293	
Estonia	**Tallinn**			403 981	Cp 31.01.2000

		Tartu		101 246	
Hungary	**Budapest**	not defined yet		1 775 203	C C 2001-02-01
		(included to list of	Békéscsaba		
		regional FUAs)	Debrecen	211 034	
			Dunaújváros		
			Eger		
			Gyor	129 412	
			Kaposvár		
			Kecskemét	107 749	
			Miskolc	184 125	
			Nagykanizsa		
			Nyíregyháza	118 795	
			Pécs	162 498	
			Sopron		
			Szeged	168 372	
			Székesfehérvár	106 346	
			Szolnok	77 631	
			Szombathely	81 920	
			Tatabánya		
			Veszprém		
			Zalaegerszeg		
Latvia	**Riga**			764 328	C Cp 31.03.2000
		Daugavpils		114 829	
Lithuania	**Vilnius**			542 287	C C 06.04.2001
		Kaunas		378 943	
		Klaipeda		192 954	
		Šiauliai		133 883	
		Panevezys		119 749	

Malta	**Malta**			378 518	E 31.12.1998
Poland	**Warsaw**			1 610 471	C E 31.12.2000
	Katowice (FUR)			340 539	
	Wroclaw			633 857	
	Lódz			793 217	
	Gdansk			456 574	
	Kraków			741 510	
	Poznan			574 896	
	Szczecin			416 485	
	Lublin			355 803	
		Koszalin			
		Bydgoszcz		384 537	
		Torun			
		Olsztyn			
		Bialystok		285 507	
		Zielona Góra			
		Kalisz			
		Opole			
		Czestochowa		255 549	
		Bielsko-Biala			
		Rzeszów			
		Kielce			
		Radom			
Romania	**Bucharest**			1 921 751	C C 18.03.2002
		not defined yet	Alexandria		
		(included to list of	Arad	172 824	
		regional FUAs)	Bacau	175 921	
			Baia Mare		
			Bârlad		
			Bistrita		

			Botosani		
			Braila	216 929	
			Brasov	283 901	
			Buzau		
			Calarasi		
			Cluj-Napoca	318 027	
			Constanta	310 526	
			Craiova	302 622	
			Deva		
			Drobeta-Turnu Severin		
			Focsani		
			Galati	298 584	
			Giurgiu		
			Hunedoara		
			Iasi	321 580	
			Medias		
			Onesti		
			Oradea	206 527	
			Piatra Neamt		
			Pitesti	168 756	
			Ploiesti	232 452	
			Râmnicu Vâlcea		
			Resita		
			Roman		
			Satu Mare		
			Sfântu Gheorghe		
			Sibiu	155 045	
			Slatina		
			Slobozia		
			Suceava		
			Târgoviste		

			Târgu Jiu		
			Târgu Mures		
			Timisoara	317 651	
			Tulcea		
			Turda		
			Vaslui		
			Zalau		
Slovakia	**Bratislava**			428 672	Cp 26.05.2001
		Košice		236 093	
Slovenia	**Ljubljana**			257 338	Cp 31.03.2002
		Maribor		92 284	

Croatia	**Zagreb**			691 724	
Bosnia & Herzegovina	**Serajevo**			416 497	
Yugoslavia	**Belgrad**			1 194 878	
Albania	**Tirana**			243 000	
FYROM	**Skopje**			444 299	
Turkey	**İstanbul**			8 803 468	
	Ankara			3 203 362	

Sources

For the typology of cities: ESPON 111 SIR

For the population:

Thomas Brinkhoff: City Population, http://www.citypopulation.de.

We added data for the countries of the western Balkan and Turkey

Abbreviations

C	census
Cp	census (provisional)
E	estimate

APPENDIX Table A.6. "European cities" of the accession countries

Rank	COUNTRY	**CITY_CODE**	**CITY_NAME**	**synthesis**
15	BULGARY	BG020	SOFIA	3,6
16	HUNGARY	HU006	BUDAPEST	3,6
17	POLAND	PL183	WARSZAWA	3,6
22	CZECH REP.	CZ047	PRAHA	3,5
23	ROMANIA	RO020	BUCURESTI	3,5
25	SLOVENIA	SI009	LJUBLJANA	3,4
26	SLOVAKIA	SK004	BRATISLAVA	3,4
27	LATVIA	LV004	RIGA	3,3
29	ESTONIA	EE002	TALLINN	3,3
30	LITUANIA	LT006	VILNIUS	3,2
32	MALTA	MT001	VALLETTA	3,2

Source of the data: ESPON 1.1.1 SIR

APPENDIX Table A.7. "Transnational cities" of the accession countries

Rank		**CITY_CODE**	**CITY_NAME**	**synthesis**

5		PL189	WROCLAW	2,8
6		PL061	KATOWICE	2,8
7		PL130	POZNAN	2,8
14		BG023	VARNA	2,6
15		PL034	GDANSK	2,6
24		RO096	TIMISOARA	2,5
36		PL074	KRAKOW	2,4
43		CZ042	OSTRAVA	2,3
52		BG003	BURGAS	2,2
53		LT003	KLAIPEDA	2,2
54		LT002	KAUNAS	2,2
72		CY004	LARNACA	2,0
74		SI023	KOPER	2,0
84		CZ003	BRNO	2,0
94		BG014	PLOVDIV	2,0
96		CY001	NICOSIA	2,0
98		EE003	TARTU	2,0
100		PL093	LUBLIN	2,0
101		PL086	LODZ	2,0
102		PL064	KIELCE	2,0
103		PL167	SZCZECIN	2,0
104		SK012	KOSICE	2,0
132		CY007	PAPHOS	1,8
136		HU054	SZEGED	1,8
137		PL017	BYDGOSZCZ	1,8
138		PL008	BIALYSTOK	1,8
139		SK018	NITRA	1,8
140		SK002	BANSKA BYSTRICA	1,8
145		RO033	CLUJ-NAPOCA	1,8
146		RO019	BRASOV	1,8
147		SI010	MARIBOR	1,8

180		PL176	TORUN	1,6
181		BG021	STARA ZAGORA	1,6
182		CY005	LIMASSOL	1,6
183		HU018	GYOR	1,6
184		LT005	SIAULIAI	1,6
185		PL201	ZIELONA GORA	1,6
186		PL115	OPOLE	1,6
187		PL142	RZESZOW	1,6
188		PL113	OLSZTYN	1,6
189		SK035	TRNAVA	1,6
190		SK038	ZILINA	1,6
226		RO036	CONSTANTA	1,5
241		PL027	CZESTOCHOWA	1,5
243		RO077	PLOIESTI	1,5
245		CZ046	PLZEN	1,5

Source of the data: ESPON 1.1.1 SIR

APPENDIX Table A.8. "Transnational cities" of the accession countries - ranked per country code

52	BULGARY	BG003	BURGAS	2,2
94		BG014	PLOVDIV	2,0
181		BG021	STARA ZAGORA	1,6
14		BG023	VARNA	2,6
96	CYPRUS	CY001	NICOSIA	2,0
72		CY004	LARNACA	2,0
182		CY005	LIMASSOL	1,6
132		CY007	PAPHOS	1,8
84	CZECH REPUBLIC	CZ003	BRNO	2,0
43		CZ042	OSTRAVA	2,3
245		CZ046	PLZEN	1,5

98	ESTONIA	EE003	TARTU	2,0
183	HUNGARY	HU018	GYOR	1,6
136		HU054	SZEGED	1,8
54	LITHUANIA	LT002	KAUNAS	2,2
53		LT003	KLAIPEDA	2,2
184		LT005	SIAULIAI	1,6
138	POLAND	PL008	BIALYSTOK	1,8
137		PL017	BYDGOSZCZ	1,8
241		PL027	CZESTOCHOWA	1,5
15		PL034	GDANSK	2,6
6		PL061	KATOWICE	2,8
102		PL064	KIELCE	2,0
36		PL074	KRAKOW	2,4
101		PL086	LODZ	2,0
100		PL093	LUBLIN	2,0
188		PL113	OLSZTYN	1,6
186		PL115	OPOLE	1,6
7		PL130	POZNAN	2,8
187		PL142	RZESZOW	1,6
103		PL167	SZCZECIN	2,0
180		PL176	TORUN	1,6
5		PL189	WROCLAW	2,8
185		PL201	ZIELONA GORA	1,6
146	ROMANIA	RO019	BRASOV	1,8
145		RO033	CLUJ-NAPOCA	1,8
226		RO036	CONSTANTA	1,5
243		RO077	PLOIESTI	1,5
24		RO096	TIMISOARA	2,5
147	SLOVENIA	SI010	MARIBOR	1,8
74		SI023	KOPER	2,0
140	SLOVAKIA	SK002	BANSKA BYSTRICA	1,8

104		SK012	KOSICE	2,0
139		SK018	NITRA	1,8
189		SK035	TRNAVA	1,6
190		SK038	ZILINA	1,6

Source of the data: ESPON 1.1.1 SIR